

Traffic Impact and Access Study

Proposed Aroma Joe's 79 Haverhill Street

Methuen, MA



August 1, 2023

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TRAFFIC IMPACT AND ACCESS STUDY

PROPOSED AROMA JOE'S COFFEE SHOP

79 Haverhill Street

METHUEN, MASSACHUSETTS

Prepared for:

AMIGOS COFFEE, LLC
Lee, New Hampshire

August 1, 2023

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SECTION 1: EXECUTIVE SUMMARY

Bayside Engineering has prepared this Traffic Impact and Access Study (TIAS) for the proposed Aroma Joe's Coffee Shop (the "Project"), to be located at 79 Haverhill Street in Methuen, Massachusetts. The study has been prepared to conform with the March 2014 MassDOT/EOEEA *Transportation Impact Assessment (TIA) Guidelines*.

This report identifies existing traffic operating parameters on key roadways and intersections within the study area, evaluates the anticipated traffic volume increases as a result of the proposed project, analyzes the project's traffic-related impacts, determines the projects access/egress requirements and identifies appropriate mitigating measures designed to minimize the traffic-related impacts created by the project. The following provides a brief summary of the study findings.

Review of the Project and its access plan shows that in relation to roadway capacity, traffic safety, and traffic impacts upon the surrounding roadway network, the proposed project will meet safety standards and have a minimal impact on existing traffic conditions. With the proposed access, in conjunction with the mitigation measures described above, safe and efficient access can be provided to the clientele of the Project and to the motoring public in the area.

PROJECT DESCRIPTION

The site contains approximately 0.41± acres (17,928± square feet) of land and is located on the north side of Haverhill Street (Route 110), east of Strathmore Road. The site is bordered by commercial developments to the east and west, Haverhill Street to the south and open space/wooded land to the north. Currently, the site contains parking for the adjacent commercial spaces. Access is currently provided to the site by way of a single full movement driveway to Haverhill Street.

The project will consist of the removal of the existing parking lot on the site and the construction of a 782 square feet (sf) Aroma Joe's coffee shop. There will be no indoor seating and a single drive-through window will be provided. Access to the site will be provided by way of a driveway across from Madison Street. A new exit only driveway

will also be provided approximately 100 feet west of the entrance driveway. Parking on the site will be provided for six (6) vehicles. Figure 1 shows the site location in relation to the surrounding area.



Figure 1
Site Location Map

STUDY AREA

Based on a review of the anticipated trip generation and trip distribution for the proposed development, a local study area was established. The study area includes the following intersections:

- Haverhill Street, Strathmore Road and existing site driveway, and
- Haverhill Street, Madison Street and existing site driveway.

EXISTING CONDITIONS

Evaluation of existing conditions within the study area includes a description of roadway geometrics, traffic constraints, land uses at the intersections, and quantification of traffic volumes.

Existing Traffic Volumes

To establish base traffic conditions within the study area, manual turning movement and vehicle classification counts were obtained in June 2023. Peak-period manual turning movement counts were conducted during the weekday morning peak period (7:00 to 9:00 AM) and weekday evening period (4:00 to 6:30 PM) on June 5, 2023. Daily traffic counts were conducted on Haverhill Street from June 20 through June 21, 2023 for a two day period using automatic traffic recorders (ATR).

The traffic-volume data gathered as part of this study was collected during the month of June 2023. Data from the MassDOT was reviewed to determine the appropriate seasonal adjustments. Based on available Massachusetts Department of Transportation (MassDOT) data, June represents above average month conditions. The June volumes were used to represent average month conditions.

Due to the COVID-19 pandemic, traffic volumes from Spring 2019 through Winter 2021 were lower than normal. To account for this, data from the Massachusetts Department of Transportation's (MassDOT) Mobility Dashboard website and historical traffic volume data were used to adjust for the downturn in traffic volumes. However, effective March 1, 2022, MassDOT has indicated that overall, traffic volumes have established a 'new normal' and no adjustment for COVID-19 is required. The exception is in areas of high office development. Hence, no COVID-19 adjustment is necessary.

Haverhill Street carries approximately 15,650 vpd east of Madison Street. During the weekday morning peak hour, Haverhill Street carries approximately 777 vph. During the weekday evening peak hour, Haverhill Street carries approximately 1,247 vph.

Motor Vehicle Crash Data

Motor vehicle crash data for the study area intersections were obtained from the MassDOT Crash Portal for 2017 through the end of 2022. The motor vehicle crash data was reviewed to determine crash trends in the study area. Four (4) crashes were reported at the study area intersections. Of the four (4) crashes, one (1) was reported at the intersection of Haverhill Street, Strathmore Road, and the driveway to 79 Haverhill Street, and three (3) crashes were reported at the intersection of Haverhill Street, Madison Street, and the driveway to 39 Haverhill Street. No fatalities were reported.

Vehicle Speeds

Existing speed data for Haverhill Street was also collected. The average speed of vehicles travelling eastbound and westbound on Haverhill Street, east of Madison Street was found to be 31.6 mph to 28.4 mph, respectively. The 85th percentile speed was found to be 34 mph for eastbound vehicles and 32 mph for westbound vehicles. The 85th percentile speed is the speed at which sight distances are evaluated.

Public Transportation

Public transportation services are provided within the study area by the Merrimack Valley Regional Transportation Authority (MVRTA). Bus Route 24 (Lawrence/Lowell) provides access from Buckley Transportation Center in Lawrence to the Robert B. Kennedy Transfer Center in Lowell. Route 24 bus service is provided Monday through Friday from 5:00 AM to 7:40 PM and on Saturday from 7:00 AM to 6:40 PM.

At the Robert B. Kennedy Transfer Center, access is provided to the Lowell MBTA Station on the Lowell Line of the MBTA Commuter Rail.

Planned Roadway Improvements

Officials for MassDOT and the City of Methuen were contacted regarding roadway improvements planned for the study area intersections. No improvements are currently contemplated that would increase capacity in the study area.

PROBABLE IMPACTS OF THE PROJECT

No-Build Traffic Volumes

To determine the impact of site-generated traffic volumes on the roadway network under future conditions, baseline traffic volumes in the study area were projected to the year 2030. Traffic volumes on the roadway network at that time, in the absence of the proposed project, would include existing traffic, new traffic due to general background traffic growth, and traffic related to specific developments by others expected to be completed by 2030. Available data compiled by the Central Transportation Planning Staff (CTPS) indicate that a 0.644 percent (minor arterials) to 0.95 percent (interstate) compounded growth rate would be appropriate to develop future No-Build conditions. For this study, a one (1.0) percent compounded growth was used.

The City of Methuen and the Town of Norwood were also contacted to determine if any specific background projects could impact future traffic conditions. Based on these contacts, no other projects were identified that would need to be included in the No-Build projections.

However, a small project at 436 Haverhill Street is being contemplated. Currently at that site is an approximately 3,275 sf one-story building formerly used as a printing shop. The plan is to convert the building into a mixed-used building with 3,275 sf commercial/office space on the first floor and five (5) one-bedroom affordable apartments on the second floor. Traffic from this project would be accounted for in the compounded growth rate used in the No-Build projections.

Build Traffic Volumes

Site generated traffic was based on trip-generation data published by the ITE *Trip Generation* manual¹. The trip generation data for Land Use Code (LUC) 221 – Multifamily Housing (Mid-Rise) and ITE LUC 882 – Shopping Center (<40,000 sf) published by the ITE was evaluated to determine the expected trip generation for the proposed project.

On a typical weekday, the proposed project is expected to generate 242 *new* vehicle trips (121 vehicles entering and 121 vehicles exiting). During the weekday morning peak hour, 40 vehicle trips (20 vehicles entering and 20 vehicles exiting) are expected. During the weekday evening peak hour, 17 vehicle trips (9 vehicles entering and 8 vehicles exiting) are expected.

TRAFFIC OPERATIONS ANALYSIS

At the unsignalized intersections within the study area on Haverhill Street, the critical movements operate at reasonable levels of service with moderate delays during the weekday morning and evening peak hours. The critical movements at the unsignalized intersections all are expected to have volume to capacity (v/c) ratios below 1.0 (theoretical capacity), indicating capacity for the critical movement.

RECOMMENDATIONS

A comprehensive transportation mitigation program has been developed that is designed to reduce automobile trips associated with the Project and accommodate the additional traffic expected to be generated by the Project in a safe and efficient manner.

Project Access

Access to the Project site will be provided by way of two driveways to Haverhill Street. The following recommendations are offered with respect to the design and operation of the Project site driveways:

- The Project primary site driveways 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. The west site driveway will consist of one exiting lane. The east site driveway will consist of one (1) entering lane and one (1) exiting lane.
- Vehicles exiting the Project site will be placed under STOP-sign control with a marked STOP line provided.

¹*Trip Generation*, Eleventh Edition; Institute of Transportation Engineers; Haverhill, DC; 2021.

- The Project site driveways and internal circulating aisles will be designed to accommodate the turning and maneuvering requirements of service and delivery trucks and emergency vehicles.
- All signs and pavement markings to be installed within the Project site will conform to the applicable standards of the *Manual on Uniform Traffic Control Devices*² (MUTCD).
- Signs and landscaping to be installed as a part of the Project within the intersection sight triangle areas of the Project site driveway will be designed and maintained so as not to restrict lines of sight.
- Snow windrows within sight triangle areas of the Project site driveways will be promptly removed where such accumulations would impede sight lines.

CONCLUSION

Based on this assessment, the following can be concluded with respect to the Project:

- On a typical weekday, the proposed project is expected to generate 242 *new* vehicle trips (121 vehicles entering and 121 vehicles exiting). During the weekday morning peak hour, 40 vehicle trips (20 vehicles entering and 20 vehicles exiting) are expected. During the weekday evening peak hour, 17 vehicle trips (9 vehicles entering and 8 vehicles exiting) are expected.
- The Project will not have a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions). Volume to capacity ratios (v/c) at the unsignalized intersections show very small increases overall. The v/c ratios for the critical movements at the unsignalized study area intersections are below 1.0, indicating capacity for the movement.
- Lines of sight at the Project site driveway intersections with Haverhill Street were found to exceed the recommended minimum distances for safe and efficient operation based on the appropriate approach speed. It is recommended that any landscaping or site signage be set-back from Haverhill Street to not impede sight lines.
- A review of the Site Plan for the Project indicates that human-made objects, landscaping, and signs have been appropriately designed and located so as not to inhibit sight lines to and from the Project site driveways along Haverhill Street.

² *Manual on Uniform Traffic Control Devices*; Federal Highway Administration; Haverhill D.C.; 2009.

SECTION 2: EXISTING TRAFFIC CONDITIONS

The evaluation of a proposed project's transportation impacts requires a complete understanding of the existing transportation system within the study area. Existing conditions include roadway geometrics, traffic control, daily and peak hour traffic flows, public transportation and vehicular crash data. Each of these are discussed below.

STUDY AREA

Based on a review of the anticipated trip generation and trip distribution for the proposed development, a local study area was established. The study area includes the following intersections:

- Haverhill Street, Strathmore Road and existing site driveway, and
- Haverhill Street, Madison Street and existing site driveway.

FIELD SURVEY

A comprehensive field inventory of the proposed site was conducted in June 2023. The inventory included collection of existing roadway geometrics, traffic volumes, and safety data for the existing study area intersections and site access driveway locations. Traffic volumes were measured by means of automatic traffic recorder (ATR) counts and substantiated by manual turning movement counts (TMCs) conducted at the study area intersections.

GEOMETRICS

Primary study area roadways are described below. Figure 2 graphically summarizes the existing roadway and intersection characteristics within the study area.

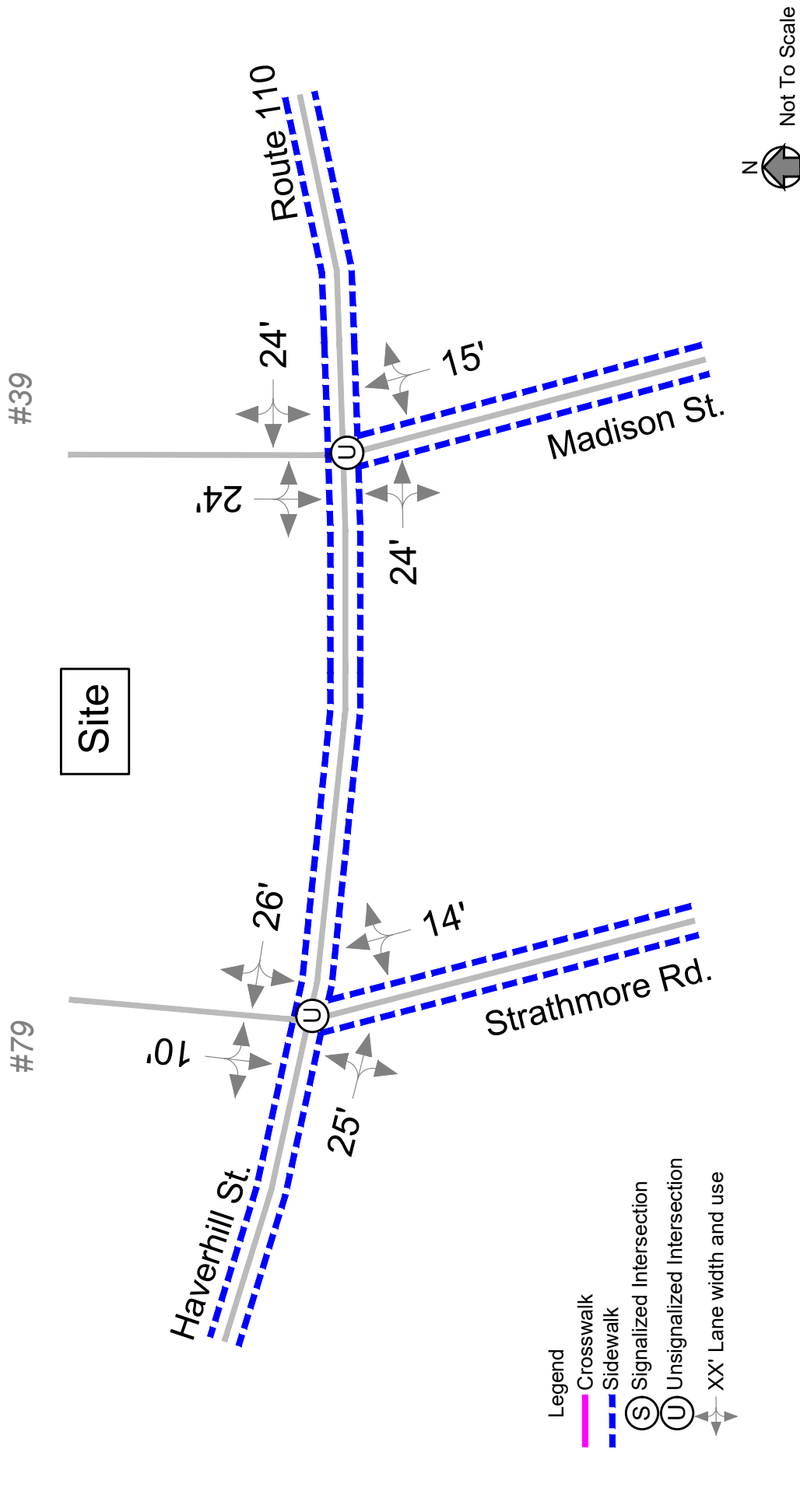


Figure 2
Existing Lane Use, Travel
Lane Width, and
Pedestrian/Bicycle Facilities

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Roadways

Haverhill Street (Route 110)

Haverhill Street (Route 110) is a two-lane Urban Principal Arterial under the jurisdiction of the City of Methuen. Haverhill Street traverses the study area in a general east/west direction from Lowell Street easterly to Prospect Street in Lawrence. The speed limit on Haverhill Street is 30 mph. Additional turn lanes exist at key intersections. Sidewalks are provided along both sides of Haverhill Street. Land use in the vicinity of the site consists of commercial and residential properties.

Intersections

Haverhill Street, Strathmore Road and Existing Driveway

Haverhill Street forms the east leg of this four-legged unsignalized intersection with Strathmore Road, which forms the south leg and the existing driveway to 79 Haverhill Street which forms the north leg. The Haverhill Street approaches each consist of a single lane permitting left and right turns. The Strathmore Road northbound approach consists of a single lane permitting left and right turns. The driveway approach consists of a single lane permitting left and right turns. Sidewalks exist along both sides of all approaches to the intersection except for the driveway approach. The Strathmore Road and driveway approaches operate under STOP control. Land use in the vicinity of the intersection consists of residential and commercial properties.

Haverhill Street, Madison Street and Existing Driveway

Haverhill Street forms the east leg of this four-legged unsignalized intersection with Madison Street, which forms the south leg and the existing driveway to 39 Haverhill Street which forms the north leg. The Haverhill Street approaches each consist of a single lane permitting left and right turns. The Madison Street northbound approach consists of a single lane permitting left and right turns. The driveway approach consists of a single lane permitting left and right turns. Sidewalks exist along both sides of all approaches to the intersection except for the driveway approach. The Madison Street and driveway approaches operate under STOP control. Land use in the vicinity of the intersection consists of residential and commercial properties.

TRAFFIC VOLUMES

Existing Traffic Volumes

To establish base traffic conditions within the study area, manual turning movement and vehicle classification counts were obtained in June 2023. Peak-period turning movement counts were conducted during the weekday morning peak period (7:00 to 9:00 AM) and

weekday evening period (4:00 to 6:30 PM) on June 20, 2023 at the following intersections:

- Haverhill Street, Strathmore Road and existing site driveway, and
- Haverhill Street, Madison Street and existing site driveway.

Daily traffic counts were conducted on Haverhill Street (north of Haverhill Street) and on Haverhill Street (east of the site) for a two day period using automatic traffic recorders (ATR) on June 20 and 21, 2023.

Analysis of the peak-period traffic counts indicated that the weekday morning commuter peak hour generally occurs between 7:45 and 8:45 AM and the weekday evening commuter peak hour generally occurs between 4:00 and 5:00 PM. The traffic count worksheets are provided in the Appendix.

Seasonal Adjustment

The traffic-volume data gathered as part of this study was collected during the month of June 2023. Available traffic volume data from the MassDOT was reviewed to determine the monthly variations of the traffic volumes. The traffic data showed June volumes to be above average month conditions. Therefore, the June traffic volumes were used to represent average month conditions. The 2023 existing weekday daily and peak-hour traffic volumes are summarized in Table 1. Figure 3 shows the 2023 Existing weekday morning and weekday evening peak hour traffic volumes. The seasonal worksheets are provided in the Appendix.

Due to the COVID-19 pandemic, traffic volumes from Spring 2019 through Winter 2021 were lower than normal. To account for this, data from the Massachusetts Department of Transportation's (MassDOT) Mobility Dashboard website and historical traffic volume data were used to adjust for the downturn in traffic volumes. However, effective March 1, 2022, MassDOT has indicated that overall, traffic volumes have established a 'new normal' and no adjustment for COVID-19 is required. The exception is in areas of high office development. Hence, no COVID-19 adjustment is necessary.

TABLE 1
EXISTING WEEKDAY TRAFFIC VOLUME SUMMARY^a

Location	Weekday	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
	Traffic Volume ^b	Traffic Volume ^c	K Factor ^d	Directional Distribution ^e	Traffic Volume	K Factor	Directional Distribution
Haverhill Street, west of Madison Street	15,650	777	5.0	60.1% WB	1,247	8.0	60.2% EB

^aTwo-way traffic volume

^bDaily traffic expressed in vehicles per day.

^cExpressed in vehicles per hour.

^dPercent of daily traffic volumes which occurs during the peak hour.

^ePercent of peak-hour volume in the predominant direction of travel.

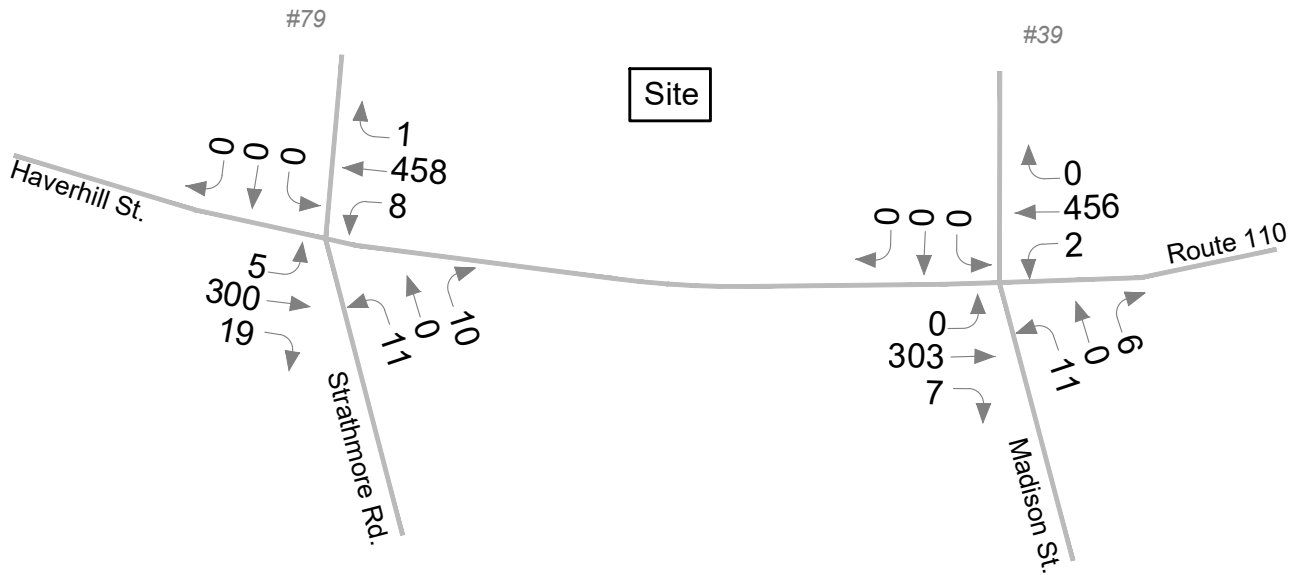
NB = northbound; SB = southbound; EB = eastbound; WB = westbound.

Haverhill Street carries approximately 15,650 vpd east of Madison Street. During the weekday morning peak hour, Haverhill Street carries approximately 777 vph. During the weekday evening peak hour, Haverhill Street carries approximately 1,247 vph.

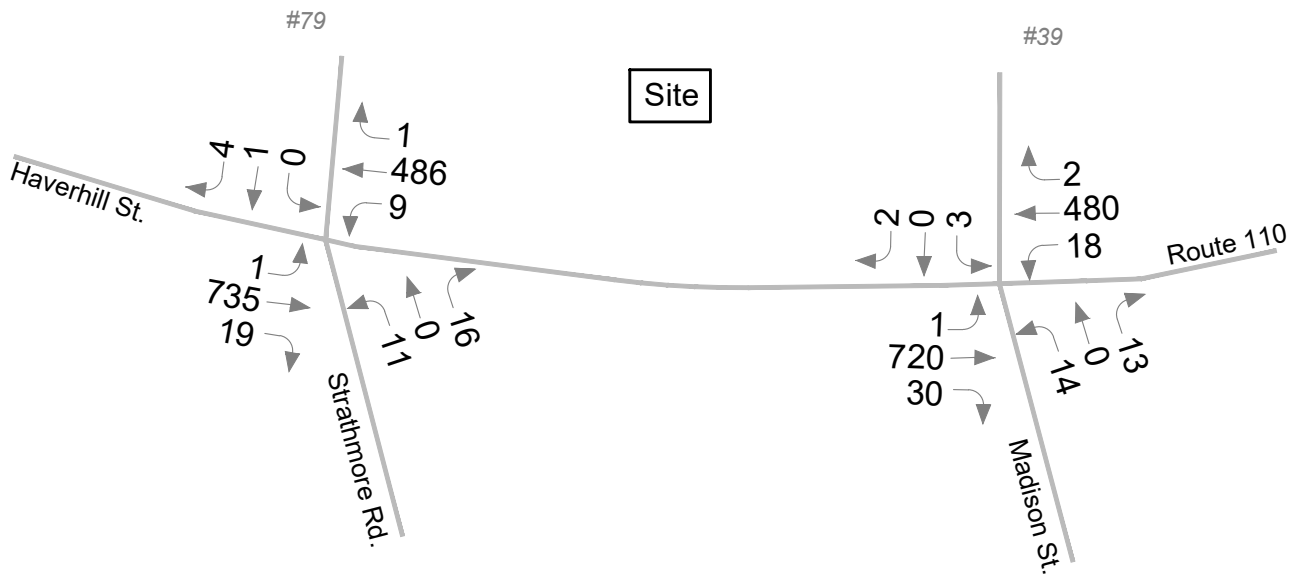
MOTOR VEHICLE CRASH DATA

Motor vehicle crash data for the study area intersections were obtained from the MassDOT Crash Portal for 2017 through the end of 2022. The motor vehicle crash data was reviewed to determine crash trends in the study area. Four (4) crashes were reported at the study area intersections. Of the four (4) crashes, one (1) was reported at the intersection of Haverhill Street, Strathmore Road, and the driveway to 79 Haverhill Street, and three (3) crashes were reported at the intersection of Haverhill Street, Madison Street, and the driveway to 39 Haverhill Street. No fatalities were reported. The crash data is summarized in Table 2 and included in the Appendix.

Weekday Morning Peak Hour



Weekday Evening Peak Hour



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Figure 3
 2023 Existing
 Peak Hour Traffic Volumes

TABLE 2
MOTOR VEHICLE CRASH DATA SUMMARY^a

<u>Scenario</u>	<u>Haverhill Street, Strathmore Road, and 79 Haverhill Street Driveway</u>	<u>Haverhill Street, Madison Street, and 39 Haverhill Street Driveway</u>
<i>Year:</i>		
2017	0	1
2018	0	0
2019	0	0
2020	0	1
2021	0	0
<u>2022</u>	<u>1</u>	<u>1</u>
Total	1	3
<i>Average:</i>	0.17	0.50
<i>Crash Rate:</i>	0.03	0.09
<i>Significance:</i>	No	No
<i>Type:</i>		
Angle	0	2
Rear-End	0	1
<u>Single Vehicle Crash</u>	<u>1</u>	<u>0</u>
Total	1	3
<i>Time of Day:</i>		
Weekday (7:00 to 9:00 AM)	0	1
Weekday (4:00 to 6:00 PM)	0	2
<u>Remainder of Day</u>	<u>1</u>	<u>0</u>
Total	1	3
<i>Pavement Conditions:</i>		
Dry	0	3
Wet	1	0
Snow/Ice	0	0
Other	0	0
<u>Unknown</u>	<u>0</u>	<u>0</u>
Total	1	3
<i>Severity:</i>		
Property Damage Only	1	2
Personal Injury	0	1
Fatal Accident	0	0
<u>Unknown</u>	<u>0</u>	<u>0</u>
Total	1	3

^aSource: MassDOT Crash Portal, 2017 to 2022.

^bAverage crashes over analysis period.

^cCrash rate per million entering vehicles (mev).

^dSignalized intersections are significant if rate >0.75 crashes per million vehicles, and unsignalized intersections are significant if rate >0.57 crashes per million vehicles.

VEHICLE SPEEDS

Existing speed data for Haverhill Street was also collected using the ATR. The speed data is summarized in Table 3.

TABLE 3
OBSERVED VEHICLE SPEEDS

Location	Posted Speed Limit (mph)	Direction	Average Observed Speed ^a (mph)	85 th Percentile Speed (mph)
Haverhill Street, east of Madison Street	30	EB	31.6	34
	30	WB	28.4	32

^aBased on speed data compiled on June 20 and 21, 2022.

As shown in Table 3, the average speed of vehicles travelling eastbound and westbound on Haverhill Street, east of Madison Street was found to be 31.6 mph to 28.4 mph, respectively. The 85th percentile speed was found to be 34 mph for eastbound vehicles and 32 mph for westbound vehicles. The 85th percentile speed is the speed at which sight distances are evaluated.

PUBLIC TRANSPORTATION

Public transportation services are provided within the study area by the Merrimack Valley Regional Transportation Authority (MVRTA). Bus Route 24 (Lawrence/Lowell) provides access from Buckley Transportation Center in Lawrence to the Robert B. Kennedy Transfer Center in Lowell. Route 24 bus service is provided Monday through Friday from 5:00 AM to 7:40 PM and on Saturday from 7:00 AM to 6:40 PM.

At the Robert B. Kennedy Transfer Center, access is provided to the Lowell MBTA Station on the Lowell Line of the MBTA Commuter Rail.

PLANNED ROADWAY IMPROVEMENTS

Officials for MassDOT and the City of Methuen were contacted regarding roadway improvements planned for the study area intersections. No improvements are currently contemplated that would increase capacity in the study area.

SECTION 3:

2030 NO-BUILD AND BUILD TRAFFIC CONDITIONS

To determine the impact of site-generated traffic volumes on the roadway network under future conditions, baseline traffic volumes in the study area were projected to the year 2030. Traffic volumes on the roadway network at that time, in the absence of the proposed project, would include existing traffic, new traffic due to general background traffic growth, and traffic related to specific developments by others expected to be completed by 2030. Consideration of these factors resulted in the development of 2030 No-Build traffic volumes. Anticipated site-generated traffic volumes were then superimposed upon these No-Build traffic flow networks to develop 2030 Build conditions.

2030 NO-BUILD TRAFFIC VOLUMES

Traffic growth on area roadways is a function of the expected land development in the immediate area as well as 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 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 produces a more realistic estimate of growth for local traffic. However, the drawback of this procedure is that the potential growth in population and development external to the study area would not be accounted for in the traffic projections.

To provide a conservative analysis framework, both procedures were used.

Background Traffic Growth

Research was performed to determine the historic growth rate for traffic in the study area as well as other planned developments that may affect traffic within the study area for the proposed project. The Central Transportation Planning Staff (CTPS) was contacted to determine regional growth for Methuen and the surrounding area. Based on this data, growth is expected to occur at a rate of 0.872 percent per year. To provide a conservative analysis, a background growth rate of 1.0 percent per year was applied.

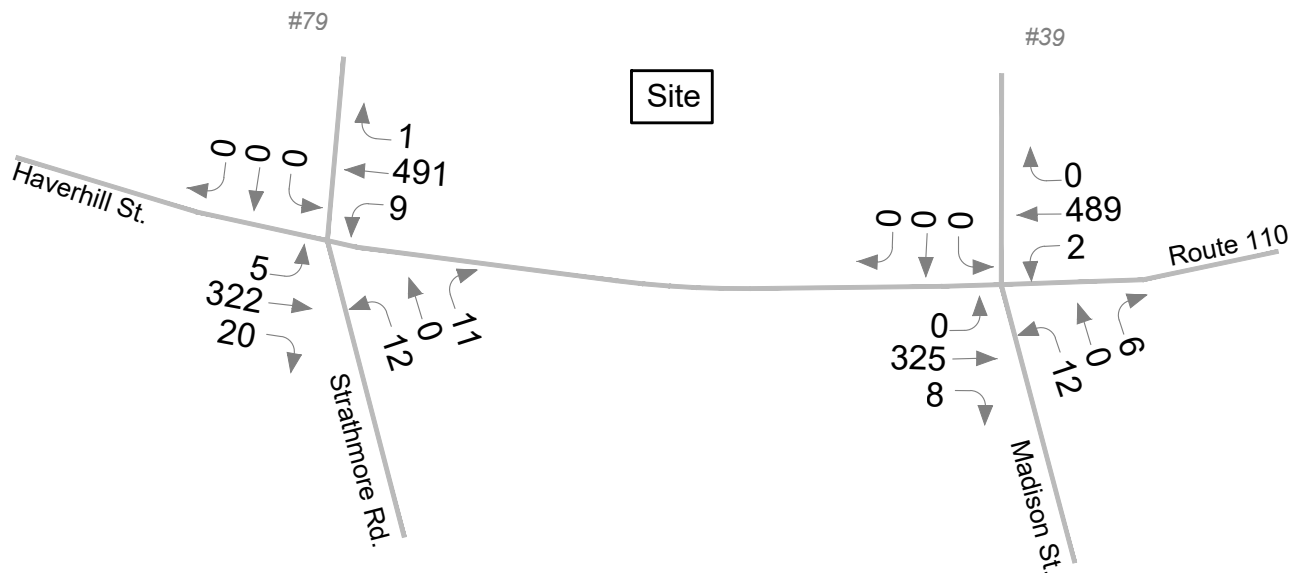
Specific Development by Others

The City of Methuen was contacted to identify specific planned developments in the vicinity of the study that could impact future traffic conditions. The City indicated that there are no projects that would impact traffic flows in the surrounding area.

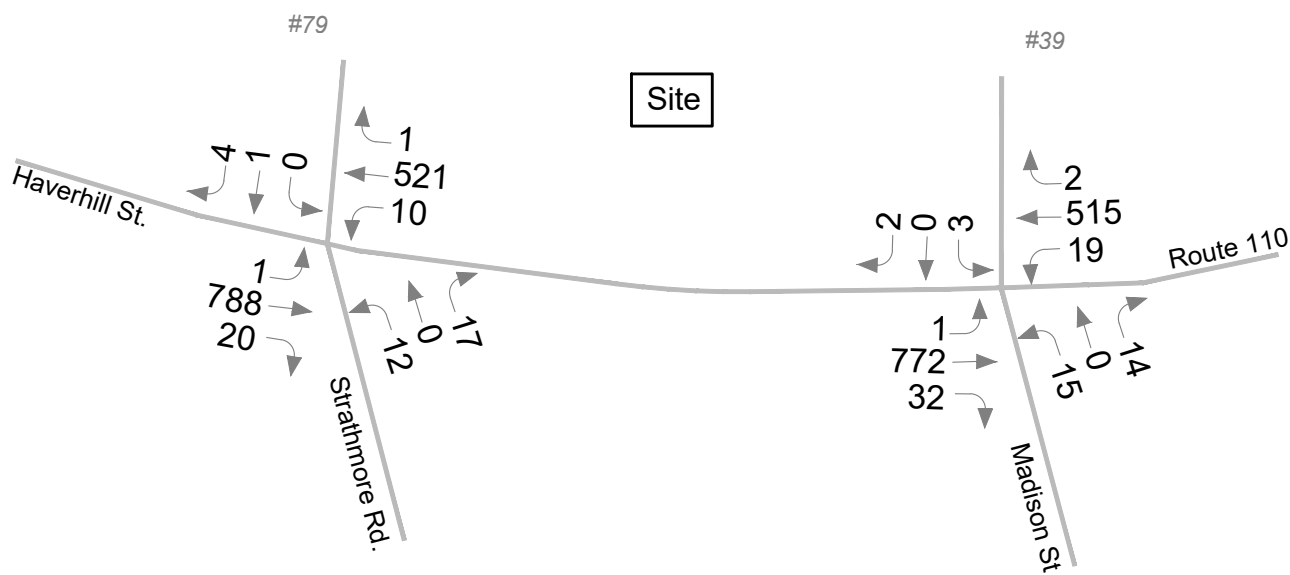
No-Build Condition Traffic Volumes

The 2030 No-Build weekday morning and evening peak-hour traffic volumes were developed by applying a compounded 1.0 percent annual growth rate to the 2023 Existing peak-hour traffic volumes. Figure 4 shows the projected 2023 No-Build peak hour traffic volumes for the respective weekday morning and weekday evening peak-hours.

Weekday Morning Peak Hour



Weekday Evening Peak Hour



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Figure 4

2030 No-Build
 Peak Hour Traffic Volumes

FUTURE 2030 BUILD CONDITIONS

Project Description

The project will consist of the removal of the existing parking lot on the site and the construction of a 782 square feet (sf) Aroma Joe's coffee shop. There will be no indoor seating and a single drive-through window will be provided. Access to the site will be provided by way of a driveway across from Madison Street. A new exit only driveway will also be provided approximately 100 feet west of the entrance driveway. Parking on the site will be provided for six (6) vehicles.

Traffic Generation

Site generated traffic was based on trip-generation data published by the ITE *Trip Generation* manual³ compared with available empirical trip generation data. Bayside used the following sources to determine the potential trip generation of the site.

- **Historical Aroma Joe's Sales and Traffic Data** – CES, Inc. analyzed order data from an existing Aroma Joe's franchise on Route 1 in Saco for a three-week period. Based on order data from this site, the weekday morning peak hour traffic generation was found to be 110 trips in the weekday morning peak hour. The AADT at the Saco location was found to be 21,480 vehicles per day (vpd). From this data it was determined that the traffic generation based on AADT would be 5.12 trips/1,000 AADT.
- **Eaton Traffic Engineering Queue Study for Aroma Joe's** – A queue study was performed by Eaton Traffic Engineering in August of 2014 to determine queue lengths for three different Aroma Joe's franchises in Maine. Based on the study, it was determined that the weekday morning peak hour traffic generation of 130 trips has been an accepted traffic generation for a drive-through Aroma Joe's with no seating.
- **ITE Trip Generation Manual, 8th Edition (LUC 937 – Coffee Donut Shop w/Drive Through Window)** – LUC 937 gives an AM peak traffic generation rate of 85.88 trips/1,000 SF of gross floor area. This would equate to a weekday morning peak generation rate for this site of 67 trips in the weekday morning peak hour.
- **AADT Data for the Proposed Site** – Based on the data collected for Haverhill Street it was determined that the AADT (factored to 2030) at the site location would be approximately 16,800 vpd. Using the previously determined trip generation based on AADT and the future AADT's of Haverhill Street, the trip generation would be 86 trips during the weekday morning peak hour.

³*Trip Generation*, Eleventh Edition; Institute of Transportation Engineers; Haverhill, DC; 2021.

Based on the above it was determined that an appropriate weekday morning peak hour trip generation would be 130 vehicle trips.

To determine Daily and weekday evening peak hour trips, the respective ratios of the Weekday morning and daily trip characteristics found in Land Use Code 937 were used to determine the daily traffic generation and the weekday evening peak hour generation. The expected trip generation is summarized in Table 4 and the trip generation worksheets are included in the Appendix.

TABLE 4
TRIP-GENERATION SUMMARY

	Proposed Aroma Joe's Trips ^a
Average Weekday Daily Traffic	808
<i>Weekday Morning Peak Hour:</i>	
Entering	65
<u>Exiting</u>	<u>65</u>
Total	130
<i>Weekday Evening Peak Hour:</i>	
Entering	30
<u>Exiting</u>	<u>29</u>
Total	59

^aBased on compilation of empirical data and ITE LUC 937 data.

Not all of the trips expected to be generated by the coffee shop represent new trips on the study area roadway system. According to the ITE Trip Generation Handbook, a portion of these trips can be considered pass-by trips. That is, they are not considered primary trips of site generated traffic, but consist of vehicles passing by the site on their way to another destination. For various coffee shop uses, the ITE Trip Generation Handbook estimates that on average, pass-by trips can account for approximately 89 percent of the weekday morning peak hour trip generation. It is expected that coffee and donut shops have a high pass-by rate. Based on empirical studies for Aroma Joe's, the pass-by rate is 70%. It was assumed that 70 percent of the peak hour trips will be pass-by trips. These trips are shown in the second column of Table 5. The total *net new* trips are shown in the last column of Table 5.

TABLE 5
TRIP-GENERATION SUMMARY WITH PASS-BY TRIPS

	Total Site Trips ^a	Pass-By Trips	Total Site Trips
Average Weekday Daily Traffic	808	566	242
<i>Weekday Morning Peak Hour:</i>			
Entering	65	45	20
<u>Exiting</u>	<u>65</u>	<u>45</u>	<u>20</u>
Total	130	90	40
<i>Weekday Evening Peak Hour:</i>			
Entering	30	21	9
<u>Exiting</u>	<u>29</u>	<u>21</u>	<u>8</u>
Total	59	42	17

^aFrom Table 4.

On a typical weekday, the proposed project is expected to generate 242 *new* vehicle trips (121 vehicles entering and 121 vehicles exiting). During the weekday morning peak hour, 40 vehicle trips (20 vehicles entering and 20 vehicles exiting) are expected. During the weekday evening peak hour, 17 vehicle trips (9 vehicles entering and 8 vehicles exiting) are expected.

Trip Distribution

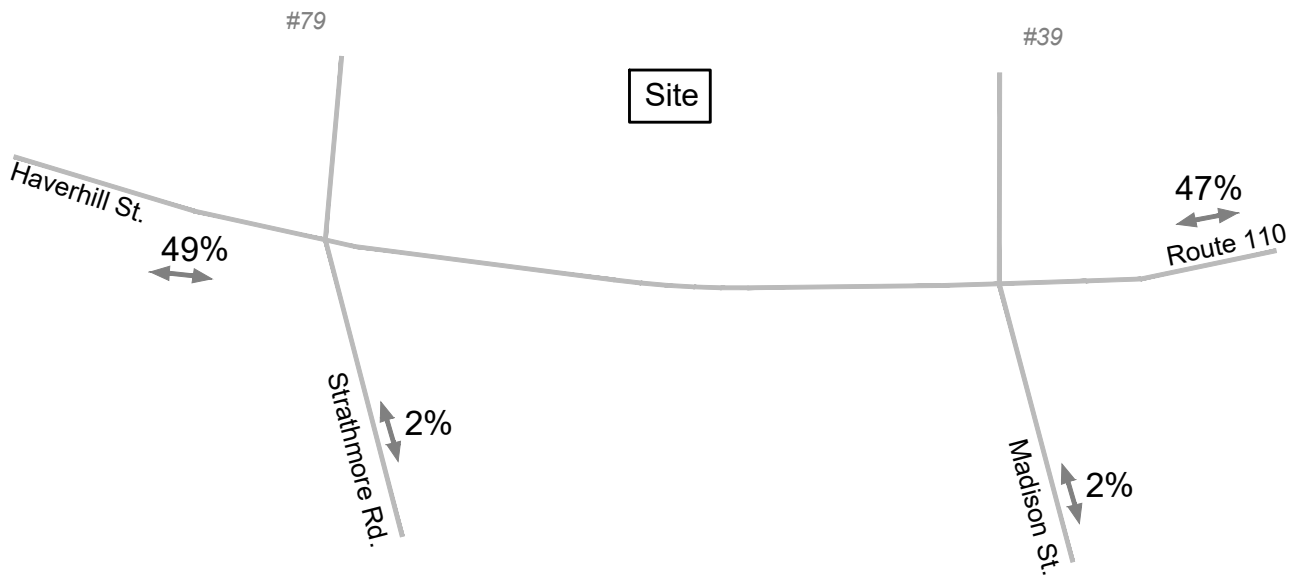
The directional distribution of the vehicular traffic approaching and departing the site is a function of existing travel patterns, similar uses, and the efficiency of the existing roadway system. Table 6 summarizes the expected trip distribution, which is also shown on Figure 5.

TABLE 6
TRIP DISTRIBUTION

Route	Direction	Percent of Mixed-use Trips
Haverhill Street	East	47
Haverhill Street	West	49
Strathmore Road	South	2
Madison Street	South	<u>2</u>
TOTAL		100

Future Traffic Volumes - Build Condition

The site-generated traffic was distributed within the study area according to the percentages summarized in Table 6. The site generated volumes for the project are shown on Figure 6 and 9 for the respective weekday morning and weekday evening peak hours. The existing site generated volumes were removed and the site generated traffic volumes for the Project were then superimposed onto the 2030 No-Build traffic flow networks to reflect the proposed 2030 Build peak hour traffic volumes and are shown on Figures 10 and 11 for the respective weekday morning and weekday evening peak hours. These volumes were used as the basis for all analysis as well as to identify potential mitigation measures to ameliorate the project's impacts.



N.T.S. 



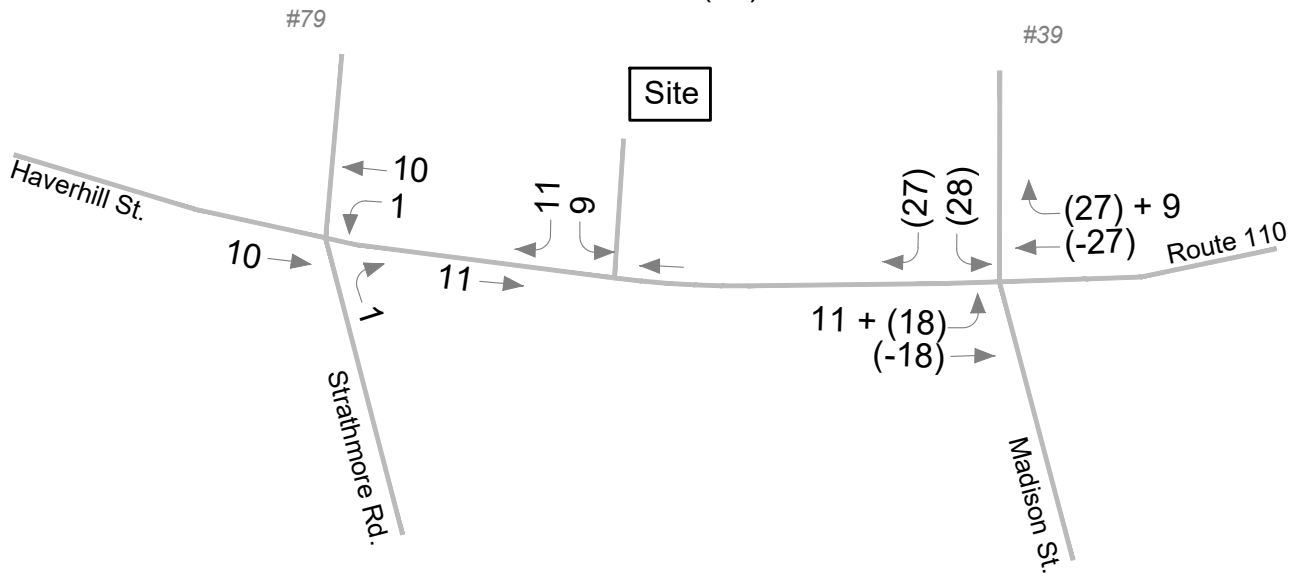
600 Unicorn Park Drive ▲ Woburn, MA 01801
Phone: 781.932.3201 ▲ Fax: 781.932.3413
www.baysideengineering.com

Proposed Coffee Shop
Methuen, MA

Figure 5
Trip Distribution

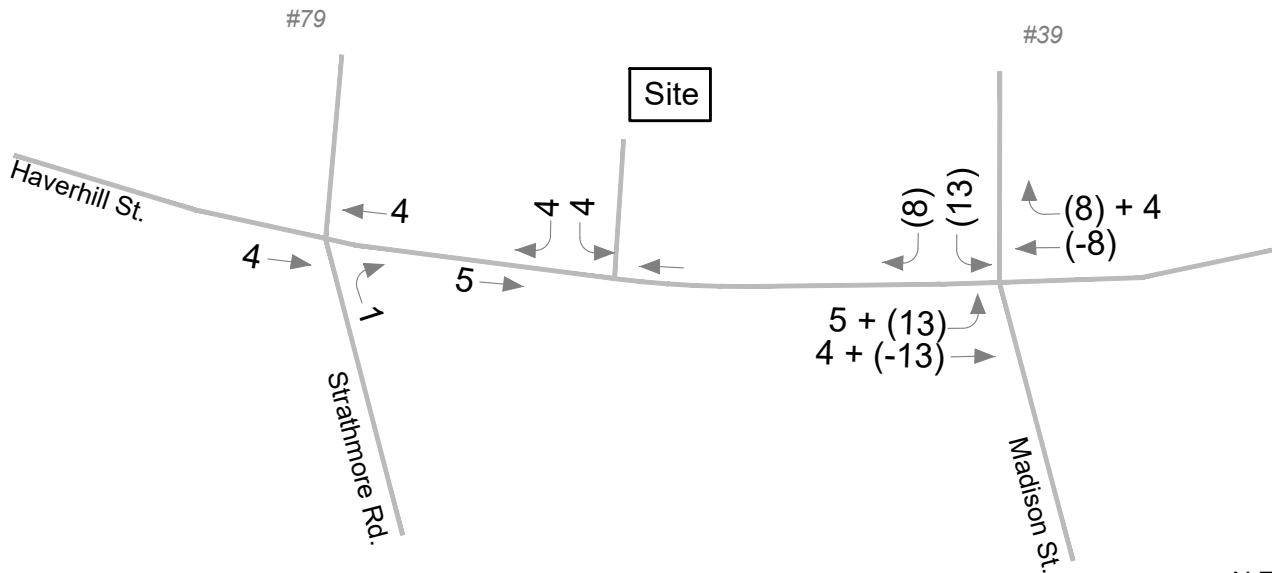
Weekday Morning Peak Hour

	New Trips	Pass-by Trips	Total Trips
In	20	(45)	65
Out	20	(45)	65
Total	40	(90)	130



Weekday Evening Peak Hour

	New Trips	Pass-by Trips	Total Trips
In	9	(21)	30
Out	8	(21)	29
Total	17	(42)	50



N.T.S.



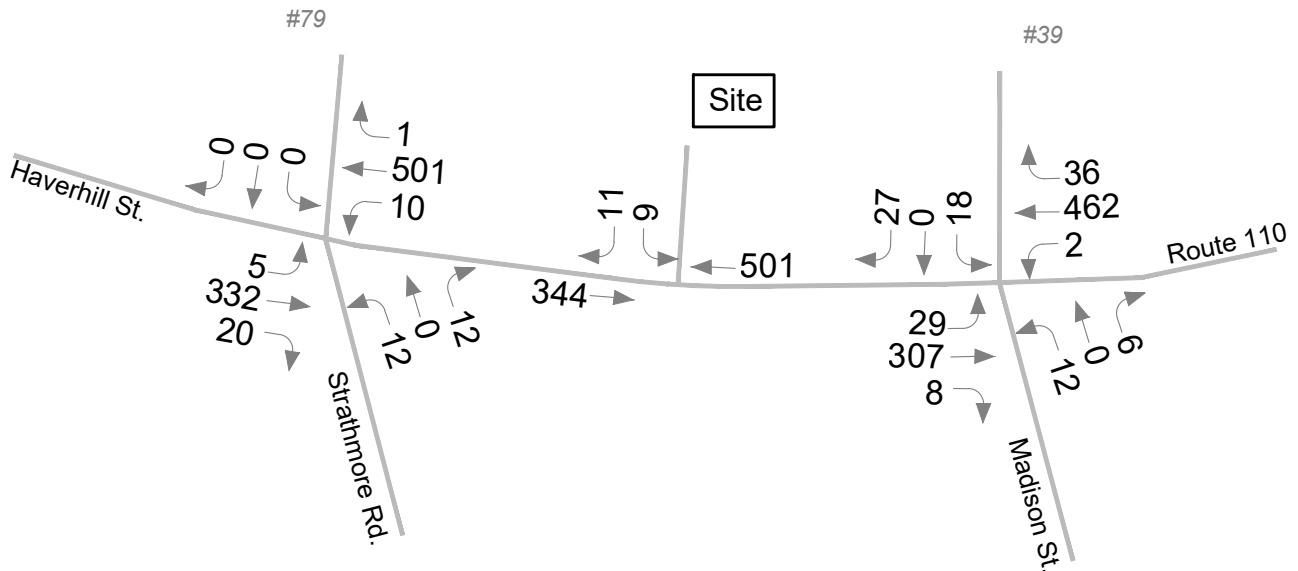
600 Unicorn Park Drive ▲ Woburn, MA 01801
 Phone: 781.932.3201 ▲ Fax: 781.932.3413
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Proposed Coffee Shop
 Methuen, MA

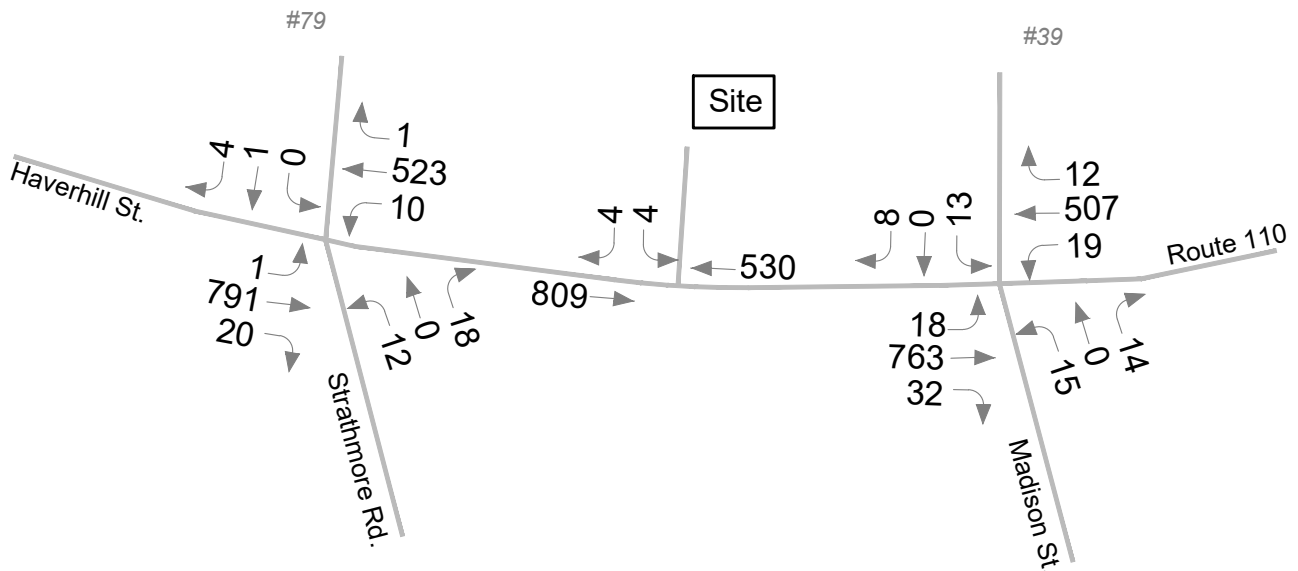
Figure 6

Site Generated
 Peak Hour Traffic Volumes

Weekday Morning Peak Hour



Weekday Evening Peak Hour



N.T.S.



600 Unicorn Park Drive ▲ Woburn, MA 01801
 Phone: 781.932.3201 ▲ Fax: 781.932.3413
www.baysideengineering.com

Proposed Coffee Shop
 Methuen, MA

Figure 7

2030 Build
 Peak Hour Traffic Volumes

A summary of peak-hour projected traffic-volume changes in the site vicinity is shown in Table 7. These volumes are based on the expected increases from the site traffic generation.

TABLE 7
TRAFFIC-VOLUME INCREASES AVERAGE MONTH CONDITIONS^a

Location/Peak Hour	2030 No-Build	2030 Build	Volume Change over No-Build	Percent Change over No-Build
<i>Haverhill Street east of Madison Street</i>				
Weekday Morning	822	831	9	1.1
Weekday Evening	1,325	1,328	3	0.2
<i>Haverhill Street west of Strathmore Road</i>				
Weekday Morning	850	870	20	2.4
Weekday Evening	1,346	1,351	5	0.4

^aAll volumes are vehicles per hour, total of both directions.

As shown in Table 7, project-related increases are in the range of 5 to 20 new vehicles during the weekday morning and weekday evening peak hours entering the study area. This is equivalent to approximately one (1) bi-directional vehicle every ten (10) minutes on average during the peak hours.

SECTION 4: ANALYSIS

To assess intersection operations, capacity analyses were conducted for Existing, No-Build, and Build traffic-volume conditions. Capacity analyses provide an indication of how well the study area intersections serve existing and projected traffic volumes. Vehicle queue analyses provide a secondary measure of the operational characteristics of an intersection or section of roadway under study in terms of lane use and demand.

METHODOLOGY

Levels of Service

Level of service (LOS) is a quantitative measure used to describe the operation of an intersection or roadway segment. The level of service definition is described by the quality of traffic flow and is primarily defined in terms of traffic delays. The primary result of capacity analyses⁴ is the assignment of a level of service to traffic intersections or roadway segments under various traffic-flow conditions. Six levels of service are defined for traffic intersections and roadway segments. Levels of service range from LOS A to LOS F. LOS A represents very good operating conditions and LOS F represents very poor operating conditions.

Signalized Intersections

Levels of service for signalized intersections are calculated using the methodology and procedures described in the 2010 *Highway Capacity Manual*⁵(HCM). The methodology assesses the intersection based on type of signal operation, signal timing and phasing, progression, vehicle mix, and intersection geometrics. Level-of-service designations are based on the delay per vehicle. Table 8 summarizes the relationship between level of service and delay. The calculated delay values result in level-of-service designations which

⁴The capacity analysis methodology is based on procedures presented in the *Highway Capacity Manual*; Transportation Research Board; Haverhill, DC; 2010.

⁵*Highway Capacity Manual*; Transportation Research Board; Haverhill, DC; 2010.

are applied to individual lane groups, to individual intersection approaches, and to the entire intersection. In the 2010 HCM methodology, the critical lane group volume to capacity ratio is reported.

TABLE 8
LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS^a

Delay per Vehicle (Seconds)	Defined Level of Service $v/c^b < 1.0$	Defined Level of Service $v/c^b > 1.0$
≤ 10.0	A	F
10.1 to 20.0	B	F
20.1 to 35.0	C	F
35.1 to 55.0	D	F
55.1 to 80.0	E	F
> 80.0	F	F

^a*Highway Capacity Manual*; Transportation Research Board; Broad, DC; 2010; page 18-6.

^bVolume to capacity ratio.

Unsignalized Intersections

The level of service for an unsignalized intersection is determined by the methodology and procedures described in the 2010 HCM. The level of service for unsignalized intersections is measured in terms of average delay for the critical movements (typically side street turning movements or mainline turning movements). The delay for the critical movements is a function of the available capacity for the movement and the degree of saturation of the lane group containing the critical movement. The delay calculation includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. The definitions for level of service at unsignalized intersections are also provided in the 2010 *Highway Capacity Manual*. Table 9 summarizes the relationship between level of service and average control delay for the critical movements at unsignalized intersections.

TABLE 9
LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS^a

Average Delay (seconds per vehicle)	Defined Level of Service $v/c^b < 1.0$	Defined Level of Service $v/c > 1.0$
≤ 10.0	A	F
10.1 to 15.0	B	F
15.1 to 25.0	C	F
25.1 to 35.0	D	F
35.1 to 50.0	E	F
> 50.0	F	F

^aHighway Capacity Manual; Transportation Research Board; Broad, DC; 2010; page 19-2

^bVolume to capacity ratio.

The analytical methodologies used for the analysis of unsignalized intersections use conservative analysis parameters, such as high critical gaps. The critical gap is defined as the minimum time between successive main line vehicles for a side street vehicle to execute the appropriate turning maneuver. Actual field observations indicate that drivers at the study area intersections accept smaller gaps in traffic than those used in the analysis procedures and therefore experience less delay than calculated by the HCM methodology. **The analysis results from the HCM model overstate the actual delays experienced in the field.** It should be noted that the unsignalized intersections along heavily trafficked roadways operate at constrained levels and the resulting calculated results of the unsignalized intersection analyses should be considered highly conservative.

CAPACITY ANALYSIS RESULTS

Level-of-service analyses were conducted for both average and peak month conditions for 2023 Existing, 2030 No-Build and 2030 Build conditions for the intersections within the study area. The results of the unsignalized capacity analyses are summarized in Table 10. Detailed analysis sheets are presented in the Appendix.

TABLE 10
UNIGNALIZED LEVEL-OF-SERVICE ANALYSIS SUMMARY

Critical Movement/ Peak Hour	2023 Existing					2030 No-Build					2030 Build				
	Demand ^a	V/C ^b	Delay ^c	LOS ^d	Queue ^e	Demand	V/C	Delay	LOS	Queue	Demand	V/C	Delay	LOS	Queue
<i>Haverhill Street, Strathmore Road, and 79 Haverhill Street Driveway</i>															
<i>All movements from Strathmore Road (NB):</i>															
Weekday Morning	21	0.10	15.5	C	7.5	23	0.12	16.6	C	10.0	24	0.13	16.9	C	10.0
Weekday Evening	27	0.17	24.9	C	15.0	29	0.21	28.9	D	17.5	30	0.21	28.8	D	20.0
<i>All movements from 79 Haverhill Street (SB):</i>															
Weekday Morning	0	--	0	A	--	0	--	0	A	--	0	--	0	A	--
Weekday Evening	5	0.02	15.0	C	2.5	5	0.02	16.0	C	2.5	5	0.02	16.0	C	2.5
<i>Haverhill Street, Madison Street, and 39 Haverhill Street Driveway</i>															
<i>All movements from Madison Street (NB):</i>															
Weekday Morning	17	0.07	15.8	C	5.0	18	0.08	17.1	C	7.5	18	0.09	19.0	C	7.5
Weekday Evening	27	0.27	30.6	D	25.0	29	0.33	37.0	E	35.0	29	0.35	39.4	E	37.5
<i>All movements from 39 Haverhill Street (SB):</i>															
Weekday Morning	0	--	0	A	--	0	--	0	A	--	45	0.14	16.6	C	12.5
Weekday Evening	5	0.11	27.9	D	10.0	5	0.13	32.2	D	10.0	21	0.16	35.7	E	15.0
<i>Haverhill Street and Proposed Site Exit Driveway</i>															
<i>All movements from Exit Driveway (SB):</i>															
Weekday Morning	--	--	--	--	--	--	--	--	--	--	20	0.06	14.6	B	5.0
Weekday Evening	--	--	--	--	--	--	--	--	--	--	8	0.04	21.7	C	2.5

^aDemand of critical movements in vehicles per hour.

^bVolume-to-capacity ratio.

^cDelay in seconds per vehicle.

^dLevel of service.

^e95th percentile queue in feet.

Haverhill Street, Strathmore Road and Driveway

Under 2023 Existing conditions, the critical movements (all movements from Strathmore Road) are modeled to operate at LOS C during the weekday morning peak hour and at LOS C during the weekday evening peak hour. Under future 2030 No-Build conditions, the critical movements are expected to operate at LOS C during the weekday morning peak hour and at LOS D during the weekday evening peak hour. Under future 2030 Build conditions, the critical movements are expected to continue to operate at LOS C during the weekday morning peak hour and at LOS D during the weekday evening peak hour. The volume to capacity ratios (v/c) for the critical movements are projected to be below 1.0 (theoretical capacity) indicating capacity for the critical movements.

Haverhill Street, Madison Street and Driveway

Under 2023 Existing conditions, the critical movements (all movements from Madison Street) are modeled to operate at LOS C during the weekday morning peak hour and at LOS D during the weekday evening peak hour. Under future 2030 No-Build conditions, the critical movements are expected to operate at LOS C during the weekday morning peak hour and at LOS E during the weekday evening peak hour. Under future 2030 Build conditions, the critical movements are expected to continue to operate at LOS C during the weekday morning peak hour and at LOS E during the weekday evening peak hour. The v/c ratio for the critical movements are projected to be below 1.0 indicating capacity for the critical movements.

Haverhill Street and Proposed Site Driveway (Exit)

Under future 2030 Build conditions, movements from the site exit only driveway are projected to operate at LOS B during the weekday morning peak hour and at LOS C during the weekday evening peak hour.

SIGHT DISTANCE

Sight distance measurements were performed at the proposed site driveway intersections with Haverhill Street in accordance with Massachusetts Department of Transportation (MassDOT) and American Association of State Highway and Transportation Officials (AASHTO) standards. Stopping sight distance (SSD) 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. Table 11 presents the measured SSD at the site access intersections. The sight distance calculations are included in the Appendix.

TABLE 11
SIGHT DISTANCE SUMMARY

	Required Minimum (Feet) ^a	Measured (Feet)
<i>Haverhill Street, Madison Street and Proposed East Site Driveway</i>		
<i>Stopping Sight Distance:</i>	216	290
Haverhill Street approaching from the east	236	370
Haverhill Street approaching from the west		
<i>Intersection Sight Distance:</i>		
Site Driveway looking to the east	325 ^b /375 ^c	240
Site Driveway looking to the west	325 ^b /375 ^c	330
<i>Haverhill Street and Proposed Site (Exit) Driveway</i>		
<i>Stopping Sight Distance:</i>		
Haverhill Street approaching from the east	216	325
Haverhill Street approaching from the west	236	345
<i>Intersection Sight Distance:</i>		
Site Driveway looking to the east	325 ^b /375 ^c	340
Site Driveway looking to the west	325 ^b /375 ^c	310

^aRecommended minimum values obtained from *A Policy on Geometric Design of Highways and Streets*; American Association of State Highway and Transportation Officials (AASHTO); 2018 and based on 85th percentile speed.

^bRecommended minimum value for vehicles turning right exiting a roadway under STOP-sign control.

^cRecommended minimum value for vehicles turning left exiting a roadway under STOP-sign control.

As can be seen in Table 11, the SSD measurements performed at Haverhill Street and the proposed site driveway intersections indicate that the intersection exceeds the recommended minimum SSD requirements based on the 85th percentile speeds. In accordance with the AASHTO manual, “*If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road.*” Accordingly, the ISD should be at least equal to the SSD, which would allow a driver approaching the minor road to safely stop. It is recommended that any landscaping or site signage be set-back from Haverhill Street to not impede sight lines.

SECTION 5: RECOMMENDATIONS AND CONCLUSION

RECOMMENDATIONS

A comprehensive transportation mitigation program has been developed that is designed to reduce automobile trips associated with the Project and accommodate the additional traffic expected to be generated by the Project in a safe and efficient manner.

Project Access

Access to the Project site will be provided by way of two driveways to Haverhill Street. The following recommendations are offered with respect to the design and operation of the Project site driveways:

- The Project primary site driveways 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. The west site driveway will consist of one exiting lane. The east site driveway will consist of one (1) entering lane and one (1) exiting lane.
- Vehicles exiting the Project site will be placed under STOP-sign control with a marked STOP line provided.
- The Project site driveways and internal circulating aisles will be designed to accommodate the turning and maneuvering requirements of service and delivery trucks and emergency vehicles.
- All signs and pavement markings to be installed within the Project site will conform to the applicable standards of the *Manual on Uniform Traffic Control Devices*⁶ (MUTCD).

⁶ *Manual on Uniform Traffic Control Devices*; Federal Highway Administration; Haverhill D.C.; 2009.

- Signs and landscaping to be installed as a part of the Project within the intersection sight triangle areas of the Project site driveway will be designed and maintained so as not to restrict lines of sight.
- Snow windrows within sight triangle areas of the Project site driveways will be promptly removed where such accumulations would impede sight lines.

CONCLUSION

Based on this assessment, the following can be concluded with respect to the Project:

- On a typical weekday, the proposed project is expected to generate 242 *new* vehicle trips (121 vehicles entering and 121 vehicles exiting). During the weekday morning peak hour, 40 vehicle trips (20 vehicles entering and 20 vehicles exiting) are expected. During the weekday evening peak hour, 17 vehicle trips (9 vehicles entering and 8 vehicles exiting) are expected.
- The Project will not have a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions). Volume to capacity ratios (v/c) at the unsignalized intersections show very small increases overall. The v/c ratios for the critical movements at the unsignalized study area intersections are below 1.0, indicating capacity for the movement.
- Lines of sight at the Project site driveway intersections with Haverhill Street were found to exceed the recommended minimum distances for safe and efficient operation based on the appropriate approach speed. It is recommended that any landscaping or site signage be set-back from Haverhill Street to not impede sight lines.
- A review of the Site Plan for the Project indicates that human-made objects, landscaping, and signs have been appropriately designed and located so as not to inhibit sight lines to and from the Project site driveways along Haverhill Street.

APPENDIX

Traffic Count Data

Seasonal Adjustment

Crash Data Worksheets

Trip Generation Worksheets

Capacity Analysis Worksheets

Sight Distance Worksheets

Traffic Count Data

Accurate Counts
978-664-2565

Location : Haverhill Street
Location : West of Madison Street
City/State: Methuen, MA
Direction: WB

34290001

6/20/2023	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	6	8	13	17	6	2	0	0	52
1:00	0	0	0	0	0	0	2	11	11	12	9	2	1	2	50
2:00	0	0	0	0	0	0	0	1	7	11	4	3	5	0	31
3:00	0	0	0	0	0	0	1	5	8	10	11	6	3	0	44
4:00	0	0	0	0	0	0	2	16	35	56	48	20	6	5	188
5:00	0	0	0	0	0	0	1	12	54	129	148	53	23	7	427
6:00	0	0	0	0	0	1	5	33	123	162	111	32	20	4	491
7:00	0	0	0	0	2	0	11	24	133	140	92	21	10	3	436
8:00	0	0	0	0	0	3	11	39	133	142	81	24	4	4	441
9:00	0	0	1	0	0	1	24	44	133	103	60	12	12	0	390
10:00	0	0	0	0	1	1	14	60	123	102	52	16	9	1	379
11:00	0	0	0	0	1	0	18	36	124	151	72	26	7	0	435
12:00 PM	0	0	0	0	1	0	8	56	122	137	64	19	6	2	415
1:00	0	0	0	1	0	0	15	57	120	142	82	20	9	1	447
2:00	0	0	0	0	0	1	8	48	153	138	67	27	4	1	447
3:00	0	0	0	0	5	0	27	49	113	131	61	20	7	2	415
4:00	0	0	2	2	2	2	23	65	161	136	75	12	4	1	485
5:00	0	0	1	0	3	6	14	51	136	149	45	16	10	1	432
6:00	0	0	0	0	1	2	25	41	114	101	52	13	6	1	356
7:00	0	0	1	0	1	1	6	38	98	109	69	15	5	0	343
8:00	0	0	0	0	0	0	9	24	78	112	52	13	6	1	295
9:00	0	0	0	0	2	1	15	30	76	75	36	4	2	1	242
10:00	0	0	1	0	0	0	4	18	37	46	30	11	2	0	149
11:00	0	0	0	0	0	1	8	12	21	31	14	4	3	1	95
Total	0	0	6	3	19	20	257	778	2126	2342	1341	391	164	38	7485

Percentile	15th
Speed	24
	50th
	28
	85th
	32
	95th
	34
Mean Speed (Average)	28.3
10 MPH Pace Speed	23-32
Number in Pace	6050
Percent in Pace	80.8%
Number > 30 MPH	1934
Percent > 30 MPH	25.8%

Accurate Counts
978-664-2565

Location : Haverhill Street
Location : West of Madison Street
City/State: Methuen, MA
Direction: WB

34290001

6/21/2023	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	2	4	14	5	5	4	2	1	37
1:00	0	0	0	0	0	1	2	4	4	9	7	2	1	0	30
2:00	0	0	0	0	0	0	1	4	10	7	8	2	2	0	34
3:00	0	0	0	1	0	0	2	5	13	10	6	4	3	3	47
4:00	0	0	0	0	0	0	5	8	30	61	36	23	11	8	182
5:00	0	0	0	0	0	0	9	21	70	117	141	61	29	10	458
6:00	0	0	0	0	2	0	7	35	109	163	113	33	6	8	476
7:00	0	0	0	0	1	2	14	41	89	134	96	26	5	1	409
8:00	0	0	0	0	1	1	5	28	120	153	83	26	13	2	432
9:00	0	0	0	0	3	4	24	27	104	131	65	18	4	3	383
10:00	0	0	0	0	0	0	6	40	114	143	72	15	6	0	396
11:00	0	0	0	0	1	2	31	63	92	130	62	14	8	0	403
12:00 PM	0	0	0	0	1	3	18	44	132	127	64	19	4	2	414
1:00	0	0	0	0	0	3	21	66	136	133	67	13	2	2	443
2:00	0	0	0	2	1	0	8	57	103	128	98	20	10	2	429
3:00	0	0	0	0	0	5	15	39	124	125	72	15	5	3	403
4:00	0	0	0	0	0	3	11	37	143	161	81	18	1	0	455
5:00	0	0	0	0	6	4	23	44	118	136	94	14	5	1	445
6:00	0	0	1	0	0	1	14	53	146	110	54	19	5	0	403
7:00	0	0	0	0	0	3	21	36	109	128	50	10	4	1	362
8:00	0	0	0	0	1	5	24	42	90	72	51	15	5	0	305
9:00	0	0	0	0	0	5	14	25	63	69	28	6	6	0	216
10:00	0	0	0	0	2	2	7	22	35	40	31	10	3	2	154
11:00	0	0	0	0	0	0	0	8	8	13	4	0	0	1	34
Total	0	0	1	3	19	44	284	753	1976	2305	1388	387	140	50	7350
Percentile															
				15th	50th	85th	95th								
Speed				24	28	32	34								
Mean Speed (Average)				28.5											
10 MPH Pace Speed				23-32											
Number in Pace				5899											
Percent in Pace				80.3%											
Number > 30 MPH				1965											
Percent > 30 MPH				26.7%											
Grand Total	0	0	7	6	38	64	541	1531	4102	4647	2729	778	304	88	14835
Stats															
				Percentile	15th	50th	85th	95th							
Speed				24	28	32	34								
Mean Speed (Average)				28.4											
10 MPH Pace Speed				23-32											
Number in Pace				11948											
Percent in Pace				80.5%											
Number > 30 MPH				3899											
Percent > 30 MPH				26.3%											

Accurate Counts
978-664-2565

Location : Haverhill Street
Location : West of Madison Street
City/State: Methuen, MA
Direction: EB

34290001

6/20/2023	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	1	0	6	15	24	26	10	9	6	97
1:00	0	0	0	0	0	0	0	4	5	21	20	10	4	3	67
2:00	0	0	0	0	0	0	0	3	10	8	20	11	5	3	60
3:00	0	0	0	0	0	0	1	1	2	10	15	8	4	2	43
4:00	0	0	0	0	0	0	2	1	7	8	8	3	6	2	37
5:00	0	0	0	0	0	0	1	4	4	14	22	18	11	13	87
6:00	0	0	1	0	0	0	6	6	18	28	36	23	14	10	142
7:00	0	0	0	0	1	3	9	6	36	59	91	34	25	11	275
8:00	0	0	0	0	1	1	9	18	36	52	97	57	23	11	305
9:00	0	0	1	0	0	1	6	21	73	98	103	53	18	12	386
10:00	0	0	0	1	2	4	11	38	78	116	97	30	16	6	399
11:00	0	0	1	0	1	1	11	22	55	112	143	60	18	11	435
12:00 PM	0	0	0	0	1	4	10	25	76	132	130	54	31	5	468
1:00	0	0	1	0	0	1	11	25	93	142	127	36	21	20	477
2:00	0	0	0	0	1	2	5	37	116	139	147	73	32	5	557
3:00	0	0	1	1	5	3	19	46	109	214	181	62	31	8	680
4:00	0	0	2	4	7	7	34	64	132	227	199	60	16	5	757
5:00	0	0	8	2	7	7	11	41	112	186	193	76	27	7	677
6:00	0	0	1	1	2	2	19	31	103	140	152	80	33	10	574
7:00	0	0	2	0	1	1	4	9	51	137	187	72	30	5	499
8:00	0	0	0	0	0	4	12	27	55	146	126	50	21	2	443
9:00	0	0	0	0	1	2	8	31	94	120	100	20	8	3	387
10:00	0	0	0	0	1	0	2	17	53	90	70	20	7	4	264
11:00	0	0	0	0	0	0	2	13	43	54	42	22	10	1	187
Total	0	0	18	9	31	44	193	496	1376	2277	2332	942	420	165	8303

Percentile	15th
Speed	25
	50th
	30
	85th
	34
	95th
	37
Mean Speed (Average)	31.6
10 MPH Pace Speed	24-33
Number in Pace	6284
Percent in Pace	75.7%
Number > 30 MPH	3859
Percent > 30 MPH	46.5%

Accurate Counts
978-664-2565

Location : Haverhill Street
Location : West of Madison Street
City/State: Methuen, MA
Direction: EB

34290001

6/21/2023	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	1	0	0	1	2	14	25	23	14	13	2	95
1:00	0	0	0	0	0	0	1	4	8	17	17	9	6	1	63
2:00	0	0	0	0	0	0	1	2	6	22	16	7	7	2	63
3:00	0	0	0	0	0	0	1	1	2	5	8	9	4	3	33
4:00	0	0	0	0	0	0	0	1	2	8	15	5	6	9	46
5:00	0	0	0	0	0	0	0	7	4	17	25	22	11	6	92
6:00	0	0	0	0	0	0	4	7	24	36	41	29	9	12	162
7:00	0	0	1	1	3	3	4	13	36	60	83	44	18	12	278
8:00	0	0	0	0	0	1	2	12	21	62	80	50	17	10	255
9:00	0	0	0	0	1	2	7	20	67	93	100	38	20	8	356
10:00	0	0	0	0	0	3	5	12	48	89	99	37	17	10	320
11:00	0	0	3	4	5	2	20	15	61	120	112	45	23	8	418
12:00 PM	0	0	0	0	2	4	13	33	90	148	119	36	12	1	458
1:00	0	0	0	0	2	0	11	36	97	137	145	36	8	8	480
2:00	0	0	0	0	8	4	14	39	123	170	171	57	27	11	624
3:00	0	0	0	0	4	10	17	32	122	209	174	65	27	6	666
4:00	0	0	1	0	2	2	27	55	157	213	159	62	33	7	718
5:00	0	0	1	3	11	7	29	64	125	242	166	64	14	5	731
6:00	0	0	0	1	1	1	19	35	95	188	215	80	38	7	680
7:00	0	0	0	0	4	1	7	17	79	174	139	51	30	4	506
8:00	0	0	0	0	1	2	2	21	109	129	145	33	14	10	466
9:00	0	0	0	0	1	0	8	25	72	105	122	27	11	2	373
10:00	0	0	0	0	0	0	2	9	42	78	87	41	13	6	278
11:00	0	0	0	0	0	0	0	3	6	14	17	5	0	1	46
Total	0	0	6	10	45	42	195	465	1410	2361	2278	866	378	151	8207
Percentile															
Speed															
Mean Speed (Average)															31.4
10 MPH Pace Speed															24-33
Number in Pace															6324
Percent in Pace															77.1%
Number > 30 MPH															3673
Percent > 30 MPH															44.8%
Grand Total	0	0	24	19	76	86	388	961	2786	4638	4610	1808	798	316	16510
Stats															
Percentile															15th
Speed															25
Mean Speed (Average)															31.5
10 MPH Pace Speed															24-33
Number in Pace															12608
Percent in Pace															76.4%
Number > 30 MPH															7532
Percent > 30 MPH															45.6%

Accurate Counts
978-664-2565

Location : Haverhill Street
Location : West of Madison Street
City/State: Methuen, MA
Direction: Combined

34290001

6/20/2023	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	1	6	14	28	41	32	12	9	6	149
1:00	0	0	0	0	0	0	2	15	16	33	29	12	5	5	117
2:00	0	0	0	0	0	0	0	4	17	19	24	14	10	3	91
3:00	0	0	0	0	0	0	2	6	10	20	26	14	7	2	87
4:00	0	0	0	0	0	0	4	17	42	64	56	23	12	7	225
5:00	0	0	0	0	0	0	2	16	58	143	170	71	34	20	514
6:00	0	0	1	0	0	1	11	39	141	190	147	55	34	14	633
7:00	0	0	0	0	3	3	20	30	169	199	183	55	35	14	711
8:00	0	0	0	0	1	4	20	57	169	194	178	81	27	15	746
9:00	0	0	2	0	0	2	30	65	206	201	163	65	30	12	776
10:00	0	0	0	1	3	5	25	98	201	218	149	46	25	7	778
11:00	0	0	1	0	2	1	29	58	179	263	215	86	25	11	870
12:00 PM	0	0	0	0	2	4	18	81	198	269	194	73	37	7	883
1:00	0	0	1	1	0	1	26	82	213	284	209	56	30	21	924
2:00	0	0	0	0	1	3	13	85	269	277	214	100	36	6	1004
3:00	0	0	1	1	10	3	46	95	222	345	242	82	38	10	1095
4:00	0	0	4	6	9	9	57	129	293	363	274	72	20	6	1242
5:00	0	0	9	2	10	13	25	92	248	335	238	92	37	8	1109
6:00	0	0	1	1	3	4	44	72	217	241	204	93	39	11	930
7:00	0	0	3	0	2	2	10	47	149	246	256	87	35	5	842
8:00	0	0	0	0	0	4	21	51	133	258	178	63	27	3	738
9:00	0	0	0	0	3	3	23	61	170	195	136	24	10	4	629
10:00	0	0	1	0	1	0	6	35	90	136	100	31	9	4	413
11:00	0	0	0	0	0	1	10	25	64	85	56	26	13	2	282
Total	0	0	24	12	50	64	450	1274	3502	4619	3673	1333	584	203	15788

Percentile	15th
Speed	24
	29
Mean Speed (Average)	30.1
10 MPH Pace Speed	24-33
Number in Pace	12236
Percent in Pace	77.5%
Number > 30 MPH	5793
Percent > 30 MPH	36.7%

Accurate Counts
978-664-2565

Location : Haverhill Street
Location : West of Madison Street
City/State: Methuen, MA
Direction: Combined

34290001

6/21/2023	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	1	0	0	3	6	28	30	28	18	15	3	132
1:00	0	0	0	0	0	1	3	8	12	26	24	11	7	1	93
2:00	0	0	0	0	0	0	2	6	16	29	24	9	9	2	97
3:00	0	0	0	1	0	0	3	6	15	15	14	13	7	6	80
4:00	0	0	0	0	0	0	5	9	32	69	51	28	17	17	228
5:00	0	0	0	0	0	0	9	28	74	134	166	83	40	16	550
6:00	0	0	0	0	2	0	11	42	133	199	154	62	15	20	638
7:00	0	0	1	1	4	5	18	54	125	194	179	70	23	13	687
8:00	0	0	0	0	1	2	7	40	141	215	163	76	30	12	687
9:00	0	0	0	0	4	6	31	47	171	224	165	56	24	11	739
10:00	0	0	0	0	0	3	11	52	162	232	171	52	23	10	716
11:00	0	0	3	4	6	4	51	78	153	250	174	59	31	8	821
12:00 PM	0	0	0	0	3	7	31	77	222	275	183	55	16	3	872
1:00	0	0	0	0	2	3	32	102	233	270	212	49	10	10	923
2:00	0	0	0	2	9	4	22	96	226	298	269	77	37	13	1053
3:00	0	0	0	0	4	15	32	71	246	334	246	80	32	9	1069
4:00	0	0	1	0	2	5	38	92	300	374	240	80	34	7	1173
5:00	0	0	1	3	17	11	52	108	243	378	260	78	19	6	1176
6:00	0	0	1	1	1	2	33	88	241	298	269	99	43	7	1083
7:00	0	0	0	0	4	4	28	53	188	302	189	61	34	5	868
8:00	0	0	0	0	2	7	26	63	199	201	196	48	19	10	771
9:00	0	0	0	0	1	5	22	50	135	174	150	33	17	2	589
10:00	0	0	0	0	2	2	9	31	77	118	118	51	16	8	432
11:00	0	0	0	0	0	0	0	11	14	27	21	5	0	2	80
Total	0	0	7	13	64	86	479	1218	3386	4666	3666	1253	518	201	15557
Percentile				15th	50th	85th	95th								
Speed				24	29	33	35								
Mean Speed (Average)				30.0											
10 MPH Pace Speed				24-33											
Number in Pace				12135											
Percent in Pace				78.0%											
Number > 30 MPH				5638											
Percent > 30 MPH				36.2%											
Grand Total	0	0	31	25	114	150	929	2492	6888	9285	7339	2586	1102	404	31345
Stats				Percentile	15th	50th	85th	95th							
				Speed	24	29	33	35							
Mean Speed (Average)				30.0											
10 MPH Pace Speed				24-33											
Number in Pace				24371											
Percent in Pace				77.8%											
Number > 30 MPH				11432											
Percent > 30 MPH				36.5%											

Accurate Counts
978-664-2565

Location : Haverhill Street
Location : West of Madison Street
City/State: Methuen, MA

34290001

6/20/2023	WB		Hour Totals		EB		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	15	105			26	113				
12:15	15	117			34	119				
12:30	8	86			22	108				
12:45	14	107	52	415	15	128	97	468	149	883
1:00	16	104			16	102				
1:15	16	118			17	132				
1:30	7	124			24	138				
1:45	11	101	50	447	10	105	67	477	117	924
2:00	6	122			15	134				
2:15	7	114			14	129				
2:30	9	115			21	149				
2:45	9	96	31	447	10	145	60	557	91	1004
3:00	5	102			13	152				
3:15	9	119			14	172				
3:30	18	105			11	173				
3:45	12	89	44	415	5	183	43	680	87	1095
4:00	15	109			10	200				
4:15	38	121			6	188				
4:30	55	128			9	192				
4:45	80	127	188	485	12	177	37	757	225	1242
5:00	90	122			18	183				
5:15	109	107			10	181				
5:30	112	108			26	166				
5:45	116	95	427	432	33	147	87	677	514	1109
6:00	123	88			19	135				
6:15	118	86			31	168				
6:30	147	97			37	149				
6:45	103	85	491	356	55	122	142	574	633	930
7:00	109	103			70	115				
7:15	103	86			60	132				
7:30	110	81			57	124				
7:45	114	73	436	343	88	128	275	499	711	842
8:00	120	81			68	119				
8:15	117	77			81	117				
8:30	108	71			73	96				
8:45	96	66	441	295	83	111	305	443	746	738
9:00	97	75			81	125				
9:15	108	65			107	101				
9:30	86	54			105	82				
9:45	99	48	390	242	93	79	386	387	776	629
10:00	88	41			116	98				
10:15	98	38			97	59				
10:30	81	41			80	53				
10:45	112	29	379	149	106	54	399	264	778	413
11:00	100	34			126	59				
11:15	126	24			102	47				
11:30	116	21			86	51				
11:45	93	16	435	95	121	30	435	187	870	282
Total	3364	4121			2333	5970			5697	10091
Percent	44.9%	55.1%			28.1%	71.9%			36.1%	63.9%

Accurate Counts
978-664-2565

Location : Haverhill Street
Location : West of Madison Street
City/State: Methuen, MA

34290001

6/21/2023	WB		Hour Totals		EB		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	8	108			26	128				
12:15	14	104			24	117				
12:30	7	95			23	107				
12:45	8	107	37	414	22	106	95	458	132	872
1:00	8	109			20	108				
1:15	10	114			17	135				
1:30	6	111			17	106				
1:45	6	109	30	443	9	131	63	480	93	923
2:00	10	99			11	131				
2:15	10	94			25	151				
2:30	11	134			18	174				
2:45	3	102	34	429	9	168	63	624	97	1053
3:00	11	94			11	168				
3:15	3	124			12	159				
3:30	18	94			2	189				
3:45	15	91	47	403	8	150	33	666	80	1069
4:00	23	116			8	167				
4:15	36	108			14	181				
4:30	65	115			14	184				
4:45	58	116	182	455	10	186	46	718	228	1173
5:00	94	109			20	198				
5:15	134	125			13	186				
5:30	118	125			17	181				
5:45	112	86	458	445	42	166	92	731	550	1176
6:00	121	108			26	177				
6:15	107	105			32	163				
6:30	130	105			55	154				
6:45	118	85	476	403	49	186	162	680	638	1083
7:00	103	101			64	140				
7:15	97	96			47	130				
7:30	109	85			88	120				
7:45	100	80	409	362	79	116	278	506	687	868
8:00	108	96			67	132				
8:15	103	73			68	111				
8:30	116	67			48	113				
8:45	105	69	432	305	72	110	255	466	687	771
9:00	88	63			85	94				
9:15	90	51			91	103				
9:30	107	52			94	93				
9:45	98	50	383	216	86	83	356	373	739	589
10:00	87	39			85	86				
10:15	93	37			88	63				
10:30	111	42			75	69				
10:45	105	36	396	154	72	60	320	278	716	432
11:00	107	34			104	46				
11:15	103	28			101	48				
11:30	105	19			111	50				
11:45	88	13	403	94	102	32	418	176	821	270
Total	3287	4123			2181	6156			5468	10279
Percent	44.4%	55.6%			26.2%	73.8%			34.7%	65.3%
Grand Total	6651	8244			4514	12126			11165	20370
Percent	44.7%	55.3%			27.1%	72.9%			35.4%	64.6%

ADT

ADT: 15,768

AADT: 15,768

Accurate Counts
978-664-2565

Location : Haverhill Street
Location : West of Madison Street
City/State: Methuen, MA

34290001

6/19/2023	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	*	*	52	97	37	95	*	*	*	*	*	*	*	*	44	96
1:00	*	*	50	67	30	63	*	*	*	*	*	*	*	*	40	65
2:00	*	*	31	60	34	63	*	*	*	*	*	*	*	*	32	62
3:00	*	*	44	43	47	33	*	*	*	*	*	*	*	*	46	38
4:00	*	*	188	37	182	46	*	*	*	*	*	*	*	*	185	42
5:00	*	*	427	87	458	92	*	*	*	*	*	*	*	*	442	90
6:00	*	*	491	142	476	162	*	*	*	*	*	*	*	*	484	152
7:00	*	*	436	275	409	278	*	*	*	*	*	*	*	*	422	276
8:00	*	*	441	305	432	255	*	*	*	*	*	*	*	*	436	280
9:00	*	*	390	386	383	356	*	*	*	*	*	*	*	*	386	371
10:00	*	*	379	399	396	320	*	*	*	*	*	*	*	*	388	360
11:00	*	*	435	435	403	418	*	*	*	*	*	*	*	*	419	426
12:00 PM	*	*	415	468	414	458	*	*	*	*	*	*	*	*	414	463
1:00	*	*	447	477	443	480	*	*	*	*	*	*	*	*	445	478
2:00	*	*	447	557	429	624	*	*	*	*	*	*	*	*	438	590
3:00	*	*	415	680	403	666	*	*	*	*	*	*	*	*	409	673
4:00	*	*	485	757	455	718	*	*	*	*	*	*	*	*	470	738
5:00	*	*	432	677	445	731	*	*	*	*	*	*	*	*	438	704
6:00	*	*	356	574	403	680	*	*	*	*	*	*	*	*	380	627
7:00	*	*	343	499	362	506	*	*	*	*	*	*	*	*	352	502
8:00	*	*	295	443	305	466	*	*	*	*	*	*	*	*	300	454
9:00	*	*	242	387	216	373	*	*	*	*	*	*	*	*	229	380
10:00	*	*	149	264	154	278	*	*	*	*	*	*	*	*	152	271
11:00	*	*	95	187	34	46	*	*	*	*	*	*	*	*	64	116
Total	0	0	7485	8303	7350	8207	0	0	0	0	0	0	0	0	7415	8254
Day	0		15788		15557		0		0		0		0		15669	
AM Peak			6:00	11:00	6:00	11:00									6:00	11:00
Volume			491	435	476	418									484	426
PM Peak			4:00	4:00	4:00	5:00									4:00	4:00
Volume			485	757	455	731									470	738
Comb Total	0		15788		15557		0		0		0		0		15669	
ADT	ADT: 15,768		AADT: 15,768													

Accurate Counts

978-664-2565

N/S Street : Driveway / Madison Street

E/W Street : Haverhill Street

City/State : Methuen, MA

Weather : Cloudy

File Name : 34290001

Site Code : 34290001

Start Date : 6/20/2023

Page No : 1

Groups Printed- Cars - Trucks

	Driveway From North			Haverhill St From East			Madison St From South			Haverhill St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	1	101	0	6	0	0	0	66	2	176
07:15 AM	0	0	0	2	101	0	4	0	0	0	59	1	167
07:30 AM	0	0	0	1	106	0	5	0	1	0	51	3	167
07:45 AM	0	0	0	0	114	0	4	0	1	0	91	0	210
Total	0	0	0	4	422	0	19	0	2	0	267	6	720
08:00 AM	0	0	0	0	121	0	0	0	2	0	62	4	189
08:15 AM	0	0	0	1	111	0	5	0	1	0	76	3	197
08:30 AM	0	0	0	1	110	0	2	0	2	0	74	0	189
08:45 AM	0	0	0	0	91	0	4	0	3	0	79	2	179
Total	0	0	0	2	433	0	11	0	8	0	291	9	754
Grand Total	0	0	0	6	855	0	30	0	10	0	558	15	1474
Apprch %	0	0	0	0.7	99.3	0	75	0	25	0	97.4	2.6	
Total %	0	0	0	0.4	58	0	2	0	0.7	0	37.9	1	
Cars	0	0	0	6	826	0	30	0	10	0	524	15	1411
% Cars	0	0	0	100	96.6	0	100	0	100	0	93.9	100	95.7
Trucks	0	0	0	0	29	0	0	0	0	0	34	0	63
% Trucks	0	0	0	0	3.4	0	0	0	0	0	6.1	0	4.3

	Driveway From North				Haverhill St From East				Madison St From South				Haverhill St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	114	0	114	4	0	1	5	0	91	0	91	210
08:00 AM	0	0	0	0	0	121	0	121	0	0	2	2	0	62	4	66	189
08:15 AM	0	0	0	0	1	111	0	112	5	0	1	6	0	76	3	79	197
08:30 AM	0	0	0	0	1	110	0	111	2	0	2	4	0	74	0	74	189
Total Volume	0	0	0	0	2	456	0	458	11	0	6	17	0	303	7	310	785
% App. Total	0	0	0		0.4	99.6	0		64.7	0	35.3		0	97.7	2.3		
PHF	.000	.000	.000	.000	.500	.942	.000	.946	.550	.000	.750	.708	.000	.832	.438	.852	.935
Cars	0	0	0	0	2	442	0	444	11	0	6	17	0	290	7	297	758
% Cars	0	0	0	0	100	96.9	0	96.9	100	0	100	100	0	95.7	100	95.8	96.6
Trucks	0	0	0	0	0	14	0	14	0	0	0	0	0	13	0	13	27
% Trucks	0	0	0	0	0	3.1	0	3.1	0	0	0	0	0	4.3	0	4.2	3.4

Accurate Counts

978-664-2565

N/S Street : Driveway / Madison Street

E/W Street : Haverhill Street

City/State : Methuen, MA

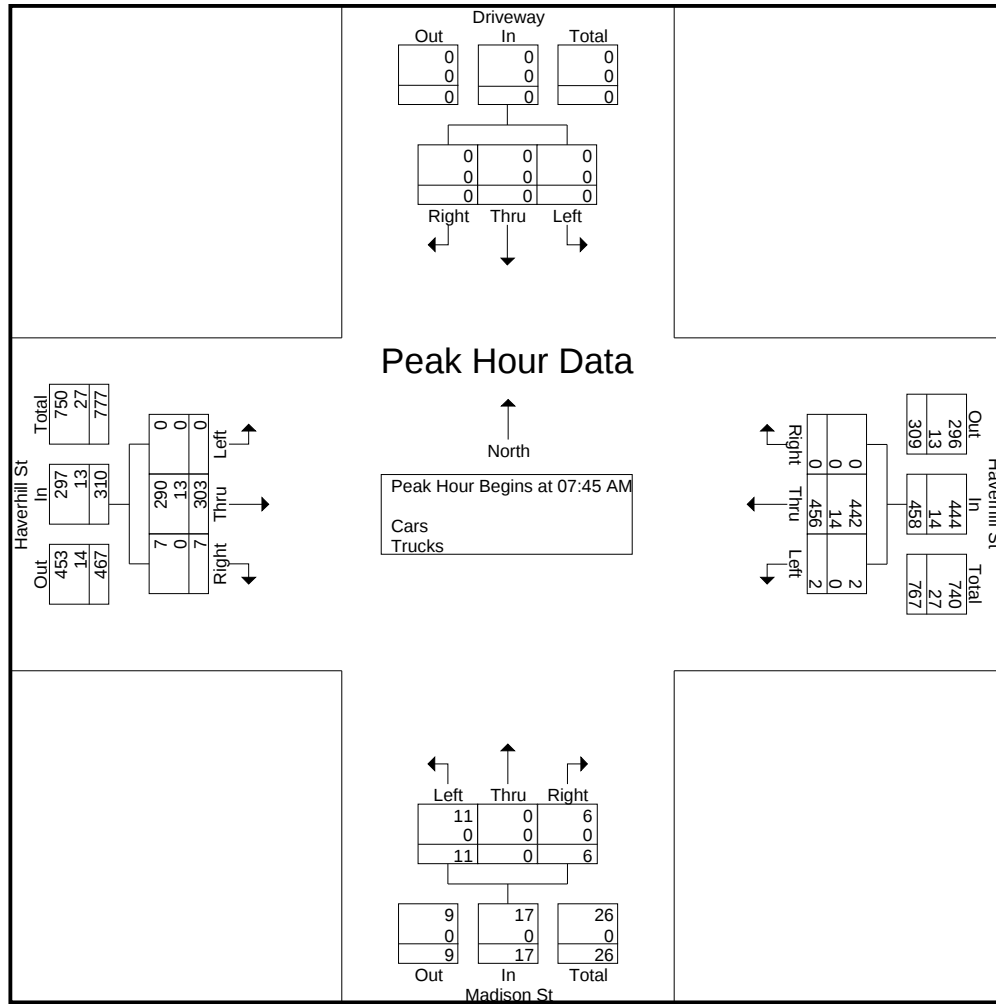
Weather : Cloudy

File Name : 34290001

Site Code : 34290001

Start Date : 6/20/2023

Page No : 2



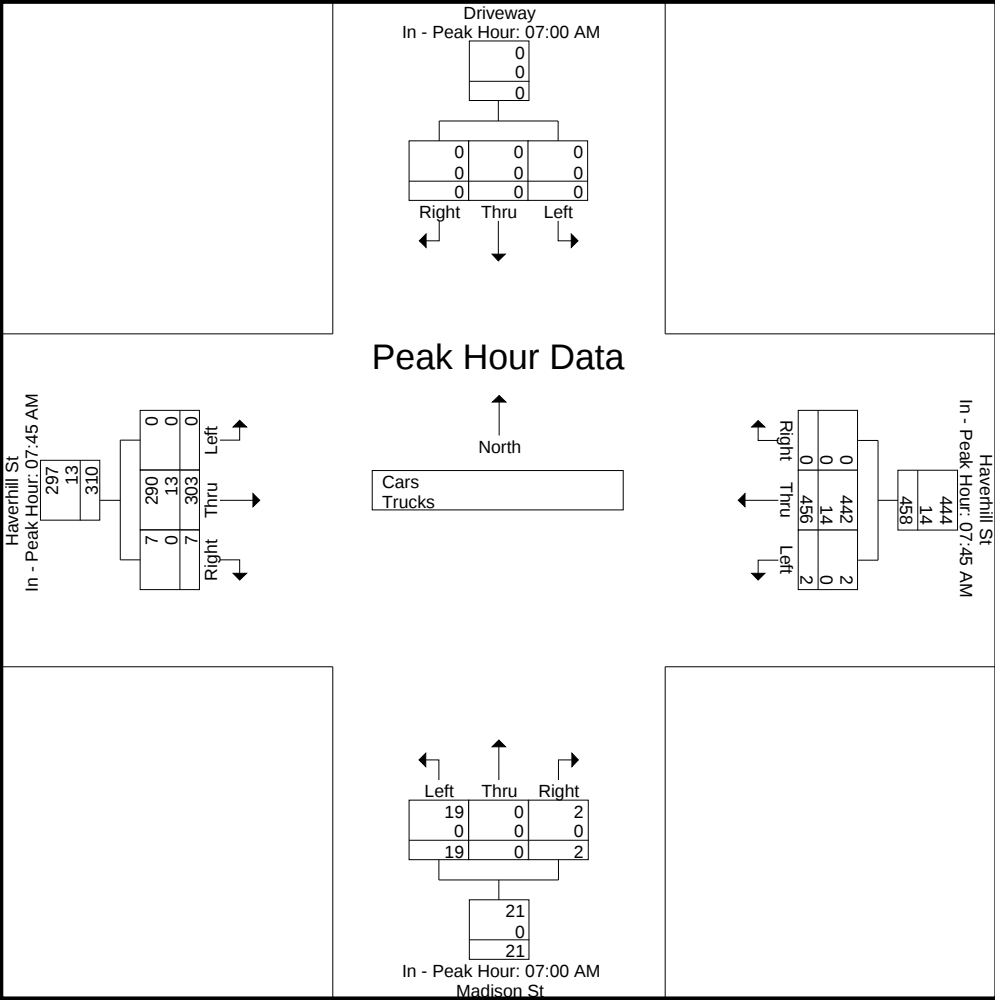
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:45 AM				07:00 AM				07:45 AM			
+0 mins.	0	0	0	0	0	114	0	114	6	0	0	6	0	91	0	91
+15 mins.	0	0	0	0	0	121	0	121	4	0	0	4	0	62	4	66
+30 mins.	0	0	0	0	1	111	0	112	5	0	1	6	0	76	3	79
+45 mins.	0	0	0	0	1	110	0	111	4	0	1	5	0	74	0	74
Total Volume	0	0	0	0	2	456	0	458	19	0	2	21	0	303	7	310
% App. Total	0	0	0	0	0.4	99.6	0		90.5	0	9.5		0	97.7	2.3	
PHF	.000	.000	.000	.000	.500	.942	.000	.946	.792	.000	.500	.875	.000	.832	.438	.852
Cars	0	0	0	0	2	442	0	444	19	0	2	21	0	290	7	297
% Cars	0	0	0	0	100	96.9	0	96.9	100	0	100	100	0	95.7	100	95.8
Trucks	0	0	0	0	0	14	0	14	0	0	0	0	0	13	0	13
% Trucks	0	0	0	0	0	3.1	0	3.1	0	0	0	0	0	4.3	0	4.2

N/S Street : Driveway / Madison Street
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290001
Site Code : 34290001
Start Date : 6/20/2023
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Driveway / Madison Street

E/W Street : Haverhill Street

City/State : Methuen, MA

Weather : Cloudy

File Name : 34290001

Site Code : 34290001

Start Date : 6/20/2023

Page No : 4

Groups Printed- Cars

	Driveway From North			Haverhill St From East			Madison St From South			Haverhill St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	1	98	0	6	0	0	0	58	2	165
07:15 AM	0	0	0	2	100	0	4	0	0	0	54	1	161
07:30 AM	0	0	0	1	102	0	5	0	1	0	49	3	161
07:45 AM	0	0	0	0	111	0	4	0	1	0	86	0	202
Total	0	0	0	4	411	0	19	0	2	0	247	6	689
08:00 AM	0	0	0	0	117	0	0	0	2	0	57	4	180
08:15 AM	0	0	0	1	107	0	5	0	1	0	75	3	192
08:30 AM	0	0	0	1	107	0	2	0	2	0	72	0	184
08:45 AM	0	0	0	0	84	0	4	0	3	0	73	2	166
Total	0	0	0	2	415	0	11	0	8	0	277	9	722
Grand Total	0	0	0	6	826	0	30	0	10	0	524	15	1411
Apprch %	0	0	0	0.7	99.3	0	75	0	25	0	97.2	2.8	
Total %	0	0	0	0.4	58.5	0	2.1	0	0.7	0	37.1	1.1	

	Driveway From North				Haverhill St From East				Madison St From South				Haverhill St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	111	0	111	4	0	1	5	0	86	0	86	202
08:00 AM	0	0	0	0	0	117	0	117	0	0	2	2	0	57	4	61	180
08:15 AM	0	0	0	0	1	107	0	108	5	0	1	6	0	75	3	78	192
08:30 AM	0	0	0	0	1	107	0	108	2	0	2	4	0	72	0	72	184
Total Volume	0	0	0	0	2	442	0	444	11	0	6	17	0	290	7	297	758
% App. Total	0	0	0		0.5	99.5	0		64.7	0	35.3		0	97.6	2.4		
PHF	.000	.000	.000	.000	.500	.944	.000	.949	.550	.000	.750	.708	.000	.843	.438	.863	.938

Accurate Counts

978-664-2565

N/S Street : Driveway / Madison Street

E/W Street : Haverhill Street

City/State : Methuen, MA

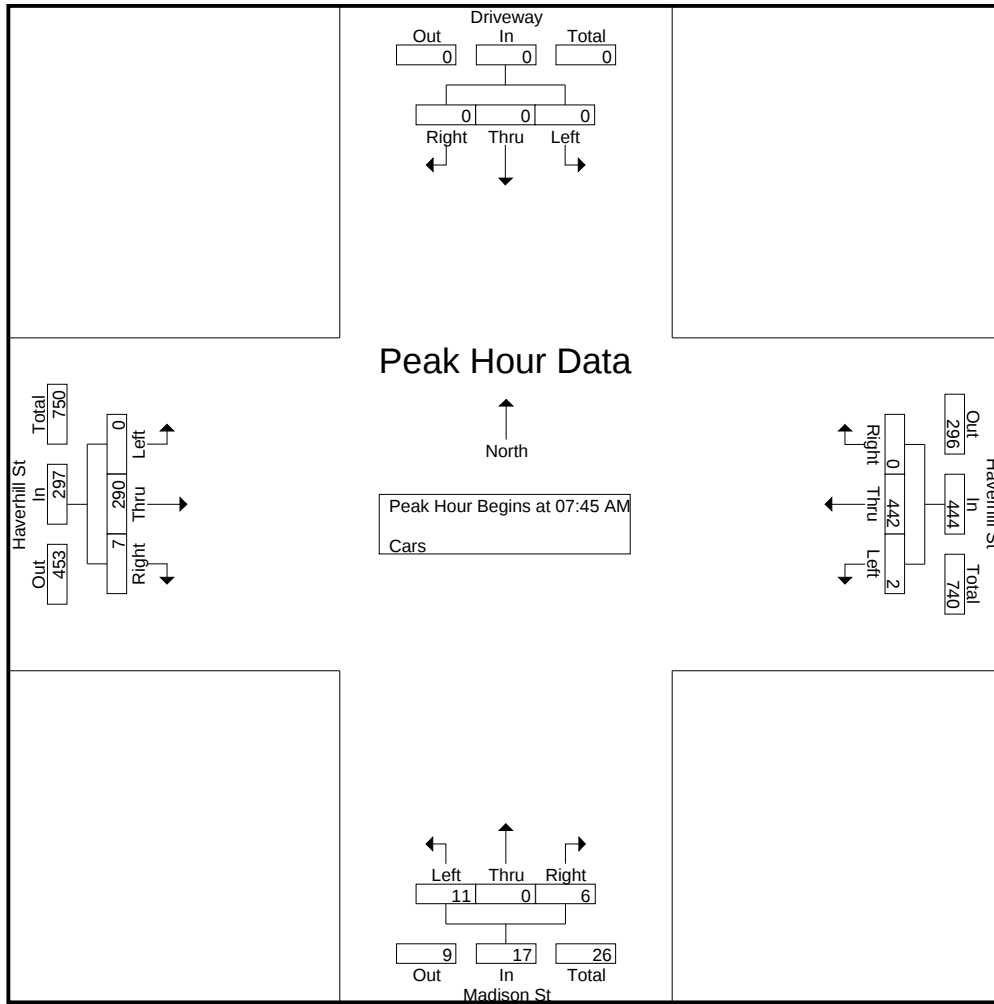
Weather : Cloudy

File Name : 34290001

Site Code : 34290001

Start Date : 6/20/2023

Page No : 5



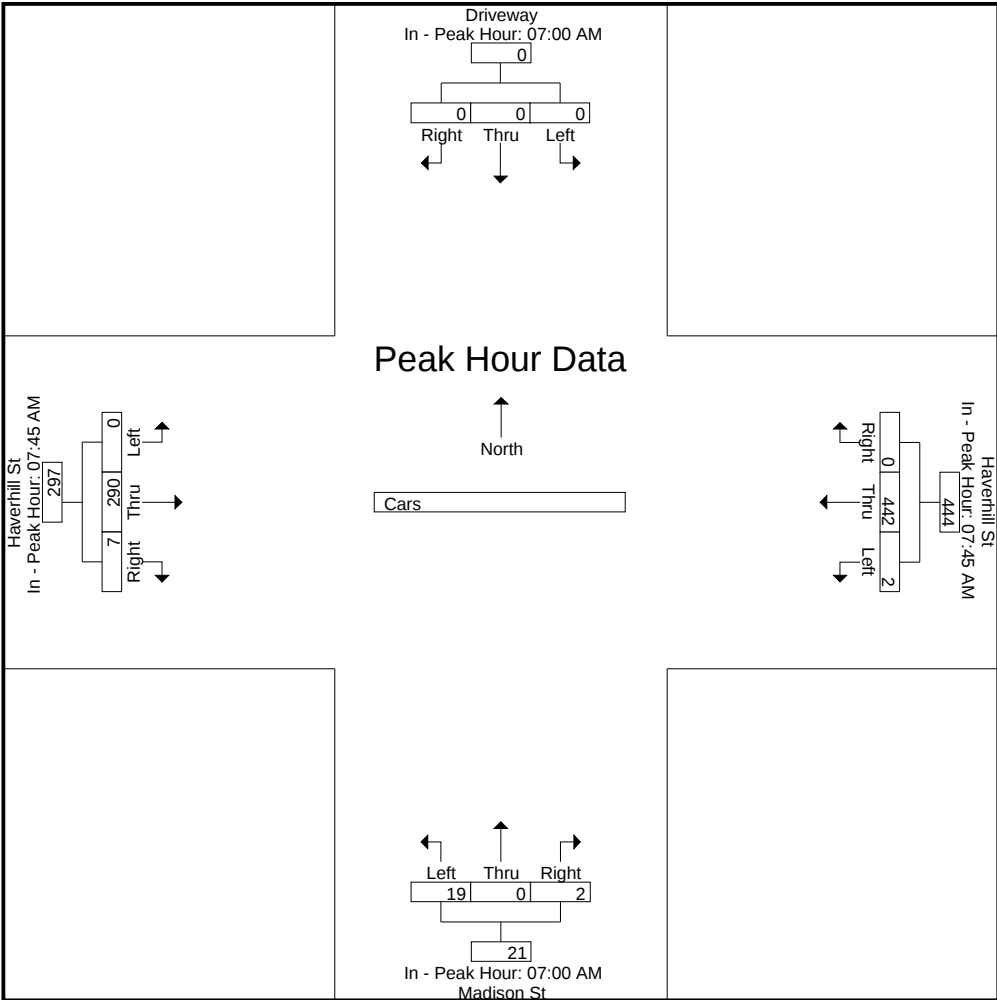
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:45 AM				07:00 AM				07:45 AM			
+0 mins.	0	0	0	0	0	111	0	111	6	0	0	6	0	86	0	86
+15 mins.	0	0	0	0	0	117	0	117	4	0	0	4	0	57	4	61
+30 mins.	0	0	0	0	1	107	0	108	5	0	1	6	0	75	3	78
+45 mins.	0	0	0	0	1	107	0	108	4	0	1	5	0	72	0	72
Total Volume	0	0	0	0	2	442	0	444	19	0	2	21	0	290	7	297
% App. Total	0	0	0	0	0.5	99.5	0		90.5	0	9.5		0	97.6	2.4	
PHF	.000	.000	.000	.000	.500	.944	.000	.949	.792	.000	.500	.875	.000	.843	.438	.863

N/S Street : Driveway / Madison Street
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290001
Site Code : 34290001
Start Date : 6/20/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Driveway / Madison Street

E/W Street : Haverhill Street

City/State : Methuen, MA

Weather : Cloudy

File Name : 34290001

Site Code : 34290001

Start Date : 6/20/2023

Page No : 7

Groups Printed- Trucks

	Driveway From North			Haverhill St From East			Madison St From South			Haverhill St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	3	0	0	0	0	0	8	0	11
07:15 AM	0	0	0	0	1	0	0	0	0	0	5	0	6
07:30 AM	0	0	0	0	4	0	0	0	0	0	2	0	6
07:45 AM	0	0	0	0	3	0	0	0	0	0	5	0	8
Total	0	0	0	0	11	0	0	0	0	0	20	0	31
08:00 AM	0	0	0	0	4	0	0	0	0	0	5	0	9
08:15 AM	0	0	0	0	4	0	0	0	0	0	1	0	5
08:30 AM	0	0	0	0	3	0	0	0	0	0	2	0	5
08:45 AM	0	0	0	0	7	0	0	0	0	0	6	0	13
Total	0	0	0	0	18	0	0	0	0	0	14	0	32
Grand Total	0	0	0	0	29	0	0	0	0	0	34	0	63
Apprch %	0	0	0	0	100	0	0	0	0	0	100	0	
Total %	0	0	0	0	46	0	0	0	0	0	54	0	

	Driveway From North				Haverhill St From East				Madison St From South				Haverhill St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	4	0	4	0	0	0	0	0	5	0	5	9
08:15 AM	0	0	0	0	0	4	0	4	0	0	0	0	0	1	0	1	5
08:30 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	2	0	2	5
08:45 AM	0	0	0	0	0	7	0	7	0	0	0	0	0	6	0	6	13
Total Volume	0	0	0	0	0	18	0	18	0	0	0	0	0	14	0	14	32
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.643	.000	.643	.000	.000	.000	.000	.000	.583	.000	.583	.615

Accurate Counts

978-664-2565

N/S Street : Driveway / Madison Street

E/W Street : Haverhill Street

City/State : Methuen, MA

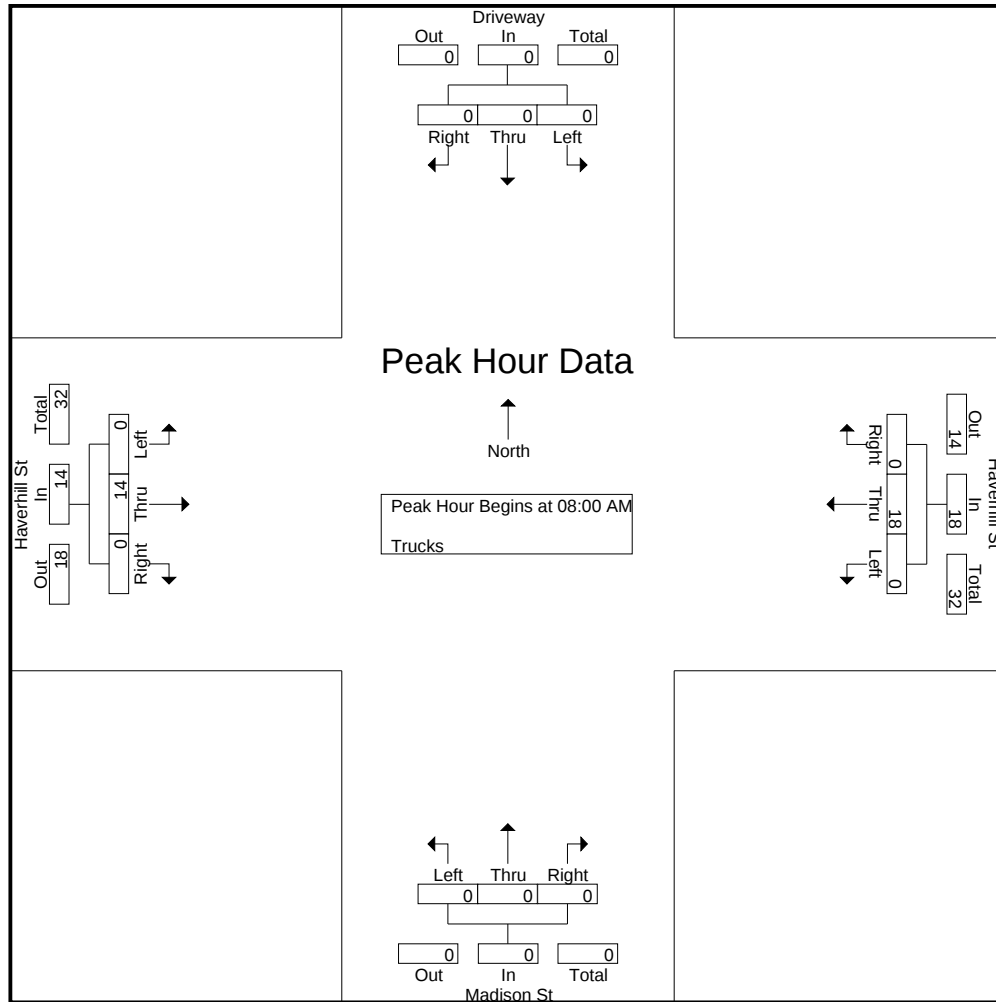
Weather : Cloudy

File Name : 34290001

Site Code : 34290001

Start Date : 6/20/2023

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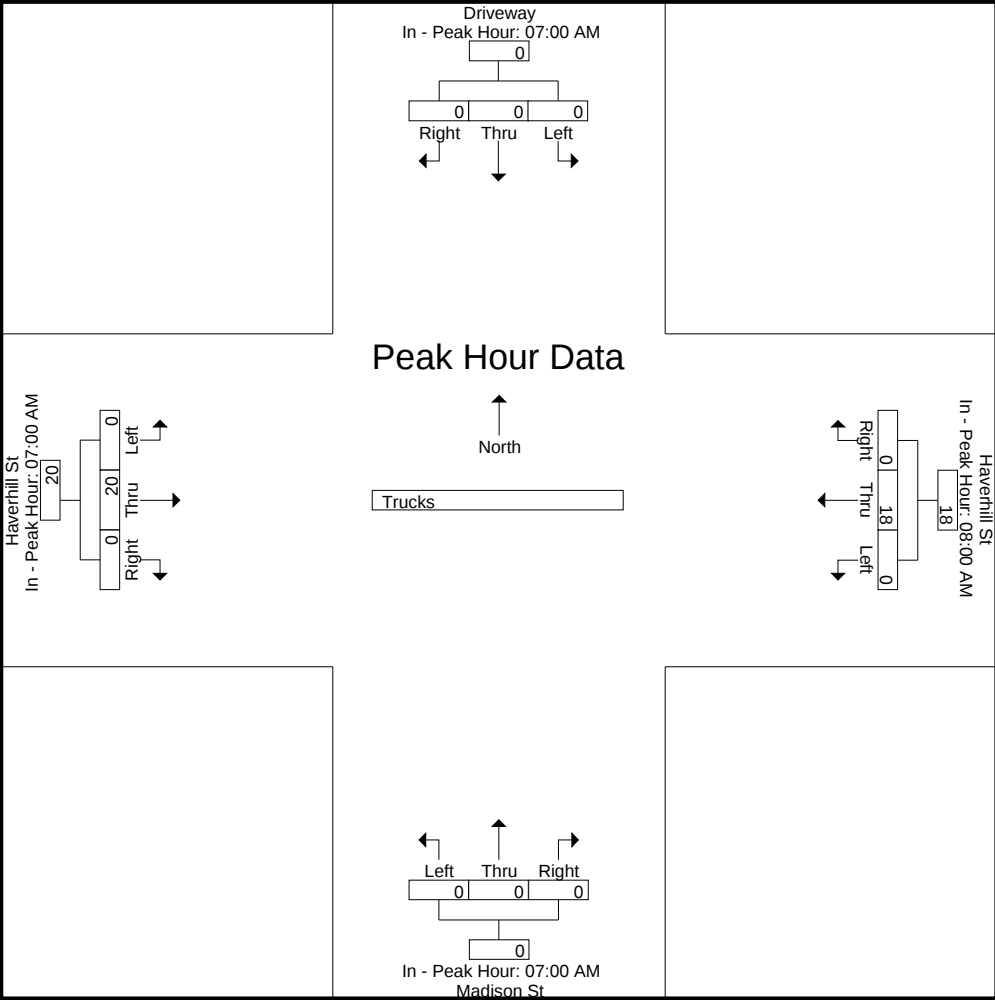
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				08:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	4	0	4	0	0	0	0	0	8	0	8
+15 mins.	0	0	0	0	0	4	0	4	0	0	0	0	0	5	0	5
+30 mins.	0	0	0	0	0	3	0	3	0	0	0	0	0	2	0	2
+45 mins.	0	0	0	0	0	7	0	7	0	0	0	0	0	5	0	5
Total Volume	0	0	0	0	0	18	0	18	0	0	0	0	0	20	0	20
% App. Total	0	0	0	0	0	100	0	100	0	0	0	0	0	100	0	100
PHF	.000	.000	.000	.000	.000	.643	.000	.643	.000	.000	.000	.000	.000	.625	.000	.625

N/S Street : Driveway / Madison Street
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290001
Site Code : 34290001
Start Date : 6/20/2023
Page No : 9



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Page No : 10

[illegible]

978-664-2565

N/S Street : Driveway / Madison Street

E/W Street : Haverhill Street

City/State : Methuen, MA

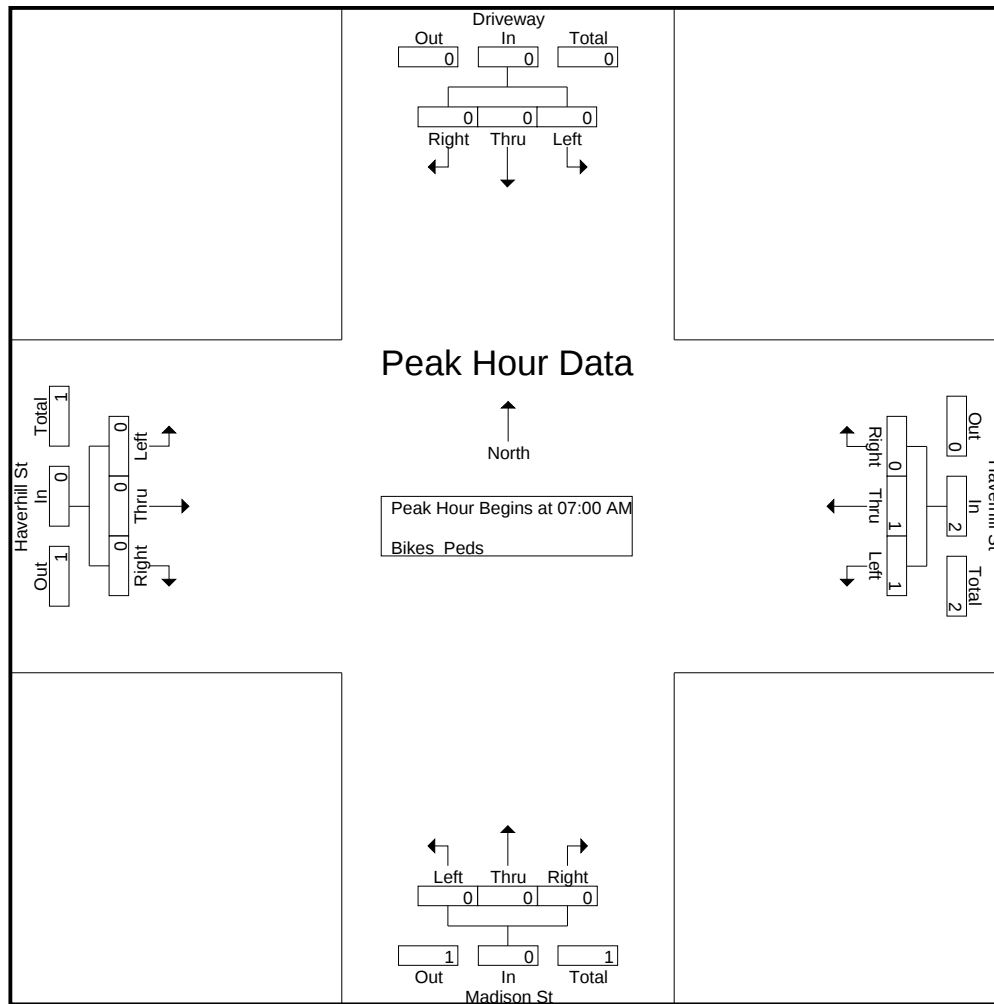
Weather : Cloudy

File Name : 34290001

Site Code : 34290001

Start Date : 6/20/2023

Page No : 11



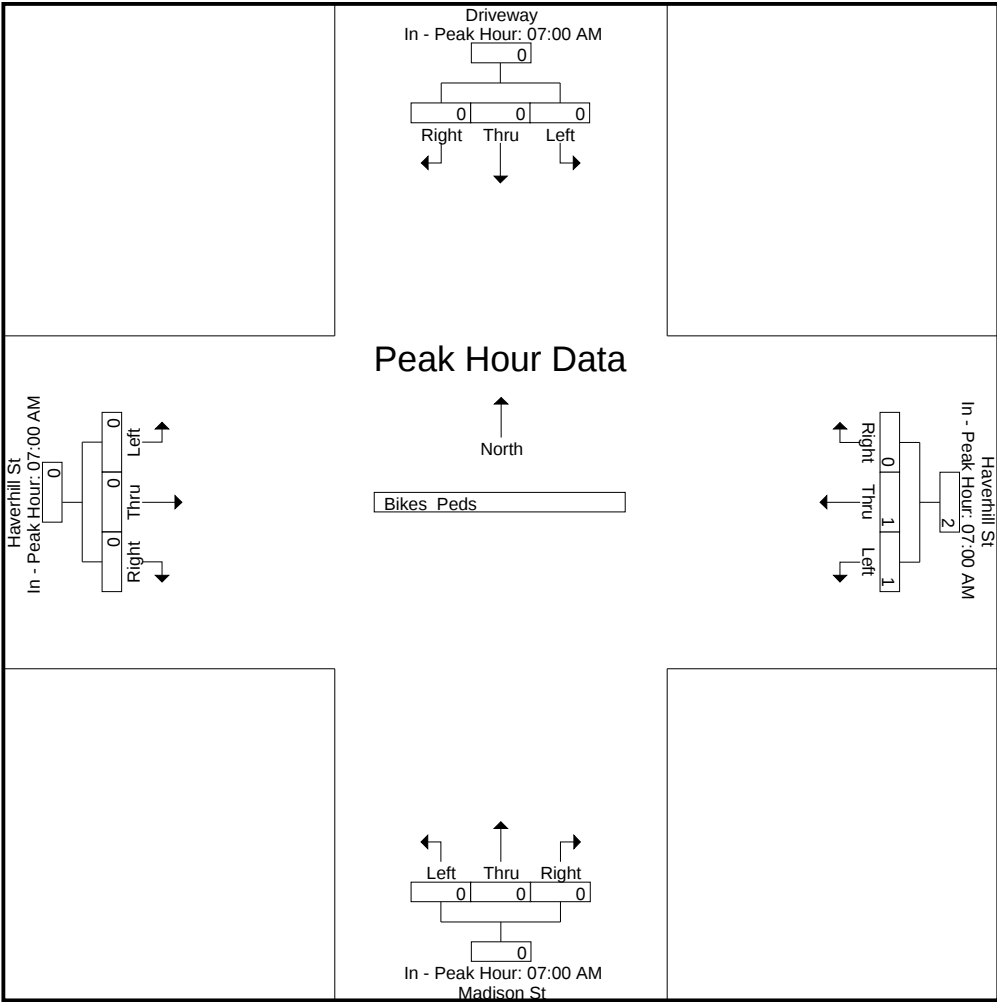
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

[illegible]

N/S Street : Driveway / Madison Street
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290001
Site Code : 34290001
Start Date : 6/20/2023
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Driveway / Madison Street

E/W Street : Haverhill Street

City/State : Methuen, MA

Weather : Cloudy

File Name : 34290001

Site Code : 34290001

Start Date : 6/20/2023

Page No : 1

Groups Printed- Cars - Trucks

	Driveway From North			Haverhill St From East			Madison St From South			Haverhill St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	1	0	1	6	105	1	8	0	5	1	194	6	328
04:15 PM	1	0	1	6	121	1	2	0	3	0	179	7	321
04:30 PM	1	0	0	2	127	0	2	0	1	0	181	4	318
04:45 PM	0	0	0	4	127	0	2	0	4	0	164	13	314
Total	3	0	2	18	480	2	14	0	13	1	718	30	1281
05:00 PM	1	0	0	0	115	0	9	0	5	0	171	10	311
05:15 PM	0	0	0	2	106	1	0	0	3	0	172	8	292
05:30 PM	1	1	0	3	102	2	5	0	1	0	157	3	275
05:45 PM	1	0	0	3	90	1	3	0	5	0	144	1	248
Total	3	1	0	8	413	4	17	0	14	0	644	22	1126
06:00 PM	0	0	1	3	85	0	2	0	2	0	135	1	229
06:15 PM	0	0	0	1	84	0	2	0	4	0	162	4	257
Grand Total	6	1	3	30	1062	6	35	0	33	1	1659	57	2893
Apprch %	60	10	30	2.7	96.7	0.5	51.5	0	48.5	0.1	96.6	3.3	
Total %	0.2	0	0.1	1	36.7	0.2	1.2	0	1.1	0	57.3	2	
Cars	6	1	3	30	1050	6	35	0	33	1	1641	57	2863
% Cars	100	100	100	100	98.9	100	100	0	100	100	98.9	100	99
Trucks	0	0	0	0	12	0	0	0	0	0	18	0	30
% Trucks	0	0	0	0	1.1	0	0	0	0	0	1.1	0	1

	Driveway From North				Haverhill St From East				Madison St From South				Haverhill St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	0	1	2	6	105	1	112	8	0	5	13	1	194	6	201	328
04:15 PM	1	0	1	2	6	121	1	128	2	0	3	5	0	179	7	186	321
04:30 PM	1	0	0	1	2	127	0	129	2	0	1	3	0	181	4	185	318
04:45 PM	0	0	0	0	4	127	0	131	2	0	4	6	0	164	13	177	314
Total Volume	3	0	2	5	18	480	2	500	14	0	13	27	1	718	30	749	1281
% App. Total	60	0	40		3.6	96	0.4		51.9	0	48.1		0.1	95.9	4		
PHF	.750	.000	.500	.625	.750	.945	.500	.954	.438	.000	.650	.519	.250	.925	.577	.932	.976
Cars	3	0	2	5	18	473	2	493	14	0	13	27	1	711	30	742	1267
% Cars	100	0	100	100	100	98.5	100	98.6	100	0	100	100	100	99.0	100	99.1	98.9
Trucks	0	0	0	0	0	7	0	7	0	0	0	0	0	7	0	7	14
% Trucks	0	0	0	0	0	1.5	0	1.4	0	0	0	0	0	1.0	0	0.9	1.1

Accurate Counts

978-664-2565

N/S Street : Driveway / Madison Street

E/W Street : Haverhill Street

City/State : Methuen, MA

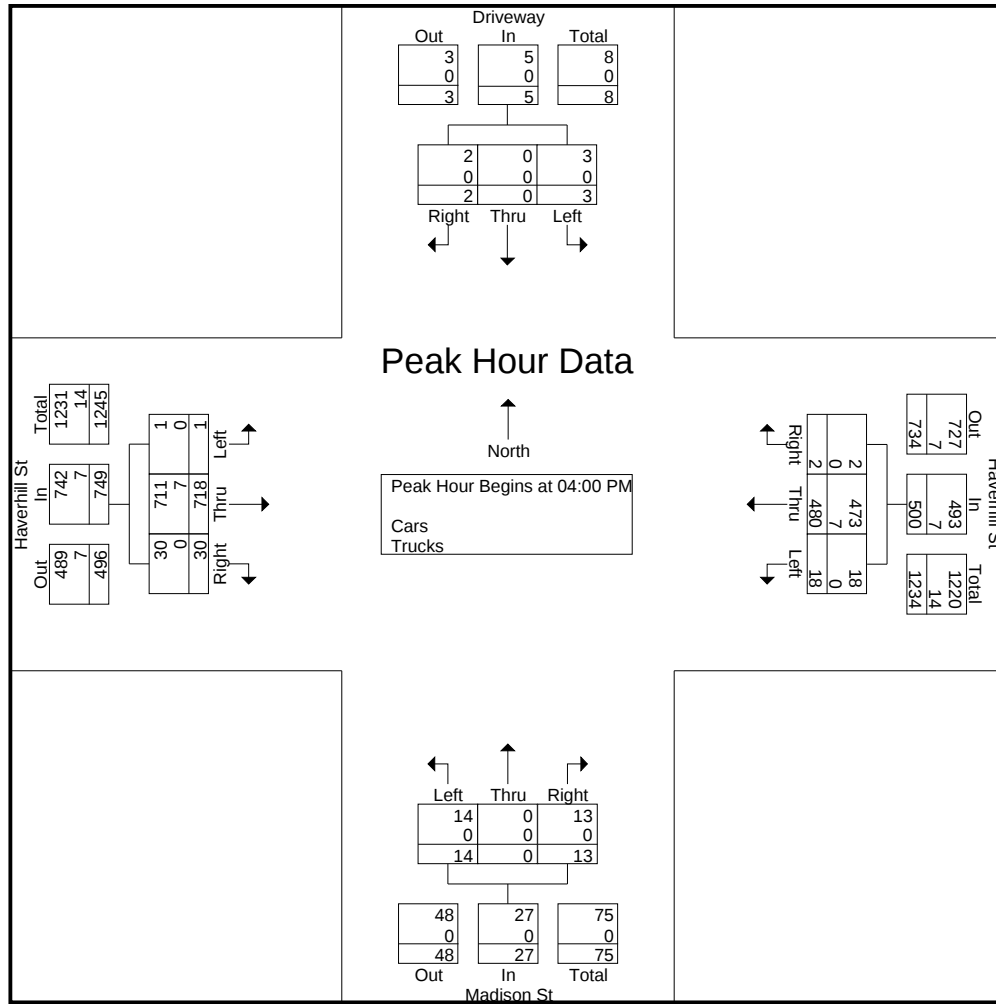
Weather : Cloudy

File Name : 34290001

Site Code : 34290001

Start Date : 6/20/2023

Page No : 2



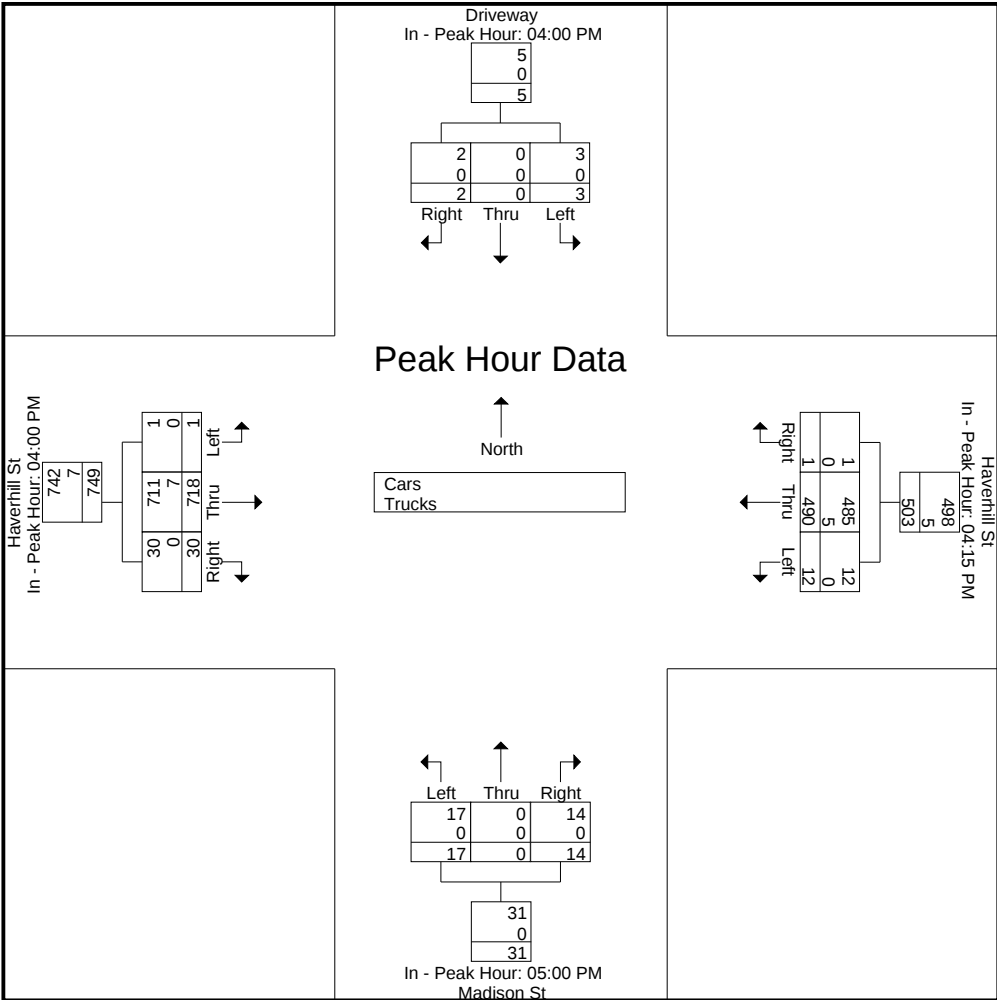
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				05:00 PM				04:00 PM			
+0 mins.	1	0	1	2	6	121	1	128	9	0	5	14	1	194	6	201
+15 mins.	1	0	1	2	2	127	0	129	0	0	3	3	0	179	7	186
+30 mins.	1	0	0	1	4	127	0	131	5	0	1	6	0	181	4	185
+45 mins.	0	0	0	0	0	115	0	115	3	0	5	8	0	164	13	177
Total Volume	3	0	2	5	12	490	1	503	17	0	14	31	1	718	30	749
% App. Total	60	0	40		2.4	97.4	0.2		54.8	0	45.2		0.1	95.9	4	
PHF	.750	.000	.500	.625	.500	.965	.250	.960	.472	.000	.700	.554	.250	.925	.577	.932
Cars	3	0	2	5	12	485	1	498	17	0	14	31	1	711	30	742
% Cars	100	0	100	100	100	99	100	99	100	0	100	100	100	99	100	99.1
Trucks	0	0	0	0	0	5	0	5	0	0	0	0	0	7	0	7
% Trucks	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0.9

N/S Street : Driveway / Madison Street
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290001
Site Code : 34290001
Start Date : 6/20/2023
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Driveway / Madison Street

E/W Street : Haverhill Street

City/State : Methuen, MA

Weather : Cloudy

File Name : 34290001

Site Code : 34290001

Start Date : 6/20/2023

Page No : 4

Groups Printed- Cars

	Driveway From North			Haverhill St From East			Madison St From South			Haverhill St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	1	0	1	6	102	1	8	0	5	1	193	6	324
04:15 PM	1	0	1	6	120	1	2	0	3	0	178	7	319
04:30 PM	1	0	0	2	125	0	2	0	1	0	176	4	311
04:45 PM	0	0	0	4	126	0	2	0	4	0	164	13	313
Total	3	0	2	18	473	2	14	0	13	1	711	30	1267
05:00 PM	1	0	0	0	114	0	9	0	5	0	168	10	307
05:15 PM	0	0	0	2	105	1	0	0	3	0	171	8	290
05:30 PM	1	1	0	3	100	2	5	0	1	0	155	3	271
05:45 PM	1	0	0	3	90	1	3	0	5	0	144	1	248
Total	3	1	0	8	409	4	17	0	14	0	638	22	1116
06:00 PM	0	0	1	3	85	0	2	0	2	0	133	1	227
06:15 PM	0	0	0	1	83	0	2	0	4	0	159	4	253
Grand Total	6	1	3	30	1050	6	35	0	33	1	1641	57	2863
Apprch %	60	10	30	2.8	96.7	0.6	51.5	0	48.5	0.1	96.6	3.4	
Total %	0.2	0	0.1	1	36.7	0.2	1.2	0	1.2	0	57.3	2	

	Driveway From North				Haverhill St From East				Madison St From South				Haverhill St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	0	1	2	6	102	1	109	8	0	5	13	1	193	6	200	324
04:15 PM	1	0	1	2	6	120	1	127	2	0	3	5	0	178	7	185	319
04:30 PM	1	0	0	1	2	125	0	127	2	0	1	3	0	176	4	180	311
04:45 PM	0	0	0	0	4	126	0	130	2	0	4	6	0	164	13	177	313
Total Volume	3	0	2	5	18	473	2	493	14	0	13	27	1	711	30	742	1267
% App. Total	60	0	40		3.7	95.9	0.4		51.9	0	48.1		0.1	95.8	4		
PHF	.750	.000	.500	.625	.750	.938	.500	.948	.438	.000	.650	.519	.250	.921	.577	.928	.978

Accurate Counts

978-664-2565

N/S Street : Driveway / Madison Street

E/W Street : Haverhill Street

City/State : Methuen, MA

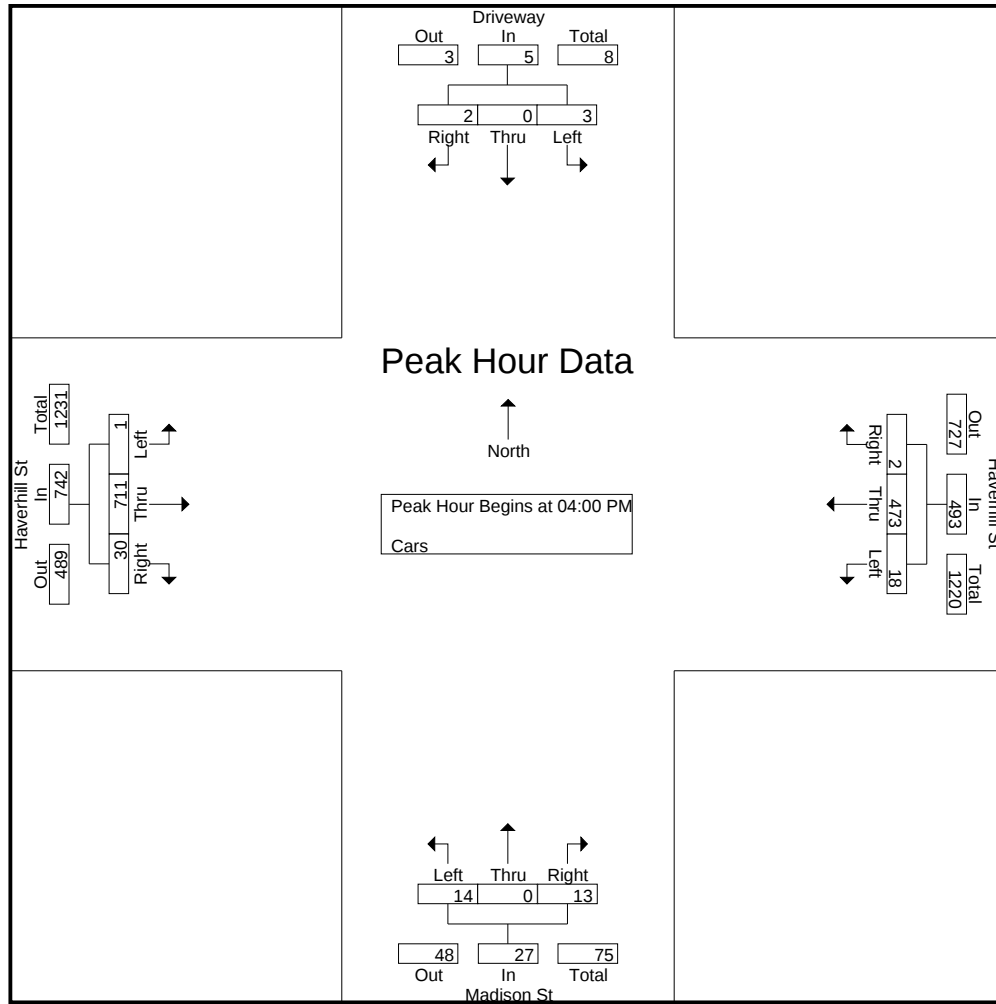
Weather : Cloudy

File Name : 34290001

Site Code : 34290001

Start Date : 6/20/2023

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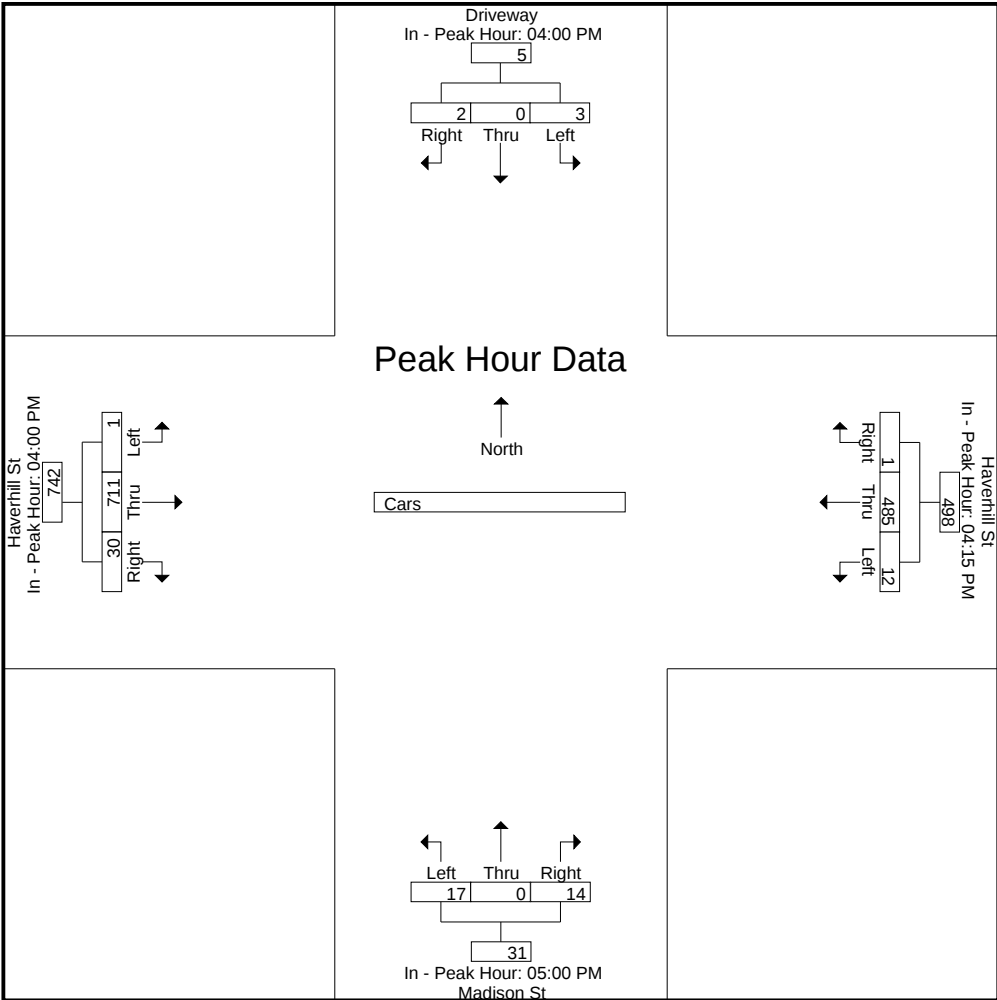
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				05:00 PM				04:00 PM			
+0 mins.	1	0	1	2	6	120	1	127	9	0	5	14	1	193	6	200
+15 mins.	1	0	1	2	2	125	0	127	0	0	3	3	0	178	7	185
+30 mins.	1	0	0	1	4	126	0	130	5	0	1	6	0	176	4	180
+45 mins.	0	0	0	0	0	114	0	114	3	0	5	8	0	164	13	177
Total Volume	3	0	2	5	12	485	1	498	17	0	14	31	1	711	30	742
% App. Total	60	0	40		2.4	97.4	0.2		54.8	0	45.2		0.1	95.8	4	
PHF	.750	.000	.500	.625	.500	.962	.250	.958	.472	.000	.700	.554	.250	.921	.577	.928

N/S Street : Driveway / Madison Street
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290001
Site Code : 34290001
Start Date : 6/20/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Driveway / Madison Street

E/W Street : Haverhill Street

City/State : Methuen, MA

Weather : Cloudy

File Name : 34290001

Site Code : 34290001

Start Date : 6/20/2023

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Groups Printed- Trucks

	Driveway From North			Haverhill St From East			Madison St From South			Haverhill St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	3	0	0	0	0	0	1	0	4
04:15 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
04:30 PM	0	0	0	0	2	0	0	0	0	0	5	0	7
04:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	0	0	0	7	0	0	0	0	0	7	0	14
05:00 PM	0	0	0	0	1	0	0	0	0	0	3	0	4
05:15 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
05:30 PM	0	0	0	0	2	0	0	0	0	0	2	0	4
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	4	0	0	0	0	0	6	0	10
06:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
06:15 PM	0	0	0	0	1	0	0	0	0	0	3	0	4
Grand Total	0	0	0	0	12	0	0	0	0	0	18	0	30
Apprch %	0	0	0	0	100	0	0	0	0	0	100	0	
Total %	0	0	0	0	40	0	0	0	0	0	60	0	

	Driveway From North				Haverhill St From East				Madison St From South				Haverhill St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	3	0	3	0	0	0	0	0	1	0	1	4
04:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
04:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	5	0	5	7
04:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	7	0	7	0	0	0	0	0	7	0	7	14
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.583	.000	.583	.000	.000	.000	.000	.000	.350	.000	.350	.500

Accurate Counts

978-664-2565

N/S Street : Driveway / Madison Street

E/W Street : Haverhill Street

City/State : Methuen, MA

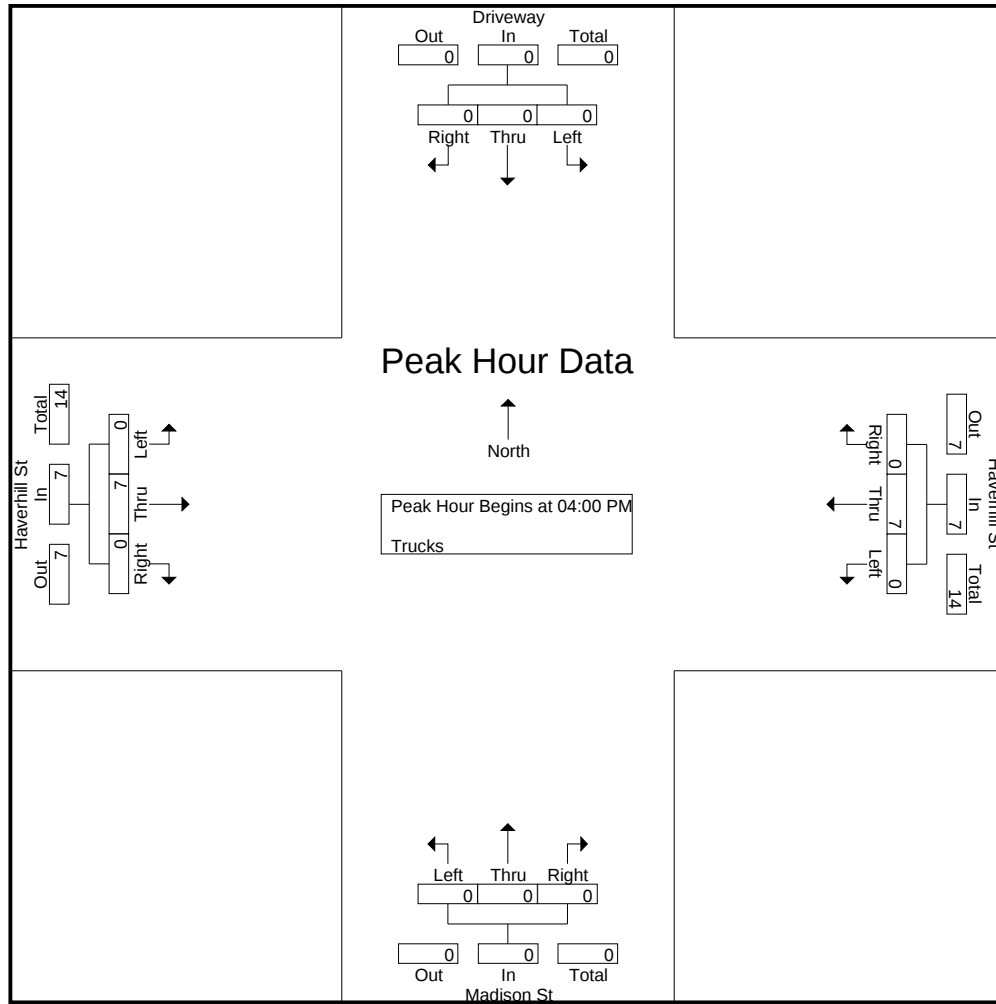
Weather : Cloudy

File Name : 34290001

Site Code : 34290001

Start Date : 6/20/2023

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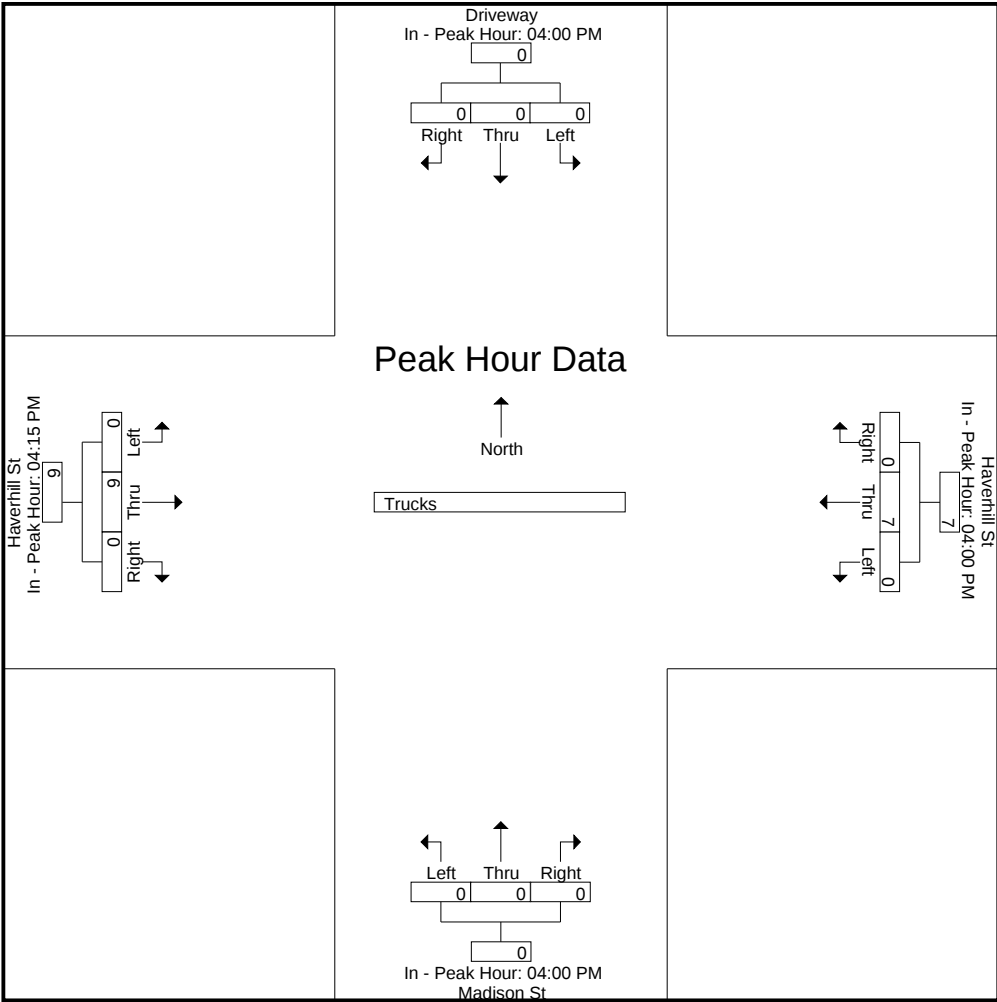
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:15 PM			
+0 mins.	0	0	0	0	0	3	0	3	0	0	0	0	0	1	0	1
+15 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	5	0	5
+30 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	3
Total Volume	0	0	0	0	0	7	0	7	0	0	0	0	0	9	0	9
% App. Total	0	0	0	0	0	100	0		0	0	0	0	0	100	0	
PHF	.000	.000	.000	.000	.000	.583	.000	.583	.000	.000	.000	.000	.000	.450	.000	.450

N/S Street : Driveway / Madison Street
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290001
Site Code : 34290001
Start Date : 6/20/2023
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[illegible]

Accurate Counts

978-664-2565

N/S Street : Driveway / Madison Street

E/W Street : Haverhill Street

City/State : Methuen, MA

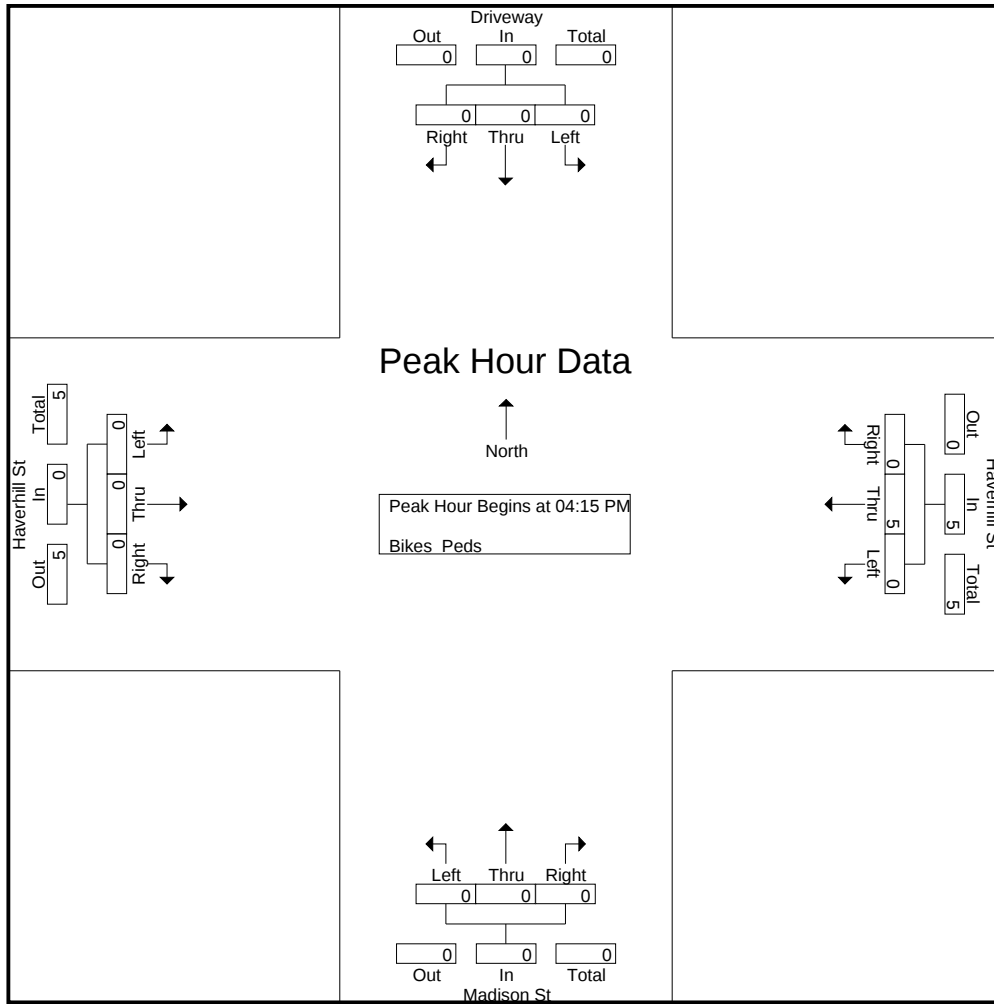
Weather : Cloudy

File Name : 34290001

Site Code : 34290001

Start Date : 6/20/2023

Page No : 11



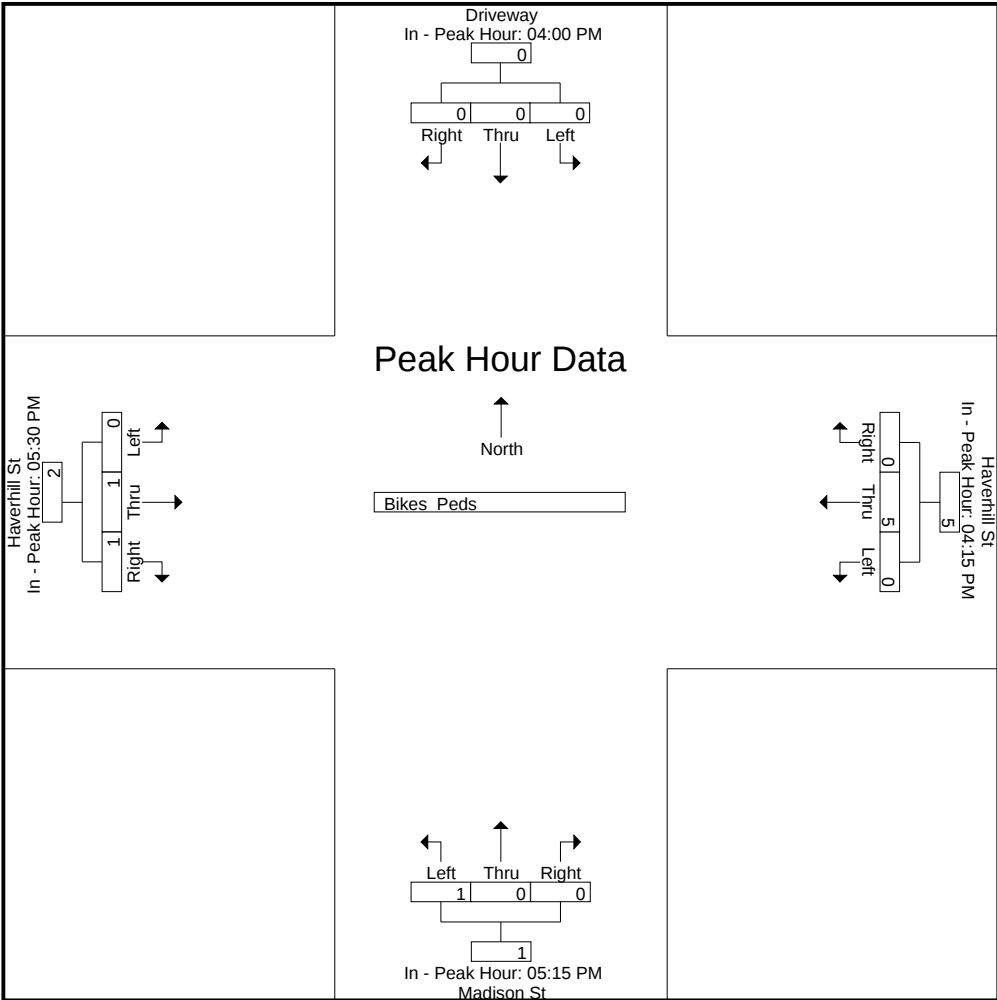
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				05:15 PM				05:30 PM			
+0 mins.	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	1	0	1	1	0	0	1	0	0	1	1
Total Volume	0	0	0	0	0	5	0	5	1	0	0	1	0	1	1	2
% App. Total	0	0	0	0	0	100	0		100	0	0		0	50	50	
PHF	.000	.000	.000	.000	.000	.313	.000	.313	.250	.000	.000	.250	.000	.250	.250	.500

N/S Street : Driveway / Madison Street
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290001
Site Code : 34290001
Start Date : 6/20/2023
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

Page No : 1

Groups Printed- Cars - Trucks

	Driveway From North			Haverhill St From East			Strathmore Rd From South			Haverhill St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	108	0	1	0	2	0	67	2	180
07:15 AM	0	0	0	2	102	0	2	0	5	0	55	3	169
07:30 AM	0	0	0	0	113	0	1	0	1	0	53	1	169
07:45 AM	0	0	0	1	113	0	3	0	0	0	88	4	209
Total	0	0	0	3	436	0	7	0	8	0	263	10	727
08:00 AM	0	0	0	2	119	0	5	0	5	0	61	2	194
08:15 AM	0	0	0	4	113	0	3	0	2	1	76	5	204
08:30 AM	0	0	0	1	109	1	0	0	3	4	71	8	197
08:45 AM	0	0	0	1	96	0	3	0	2	3	80	4	189
Total	0	0	0	8	437	1	11	0	12	8	288	19	784
Grand Total	0	0	0	11	873	1	18	0	20	8	551	29	1511
Apprch %	0	0	0	1.2	98.6	0.1	47.4	0	52.6	1.4	93.7	4.9	
Total %	0	0	0	0.7	57.8	0.1	1.2	0	1.3	0.5	36.5	1.9	
Cars	0	0	0	11	843	1	17	0	20	8	519	28	1447
% Cars	0	0	0	100	96.6	100	94.4	0	100	100	94.2	96.6	95.8
Trucks	0	0	0	0	30	0	1	0	0	0	32	1	64
% Trucks	0	0	0	0	3.4	0	5.6	0	0	0	5.8	3.4	4.2

	Driveway From North				Haverhill St From East				Strathmore Rd From South				Haverhill St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	1	113	0	114	3	0	0	3	0	88	4	92	209
08:00 AM	0	0	0	0	2	119	0	121	5	0	5	10	0	61	2	63	194
08:15 AM	0	0	0	0	4	113	0	117	3	0	2	5	1	76	5	82	204
08:30 AM	0	0	0	0	1	109	1	111	0	0	3	3	4	71	8	83	197
Total Volume	0	0	0	0	8	454	1	463	11	0	10	21	5	296	19	320	804
% App. Total	0	0	0		1.7	98.1	0.2		52.4	0	47.6		1.6	92.5	5.9		
PHF	.000	.000	.000	.000	.500	.954	.250	.957	.550	.000	.500	.525	.313	.841	.594	.870	.962
Cars	0	0	0	0	8	439	1	448	11	0	10	21	5	284	19	308	777
% Cars	0	0	0	0	100	96.7	100	96.8	100	0	100	100	100	95.9	100	96.3	96.6
Trucks	0	0	0	0	0	15	0	15	0	0	0	0	0	12	0	12	27
% Trucks	0	0	0	0	0	3.3	0	3.2	0	0	0	0	0	4.1	0	3.8	3.4

Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

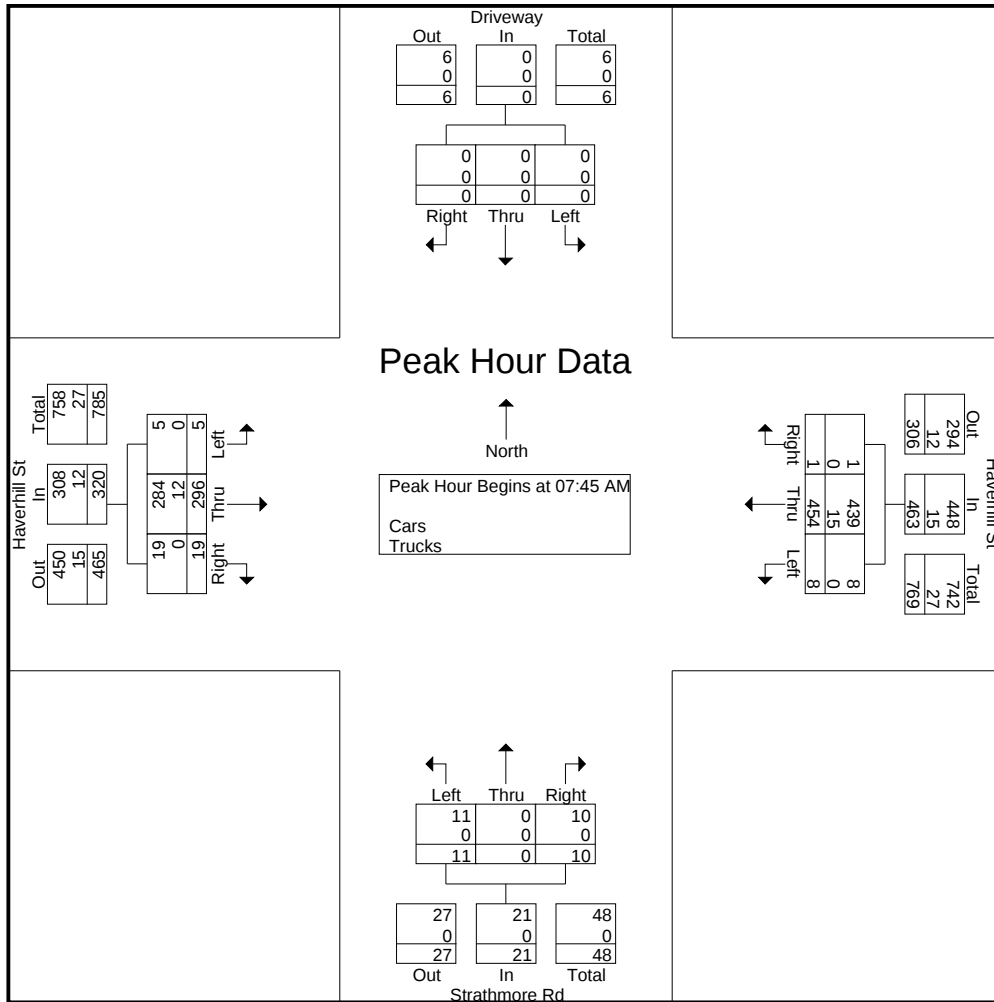
Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

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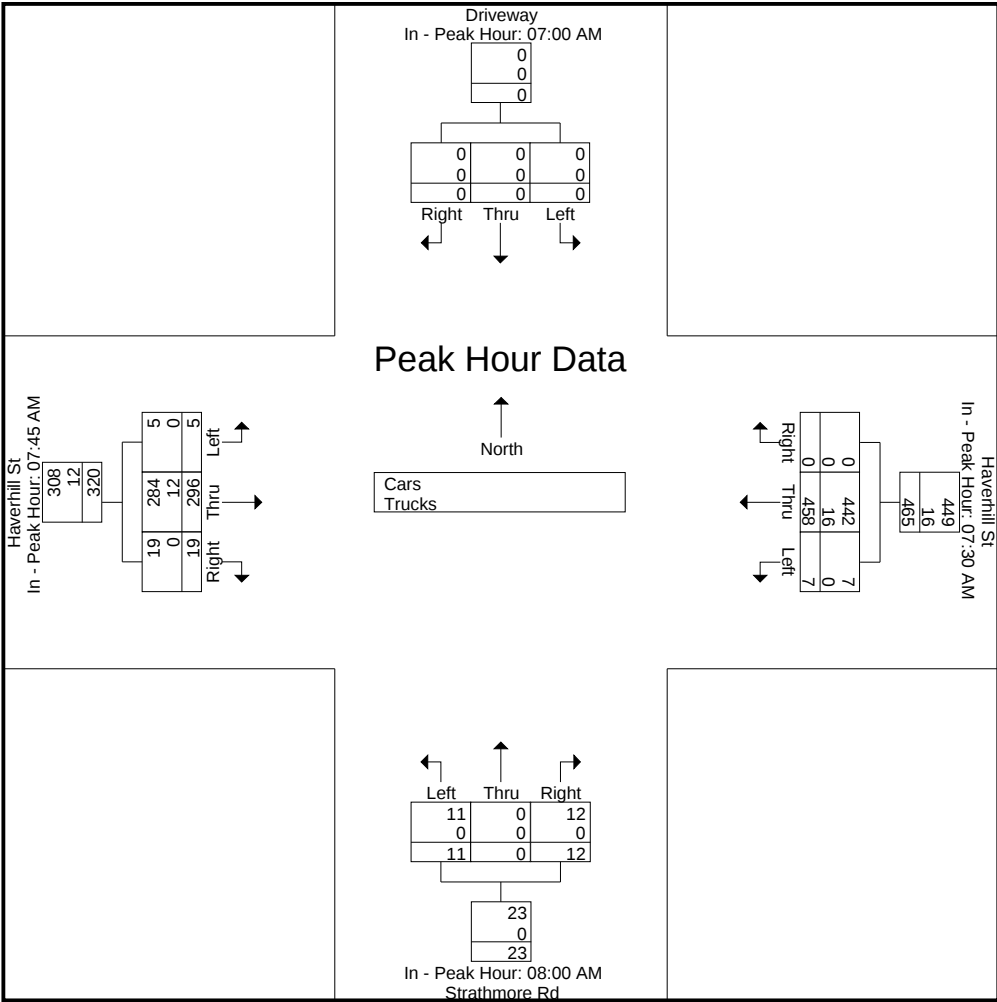
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:30 AM				08:00 AM				07:45 AM			
+0 mins.	0	0	0	0	0	113	0	113	5	0	5	10	0	88	4	92
+15 mins.	0	0	0	0	1	113	0	114	3	0	2	5	0	61	2	63
+30 mins.	0	0	0	0	2	119	0	121	0	0	3	3	1	76	5	82
+45 mins.	0	0	0	0	4	113	0	117	3	0	2	5	4	71	8	83
Total Volume	0	0	0	0	7	458	0	465	11	0	12	23	5	296	19	320
% App. Total	0	0	0	0	1.5	98.5	0		47.8	0	52.2		1.6	92.5	5.9	
PHF	.000	.000	.000	.000	.438	.962	.000	.961	.550	.000	.600	.575	.313	.841	.594	.870
Cars	0	0	0	0	7	442	0	449	11	0	12	23	5	284	19	308
% Cars	0	0	0	0	100	96.5	0	96.6	100	0	100	100	100	95.9	100	96.2
Trucks	0	0	0	0	0	16	0	16	0	0	0	0	0	12	0	12
% Trucks	0	0	0	0	0	3.5	0	3.4	0	0	0	0	0	4.1	0	3.8

N/S Street : Driveway / Strathmore Road
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290002
Site Code : 34290002
Start Date : 6/20/2023
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Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

Page No : 4

Groups Printed- Cars

	Driveway From North			Haverhill St From East			Strathmore Rd From South			Haverhill St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	106	0	1	0	2	0	59	2	170
07:15 AM	0	0	0	2	100	0	2	0	5	0	51	3	163
07:30 AM	0	0	0	0	109	0	0	0	1	0	51	1	162
07:45 AM	0	0	0	1	109	0	3	0	0	0	84	4	201
Total	0	0	0	3	424	0	6	0	8	0	245	10	696
08:00 AM	0	0	0	2	115	0	5	0	5	0	56	2	185
08:15 AM	0	0	0	4	109	0	3	0	2	1	75	5	199
08:30 AM	0	0	0	1	106	1	0	0	3	4	69	8	192
08:45 AM	0	0	0	1	89	0	3	0	2	3	74	3	175
Total	0	0	0	8	419	1	11	0	12	8	274	18	751
Grand Total	0	0	0	11	843	1	17	0	20	8	519	28	1447
Apprch %	0	0	0	1.3	98.6	0.1	45.9	0	54.1	1.4	93.5	5	
Total %	0	0	0	0.8	58.3	0.1	1.2	0	1.4	0.6	35.9	1.9	

	Driveway From North				Haverhill St From East				Strathmore Rd From South				Haverhill St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	1	109	0	110	3	0	0	3	0	84	4	88	201
08:00 AM	0	0	0	0	2	115	0	117	5	0	5	10	0	56	2	58	185
08:15 AM	0	0	0	0	4	109	0	113	3	0	2	5	1	75	5	81	199
08:30 AM	0	0	0	0	1	106	1	108	0	0	3	3	4	69	8	81	192
Total Volume	0	0	0	0	8	439	1	448	11	0	10	21	5	284	19	308	777
% App. Total	0	0	0		1.8	98	0.2		52.4	0	47.6		1.6	92.2	6.2		
PHF	.000	.000	.000	.000	.500	.954	.250	.957	.550	.000	.500	.525	.313	.845	.594	.875	.966

Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

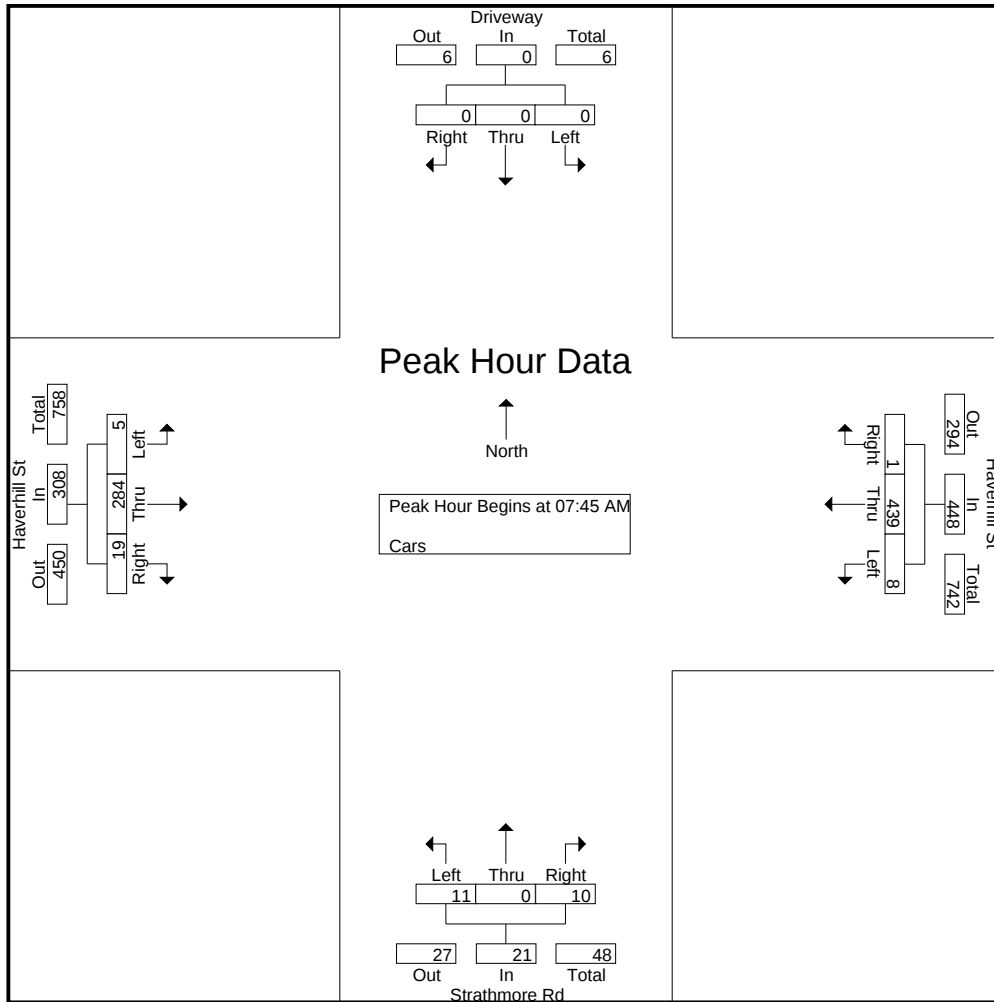
Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

Page No : 5



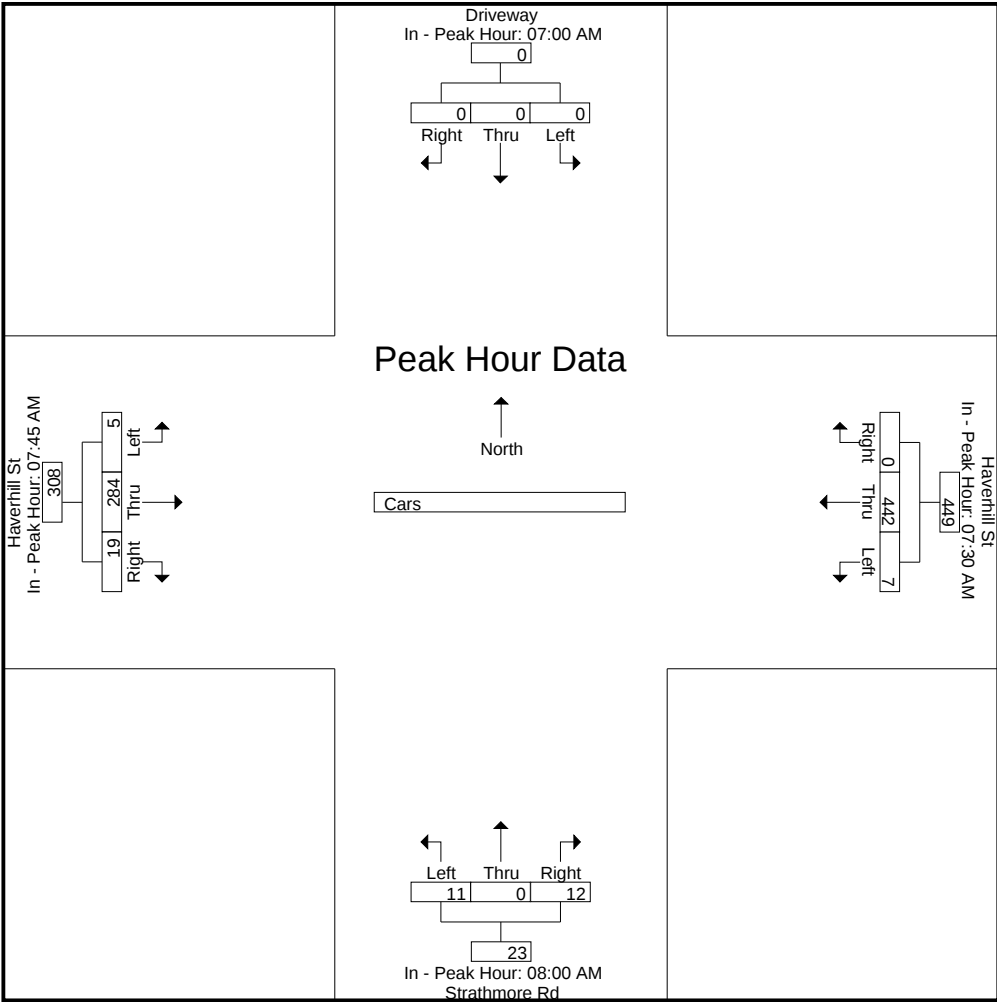
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:30 AM				08:00 AM				07:45 AM			
+0 mins.	0	0	0	0	0	109	0	109	5	0	5	10	0	84	4	88
+15 mins.	0	0	0	0	1	109	0	110	3	0	2	5	0	56	2	58
+30 mins.	0	0	0	0	2	115	0	117	0	0	3	3	1	75	5	81
+45 mins.	0	0	0	0	4	109	0	113	3	0	2	5	4	69	8	81
Total Volume	0	0	0	0	7	442	0	449	11	0	12	23	5	284	19	308
% App. Total	0	0	0	0	1.6	98.4	0		47.8	0	52.2		1.6	92.2	6.2	
PHF	.000	.000	.000	.000	.438	.961	.000	.959	.550	.000	.600	.575	.313	.845	.594	.875

N/S Street : Driveway / Strathmore Road
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290002
Site Code : 34290002
Start Date : 6/20/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

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Groups Printed- Trucks

	Driveway From North			Haverhill St From East			Strathmore Rd From South			Haverhill St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	2	0	0	0	0	0	8	0	10
07:15 AM	0	0	0	0	2	0	0	0	0	0	4	0	6
07:30 AM	0	0	0	0	4	0	1	0	0	0	2	0	7
07:45 AM	0	0	0	0	4	0	0	0	0	0	4	0	8
Total	0	0	0	0	12	0	1	0	0	0	18	0	31
08:00 AM	0	0	0	0	4	0	0	0	0	0	5	0	9
08:15 AM	0	0	0	0	4	0	0	0	0	0	1	0	5
08:30 AM	0	0	0	0	3	0	0	0	0	0	2	0	5
08:45 AM	0	0	0	0	7	0	0	0	0	0	6	1	14
Total	0	0	0	0	18	0	0	0	0	0	14	1	33
Grand Total	0	0	0	0	30	0	1	0	0	0	32	1	64
Apprch %	0	0	0	0	100	0	100	0	0	0	97	3	
Total %	0	0	0	0	46.9	0	1.6	0	0	0	50	1.6	

	Driveway From North				Haverhill St From East				Strathmore Rd From South				Haverhill St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	4	0	4	0	0	0	0	0	5	0	5	9
08:15 AM	0	0	0	0	0	4	0	4	0	0	0	0	0	1	0	1	5
08:30 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	2	0	2	5
08:45 AM	0	0	0	0	0	7	0	7	0	0	0	0	0	6	1	7	14
Total Volume	0	0	0	0	0	18	0	18	0	0	0	0	0	14	1	15	33
% App. Total	0	0	0		0	100	0		0	0	0		0	93.3	6.7		
PHF	.000	.000	.000	.000	.000	.643	.000	.643	.000	.000	.000	.000	.000	.583	.250	.536	.589

Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

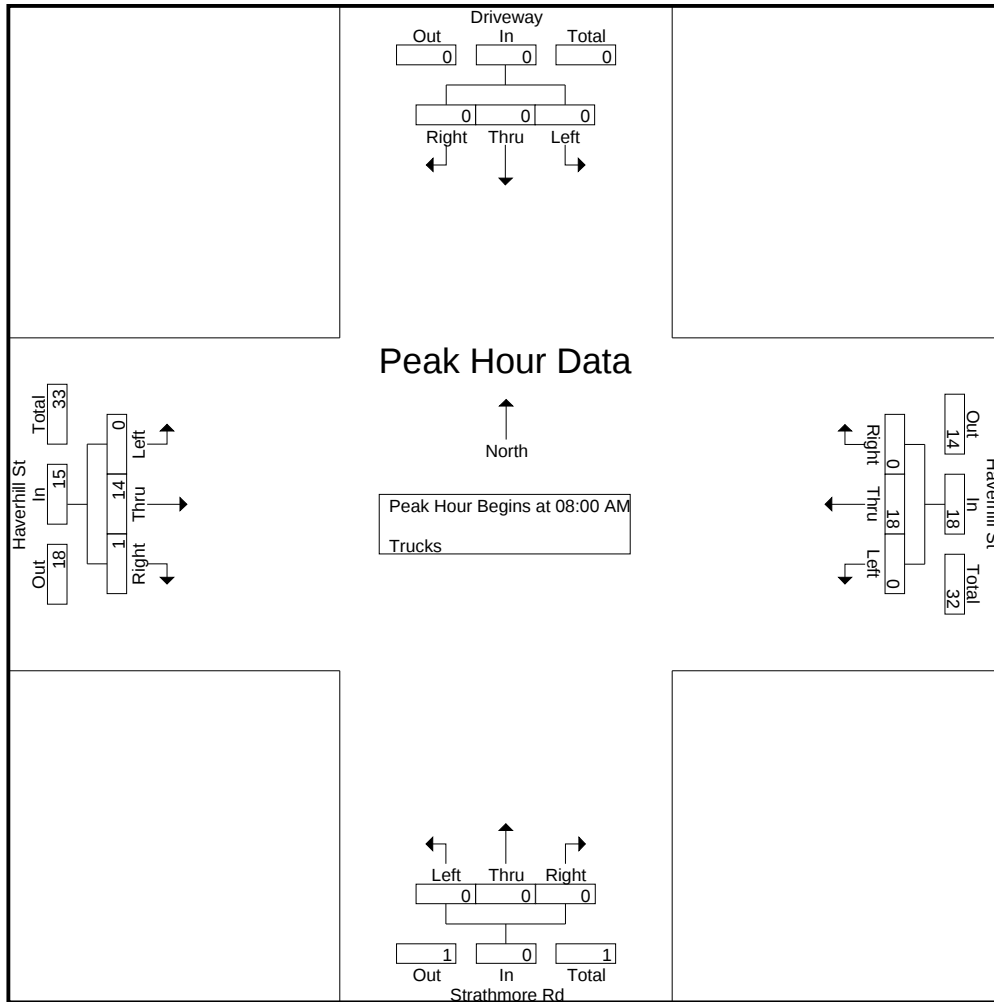
Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

Page No : 8



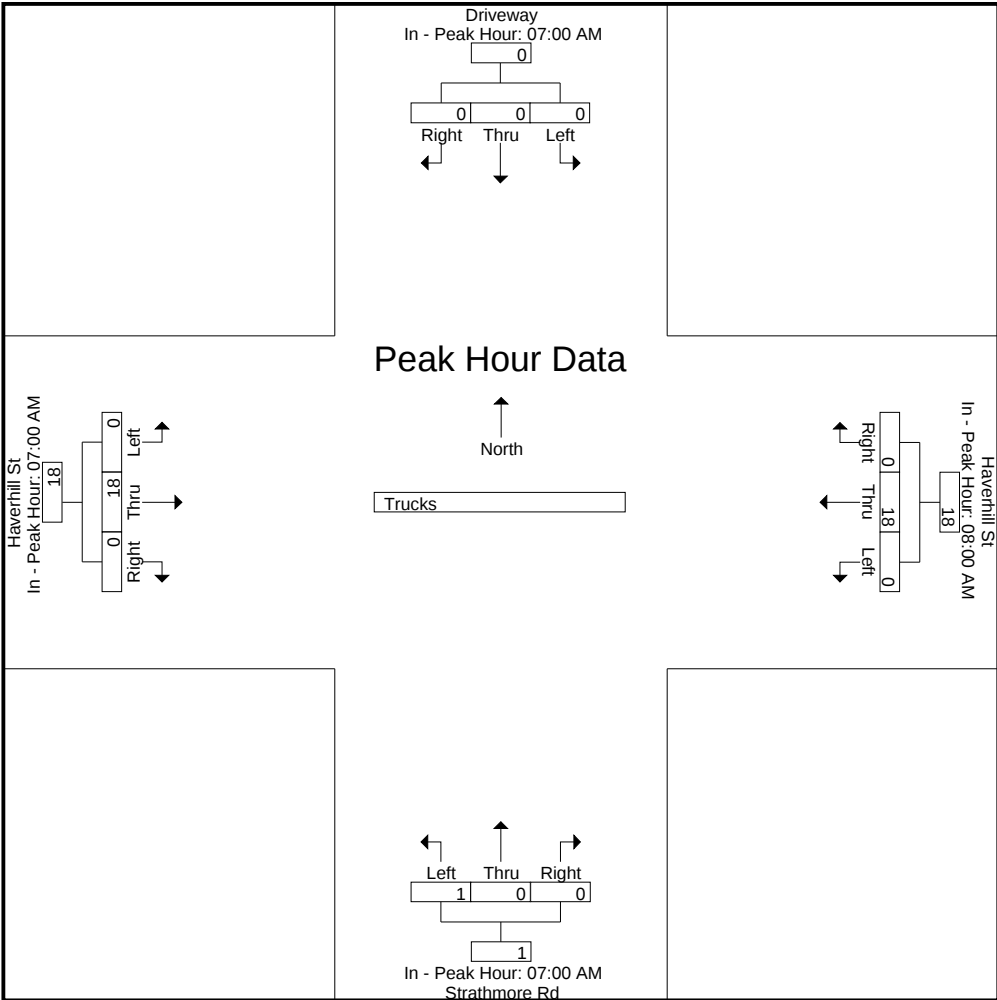
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				08:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	4	0	4	0	0	0	0	0	8	0	8
+15 mins.	0	0	0	0	0	4	0	4	0	0	0	0	0	4	0	4
+30 mins.	0	0	0	0	0	3	0	3	1	0	0	1	0	2	0	2
+45 mins.	0	0	0	0	0	7	0	7	0	0	0	0	0	4	0	4
Total Volume	0	0	0	0	0	18	0	18	1	0	0	1	0	18	0	18
% App. Total	0	0	0	0	0	100	0		100	0	0		0	100	0	
PHF	.000	.000	.000	.000	.000	.643	.000	.643	.250	.000	.000	.250	.000	.563	.000	.563

N/S Street : Driveway / Strathmore Road
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290002
Site Code : 34290002
Start Date : 6/20/2023
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Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

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Groups Printed- Bikes Peds

	Driveway From North				Haverhill St From East				Strathmore Rd From South				Haverhill St From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	2
07:15 AM	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5
07:30 AM	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	1	5	0	5
07:45 AM	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	2	2	4
Total	0	0	0	10	0	1	0	0	0	0	0	2	0	1	0	2	14	2	16
08:00 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	2
08:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	2
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2
Total	0	0	0	3	0	1	0	0	0	0	0	3	0	0	0	0	6	1	7
Grand Total	0	0	0	13	0	2	0	0	0	0	0	5	0	1	0	2	20	3	23
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0				
Total %	0	0	0		0	66.7	0		0	0	0		0	33.3	0		87	13	

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

Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

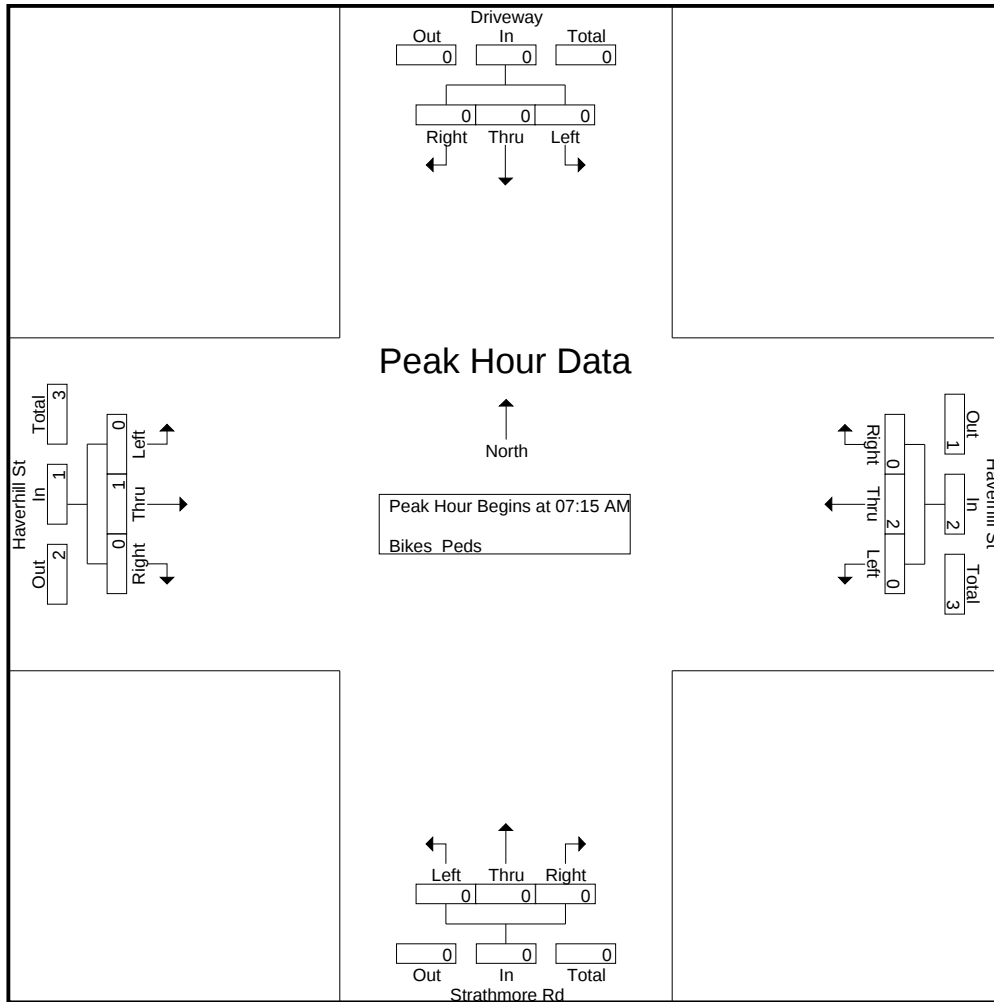
Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

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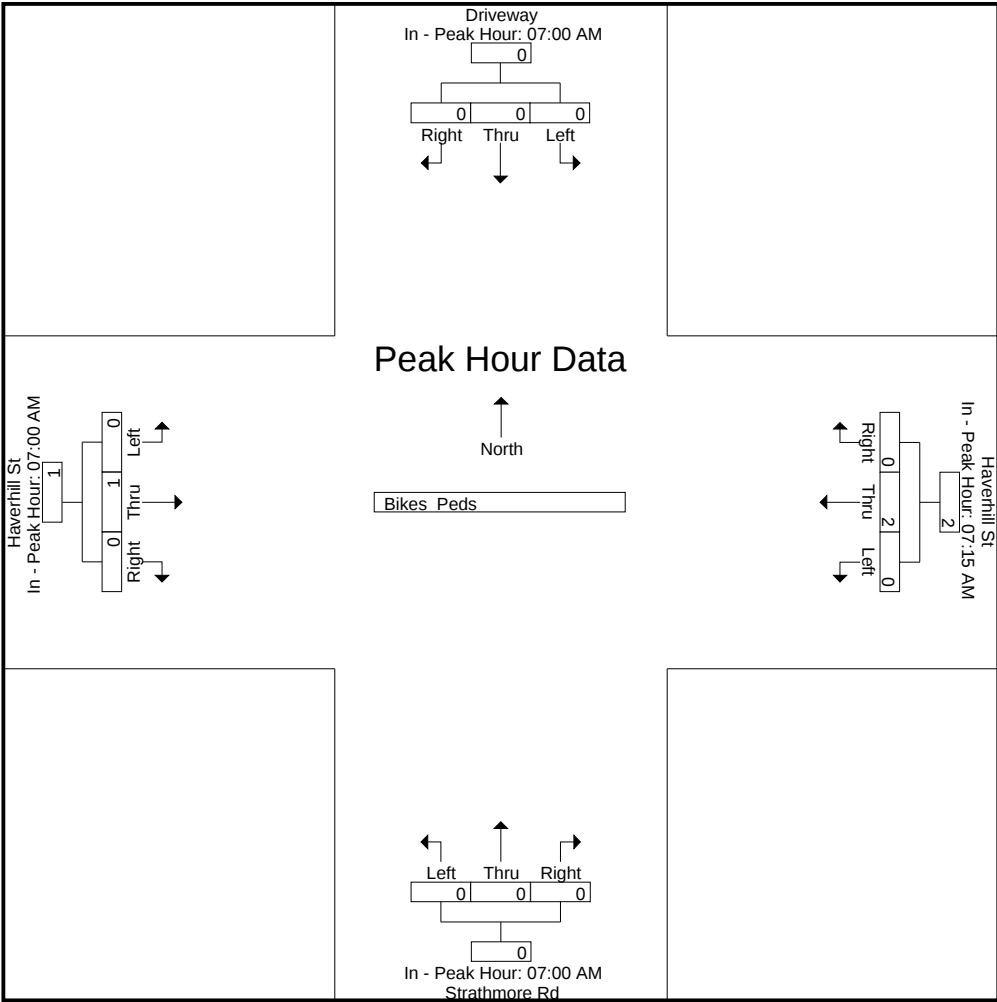
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

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

N/S Street : Driveway / Strathmore Road
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290002
Site Code : 34290002
Start Date : 6/20/2023
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Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

Page No : 1

Groups Printed- Cars - Trucks

	Driveway From North			Haverhill St From East			Strathmore Rd From South			Haverhill St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	1	4	111	1	4	0	4	1	199	5	330
04:15 PM	0	1	1	2	119	0	2	0	3	0	182	5	315
04:30 PM	0	0	0	3	128	0	2	0	3	0	183	5	324
04:45 PM	0	0	2	0	127	0	3	0	6	0	171	4	313
Total	0	1	4	9	485	1	11	0	16	1	735	19	1282
05:00 PM	0	0	3	5	118	0	2	0	2	0	181	4	315
05:15 PM	0	0	0	3	105	0	0	0	6	0	170	2	286
05:30 PM	0	0	1	0	107	0	2	0	8	0	157	6	281
05:45 PM	1	0	0	4	91	0	5	0	3	0	143	6	253
Total	1	0	4	12	421	0	9	0	19	0	651	18	1135
06:00 PM	0	0	2	2	86	0	2	0	0	0	136	2	230
06:15 PM	0	0	0	2	85	0	4	0	5	0	160	8	264
Grand Total	1	1	10	25	1077	1	26	0	40	1	1682	47	2911
Apprch %	8.3	8.3	83.3	2.3	97.6	0.1	39.4	0	60.6	0.1	97.2	2.7	
Total %	0	0	0.3	0.9	37	0	0.9	0	1.4	0	57.8	1.6	
Cars	1	1	10	25	1066	1	26	0	39	1	1665	46	2881
% Cars	100	100	100	100	99	100	100	0	97.5	100	99	97.9	99
Trucks	0	0	0	0	11	0	0	0	1	0	17	1	30
% Trucks	0	0	0	0	1	0	0	0	2.5	0	1	2.1	1

	Driveway From North				Haverhill St From East				Strathmore Rd From South				Haverhill St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	1	1	4	111	1	116	4	0	4	8	1	199	5	205	330
04:15 PM	0	1	1	2	2	119	0	121	2	0	3	5	0	182	5	187	315
04:30 PM	0	0	0	0	3	128	0	131	2	0	3	5	0	183	5	188	324
04:45 PM	0	0	2	2	0	127	0	127	3	0	6	9	0	171	4	175	313
Total Volume	0	1	4	5	9	485	1	495	11	0	16	27	1	735	19	755	1282
% App. Total	0	20	80		1.8	98	0.2		40.7	0	59.3		0.1	97.4	2.5		
PHF	.000	.250	.500	.625	.563	.947	.250	.945	.688	.000	.667	.750	.250	.923	.950	.921	.971
Cars	0	1	4	5	9	479	1	489	11	0	16	27	1	727	18	746	1267
% Cars	0	100	100	100	100	98.8	100	98.8	100	0	100	100	100	98.9	94.7	98.8	98.8
Trucks	0	0	0	0	0	6	0	6	0	0	0	0	0	8	1	9	15
% Trucks	0	0	0	0	0	1.2	0	1.2	0	0	0	0	0	1.1	5.3	1.2	1.2

Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

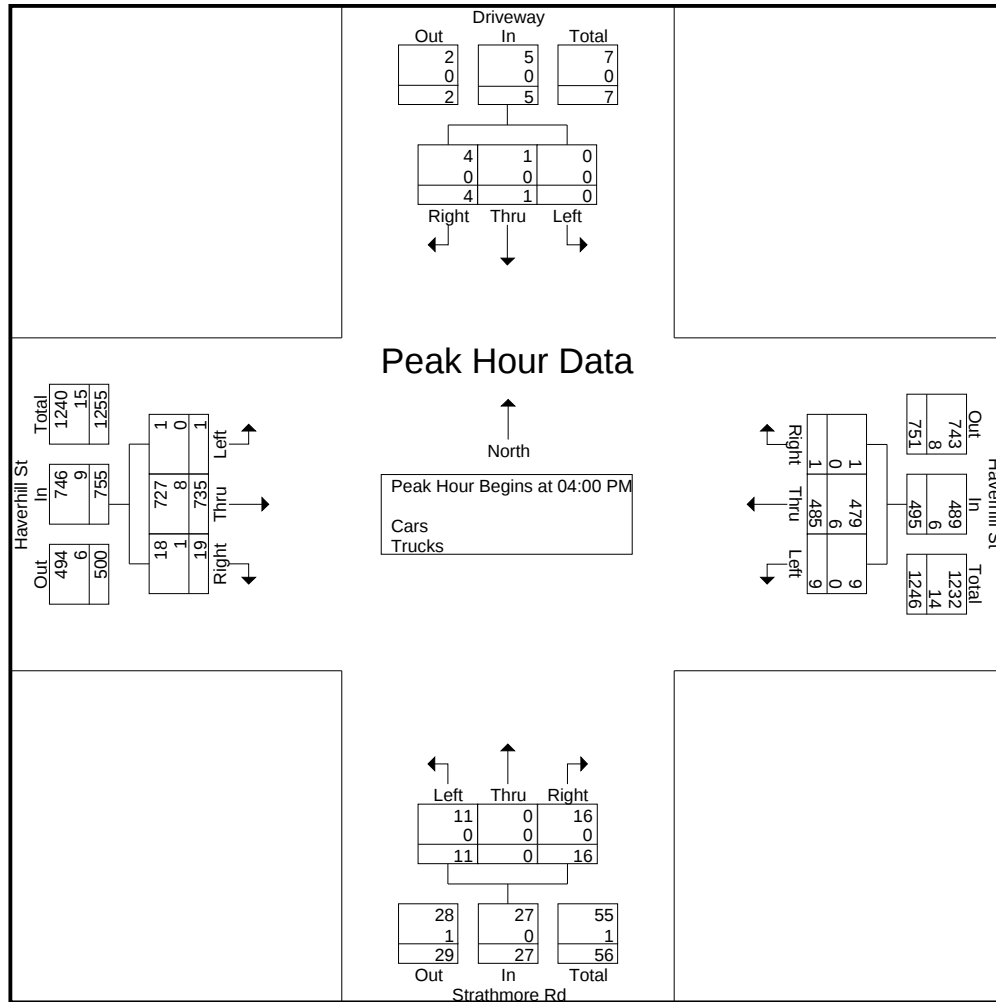
Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

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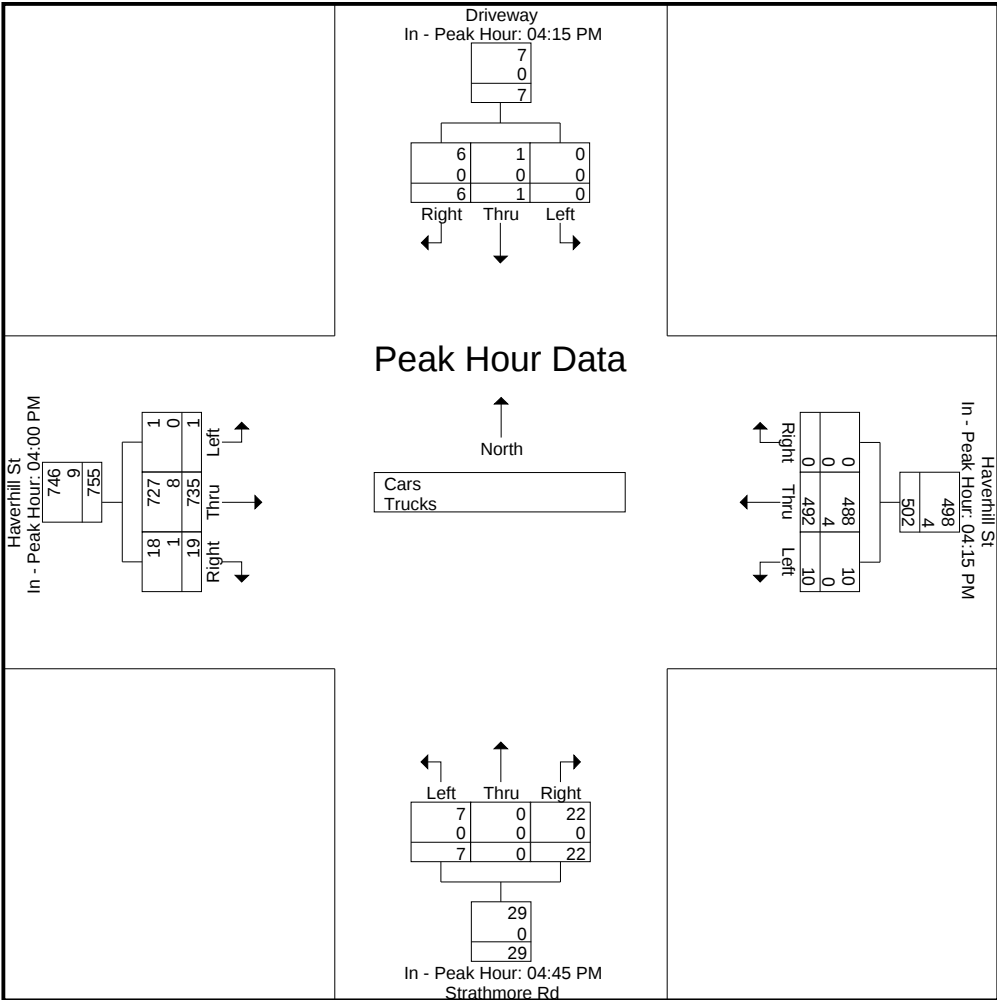
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				04:15 PM				04:45 PM				04:00 PM			
+0 mins.	0	1	1	2	2	119	0	121	3	0	6	9	1	199	5	205
+15 mins.	0	0	0	0	3	128	0	131	2	0	2	4	0	182	5	187
+30 mins.	0	0	2	2	0	127	0	127	0	0	6	6	0	183	5	188
+45 mins.	0	0	3	3	5	118	0	123	2	0	8	10	0	171	4	175
Total Volume	0	1	6	7	10	492	0	502	7	0	22	29	1	735	19	755
% App. Total	0	14.3	85.7		2	98	0		24.1	0	75.9		0.1	97.4	2.5	
PHF	.000	.250	.500	.583	.500	.961	.000	.958	.583	.000	.688	.725	.250	.923	.950	.921
Cars	0	1	6	7	10	488	0	498	7	0	22	29	1	727	18	746
% Cars	0	100	100	100	100	99.2	0	99.2	100	0	100	100	100	98.9	94.7	98.8
Trucks	0	0	0	0	0	4	0	4	0	0	0	0	0	8	1	9
% Trucks	0	0	0	0	0	0.8	0	0.8	0	0	0	0	0	1.1	5.3	1.2

N/S Street : Driveway / Strathmore Road
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290002
Site Code : 34290002
Start Date : 6/20/2023
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

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Groups Printed- Cars

	Driveway From North			Haverhill St From East			Strathmore Rd From South			Haverhill St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	1	4	108	1	4	0	4	1	197	5	325
04:15 PM	0	1	1	2	118	0	2	0	3	0	181	5	313
04:30 PM	0	0	0	3	126	0	2	0	3	0	178	4	316
04:45 PM	0	0	2	0	127	0	3	0	6	0	171	4	313
Total	0	1	4	9	479	1	11	0	16	1	727	18	1267
05:00 PM	0	0	3	5	117	0	2	0	2	0	179	4	312
05:15 PM	0	0	0	3	104	0	0	0	6	0	170	2	285
05:30 PM	0	0	1	0	105	0	2	0	8	0	155	6	277
05:45 PM	1	0	0	4	91	0	5	0	3	0	143	6	253
Total	1	0	4	12	417	0	9	0	19	0	647	18	1127
06:00 PM	0	0	2	2	86	0	2	0	0	0	134	2	228
06:15 PM	0	0	0	2	84	0	4	0	4	0	157	8	259
Grand Total	1	1	10	25	1066	1	26	0	39	1	1665	46	2881
Apprch %	8.3	8.3	83.3	2.3	97.6	0.1	40	0	60	0.1	97.3	2.7	
Total %	0	0	0.3	0.9	37	0	0.9	0	1.4	0	57.8	1.6	

	Driveway From North				Haverhill St From East				Strathmore Rd From South				Haverhill St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	1	1	4	108	1	113	4	0	4	8	1	197	5	203	325
04:15 PM	0	1	1	2	2	118	0	120	2	0	3	5	0	181	5	186	313
04:30 PM	0	0	0	0	3	126	0	129	2	0	3	5	0	178	4	182	316
04:45 PM	0	0	2	2	0	127	0	127	3	0	6	9	0	171	4	175	313
Total Volume	0	1	4	5	9	479	1	489	11	0	16	27	1	727	18	746	1267
% App. Total	0	20	80		1.8	98	0.2		40.7	0	59.3		0.1	97.5	2.4		
PHF	.000	.250	.500	.625	.563	.943	.250	.948	.688	.000	.667	.750	.250	.923	.900	.919	.975

Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

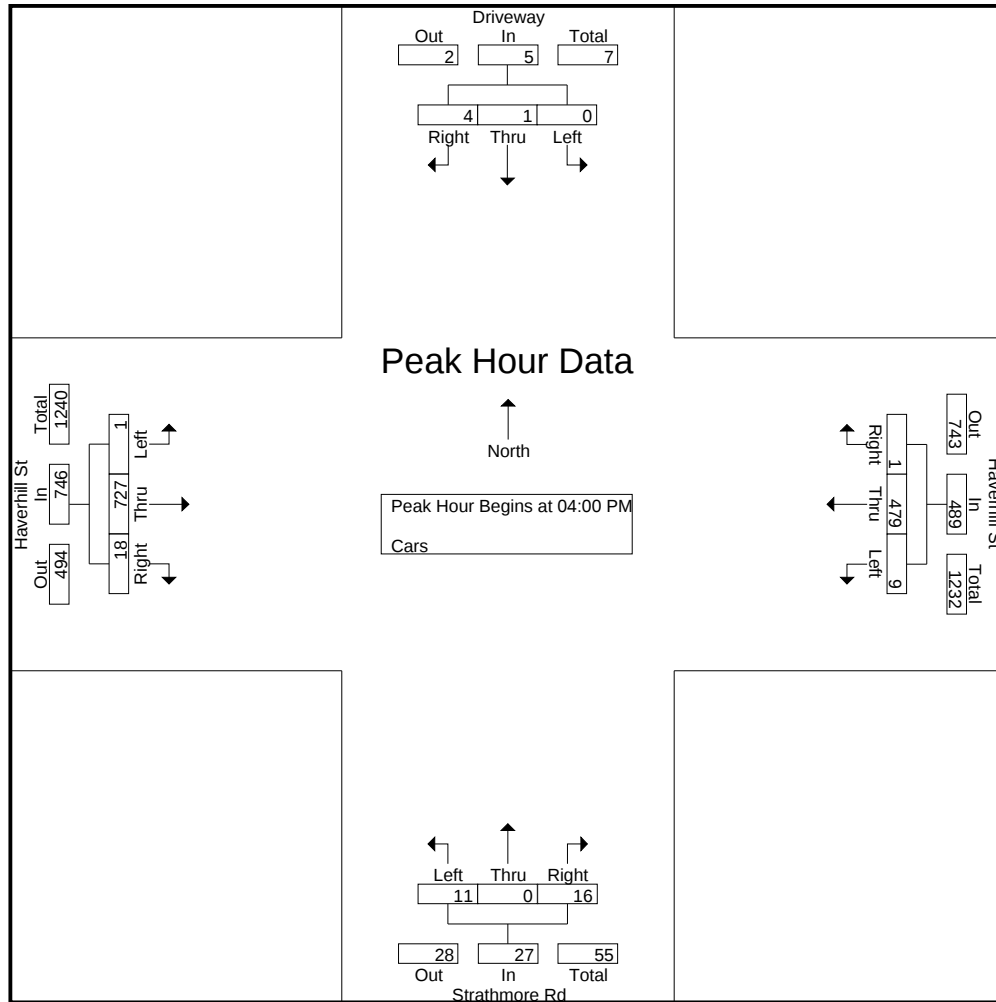
Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

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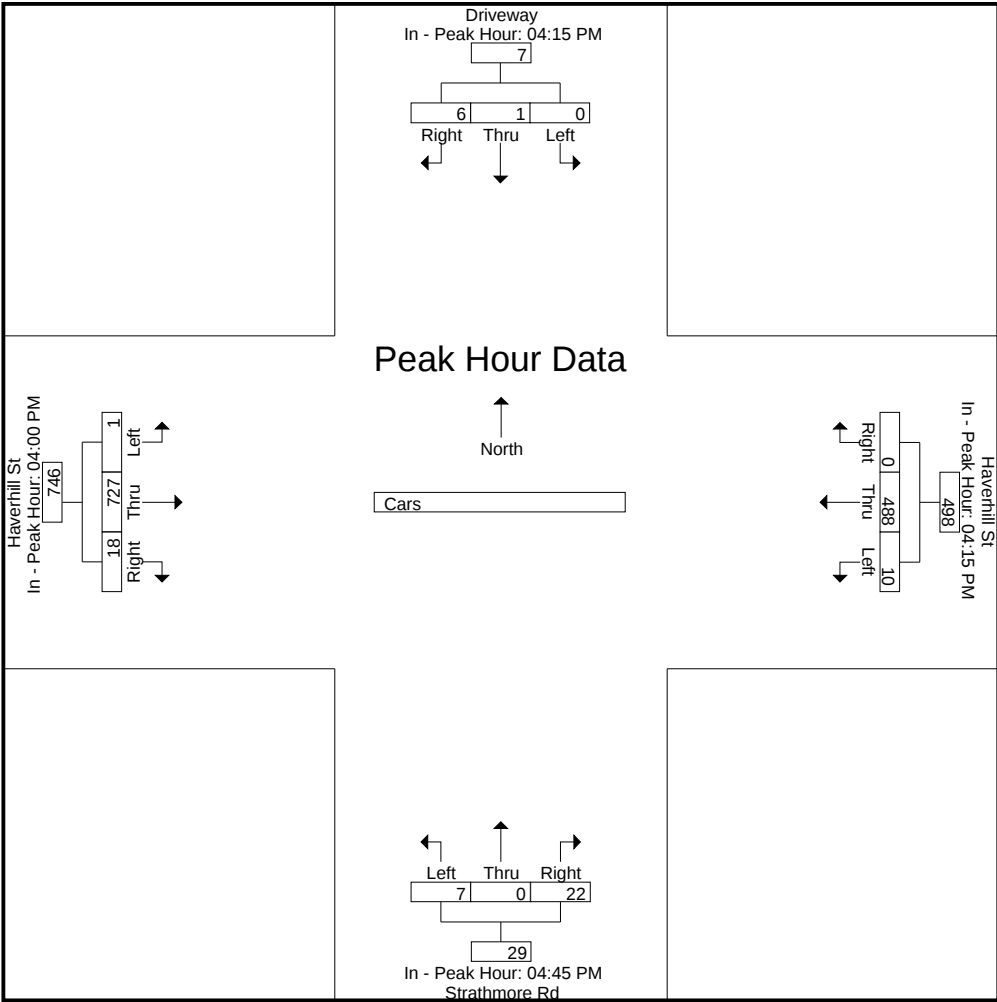
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				04:15 PM				04:45 PM				04:00 PM			
+0 mins.	0	1	1	2	2	118	0	120	3	0	6	9	1	197	5	203
+15 mins.	0	0	0	0	3	126	0	129	2	0	2	4	0	181	5	186
+30 mins.	0	0	2	2	0	127	0	127	0	0	6	6	0	178	4	182
+45 mins.	0	0	3	3	5	117	0	122	2	0	8	10	0	171	4	175
Total Volume	0	1	6	7	10	488	0	498	7	0	22	29	1	727	18	746
% App. Total	0	14.3	85.7		2	98	0		24.1	0	75.9		0.1	97.5	2.4	
PHF	.000	.250	.500	.583	.500	.961	.000	.965	.583	.000	.688	.725	.250	.923	.900	.919

N/S Street : Driveway / Strathmore Road
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290002
Site Code : 34290002
Start Date : 6/20/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

Page No : 7

Groups Printed- Trucks

	Driveway From North			Haverhill St From East			Strathmore Rd From South			Haverhill St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	3	0	0	0	0	0	2	0	5
04:15 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
04:30 PM	0	0	0	0	2	0	0	0	0	0	5	1	8
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	6	0	0	0	0	0	8	1	15
05:00 PM	0	0	0	0	1	0	0	0	0	0	2	0	3
05:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	2	0	0	0	0	0	2	0	4
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	4	0	0	0	0	0	4	0	8
06:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
06:15 PM	0	0	0	0	1	0	0	0	1	0	3	0	5
Grand Total	0	0	0	0	11	0	0	0	1	0	17	1	30
Apprch %	0	0	0	0	100	0	0	0	100	0	94.4	5.6	
Total %	0	0	0	0	36.7	0	0	0	3.3	0	56.7	3.3	

	Driveway From North				Haverhill St From East				Strathmore Rd From South				Haverhill St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	3	0	3	0	0	0	0	0	2	0	2	5
04:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
04:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	5	1	6	8
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	6	0	6	0	0	0	0	0	8	1	9	15
% App. Total	0	0	0		0	100	0		0	0	0		0	88.9	11.1		
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.400	.250	.375	.469

Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

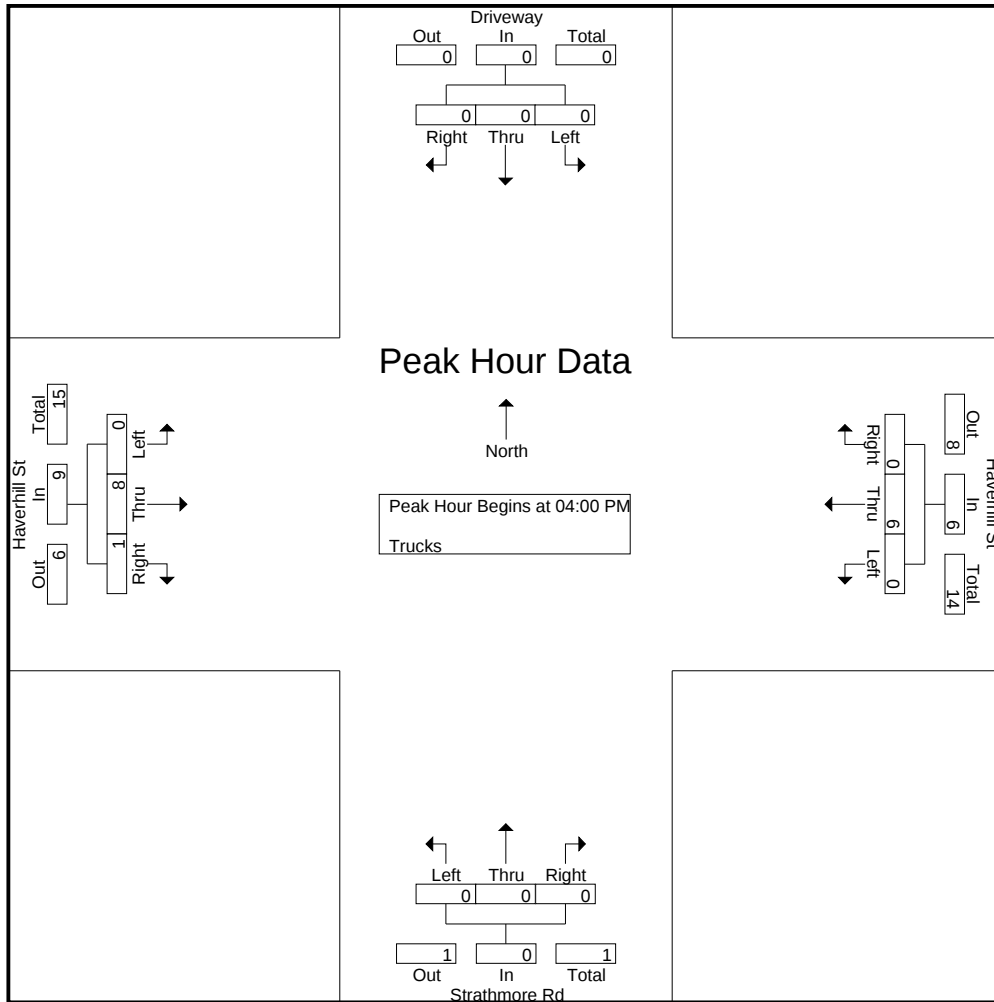
Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

Page No : 8



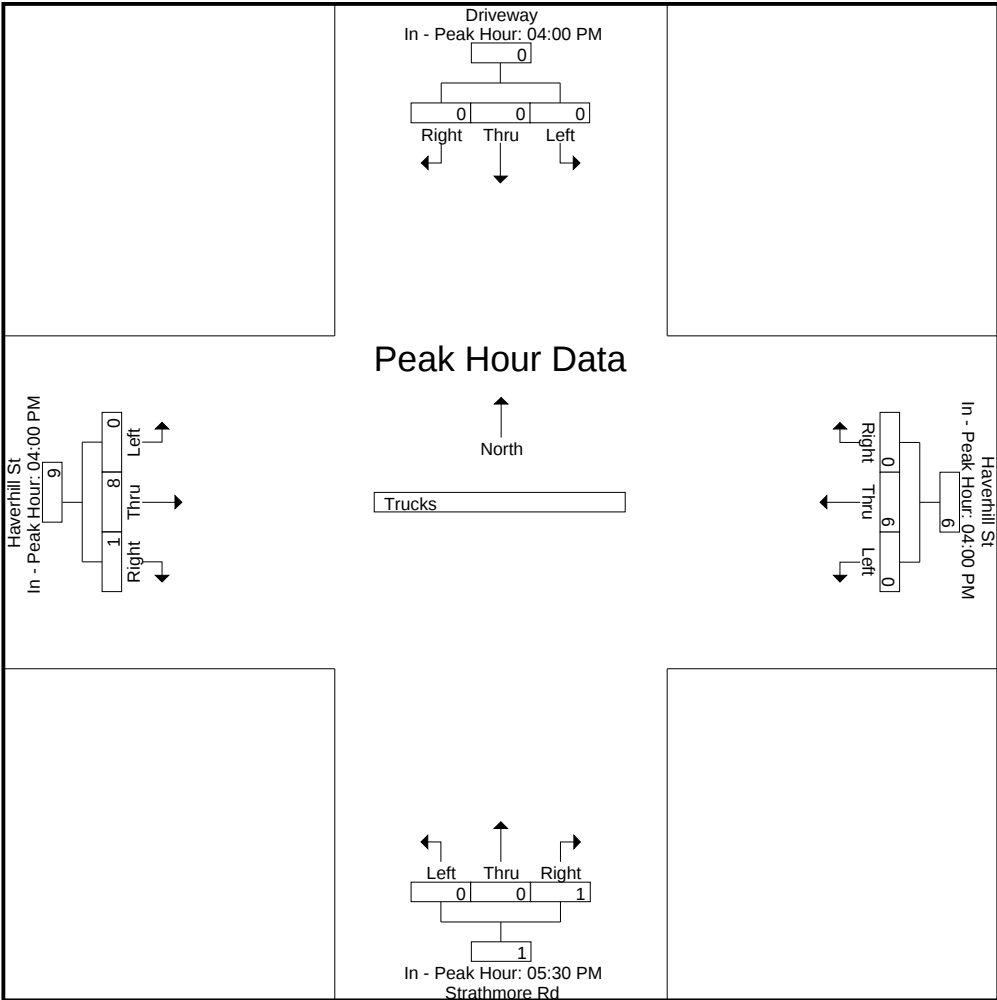
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				05:30 PM				04:00 PM			
+0 mins.	0	0	0	0	0	3	0	3	0	0	0	0	0	2	0	2
+15 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1
+30 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	5	1	6
+45 mins.	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Total Volume	0	0	0	0	0	6	0	6	0	0	1	1	0	8	1	9
% App. Total	0	0	0	0	0	100	0		0	0	100		0	88.9	11.1	
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.250	.250	.000	.400	.250	.375

N/S Street : Driveway / Strathmore Road
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290002
Site Code : 34290002
Start Date : 6/20/2023
Page No : 9



978-664-2565

Page No : 10

[illegible]

Accurate Counts

978-664-2565

N/S Street : Driveway / Strathmore Road

E/W Street : Haverhill Street

City/State : Methuen, MA

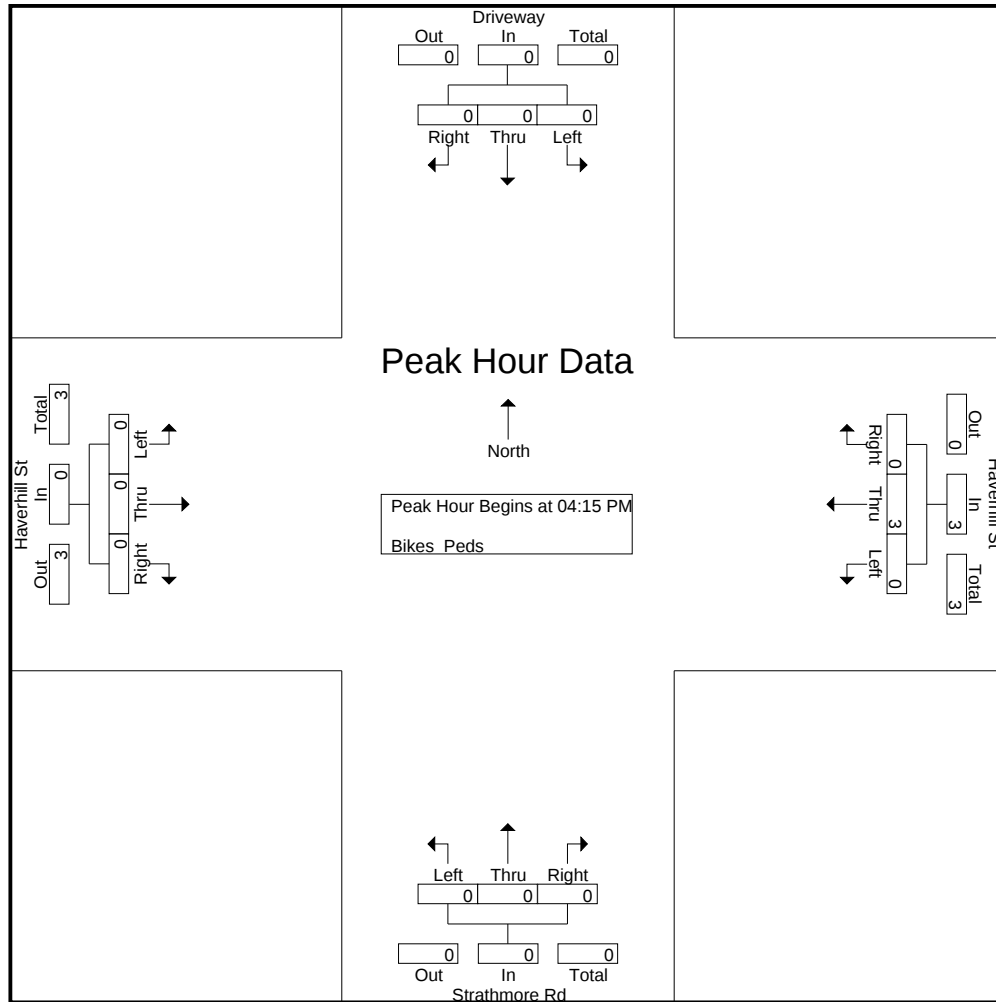
Weather : Cloudy

File Name : 34290002

Site Code : 34290002

Start Date : 6/20/2023

Page No : 11



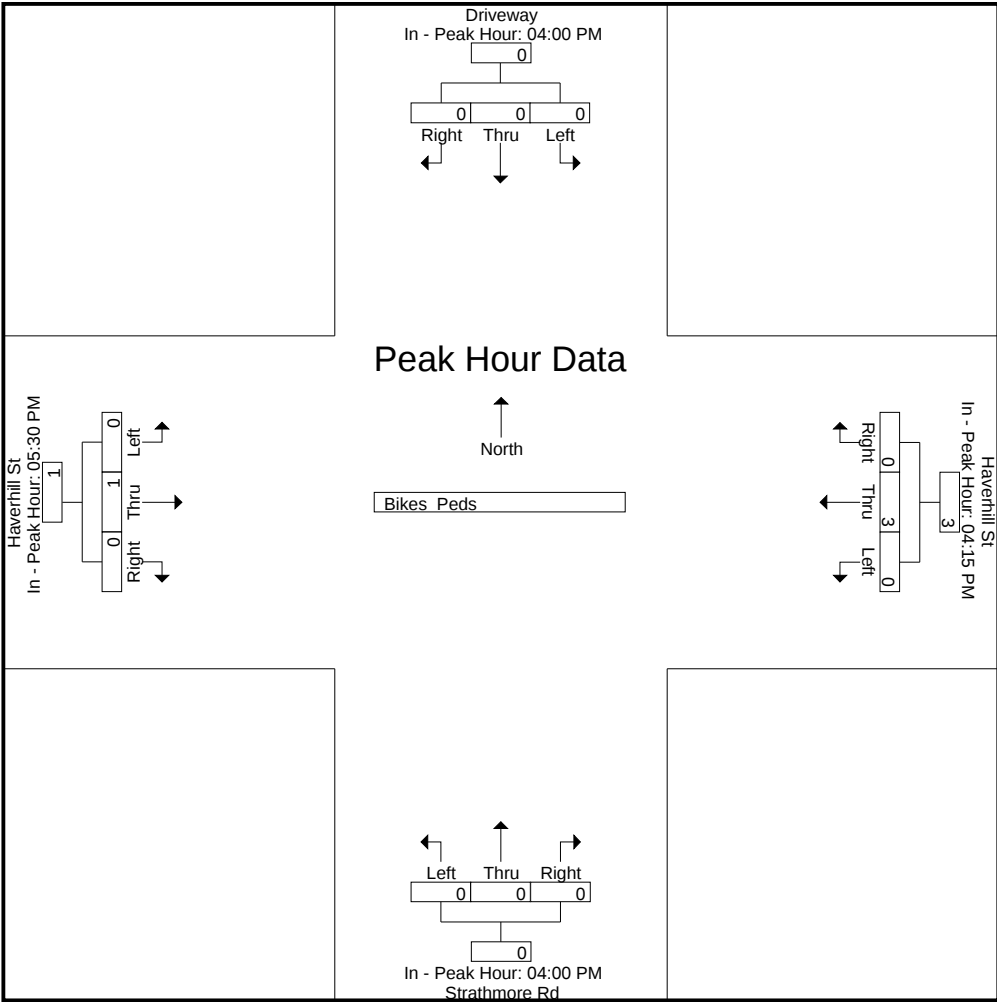
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				04:00 PM				05:30 PM			
+0 mins.	0	0	0	0	0	2	0	2	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	1	0	1	0	0	0	0	0	1	0	1
Total Volume	0	0	0	0	0	3	0	3	0	0	0	0	0	1	0	1
% App. Total	0	0	0	0	0	100	0		0	0	0	0	0	100	0	
PHF	.000	.000	.000	.000	.000	.375	.000	.375	.000	.000	.000	.000	.000	.250	.000	.250

N/S Street : Driveway / Strathmore Road
E/W Street : Haverhill Street
City/State : Methuen, MA
Weather : Cloudy

File Name : 34290002
Site Code : 34290002
Start Date : 6/20/2023
Page No : 12



Seasonal Adjustment

Massachusetts Highway Department
5093: Monthly Hourly Volume for January 2023

Location ID: County: Functional Class Location:			5093 Essex 1 INTERSTATE 93				Seasonal Factor Group: Daily Factor Group: Axle Factor Group: Growth Factor Group:																			
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	
1	1,457	1,428	886	559	475	537	953	1,331	1,975	3,019	4,696	6,405	7,984	7,466	7,004	6,298	5,995	5,441	4,619	3,521	2,714	1,910	1,390	987	79,050	
2	526	387	349	430	629	1,162	2,053	2,733	3,179	4,299	5,547	6,571	7,371	7,407	7,488	7,111	6,720	5,858	4,830	3,710	2,861	1,983	1,351	844	85,399	
3																										
4	682	509	447	653	1,860	4,886	6,668	7,921	7,135	5,906	5,475	5,617	5,817	6,135	7,619	8,372	8,033	7,891	5,783	4,105	2,949	2,073	1,433	1,119	109,088	
5	619	443	455	638	1,856	4,657	6,023	7,250	7,369	5,683	5,481	5,859	6,187	6,646	8,238	8,959	8,406	8,069	6,355	4,340	3,232	2,456	1,665	1,207	112,093	
6	640	513	453	655	1,732	3,998	5,403	6,334	5,780	5,171	4,694	5,364	5,728	6,298	6,914	8,033	7,896	6,977	6,466	4,399	3,334	2,595	1,949	1,431	102,757	
7	810	551	412	458	776	1,640	2,733	3,717	4,574	5,784	6,810	7,648	7,794	7,819	7,857	8,091	7,761	7,528	5,920	4,566	3,697	3,221	2,516	1,676	104,359	
8	1,044	629	456	368	447	878	1,648	2,437	3,164	4,548	5,887	7,049	8,018	7,677	7,116	7,103	7,731	7,332	6,086	4,264	3,154	2,048	1,407	856	91,347	
9	525	387	356	646	1,872	4,939	4,928	7,748	7,009	5,675	4,969	5,431	5,901	6,483	8,057	8,376	8,367	8,085	5,647	3,843	2,795	2,069	1,674	1,139	106,921	
10	630	453	402	605	1,896	4,901	6,638	7,959	7,264	5,737	5,187	5,626	5,956	6,658	8,043	8,510	8,285	8,456	6,028	4,225	3,236	2,298	1,556	1,142	111,691	
11	658	444	433	600	1,887	4,952	6,805	7,929	7,361	5,855	5,494	5,365	5,637	6,424	7,876	8,707	9,026	8,226	6,401	4,553	3,418	2,404	1,890	1,293	113,638	
12	715	489	459	628	1,878	4,827	6,526	7,745	7,054	5,840	5,272	5,441	5,768	6,131	7,285	7,909	8,380	8,016	5,847	4,126	3,103	2,413	1,958	1,300	109,110	
13	713	510	476	642	1,743	4,060	5,627	6,530	6,278	5,381	5,485	6,194	6,699	7,150	8,318	8,892	8,144	8,159	7,411	5,302	4,117	3,027	2,306	1,741	114,905	
14	996	628	500	484	770	1,533	2,380	3,401	4,509	5,817	7,095	8,296	8,508	8,018	8,669	8,191	7,793	6,934	5,608	4,304	3,617	3,023	2,677	1,836	105,587	
15	1,108	648	475	371	469	825	1,631	2,423	3,299	4,501	6,127	7,522	8,041	7,816	7,393	7,324	7,006	6,445	5,187	3,881	3,089	2,135	1,373	976	90,065	
16	633	505	379	551	1,278	3,027	3,996	4,489	5,098	4,824	5,765	6,933	7,350	7,633	8,529	8,737	8,759	8,252	6,036	4,526	2,966	2,004	1,374	952	104,596	
17	556	434	395	654	1,945	5,079	7,061	8,029	7,650	6,080	5,218	5,618	5,965	6,538	7,951	8,387	8,571	8,195	5,819	4,196	3,214	2,474	1,637	1,261	112,927	
18	664	451	437	611	1,862	4,903	6,721	7,501	7,075	5,744	5,602	5,536	5,902	6,314	8,139	8,454	8,432	8,414	6,524	4,607	3,548	2,613	1,673	1,191	112,918	
19	584	446	454	648	1,911	5,049	7,038	8,310	7,582	6,028	5,786	5,875	6,331	6,684	8,275	8,799	8,457	8,257	6,615	4,407	3,105	2,253	1,707	1,402	116,003	
20	720	592	497	606	1,581	3,483	4,296	5,170	4,947	4,626	4,641	4,861	5,318	6,002	7,165	7,376	7,680	6,945	6,104	4,293	3,457	2,560	2,037	1,452	96,409	
21	830	616	493	484	786	1,779	3,120	4,140	4,905	5,964	7,307	8,478	8,678	8,581	8,695	8,777	8,691	8,008	6,445	4,846	3,879	3,266	2,693	1,915	113,376	
22	1,042	737	473	356	401	815	1,865	2,663	3,347	4,677	6,465	8,312	8,826	9,128	9,024	8,345	7,938	7,375	6,481	4,177	2,728	1,898	1,490	891	99,454	
23	503	365	345	543	1,543	3,823	5,149	5,707	5,183	4,200	4,269	4,576	4,868	4,769	4,861	5,837	4,922	4,081	3,036	2,094	1,794	1,394	1,155	940	75,957	
24	631	435	434	657	1,792	4,645	6,458	7,269	7,636	6,328	5,553	5,526	5,860	6,515	7,837	8,569	9,325	8,786	6,531	4,493	3,436	2,479	1,688	1,201	114,084	
25	641	463	418	578	1,821	4,941	6,399	6,815	7,731	5,984	5,333	5,799	6,061	6,644	8,029	8,613	8,081	7,058	4,420	3,021	2,084	1,789	1,320	969	105,012	
26	524	444	400	613	1,766	4,638	6,457	7,700	6,946	5,957	5,322	5,561	6,039	6,490	7,917	8,972	8,953	8,869	6,813	5,028	3,911	2,687	2,053	1,489	115,549	
27	747	546	482	648	1,810	4,604	6,465	7,860	8,081	6,998	6,007	6,848	7,550	7,940	9,278	9,366	9,271	8,791	6,702	5,959	4,267	3,239	2,532	1,794	127,785	
28	1,110	636	499	503	835	1,799	3,270	4,148	5,064	5,934	7,353	8,629	9,090	8,823	9,108	9,111	5,232	7,462	6,298	4,514	3,719	3,141	2,565	1,742	110,585	
29																										
30	535	409	353	581	1,777	4,416	6,070	7,261	6,399	5,225	5,322	5,782	6,532	6,750	8,478	8,597	8,380	8,399	5,694	3,916	3,037	2,168	1,377	1,089	108,547	
31	563	455	375	601	1,771	4,480	6,367	7,599	7,147	5,749	5,127	5,342	5,699	6,297	7,910	8,194	8,378	7,849	6,297	4,385	3,137	2,352	1,542	1,192	108,808	
																									105449	

Location ID:	5093
County:	Essex
Functional Class	1
Location:	INTERSTATE 93

Daily Factor Group:

Growth Factor Group:

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL
1	614	481	411	607	1,896	4,901	7,007	8,392	7,457	5,823	5,276	5,439	5,959	6,707	8,005	8,643	8,574	8,500	6,269	4,475	3,477	2,592	1,946	1,269	114,720
2	690	456	428	637	1,861	4,850	6,680	7,974	7,237	5,883	5,706	5,650	6,559	7,002	8,295	8,759	8,920	8,532	6,813	4,795	3,630	2,820	1,908	1,398	117,483
3	773	562	460	606	1,665	4,199	5,685	6,935	6,563	5,641	5,662	5,988	6,429	6,836	7,902	8,855	9,239	8,422	6,158	4,450	3,221	2,581	2,157	1,519	112,508
4	789	576	411	430	632	1,193	1,682	2,274	3,126	4,300	5,356	6,133	6,402	6,210	6,382	6,309	6,361	5,769	4,850	3,683	3,141	2,549	2,311	1,455	82,324
5	921	598	420	376	456	829	1,866	2,678	3,488	4,595	6,361	8,242	9,012	9,092	8,818	8,832	8,803	8,010	6,565	4,790	3,222	2,155	1,390	990	102,509
6	522	386	333	588	1,728	4,387	5,944	7,279	6,631	5,283	5,277	5,848	6,116	6,801	8,211	9,158	8,764	8,081	5,676	3,792	2,869	1,983	1,494	1,118	108,269
7	595	449	406	592	1,846	4,806	6,692	7,965	6,924	5,563	5,262	5,784	6,134	6,614	7,944	9,007	8,745	8,078	5,760	3,901	3,143	2,154	1,413	1,116	110,893
8	601	476	389	575	1,746	4,579	6,322	7,516	6,672	5,598	5,806	6,085	6,324	7,087	8,267	9,076	9,249	8,854	6,190	4,510	3,348	2,586	1,824	1,494	115,174
9	736	471	439	620	1,863	4,695	6,587	7,824	7,008	5,649	5,621	5,892	6,496	6,902	8,606	8,835	8,942	8,577	6,436	4,848	3,680	2,802	1,839	1,390	116,758
10	692	470	459	684	1,640	4,056	5,864	7,092	6,616	5,972	6,531	7,082	7,809	8,347	9,164	9,767	9,840	9,346	8,156	5,826	4,325	3,249	2,696	1,829	127,512
11	1,039	691	585	559	832	1,690	2,874	4,109	5,077	6,019	7,405	8,759	9,318	9,195	9,163	8,813	8,280	7,480	6,413	5,070	3,929	3,344	2,548	1,808	115,000
12	1,063	734	452	334	445	767	1,736	2,563	3,673	4,874	6,777	8,751	9,327	9,340	9,144	8,747	8,499	7,944	5,602	3,111	2,384	2,227	2,386	1,459	102,339
13	697	418	310	529	1,630	4,214	5,920	6,880	6,375	5,332	5,220	5,729	6,197	6,513	8,060	9,018	8,670	8,125	5,473	3,825	2,962	2,172	1,408	1,074	106,751
14	606	464	377	602	1,761	4,753	6,470	7,583	6,576	5,634	5,617	6,095	6,334	6,822	8,046	8,935	9,268	9,103	6,163	4,480	3,125	2,336	1,674	1,354	114,178
15	718	489	375	596	1,817	4,641	6,604	7,778	6,860	5,475	5,373	5,883	6,371	6,856	8,249	9,126	9,049	9,275	6,706	4,803	3,587	2,556	1,935	1,285	116,407
16	639	477	455	616	1,750	4,591	6,702	8,246	7,544	6,281	5,977	6,283	6,655	7,186	8,622	9,121	9,047	9,153	6,825	5,049	3,758	2,878	1,992	1,380	121,227
17	731	561	463	610	1,648	4,003	5,636	7,110	6,362	6,065	6,518	7,379	8,127	8,103	8,765	9,194	9,063	8,543	7,852	5,389	4,019	3,088	2,336	1,896	123,461
18	987	605	449	480	739	1,490	2,573	3,822	5,078	6,566	7,804	8,841	9,432	9,409	9,318	8,783	8,172	7,527	6,448	4,993	4,242	3,245	2,734	1,875	115,612
19	1,122	710	484	338	458	738	1,534	2,545	3,534	5,057	6,737	8,201	9,048	8,909	8,724	8,294	7,677	6,940	5,888	4,428	3,229	2,328	1,595	1,034	99,552
20	653	473	332	486	943	2,495	4,193	5,172	5,182	5,528	6,983	8,048	8,461	8,610	9,046	8,988	9,063	8,436	6,244	4,506	3,177	2,328	1,491	1,034	111,872
21	558	431	396	637	1,772	4,406	5,859	6,477	6,617	5,666	5,588	5,872	6,218	6,670	7,338	7,513	8,372	8,098	5,676	3,789	2,930	2,274	1,629	1,152	105,938
22	653	467	412	582	1,739	4,694	6,335	5,985	7,218	6,547	6,149	6,615	7,103	7,409	8,750	9,137	9,238	8,660	6,749	4,585	3,496	2,448	1,399	1,264	117,634
23	727	506	416	548	1,345	3,129	3,569	4,145	3,956	3,873	3,749	4,261	4,826	5,353	6,257	6,711	6,707	6,118	4,853	3,520	2,753	2,053	1,488	1,146	82,009
24																									
25	1,032	608	577	686	996	1,813	2,687	3,836	4,750	6,034	7,505	8,480	8,795	8,794	8,756	8,607	8,287	7,612	6,282	4,863	3,766	3,114	2,613	1,854	112,347
26	1,088	649	453	489	540	905	1,688	2,531	3,443	4,823	6,009	7,150	8,160	8,147	8,602	7,841	7,901	7,399	6,571	4,719	3,279	2,371	1,574	960	97,292
27	572	424	410	647	1,839	4,810	6,684	7,932	7,296	6,022	5,565	6,049	6,221	6,364	7,699	8,361	8,945	8,208	6,217	4,397	3,399	2,479	1,652	1,233	113,425
28	635	470	470	571	1,413	3,235	4,100	4,325	3,757	3,216	3,128	3,390	3,580	4,065	5,215	5,555	5,531	5,281	3,918	2,952	2,233	1,723	1,258	1,108	71,129
																									108679

Massachusetts Highway Department
5093: Monthly Hourly Volume for March 2023

Location ID:	5093						Seasonal Factor Group:																		
County:	Essex						Daily Factor Group:																		
Functional Class	1						Axle Factor Group:																		
Location:	INTERSTATE 93						Growth Factor Group:																		
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL
1	770	460	383	601	1,660	4,590	6,859	8,094	7,532	6,059	5,805	6,108	6,472	6,709	8,205	9,101	9,169	9,119	6,736	5,108	3,661	2,725	2,032	1,544	119,502
2	770	514	505	653	1,883	4,604	6,382	7,530	7,091	6,034	5,901	6,145	6,640	7,008	8,212	8,950	9,241	8,962	7,004	5,319	3,965	3,008	2,400	1,595	120,316
3	938	577	517	650	1,799	4,475	6,469	7,907	6,958	6,094	6,237	6,916	7,504	8,201	8,873	9,467	9,919	9,572	8,310	6,705	4,921	3,799	2,750	1,857	131,415
4	983	619	475	473	560	842	1,397	1,762	2,173	2,338	2,506	3,110	3,514	3,841	4,410	4,839	5,179	5,062	4,750	3,630	2,889	2,589	2,031	1,577	61,549
5	974	816	514	417	498	1,049	2,528	3,475	4,186	5,769	7,362	8,501	9,465	9,226	9,022	8,685	8,535	8,171	7,291	5,683	3,881	2,480	1,724	1,219	111,471
6	715	501	364	655	1,889	4,883	7,123	8,229	7,175	5,475	5,533	5,735	6,053	6,470	7,757	8,541	8,503	8,863	6,293	4,280	3,228	2,260	1,618	1,315	113,458
7	807	495	429	627	1,927	5,116	7,325	8,580	7,061	6,119	5,442	5,608	5,861	6,399	7,853	8,697	8,963	8,617	6,460	4,414	3,467	2,456	1,572	1,315	115,610
8	669	451	394	613	1,951	4,978	7,276	8,807	7,457	5,782	5,371	5,428	5,893	6,636	8,346	8,896	8,938	8,497	6,611	4,557	3,573	2,604	1,983	1,341	117,052
9	758	469	434	652	1,895	4,943	7,094	8,359	7,305	5,778	5,457	5,952	6,659	7,228	8,819	8,926	9,602	9,034	6,381	5,092	3,839	2,819	2,138	1,732	121,365
10	847	551	479	728	1,781	4,589	6,700	7,860	6,921	6,028	6,337	7,139	7,784	8,228	9,271	9,842	9,975	9,235	8,533	6,190	4,623	3,462	2,580	1,849	131,532
11	1,121	687	502	545	837	1,709	2,905	4,100	4,955	6,265	7,508	8,339	8,370	8,201	8,487	8,420	8,205	7,976	6,691	5,227	4,021	3,478	2,818	1,870	113,237
12	1,102	697	0	639	580	823	1,641	2,509	3,395	4,504	6,152	7,514	8,870	9,422	9,072	8,826	8,863	8,090	7,211	5,293	3,874	2,659	1,784	1,077	104,597
13	613	489	432	614	1,865	4,671	6,298	7,088	7,261	5,764	5,326	5,486	6,058	6,670	7,897	7,891	8,216	7,870	6,422	4,354	3,255	2,202	1,519	1,170	109,431
14																									
15	475	380	370	516	1,469	3,923	5,598	7,045	6,722	6,035	5,266	5,481	5,768	6,013	7,507	8,406	8,486	8,199	6,355	4,754	3,698	2,659	1,844	1,385	108,354
16	791	536	496	712	1,950	4,864	7,239	8,598	7,980	6,303	5,893	6,170	6,684	7,332	8,598	9,456	9,517	9,417	7,275	5,581	4,152	3,096	2,174	1,492	126,306
17	960	603	521	672	1,734	4,417	6,157	7,704	7,035	6,173	6,387	6,872	7,283	8,030	8,935	9,302	9,509	9,394	7,484	5,844	4,367	3,342	2,486	2,029	127,240
18	1,248	768	566	592	807	1,660	2,603	3,798	4,756	6,043	7,435	8,686	9,224	9,220	9,377	8,759	8,804	8,442	7,073	5,770	4,567	3,736	2,939	2,181	119,054
19	1,225	829	499	419	463	808	1,576	2,543	3,347	4,650	6,946	8,671	9,523	9,207	9,006	8,799	8,478	7,623	6,104	4,640	3,602	2,613	1,655	1,081	104,307
20	683	528	381	636	1,892	4,705	6,261	7,896	6,810	5,473	5,669	5,924	6,366	6,924	8,119	8,840	8,847	9,147	6,015	4,401	3,364	2,457	1,752	1,548	114,638
21	775	495	438	651	1,898	4,731	6,739	8,005	7,186	5,924	5,517	6,009	6,398	6,957	8,297	9,065	9,159	9,560	7,010	4,837	3,663	2,702	2,100	1,344	119,460
22	724	450	413	633	1,780	4,450	6,405	7,716	7,190	5,978	5,977	6,047	6,520	6,903	8,254	9,144	9,299	9,160	6,909	4,848	3,686	2,739	1,931	1,277	118,433
23	781	503	444	661	1,780	4,423	6,440	7,707	6,914	5,864	5,771	6,171	6,608	7,212	8,450	9,352	9,507	9,306	6,811	5,126	4,068	2,876	2,343	1,514	120,632
24	822	537	453	662	1,724	4,142	5,990	7,293	6,574	6,083	6,199	6,978	7,591	8,031	8,443	9,295	10,040	9,469	7,402	5,688	4,555	3,315	2,784	1,863	125,933
25	1,147	729	574	529	811	1,510	2,530	3,791	4,889	5,711	7,117	7,966	8,086	8,095	8,187	7,693	7,266	6,535	5,725	4,506	3,607	2,995	2,488	1,728	104,215
26	1,099	704	448	394	424	756	1,553	2,346	3,303	5,110	7,197	8,383	9,366	9,354	9,083	8,876	8,468	7,670	6,716	5,021	3,805	2,769	1,665	1,023	105,533
27	624	452	393	609	1,909	4,627	6,633	7,066	6,742	5,429	5,770	5,920	6,429	6,913	8,231	9,164	9,170	8,680	5,919	4,540	3,174	2,250	1,658	1,298	113,600
28	703	507	474	600	1,789	4,658	6,957	7,709	7,151	5,795	5,434	5,554	5,758	6,415	7,454	8,865	9,066	9,000	6,403	4,364	3,566	2,643	2,229	1,471	114,565
29	716	546	428	627	1,894	4,775	6,974	8,214	7,245	6,055	5,947	6,087	6,314	6,946	8,303	9,259	9,258	9,210	7,271	5,034	4,023	3,032	2,084	1,425	121,667
30	754	556	481	643	1,824	4,868	6,802	7,858	7,326	5,816	5,743	6,518	6,668	7,187	7,950	8,516	9,507	9,314	7,194	5,065	4,064	3,059	2,505	1,684	121,902
31	891	605	477	698	1,859	4,305	6,316	7,150	6,602	5,995	6,162	6,917	7,548	8,115	9,233	10,179	9,880	9,517	7,039	4,917	3,969	3,003	2,485	1,807	125,669

115401

5093: Monthly Hourly Volume for April 2023

Location ID:	5093
County:	Essex
Functional Class	1
Location:	INTERSTATE 93

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

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL
1	1,068	678	494	529	746	1,311	2,087	3,127	4,204	5,680	7,098	8,069	7,962	8,210	8,163	7,682	7,110	6,385	5,550	4,542	4,113	3,354	2,518	2,011	102,691
2	1,265	707	522	396	477	803	1,406	2,247	3,215	5,198	7,141	8,414	8,962	8,967	8,795	8,277	7,935	7,226	6,449	4,971	3,574	2,421	1,526	1,059	101,953
3	601	418	416	630	1,849	4,730	6,834	7,644	6,850	5,653	5,871	5,976	6,392	6,844	8,260	8,894	8,959	9,131	6,388	4,562	3,548	2,429	1,697	1,289	115,865
4	672	508	410	657	1,826	4,595	6,645	7,647	6,945	5,769	5,679	5,884	6,209	6,837	8,190	8,941	9,281	9,110	7,059	4,899	3,632	2,687	1,904	1,313	117,299
5	676	490	415	656	1,750	4,589	6,781	7,812	7,114	5,844	5,676	6,017	6,359	7,026	8,156	9,099	9,140	8,914	6,584	4,800	3,717	2,738	2,017	1,329	117,699
6	655	498	456	655	1,761	4,609	6,960	8,029	7,324	5,789	5,786	6,077	6,759	7,567	8,659	9,581	10,136	9,299	7,771	5,432	4,320	3,169	2,519	1,589	125,400
7	931	591	464	687	1,740	4,271	5,749	6,685	6,862	6,815	6,990	7,594	8,227	9,039	9,811	10,026	9,567	8,650	7,484	5,705	4,326	3,232	2,647	1,866	129,959
8	1,127	657	539	532	756	1,415	2,395	3,663	4,906	6,761	8,054	9,200	9,486	9,357	9,337	9,204	8,604	7,935	6,985	5,674	4,294	3,611	2,566	2,080	119,138
9	1,237	813	451	354	366	551	1,006	1,681	2,549	4,651	6,936	8,824	9,669	8,704	7,539	7,207	8,326	9,202	8,752	7,147	4,978	2,975	1,680	970	106,568
10	539	421	356	624	1,778	4,523	6,537	7,652	7,248	6,363	6,240	6,577	6,887	7,103	8,269	9,203	9,343	9,003	6,650	4,996	3,664	2,473	1,649	1,232	119,330
11	656	472	426	688	1,851	4,680	6,880	7,945	7,428	6,386	6,036	6,063	6,415	7,015	8,493	9,367	9,329	8,657	7,262	4,965	3,714	2,677	2,108	1,331	120,844
12	643	480	432	679	1,895	4,778	7,046	7,915	7,863	6,526	6,240	6,290	6,587	6,961	8,416	9,289	9,458	9,216	7,122	5,223	4,196	2,958	1,785	1,362	123,360
13	636	484	446	659	1,837	4,694	6,833	7,987	7,882	6,821	6,131	6,486	6,832	7,297	8,658	9,557	8,236	8,782	7,430	5,524	4,537	3,204	2,184	1,693	124,830
14	879	540	475	736	1,792	4,455	6,602	7,687	7,055	6,772	6,917	7,442	7,896	7,942	9,259	9,735	9,908	9,152	7,474	6,072	4,725	3,721	2,858	2,118	132,212
15	1,192	785	555	487	739	1,502	2,548	3,879	5,546	7,176	7,961	9,373	9,120	9,002	8,969	8,706	8,203	7,547	6,625	5,623	4,824	3,711	2,840	1,942	118,855
16	1,194	730	514	373	412	833	1,566	2,318	3,447	4,900	7,024	8,369	8,687	8,761	8,346	7,983	7,764	7,052	6,156	4,829	3,634	2,526	1,719	1,173	100,310
17	619	473	409	588	1,320	3,260	5,363	6,225	6,278	5,984	5,780	6,331	6,526	6,744	7,585	8,089	8,326	7,950	5,620	4,257	3,231	2,285	1,649	1,569	106,461
18	662	431	429	664	1,848	4,732	6,691	7,616	7,330	6,316	6,220	6,229	6,681	7,048	8,304	9,046	9,434	8,972	6,445	4,625	3,493	2,557	1,925	1,428	119,126
19	676	449	429	649	1,767	4,583	6,250	7,360	7,324	6,361	6,253	6,594	6,854	7,131	8,452	9,387	9,954	9,293	6,906	4,709	3,649	2,470	2,007	1,775	121,282
20	858	500	473	674	1,863	4,466	6,057	6,972	7,175	6,696	6,590	6,693	7,210	7,562	8,744	9,353	9,494	9,424	7,197	5,552	4,336	2,944	2,129	1,508	124,470
21	856	614	496	772	1,855	4,173	5,658	6,426	6,693	6,717	6,894	7,324	7,727	6,565	8,658	9,322	9,862	8,898	7,420	5,704	4,275	3,263	2,517	1,886	124,575
22	1,057	694	556	722	1,078	1,883	2,747	3,970	5,063	6,617	7,935	8,809	9,114	9,074	8,885	8,502	8,402	7,719	6,315	4,982	4,054	3,429	2,463	1,788	115,858
23	1,205	809	503	519	618	832	1,324	2,049	2,798	3,905	5,309	6,560	7,042	7,065	6,840	6,467	5,668	5,321	4,412	3,718	2,748	2,090	1,409	892	80,103
24	630	434	405	661	1,887	4,556	6,150	6,894	6,631	5,683	5,818	5,811	6,531	6,801	8,196	9,206	9,084	8,389	5,477	3,952	3,113	2,193	1,443	1,191	111,136
25	661	428	438	695	1,833	4,632	6,756	7,938	7,247	6,134	5,889	6,153	6,510	6,987	8,513	9,027	9,412	9,035	6,904	4,659	3,623	2,721	1,976	1,528	119,699
26	702	495	459	614	1,880	4,736	6,871	8,316	7,515	6,420	6,199	6,266	6,625	7,094	8,660	9,438	9,536	9,120	7,018	5,489	4,072	2,962	2,002	1,699	124,188
27	844	584	519	721	1,847	4,914	7,112	8,238	7,494	6,546	6,210	6,102	7,110	7,390	8,501	9,089	9,193	9,228	7,077	5,646	4,398	3,048	2,259	1,538	125,608
28	968	671	540	718	1,699	4,199	6,043	7,279	7,269	6,855	6,905	7,495	7,883	8,037	9,192	9,516	9,793	9,353	8,241	5,877	4,780	3,724	3,086	2,236	132,359
29	1,328	890	585	562	766	1,558	2,652	4,043	5,349	6,705	7,859	8,827	9,149	9,330	9,213	8,907	8,581	8,052	6,970	5,614	4,548	3,760	3,005	2,316	120,569
30	1,381	774	561	439	436	727	1,376	2,173	3,237	4,613	6,215	7,428	8,283	7,933	7,603	7,396	6,872	6,373	5,143	3,695	2,869	2,067	1,922	1,235	90,751

116417

Massachusetts Highway Department
5093: Monthly Hourly Volume for May 2023

Location ID:	5093						Seasonal Factor Group:																		
County:	Essex						Daily Factor Group:																		
Functional Class	1						Axle Factor Group:																		
Location:	INTERSTATE 93						Growth Factor Group:																		
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL
1	656	511	478	645	1,767	4,535	5,424	7,087	6,732	5,777	5,885	6,087	6,329	6,793	8,233	9,223	9,329	8,901	6,291	4,649	3,544	2,405	1,849	1,579	114,709
2	773	518	487	708	1,912	5,222	7,573	7,717	7,511	6,138	5,607	5,905	6,130	6,696	7,583	7,884	8,500	8,080	6,158	4,182	3,563	2,563	1,849	1,386	114,645
3	738	482	414	645	1,790	4,574	6,838	7,875	7,870	6,430	6,058	6,157	6,581	7,210	8,474	8,933	9,271	9,162	7,580	4,907	3,817	2,734	2,030	1,705	122,275
4	758	558	444	701	1,859	5,212	6,456	7,514	7,484	6,242	6,091	6,326	6,759	7,261	8,597	9,753	9,717	9,578	7,043	5,385	4,318	3,212	2,344	1,598	125,210
5	943	587	504	750	1,852	4,814	6,614	7,505	6,960	6,489	6,529	7,061	7,615	8,220	8,841	9,862	9,862	9,277	7,761	5,838	4,743	3,595	2,830	2,116	131,168
6	1,241	756	573	589	860	1,747	2,918	4,402	5,834	6,946	8,133	8,958	9,006	9,193	9,084	8,770	8,369	7,662	6,618	5,673	4,801	4,194	3,266	2,270	121,863
7	1,304	749	508	381	473	904	1,766	2,946	4,211	5,679	7,337	8,588	8,796	8,688	8,477	8,251	8,133	7,422	6,441	5,647	4,285	2,865	1,930	1,162	106,943
8	689	526	417	648	1,951	5,295	7,406	8,302	7,540	5,968	5,596	6,416	6,816	7,241	8,361	9,238	9,209	8,659	6,429	4,863	3,742	2,548	1,699	1,199	120,758
9	641	497	444	630	1,767	4,865	7,007	7,927	7,509	6,427	5,912	6,245	6,628	7,275	8,503	9,398	9,561	9,517	6,926	5,143	4,108	2,645	1,977	1,474	123,026
10	847	502	421	625	1,817	4,940	6,091	7,461	7,820	6,864	6,302	6,350	6,696	7,114	8,638	9,484	9,521	9,437	7,197	5,613	4,389	3,130	1,989	1,451	124,699
11	781	538	482	685	1,874	4,876	6,926	8,062	8,156	6,679	6,421	6,560	7,148	7,770	8,924	9,425	9,681	9,668	7,455	5,882	4,702	3,317	2,288	1,543	129,843
12	901	656	497	695	1,716	4,470	6,299	7,546	7,598	7,060	7,043	7,719	8,199	8,422	9,398	10,261	10,031	9,299	8,407	6,132	4,949	4,121	3,016	2,255	136,690
13	1,296	763	513	602	844	1,745	2,883	4,422	5,959	7,485	8,627	9,417	9,619	9,388	9,186	9,023	8,825	8,431	8,046	6,388	5,394	4,568	3,183	2,156	128,763
14	1,230	757	477	396	467	745	1,518	2,417	4,047	6,184	8,413	9,645	9,739	9,355	8,886	8,664	8,523	8,258	7,628	6,618	4,412	2,478	1,918	1,592	114,367
15	644	528	411	685	1,868	4,902	6,756	7,706	7,314	6,434	6,137	6,285	6,602	7,159	8,467	8,943	9,378	8,866	6,850	4,738	3,924	2,680	1,895	1,324	120,496
16	680	529	470	704	1,917	4,952	7,112	7,892	8,133	6,492	6,163	6,348	6,671	7,044	8,476	9,409	9,655	9,708	7,323	5,330	4,159	2,919	2,163	1,414	125,663
17	772	490	408	630	1,865	4,974	7,182	7,742	7,559	6,562	6,327	6,446	6,802	7,397	8,540	9,248	9,927	9,532	7,582	5,209	4,287	2,817	2,105	1,786	126,189
18	886	551	481	703	1,981	5,256	6,197	7,604	7,760	6,769	6,440	6,684	6,992	7,555	8,741	9,666	9,885	9,684	7,624	5,848	4,811	3,335	2,365	1,451	129,269
19	860	649	532	678	1,793	4,553	6,283	7,428	7,252	6,925	7,046	7,787	8,244	8,694	9,413	9,731	9,117	9,815	7,771	6,059	5,048	3,856	2,803	2,294	134,631
20	1,509	1,012	767	651	771	1,610	2,748	3,986	5,655	6,856	8,231	8,930	9,033	8,854	8,287	7,380	7,285	6,473	5,756	4,778	3,885	3,284	2,545	1,764	112,050
21	1,227	897	606	538	504	898	1,679	2,771	4,298	6,202	8,445	8,991	9,397	9,443	8,659	8,429	8,493	7,756	6,925	6,049	4,460	3,207	1,987	1,421	113,282
22	1,111	746	590	831	2,007	5,341	7,353	8,300	7,659	6,387	6,374	6,508	7,109	7,420	8,482	9,240	9,627	8,910	6,922	4,991	3,784	2,808	1,774	1,171	125,445
23	714	492	452	713	2,007	5,180	7,430	8,422	8,077	6,493	6,086	6,454	6,754	7,483	8,779	9,139	9,422	9,303	7,331	5,603	4,200	2,812	1,754	1,407	126,507
24	730	545	451	698	1,926	4,992	7,172	8,319	8,199	6,652	6,329	6,563	7,087	7,469	8,811	9,529	9,608	8,571	7,287	5,143	4,152	2,840	1,982	1,309	126,364
25	991	752	503	759	2,099	5,093	7,054	8,255	7,904	6,816	6,767	6,938	7,358	7,923	9,115	9,920	9,948	9,563	7,832	6,257	4,978	3,422	2,436	1,776	134,459
26	1,055	698	545	763	1,781	4,470	6,410	7,541	7,337	7,107	7,825	8,577	9,062	9,263	9,639	9,743	9,336	8,791	7,824	6,354	5,324	4,077	2,810	2,069	138,401
27	1,314	740	563	533	748	1,516	2,858	4,302	5,838	7,715	9,108	9,448	8,965	8,916	8,921	8,210	7,807	7,308	6,362	5,902	4,716	3,873	2,713	2,094	120,470
28	1,421	687	466	359	458	870	1,725	2,572	3,810	5,894	7,684	8,724	8,941	8,597	7,869	7,325	7,092	6,839	6,679	5,957	4,862	3,875	2,724	1,782	107,212
29	1,079	661	383	386	552	1,009	1,634	2,346	3,403	5,125	6,927	8,054	8,102	8,533	7,905	7,776	7,519	7,348	7,002	6,231	4,465	2,785	1,859	1,575	102,659
30	689	536	405	662	1,822	4,903	6,936	8,117	7,871	6,498	6,191	6,401	6,880	7,428	8,681	9,523	9,500	8,937	7,177	5,216	3,976	2,916	2,002	1,430	124,697
31	736	572	453	679	1,941	5,166	7,359	8,280	7,540	6,675	6,259	6,420	6,916	7,377	8,611	9,324	9,474	9,378	7,634	5,485	4,653	3,169	2,062	1,693	127,856

122923

Massachusetts Highway Department
5093: Monthly Hourly Volume for June 2022

Location ID:	5093										Seasonal Factor Group:					U1-Essex													
County:	Essex										Daily Factor Group:																		
Functional Class	1										Axle Factor Group:					U1-Essex													
Location:	INTERSTATE 93										Growth Factor Group:																		
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL				
1	717	535	432	642	1,821	5,070	7,001	8,401	7,632	6,445	6,012	6,243	6,582	6,915	7,910	8,741	9,321	9,164	6,885	5,151	3,886	2,801	2,041	1,542	121,890				
2	913	600	508	641	1,814	4,884	6,910	5,522	7,826	6,444	5,960	6,561	7,031	7,308	8,720	9,524	9,332	9,519	7,547	5,483	4,720	3,156	2,100	1,676	124,699				
3	1,051	684	521	672	1,722	4,755	6,560	7,150	6,511	6,316	6,601	7,481	7,835	8,284	9,344	9,733	9,983	9,858	7,736	5,877	4,462	3,448	2,707	2,004	131,295				
4	1,289	777	581	510	832	1,873	2,961	4,190	5,445	6,790	8,249	9,118	8,911	9,323	9,010	8,821	8,347	7,852	6,829	5,969	5,078	3,919	3,136	2,424	122,234				
5	1,504	792	494	405	520	956	1,751	2,706	4,081	5,896	8,102	9,142	9,381	9,214	8,676	8,606	8,377	8,769	7,595	6,198	4,354	2,722	1,962	1,234	113,437				
6	730	538	417	615	1,850	5,264	7,031	8,000	7,342	6,468	5,820	6,274	6,719	7,013	8,450	9,044	9,267	9,451	6,555	4,869	3,895	2,661	1,882	1,316	121,471				
7	742	570	466	657	1,870	5,188	7,355	8,099	7,573	6,207	6,039	6,296	6,577	6,988	8,419	9,383	9,445	8,741	7,093	5,263	4,013	3,015	2,019	1,662	123,680				
8	842	536	414	645	1,747	4,909	6,864	7,808	7,404	6,378	5,987	6,281	6,558	6,975	8,565	9,469	9,650	9,041	7,378	5,600	4,531	3,055	2,153	1,846	124,636				
9	1,375	743	541	659	1,796	5,009	6,783	7,387	6,813	5,834	5,917	6,689	6,900	7,365	8,552	9,237	9,353	9,268	7,055	5,836	4,483	3,192	2,406	1,754	124,947				
10	987	669	526	649	1,818	4,701	6,662	7,612	7,240	7,099	7,331	7,827	8,132	8,506	9,595	9,975	10,005	9,833	8,224	6,071	5,126	3,978	2,876	2,277	137,719				
11	1,590	909	630	513	908	1,809	2,918	4,110	5,464	7,048	8,231	9,001	9,221	8,933	8,937	8,470	8,181	7,851	7,072	6,173	4,923	3,998	3,334	2,317	122,541				
12	1,262	832	548	357	518	977	1,751	2,541	3,708	5,688	7,540	8,887	9,302	8,248	7,971	8,269	8,329	7,628	7,036	6,038	4,367	3,218	1,969	1,181	108,165				
13	687	485	403	644	1,800	5,087	6,954	7,898	7,296	6,396	6,105	6,516	6,705	7,284	8,475	8,984	9,113	8,787	6,381	5,029	3,881	2,689	1,876	1,387	120,862				
14	871	511	491	661	1,857	5,285	7,160	8,112	7,327	6,533	6,099	6,322	6,804	7,165	7,651	8,335	9,640	9,400	7,129	5,257	4,201	3,135	2,226	1,626	123,798				
15	787	551	457	623	1,899	5,135	6,641	8,242	8,147	6,582	6,602	6,640	6,936	7,478	8,664	9,421	9,798	9,547	7,191	5,687	4,602	3,272	2,325	1,723	128,950				
16	910	566	552	686	1,871	5,216	7,136	7,966	7,772	7,043	6,876	7,269	7,411	8,077	9,084	9,653	9,094	9,600	7,722	6,164	4,852	3,457	2,230	1,860	133,067				
17	1,222	770	610	742	1,756	4,736	6,332	7,352	7,068	6,888	7,727	8,287	8,749	8,959	9,421	9,718	10,077	9,895	8,165	6,434	4,904	3,995	3,097	2,439	139,343				
18	1,464	874	621	581	922	1,740	2,798	3,980	5,740	7,345	8,850	9,353	9,623	9,320	9,557	8,813	8,650	8,464	7,322	6,247	4,903	3,893	3,109	2,214	126,383				
19	1,351	789	476	368	461	812	1,452	2,154	3,569	5,552	7,677	9,223	9,847	9,425	8,839	8,417	8,194	7,699	6,867	5,859	4,588	3,173	2,089	1,333	110,214				
20	758	554	449	581	1,665	4,623	5,707	6,379	6,275	6,411	6,813	7,693	8,005	8,055	9,086	9,039	9,081	9,011	6,794	5,380	4,162	3,182	2,033	1,504	123,240				
21	858	537	467	665	1,899	5,216	7,198	7,716	7,305	6,380	6,174	6,869	6,996	7,229	8,481	9,097	9,287	9,369	7,092	5,351	4,107	3,034	2,286	1,693	125,306				
22	954	568	462	655	1,802	5,226	6,935	7,935	7,331	6,505	6,655	7,044	7,176	7,637	8,486	9,333	9,707	9,388	7,295	6,017	4,316	3,286	2,218	1,745	128,676				
23	1,000	617	567	746	1,866	5,138	6,767	7,512	7,331	6,734	6,942	7,071	7,662	7,634	8,790	9,480	9,608	9,560	7,813	6,073	4,826	3,511	2,502	1,667	131,417				
24	1,096	666	553	726	1,755	4,739	6,164	7,154	6,983	7,146	8,104	8,327	6,517	7,517	9,547	9,711	9,622	9,704	8,209	6,397	5,108	4,053	3,154	2,103	135,055				
25	1,329	804	604	546	825	1,894	2,990	4,170	5,667	7,213	9,121	9,284	9,530	9,298	8,918	8,242	7,770	7,736	6,866	5,817	5,173	4,483	3,512	2,359	124,151				
26	1,461	834	495	434	517	1,005	1,881	2,677	4,051	6,072	8,114	9,424	9,790	9,389	8,472	8,266	7,398	7,371	7,202	6,347	4,839	3,621	2,450	1,529	113,639				
27	840	560	446	643	1,813	5,034	6,462	7,275	6,851	6,165	6,312	6,527	7,214	7,024	7,987	8,639	8,900	8,585	6,155	4,754	3,625	2,684	1,747	1,269	117,511				
28	807	535	453	666	1,908	5,192	6,961	7,544	7,697	6,536	6,358	7,026	7,117	7,411	8,366	8,931	9,437	9,297	7,200	5,599	4,128	3,324	2,201	1,607	126,301				
29	815	563	472	610	1,826	5,088	6,861	7,590	7,432	6,669	7,080	7,160	7,278	7,446	8,551	9,313	9,640	9,537	7,654	5,944	4,687	3,403	2,287	1,696	129,602				
30	935	574	496	650	1,855	4,986	6,755	7,415	7,446	6,950	7,181	7,473	7,882	8,195	8,746	9,062	9,587	9,665	8,240	6,388	5,662	4,170	2,665	1,871	134,849				

124969

Massachusetts Highway Department
5093: Monthly Hourly Volume for July 2022

Location ID:	5093										Seasonal Factor Group:					U1-Essex									
County:	Essex										Daily Factor Group:														
Functional Class	1										Axle Factor Group:					U1-Essex									
Location:	INTERSTATE 93										Growth Factor Group:														
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL
1	1,115	665	542	706	1,750	4,418	5,902	6,709	7,087	7,527	8,550	8,912	8,986	8,952	9,123	9,282	9,134	8,435	7,066	6,221	5,053	4,148	3,000	1,987	135,270
2	1,298	769	542	504	655	1,212	2,216	3,289	4,949	6,775	8,105	8,663	8,878	8,021	8,542	7,675	7,428	6,853	5,818	5,126	4,098	3,963	3,128	1,994	110,501
3	1,401	773	480	363	476	901	1,686	2,422	3,811	5,524	7,347	8,387	8,792	8,697	7,638	6,912	6,622	6,151	5,983	5,628	4,877	4,264	3,762	2,436	105,333
4	1,121	634	423	364	545	936	1,464	1,944	2,768	4,194	5,916	6,979	7,650	7,571	6,716	6,333	6,115	6,404	6,195	5,598	4,713	3,922	3,231	1,833	93,569
5	1,054	540	407	610	1,668	4,540	6,077	6,692	6,601	6,444	6,701	7,458	7,818	8,117	8,839	7,278	9,125	8,931	6,494	4,823	3,792	2,745	1,771	1,402	119,927
6	833	432	410	588	1,752	4,812	6,379	7,379	7,094	6,479	6,972	6,960	7,316	7,251	8,479	9,396	9,598	9,260	7,020	5,668	4,309	3,320	2,273	1,639	125,619
7	921	527	479	608	1,799	4,934	6,414	7,274	7,260	6,588	7,173	7,178	7,528	7,726	8,530	9,316	9,623	9,219	7,565	5,937	4,583	3,338	2,464	1,854	128,838
8	989	730	555	596	1,753	4,510	5,856	6,644	6,942	6,998	7,894	8,233	8,643	8,493	9,691	9,765	9,859	9,715	7,857	6,450	4,894	4,029	3,076	2,200	136,372
9																									
10	1,529	823	504	437	496	995	1,790	2,523	3,858	5,834	8,236	9,130	9,237	9,088	8,703	8,490	8,165	8,209	7,287	6,409	5,376	3,732	2,314	1,637	114,802
11	887	516	439	619	1,800	5,136	6,656	7,506	7,292	6,587	6,855	7,005	7,174	7,173	8,593	8,808	8,866	9,203	6,879	5,293	4,041	2,984	1,976	1,337	123,625
12	775	541	436	627	1,864	5,192	6,793	7,878	7,486	6,551	6,333	6,695	7,123	7,449	8,552	8,834	9,282	9,175	7,282	5,131	3,807	2,904	1,888	1,640	124,238
13	991	576	450	591	1,765	5,021	6,883	7,982	7,542	6,662	6,864	6,950	7,315	7,671	8,657	9,193	9,417	9,464	7,328	5,855	4,625	3,550	2,330	1,657	129,339
14	1,021	591	546	654	1,791	4,971	6,747	7,641	7,557	6,878	6,891	7,122	7,826	7,966	9,129	9,311	9,646	9,620	7,521	6,240	4,885	3,575	2,429	1,720	132,278
15	962	627	549	679	1,759	4,738	6,109	7,065	7,237	7,240	8,211	8,323	9,065	9,099	9,598	9,978	9,933	9,875	8,462	6,572	5,190	4,212	3,315	2,305	141,103
16	1,594	865	561	515	909	1,869	2,735	4,175	5,838	7,735	9,309	9,427	8,254	9,120	9,299	8,295	8,092	7,808	6,972	5,997	5,372	4,793	3,676	2,217	125,427
17	1,433	734	480	406	506	884	1,806	3,166	4,215	6,175	8,436	9,540	9,280	9,005	8,366	8,384	7,918	8,093	7,746	6,661	5,440	4,516	2,929	1,375	117,494
18	800	499	436	658	1,853	5,123	6,738	7,793	7,541	6,688	6,815	7,122	6,746	7,367	8,504	8,510	8,630	8,728	6,415	4,541	3,651	2,519	1,709	1,255	120,641
19	742	462	464	648	1,808	5,120	6,905	7,655	7,627	6,613	6,309	6,709	7,148	7,383	8,425	8,965	9,241	8,783	7,368	6,049	6,005	4,788	2,623	1,544	129,384
20	869	554	478	647	1,783	5,111	6,922	7,881	7,657	6,583	6,538	6,816	7,289	7,654	8,465	7,475	7,897	9,442	7,204	5,889	4,633	3,277	2,463	1,530	125,057
21	1,005	634	510	651	1,824	5,080	6,713	7,365	7,434	6,716	6,848	7,282	7,680	8,063	8,787	8,937	8,930	9,433	7,407	5,860	4,553	3,472	2,340	1,642	129,166
22	1,028	866	568	716	1,756	4,534	6,175	6,886	7,210	6,895	7,909	8,400	8,659	8,401	9,128	9,277	9,306	9,557	8,277	6,346	5,350	4,308	3,280	2,338	137,170
23	1,337	827	554	557	862	1,765	2,906	4,173	6,112	7,661	9,230	9,412	9,419	9,142	8,859	7,931	7,389	7,643	6,605	6,057	5,280	4,623	3,534	2,371	124,249
24	1,386	834	542	425	501	918	1,800	2,597	3,997	5,980	8,293	9,165	9,365	8,622	8,648	8,292	8,017	7,750	7,463	6,548	5,236	3,607	2,391	1,383	113,760
25	819	570	459	626	1,875	4,967	6,620	7,565	7,226	6,550	6,558	7,172	7,531	7,749	8,888	8,839	9,279	8,844	6,252	4,660	3,861	2,751	1,897	1,438	122,996
26	813	538	453	680	1,898	5,031	6,779	7,719	7,387	6,580	6,470	6,870	7,115	7,635	8,761	9,198	9,579	9,496	6,979	5,438	4,221	3,278	2,236	1,587	126,741
27	826	557	417	628	1,797	5,073	6,705	7,765	7,358	6,720	7,141	7,036	7,238	7,823	8,896	9,499	9,918	9,662	7,400	5,951	4,574	3,472	2,344	1,813	130,613
28	1,192	817	484	647	1,851	4,917	6,675	7,642	7,517	6,889	7,079	7,517	8,304	8,655	9,011	9,105	9,920	9,637	7,555	5,842	4,706	3,225	2,439	1,964	133,590
29	1,262	872	569	710	1,711	4,609	6,020	7,009	7,125	7,493	8,365	8,682	9,008	9,011	9,489	10,076	9,789	9,802	8,511	6,465	5,314	4,177	3,283	2,197	141,549
30	1,410	816	554	543	864	1,806	2,814	4,036	5,684	7,479	9,093	10,221	9,636	9,322	9,157	8,720	8,004	7,714	6,711	6,014	5,332	4,764	3,698	2,195	126,587
31	1,567	843	488	428	531	940	1,638	2,466	3,999	6,121	8,277	9,312	9,376	9,016	8,755	7,657	7,379	7,953	7,540	7,194	5,397	3,693	2,528	1,469	

124660

Massachusetts Highway Department
5093: Monthly Hourly Volume for August 2022

Location ID:		5093									Seasonal Factor Group:					U1-Essex											
County:		Essex									Daily Factor Group:																
Functional Class		1									Axle Factor Group:					U1-Essex											
Location:		INTERSTATE 93									Growth Factor Group:																
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL		
1	829	539	443	674	1,819	4,820	6,552	7,577	7,232	6,647	6,954	7,155	7,453	7,717	8,983	9,325	9,603	9,083	6,705	5,454	4,229	2,903	1,955	1,293	125,944		
2	746	508	463	654	1,895	5,054	6,771	7,743	7,351	6,567	6,530	6,805	7,259	7,511	8,629	9,229	8,985	8,796	7,243	5,361	4,237	3,149	2,072	1,418	124,976		
3	808	513	453	661	1,851	4,984	6,872	7,697	7,497	6,812	7,071	7,352	7,370	7,718	8,554	9,134	9,099	9,255	7,500	6,142	4,896	3,383	2,326	1,479	129,427		
4	838	567	488	693	1,876	4,859	6,590	7,612	7,407	6,892	7,151	7,359	7,818	8,194	8,803	9,212	9,463	9,330	7,269	5,964	4,845	3,504	2,480	1,761	130,975		
5	988	659	569	719	1,720	4,533	6,050	7,045	6,867	7,049	8,133	8,824	9,123	9,461	9,352	8,945	8,956	9,307	8,051	6,085	4,867	3,729	2,879	2,242	136,153		
6																											
7	1,467	815	557	391	541	941	1,687	2,614	4,100	5,876	8,337	9,276	9,685	8,828	8,771	8,493	7,968	7,864	7,117	6,434	4,996	3,499	2,152	1,262	113,671		
8	695	517	442	693	1,837	4,843	6,528	7,469	7,218	6,650	7,026	7,461	7,580	7,747	8,620	9,181	9,054	8,859	6,611	5,325	4,146	2,923	1,824	1,299	124,548		
9	732	490	446	671	1,882	4,919	6,863	7,541	7,545	6,558	6,308	6,489	7,133	7,391	8,035	8,976	9,268	9,386	6,820	4,993	4,039	3,194	2,163	1,682	123,524		
10	1,149	686	461	708	1,824	4,852	6,545	7,725	7,537	6,702	7,109	7,355	7,326	7,692	8,735	9,280	9,199	10,124	7,491	5,919	4,692	3,522	2,520	2,048	131,201		
11	1,126	711	495	717	1,875	4,968	6,612	7,817	7,498	6,972	7,203	7,508	7,842	8,154	9,145	9,440	10,190	9,971	7,827	6,088	4,847	3,706	2,633	1,938	135,283		
12	1,080	658	576	722	1,756	4,570	5,971	6,905	7,138	7,377	8,587	8,980	8,797	8,987	9,584	10,242	9,750	9,934	8,727	6,776	5,435	4,160	3,425	2,131	142,268		
13	1,392	802	629	545	874	1,831	2,862	4,102	5,621	7,478	9,151	9,632	9,794	10,038	9,283	8,727	8,184	7,960	7,057	5,924	5,169	4,243	3,661	2,316	127,275		
14	1,386	835	465	441	509	906	1,638	2,596	3,929	6,066	8,449	9,545	9,619	8,881	9,309	8,127	7,468	7,838	7,493	6,997	5,455	3,897	2,563	1,488	115,900		
15	797	469	425	678	1,825	4,856	6,410	7,461	7,200	6,780	7,459	7,286	7,618	7,841	8,687	9,229	9,410	8,954	6,857	5,717	4,218	3,096	1,923	1,366	126,562		
16	663	516	469	662	1,876	4,823	6,628	7,733	7,562	6,585	6,382	6,966	6,994	7,553	8,580	9,013	9,393	9,414	7,233	5,272	4,211	3,039	2,011	1,434	125,012		
17	814	511	455	580	1,843	4,792	6,418	7,581	7,218	6,569	6,976	7,195	7,587	7,725	8,818	9,391	9,721	9,442	7,209	5,539	4,160	3,071	2,001	1,417	127,033		
18	812	548	477	651	1,870	4,829	6,441	7,500	7,476	6,580	7,357	7,647	8,262	8,494	8,831	9,098	10,117	9,518	8,035	6,345	4,913	3,312	2,329	1,692	133,134		
19	1,069	612	556	727	1,763	4,519	5,968	6,843	6,853	7,140	8,106	8,868	9,250	9,289	9,654	10,166	10,132	9,717	8,183	6,583	5,367	4,046	3,342	2,377	141,130		
20	1,617	924	589	562	851	1,768	2,741	4,122	5,849	7,523	8,778	9,553	9,738	9,211	9,346	8,339	8,116	7,949	6,964	6,101	5,072	4,293	3,485	2,396	125,887		
21	1,293	885	531	405	526	904	1,647	2,547	3,792	5,987	8,450	9,386	9,483	9,470	8,870	8,443	8,239	7,464	6,822	6,784	5,058	3,724	2,347	1,637	114,694		
22	843	518	459	663	1,899	4,818	6,360	7,625	7,030	6,497	6,675	7,137	7,223	7,713	8,638	9,213	9,073	9,077	6,492	4,769	3,548	2,547	1,763	1,175	121,755		
23	708	551	461	686	1,834	4,921	6,346	7,534	7,150	6,199	6,291	6,759	7,166	7,583	8,663	9,377	9,109	9,462	6,971	4,951	3,774	2,680	1,821	1,375	122,372		
24	783	530	433	637	1,875	5,017	6,529	7,562	7,065	6,505	7,274	7,360	7,574	7,885	8,715	9,653	9,630	9,447	7,550	6,166	4,756	3,080	2,261	1,670	129,957		
25	932	636	522	674	1,883	5,083	6,662	7,660	7,243	6,983	7,322	7,444	7,622	7,963	8,885	9,439	10,022	9,915	7,811	6,573	5,050	3,737	2,714	1,960	134,735		
26	1,146	732	583	680	1,800	4,597	6,010	7,059	6,832	6,948	7,648	8,561	8,948	9,374	9,847	9,315	9,713	9,006	7,000	5,700	4,595	3,418	2,607	1,947	134,066		
27	1,358	937	690	553	851	1,803	2,979	3,991	5,966	7,491	9,238	9,650	10,137	9,552	9,073	8,168	8,207	7,790	6,886	5,997	5,442	4,232	3,365	2,247	126,603		
28	1,365	908	589	394	490	884	1,545	2,477	3,847	5,776	8,073	9,000	8,854	8,863	7,932	8,519	8,287	7,975	7,453	6,415	5,010	3,341	2,312	1,396	111,705		
29	723	499	463	675	1,832	4,937	6,601	7,481	7,192	6,091	6,135	6,617	6,986	7,409	8,140	8,857	9,305	8,800	6,458	5,040	3,894	2,775	1,981	1,472	120,363		
30	697	548	465	666	1,841	5,047	6,885	8,008	7,528	6,350	6,200	6,387	6,897	7,221	8,292	9,034	9,030	9,339	7,027	5,340	4,195	2,810	1,986	1,401	123,194		
31	819	535	470	655	1,863	4,936	6,712	7,374	7,909	6,882	6,350	6,454	7,128	7,380	8,433	8,933	9,260	9,114	7,328	5,682	4,286	3,104	2,195	1,574	125,376		
																									126824		

Location ID:		5093									Seasonal Factor Group:				U1-Essex										
County:		Essex									Daily Factor Group:														
Functional Class		1									Axle Factor Group:				U1-Essex										
Location:		INTERSTATE 93									Growth Factor Group:														
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL
1	854	597	535	688	1,911	5,015	6,265	7,996	7,476	6,619	6,616	7,114	7,431	7,832	8,648	9,268	9,631	9,504	8,400	6,418	5,058	3,786	2,632	1,862	132,156
2	1,079	677	608	660	1,758	4,405	5,754	6,873	6,820	7,171	8,335	8,634	8,781	9,208	9,311	8,846	7,415	9,285	8,224	7,151	5,179	3,767	2,620	2,040	134,601
3	1,146	720	547	566	737	1,455	2,671	3,936	5,390	7,542	8,881	9,230	9,111	8,941	8,403	7,863	7,544	7,155	6,651	6,203	5,030	3,923	2,825	1,920	118,390
4	1,210	694	502	363	435	813	1,380	2,322	3,639	5,303	7,209	8,364	8,975	8,450	7,867	7,283	7,209	6,907	6,756	6,117	4,662	3,421	2,364	1,608	103,853
5	1,019	631	395	365	552	839	1,335	1,806	2,613	4,079	5,811	7,057	7,039	7,515	7,431	7,614	7,249	6,801	5,358	4,364	3,172	2,230	1,518	904	87,697
6	525	371	380	647	1,751	4,764	6,455	7,165	7,132	6,157	5,640	5,924	6,341	6,651	7,883	8,622	8,362	8,299	6,348	4,364	3,346	2,429	1,632	1,192	112,380
7	726	517	437	624	1,905	4,886	7,112	7,731	7,073	6,257	6,281	6,212	6,625	7,290	8,384	9,151	9,364	9,619	7,082	5,250	4,013	2,745	1,859	1,379	122,522
8	887	608	507	645	1,919	5,098	7,150	8,008	7,677	6,423	6,246	6,580	7,075	7,338	8,876	9,361	9,465	9,432	7,435	5,838	4,518	2,972	2,129	1,726	127,913
9	1,424	669	557	689	1,802	4,726	6,760	6,821	7,210	6,496	6,990	7,368	8,015	8,294	9,085	9,692	9,802	9,818	8,102	6,286	4,703	3,575	2,646	2,000	133,530
10	1,436	848	566	568	897	1,899	2,928	4,078	5,619	7,019	8,631	8,607	9,318	9,128	8,723	8,815	8,211	8,111	7,101	6,142	4,730	3,856	2,966	2,317	122,514
11	1,487	869	509	424	504	925	1,610	2,645	4,018	5,612	8,034	9,297	9,538	8,612	7,989	8,007	8,216	7,767	6,686	5,657	4,037	2,570	1,683	1,081	107,777
12	562	451	411	673	1,858	5,076	7,005	8,229	7,241	6,091	5,944	6,225	6,571	6,923	8,168	8,890	9,348	8,795	6,210	4,820	3,529	2,451	1,604	1,159	118,234
13																									
14																									
15	937	552	507	666	1,966	5,220	7,219	7,940	7,726	6,521	6,087	6,550	6,890	7,269	8,353	9,227	9,560	9,553	7,916	6,003	4,599	3,099	2,103	1,494	127,957
16	946	616	519	734	1,863	4,727	6,735	7,542	6,866	6,479	6,806	7,608	8,084	8,492											

Massachusetts Highway Department

5093: Monthly Hourly Volume for October 2022

Location ID: 5093
 County: Essex
 Functional Class: 1
 Location: INTERSTATE 93

Seasonal Factor Group: U1-Essex
 Daily Factor Group:
 Axle Factor Group: U1-Essex
 Growth Factor Group:

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL
1	1,471	810	581	523	886	1,821	2,836	4,100	5,671	6,321	7,404	8,589	8,987	9,043	8,859	8,725	8,464	8,195	7,058	5,923	4,731	4,018	3,150	2,452	120,618
2	1,246	768	502	381	500	888	1,680	2,630	4,127	6,219	7,659	9,050	9,410	9,307	8,640	8,685	8,316	7,630	6,639	5,360	4,375	2,847	1,690	1,019	109,568
3	579	447	412	693	1,875	5,109	7,040	8,094	7,263	6,151	6,030	6,383	6,749	6,935	8,456	9,409	9,672	8,905	6,472	4,601	3,259	2,301	1,770	1,412	120,017
4	734	497	435	670	1,946	5,195	7,172	8,249	7,395	6,333	5,883	6,281	6,564	6,766	8,529	9,246	9,446	8,885	6,920	4,934	3,533	2,667	1,789	1,666	121,735
5	915	541	445	611	1,893	5,139	6,841	7,744	7,282	6,341	6,149	6,181	6,605	7,261	8,258	8,951	9,042	9,009	7,019	5,033	3,807	2,781	1,957	1,324	121,129
6	768	558	472	719	1,885	5,183	6,810	7,826	7,598	6,455	6,676	7,083	7,674	8,052	8,987	9,653	9,852	9,583	8,124	6,338	4,681	3,291	2,166	1,616	132,050
7	854	540	551	713	1,826	4,697	6,519	7,647	7,243	7,093	7,524	8,004	8,406	9,047	9,353	9,998	9,874	9,380	9,152	7,864	5,684	4,186	3,528	2,571	142,254
8	1,272	785	574	524	825	1,819	3,103	4,980	6,890	8,426	8,993	9,212	9,479	9,596	9,420	9,591	8,905	8,728	7,659	6,596	5,463	4,737	4,004	2,762	134,343
9	1,475	871	533	415	502	955	1,771	3,102	4,911	7,075	8,423	9,441	9,509	8,776	8,878	8,878	8,581	8,425	7,786	6,449	5,334	3,797	2,881	1,986	120,754
10	860	491	421	537	1,201	3,040	4,694	5,753	6,076	6,674	7,809	8,473	8,272	8,496	9,109	8,877	8,841	8,255	6,909	5,852	4,197	2,868	1,746	1,247	120,698
11																									
12	818	518	420	676	1,932	5,129	6,886	7,881	7,406	6,717	6,122	6,480	6,865	7,325	8,477	9,219	9,506	9,706	7,512	5,460	3,971	2,870	1,945	1,378	125,219
13	762	517	472	668	1,928	5,144	7,259	8,134	7,660	5,936	6,200	6,539	7,108	7,457	8,698	8,967	9,401	8,591	6,897	5,282	4,016	2,880	2,010	1,465	123,991
14																									
15																									
16																									
17																									
18																									
19	812	526	410	653	1,976	5,168	6,635	7,266	7,676	6,334	6,249	6,432	6,866	7,116	8,382	9,186	9,362	9,412	7,076	5,213	3,891	2,890	1,872	1,286	122,689
20	741	554	480	727	1,996	5,310	6,794	8,054	7,705	6,416	6,249	6,521	7,072	7,410	8,685	9,308	9,605	9,654	7,179	5,633	4,171	3,195	2,249	1,682	127,390
21	886	639	530	649	1,839	4,910	6,577	7,447	7,342	6,733	6,895	7,392	8,048	8,351	9,101	9,794	9,932	9,743	8,526	6,545	4,679	3,636	3,130	2,999	136,323
22	1,392	799	546	530	846	1,856	2,892	4,221	5,932	7,499	8,453	9,584	9,045	9,208	9,364	9,263	8,790	9,143	7,843	6,007	4,960	4,463	3,979	2,877	129,492
23	1,376	797	503	437	507	796	1,435	2,852	4,012	5,760	7,690	8,876	9,598	9,264	9,076	8,745	8,541	7,641	6,341	5,166	3,826	2,797	1,679	1,033	108,748
24	650	460	402	654	1,887	5,056	6,650	7,701	7,035	5,946	5,745	6,132	6,641	6,605	8,266	9,022	8,873	8,509	5,889	4,129	3,117	2,129	1,516	1,356	114,370
25	920	665	518	705	2,001	5,379	7,064	7,725	7,225	6,126	5,760	5,958	6,405	6,923	8,441	8,917	9,005	8,607	6,568	4,689	3,480	2,614	1,958	1,282	118,935
26	730	501	450	615	1,928	5,187	6,982	7,869	7,286	6,178	5,864	5,929	6,358	6,939	7,990	9,023	9,496	9,016	6,846	4,951	3,734	2,664	1,861	1,377	119,774
27	771	563	481	695	2,011	5,210	7,284	8,072	7,409	6,233	6,234	6,506	6,905	7,488	8,639	9,375	9,641	8,600	7,734	5,549	4,086	2,992	2,356	1,596	126,430
28	863	616	546	726	1,809	4,826	6,542	7,432	6,833	6,547	6,638	7,251	8,055	8,666	9,539	9,408	9,875	10,170	7,854	5,862	4,541	3,585	3,354	2,680	134,218
29	1,349	820	590	598	858	1,665	2,587	3,841	5,147	6,613	7,940	8,811	9,073	8,564	9,389	9,326	8,722	8,345	7,587	6,163	4,916	4,109	3,593	2,940	123,546
30	1,586	959	681	541	524	797	1,351	2,233	3,509	5,241	7,131	8,529	9,261	8,705	8,256	8,245	8,292	7,957	6,838	5,297	4,035	3,293	1,921	1,085	106,267
31	598	440	426	665	1,882	4,896	6,918	7,845	7,027	5,875	5,623	5,932	6,202	6,861	7,715	8,970	9,176	8,280	4,843	3,970	3,589	2,483	1,625	1,135	112,976

122941

Massachusetts Highway Department

5093: Monthly Hourly Volume for November 2022

Location ID: 5093
 County: Essex
 Functional Class: 1
 Location: INTERSTATE 93

Seasonal Factor Group: U1-Essex
 Daily Factor Group:
 Axle Factor Group: U1-Essex
 Growth Factor Group:

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL
1																									
2	683	421	422	613	1,930	5,332	7,297	8,026	7,611	6,898	6,197	5,932	6,457	6,851	8,392	9,249	9,117	8,556	6,999	4,869	3,733	2,620	1,784	1,224	121,213
3	773	543	454	682	1,906	5,125	6,312	7,934	7,866	6,411	6,030	6,241	6,471	7,197	8,388	9,217	9,460	9,310	7,046	5,231	3,900	2,875	1,925	1,388	122,685
4	758	518	492	720	1,765	4,884	6,465	7,428	7,015	6,493	6,589	7,330	7,844	8,197	9,277	9,509	9,187	9,509	7,650	5,336	4,286	3,647	2,559	2,162	129,620
5	1,164	723	527	540	827	1,856	2,655	3,931	5,285	6,926	8,049	8,704	8,785	8,860	9,083	8,575	8,539	8,080	6,893	5,475	4,293	3,643	2,726	2,115	118,254
6	1,264	1,198	337	345	511	853	1,676	2,947	4,556	6,258	7,772	8,580	9,026	8,805	8,162	6,880	8,075	7,236	6,141	4,581	3,185	2,229	1,491	1,034	103,142
7	671	457	411	662	2,031	5,231	6,879	7,596	7,112	6,162	5,836	6,054	6,515	6,868	8,119	8,888	9,053	8,721	6,233	4,128	3,305	2,461	2,050	1,328	116,771
8	730	485	456	700	1,953	5,337	7,279	7,935	7,325	6,196	6,024	6,109	6,727	7,004	8,236	9,113	9,287	9,020	6,283	4,369	3,166	2,320	1,660	1,220	118,934
9	729	454	400	685	1,838	4,693	6,686	7,444	7,284	6,217	5,976	6,051	6,457	6,941	8,470	9,083	9,352	9,109	6,888	4,712	3,550	2,582	1,856	1,307	118,764
10	732	483	454	692	1,980	5,210	7,319	8,109	7,659	6,346	6,275	6,478	7,141	7,671	8,514	9,246	9,730	9,456	6,510	5,949	4,210	3,150	2,530	1,631	127,475
11	892	638	553	679	1,330	3,462	5,271	6,174	6,809	7,190	7,887	8,550	8,854	9,182	9,484	9,619	9,185	8,442	6,331	4,652	3,329	2,896	2,571	1,757	125,737
12	1,202	693	575	518	703	1,415	2,222	3,327	4,545	6,178	7,864	8,730	8,901	9,380	8,553	8,277	8,207	6,378	6,733	4,917	3,857	3,338	2,621	1,959	111,093
13	1,236	870	506	423	483	805	1,396	2,374	3,423	4,972	6,720	8,496	8,399	7,647	7,195	6,889	7,072	5,853	4,773	3,866	2,965	2,340	1,527	1,047	91,277
14	572	399	384	645	1,785	4,731	6,567	7,451	7,046	6,009	5,895	5,996	6,467	6,574	8,215	8,948	9,161	6,899	6,385	4,046	2,999	2,188	1,687	1,196	112,245
15	671	461	445	679	1,856	4,818	6,687	7,779	7,602	6,004	6,041	6,001	6,407	6,978	8,236	9,219	9,330	8,753	6,409	4,378	3,305	2,479	1,645	1,200	117,383
16	662	463	414	634	1,713	4,578	6,275	7,088	6,495	5,235	4,803	5,192	5,273	5,873	7,138	8,423	7,954	8,245	6,052	4,156	3,344	2,434	1,616	1,268	105,328
17	749	541	456	664	1,780	4,518	6,317	7,283	6,690	6,083	6,203	6,432	7,156	7,086	8,376	9,288	9,445	7,809	6,219	4,954	3,983	2,871	2,288	1,646	118,837
18	888	574	504	691	1,688	4,263	5,846	6,974	6,814	6,411	6,597	7,193	7,758	8,314	9,522	8,936	9,627	9,376	7,787	5,619	4,309	3,415	2,825	1,805	127,736
19	1,141	708	566	572	838	1,675	2,547	3,736	5,204	6,735	8,213	9,139	9,917	9,740	9,499	9,325	8,916	6,986	6,671	4,953	4,182	3,549	3,088	2,090	119,990
20	1,265	756	502	408	484	787	1,322	2,483	3,853	5,715	7,416	8,475	9,215	8,308	7,879	7,350	7,290	6,690	5,607	4,095	2,944	2,121	1,388	998	97,351
21	555	440	401	615	1,711	4,510	5,885	6,685	6,719	6,407	6,403	6,531	7,138	7,542	8,650	8,932	9,180	8,570	6,384	4,481	3,280	2,503	1,578	1,206	116,306
22	785	507	374	705	1,893	4,822	6,706	7,856	7,467	6,688	6,869	7,298	7,403	7,914	8,887	9,876	9,815	9,226	7,592	5,553	4,191	2,992	2,001	1,508	128,928
23	840	566	522	707	1,837	4,504	6,188	7,162	6,768	6,744	7,663	8,490	8,824	9,182	9,350	9,523	9,543	7,959	6,278	5,001	4,267	2,992	2,416	1,690	129,016
24	969	660	404	356	386	604	1,046	1,686	2,551	4,237	6,478	8,832	9,575	8,058	5,177	4,453	5,963	6,950	7,407	6,608	5,228	3,194	2,194	1,457	94,473
25	805	389	350	447	935	2,083	2,732	3,476	4,531	5,918	7,776	8,914	9,052	9,343	8,567	8,282	8,383	7,652	6,068	4,853	3,814	2,991	2,371	1,612	111,344
26	876	593	447	494	691	1,251	1,929	2,851	4,258	6,049	7,769	8,886	8,669	9,117	8,816	8,520	8,424	7,707	6,473	5,030	4,087	3,259	2,650	1,845	110,691
27	1,263	779	484	413	553	835	1,386	2,180	3,369	5,031	7,144	8,831	9,715	9,363	8,757	8,335	7,425	6,231	5,556	4,218	3,171	2,191	1,348	908	99,486
28	484	405	386	651	1,754	4,416	6,002	7,023	7,013	6,225	5,987	6,210	6,588	7,192	8,335	8,909	9,055	8,528	6,138	4,172	3,108	2,272	1,661	1,112	113,626
29	618	453	455	674	1,757	4,648	6,629	7,314	7,152	6,197	5,998	6,401	6,481	7,104	8,435	9,062	9,065	8,729	6,670	4,390	3,353	2,499	1,992	1,233	117,309
30	632	486	416	624	1,853	5,035	6,943	8,035	7,295	6,135	6,053	6,037	6,295	6,897	7,885	8,313	8,290	8,038	6,133	3,716	3,103	2,353	1,806	1,267	113,640

115126

Location ID:	5093
County:	Essex
Functional Class	1
Location:	INTERSTATE 93

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL
1	677	475	460	693	1,801	4,636	6,325	7,209	6,348	5,810	6,191	6,581	6,694	7,546	8,613	9,268	9,305	9,114	6,859	4,728	3,628	2,709	2,038	1,444	119,152
2	956	787	553	686	1,713	4,332	5,945	7,032	6,614	6,424	6,655	7,134	7,696	8,236	8,994	9,847	9,872	8,906	5,631	4,953	4,041	3,266	2,588	2,032	124,893
3	1,073	645	565	533	821	1,680	2,211	3,320	4,648	6,272	7,230	8,017	8,561	8,050	7,720	8,021	7,624	7,277	5,792	4,397	3,702	3,198	2,918	1,943	106,218
4	1,076	603	459	388	471	744	1,291	2,150	3,105	4,934	6,912	8,094	8,767	8,616	8,402	8,323	8,026	7,069	5,689	4,145	3,200	2,496	1,669	936	97,565
5	572	435	374	617	1,705	4,416	6,239	7,352	6,660	6,004	5,830	5,981	6,361	6,902	8,197	9,182	8,414	8,549	5,684	4,067	3,079	2,235	1,759	1,169	111,783
6	668	438	414	648	1,922	5,007	6,839	8,111	7,408	6,139	5,829	6,059	6,277	6,916	8,368	9,268	9,000	8,447	6,473	4,180	3,302	2,572	1,635	1,221	117,141
7	652	459	392	596	1,629	3,974	5,412	6,742	6,268	5,300	4,991	5,429	5,553	6,322	7,581	8,161	7,972	8,127	6,380	4,338	3,536	2,772	1,777	1,223	105,586
8	724	519	447	678	1,968	5,041	6,800	7,752	7,114	6,274	6,102	6,513	7,074	7,295	8,533	9,293	9,525	9,105	6,797	4,983	3,838	3,054	2,042	1,409	122,880
9	786	540	521	641	1,745	4,057	5,553	6,654	6,479	6,180	6,639	7,289	7,853	8,129	9,125	9,564	9,939	8,977	7,312	5,205	4,181	3,363	2,738	2,023	125,493
10	1,131	669	540	534	764	1,555	2,524	3,387	4,666	6,172	7,720	8,549	9,103	9,094	8,985	8,834	8,463	8,068	6,595	4,923	4,237	3,565	2,876	2,163	115,117
11	1,271	791	477	402	478	686	1,367	2,035	2,988	4,516	6,404	7,912	8,667	8,568	8,371	8,136	6,159	5,286	5,038	3,505	2,636	1,807	1,371	839	89,710
12	542	445	398	537	1,483	4,023	5,593	6,874	6,264	5,430	5,558	5,986	6,261	6,662	7,918	8,225	8,127	7,668	5,733	3,894	3,035	2,111	1,489	1,142	105,398
13	661	469	431	684	1,911	4,819	6,729	7,141	6,544	5,731	5,788	6,210	6,916	7,060	7,722	8,164	8,558	8,047	5,712	4,201	3,397	2,562	1,849	1,241	112,547
14	698	473	453	609	1,819	4,854	6,883	7,882	7,425	5,978	5,671	6,278	6,999	7,406	8,455	8,525	8,247	8,276	6,742	4,794	3,821	2,733	1,868	1,257	118,146
15	722	504	505	731	1,876	4,749	6,221	7,012	6,759	5,988	5,992	6,269	6,639	7,259	8,331	8,782	8,731	8,195	6,943	5,249	4,111	3,197	2,429	1,845	119,039
16	884	628	578	684	1																				

Massachusetts Highway Department
5093: Monthly Volumes for 2022/2023

Location ID:	5093	Seasonal Factor Group:	U1-Essex
County:	Essex	Daily Factor Group:	
Functional Class	1	Axle Factor Group:	U1-Essex
Location:	INTERSTATE 93	Growth Factor Group:	

Month	Volume	Seasonal Factor
January	105449	0.89
February	108679	0.92
March	115401	0.98
April	116417	0.99
May	122923	1.04
June	124969	1.06
July	124660	1.06
August	126824	1.07
September	121513	1.03
October	122941	1.04
November	115126	0.98
December	111188	0.94

June Multiplier to Average Month
0.944

118008

Crash Data Worksheets

Crash Number	Crash Date	Crash Severity	Crash Time	Max Injury Severity Reported	Number of Vehicles	Driver Contributing Circumstances (All Drivers)	Driver Distracted By (All Vehicles)	First Harmful Event	Is Geocoded	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Total Fatalities	Total Non-Fatal Injuries	Traffic Control Device Type	Trafficway Description	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Emergency Use (All Vehicles)	Vehicle Towed From Scene (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Hit and Run	Most Harmful Event (All Vehicles)	Road Contributing Circumstance	School Bus Related	Speed Limit	Traffic Control Device Function	Vehicle Sequence of Events (All Vehicles)	Latitude	Longitude	Roadway
5032322	11/13/2021	Property damage only (none injured)	8:52 PM	No Apparent Injury (O)	1	D1: (Driving too fast for conditions)	D1: Not Distracted	Collision with utility pole	Yes	Dark - lighted roadway	Head-on	Wet	Not at junction	0	0	No controls	Two-way, divided, unprotected median	V1: Leaving traffic lane	V1:(Passenger car)	V1:(No)	V1:(Yes, vehicle or trailer disabled)	V1: E	Rain	No hit and run	V1:(Collision with utility pole)	Road surface condition (wet, icy, snow, slush, etc.)	No, school bus not involved	30	Not reported	V1:(Collision with utility pole)	42.703997	-71.19432	79 HAVERHILL ST / STRATHMORE RD

Crash Number	Crash Date	Crash Severity	Crash Time	Max Injury Severity Reported	Number of Vehicles	Driver Contributing Circumstances (All Drivers)	Driver Distracted By (All Vehicles)	First Harmful Event	Is Geocoded	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Total Fatalities	Total Non-Fatal Injuries	Traffic Control Device Type	Trafficway Description	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Emergency Use (All Vehicles)	Vehicle Towed From Scene (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Hit and Run	Most Harmful Event (All Vehicles)	Road Contributing Circumstance	School Bus Related	Speed Limit	Traffic Control Device Function	Vehicle Sequence of Events (All Vehicles)	Latitude	Longitude	Roadway
4401711	08/01/2017	Property damage only (none injured)	10:52 AM	No injury	2	D1: (No improper driving)	D1: Not Distracted	Collision with parked motor vehicle	Yes	Daylight	Rear-end	Dry	T-intersection	0	0	No controls	Two-way, not divided	V1: Backing / V2: Parked	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Light truck(van, mini-van, pickup, sport utility))		V1:(No)	V1: N / V2: Not Reported	Clear/Clear	No hit and run	V1:(Collision with parked motor vehicle) / V2:(Collision with parked motor vehicle)	None	No, school bus not involved	30	Not reported	V1:(Collision with parked motor vehicle) V2:(Collision with parked motor vehicle) V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.70384	-71.19333	HAVERHILL STREET / MADISON STREET
4829250	03/10/2020	Non-fatal injury	2:37 PM	Possible Injury (C)	2	D1: (Failed to yield right of way) / D2: (No improper driving)	D1: Not Distracted / D2: Not Distracted	Collision with motor vehicle in traffic	Yes	Daylight	Angle	Dry	T-intersection	0	1	Stop signs	Two-way, divided, unprotected median	V1: Entering traffic lane / V2: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(Yes, vehicle or trailer disabled) / V2:(Yes, vehicle or trailer disabled)	V1: N / V2: E	Clear/Clear	No hit and run	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	No, school bus not involved	35	Yes, device functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic) V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.70395	-71.19337	HAVERHILL ST / MADISON ST
5063748	01/27/2022	Property damage only (none injured)	7:08 AM	No Apparent Injury (O)	2	D1: (Failed to yield right of way) / D2: (No improper driving)		Collision with motor vehicle in traffic	Yes	Daylight	Angle	Dry	T-intersection	0	0	No controls	Two-way, not divided	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(No) / V2:(Yes, vehicle or trailer disabled)	V1: N / V2: E	Clear/Clear	No hit and run	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	No, school bus not involved	35	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.70395	-71.19337	HAVERHILL ST Rte 110 E / MADISON ST

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Methuen COUNT DATE : June 2023

DISTRICT : 4 UNSIGNALIZED : ☒ X SIGNALIZED : ☐

~ INTERSECTION DATA ~

MAJOR STREET : Haverhill Street

MINOR STREET(S) : Strathmore Road

INTERSECTION
DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM/PM) :	755	496	27	5		1,283

" K " FACTOR :

0.080

INTERSECTION ADT (V) = TOTAL DAILY
APPROACH VOLUME :

16,038

TOTAL # OF CRASHES :

1

OF
YEARS :

6

AVERAGE # OF
CRASHES PER YEAR (A) :

0.17

CRASH RATE CALCULATION :

0.03

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

Comments : _____

Project Title & Date: _____

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Methuen COUNT DATE : June 2023

DISTRICT : 4 UNSIGNALIZED : ☒ X SIGNALIZED : ☐

~ INTERSECTION DATA ~

MAJOR STREET : Haverhill Street

MINOR STREET(S) : Madison

INTERSECTION
DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM/PM) :	751	500	27	5		1,283

" K " FACTOR :

0.080

INTERSECTION ADT (V) = TOTAL DAILY
APPROACH VOLUME :

16,038

TOTAL # OF CRASHES :

3

OF
YEARS :

6

AVERAGE # OF
CRASHES PER YEAR (A) :

0.50

CRASH RATE CALCULATION :

0.09

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

Comments : _____

Project Title & Date: _____

Trip Generation Worksheets

Section I

Site and Traffic Information

I.A. Site Description and Site Plan

This application is for the proposed development of an Aroma Joes coffee shop located at 3 Bangor Street in Augusta, Maine. The site is bounded by Bangor Street to the west and Morse Street to the east, with a restaurant to the north and a gun shop to the south. The overall site is shown on Augusta's Tax Map 38 as Lot 73. The proposed preliminary site plans are included in Attachment IA.

I.B. Existing and Proposed Site Uses

The existing 0.37 acre site is currently undeveloped. A car wash had existed on the site previously but has since been razed. The site is anticipated to be accessed by a right turn in only and a right turn out only from Bangor Street. The ingress is to be located approximately 240 feet north of the existing roundabout where Bangor Street, Cony Street, and Stone Street intersect. The right turn out only egress will be located to the south of the ingress. In addition to the Bangor Street accesses, an egress only will be provided to Morse Street.

The applicant is proposing to construct a new 897 SF Aroma Joes coffee shop complete with a drive thru and parking area (no indoor seating). The internal circulation has been designed to accommodate approximately 14 vehicles from the pick-up window to reduce the potential for vehicles to back onto Bangor Street. The proposed preliminary site plan is provided in Attachment IA.

I.C. Site and Vicinity Boundaries

The site is bounded by Bangor Street to the west and Morse Street to the east, with a restaurant to the north and a gun shop to the south. The overall site is shown on Augusta's Tax Map 38 as Lot 73. The preliminary site plans are included in Attachment IA.

I.D. Proposed Uses in Vicinity of Proposed Development

Based on discussions with City staff and the MaineDOT, there are no other developments that need to be included in future analysis.

I.E Trip Generation

The trip generation for the potential Aroma Joes is based on the study by Haley Ward that was previously completed for the Scarborough, Maine Aroma Joe's location (stamped & signed 12/9/19). Since Aroma Joe's highest trip generation is the AM peak hour, that is the time period that was used for this evaluation. Based on that information, the following trip generation was used.

Table 1 – Trip Generation

	AM Trip Generation (Trip Ends)		
	Enter	Exit	Total
Primary + Diverted (30%)	20	19	39
Pass-By (70%)	46	45	91
Total	66	64	130

Shown in the table above are the trip ends anticipated for the proposed use, where a trip end is a trip into or out of the site, thus a round trip is equal to two trip ends. The proposed site is forecast to generate 130 trip ends during the AM peak hour of adjacent street traffic – the busiest time of day for Aroma Joes.

As seen in Table I, the proposed development is forecast to generate a peak of 130 trip ends during the AM peak hour of the generator. Therefore a 100-200 level MaineDOT Traffic Movement Permit is required.

I.F. Trip Distribution

Based on the study previously completed by Haley Ward (stamped and signed 12/9/19), the highest trip generation for Aroma Joe's is in the AM peak hour, and the following distribution is appropriate:

- AM Peak Hour Adjacent Street: 51% enter / 49% exit

I.G. Trip Composition and Assignment

Given the proposed uses, the trip composition for this project has been categorized as follows:

- 30% Primary and Diverted
- 70% Pass By

Primary trips are made for the sole purpose of going to or from the site. These primary drivers go back in the direction where they came from when exiting the site. Diverted trips are made a short distance out of the way while on route to somewhere else. Pass-By trips are made by people who would otherwise already be driving past the site location and elect to stop – someone commuting on Bangor Street stopping on their way to work for coffee, for example. For this project, the primary and diverted trips have all been assumed as primary.

To establish existing traffic volumes and patterns, turning movement counts were collected at the intersections of Noyes Street / Bangor Street and Cony Street / Morse Street on Wednesday August 24, 2021. The turning movement counts were completed from 6:30 – 8:30 AM and again from 3:30 – 6:00 PM. The turning movement Raw Data is shown on the attached Figure 2 in Attachment 1B. The trip assignment for this project has been based on a combination of existing traffic patterns, proposed driveway location and restrictions as well as AADTs of the surrounding roadway network. See Figures 3-5 in Attachment 1B.

I.H. Attachments

Attachment 1A – Site Survey, Proposed Site Plan

Attachment 1B – Site Location Map, Trip Assignment Diagrams

Attachment 1C – Trip Generation Calculations

AM Main Line Volume = 777

PM Main Line Volume = 1247

I Using Sheppard's Methodology

$$\text{AM trips} = 777 \times .0488 = 38 \text{ trips}$$

$$\text{PM trips} = 1247 \times .0172 = 22 \text{ trips}$$

$$\text{Daily trips} = 38 \times 5.93 = 226 \text{ trips}$$

> Seems very low

II Using ITE LUC 937 - Coffee/Daunt Shop with Drive-Through Window (790 sf)

$$\text{AM trips} = 68 \text{ (35 in 33 out)}$$

$$\text{PM trips} = 31 \text{ (15 in 16 out)}$$

$$\text{Daily trips} = 422$$

III Using ITE LUC 938 Coffee/Daunt Shop with Drive-Through window and No Indoor Seating

$$\text{AM trips} = 40 \text{ (20 in 20 out)}$$

$$\text{PM trips} = 15 \text{ (8 in 7 out)}$$

$$\text{Daily trips} = 180$$

> Seems Low

IV Using Haly Word/CES/ETE Data

$$\text{AM trips} = 130 \text{ trips (65 in 65 out)}$$

$$\text{PM trips} = 59 \text{ trips (30 in 29 out)}$$

$$\text{Daily trips} = 808 \text{ trips (404 in 404 out)}$$

(Pro-rated based on AM/PM Ratio LUC 937)
85.80/38.99(Pro-rated based on AM/Daily Ratio
LUC 937 533.57/85.80)

Capacity Analysis Worksheets

3: Strathmore Road/79 Haverhill St Driveway & Haverhill St Lanes, Volumes, Timings

2023 Existing AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	300	19	8	458	1	11	0	10	0	0	0
Future Volume (vph)	5	300	19	8	458	1	11	0	10	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	14	14	14	10	10	10
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992						0.936				
Flt Protected		0.999			0.999			0.974				
Satd. Flow (prot)	0	2058	0	0	2090	0	0	1848	0	0	1773	0
Flt Permitted		0.999			0.999			0.974				
Satd. Flow (perm)	0	2058	0	0	2090	0	0	1848	0	0	1773	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		110			261			147			93	
Travel Time (s)		2.5			5.9			3.3			2.1	
Peak Hour Factor	0.87	0.87	0.87	0.95	0.95	0.95	0.53	0.53	0.53	0.25	0.25	0.25
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	6	345	22	8	482	1	21	0	19	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	373	0	0	491	0	0	40	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.92	0.92	0.92	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	38.6%											
Analysis Period (min)	15											
ICU Level of Service A												

3: Strathmore Road/79 Haverhill St Driveway & Haverhill St HCM 6th TWSC

2023 Existing AM Peak Hour

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	300	19	8	458	1	11	0	10	0	0	0
Future Vol, veh/h	5	300	19	8	458	1	11	0	10	0	0	0
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	87	87	87	95	95	95	53	53	53	25	25	25
Heavy Vehicles, %	0	4	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	6	345	22	8	482	1	21	0	19	0	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	483	0	0	367	0	0	867	867	356	877	878	483
Stage 1	-	-	-	-	-	-	368	368	-	499	499	-
Stage 2	-	-	-	-	-	-	499	499	-	378	379	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1090	-	-	1203	-	-	275	293	693	271	289	588
Stage 1	-	-	-	-	-	-	656	625	-	557	547	-
Stage 2	-	-	-	-	-	-	557	547	-	648	618	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1090	-	-	1203	-	-	272	288	693	260	284	588
Mov Cap-2 Maneuver	-	-	-	-	-	-	272	288	-	260	284	-
Stage 1	-	-	-	-	-	-	651	621	-	553	542	-
Stage 2	-	-	-	-	-	-	552	542	-	626	614	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.1			15.5			0		
HCM LOS							C			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	383	1090	-	-	1203	-	-	-				
HCM Lane V/C Ratio	0.103	0.005	-	-	0.007	-	-	-				
HCM Control Delay (s)	15.5	8.3	0	-	8	0	-	0				
HCM Lane LOS	C	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	-				

5: Madison St/39 Haverhill St Driveway & Haverhill St Lanes, Volumes, Timings

2023 Existing AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	303	7	2	456	0	11	0	6	0	0	0
Future Volume (vph)	0	303	7	2	456	0	11	0	6	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	15	15	15	16	16	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997						0.953					
Flt Protected							0.968					
Satd. Flow (prot)	0	2066	0	0	2091	0	0	1928	0	0	2153	0
Flt Permitted							0.968					
Satd. Flow (perm)	0	2066	0	0	2091	0	0	1928	0	0	2153	0
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	261			93			128			105		
Travel Time (s)	5.9			2.1			2.9			2.4		
Peak Hour Factor	0.85	0.85	0.85	0.95	0.95	0.95	0.71	0.71	0.71	0.25	0.25	0.25
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	356	8	2	480	0	15	0	8	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	364	0	0	482	0	0	23	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			0			0		
Link Offset(ft)	0			0			0			0		
Crosswalk Width(ft)	16			16			16			16		
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Free			Free			Stop			Stop		
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	35.6%			ICU Level of Service A								
Analysis Period (min)	15											

5: Madison St/39 Haverhill St Driveway & Haverhill St
HCM 6th TWSC

2023 Existing AM Peak Hour

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	303	7	2	456	0	11	0	6	0	0	0
Future Vol, veh/h	0	303	7	2	456	0	11	0	6	0	0	0
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	85	85	85	95	95	95	71	71	71	25	25	25
Heavy Vehicles, %	0	4	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	0	356	8	2	480	0	15	0	8	0	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	480	0	0	364	0	0	844	844	360	848	848	480
Stage 1	-	-	-	-	-	-	360	360	-	484	484	-
Stage 2	-	-	-	-	-	-	484	484	-	364	364	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1093	-	-	1206	-	-	285	302	689	284	301	590
Stage 1	-	-	-	-	-	-	662	630	-	568	555	-
Stage 2	-	-	-	-	-	-	568	555	-	659	627	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1093	-	-	1206	-	-	284	301	689	280	300	590
Mov Cap-2 Maneuver	-	-	-	-	-	-	284	301	-	280	300	-
Stage 1	-	-	-	-	-	-	662	630	-	568	554	-
Stage 2	-	-	-	-	-	-	567	554	-	651	627	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			15.8			0		
HCM LOS							C			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	358	1093	-	-	1206	-	-	-				
HCM Lane V/C Ratio	0.067	-	-	-	0.002	-	-	-				
HCM Control Delay (s)	15.8	0	-	-	8	0	-	0				
HCM Lane LOS	C	A	-	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	-				

3: Strathmore Road/79 Haverhill St Driveway & Haverhill St Lanes, Volumes, Timings

2023 Existing PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	735	19	9	486	1	11	0	16	0	1	4
Future Volume (vph)	1	735	19	9	486	1	11	0	16	0	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	14	14	14	10	10	10
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997						0.921			0.899	
Flt Protected					0.999			0.980				
Satd. Flow (prot)	0	2124	0	0	2130	0	0	1829	0	0	1594	0
Flt Permitted					0.999			0.980				
Satd. Flow (perm)	0	2124	0	0	2130	0	0	1829	0	0	1594	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		110			261			147			93	
Travel Time (s)		2.5			5.9			3.3			2.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.75	0.75	0.75	0.63	0.63	0.63
Heavy Vehicles (%)	0%	1%	5%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	774	20	9	512	1	15	0	21	0	2	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	795	0	0	522	0	0	36	0	0	8	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.92	0.92	0.92	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	55.3%					ICU Level of Service B						
Analysis Period (min)	15											

3: Strathmore Road/79 Haverhill St Driveway & Haverhill St HCM 6th TWSC

2023 Existing PM Peak Hour

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	735	19	9	486	1	11	0	16	0	1	4
Future Vol, veh/h	1	735	19	9	486	1	11	0	16	0	1	4
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	95	95	95	95	95	95	75	75	75	63	63	63
Heavy Vehicles, %	0	1	5	0	1	0	0	0	0	0	0	0
Mvmt Flow	1	774	20	9	512	1	15	0	21	0	2	6
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	513	0	0	794	0	0	1321	1317	784	1328	1327	513
Stage 1	-	-	-	-	-	-	786	786	-	531	531	-
Stage 2	-	-	-	-	-	-	535	531	-	797	796	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1063	-	-	836	-	-	135	159	396	133	157	565
Stage 1	-	-	-	-	-	-	388	406	-	536	529	-
Stage 2	-	-	-	-	-	-	533	529	-	383	402	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1063	-	-	836	-	-	131	156	396	124	154	565
Mov Cap-2 Maneuver	-	-	-	-	-	-	131	156	-	124	154	-
Stage 1	-	-	-	-	-	-	387	405	-	535	521	-
Stage 2	-	-	-	-	-	-	518	521	-	362	401	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.2			24.9			15		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	217	1063	-	-	836	-	-	368				
HCM Lane V/C Ratio	0.166	0.001	-	-	0.011	-	-	0.022				
HCM Control Delay (s)	24.9	8.4	0	-	9.4	0	-	15				
HCM Lane LOS	C	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1				

5: Madison St/39 Haverhill St Driveway & Haverhill St Lanes, Volumes, Timings

2023 Existing PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	720	30	18	480	2	14	0	13	3	0	2
Future Volume (vph)	1	720	30	18	480	2	14	0	13	3	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	15	15	15	16	16	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.999			0.935			0.946	
Flt Protected					0.998			0.975			0.971	
Satd. Flow (prot)	0	2122	0	0	2106	0	0	1905	0	0	1978	0
Flt Permitted					0.998			0.975			0.971	
Satd. Flow (perm)	0	2122	0	0	2106	0	0	1905	0	0	1978	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		261			93			128			105	
Travel Time (s)		5.9			2.1			2.9			2.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.52	0.52	0.52	0.25	0.25	0.25
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	758	32	19	505	2	27	0	25	12	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	791	0	0	526	0	0	52	0	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	50.1%					ICU Level of Service A						
Analysis Period (min)	15											

5: Madison St/39 Haverhill St Driveway & Haverhill St
HCM 6th TWSC

2023 Existing PM Peak Hour

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	720	30	18	480	2	14	0	13	3	0	2
Future Vol, veh/h	1	720	30	18	480	2	14	0	13	3	0	2
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	95	95	95	95	95	95	52	52	52	25	25	25
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	1	758	32	19	505	2	27	0	25	12	0	8
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	507	0	0	790	0	0	1324	1321	774	1333	1336	506
Stage 1	-	-	-	-	-	-	776	776	-	544	544	-
Stage 2	-	-	-	-	-	-	548	545	-	789	792	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1068	-	-	839	-	-	134	158	402	132	155	570
Stage 1	-	-	-	-	-	-	393	410	-	527	522	-
Stage 2	-	-	-	-	-	-	524	522	-	387	404	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1068	-	-	839	-	-	129	153	402	121	150	570
Mov Cap-2 Maneuver	-	-	-	-	-	-	129	153	-	121	150	-
Stage 1	-	-	-	-	-	-	392	409	-	526	505	-
Stage 2	-	-	-	-	-	-	500	505	-	362	403	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.3			30.6			27.9		
HCM LOS							D			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	192	1068	-	-	839	-	-	177				
HCM Lane V/C Ratio	0.27	0.001	-	-	0.023	-	-	0.113				
HCM Control Delay (s)	30.6	8.4	0	-	9.4	0	-	27.9				
HCM Lane LOS	D	A	A	-	A	A	-	D				
HCM 95th %tile Q(veh)	1	0	-	-	0.1	-	-	0.4				

3: Strathmore Road/79 Haverhill St Driveway & Haverhill St Lanes, Volumes, Timings

2030 No-Build AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	322	20	9	491	1	12	0	11	0	0	0
Future Volume (vph)	5	322	20	9	491	1	12	0	11	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	14	14	14	10	10	10
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992						0.936				
Flt Protected		0.999			0.999			0.975				
Satd. Flow (prot)	0	2058	0	0	2090	0	0	1850	0	0	1773	0
Flt Permitted		0.999			0.999			0.975				
Satd. Flow (perm)	0	2058	0	0	2090	0	0	1850	0	0	1773	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		110			261			147			93	
Travel Time (s)		2.5			5.9			3.3			2.1	
Peak Hour Factor	0.87	0.87	0.87	0.95	0.95	0.95	0.53	0.53	0.53	0.25	0.25	0.25
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	6	370	23	9	517	1	23	0	21	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	399	0	0	527	0	0	44	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.92	0.92	0.92	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	41.0%						ICU Level of Service A					
Analysis Period (min)	15											

3: Strathmore Road/79 Haverhill St Driveway & Haverhill St HCM 6th TWSC

2030 No-Build AM Peak Hour

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	322	20	9	491	1	12	0	11	0	0	0
Future Vol, veh/h	5	322	20	9	491	1	12	0	11	0	0	0
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	87	87	87	95	95	95	53	53	53	25	25	25
Heavy Vehicles, %	0	4	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	6	370	23	9	517	1	23	0	21	0	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	518	0	0	393	0	0	930	930	382	940	941	518
Stage 1	-	-	-	-	-	-	394	394	-	536	536	-
Stage 2	-	-	-	-	-	-	536	536	-	404	405	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1058	-	-	1177	-	-	250	269	670	246	265	562
Stage 1	-	-	-	-	-	-	635	609	-	532	527	-
Stage 2	-	-	-	-	-	-	532	527	-	627	602	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1058	-	-	1177	-	-	247	264	670	235	260	562
Mov Cap-2 Maneuver	-	-	-	-	-	-	247	264	-	235	260	-
Stage 1	-	-	-	-	-	-	631	605	-	528	521	-
Stage 2	-	-	-	-	-	-	526	521	-	603	598	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.1			16.6			0		
HCM LOS							C			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	354	1058	-	-	1177	-	-	-				
HCM Lane V/C Ratio	0.123	0.005	-	-	0.008	-	-	-				
HCM Control Delay (s)	16.6	8.4	0	-	8.1	0	-	0				
HCM Lane LOS	C	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	-				

5: Madison St/39 Haverhill St Driveway & Haverhill St Lanes, Volumes, Timings

2030 No-Build AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	325	8	2	489	0	12	0	6	0	0	0
Future Volume (vph)	0	325	8	2	489	0	12	0	6	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	15	15	15	16	16	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997						0.957					
Flt Protected							0.967					
Satd. Flow (prot)	0	2066	0	0	2091	0	0	1934	0	0	2153	0
Flt Permitted							0.967					
Satd. Flow (perm)	0	2066	0	0	2091	0	0	1934	0	0	2153	0
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	261			93			128			105		
Travel Time (s)	5.9			2.1			2.9			2.4		
Peak Hour Factor	0.85	0.85	0.85	0.95	0.95	0.95	0.71	0.71	0.71	0.25	0.25	0.25
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	382	9	2	515	0	17	0	8	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	391	0	0	517	0	0	25	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			0			0		
Link Offset(ft)	0			0			0			0		
Crosswalk Width(ft)	16			16			16			16		
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control	Free			Free			Stop			Stop		
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 37.3%												
ICU Level of Service A												
Analysis Period (min) 15												

5: Madison St/39 Haverhill St Driveway & Haverhill St
HCM 6th TWSC

2030 No-Build AM Peak Hour

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	325	8	2	489	0	12	0	6	0	0	0
Future Vol, veh/h	0	325	8	2	489	0	12	0	6	0	0	0
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	85	85	85	95	95	95	71	71	71	25	25	25
Heavy Vehicles, %	0	4	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	0	382	9	2	515	0	17	0	8	0	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	515	0	0	391	0	0	906	906	387	910	910	515
Stage 1	-	-	-	-	-	-	387	387	-	519	519	-
Stage 2	-	-	-	-	-	-	519	519	-	391	391	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1061	-	-	1179	-	-	259	278	665	258	277	564
Stage 1	-	-	-	-	-	-	641	613	-	544	536	-
Stage 2	-	-	-	-	-	-	544	536	-	637	611	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1061	-	-	1179	-	-	258	277	665	254	276	564
Mov Cap-2 Maneuver	-	-	-	-	-	-	258	277	-	254	276	-
Stage 1	-	-	-	-	-	-	641	613	-	544	535	-
Stage 2	-	-	-	-	-	-	543	535	-	629	611	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			17.1			0		
HCM LOS							C			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	324	1061	-	-	1179	-	-	-				
HCM Lane V/C Ratio	0.078	-	-	-	0.002	-	-	-				
HCM Control Delay (s)	17.1	0	-	-	8.1	0	-	0				
HCM Lane LOS	C	A	-	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	-				

3: Strathmore Road/79 Haverhill St Driveway & Haverhill St Lanes, Volumes, Timings

2030 No-Build PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	788	20	10	521	1	12	0	17	0	1	4
Future Volume (vph)	1	788	20	10	521	1	12	0	17	0	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	14	14	14	10	10	10
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997						0.920			0.899	
Flt Protected					0.999			0.980				
Satd. Flow (prot)	0	2124	0	0	2130	0	0	1827	0	0	1594	0
Flt Permitted					0.999			0.980				
Satd. Flow (perm)	0	2124	0	0	2130	0	0	1827	0	0	1594	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		110			261			147			93	
Travel Time (s)		2.5			5.9			3.3			2.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.75	0.75	0.75	0.63	0.63	0.63
Heavy Vehicles (%)	0%	1%	5%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	829	21	11	548	1	16	0	23	0	2	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	851	0	0	560	0	0	39	0	0	8	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.92	0.92	0.92	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	58.2%						ICU Level of Service B					
Analysis Period (min)	15											

3: Strathmore Road/79 Haverhill St Driveway & Haverhill St HCM 6th TWSC

2030 No-Build PM Peak Hour

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	788	20	10	521	1	12	0	17	0	1	4
Future Vol, veh/h	1	788	20	10	521	1	12	0	17	0	1	4
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	95	95	95	95	95	95	75	75	75	63	63	63
Heavy Vehicles, %	0	1	5	0	1	0	0	0	0	0	0	0
Mvmt Flow	1	829	21	11	548	1	16	0	23	0	2	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	549	0	0	850	0	0	1417	1413	840	1424	1423	549
Stage 1	-	-	-	-	-	-	842	842	-	571	571	-
Stage 2	-	-	-	-	-	-	575	571	-	853	852	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1031	-	-	797	-	-	116	139	368	115	137	539
Stage 1	-	-	-	-	-	-	362	383	-	509	508	-
Stage 2	-	-	-	-	-	-	507	508	-	357	379	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1031	-	-	797	-	-	112	136	368	106	134	539
Mov Cap-2 Maneuver	-	-	-	-	-	-	112	136	-	106	134	-
Stage 1	-	-	-	-	-	-	361	382	-	508	498	-
Stage 2	-	-	-	-	-	-	489	498	-	334	378	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.2			28.9			16		
HCM LOS							D			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	189	1031	-	-	797	-	-	336
HCM Lane V/C Ratio	0.205	0.001	-	-	0.013	-	-	0.024
HCM Control Delay (s)	28.9	8.5	0	-	9.6	0	-	16
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.7	0	-	-	0	-	-	0.1

5: Madison St/39 Haverhill St Driveway & Haverhill St Lanes, Volumes, Timings

2030 No-Build PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	772	32	19	515	2	15	0	14	3	0	2
Future Volume (vph)	1	772	32	19	515	2	15	0	14	3	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	15	15	15	16	16	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995						0.935			0.946	
Flt Protected					0.998			0.975			0.971	
Satd. Flow (prot)	0	2122	0	0	2109	0	0	1905	0	0	1978	0
Flt Permitted					0.998			0.975			0.971	
Satd. Flow (perm)	0	2122	0	0	2109	0	0	1905	0	0	1978	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		261			93			128			105	
Travel Time (s)		5.9			2.1			2.9			2.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.52	0.52	0.52	0.25	0.25	0.25
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	813	34	20	542	2	29	0	27	12	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	848	0	0	564	0	0	56	0	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	53.0%				ICU Level of Service A							
Analysis Period (min)	15											

5: Madison St/39 Haverhill St Driveway & Haverhill St
HCM 6th TWSC

2030 No-Build PM Peak Hour

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	772	32	19	515	2	15	0	14	3	0	2
Future Vol, veh/h	1	772	32	19	515	2	15	0	14	3	0	2
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	95	95	95	95	95	95	52	52	52	25	25	25
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	1	813	34	20	542	2	29	0	27	12	0	8
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	544	0	0	847	0	0	1419	1416	830	1429	1432	543
Stage 1	-	-	-	-	-	-	832	832	-	583	583	-
Stage 2	-	-	-	-	-	-	587	584	-	846	849	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1035	-	-	799	-	-	115	139	373	114	136	544
Stage 1	-	-	-	-	-	-	366	387	-	502	502	-
Stage 2	-	-	-	-	-	-	499	501	-	360	380	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1035	-	-	799	-	-	110	134	373	103	131	544
Mov Cap-2 Maneuver	-	-	-	-	-	-	110	134	-	103	131	-
Stage 1	-	-	-	-	-	-	365	386	-	501	484	-
Stage 2	-	-	-	-	-	-	474	483	-	333	379	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.3			37			32.2		
HCM LOS							E			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	167	1035	-	-	799	-	-	152				
HCM Lane V/C Ratio	0.334	0.001	-	-	0.025	-	-	0.132				
HCM Control Delay (s)	37	8.5	0	-	9.6	0	-	32.2				
HCM Lane LOS	E	A	A	-	A	A	-	D				
HCM 95th %tile Q(veh)	1.4	0	-	-	0.1	-	-	0.4				

3: Strathmore Road/79 Haverhill St Driveway & Haverhill St Lanes, Volumes, Timings

2030 Build AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	332	20	10	501	1	12	0	12	0	0	0
Future Volume (vph)	5	332	20	10	501	1	12	0	12	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	14	14	14	10	10	10
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992						0.932				
Flt Protected		0.999			0.999			0.976				
Satd. Flow (prot)	0	2057	0	0	2090	0	0	1844	0	0	1773	0
Flt Permitted		0.999			0.999			0.976				
Satd. Flow (perm)	0	2057	0	0	2090	0	0	1844	0	0	1773	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		110			122			147			93	
Travel Time (s)		2.5			2.8			3.3			2.1	
Peak Hour Factor	0.87	0.87	0.87	0.95	0.95	0.95	0.53	0.53	0.53	0.25	0.25	0.25
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	6	382	23	11	527	1	23	0	23	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	411	0	0	539	0	0	46	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.92	0.92	0.92	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	42.1%											
Analysis Period (min)	15											
ICU Level of Service A												

3: Strathmore Road/79 Haverhill St Driveway & Haverhill St HCM 6th TWSC

2030 Build AM Peak Hour

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	332	20	10	501	1	12	0	12	0	0	0
Future Vol, veh/h	5	332	20	10	501	1	12	0	12	0	0	0
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	87	87	87	95	95	95	53	53	53	25	25	25
Heavy Vehicles, %	0	4	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	6	382	23	11	527	1	23	0	23	0	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	528	0	0	405	0	0	956	956	394	967	967	528
Stage 1	-	-	-	-	-	-	406	406	-	550	550	-
Stage 2	-	-	-	-	-	-	550	550	-	417	417	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1049	-	-	1165	-	-	240	260	659	236	256	554
Stage 1	-	-	-	-	-	-	626	601	-	523	519	-
Stage 2	-	-	-	-	-	-	523	519	-	617	595	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1049	-	-	1165	-	-	236	255	659	224	251	554
Mov Cap-2 Maneuver	-	-	-	-	-	-	236	255	-	224	251	-
Stage 1	-	-	-	-	-	-	622	597	-	519	512	-
Stage 2	-	-	-	-	-	-	516	512	-	592	591	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.2			16.9			0		
HCM LOS							C			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	348	1049	-	-	1165	-	-	-				
HCM Lane V/C Ratio	0.13	0.005	-	-	0.009	-	-	-				
HCM Control Delay (s)	16.9	8.5	0	-	8.1	0	-	0				
HCM Lane LOS	C	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	-				

5: Madison St/39 Haverhill St Driveway & Haverhill St Lanes, Volumes, Timings

2030 Build AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	307	8	2	462	36	12	0	6	18	0	27
Future Volume (vph)	29	307	8	2	462	36	12	0	6	18	0	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	15	15	15	16	16	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.990			0.957			0.920	
Flt Protected		0.996						0.967			0.980	
Satd. Flow (prot)	0	2064	0	0	2074	0	0	1934	0	0	1941	0
Flt Permitted		0.996						0.967			0.980	
Satd. Flow (perm)	0	2064	0	0	2074	0	0	1934	0	0	1941	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		140			93			128			105	
Travel Time (s)		3.2			2.1			2.9			2.4	
Peak Hour Factor	0.85	0.85	0.85	0.95	0.95	0.95	0.71	0.71	0.71	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	34	361	9	2	486	38	17	0	8	20	0	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	404	0	0	526	0	0	25	0	0	49	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 48.4% ICU Level of Service A

Analysis Period (min) 15

5: Madison St/39 Haverhill St Driveway & Haverhill St
HCM 6th TWSC

2030 Build AM Peak Hour

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	307	8	2	462	36	12	0	6	18	0	27
Future Vol, veh/h	29	307	8	2	462	36	12	0	6	18	0	27
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	85	85	85	95	95	95	71	71	71	92	92	92
Heavy Vehicles, %	0	4	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	34	361	9	2	486	38	17	0	8	20	0	29
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	524	0	0	370	0	0	958	962	366	947	947	505
Stage 1	-	-	-	-	-	-	434	434	-	509	509	-
Stage 2	-	-	-	-	-	-	524	528	-	438	438	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1053	-	-	1200	-	-	239	258	684	243	263	571
Stage 1	-	-	-	-	-	-	604	585	-	550	541	-
Stage 2	-	-	-	-	-	-	540	531	-	601	582	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1053	-	-	1200	-	-	219	247	684	232	252	571
Mov Cap-2 Maneuver	-	-	-	-	-	-	219	247	-	232	252	-
Stage 1	-	-	-	-	-	-	579	561	-	527	540	-
Stage 2	-	-	-	-	-	-	511	530	-	569	558	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0			19			16.6		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	283	1053	-	-	1200	-	-	360				
HCM Lane V/C Ratio	0.09	0.032	-	-	0.002	-	-	0.136				
HCM Control Delay (s)	19	8.5	0	-	8	0	-	16.6				
HCM Lane LOS	C	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	0.5				

9: Haverhill St & Proposed Site Exit Driveway Lanes, Volumes, Timings

2030 Build AM Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	344	501	0	9	11
Future Volume (vph)	0	344	501	0	9	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.926	
Flt Protected					0.978	
Satd. Flow (prot)	0	1863	1863	0	1687	0
Flt Permitted					0.978	
Satd. Flow (perm)	0	1863	1863	0	1687	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		122	140		90	
Travel Time (s)		2.8	3.2		2.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	374	545	0	10	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	374	545	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	36.4%			ICU Level of Service A		
Analysis Period (min)	15					

9: Haverhill St & Proposed Site Exit Driveway
HCM 6th TWSC

2030 Build AM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	↓
Traffic Vol, veh/h	0	344	501	0	9	11
Future Vol, veh/h	0	344	501	0	9	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	374	545	0	10	12
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	919	545
Stage 1	-	-	-	-	545	-
Stage 2	-	-	-	-	374	-
Critical Hdwy	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	0	-	-	0	301	538
Stage 1	0	-	-	0	581	-
Stage 2	0	-	-	0	696	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	301	538
Mov Cap-2 Maneuver	-	-	-	-	301	-
Stage 1	-	-	-	-	581	-
Stage 2	-	-	-	-	696	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		14.6		
HCM LOS	B					
Minor Lane/Major Mvmt	EBT	WBT	SBLn1			
Capacity (veh/h)	-	-	397			
HCM Lane V/C Ratio	-	-	0.055			
HCM Control Delay (s)	-	-	14.6			
HCM Lane LOS	-	-	B			
HCM 95th %tile Q(veh)	-	-	0.2			

3: Strathmore Road/79 Haverhill St Driveway & Haverhill St Lanes, Volumes, Timings

2030 Build PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	791	20	10	523	1	12	0	18	0	1	4
Future Volume (vph)	1	791	20	10	523	1	12	0	18	0	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	14	14	14	10	10	10
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997						0.919			0.899	
Flt Protected					0.999			0.980				
Satd. Flow (prot)	0	2124	0	0	2130	0	0	1825	0	0	1594	0
Flt Permitted					0.999			0.980				
Satd. Flow (perm)	0	2124	0	0	2130	0	0	1825	0	0	1594	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		110			131			147			93	
Travel Time (s)		2.5			3.0			3.3			2.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.75	0.75	0.75	0.63	0.63	0.63
Heavy Vehicles (%)	0%	1%	5%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	833	21	11	551	1	16	0	24	0	2	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	855	0	0	563	0	0	40	0	0	8	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.92	0.92	0.92	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	58.5%				ICU Level of Service B							
Analysis Period (min)	15											

3: Strathmore Road/79 Haverhill St Driveway & Haverhill St HCM 6th TWSC

2030 Build PM Peak Hour

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	791	20	10	523	1	12	0	18	0	1	4
Future Vol, veh/h	1	791	20	10	523	1	12	0	18	0	1	4
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	95	95	95	95	95	95	75	75	75	63	63	63
Heavy Vehicles, %	0	1	5	0	1	0	0	0	0	0	0	0
Mvmt Flow	1	833	21	11	551	1	16	0	24	0	2	6
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	552	0	0	854	0	0	1424	1420	844	1432	1430	552
Stage 1	-	-	-	-	-	-	846	846	-	574	574	-
Stage 2	-	-	-	-	-	-	578	574	-	858	856	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1028	-	-	794	-	-	115	138	366	113	136	537
Stage 1	-	-	-	-	-	-	360	381	-	507	506	-
Stage 2	-	-	-	-	-	-	505	506	-	354	377	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1028	-	-	794	-	-	111	135	366	104	133	537
Mov Cap-2 Maneuver	-	-	-	-	-	-	111	135	-	104	133	-
Stage 1	-	-	-	-	-	-	359	380	-	506	496	-
Stage 2	-	-	-	-	-	-	487	496	-	330	376	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.2			28.8			16		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	191	1028	-	-	794	-	-	334				
HCM Lane V/C Ratio	0.209	0.001	-	-	0.013	-	-	0.024				
HCM Control Delay (s)	28.8	8.5	0	-	9.6	0	-	16				
HCM Lane LOS	D	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	0.8	0	-	-	0	-	-	0.1				

5: Madison St/39 Haverhill St Driveway & Haverhill St Lanes, Volumes, Timings

2030 Build PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	763	32	19	507	12	15	0	14	13	0	8
Future Volume (vph)	18	763	32	19	507	12	15	0	14	13	0	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	16	16	16	15	15	15	16	16	16
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.997			0.935			0.947	
Flt Protected		0.999			0.998			0.975			0.970	
Satd. Flow (prot)	0	2121	0	0	2103	0	0	1905	0	0	1978	0
Flt Permitted		0.999			0.998			0.975			0.970	
Satd. Flow (perm)	0	2121	0	0	2103	0	0	1905	0	0	1978	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		131			93			128			105	
Travel Time (s)		3.0			2.1			2.9			2.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.52	0.52	0.52	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	19	803	34	20	534	13	29	0	27	14	0	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	856	0	0	567	0	0	56	0	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.85	0.85	0.85
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	59.3%					ICU Level of Service B						
Analysis Period (min)	15											

5: Madison St/39 Haverhill St Driveway & Haverhill St
HCM 6th TWSC

2030 Build PM Peak Hour

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	763	32	19	507	12	15	0	14	13	0	8
Future Vol, veh/h	18	763	32	19	507	12	15	0	14	13	0	8
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	95	95	95	95	95	95	52	52	52	92	92	92
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	19	803	34	20	534	13	29	0	27	14	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	547	0	0	837	0	0	1443	1445	820	1453	1456	541
Stage 1	-	-	-	-	-	-	858	858	-	581	581	-
Stage 2	-	-	-	-	-	-	585	587	-	872	875	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1033	-	-	806	-	-	111	133	378	109	131	545
Stage 1	-	-	-	-	-	-	354	376	-	503	503	-
Stage 2	-	-	-	-	-	-	501	500	-	348	370	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1033	-	-	806	-	-	103	124	378	96	122	545
Mov Cap-2 Maneuver	-	-	-	-	-	-	103	124	-	96	122	-
Stage 1	-	-	-	-	-	-	342	363	-	485	485	-
Stage 2	-	-	-	-	-	-	475	482	-	312	357	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.3			39.4			35.7		
HCM LOS							E			E		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	159	1033	-	-	806	-	-	140
HCM Lane V/C Ratio	0.351	0.018	-	-	0.025	-	-	0.163
HCM Control Delay (s)	39.4	8.6	0	-	9.6	0	-	35.7
HCM Lane LOS	E	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	1.5	0.1	-	-	0.1	-	-	0.6

9: Haverhill St & Proposed Site Exit Driveway

Lanes, Volumes, Timings

2030 Build PM Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	809	530	0	4	4
Future Volume (vph)	0	809	530	0	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.932	
Flt Protected					0.976	
Satd. Flow (prot)	0	1863	1863	0	1694	0
Flt Permitted					0.976	
Satd. Flow (perm)	0	1863	1863	0	1694	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		131	131		89	
Travel Time (s)		3.0	3.0		2.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	879	576	0	4	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	879	576	0	8	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	52.6%			ICU Level of Service A		
Analysis Period (min)	15					

9: Haverhill St & Proposed Site Exit Driveway
HCM 6th TWSC

2030 Build PM Peak Hour

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	↓
Traffic Vol, veh/h	0	809	530	0	4	4
Future Vol, veh/h	0	809	530	0	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	879	576	0	4	4
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	1455	576
Stage 1	-	-	-	-	576	-
Stage 2	-	-	-	-	879	-
Critical Hdwy	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	0	-	-	0	143	517
Stage 1	0	-	-	0	562	-
Stage 2	0	-	-	0	406	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	143	517
Mov Cap-2 Maneuver	-	-	-	-	143	-
Stage 1	-	-	-	-	562	-
Stage 2	-	-	-	-	406	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		21.7		
HCM LOS	C					
Minor Lane/Major Mvmt	EBT	WBT	SBLn1			
Capacity (veh/h)	-	-	224			
HCM Lane V/C Ratio	-	-	0.039			
HCM Control Delay (s)	-	-	21.7			
HCM Lane LOS	-	-	C			
HCM 95th %tile Q(veh)	-	-	0.1			

Sight Distance Worksheets

Sight Distance Calculations

Proposed Aroma Joe's, Methuen, MA

Inputs

Posted Speed Limit = 30 mph EB and 30 mph WB

Direction 1 = Haverhill Street EB 85% Speed = 34 mph Grade = 0 t = 2.5 s a = 11.2 ft/s²

Direction 2 = Haverhill Street WB 85% Speed = 32 mph Grade = 0 t = 2.5 s a = 11.2 ft/s²

Left: t_g = 7.5 s

Right: t_g = 6.5 s

SSD = Reaction Distance + Braking Distance

Reaction Distance = 1.47 x V x t

Braking Distance = V² / (30 x ((a/32.2) + G))

ISD = 1.47 x V x t_g

Where t = reaction time (sec)

t_g = time gap for minor road vehicle to enter the major road

V = travel speed (mph)

G = roadway grade

a = deceleration rate (ft/s²)

Calculations

	Reaction Distance (ft)	Brake Distance (ft)	SSD (ft)
Haverhill Street EB	125.0	110.8	236
Haverhill Street WB	117.6	98.1	216

For 34 mph:

Left Turn ISD = 375 ft
Right Turn ISD = 325 ft

For 32 mph:

Left Turn ISD = 353 ft
Right Turn ISD = 306 ft