Transportation Impact Assessment

Proposed Multifamily Residential Development
Ferncroft Apartments
35 Village Road
Middleton, Massachusetts

Prepared for:

SOVEREIGN PARTNERS

New York City, New York

December 2025

Prepared by:

Vanasse & Associates inc
Transportation Engineers & Planners

35 New England Business Center Drive
Suite 140
Andover, MA 01810

Vanasse & Associates inc
Transportation Engineers & Planners

35 New England Business Center Drive
Suite 140
Andover, MA 01810

Dear Reviewer:

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

Sincerely,

VANASSE & ASSOCIATES, INC.

Jeffrey S. Dirk

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

CONTENTS

CONTENTS (Continued)

FIGURES

TABLES

EXECUTIVE SUMMARY

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a multifamily residential development to be known as Ferncroft Apartments and located at 35 Village Road in Middleton, Massachusetts (hereafter referred to as the "Project"). This assessment was prepared in consultation with the Massachusetts Department of Transportation (MassDOT) and the Town of Middleton, and was performed in accordance with MassDOT's *Transportation Impact Assessment (TIA) Guidelines* and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports.

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

1. Using trip-generation statistics published by the Institute of Transportation Engineers (ITE),[1] the Project is expected to generate approximately 892 vehicle trips on an average weekday (two-way, 24-hour volume), with 76 vehicle trips expected during the weekday morning peak-hour and 75 vehicle trips expected during the weekday evening peak-hour;

2. The Project will not result in a significant impact (increase) on motorist delays or vehicle queuing over anticipated future conditions without the Project (No-Build conditions), with all movements at the study area intersections shown to continue to operate at a level-of-service (LOS) of C or better, where an LOS "D" or better is generally defined as "acceptable" traffic operations, and Project-related impacts generally defined as an increase in average motorist delay of up to 1.7 seconds that resulted in a corresponding increase in vehicle queuing of up to one (1) vehicle;

3. All movements exiting the driveway that serves 35 Village Road and that will serve the Project are predicted to operate at LOS B during the peak hours with residual vehicle queuing of up to one (1) vehicle, which can be contained along the driveway without inhibiting access, or the movement of vehicles, pedestrians or bicyclists along Village Road. All movements along Village Road approaching the driveway are predicted to operate at LOS A with residual vehicle queuing of up to one (1) vehicle;

[1] *Trip Generation,* 12th Edition; Institute of Transportation Engineers; Washington, DC; August 2025.

4. No apparent safety deficiencies were noted with respect to the motor vehicle crash history at the study area intersections;

5. Based on a review of parking demand data published by the ITE[2] for the Project and the existing office buildings, it was determined that the proposed parking supply that will be available after the construction of the Project is sufficient to accommodate the anticipated peak parking demand of the existing and proposed uses at 35 Village Road; and

6. Lines of sight to and from the Project site driveway intersection with Village Road exceed the recommended minimum distances to function in a safe manner based on the appropriate approach speeds.

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

RECOMMENDATIONS

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

Project Access

Access to the Project site will be provided by way of the existing driveway that serves the office buildings at 35 Village Road and intersects the south side of Village Road. Secondary access for emergency vehicles will be provided by way of a new driveway that will intersect the north side of Locust Street approximately 220 feet north of Nichols Lane that will be designed and constructed in a manner so as to restrict use by non-emergency vehicles. The following recommendations are offered with respect to the design and operation of the Project site access, internal circulation and parking:

- The existing driveway that serves 35 Village Road and that will also serve the Project should be retained as a two-way driveway with one entering and one exiting travel lane that are separated by a raised median approaching Village Road. The driveway will continue to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle. Upon entering the Project site, the existing parking lot to the east of the parking garage that serves the existing office buildings at 35 Village Road will be reconstructed to provide a 22-foot wide, two-way drive with parallel parking that will continue to provide access to the parking garage and will extend to the north to serve the Project.

- The secondary emergency vehicle access drive should be a minimum of 20-feet in width and designed and constructed in a manner that supports travel by the largest anticipated

[2] *Parking Generation*, 6th Edition; Institute of Transportation Engineers; Washington, D.C.; October 2023.

responding emergency vehicle under all weather conditions and that restricts access by non-emergency vehicles.

- Where perpendicular parking is proposed, the drive aisle behind the parking should be a minimum of 23 feet wide in order to facilitate parking maneuvers.

- Vehicles exiting the Project site to Village Road will be placed under STOP-sign control with marked STOP-lines provided.

- All signs and pavement markings to be installed within the Project site should conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).[3]

- Sidewalks should be provided within the Project site to connect the proposed residential buildings to the parking spaces that will serve the Project and the existing parking garage, and should extend to Locust Street where a crosswalk with Americans with Disabilities Act (ADA)-compliant wheelchair ramps and a pedestrian actuated Rectangular Rapid Flashing beacon (RRFB) should be provided for crossing Locust Street.

- Marked crosswalks and ADA-compliant wheelchair ramps will be provided at all pedestrian crossings to be constructed or modified as a part of the Project.

- Signs and landscaping located within sight triangle areas should be designed and maintained so as not to restrict lines of sight.

- Snow accumulations (windrows) within sight triangle areas should be promptly removed where such accumulations would impede sightlines.

Off-Site

Village Road at Locust Street and Augusta Way

Independent of the Project, it is recommended that a STOP-sign and marked STOP-line be installed on the Locust Street approach to Village Road.

Transportation Demand Management

Regularly scheduled public transportation services are not currently provided within the Town of Middleton or in the immediate vicinity of the Project site. The Massachusetts Bay Transportation Authority (MBTA) does provide The RIDE paratransit services to eligible persons in the Town who cannot use fixed-route transit (bus, subway, trolley) due to a physical, cognitive, or mental disability in compliance with the Americans with Disabilities Act (ADA). In addition, the Town of Middleton Council on Aging (COA) provides transportation services to eligible seniors for errands and medical appointments by appointment.

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

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

- A Transportation Coordinator (TC), who may have other duties and responsibilities, should be assigned for the Project to coordinate the TDM program;

- The TC should facilitate a rideshare matching program for residents to encourage carpooling;

- A "welcome packet" should be provided to new residents that will include the contact information for the TC and detailing available public transportation services, bicycle and walking alternatives, and other commuter options;

- Short-term parking spaces should be located proximate to the residential building entrances for use by ride-hailing and delivery service providers;

- Consideration should be given to providing electric vehicle (EV) charging stations for use by residents and guests;

- A central mailroom and package delivery station should be provided within both buildings;

- Pedestrian accommodations should be incorporated within the Project site and should extend to Locust Street to encourage walking; and

- Secure bicycle parking should be provided to include weather protected bicycle parking for residents and exterior bicycle parking located proximate to the building entrances.

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

INTRODUCTION

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a multifamily residential development to be known as Ferncroft Apartments and located at 35 Village Road in Middleton, Massachusetts (hereafter referred to as the "Project"). This study evaluates the following specific areas as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; and identifies and analyzes existing traffic conditions and future traffic conditions, both with and without the Project, along Locust Street, Village Road and Newbury Street (Route 1), and at major intersections located along these roadways through which Project-related traffic will travel.

PROJECT DESCRIPTION

As proposed, the Project will entail the construction of a 200-unit multifamily residential development to be known as Ferncroft Apartments and located at 35 Village Road in Middleton, Massachusetts. The Project is proposed to consist of two buildings: Building "A" will contain 94 residential units and share parking with the existing office building parking garage (Ferncroft Corporate Center); and Building "B" will contain 106 residential units and have a dedicated garage providing parking to the residents and will also share parking with the existing office building parking garage. The site currently contains Ferncroft Corporate Center, a parking garage, associated surface parking and areas of open and wooded space.

The property is being depicted as two (2) separate land areas to demarcate the approximate area of the existing commercial use area: Lot A includes the Ferncroft Corporate Center, existing parking garage and associated surface parking; and Lot B includes the proposed residential uses, which includes both Buildings "A" and "B". The ownership of Lot B will be of the Applicant, Ferncroft Apartments, LLC, and will be divided from Lot A through one of three available means: lotting plan endorsement by the Zoning Board of Appeals pursuant to its authority under Chapter 40B, condominium and/or ground lease, to be finally determined through the Zoning Board of Appeals hearing process. Lot A will continue to operate under the current ownership, and separate ownership, financing and management of the two areas will be maintained. Figure 1 depicts the Project site in relation to the existing roadway network.

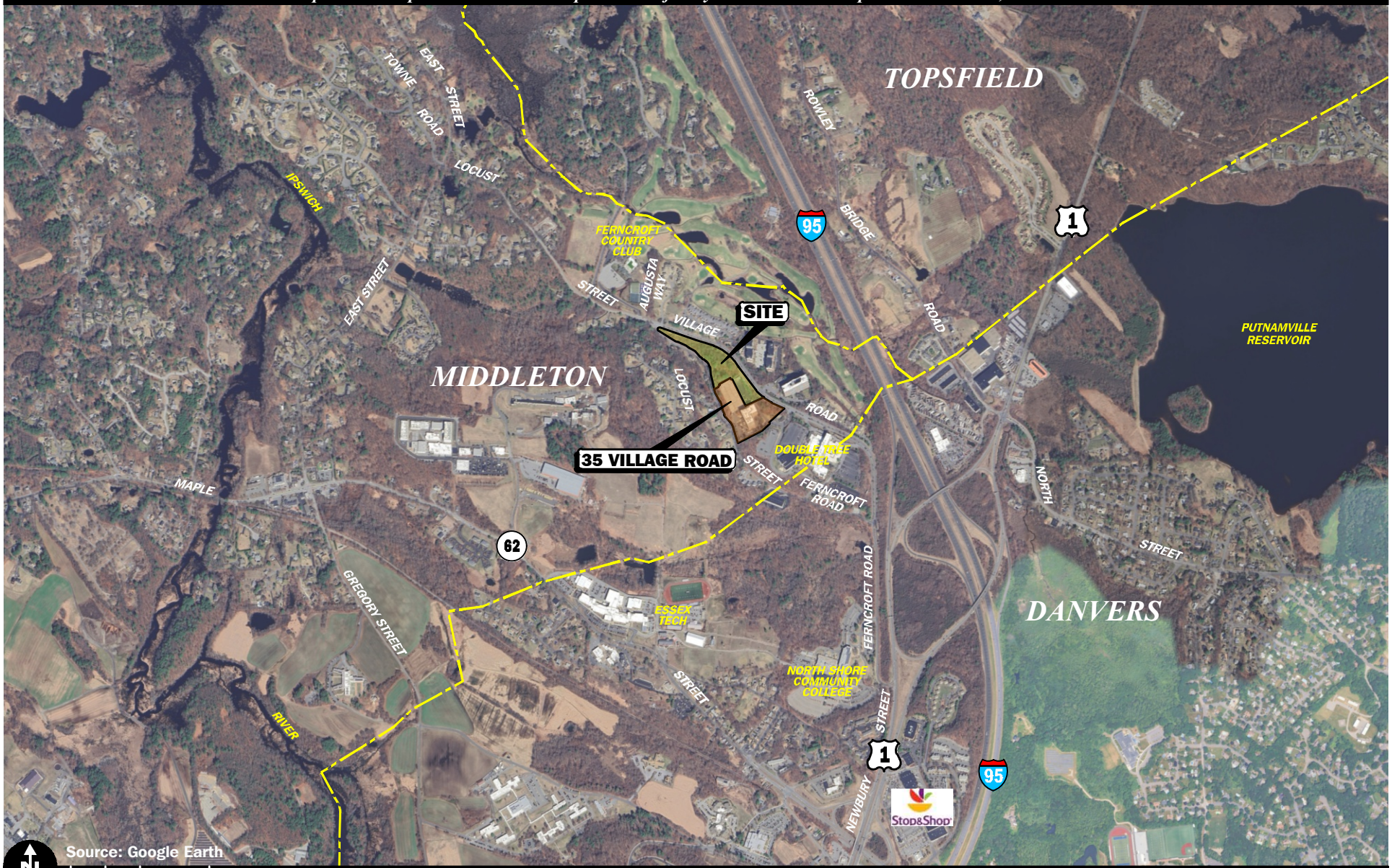


Figure 1

Site Location Map

Vanasse & Associates inc

Access to the Project site will be provided by way of the existing driveway that serves the office buildings at 35 Village Road and intersects the south side of Village Road. Secondary access for emergency vehicles will be provided by way of a new driveway that will intersect the north side of Locust Street approximately 220 feet north of Nichols Lane that will be designed and constructed in a manner so as to restrict use by non-emergency vehicles.

On-site parking will be provided for 986 vehicles, with 767 parking spaces located in the existing parking garage, 41 parking spaces located beneath the Ferncroft Corporate Center building, 131 surface parking spaces and 47 parking spaces underneath Building "B". The on-site parking will serve both residents and visitors of the Project and will continue to serve the parking demands of the Ferncroft Corporate Center. A detailed shared parking analysis for the Project and the Ferncroft Corporate Center is included as a part of this assessment (see *Shared Parking Analysis* section).

STUDY METHODOLOGY

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

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

In the second stage of the study, future traffic conditions were projected and analyzed. Specific travel demand forecasts for the Project were assessed along with future traffic demands due to expected traffic growth independent of the Project. A seven-year time horizon was selected for analyses consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. The traffic analysis conducted in stage two identifies existing or projected future roadway capacity, traffic safety, and site access issues.

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

EXISTING CONDITIONS

A comprehensive field inventory of existing conditions within the study area was conducted in August and October 2025. The field investigation consisted of an inventory of existing roadway geometrics; pedestrian and bicycle facilities; public transportation services; traffic volumes; and operating characteristics; as well as posted speed limits and land use information within the study area. The study area that was assessed for the Project consisted of Village Road, Locust Street and Newbury Street (Route 1), and the following specific intersections through which Project-related traffic will travel:

- East Street at Locust Street and Towne Road
- Locust Street at Village Road and Augusta Way
- Village Road at 35 Village Road
- Village Road at Ferncroft Road
- Ferncroft Road at Newbury Street (Route 1) Southbound Ramps

The following describes the study area roadways and intersections.

ROADWAYS

Locust Street

- Two-lane local access roadway under Town jurisdiction;
- Traverses study area in a general northwest-southeast alignment between East Street and Ferncroft Road;
- Provides two 12-foot wide travel lanes that are separated by a double-yellow centerline with 1- to 2-foot wide marked shoulders west of Village Road and a 24-foot wide paved traveled-way that accommodates two-way travel with no pavement markings provided between Village Road and Ferncroft Road;
- A posted speed limit is not provided in the vicinity of the Project site and, as such, the statutory or "prima facie" speed limit pursuant to MGL c.90 § 17 is 30 mph;[4]

[4]The statutory or "prima facie" speed is defined in M.G.L. c. 90, § 17 as the speed which would be deemed reasonable and proper to operate a motor vehicle in the absence of a regulated or posted speed limit. The statutory speed limit in a thickly settled area where a regulatory or posted speed limit has not been approved is 30 mph.

- A sidewalk is provided on the north side of the roadway between Coppermine Road and Village Road, and along the west side of the roadway between Village Road and the Danvers town line;
- Illumination is not provided in the vicinity of the Project site; and
- Land use within the study area consists of the Project site, Ferncroft Country Club, residential and commercial properties, and areas of open and wooded space.

Village Road

- Two-lane, local access roadway under Town jurisdiction;
- Traverses study area in a general northwest-southeast alignment between Locust Street and Ferncroft Road;
- Provides two 22-foot wide travel lanes that are separated by a grassed median with no marked shoulders;
- The posted speed limit in the vicinity of the Project site is 25 mph;
- A sidewalk is provided on the north side of the roadway between Locust Street and the Danvers town line;
- Illumination is provided intermittently by way of ornamental streetlights; and
- Land use within the study area consists of the Project site, residential and commercial properties, and areas of open and wooded space.

Newbury Street (Route 1)

- Two- to four-lane (one to two lanes in each direction) urban principal arterial roadway under MassDOT jurisdiction that traverses a general northeast-southwest alignment within the study area and provides an interchange with Interstate 95 (I-95) to the east of the Project site and a full-access interchange with Maple Street (Route 62) to the south of the Project site;
- Provides one (1) to two (2) 12 to 13-foot wide travel lanes per direction that are separated by a grass median with variable width marked shoulders;
- The posted speed limit within the study area is 45 mph;
- A sidewalk is provided on the west side of the roadway between Ferncroft Road and Hawthorne Green (320 Newbury Street);
- Illumination is provided intermittently by way of street lights mounted on wood poles; and
- Land use within the study area consists of residential and commercial properties, and areas of open and wooded space.

INTERSECTIONS

Table 1 and Figure 2 summarize existing lane use, traffic control, and pedestrian and bicycle accommodations at the study area intersections as observed in August and October 2025.

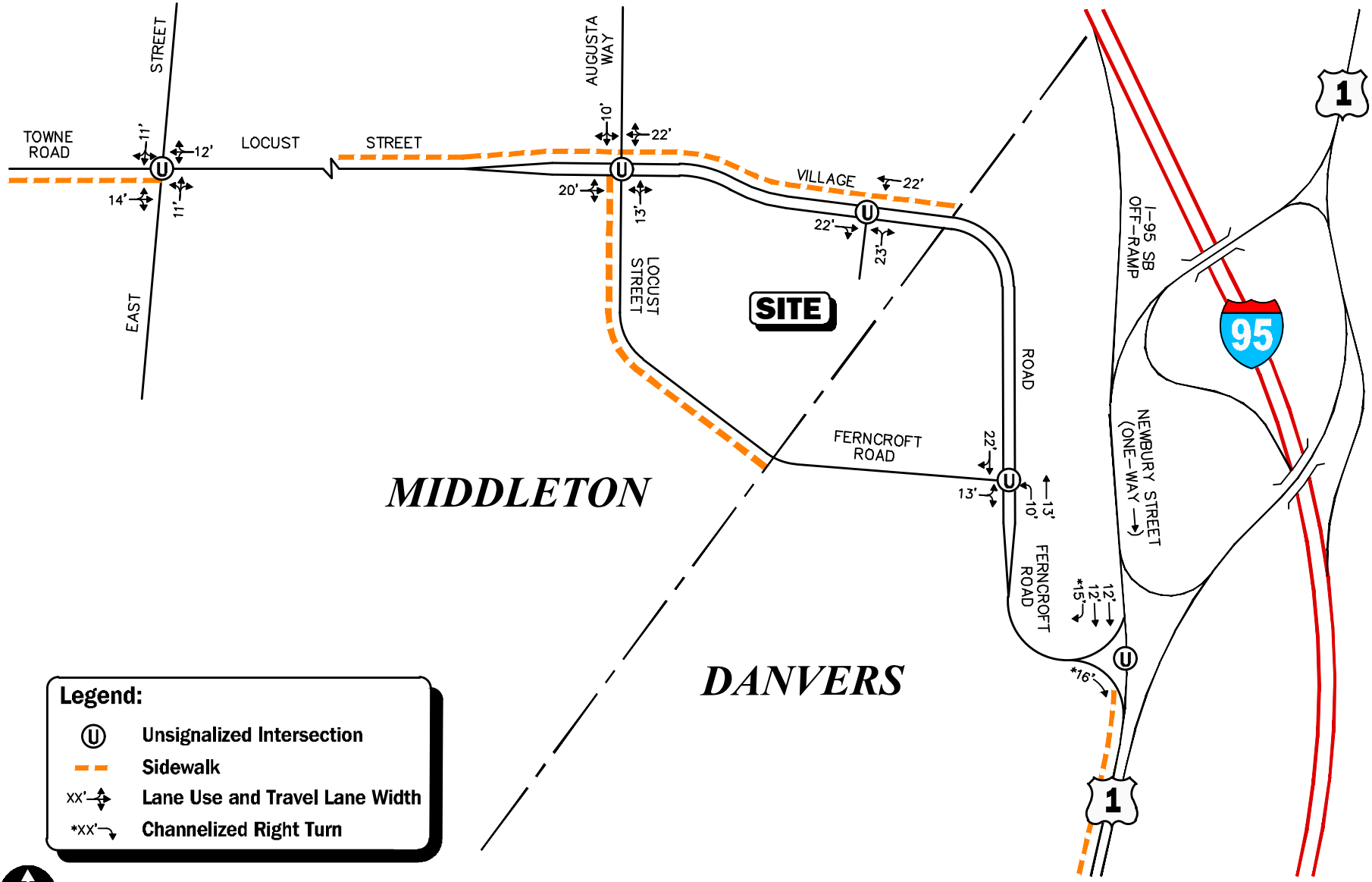


Figure 2

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

Vanasse & Associates inc

Table 1
STUDY AREA INTERSECTION DESCRIPTION

Intersection	Traffic Control Type[a]	No. of Travel Lanes Provided	Shoulder Provided? (Yes/No/Width)	Pedestrian Accommodations? (Yes/No/Description)	Bicycle Accommodations? (Yes/No/Description)
East St./ Locust St./ Towne Rd.	S	1 general-purpose travel lane provided on all approaches	Yes; 2 to 4 feet on East St. and 1 to 2 feet on Locust St.	Yes; sidewalk provided along the south side of Towne Rd.	Yes; shared traveled-way on East St.[b]
Locust St./ Village Rd./ Augusta Way	S	1 general-purpose travel lane on all approaches	No	Yes; sidewalks provided along the north side of Locust St. and Village Rd and along the west side of Locust St. south of the intersection	Yes; shared traveled-way on Village Rd.
Village Rd./ 35 Village Rd.	S	1 general-purpose travel lane on all approaches	No	Yes; sidewalk provided along the north side of Village Rd.	Yes; shared traveled-way on Village Rd.
Village Rd./ Ferncroft Rd.	S	1 general-purpose travel lane on all approaches	No	No	Yes; shared traveled-way on Village Rd.
Ferncroft Rd./ Rte. 1	S	1 channelized right-turn lane on Ferncroft Rd.; 2 through travel lanes and 1 channelized right-turn lane on Rte. 1	Yes; 1 to 2 feet on Ferncroft Rd. and 2 to 3 feet on Rte. 1	Yes; sidewalk provided along west side of Rte. 1 south of the intersection	No

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

EXISTING TRAFFIC VOLUMES

In order to determine existing traffic-volume demands and flow patterns within the study area, automatic traffic recorder (ATR) counts, turning movement counts (TMCs), and vehicle classification counts were completed in June and October 2025. The ATR counts were conducted on Village Road in the vicinity of the Project site on June 17th and 18th, 2025 (Tuesday and Wednesday, respectively) and on Locust Street in the vicinity of the Project site on October 8th and 9th, 2025 (Wednesday and Thursday, respectively) in order to record weekday traffic conditions over an extended period. Peak-period TMCs were performed at the study intersections during the weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak-periods on Tuesday, June 17, 2025, and on Wednesday, October 8, 2025. These time periods were selected for analysis purposes as they are representative of the peak traffic-volume hours for both the Project and the adjacent roadway network.

Traffic-Volume Adjustments

In order to evaluate the potential for seasonal fluctuation of traffic volumes within the study area, MassDOT weekday seasonal factors for Urban Groups 4-7 (minor arterials, major and minor collectors, and local roads and streets, the functional classifications of the study area roadways) were reviewed.[5] Based on a review of this data, it was determined that traffic volumes for the months of June and October are approximately 11.1 percent and 6.4 percent *above* average-month

[5]MassDOT statewide Traffic Data Collection; 2024 Weekday Seasonal Factors, Group U4-7.

conditions, respectively. In order to provide a conservative (high) assessment of traffic volumes within the study area, no adjustment was made to the traffic volumes.

Based on updated guidance from MassDOT,[6] adjustments to account for the impact on traffic volume and trip patterns resulting from the COVID-19 pandemic for traffic counts taken on or after March 1, 2022 are only recommended in areas where the predominant land use is office properties. As the predominant land use within the study area consists of residential and commercial uses, a pandemic-related adjustment was not required.

The 2025 Existing traffic volumes are summarized in Table 2, with the weekday morning and evening peak-hour traffic volumes graphically depicted on Figures 3 and 4, respectively. Note that the peak-hour traffic volumes that are presented in Table 2 were obtained from the aforementioned figures.

Table 2
2025 EXISTING TRAFFIC VOLUMES

Location/Peak Hour	AWT[a]	VPH[b]	K Factor[c]	Directional Distribution[d]
Village Road, east of 35 Village Road:	2,930	--	--	--
Weekday Morning (7:45 – 8:45 AM)	--	246	8.4	56.1% WB
Weekday Evening (4:00 – 5:00 PM)	--	257	8.8	52.9% EB
Locust Street, north of Nichols Lane:	225	--	--	--
Weekday Morning (7:30 – 8:30 AM)	--	16	7.1	81.3% SB
Weekday Evening (4:30 – 5:30 PM)	--	34	15.1	64.7% NB

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

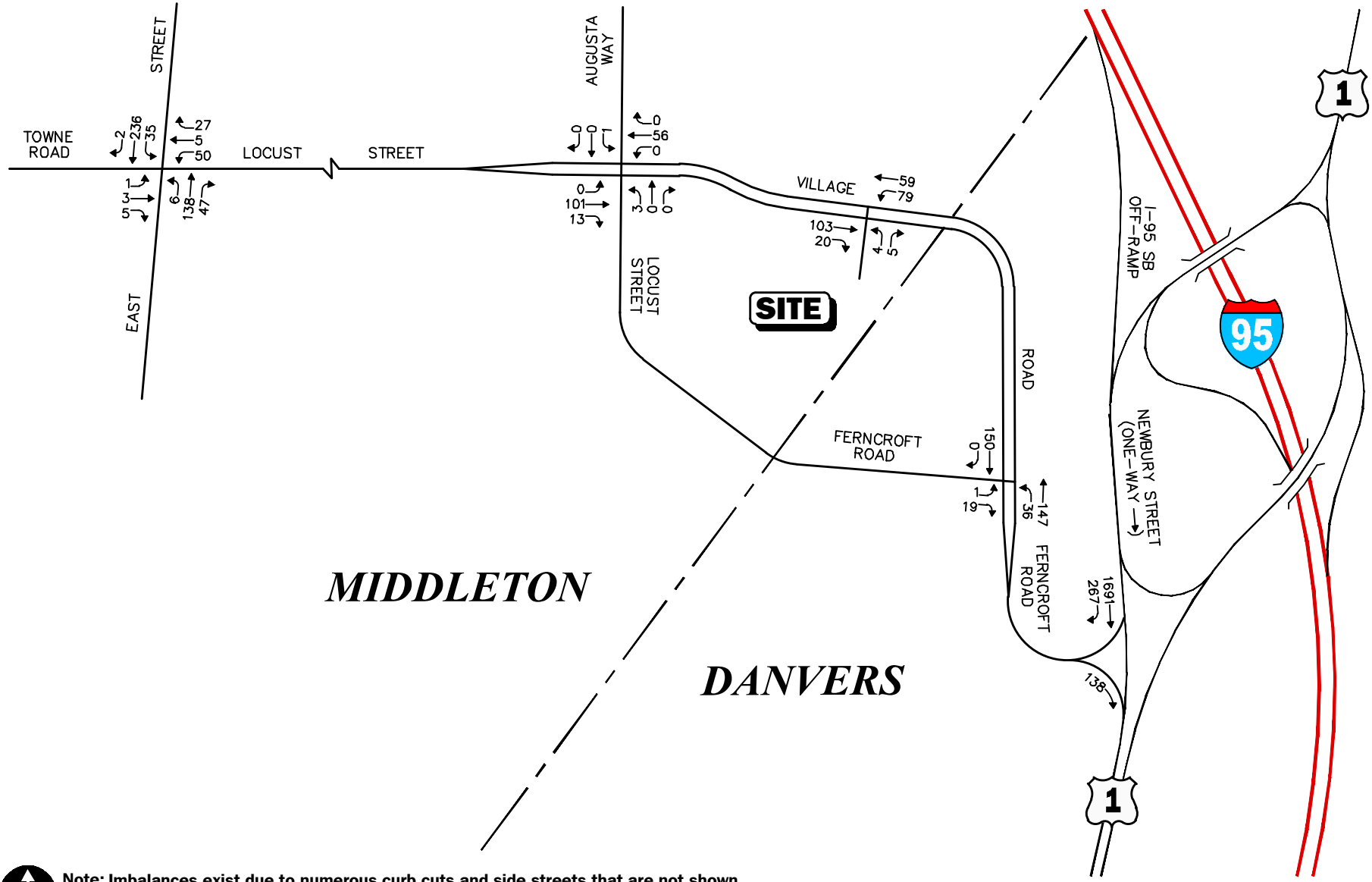
As can be seen in Table 2, Village Road in the vicinity of the Project site was found to accommodate approximately 2,930 vehicles on an average weekday (two-way, 24-hour volume), with approximately 246 vehicles per hour (vph) during the weekday morning peak-hour and 257 vph during the weekday evening peak-hour.

Locust Street in the vicinity of the Project site was found to accommodate approximately 225 vehicles on an average weekday, with approximately 16 vph during the weekday morning peak-hour and 34 vph during the weekday evening peak-hour.

PEDESTRIAN AND BICYCLE FACILITIES

A comprehensive field inventory of pedestrian and bicycle facilities in the vicinity of the Project site was undertaken in June and October 2025. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations in the vicinity of the Project site. As shown

[6]*25% Design Submission Guidelines*; MassDOT Highway Division, Traffic and Safety Engineering; Revised May 31, 2022.



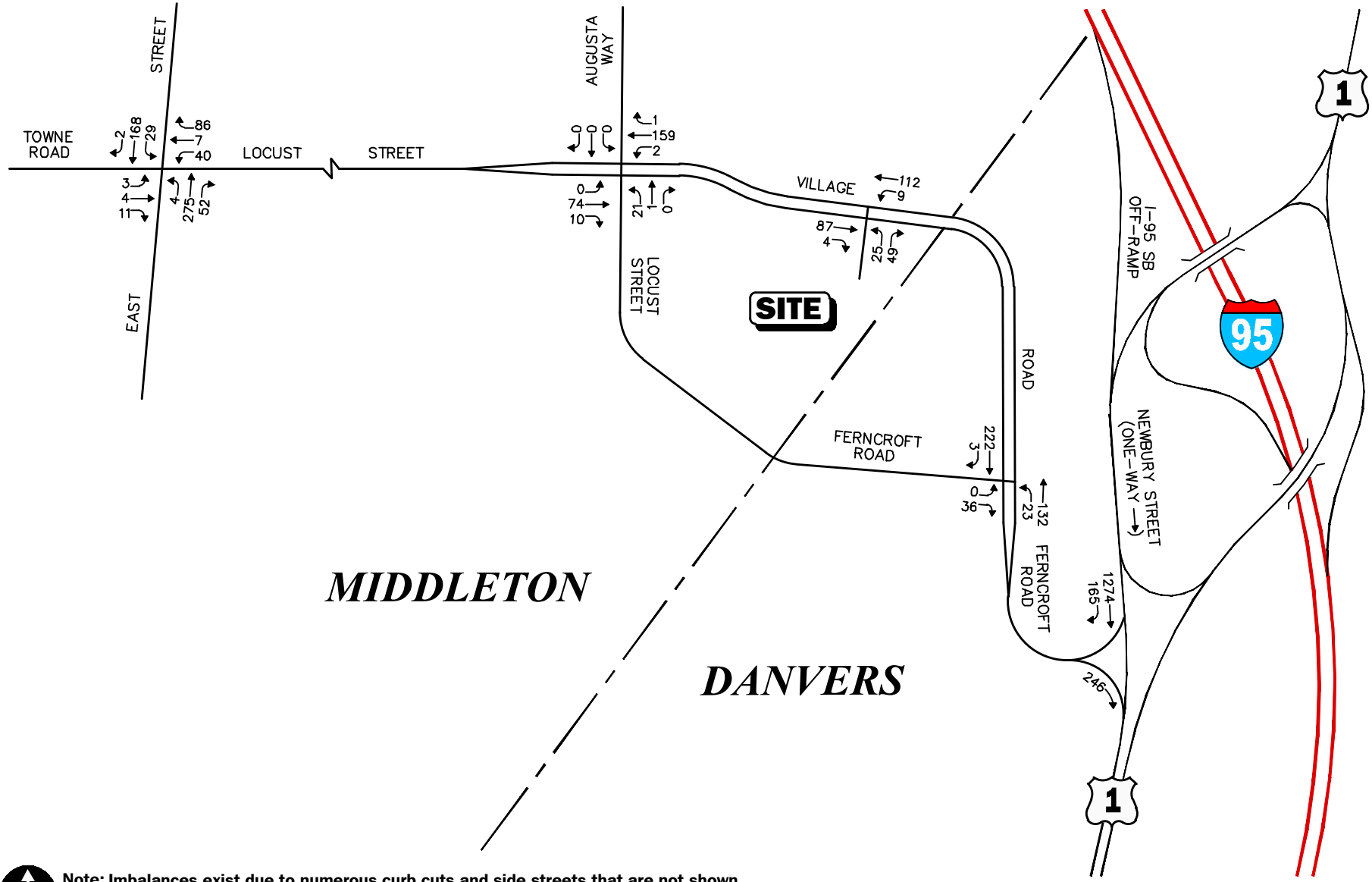
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 3

2025 Existing
Weekday Morning
Peak-Hour Traffic Volumes

Vanasse & Associates inc



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

Not To Scale

Figure 4

2025 Existing
Weekday Evening
Peak-Hour Traffic Volumes

Vanasse & Associates inc

on Figure 2, sidewalks are provided along the north side of Locust Street and Village Road from Coppermine Road to the Danvers town line; along the west side of Locust Street south of Village Road to the Danvers town line; along the south side of Towne Road; and along the west side of Route 1 southbound from Ferncroft Road to Hawthorne Green (320 Newbury Street).

Formal bicycle facilities are not provided within the study area; however, East Street and Village Road generally provide sufficient width (combined travel lane and shoulder) to support bicycle travel in a shared traveled-way configuration.[7]

PUBLIC TRANSPORTATION

Regularly scheduled public transportation services are not currently provided within the Town of Middleton or in the immediate vicinity of the Project site. The Massachusetts Bay Transportation Authority (MBTA) does provide The RIDE paratransit services to eligible persons who cannot use fixed-route transit (bus, subway, trolley) due to a physical, cognitive, or mental disability in compliance with the Americans with Disabilities Act (ADA). In addition, the Town of Middleton Council on Aging (COA) provides transportation services to eligible seniors for errands and medical appointments by appointment.

SPOT SPEED MEASUREMENTS

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

Table 3
VEHICLE TRAVEL SPEED MEASUREMENTS

	Village Road		Locust Street	
	Eastbound	Westbound	Northbound	Southbound
Mean Travel Speed (mph)	28	33	25	20
85th Percentile Speed (mph)	34	38	28	24
Posted/Statutory Speed Limit (mph)	25	25	30	30

mph = miles per hour.

As can be seen in Table 3, the mean vehicle travel speed along Village Road in the vicinity of the Project site was found to be 28 mph in the eastbound direction and 33 mph westbound. The measured 85th percentile vehicle travel speed, or the speed at which 85 percent of the observed vehicles traveled at or below, was found to be 34 mph in the eastbound direction and 38 mph westbound, which is 9 to 13 mph above the posted speed limit in the vicinity of the Project site (25 mph).

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

The mean vehicle travel speed along Locust Street in the vicinity of the Project site was found to be 25 mph in the northbound direction and 20 mph southbound. The measured 85th percentile vehicle travel speed was found to be 28 mph in the northbound direction and 24 mph southbound, which is 2 to 6 mph below the statutory speed limit in the vicinity of the Project site (30 mph).

MOTOR VEHICLE CRASH DATA

Motor vehicle crash information for the study area intersections was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2018 through 2022, inclusive) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized by intersection, type, severity, roadway and weather conditions, and day of occurrence, and is presented in Table 4.

As can be seen in Table 4, the study area intersections were found to have experienced an average of 1.60 or fewer reported motor vehicle crashes per year over the five-year review period and were found to have motor vehicle crash rates *below* both the MassDOT statewide and District average crash rates for similar intersections for the MassDOT Highway Division District in which the intersections are located (District 4). The majority of the reported crashes occurred on a weekday, under clear weather conditions, during daylight, and predominantly involved angle, read-end and sideswipe-type collisions that resulted in property damage only. No (0) motor vehicle crashes were reported to have occurred at the Locust Street/Village Road/Augusta Way or Village Road/ Ferncroft Road intersections over the five-year review period based on the MassDOT crash data.

A review of the MassDOT statewide High Crash Location List indicated that there are no Highway Safety Improvement Program (HSIP) eligible high crash locations within the study area. In addition, no (0) fatal motor vehicle crashes were reported to have occurred at the study area intersections over the five-year review period.

The detailed MassDOT Crash Rate Worksheets, High Crash Location mapping and motor vehicle crash back-up data are provided in the Appendix.

Table 4
MOTOR VEHICLE CRASH DATA SUMMARY[a]

	East St./ Locust St./ Towne Rd.	Locust St./ Village Rd./ Augusta Way	Village Rd./ 35 Village Rd.	Village Rd./ Ferncroft Rd.	Ferncroft Rd./ Rte. 1 SB Ramps
Traffic Control Type:[b]	U	U	U	U	U
Year:					
2018	2	0	0	0	2
2019	1	0	0	0	0
2020	0	0	0	0	2
2021	1	0	1	0	1
2022	1	0	0	0	3
Total	5	0	1	0	8
Average	1.00	0.00	0.20	0.00	1.60
Rate[c]	0.36	0.00	0.17	0.00	0.23
MassDOT Crash Rate:[d]	0.57/0.57	0.57/0.57	0.57/0.57	0.57/0.57	0.57/0.57
Significant?[e]	No	No	No	No	No
Type:					
Angle	2	0	0	0	0
Rear-End	0	0	0	0	2
Head-On	0	0	0	0	1
Sideswipe	1	0	1	0	2
Fixed Object	2	0	0	0	1
Pedestrian/Bicycle	0	0	0	0	0
Unknown/Other	0	0	0	0	2
Total	5	0	1	0	8
Conditions:					
Clear	4	0	1	0	2
Cloudy	0	0	0	0	2
Rain	0	0	0	0	2
Snow/Ice	1	0	0	0	2
Unknown	0	0	0	0	0
Total	5	0	1	0	8
Lighting:					
Daylight	3	0	1	0	7
Dawn/Dusk	0	0	0	0	0
Dark (Road Lit)	2	0	0	0	1
Dark (Road Unlit)	0	0	0	0	0
Total	5	0	1	0	8
Day of Week:					
Monday through Friday	5	0	1	0	7
Saturday	0	0	0	0	0
Sunday	0	0	0	0	1
Total	5	0	1	0	8
Severity:					
Property Damage Only	4	0	1	0	6
Personal Injury	1	0	0	0	2
Unknown	0	0	0	0	0
Fatality	0	0	0	0	0
Total	5	0	1	0	8

[a]Source: MassDOT Safety Management/Traffic Operations Unit records, 2018 through 2022.
[b]Traffic Control Type: U = unsignalized.
[c]Crash rate per million vehicles entering the intersection.
[d]Statewide/District crash rate.
[e]The intersection crash rate is significant if it is found to exceed the MassDOT crash rate for the MassDOT Highway Division District in which the Project is located (District 4).

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2032, which reflects a seven-year planning horizon consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. Independent of the Project, traffic volumes on the roadway network in the year 2032 under No-Build conditions include all existing traffic and new traffic resulting from background traffic growth. Anticipated Project-generated traffic volumes superimposed upon the 2032 No-Build traffic volumes reflect 2032 Build traffic-volume conditions with the Project.

FUTURE TRAFFIC GROWTH

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

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

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

Specific Development by Others

The Town of Middleton Planning Department and the Town of Danvers Planning and Economic Development Division were contacted in order to determine if there were any projects planned within the study area that would have an impact on future traffic volumes at the study intersections. Based on these consultations, no projects were identified at this time that are expected to result in an increase in traffic within the study area beyond the general background traffic growth rate (discussion follows).

At the time the traffic counts that form the basis of this assessment were completed (June and October 2025), approximately 70,367 sf (30 percent) of the Ferncroft Corporate Center (35 Village Road) was vacant. In order to develop traffic volumes associated with the full occupancy of the office buildings that comprise the Ferncroft Corporate Center, trip rates (per 1,000 sf) were established for the weekday morning and evening peak hours based on existing traffic volumes measured at the driveway that serves 35 Village Road. The trip rates were applied to the vacant office space (70,367 sf) to develop the additional peak-hour traffic volumes that would

be associated with the re-occupancy of the vacant space, which were then added to the roadway network based on a review of existing travel patterns observed at the Village Road/35 Village Road driveway intersection.

General Background Traffic Growth

Traffic-volume data compiled by MassDOT from permanent count stations located in Middleton, Danvers and surrounding towns were reviewed in order to determine general traffic growth trends in the area. This data indicates that traffic volumes have fluctuated over the 10-year period between 2009 and 2019, with an average traffic growth rate of 1.31 percent. In order to provide conservative (high) traffic volumes from which to assess the impact of the Project, a slightly higher 1.5 percent per year compounded annual background traffic growth rate was used to account for future traffic growth and presently unforeseen development within the study area.

Roadway Improvement Projects

MassDOT, the Town of Middleton and the Town of Danvers were contacted in order to determine if there were any planned future roadway improvement projects expected to be completed by 2032 within the study area. Based on these discussions, no roadway improvement projects aside from routine maintenance activities were identified to be planned within the study area at this time.

No-Build Traffic Volumes

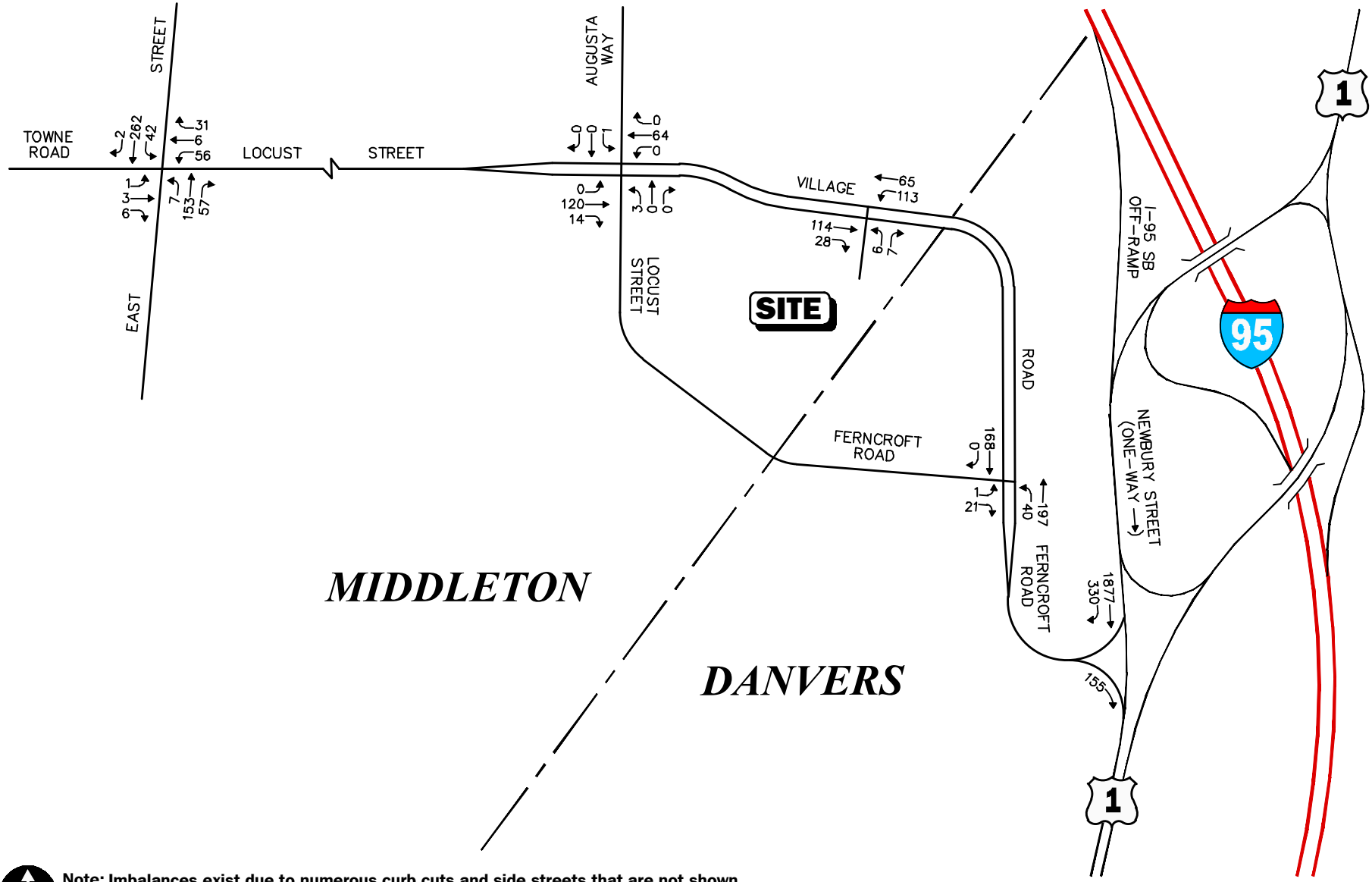
The 2032 No-Build condition peak-hour traffic-volumes were developed by applying the 1.5 percent per year compounded annual background traffic growth rate to the 2025 Existing peak-hour traffic volumes and then adding the peak-hour traffic associated with the full occupancy of the office buildings within the Ferncroft Corporate Center. The resulting 2032 No-Build weekday morning and evening peak-hour traffic volumes are shown on Figures 5 and 6, respectively.

PROJECT-GENERATED TRAFFIC

Design year (2032 Build) traffic volumes for the study area roadways were determined by estimating Project-generated traffic volumes and assigning those volumes on the study roadways. The following sections describe the methodology used to develop the anticipated traffic characteristics of the Project.

As proposed, the Project will entail the construction of a 200-unit multifamily residential development. In order to develop the anticipated traffic characteristics of the Project, trip-generation statistics published by the ITE[8] for a similar land use as that proposed was used. ITE Land Use Code (LUC) 221, *Multifamily Housing (Mid-Rise)*, was used to establish the anticipated traffic characteristics of the Project, the results of which are summarized in Table 5.

[8]Institute of Transportation Engineers; op. cit. 1.



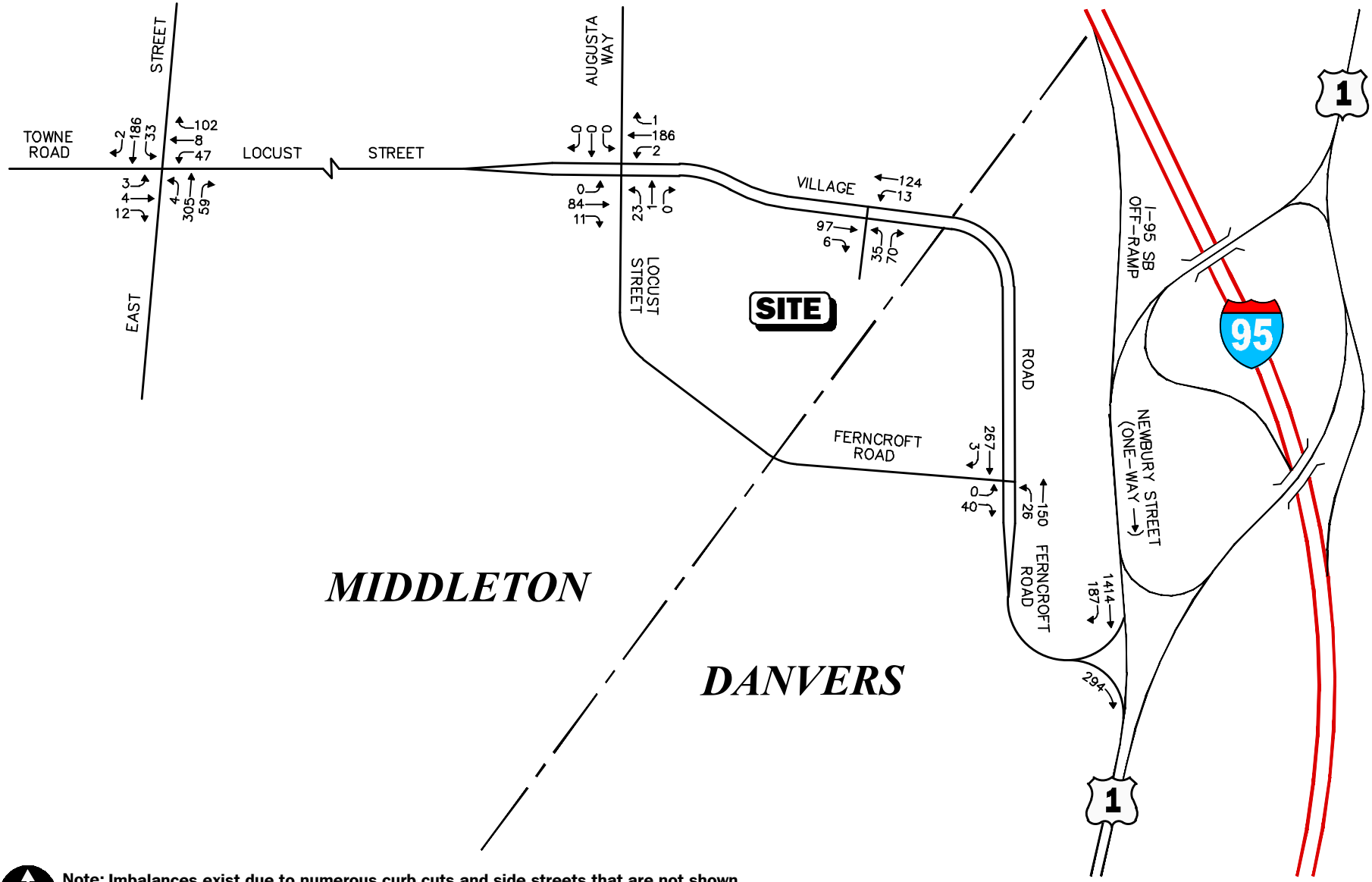
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 5

2032 No-Build
Weekday Morning
Peak-Hour Traffic Volumes

Vanasse & Associates inc



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

Not To Scale

Figure 6

2032 No-Build
Weekday Evening
Peak-Hour Traffic Volumes

Vanasse & Associates inc

Table 5
TRIP-GENERATION SUMMARY

Time Period	Vehicle Trips[a]		
	Entering	Exiting	**Total**
Average Weekday:	446	446	**892**
Weekday Morning Peak-Hour:	18	58	**76**
Weekday Evening Peak-Hour:	48	27	**75**

[a]Based on ITE LUC 221, *Multifamily Housing (Mid-Rise)*; 200 units.

Project-Generated Traffic Volume Summary

As can be seen in Table 5, the Project is expected to generate approximately 892 vehicle trips on an average weekday (two-way, 24-hour volume, or 446 vehicles entering and 446 exiting), with 76 vehicle trips (18 vehicles entering and 58 exiting) expected during the weekday morning peak-hour and 75 vehicle trips (48 vehicles entering and 27 exiting) expected during the weekday evening peak-hour.

TRIP DISTRIBUTION AND ASSIGNMENT

The directional distribution of generated trips to and from the Project site was determined based on a review of current employment location data obtained from the U.S. Census for residents of the Town of Middleton and then refined based on existing traffic patterns within the study area. The general trip distribution for the Project is graphically depicted on Figure 7. Traffic volumes expected to be generated by the Project were assigned onto the study area roadway network during the weekday morning and evening peak hours as shown on Figures 8 and 9, respectively.

FUTURE TRAFFIC VOLUMES – BUILD CONDITION

The 2032 Build condition traffic volumes were developed by adding the additional traffic expected to be generated by the Project to the 2032 No-Build condition traffic volumes. The resulting 2032 Build weekday morning and evening peak-hour traffic volumes are graphically depicted on Figures 10 and 11, respectively.

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

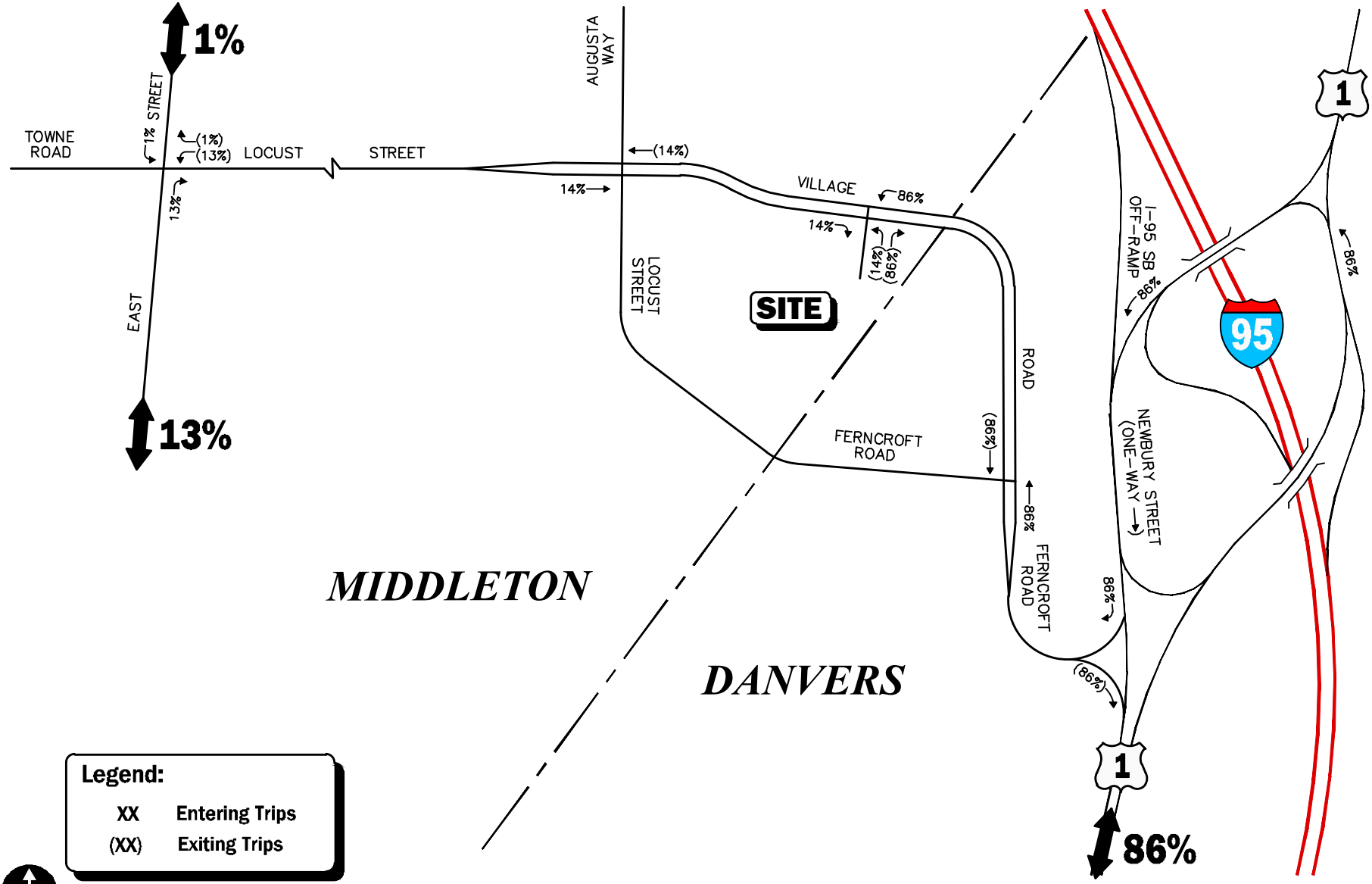


Figure 7

Trip Distribution Map

Vanasse & Associates inc

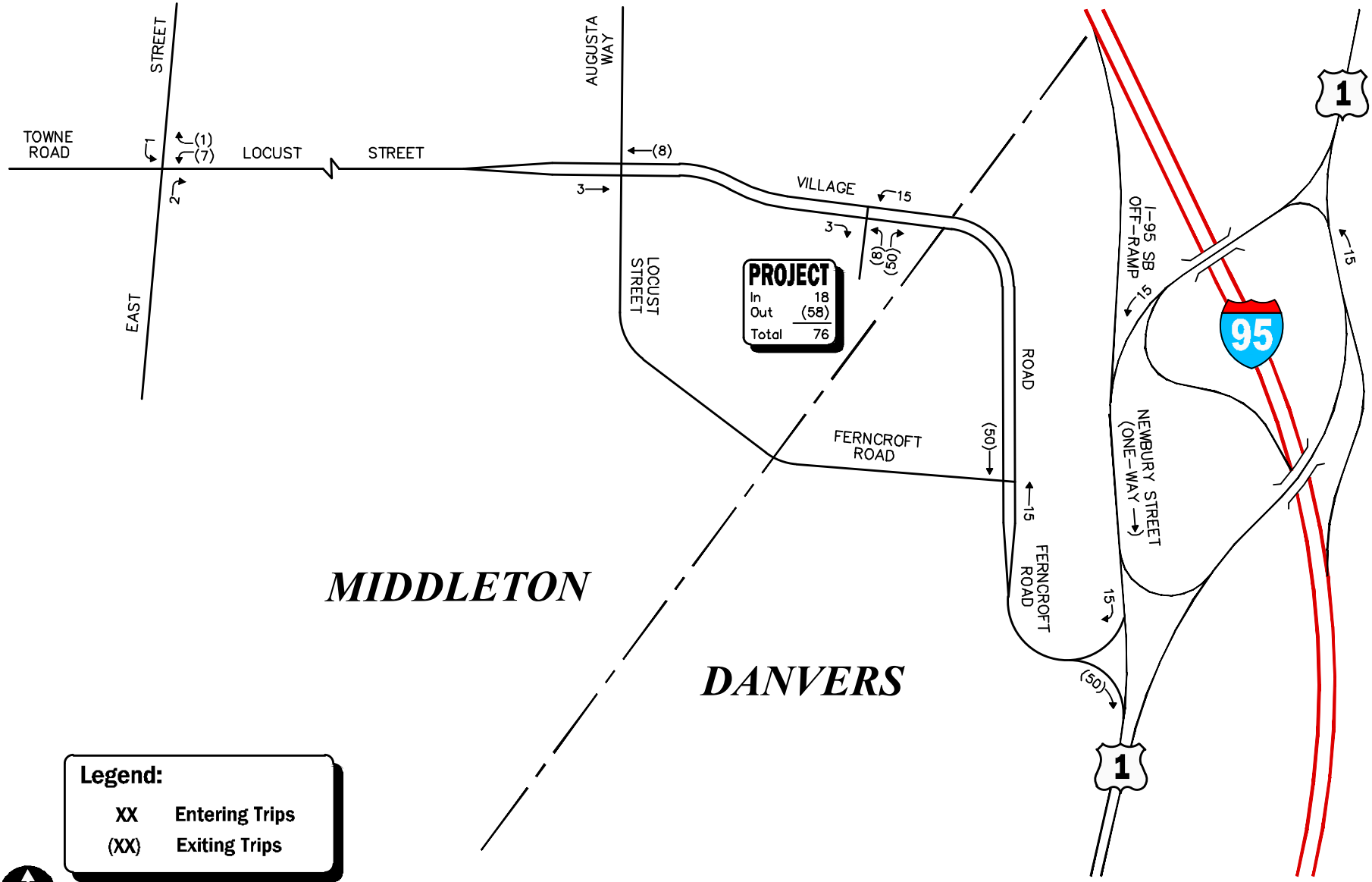


Figure 8

Project-Generated Weekday Morning Peak-Hour Traffic Volumes

Vanasse & Associates inc

R:\10255\Graphics\TIA\December 2025\10255NT2.dwg, 12/16/2025 3:57:23 PM

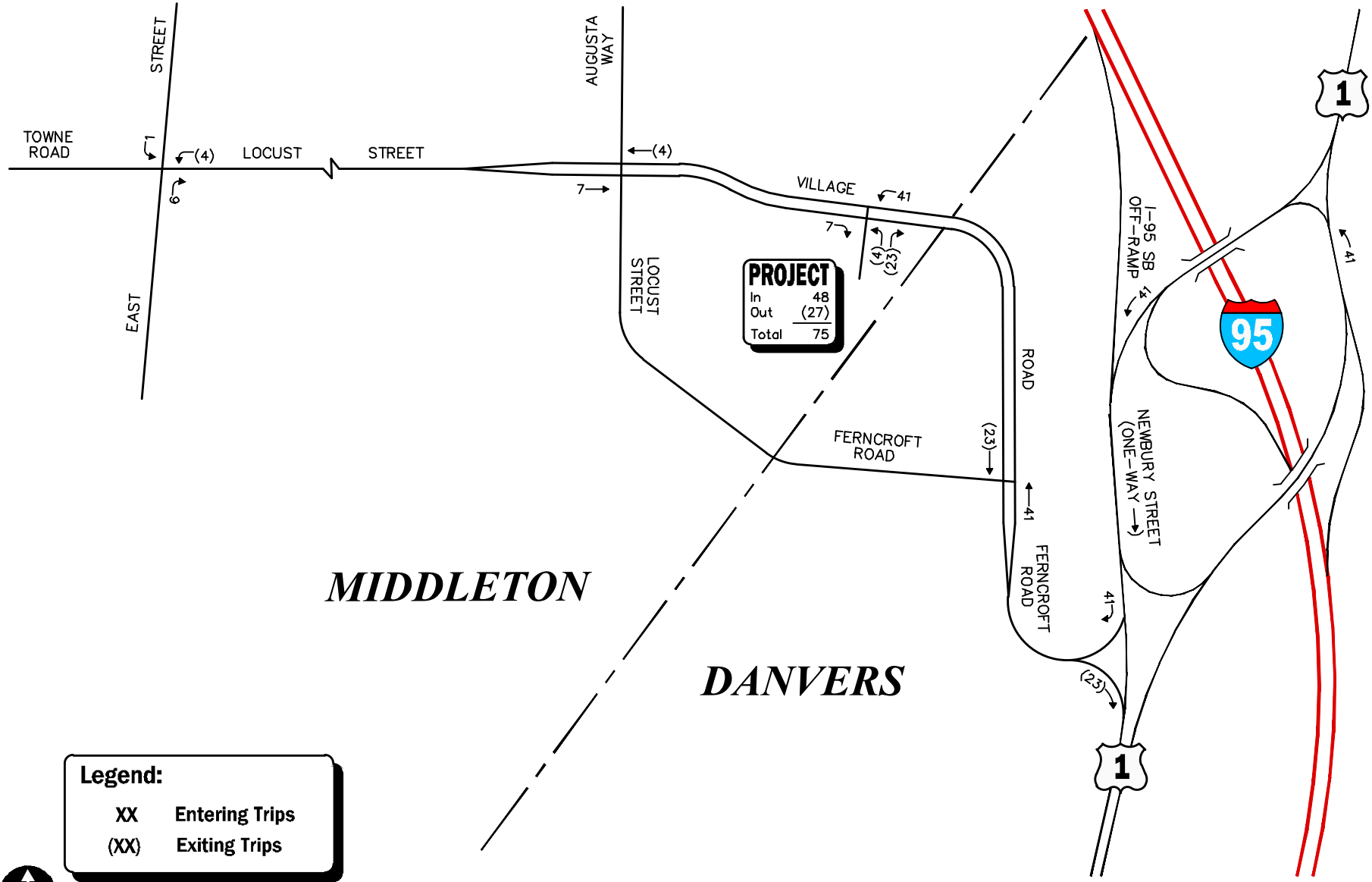
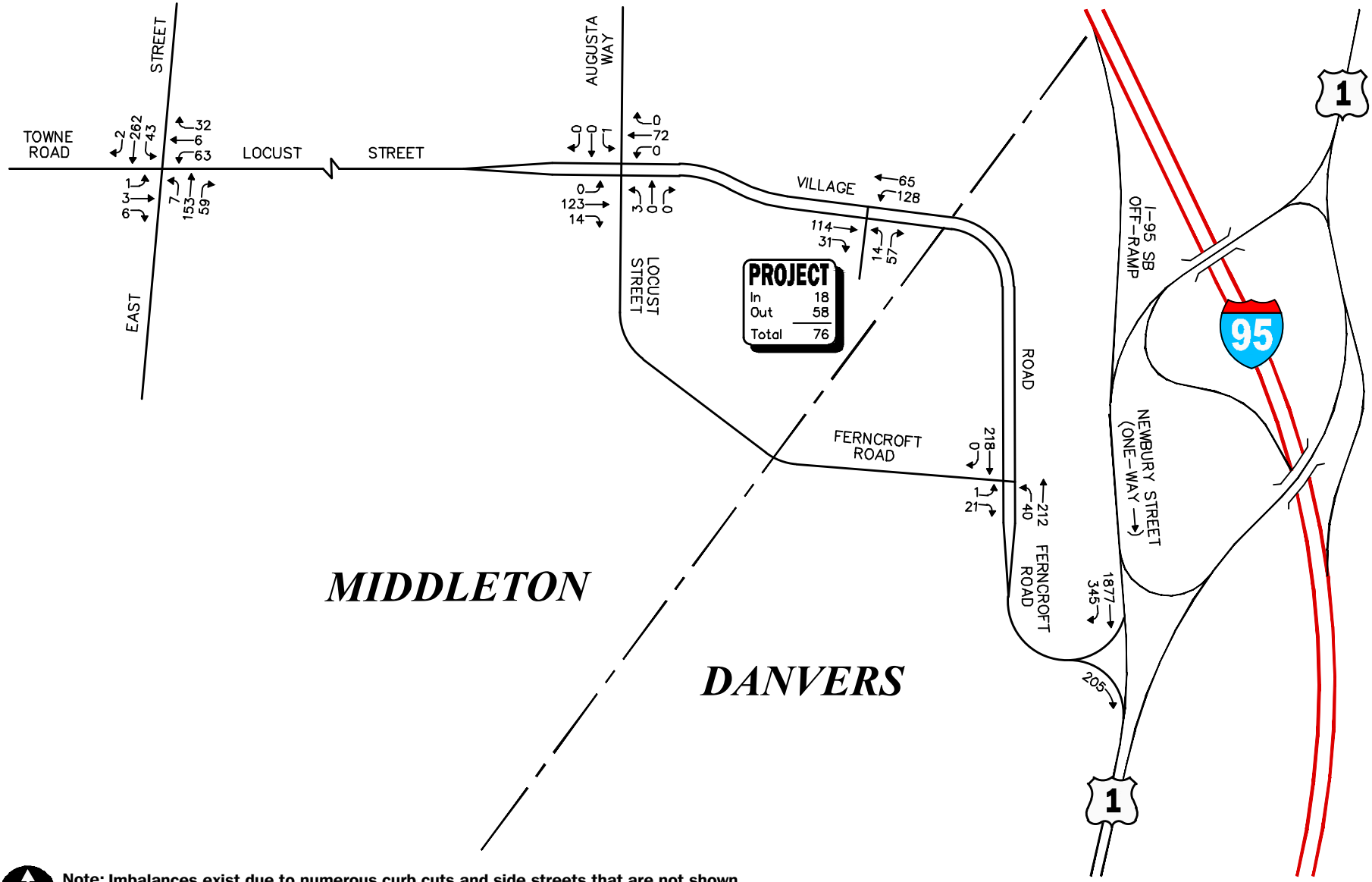


Figure 9

Project-Generated Weekday Evening Peak-Hour Traffic Volumes

Vanasse & Associates inc

R:\10255\Graphics\TIA\December 2025\10255NT2.dwg, 12/16/2025 4:00:46 PM



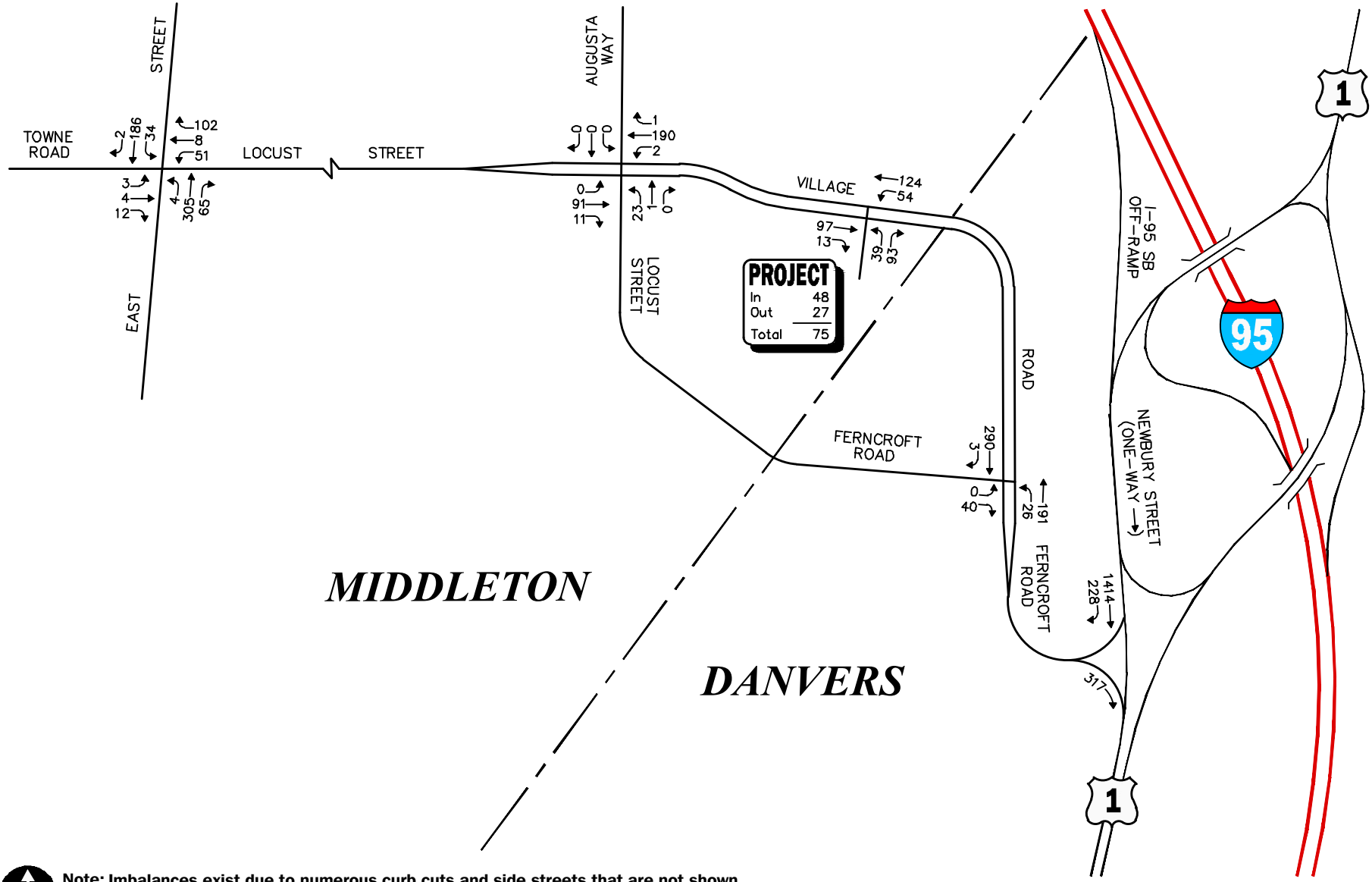
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 10

2032 Build
Weekday Morning
Peak-Hour Traffic Volumes

Vanasse & Associates inc



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

Not To Scale

Figure 11

2032 Build
Weekday Evening
Peak-Hour Traffic Volumes

Vanasse & Associates inc

R:\10255\Graphics\TIA\December 2025\10255NT2.dwg, 12/16/2025 3:24:18 PM

Table 6
PEAK-HOUR TRAFFIC-VOLUME INCREASES

Location/Peak-Hour	2025 Existing	2032 No-Build	2032 Build	Traffic-Volume Increase Over No-Build	Percent Increase Over No-Build
East Street, north of Locust Street:					
Weekday Morning	439	491	493	2	0.4
Weekday Evening	563	631	632	1	0.2
East Street, south of Locust Street:					
Weekday Morning	482	541	550	9	1.7
Weekday Evening	550	613	623	10	1.6
Route 1 Southbound, south of Ferncroft Road:					
Weekday Morning	1,829	2,032	2,082	50	2.5
Weekday Evening	1,520	1,708	1,731	23	1.3

As shown in Table 6, Project-related traffic-volume changes outside of the study area relative to 2032 No-Build conditions are anticipated to range from increases of 0.2 to 2.5 percent during the peak periods, with vehicle increases shown to range from 1 to 50 vehicles. ***When dispersed over the peak-hour, such increases would not be expected to result in a significant impact (increase) on motorist delays or vehicle queuing outside of the immediate study area that is the subject of this assessment.***

TRAFFIC OPERATIONS ANALYSIS

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

METHODOLOGY

Levels of Service

A primary result of capacity analyses is the assignment of level of service to traffic facilities under various traffic-flow conditions.[9] The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

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

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

[9]The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual;* Transportation Research Board; Washington, DC; 2016.

Unsignalized Intersections

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

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

The levels of service of unsignalized intersections are determined by application of a procedure described in the *Highway Capacity Manual 7th Edition.*[10] Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the *Highway Capacity Manual 7th Edition*. Table 7 summarizes the relationship between level of service and average control delay for two-way stop controlled and all-way stop controlled intersections.

Table 7
LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS[a]

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

[a]Source: *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2023.

[10]*Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2023.

Merge/Diverge Analysis

The merge/diverge analysis was completed using the Highway Capacity Software (HCS), which is based on the methodology described in the *Highway Capacity Manual 7th Edition (HCM)*.[11] The main features of the merge and diverge method for freeway ramp capacity estimation are: the volume of traffic on the ramps and freeway; the number of lanes; the length of the acceleration/deceleration lane; free flow speeds; ramp type; ramp location (left or right); terrain type; and the presence of upstream and downstream ramps.

The HCS analytical model calculates a roadway density expressed in passenger cars per mile per lane (pc/mi/ln). The roadway density within the merge/diverge area is correlated to a level-of-service based on the concepts described in the HCM. The density ranges that define levels of service for merge and diverge conditions are shown in Table 8.

Table 8
LEVEL-OF-SERVICE CRITERIA FOR FREEWAY MERGE AND DIVERGE SEGMENTS[a]

Level-Of-Service	Density (pc/mi/ln)
A	≤10.0
B	>10-20
C	>20-28
D	>28-35
E	>35
F	Demand Exceeds Capacity

[a]Source: *Highway Capacity Manual; 7th Edition*; Transportation Research Board, Washington, D.C.; 2023.

Vehicle Queue Analysis

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

[11]Transportation Research Board, op. cit. 9.

ANALYSIS RESULTS

Level-of-service and vehicle queue analyses were conducted for 2025 Existing, 2032 No-Build and 2032 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized in Tables 9 and 10, with the detailed analysis results presented in the Appendix.

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

Unsignalized Intersections (Table 9)

East Street at Locust Street and Towne Road

No change in level of service is predicted to occur for any movement over No-Build conditions, with all movements predicted to continue to operate at LOS C or better during both peak hours and Project-related impacts generally defined as an increase in average motorist delay of less than 1.0 seconds that resulted in a corresponding increase in vehicle queuing of up to one (1) vehicle.

Locust Street at Village Road and Augusta Way

No change in level of service or vehicle queuing is predicted to occur for any movement over No-Build conditions, with all movements predicted to continue to operate at LOS B or better during both peak hours and Project-related impacts generally defined as an increase in average motorist delay of less than 1.0 seconds.

Village Road at 35 Village Road Driveway

All movements at this intersection are predicted to operate at LOS B or better during both peak hours, with the following changes in level-of-service shown as a result of the addition of Project-related traffic: *weekday evening peak-hour* – all movements from the driveway to 35 Village Road changed from LOS A to LOS B (0.5 second increase in average motorist delay). Vehicle queuing at the intersection was shown to increase by up to one (1) vehicle as a result of the addition of Project-related traffic.

Village Road at Ferncroft Road

All movements at this intersection are predicted to operate at LOS B or better during both peak hours, with the following changes in level-of-service shown as a result of the addition of Project-related traffic: *weekday morning peak-hour* – all movements from the Ferncroft Road eastbound approach changed from LOS A to LOS B (0.4 second increase in average motorist delay). No material increase in vehicle queuing is predicted to occur as a result of the addition of Project-related traffic.

Highway Ramp Intersection (Table 10)

Ferncroft Road at Route 1 Southbound Ramps

No change in level-of-service was predicted to occur as a result of the addition of Project-related traffic. All vehicles merging from the Ferncroft Road ramps to Route 1 are predicted to continue to operate at LOS C during the weekday morning peak hour and at LOS B during the weekday evening peak hour with the addition of Project-related traffic.

Table 9
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Unsignalized Intersection/Peak-Hour/Movement	2025 Existing				2032 No-Build				2032 Build			
	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
East Street at Locust Street and Towne Road												
Weekday Morning:												
Towne Road EB LT/TH/RT	9	11.8	B	0	10	12.3	B	0	10	12.3	B	0
Locust Street WB LT/TH/RT	82	14.4	B	1	93	16.3	C	1	101	17.0	C	2
East Street NB LT/TH/RT	191	0.3	A	0	217	0.3	A	0	219	0.3	A	0
East Street SB LT/TH/RT	273	1.0	A	0	306	1.1	A	0	307	1.1	A	0
Weekday Evening:												
Towne Road EB LT/TH/RT	18	11.6	B	0	19	12.1	B	0	19	12.2	B	1
Locust Street WB LT/TH/RT	133	14.2	B	2	157	16.2	C	2	161	16.7	C	2
East Street NB LT/TH/RT	331	0.1	A	0	368	0.1	A	0	374	0.1	A	0
East Street SB LT/TH/RT	199	1.2	A	0	221	1.2	A	0	222	1.3	A	0
Locust Street at Village Road and Augusta Way												
Weekday Morning:												
Locust Street EB LT/TH/RT	114	0.0	A	0	134	0.0	A	0	137	0.0	A	0
Village Road WB LT/TH/RT	56	0.0	A	0	64	0.0	A	0	72	0.0	A	0
Locust Street NB LT/TH/RT	3	9.9	A	0	3	10.1	B	0	3	10.2	B	0
Augusta Way SB LT/TH/RT	1	9.8	A	0	1	10.1	B	0	1	10.2	B	0
Weekday Evening:												
Locust Street EB LT/TH/RT	84	0.0	A	0	95	0.0	A	0	102	0.0	A	0
Village Road WB LT/TH/RT	162	0.1	A	0	189	0.1	A	0	193	0.1	A	0
Locust Street NB LT/TH/RT	22	11.3	B	0	24	11.9	B	0	24	12.0	B	0
Augusta Way SB LT/TH/RT	0	0.0	A	0	0	0.0	A	0	0	0.0	A	0
Village Road at 35 Village Road												
Weekday Morning:												
Village Road EB TH/RT	123	0.0	A	0	142	0.0	A	0	145	0.0	A	0
Village Road WB LT/TH	138	4.4	A	0	178	4.9	A	1	193	5.2	A	1
35 Village Road NB LT/RT	9	10.0	A	0	13	10.7	B	0	71	11.2	B	1
Weekday Evening:												
Village Road EB TH/RT	91	0.0	A	0	103	0.0	A	0	110	0.0	A	0
Village Road WB LT/TH	121	0.6	A	0	137	0.7	A	0	178	2.4	A	0
35 Village Road NB LT/RT	74	9.6	A	1	105	10.0	A	1	132	10.5	B	1

See notes at end of Table.

Table 9 (Continued)
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Unsignalized Intersection/Peak-Hour/Movement	2025 Existing				2032 No-Build				2032 Build			
	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
Village Road at Ferncroft Road												
Weekday Morning:												
Ferncroft Road EB LT/RT	20	9.5	A	0	22	9.7	A	0	22	10.1	B	0
Ferncroft Road NB LT	36	7.7	A	0	40	7.7	A	0	40	7.9	A	0
Ferncroft Road NB TH	147	0.0	A	0	197	0.0	A	0	212	0.0	A	0
Village Road SB TH/RT	150	0.0	A	0	168	0.0	A	0	218	0.0	A	0
Weekday Evening:												
Ferncroft Road EB LT/RT	36	10.5	B	0	40	11.1	B	1	40	11.4	B	1
Ferncroft Road NB LT	23	8.0	A	0	26	8.2	A	0	26	8.3	A	0
Ferncroft Road NB TH	132	0.0	A	0	150	0.0	A	0	191	0.0	A	0
Village Road SB TH/RT	225	0.0	A	0	270	0.0	A	0	293	0.0	A	0

[a]Demand in vehicles per hour.
[b]Average control delay per vehicle (in seconds).
[c]Level of service.
[d]Queue length in vehicles.
NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

Table 10
MERGE AND DIVERGE CAPACITY ANALYSIS SUMMARY

	2025 Existing			2032 No-Build			2032 Build		
Intersection/Critical Movement/Peak Hour	V/C[a]	Density[b]	LOS[c]	V/C	Density	LOS	V/C	Density	LOS
Ferncroft Road at the Route 1 SB On-Ramp									
Weekday Morning:	0.09	22.3	C	0.10	24.8	C	0.13	37.0	C
Weekday Evening:	0.18	17.6	B	0.22	19.5	B	0.24	28.6	B

[a]Volume to capacity ratio.
[b]Average vehicle density in passenger cars per lane per mile.
[c]Level of service.

PARKING ANALYSIS

In order to assess the adequacy of the available parking supply to accommodate the parking demands of the Project and the existing office buildings located at 35 Village Road (Ferncroft Corporate Center), a parking demand analysis was performed using parking demand data published by the ITE for similar land uses.[12] For context, after the construction of the Project there will be 986 parking spaces to accommodate the parking demands of the existing office buildings and the proposed residential buildings.[13] Table 11 summarizes the land use and size of the uses that will be contained within the Project site after the construction of the Project, the 85th percentile ITE peak parking demand ratio for the specific use and the corresponding peak parking demand.[14]

Table 11
ITE WEEKDAY PEAK PARKING DEMAND RATIOS

Land Use	85th Percentile Peak Parking Demand Ratio[a]	Peak Parking Demand (No. of Parking Spaces Occupied)
Residential (200 Units)[b]	1.45	**290**
Office (234,556 sf)[c]	2.98	**699**

[a]ITE peak parking demand ratios are per 1,000 sf or per unit as appropriate.
[b]ITE LUC 221, *Multifamily Housing (Mid-Rise)*.
[c]ITE LUC 710, *General Office Building.*

[12]Institute of Transportation Engineers; op. cit. 2.

[13]767 parking spaces are provided within the existing parking garage; 41 parking spaces are provided underneath the office building; 131 parking spaces will be provided in surface lots; 47 parking spaces will be provided underneath Building "B"; or a total of 986 parking spaces.

[14]At the time the parking assessment was completed, approximately 70,367 sf (30%) of the Ferncroft Corporate Center (35 Village Road) was vacant. In order to develop parking volumes associated with the full (or 100%) occupancy of the office buildings that comprise the Ferncroft Corporate Center, the peak parking demand ratios below were applied as if the Ferncroft Corporate Center was 100% occupied although, based upon information provided by onsite property management of the Ferncroft Corporate Center, observed occupancy of the existing parking areas at peak demand for the office building was less than 20%.

The peak parking demand for the office building and residential development were then distributed over a 24-hour period using parking demand distribution data available from the ITE. Table 12 summarizes the 85th percentile composite hourly parking demand of the office and residential development based on the peak parking demand identified in Table 11, with the detailed parking demand calculations for each use provided in the Appendix.

Table 12
35 VILLAGE ROAD COMPOSITE HOURLY
85th PERCENTILE PARKING DEMAND

Hour	(A) Residential	(B) Office	(A+B) Total
12:00 – 4:00 AM	290	0	**290**
5:00 – 6:00 AM	279	0	**279**
6:00 – 7:00 AM	250	0	**250**
7:00 – 8:00 AM	224	91	**315**
8:00 – 9:00 AM	192	329	**521**
9:00 – 10:00 AM	174	609	**783**
10:00 – 11:00 AM	166	693	**859**
11:00 AM – 12:00 PM	160	699	**859**
12:00 – 1:00 PM	151	602	**753**
1:00 – 2:00 PM	145	588	**733**
2:00 – 3:00 PM	151	651	**802**
3:00 – 4:00 PM	148	651	**799**
4:00 – 5:00 PM	166	595	**761**
5:00 – 6:00 PM	180	399	**579**
6:00 – 7:00 PM	189	147	**336**
7:00 – 8:00 PM	198	0	**198**
8:00 – 9:00 PM	218	0	**218**
9:00 – 10:00 PM	238	0	**238**
10:00 – 11:00 PM	253	0	**253**
11:00 PM – 12:00 AM	264	0	**264**

As can be seen in Table 12, the peak parking demand for the residential development occurs between 12:00 and 4:00 AM, with a peak parking demand of 290 parking spaces, and the peak parking demand for the office building occurs between 11:00 AM and 12:00 PM, with a peak parking demand of 699 parking spaces. The composite peak parking demand for the Project site after the construction of the Project is predicted to occur between 10:00 AM and 12:00 PM, with a combined peak parking demand of 859 parking spaces. Accordingly, and given that the Project site will be served by 986 parking spaces after the construction of the Project, this analysis has determined that ***sufficient parking will be provided within the Project site to accommodate the predicted peak parking demands of the existing office buildings and proposed residential use after the construction of the Project.***

SIGHT DISTANCE EVALUATION

Sight distance measurements were performed at the driveway that will serve the Project site along Village Road (the driveway to 35 Village Road) in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)[15] requirements. Stopping sight distance (SSD) and intersection sight distance (ISD) measurements were performed. In brief, SSD is the distance required by a vehicle traveling at the design speed of a roadway, on wet pavement, to stop prior to striking an object in its travel path. ISD or corner sight distance (CSD) is the sight distance required by a driver entering or crossing an intersecting roadway to perceive an on-coming vehicle and safely complete a turning or crossing maneuver with on-coming traffic. In accordance with AASHTO standards, if the measured ISD is at least equal to the required SSD value for the appropriate design speed, the intersection can operate in a safe manner. Table 13 presents the measured SSD and ISD at the subject intersection.

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

Table 13
SIGHT DISTANCE MEASUREMENTS[a]

Intersection/Sight Distance Measurement	Feet		
	Required Minimum (SSD)	Desirable (ISD)[b]	Measured
Village Road at 35 Village Road			
Stopping Sight Distance:			
Village Road approaching from the east	305	--	422
Village Road approaching from the west	250	--	412
Intersection Sight Distance:			
Looking to the east from 35 Village Road	305	490[c]	424
Looking to the west from 35 Village Road	250	335	454

[a]Recommended minimum values obtained from *A Policy on Geometric Design of Highways and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018; and based on a 30 mph approach speed along Locust Street; a 35 mph approach speed along Village Road in the eastbound direction and 40 mph westbound.

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

[c]The gap time for the intersection sight distance value was adjusted to 8.25 seconds for left-turn movements to account for the longer gap time required for crossing a median-separated roadway (Village Road).

As can be seen in Table 13, the available lines of sight at the driveway that will serve the Project site along Village Road exceed the recommended distances to function in a safe manner (SSD) based on the appropriate approach speeds.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

VAI has completed a detailed assessment of the potential impacts on the transportation infrastructure associated with the proposed construction of a multifamily residential development to be known as Ferncroft Apartments and located at 35 Village Road in Middleton, Massachusetts. The following specific areas have been evaluated as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; under existing and future conditions, both with and without the Project. Based on this assessment, we have concluded the following with respect to the Project:

1. Using trip-generation statistics published by the ITE,[16] the Project is expected to generate approximately 892 vehicle trips on an average weekday (two-way, 24-hour volume), with 76 vehicle trips expected during the weekday morning peak-hour and 75 vehicle trips expected during the weekday evening peak-hour;

2. The Project will not result in a significant impact (increase) on motorist delays or vehicle queuing over anticipated future conditions without the Project (No-Build conditions), with all movements at the study area intersections shown to continue to operate at a LOS of C or better, where an LOS "D" or better is generally defined as "acceptable" traffic operations, and Project-related impacts generally defined as an increase in average motorist delay of up to 1.7 seconds that resulted in a corresponding increase in vehicle queuing of up to one (1) vehicle;

3. All movements exiting the driveway that serves 35 Village Road and that will serve the Project are predicted to operate at LOS B during the peak hours with residual vehicle queuing of up to one (1) vehicle, which can be contained along the driveway without inhibiting access, or the movement of vehicles, pedestrians or bicyclists along Village Road. All movements along Village Road approaching the driveway are predicted to operate at LOS A with residual vehicle queuing of up to one (1) vehicle;

4. No apparent safety deficiencies were noted with respect to the motor vehicle crash history at the study area intersections;

[16]Institute of Transportation Engineers, op. cit. 1.

5. Based on a review of parking demand data published by the ITE[17] for the Project and the existing office buildings, it was determined that the proposed parking supply that will be available after the construction of the Project is sufficient to accommodate the anticipated peak parking demand of the existing and proposed uses at 35 Village Road; and

6. Lines of sight to and from the Project site driveway intersection with Village Road exceed the recommended minimum distances to function in a safe manner based on the appropriate approach speeds.

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

RECOMMENDATIONS

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

Project Access

Access to the Project site will be provided by way of the existing driveway that serves the office buildings at 35 Village Road and intersects the south side of Village Road. Secondary access for emergency vehicles will be provided by way of a new driveway that will intersect the north side of Locust Street approximately 220 feet north of Nichols Lane that will be designed and constructed in a manner so as to restrict use by non-emergency vehicles. The following recommendations are offered with respect to the design and operation of the Project site access, internal circulation and parking:

- The existing driveway that serves 35 Village Road and that will also serve the Project should be retained as a two-way driveway with one entering and one exiting travel lane that are separated by a raised median approaching Village Road. The driveway will continue to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle. Upon entering the Project site, the existing parking lot to the east of the parking garage that serves the existing office buildings at 35 Village Road will be reconstructed to provide a 22-foot wide, two-way drive with parallel parking that will continue to provide access to the parking garage and will extend to the north to serve the Project.

- The secondary emergency vehicle access drive should be a minimum of 20-feet in width and designed and constructed in a manner that supports travel by the largest anticipated responding emergency vehicle under all weather conditions and that restricts access by non-emergency vehicles.

[17]Institute of Transportation Engineers; op. cit. 2.

- Where perpendicular parking is proposed, the drive aisle behind the parking should be a minimum of 23 feet wide in order to facilitate parking maneuvers.

- Vehicles exiting the Project site to Village Road will be placed under STOP-sign control with marked STOP-lines provided.

- All signs and pavement markings to be installed within the Project site should conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).[18]

- Sidewalks should be provided within the Project site to connect the proposed residential buildings to the parking spaces that will serve the Project and the existing parking garage, and should extend to Locust Street where a crosswalk with Americans with Disabilities Act (ADA)-compliant wheelchair ramps and a pedestrian actuated Rectangular Rapid Flashing beacon (RRFB) should be provided for crossing Locust Street.

- Marked crosswalks and ADA-compliant wheelchair ramps will be provided at all pedestrian crossings to be constructed or modified as a part of the Project.

- Signs and landscaping located within sight triangle areas should be designed and maintained so as not to restrict lines of sight.

- Snow accumulations (windrows) within sight triangle areas should be promptly removed where such accumulations would impede sightlines.

Off-Site

Village Road at Locust Street and Augusta Way

Independent of the Project, it is recommended that a STOP-sign and marked STOP-line be installed on the Locust Street approach to Village Road.

Transportation Demand Management

Regularly scheduled public transportation services are not currently provided within the Town of Middleton or in the immediate vicinity of the Project site. The MBTA does provide The RIDE paratransit services to eligible persons in the Town who cannot use fixed-route transit (bus, subway, trolley) due to a physical, cognitive, or mental disability in compliance with the Americans with Disabilities Act (ADA). In addition, the Town of Middleton Council on Aging (COA) provides transportation services to eligible seniors for errands and medical appointments by appointment.

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

- A Transportation Coordinator (TC), who may have other duties and responsibilities, should be assigned for the Project to coordinate the TDM program;

[18]Federal Highway Administration, op. cit. 3.

- The TC should facilitate a rideshare matching program for residents to encourage carpooling;
- A "welcome packet" should be provided to new residents that will include the contact information for the TC and detailing available public transportation services, bicycle and walking alternatives, and other commuter options;
- Short-term parking spaces should be located proximate to the residential building entrances for use by ride-hailing and delivery service providers;
- Consideration should be given to providing electric vehicle (EV) charging stations for use by residents and guests;
- A central mailroom and package delivery station should be provided within both buildings;
- Pedestrian accommodations should be incorporated within the Project site and should extend to Locust Street to encourage walking; and
- Secure bicycle parking should be provided to include weather protected bicycle parking for residents and exterior bicycle parking located proximate to the building entrances.

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

APPENDIX

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

PROJECT SITE PLAN

PARKING SUMMARY			
PARKING TYPE	GARAGE SPACES	SURFACE SPACES	ACCESSIBLE SPACES
EXISTING GARAGE	767	--	12
UNDER EXISTING OFFICE BUILDING	41	--	--
UNDER BUILDING B	47	--	2
SURFACE SPACES	--	131	9
TOTALS	855	131	23
OVERALL TOTAL	986		

NOTES:

1) REFER TO "TRANSPORTATION IMPACT ANALYSIS - PROPOSED MULTIFAMILY RESIDENTIAL DEVELOPMENT, FERNCROFT APARTMENTS, 35 VILLAGE ROAD, MIDDLETON, MASSACHUSETTS" PREPARED BY VAI DATED DECEMBER 2025 FOR PARKING ANALYSIS AND COMPLIANCE.

MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD83)

LOCUST STREET
(PUBLIC - VARIABLE WIDTH ROW)
TWO WAY TRAFFIC (ASPHALT ROADWAY)

LEGEND

- PROPOSED BITUMINOUS CONCRETE PAVEMENT, TYP.
- PROPOSED CONCRETE SIDEWALK, TYP.
- PROPOSED RIPRAP SURFACE TYP.

SCALE: 1"=40'

Project:
FERNCROFT APARTMENTS
RESIDENTIAL COMMUNITY
35 VILLAGE ROAD
MIDDLETON, MA 01949

Weston & Sampson Engineers, Inc.
<<Select Regional Office>>
978.532.1900 800.SAMPSON
www.westonandsampson.com

Consultants:

Revisions:

No.	Date	Description

COA:

Seal:

Issued For:
PEL SUBMISSION DRAFT
(NOT FOR CONSTRUCTION)

Scale:

Date:	12/19/2025
Drawn By:	XXX
Reviewed By:	XXX
Approved By:	XXX
W&S Project No.:	ENG25-0131
W&S File No.:	

Drawing Title:
LAYOUT AND MATERIAL PLAN

Sheet Number:
C110

P:\Private Sewergr Partners\ENG25-0131 Map Road 3\06-drafts\C2D\C1xb-Survey_XREF\Sheet\C110-Layout and Materials.dwg

LEGEND

- PROPOSED BITUMINOUS CONCRETE PAVEMENT, TYP.
- PROPOSED CONCRETE SIDEWALK, TYP.
- PROPOSED RIPRAP SURFACE TYP.

REBAR w/ CAP FOUND (MERIDIAN ENGINEERING)

R=640.00'
Δ =028°31'50"
L=318.69'
CHB=S50° 46' 07"E
CHD=315.41'

S36°30'12"E
346.58'

16" WATER

16" OLD WATER

PROPOSED BITUMINOUS CONCRETE PAVEMENT (TYP.)

PROPOSED CONCRETE SIDEWALK (TYP.)

PROPOSED CONCRETE SIDEWALK (TYP.)

PROPOSED BITUMINOUS CONCRETE PAVEMENT (TYP.)

PROPOSED BITUMINOUS CONCRETE PAVEMENT (TYP.)

PROPOSED CONCRETE SIDEWALK (TYP.)

PROPOSED RIRAP SURFACE (TYP.)

MAP 21 LOT 5

TBM-B

TBM-A

FFE=150.75

FFE=162.75

FFE=174.75

FFE=152.0

GFE=126.0

GFE=140.0

GFE=40.0

(4) spaces

(11) spaces

40.0'

22.0'

23.0'

APPROX. UNDERGROUND LIGHTING ELECTRIC

EDGE OF WOODS

WOODED

GRAVEL

ASPHALT PAVEMENT

CONC WALL

PARAPET WALL

CONC SWALE

YELLOW STRIPING

STONE WALL

PARKING GARAGE

12" PVC

"SPEED LIMIT 5"

"STOP"

40 20 0 40 80
SCALE: 1"=40'

P:\Private Drawings\Farnsworth\25x0131 - Kings Row\300-Wetl\Civil\05-cad\Survey_XREF\Sheet\C130-Layout and Materials.dwg

Project:
FERNCROFT APARTMENTS
RESIDENTIAL COMMUNITY
35 VILLAGE ROAD
MIDDLETON, MA 01949

TOWN OF MIDDLETON, MASSACHUSETTS FOUNDED IN 1728

Weston & Sampson
Weston & Sampson Engineers, Inc.
<<Select Regional Office>>
978.532.1900 800.SAMPSON
www.westonandsampson.com

Consultants:

Revisions:

No.	Date	Description

COA:

Seal:

Issued For:
PEL SUBMISSION DRAFT
(NOT FOR CONSTRUCTION)

Scale:

Date:	12/19/2025
Drawn By:	XXX
Reviewed By:	XXX
Approved By:	XXX
W&S Project No.:	ENG25-0131
W&S File No.:	

Drawing Title:
LAYOUT AND MATERIAL PLAN

Sheet Number:
C111

AUTOMATIC TRAFFIC RECORDER COUNT DATA

June 2025
October 2025

June 2025

Accurate Counts
978-664-2565

Location : Village Road EB
Location : East of 35 Village Road
City/State: Middleton, MA

Site Code: 102551EB

Time	6/17/2025 Tuesday	Morning	EB, Afternoon	Hour Totals Morning	Afternon
12:00		0	37		
12:15		2	36		
12:30		1	22		
12:45		0	34	3	129
1:00		0	31		
1:15		0	23		
1:30		2	31		
1:45		0	22	2	107
2:00		0	19		
2:15		1	21		
2:30		0	27		
2:45		1	35	2	102
3:00		0	14		
3:15		0	30		
3:30		0	30		
3:45		0	26	0	100
4:00		1	34		
4:15		4	31		
4:30		1	34		
4:45		3	37	9	136
5:00		3	35		
5:15		4	25		
5:30		6	24		
5:45		13	18	26	102
6:00		7	9		
6:15		12	8		
6:30		8	17		
6:45		11	16	38	50
7:00		19	15		
7:15		17	16		
7:30		16	9		
7:45		21	6	73	46
8:00		28	9		
8:15		27	4		
8:30		30	7		
8:45		26	9	111	29
9:00		21	6		
9:15		33	10		
9:30		20	7		
9:45		23	0	97	23
10:00		26	5		
10:15		20	1		
10:30		19	3		
10:45		21	1	86	10
11:00		17	2		
11:15		25	2		
11:30		27	0		
11:45		22	2	91	6
Total		538	840		
Percent		39.0%	61.0%		

Accurate Counts
978-664-2565

Location : Village Road EB
Location : East of 35 Village Road
City/State: Middleton, MA

Site Code: 102551EB

Time	6/18/2025 Wednesday	Morning	EB, Afternoon	Hour Totals Morning	Afternon
12:00		1	38		
12:15		0	45		
12:30		3	32		
12:45		0	24	4	139
1:00		0	28		
1:15		1	24		
1:30		0	35		
1:45		0	42	1	129
2:00		0	24		
2:15		1	19		
2:30		1	29		
2:45		0	26	2	98
3:00		0	20		
3:15		0	23		
3:30		2	25		
3:45		0	30	2	98
4:00		1	47		
4:15		3	38		
4:30		1	34		
4:45		2	38	7	157
5:00		6	35		
5:15		3	29		
5:30		5	25		
5:45		7	28	21	117
6:00		8	27		
6:15		15	22		
6:30		13	6		
6:45		13	14	49	69
7:00		20	22		
7:15		2	13		
7:30		16	13		
7:45		27	14	65	62
8:00		22	25		
8:15		25	12		
8:30		26	11		
8:45		23	11	96	59
9:00		17	10		
9:15		33	14		
9:30		27	7		
9:45		29	11	106	42
10:00		20	6		
10:15		25	5		
10:30		19	9		
10:45		39	4	103	24
11:00		26	1		
11:15		16	0		
11:30		24	4		
11:45		21	0	87	5
Total		543	999		
Percent		35.2%	64.8%		
Grand Total		1081	1839		
Percent		37.0%	63.0%		
ADT		ADT: 1,460		AADT: 1,460	

Accurate Counts
978-664-2565

Location : Village Road EB
Location : East of 35 Village Road
City/State: Middleton, MA

Site Code: 102551EB

6/16/2025	6/16/25	6/17/25	6/18/2025	6/19/2025	6/20/2025	6/21/2025	6/22/2025	Average	
Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon - Fri	Mon - Sun
12:00 AM	*	3	4	*	*	*	*	4	4
1:00	*	2	1	*	*	*	*	2	2
2:00	*	2	2	*	*	*	*	2	2
3:00	*	0	2	*	*	*	*	1	1
4:00	*	9	7	*	*	*	*	8	8
5:00	*	26	21	*	*	*	*	24	24
6:00	*	38	49	*	*	*	*	44	44
7:00	*	73	65	*	*	*	*	69	69
8:00	*	111	96	*	*	*	*	104	104
9:00	*	97	106	*	*	*	*	102	102
10:00	*	86	103	*	*	*	*	94	94
11:00	*	91	87	*	*	*	*	89	89
12:00 PM	*	129	139	*	*	*	*	134	134
1:00	*	107	129	*	*	*	*	118	118
2:00	*	102	98	*	*	*	*	100	100
3:00	*	100	98	*	*	*	*	99	99
4:00	*	136	157	*	*	*	*	146	146
5:00	*	102	117	*	*	*	*	110	110
6:00	*	50	69	*	*	*	*	60	60
7:00	*	46	62	*	*	*	*	54	54
8:00	*	29	59	*	*	*	*	44	44
9:00	*	23	42	*	*	*	*	32	32
10:00	*	10	24	*	*	*	*	17	17
11:00	*	6	5	*	*	*	*	6	6
Total	0	1378	1542	0	0	0	0	1463	1463
Percent	0.0%	47.2%	52.8%	0.0%	0.0%	0.0%	0.0%		
AM Peak		8:00	9:00					8:00	8:00
Volume		111	106					104	104
PM Peak		4:00	4:00					4:00	4:00
Volume		136	157					146	146

Accurate Counts
978-664-2565

Location : Village Road WB
Location : East of 35 Village Road
City/State: Middleton, MA

Site Code: 102551WB

Time	6/17/2025 Tuesday	WB, Morning	Afternoon	Hour Totals Morning	Afternon
12:00		1	29		
12:15		2	20		
12:30		1	24		
12:45		0	25	4	98
1:00		2	23		
1:15		1	22		
1:30		0	27		
1:45		1	26	4	98
2:00		0	24		
2:15		1	29		
2:30		0	27		
2:45		0	28	1	108
3:00		1	22		
3:15		0	26		
3:30		1	31		
3:45		2	21	4	100
4:00		2	31		
4:15		1	28		
4:30		0	29		
4:45		1	29	4	117
5:00		0	26		
5:15		0	22		
5:30		2	21		
5:45		12	19	14	88
6:00		2	20		
6:15		4	10		
6:30		9	16		
6:45		12	16	27	62
7:00		14	19		
7:15		14	15		
7:30		25	13		
7:45		33	13	86	60
8:00		35	13		
8:15		30	13		
8:30		40	13		
8:45		27	10	132	49
9:00		20	12		
9:15		22	3		
9:30		23	10		
9:45		19	12	84	37
10:00		26	2		
10:15		30	3		
10:30		28	1		
10:45		32	1	116	7
11:00		26	1		
11:15		17	1		
11:30		20	8		
11:45		19	0	82	10
Total		558	834		
Percent		40.1%	59.9%		

Accurate Counts
978-664-2565

Location : Village Road WB
Location : East of 35 Village Road
City/State: Middleton, MA

Site Code: 102551WB

Time	6/18/2025 Wednesday	WB, Morning	Afternoon	Hour Totals Morning	Afternon
12:00		0	26		
12:15		2	32		
12:30		3	23		
12:45		0	33	5	114
1:00		1	27		
1:15		2	19		
1:30		0	30		
1:45		0	27	3	103
2:00		0	28		
2:15		1	29		
2:30		0	20		
2:45		1	23	2	100
3:00		0	23		
3:15		0	28		
3:30		0	23		
3:45		0	31	0	105
4:00		1	30		
4:15		0	37		
4:30		0	29		
4:45		1	41	2	137
5:00		0	26		
5:15		1	31		
5:30		0	26		
5:45		14	21	15	104
6:00		5	28		
6:15		3	20		
6:30		8	20		
6:45		11	17	27	85
7:00		16	16		
7:15		17	21		
7:30		23	13		
7:45		19	10	75	60
8:00		32	11		
8:15		28	12		
8:30		42	25		
8:45		35	15	137	63
9:00		39	15		
9:15		22	13		
9:30		28	8		
9:45		26	11	115	47
10:00		18	2		
10:15		28	8		
10:30		20	5		
10:45		20	5	86	20
11:00		23	4		
11:15		32	6		
11:30		32	6		
11:45		28	4	115	20
Total		582	958		
Percent		37.8%	62.2%		
Grand Total		1140	1792		
Percent		38.9%	61.1%		
ADT		ADT: 1,466		AADT: 1,466	

Accurate Counts
978-664-2565

Location : Village Road WB
Location : East of 35 Village Road
City/State: Middleton, MA

Site Code: 102551WB

6/16/2025	6/16/25	6/17/25	6/18/2025	6/19/2025	6/20/2025	6/21/2025	6/22/2025	Average	
Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon - Fri	Mon - Sun
12:00 AM	*	4	5	*	*	*	*	4	4
1:00	*	4	3	*	*	*	*	4	4
2:00	*	1	2	*	*	*	*	2	2
3:00	*	4	0	*	*	*	*	2	2
4:00	*	4	2	*	*	*	*	3	3
5:00	*	14	15	*	*	*	*	14	14
6:00	*	27	27	*	*	*	*	27	27
7:00	*	86	75	*	*	*	*	80	80
8:00	*	132	137	*	*	*	*	134	134
9:00	*	84	115	*	*	*	*	100	100
10:00	*	116	86	*	*	*	*	101	101
11:00	*	82	115	*	*	*	*	98	98
12:00 PM	*	98	114	*	*	*	*	106	106
1:00	*	98	103	*	*	*	*	100	100
2:00	*	108	100	*	*	*	*	104	104
3:00	*	100	105	*	*	*	*	102	102
4:00	*	117	137	*	*	*	*	127	127
5:00	*	88	104	*	*	*	*	96	96
6:00	*	62	85	*	*	*	*	74	74
7:00	*	60	60	*	*	*	*	60	60
8:00	*	49	63	*	*	*	*	56	56
9:00	*	37	47	*	*	*	*	42	42
10:00	*	7	20	*	*	*	*	14	14
11:00	*	10	20	*	*	*	*	15	15
Total	0	1392	1540	0	0	0	0	1465	1465
Percent	0.0%	47.5%	52.5%	0.0%	0.0%	0.0%	0.0%		
AM Peak		8:00	8:00					8:00	8:00
Volume		132	137					134	134
PM Peak		4:00	4:00					4:00	4:00
Volume		117	137					127	127

October 2025

Accurate Counts
978-664-2565

Location : Locust Street
Location : North of Nichols Lane
City/State: Middleton, MA

Site Code: 10255001

10/8/2025	SB,		Hour Totals		NB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	2			0	2				
12:15	0	1			0	0				
12:30	0	2			0	2				
12:45	0	0	0	5	0	0	0	4	0	9
1:00	0	2			0	1				
1:15	0	3			0	3				
1:30	0	2			0	2				
1:45	2	1	2	8	0	4	0	10	2	18
2:00	0	1			0	2				
2:15	0	2			0	1				
2:30	0	2			0	1				
2:45	0	1	0	6	0	2	0	6	0	12
3:00	0	2			0	0				
3:15	0	1			0	1				
3:30	0	3			0	4				
3:45	0	0	0	6	0	5	0	10	0	16
4:00	0	1			0	4				
4:15	0	2			0	0				
4:30	0	3			0	3				
4:45	0	0	0	6	1	7	1	14	1	20
5:00	0	2			0	10				
5:15	1	3			0	2				
5:30	0	0			0	2				
5:45	0	3	1	8	0	2	0	16	1	24
6:00	1	2			0	4				
6:15	2	4			0	3				
6:30	0	2			1	1				
6:45	1	1	4	9	2	2	3	10	7	19
7:00	2	1			6	0				
7:15	2	1			2	2				
7:30	1	2			1	2				
7:45	4	1	9	5	4	1	13	5	22	10
8:00	1	2			2	2				
8:15	4	3			4	1				
8:30	5	1			3	1				
8:45	2	0	12	6	0	0	9	4	21	10
9:00	1	0			1	2				
9:15	1	1			3	1				
9:30	2	1			0	0				
9:45	1	0	5	2	1	0	5	3	10	5
10:00	0	1			1	1				
10:15	1	0			1	0				
10:30	1	1			1	0				
10:45	0	0	2	2	2	0	5	1	7	3
11:00	0	0			0	0				
11:15	0	0			1	0				
11:30	0	0			4	0				
11:45	0	0	0	0	0	0	5	0	5	0
Total	35	63			41	83			76	146
Percent	35.7%	64.3%			33.1%	66.9%			34.2%	65.8%

Accurate Counts
978-664-2565

Location : Locust Street
Location : North of Nichols Lane
City/State: Middleton, MA

Site Code: 10255001

10/9/2025	SB,		Hour Totals		NB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	0			0	5				
12:15	0	0			0	3				
12:30	0	0			0	0				
12:45	0	2	0	2	0	1	0	9	0	11
1:00	0	0			0	3				
1:15	0	0			0	0				
1:30	0	0			0	1				
1:45	0	1	0	1	0	3	0	7	0	8
2:00	0	0			0	0				
2:15	0	2			0	1				
2:30	0	3			0	1				
2:45	0	1	0	6	0	2	0	4	0	10
3:00	0	1			0	2				
3:15	0	2			0	2				
3:30	0	4			0	2				
3:45	0	0	0	7	0	3	0	9	0	16
4:00	0	1			0	2				
4:15	0	6			0	7				
4:30	0	0			0	5				
4:45	0	4	0	11	1	2	1	16	1	27
5:00	0	2			0	4				
5:15	0	4			0	3				
5:30	1	1			0	6				
5:45	0	0	1	7	0	3	0	16	1	23
6:00	0	3			0	2				
6:15	0	1			0	1				
6:30	1	2			1	2				
6:45	2	0	3	6	1	1	2	6	5	12
7:00	2	1			5	0				
7:15	2	0			3	0				
7:30	3	2			3	1				
7:45	4	2	11	5	2	3	13	4	24	9
8:00	6	2			3	0				
8:15	1	1			2	0				
8:30	1	0			5	0				
8:45	2	0	10	3	3	1	13	1	23	4
9:00	0	0			2	0				
9:15	3	3			1	1				
9:30	2	0			3	0				
9:45	2	0	7	3	3	4	9	5	16	8
10:00	0	3			3	1				
10:15	1	1			1	0				
10:30	0	0			3	0				
10:45	2	0	3	4	0	0	7	1	10	5
11:00	1	0			1	0				
11:15	0	0			1	0				
11:30	3	0			1	0				
11:45	3	0	7	0	2	0	5	0	12	0
Total	42	55			50	78			92	133
Percent	43.3%	56.7%			39.1%	60.9%			40.9%	59.1%
Grand Total	77	118			91	161			168	279
Percent	39.5%	60.5%			36.1%	63.9%			37.6%	62.4%
ADT		ADT: 224		AADT: 224						

Accurate Counts
978-664-2565

Location : Locust Street
Location : North of Nichols Lane
City/State: Middleton, MA

Site Code: 10255001

10/6/2025	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Week Average	
Time	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,
12:00 AM	*	*	*	*	0	0	0	0	*	*	*	*	*	*	0	0
1:00	*	*	*	*	2	0	0	0	*	*	*	*	*	*	1	0
2:00	*	*	*	*	0	0	0	0	*	*	*	*	*	*	0	0
3:00	*	*	*	*	0	0	0	0	*	*	*	*	*	*	0	0
4:00	*	*	*	*	0	1	0	1	*	*	*	*	*	*	0	1
5:00	*	*	*	*	1	0	1	0	*	*	*	*	*	*	1	0
6:00	*	*	*	*	4	3	3	2	*	*	*	*	*	*	4	2
7:00	*	*	*	*	9	13	11	13	*	*	*	*	*	*	10	13
8:00	*	*	*	*	12	9	10	13	*	*	*	*	*	*	11	11
9:00	*	*	*	*	5	5	7	9	*	*	*	*	*	*	6	7
10:00	*	*	*	*	2	5	3	7	*	*	*	*	*	*	2	6
11:00	*	*	*	*	0	5	7	5	*	*	*	*	*	*	4	5
12:00 PM	*	*	*	*	5	4	2	9	*	*	*	*	*	*	4	6
1:00	*	*	*	*	8	10	1	7	*	*	*	*	*	*	4	8
2:00	*	*	*	*	6	6	6	4	*	*	*	*	*	*	6	5
3:00	*	*	*	*	6	10	7	9	*	*	*	*	*	*	6	10
4:00	*	*	*	*	6	14	11	16	*	*	*	*	*	*	8	15
5:00	*	*	*	*	8	16	7	16	*	*	*	*	*	*	8	16
6:00	*	*	*	*	9	10	6	6	*	*	*	*	*	*	8	8
7:00	*	*	*	*	5	5	5	4	*	*	*	*	*	*	5	4
8:00	*	*	*	*	6	4	3	1	*	*	*	*	*	*	4	2
9:00	*	*	*	*	2	3	3	5	*	*	*	*	*	*	2	4
10:00	*	*	*	*	2	1	4	1	*	*	*	*	*	*	3	1
11:00	*	*	*	*	0	0	0	0	*	*	*	*	*	*	0	0
Total	0	0	0	0	98	124	97	128	0	0	0	0	0	0	97	124
Day	0		0		222		225		0		0		0		221	
AM Peak					8:00	7:00	7:00	7:00							8:00	7:00
Volume					12	13	11	13							11	13
PM Peak					6:00	5:00	4:00	4:00							4:00	5:00
Volume					9	16	11	16							8	16
Comb Total	0		0		222		225		0		0		0		221	
ADT	ADT: 224		AADT: 224													

TURNING MOVEMENT COUNT DATA

June 2025
October 2025

June 2025

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 1

Groups Printed- Cars - Trucks

	East St From North			Locust St From East			East St From South			Towne Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	5	35	1	3	0	5	0	18	9	0	1	3	80
07:15 AM	9	58	3	8	0	4	1	22	7	0	0	0	112
07:30 AM	11	61	0	4	0	2	0	21	2	0	2	3	106
07:45 AM	5	78	0	18	2	5	3	25	10	0	1	1	148
Total	30	232	4	33	2	16	4	86	28	0	4	7	446
08:00 AM	8	65	1	11	0	8	2	35	12	0	1	0	143
08:15 AM	12	50	0	15	1	11	0	37	13	1	1	2	143
08:30 AM	10	43	1	6	2	3	1	41	12	0	0	2	121
08:45 AM	9	46	0	6	0	4	2	40	18	1	2	1	129
Total	39	204	2	38	3	26	5	153	55	2	4	5	536
Grand Total	69	436	6	71	5	42	9	239	83	2	8	12	982
Apprch %	13.5	85.3	1.2	60.2	4.2	35.6	2.7	72.2	25.1	9.1	36.4	54.5	
Total %	7	44.4	0.6	7.2	0.5	4.3	0.9	24.3	8.5	0.2	0.8	1.2	
Cars	67	430	6	70	5	40	9	227	81	2	8	11	956
% Cars	97.1	98.6	100	98.6	100	95.2	100	95	97.6	100	100	91.7	97.4
Trucks	2	6	0	1	0	2	0	12	2	0	0	1	26
% Trucks	2.9	1.4	0	1.4	0	4.8	0	5	2.4	0	0	8.3	2.6

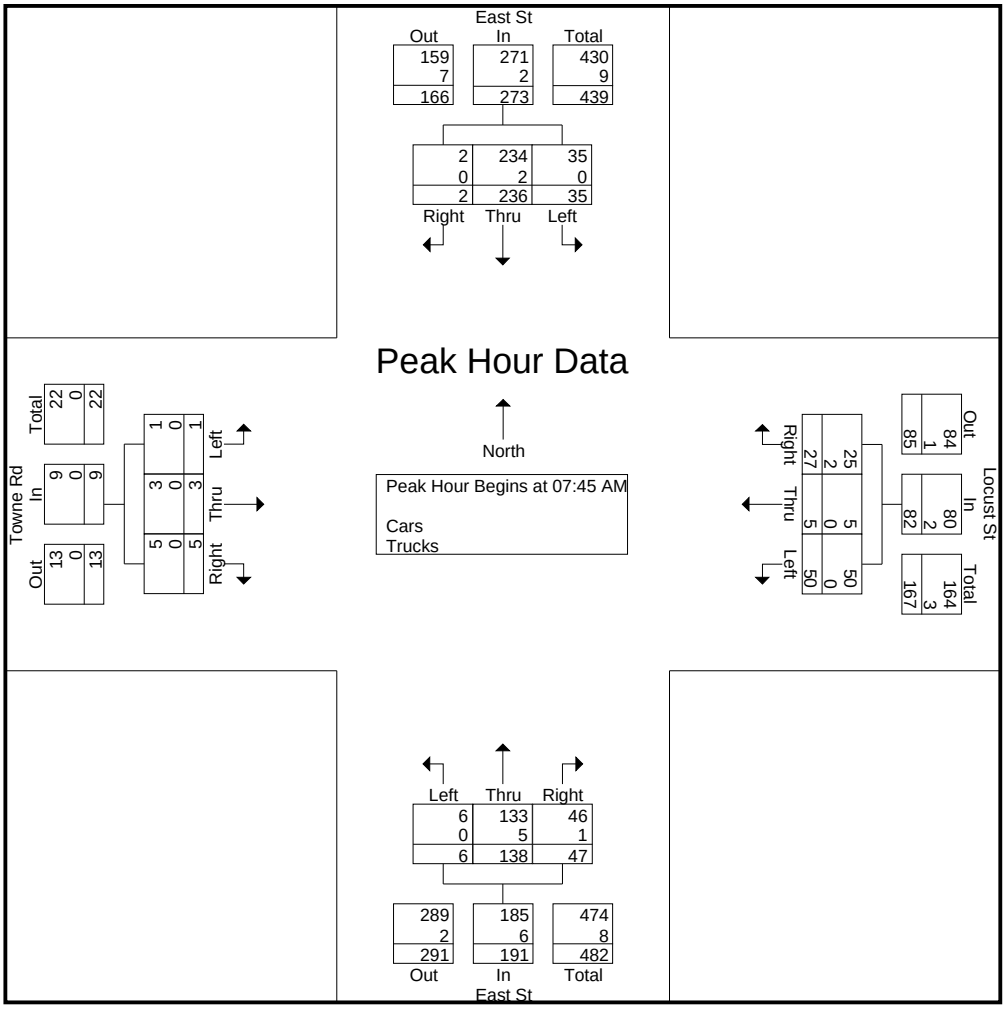
	East St From North				Locust St From East				East St From South				Towne Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	5	**78**	0	**83**	**18**	**2**	5	25	**3**	25	10	38	0	**1**	1	2	**148**
08:00 AM	8	65	**1**	74	11	0	8	19	2	35	12	49	0	1	0	1	143
08:15 AM	**12**	50	0	62	15	1	**11**	**27**	0	37	**13**	50	**1**	1	**2**	**4**	143
08:30 AM	10	43	1	54	6	2	3	11	1	**41**	12	**54**	0	0	2	2	121
Total Volume	35	236	2	273	50	5	27	82	6	138	47	191	1	3	5	9	555
% App. Total	12.8	86.4	0.7		61	6.1	32.9		3.1	72.3	24.6		11.1	33.3	55.6		
PHF	.729	.756	.500	.822	.694	.625	.614	.759	.500	.841	.904	.884	.250	.750	.625	.563	.938
Cars	35	234	2	271	50	5	25	80	6	133	46	185	1	3	5	9	545
% Cars	100	99.2	100	99.3	100	100	92.6	97.6	100	96.4	97.9	96.9	100	100	100	100	98.2
Trucks	0	2	0	2	0	0	2	2	0	5	1	6	0	0	0	0	10
% Trucks	0	0.8	0	0.7	0	0	7.4	2.4	0	3.6	2.1	3.1	0	0	0	0	1.8

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 2



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

Peak Hour for Each Approach Begins at:

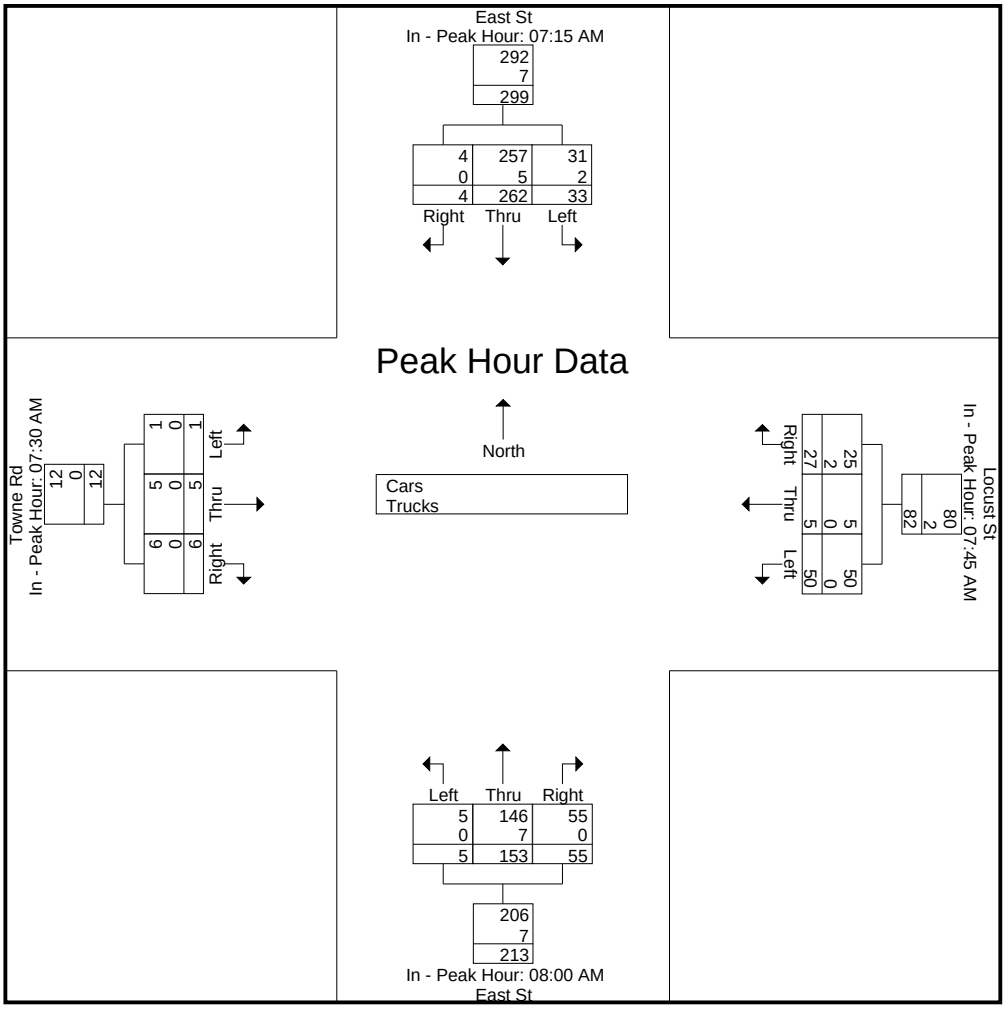
	07:15 AM				07:45 AM				08:00 AM				07:30 AM			
+0 mins.	9	58	**3**	70	**18**	**2**	5	25	**2**	35	12	49	0	**2**	**3**	**5**
+15 mins.	**11**	61	0	72	11	0	8	19	0	37	13	50	0	1	1	2
+30 mins.	5	**78**	0	**83**	15	1	**11**	**27**	1	**41**	12	54	0	1	0	1
+45 mins.	8	65	1	74	6	2	3	11	2	40	**18**	**60**	**1**	1	2	4
Total Volume	33	262	4	299	50	5	27	82	5	153	55	213	1	5	6	12
% App. Total	11	87.6	1.3		61	6.1	32.9		2.3	71.8	25.8		8.3	41.7	50	
PHF	.750	.840	.333	.901	.694	.625	.614	.759	.625	.933	.764	.888	.250	.625	.500	.600
Cars	31	257	4	292	50	5	25	80	5	146	55	206	1	5	6	12
% Cars	93.9	98.1	100	97.7	100	100	92.6	97.6	100	95.4	100	96.7	100	100	100	100
Trucks	2	5	0	7	0	0	2	2	0	7	0	7	0	0	0	0
% Trucks	6.1	1.9	0	2.3	0	0	7.4	2.4	0	4.6	0	3.3	0	0	0	0

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 3



Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025

Groups Printed- Cars

	East St From North			Locust St From East			East St From South			Towne Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	5	35	1	3	0	5	0	18	9	0	1	2	79
07:15 AM	8	56	3	7	0	4	1	20	7	0	0	0	106
07:30 AM	10	60	0	4	0	2	0	19	1	0	2	3	101
07:45 AM	5	77	0	18	2	4	3	24	9	0	1	1	144
Total	28	228	4	32	2	15	4	81	26	0	4	6	430
08:00 AM	8	64	1	11	0	7	2	34	12	0	1	0	140
08:15 AM	12	50	0	15	1	11	0	36	13	1	1	2	142
08:30 AM	10	43	1	6	2	3	1	39	12	0	0	2	119
08:45 AM	9	45	0	6	0	4	2	37	18	1	2	1	125
Total	39	202	2	38	3	25	5	146	55	2	4	5	526
Grand Total	67	430	6	70	5	40	9	227	81	2	8	11	956
Apprch %	13.3	85.5	1.2	60.9	4.3	34.8	2.8	71.6	25.6	9.5	38.1	52.4	
Total %	7	45	0.6	7.3	0.5	4.2	0.9	23.7	8.5	0.2	0.8	1.2	

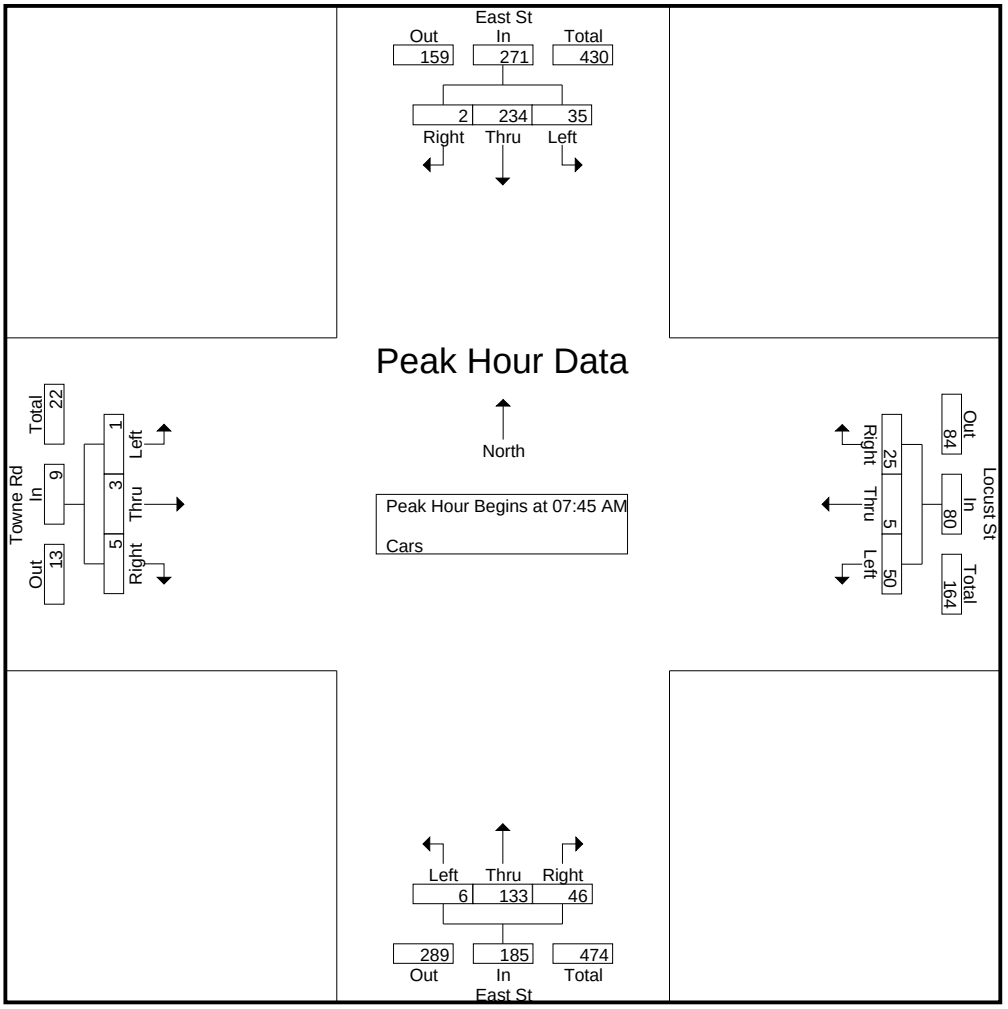
	East St From North				Locust St From East				East St From South				Towne Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	5	**77**	0	**82**	**18**	**2**	4	24	**3**	24	9	36	0	**1**	1	2	**144**
08:00 AM	8	64	**1**	73	11	0	7	18	2	34	12	48	0	1	0	1	140
08:15 AM	**12**	50	0	62	15	1	**11**	**27**	0	36	**13**	49	**1**	1	**2**	**4**	142
08:30 AM	10	43	1	54	6	2	3	11	1	**39**	12	**52**	0	0	2	2	119
Total Volume	35	234	2	271	50	5	25	80	6	133	46	185	1	3	5	9	545
% App. Total	12.9	86.3	0.7		62.5	6.2	31.2		3.2	71.9	24.9		11.1	33.3	55.6		
PHF	.729	.760	.500	.826	.694	.625	.568	.741	.500	.853	.885	.889	.250	.750	.625	.563	.946

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 5



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

Peak Hour for Each Approach Begins at:

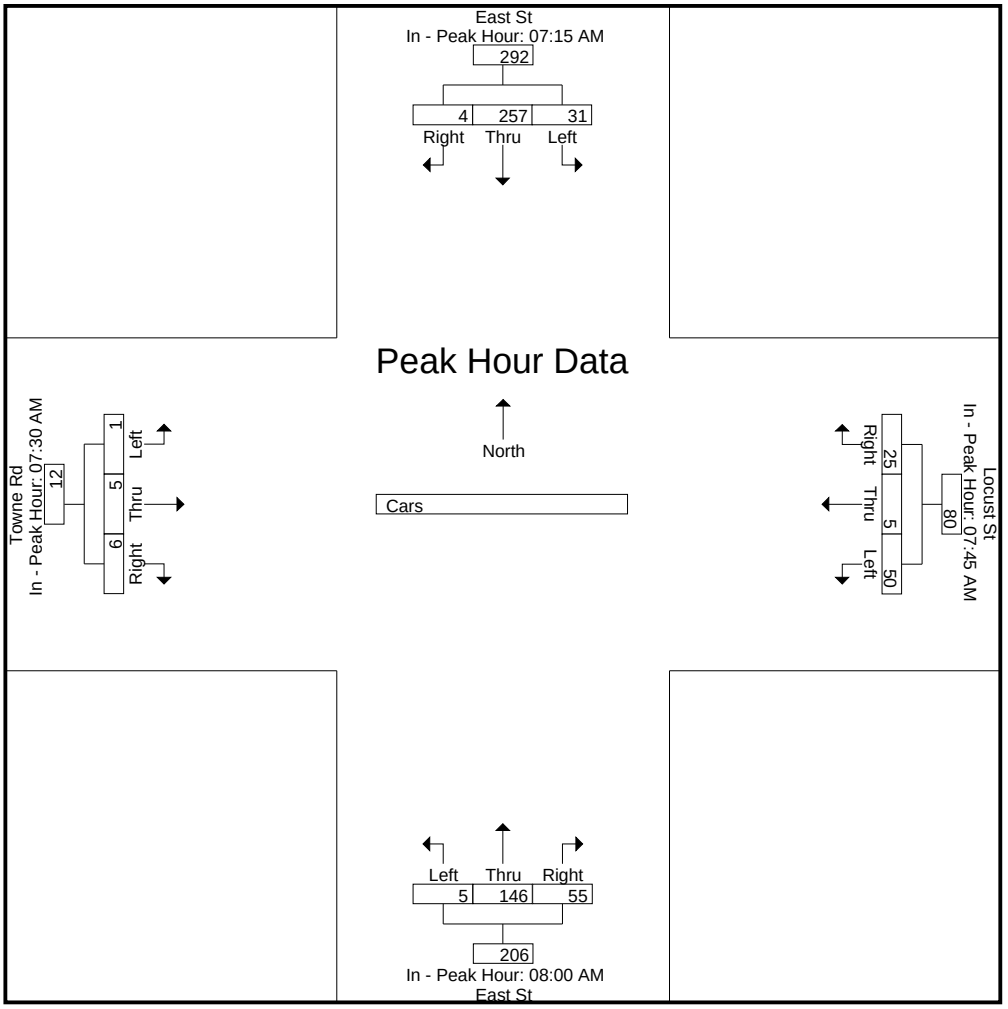
	07:15 AM				07:45 AM				08:00 AM				07:30 AM			
+0 mins.	8	56	**3**	67	**18**	**2**	4	24	**2**	34	12	48	0	**2**	**3**	**5**
+15 mins.	**10**	60	0	70	11	0	7	18	0	36	13	49	0	1	1	2
+30 mins.	5	**77**	0	**82**	15	1	**11**	**27**	1	**39**	12	52	0	1	0	1
+45 mins.	8	64	1	73	6	2	3	11	2	37	**18**	**57**	**1**	1	2	4
Total Volume	31	257	4	292	50	5	25	80	5	146	55	206	1	5	6	12
% App. Total	10.6	88	1.4		62.5	6.2	31.2		2.4	70.9	26.7		8.3	41.7	50	
PHF	.775	.834	.333	.890	.694	.625	.568	.741	.625	.936	.764	.904	.250	.625	.500	.600

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 6



Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025

Groups Printed- Trucks

	East St From North			Locust St From East			East St From South			Towne Rd 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	0	0	0	0	0	0	0	1	1
07:15 AM	1	2	0	1	0	0	0	2	0	0	0	0	6
07:30 AM	1	1	0	0	0	0	0	2	1	0	0	0	5
07:45 AM	0	1	0	0	0	1	0	1	1	0	0	0	4
Total	2	4	0	1	0	1	0	5	2	0	0	1	16
08:00 AM	0	1	0	0	0	1	0	1	0	0	0	0	3
08:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	2	0	0	0	0	2
08:45 AM	0	1	0	0	0	0	0	3	0	0	0	0	4
Total	0	2	0	0	0	1	0	7	0	0	0	0	10
Grand Total	2	6	0	1	0	2	0	12	2	0	0	1	26
Apprch %	25	75	0	33.3	0	66.7	0	85.7	14.3	0	0	100	
Total %	7.7	23.1	0	3.8	0	7.7	0	46.2	7.7	0	0	3.8	

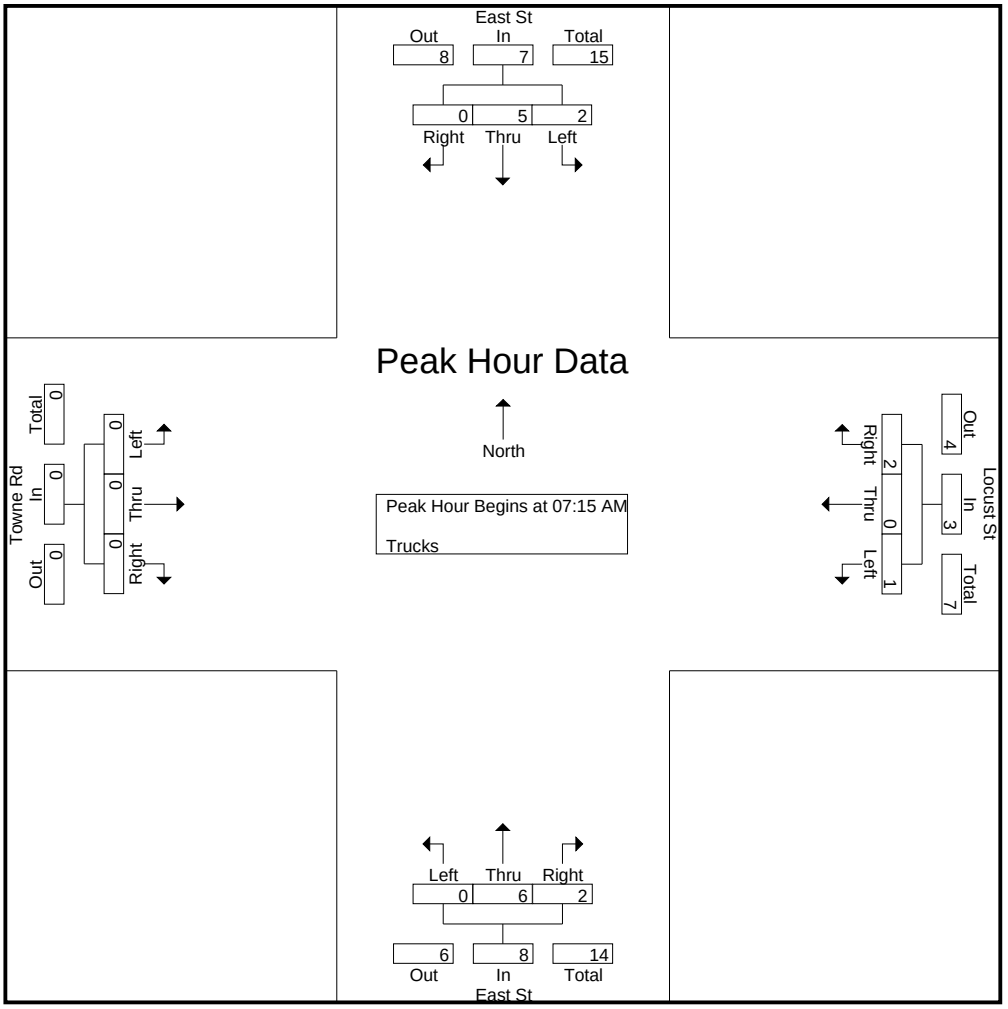
	East St From North				Locust St From East				East St From South				Towne Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**1**	**2**	0	**3**	**1**	0	0	**1**	0	**2**	0	2	0	0	0	0	**6**
07:30 AM	1	1	0	2	0	0	0	0	0	2	**1**	**3**	0	0	0	0	5
07:45 AM	0	1	0	1	0	0	**1**	1	0	1	1	2	0	0	0	0	4
08:00 AM	0	1	0	1	0	0	1	1	0	1	0	1	0	0	0	0	3
Total Volume	2	5	0	7	1	0	2	3	0	6	2	8	0	0	0	0	18
% App. Total	28.6	71.4	0		33.3	0	66.7		0	75	25		0	0	0		
PHF	.500	.625	.000	.583	.250	.000	.500	.750	.000	.750	.500	.667	.000	.000	.000	.000	.750

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 8



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

Peak Hour for Each Approach Begins at:

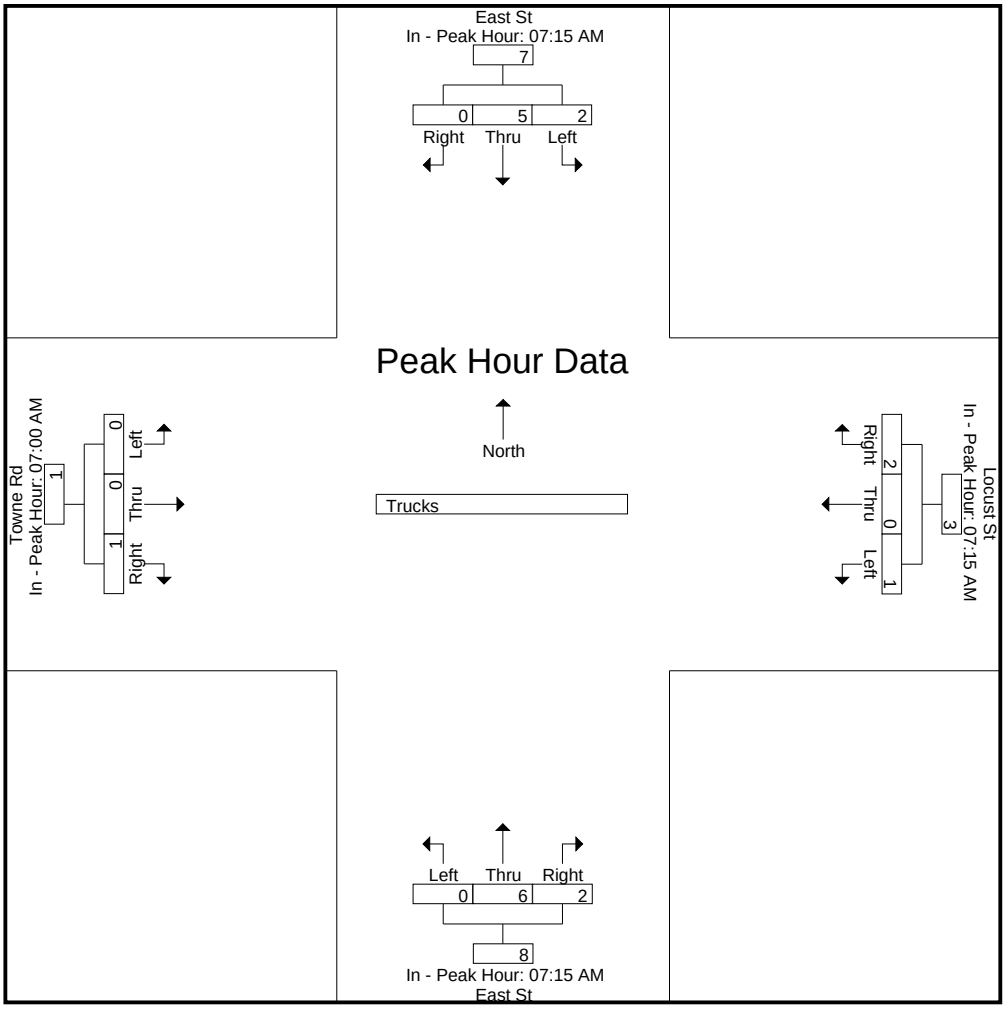
	07:15 AM				07:15 AM				07:15 AM				07:00 AM			
+0 mins.	**1**	**2**	0	**3**	**1**	0	0	**1**	0	**2**	0	2	0	0	**1**	**1**
+15 mins.	1	1	0	2	0	0	0	0	0	2	**1**	**3**	0	0	0	0
+30 mins.	0	1	0	1	0	0	**1**	1	0	1	1	2	0	0	0	0
+45 mins.	0	1	0	1	0	0	1	1	0	1	0	1	0	0	0	0
Total Volume	2	5	0	7	1	0	2	3	0	6	2	8	0	0	1	1
% App. Total	28.6	71.4	0		33.3	0	66.7		0	75	25		0	0	100	
PHF	.500	.625	.000	.583	.250	.000	.500	.750	.000	.750	.500	.667	.000	.000	.250	.250

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 9



Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025

Groups Printed- Bikes Peds

	East St From North				Locust St From East				East St From South				Towne Rd From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	0	0	

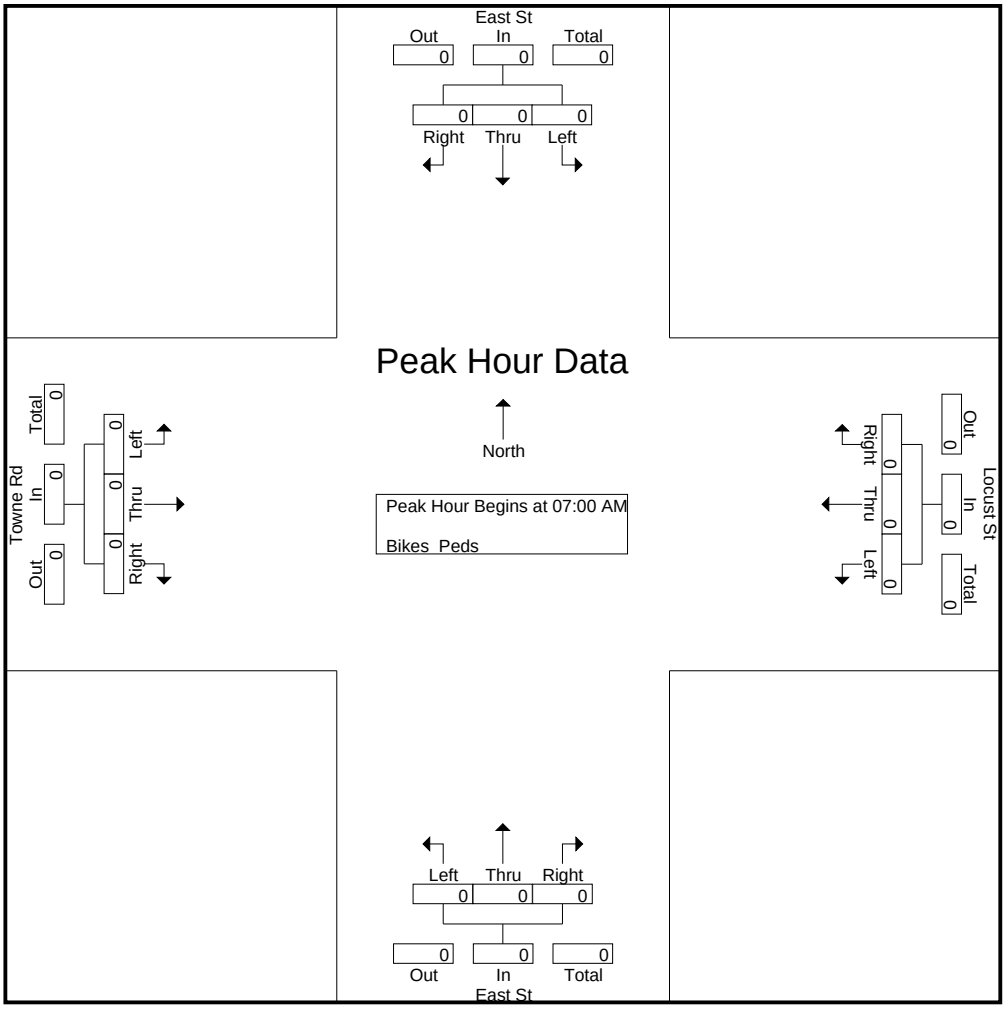
	East St From North				Locust St From East				East St From South				Towne Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak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

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 11



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

Peak Hour for Each Approach Begins at:

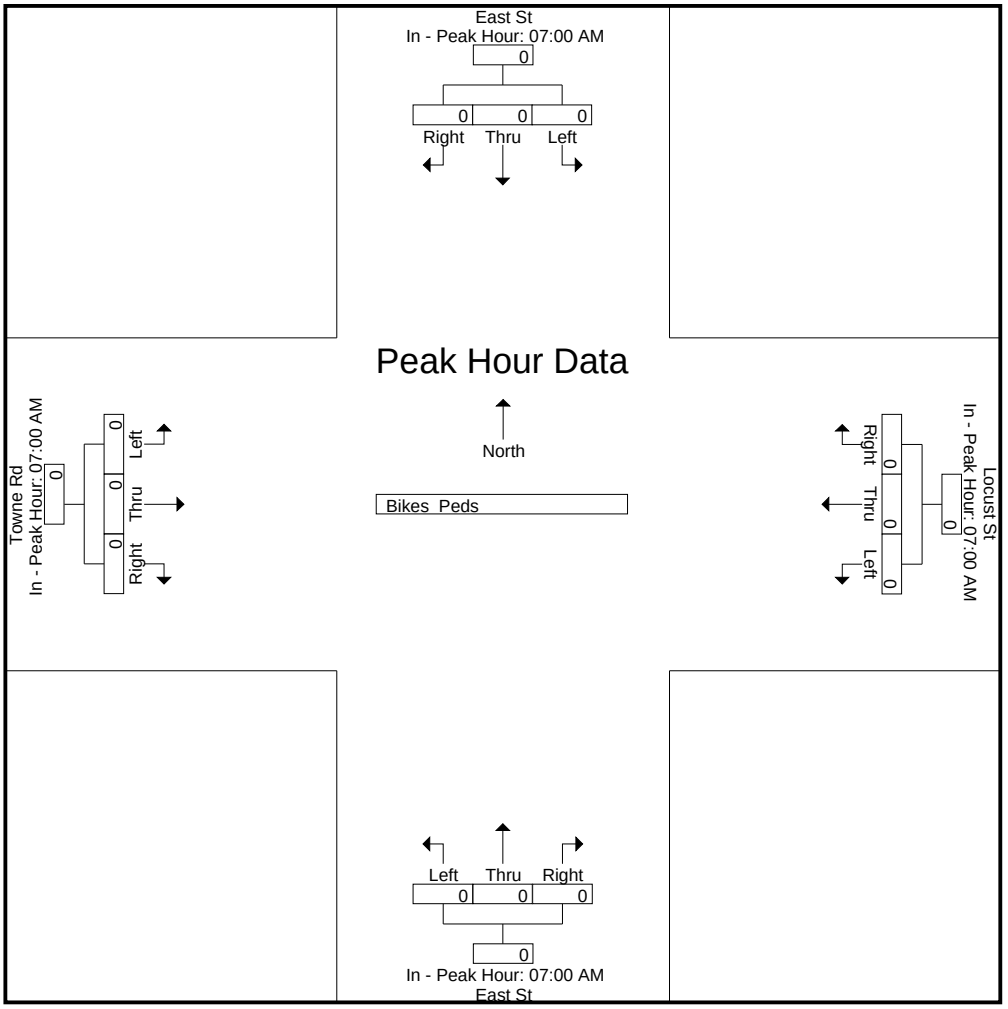
	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	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

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 12



Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 1

Groups Printed- Cars - Trucks

	East St From North			Locust St From East			East St From South			Towne Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	5	43	2	11	0	16	1	67	15	1	1	0	162
04:15 PM	11	42	0	7	3	20	1	75	8	0	0	0	167
04:30 PM	5	46	1	14	1	17	1	68	19	2	2	6	182
04:45 PM	5	42	1	8	0	20	0	68	16	0	0	4	164
Total	26	173	4	40	4	73	3	278	58	3	3	10	675
05:00 PM	8	38	0	11	3	29	2	64	9	1	2	1	168
05:15 PM	4	40	0	11	0	15	2	66	9	0	0	0	147
05:30 PM	3	47	0	10	2	10	0	58	12	0	0	1	143
05:45 PM	8	38	0	13	2	6	1	42	12	1	0	2	125
Total	23	163	0	45	7	60	5	230	42	2	2	4	583
Grand Total	49	336	4	85	11	133	8	508	100	5	5	14	1258
Apprch %	12.6	86.4	1	37.1	4.8	58.1	1.3	82.5	16.2	20.8	20.8	58.3	
Total %	3.9	26.7	0.3	6.8	0.9	10.6	0.6	40.4	7.9	0.4	0.4	1.1	
Cars	49	333	4	85	11	133	8	502	99	5	5	14	1248
% Cars	100	99.1	100	100	100	100	100	98.8	99	100	100	100	99.2
Trucks	0	3	0	0	0	0	0	6	1	0	0	0	10
% Trucks	0	0.9	0	0	0	0	0	1.2	1	0	0	0	0.8

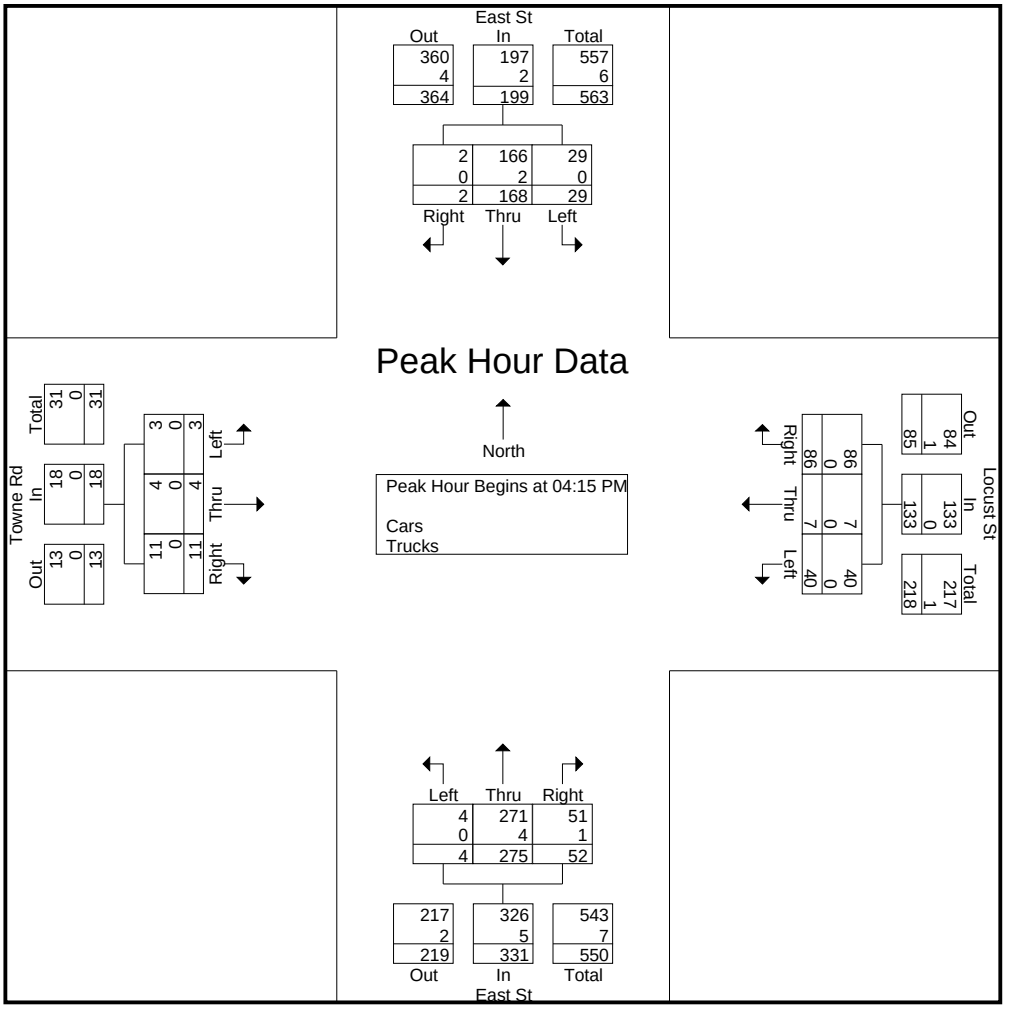
	East St From North				Locust St From East				East St From South				Towne Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	**11**	42	0	**53**	7	**3**	20	30	1	**75**	8	84	0	0	0	0	167
04:30 PM	5	**46**	**1**	52	**14**	1	17	32	1	68	**19**	**88**	**2**	**2**	**6**	**10**	**182**
04:45 PM	5	42	1	48	8	0	20	28	0	68	16	84	0	0	4	4	164
05:00 PM	8	38	0	46	11	3	**29**	**43**	**2**	64	9	75	1	2	1	4	168
Total Volume	29	168	2	199	40	7	86	133	4	275	52	331	3	4	11	18	681
% App. Total	14.6	84.4	1		30.1	5.3	64.7		1.2	83.1	15.7		16.7	22.2	61.1		
PHF	.659	.913	.500	.939	.714	.583	.741	.773	.500	.917	.684	.940	.375	.500	.458	.450	.935
Cars	29	166	2	197	40	7	86	133	4	271	51	326	3	4	11	18	674
% Cars	100	98.8	100	99.0	100	100	100	100	100	98.5	98.1	98.5	100	100	100	100	99.0
Trucks	0	2	0	2	0	0	0	0	0	4	1	5	0	0	0	0	7
% Trucks	0	1.2	0	1.0	0	0	0	0	0	1.5	1.9	1.5	0	0	0	0	1.0

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

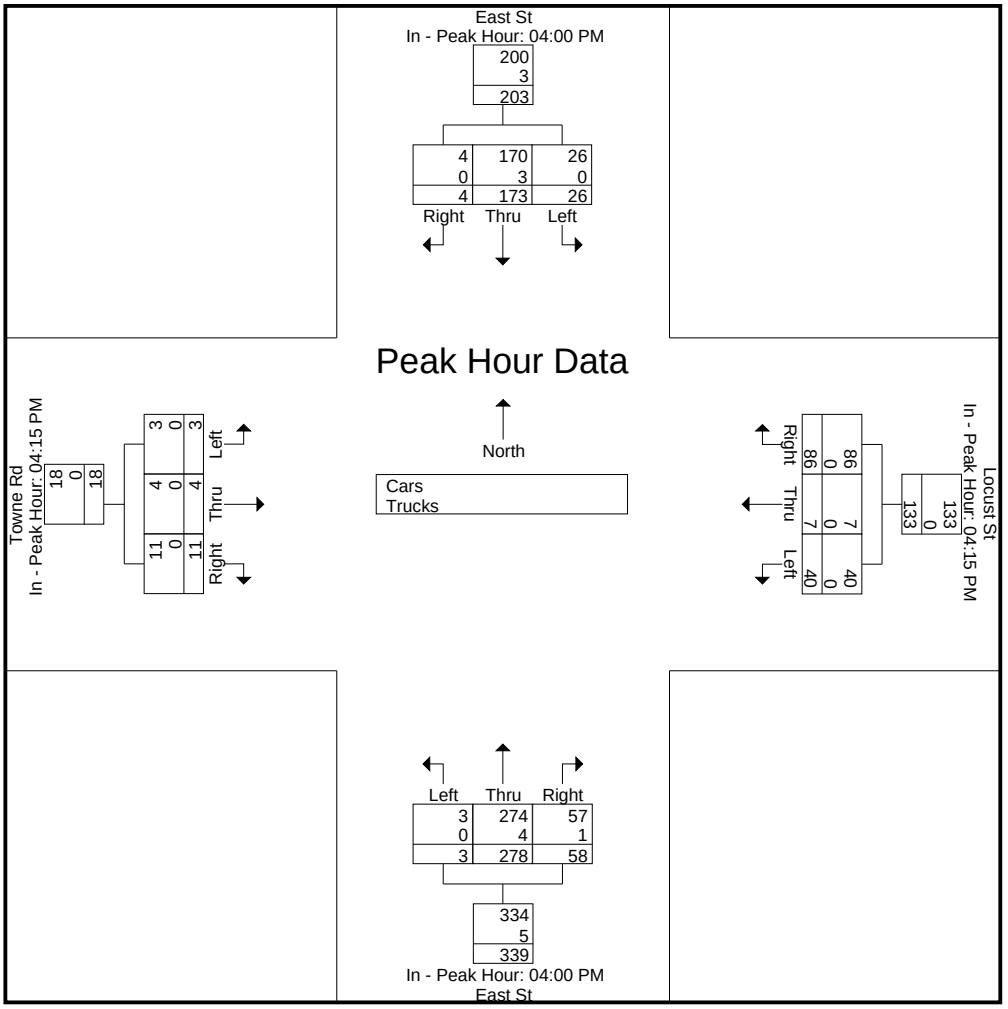
	04:00 PM				04:15 PM				04:00 PM				04:15 PM			
+0 mins.	5	43	**2**	50	7	**3**	20	30	**1**	67	15	83	0	0	0	0
+15 mins.	**11**	42	0	**53**	**14**	1	17	32	1	**75**	8	84	**2**	**2**	**6**	**10**
+30 mins.	5	**46**	1	52	8	0	20	28	1	68	**19**	**88**	0	0	4	4
+45 mins.	5	42	1	48	11	3	**29**	**43**	0	68	16	84	1	2	1	4
Total Volume	26	173	4	203	40	7	86	133	3	278	58	339	3	4	11	18
% App. Total	12.8	85.2	2		30.1	5.3	64.7		0.9	82	17.1		16.7	22.2	61.1	
PHF	.591	.940	.500	.958	.714	.583	.741	.773	.750	.927	.763	.963	.375	.500	.458	.450
Cars	26	170	4	200	40	7	86	133	3	274	57	334	3	4	11	18
% Cars	100	98.3	100	98.5	100	100	100	100	100	98.6	98.3	98.5	100	100	100	100
Trucks	0	3	0	3	0	0	0	0	0	4	1	5	0	0	0	0
% Trucks	0	1.7	0	1.5	0	0	0	0	0	1.4	1.7	1.5	0	0	0	0

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 3



Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025

Groups Printed- Cars

	East St From North			Locust St From East			East St From South			Towne Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	5	42	2	11	0	16	1	66	15	1	1	0	160
04:15 PM	11	42	0	7	3	20	1	73	8	0	0	0	165
04:30 PM	5	45	1	14	1	17	1	67	18	2	2	6	179
04:45 PM	5	41	1	8	0	20	0	68	16	0	0	4	163
Total	26	170	4	40	4	73	3	274	57	3	3	10	667
05:00 PM	8	38	0	11	3	29	2	63	9	1	2	1	167
05:15 PM	4	40	0	11	0	15	2	65	9	0	0	0	146
05:30 PM	3	47	0	10	2	10	0	58	12	0	0	1	143
05:45 PM	8	38	0	13	2	6	1	42	12	1	0	2	125
Total	23	163	0	45	7	60	5	228	42	2	2	4	581
Grand Total	49	333	4	85	11	133	8	502	99	5	5	14	1248
Apprch %	12.7	86.3	1	37.1	4.8	58.1	1.3	82.4	16.3	20.8	20.8	58.3	
Total %	3.9	26.7	0.3	6.8	0.9	10.7	0.6	40.2	7.9	0.4	0.4	1.1	

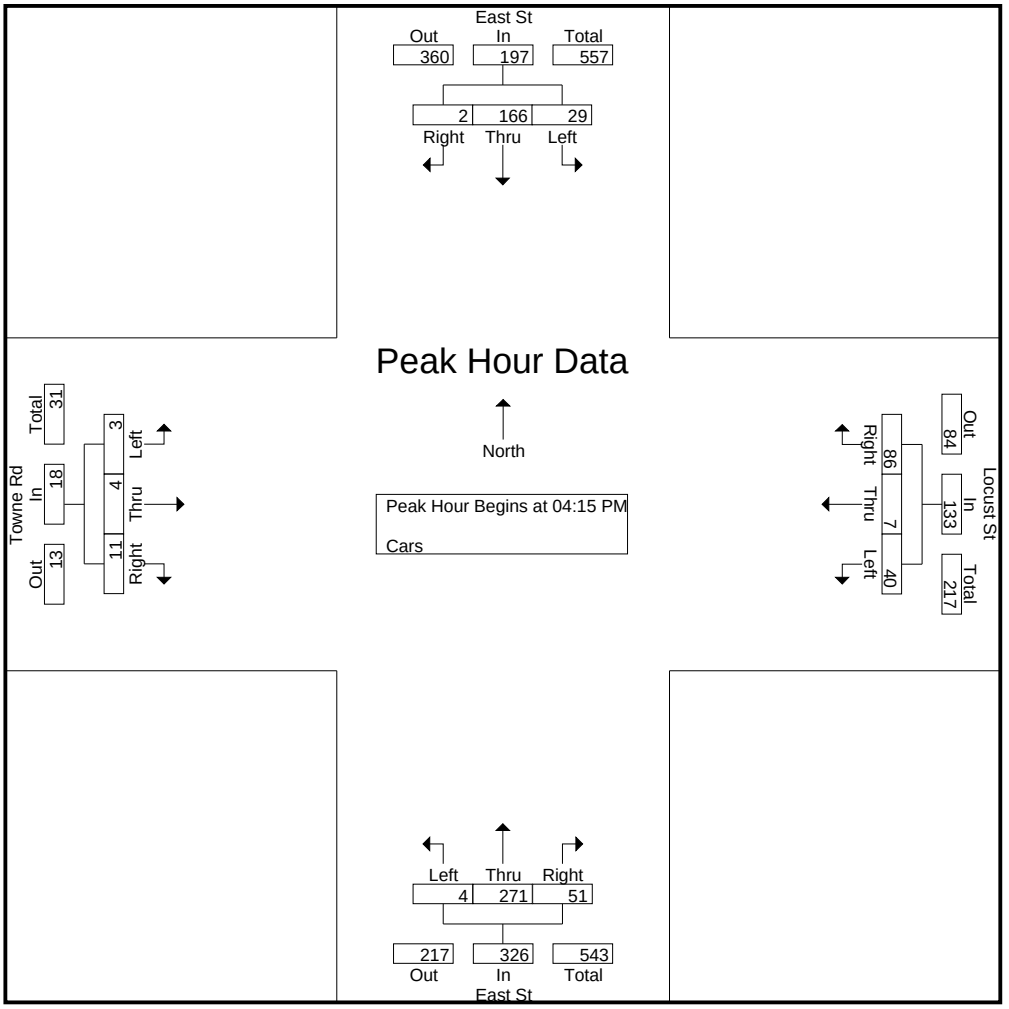
	East St From North				Locust St From East				East St From South				Towne Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	**11**	42	0	**53**	7	**3**	20	30	1	**73**	8	82	0	0	0	0	165
04:30 PM	5	**45**	**1**	51	**14**	1	17	32	1	67	**18**	**86**	**2**	**2**	**6**	**10**	**179**
04:45 PM	5	41	1	47	8	0	20	28	0	68	16	84	0	0	4	4	163
05:00 PM	8	38	0	46	11	3	**29**	**43**	**2**	63	9	74	1	2	1	4	167
Total Volume	29	166	2	197	40	7	86	133	4	271	51	326	3	4	11	18	674
% App. Total	14.7	84.3	1		30.1	5.3	64.7		1.2	83.1	15.6		16.7	22.2	61.1		
PHF	.659	.922	.500	.929	.714	.583	.741	.773	.500	.928	.708	.948	.375	.500	.458	.450	.941

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 5



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

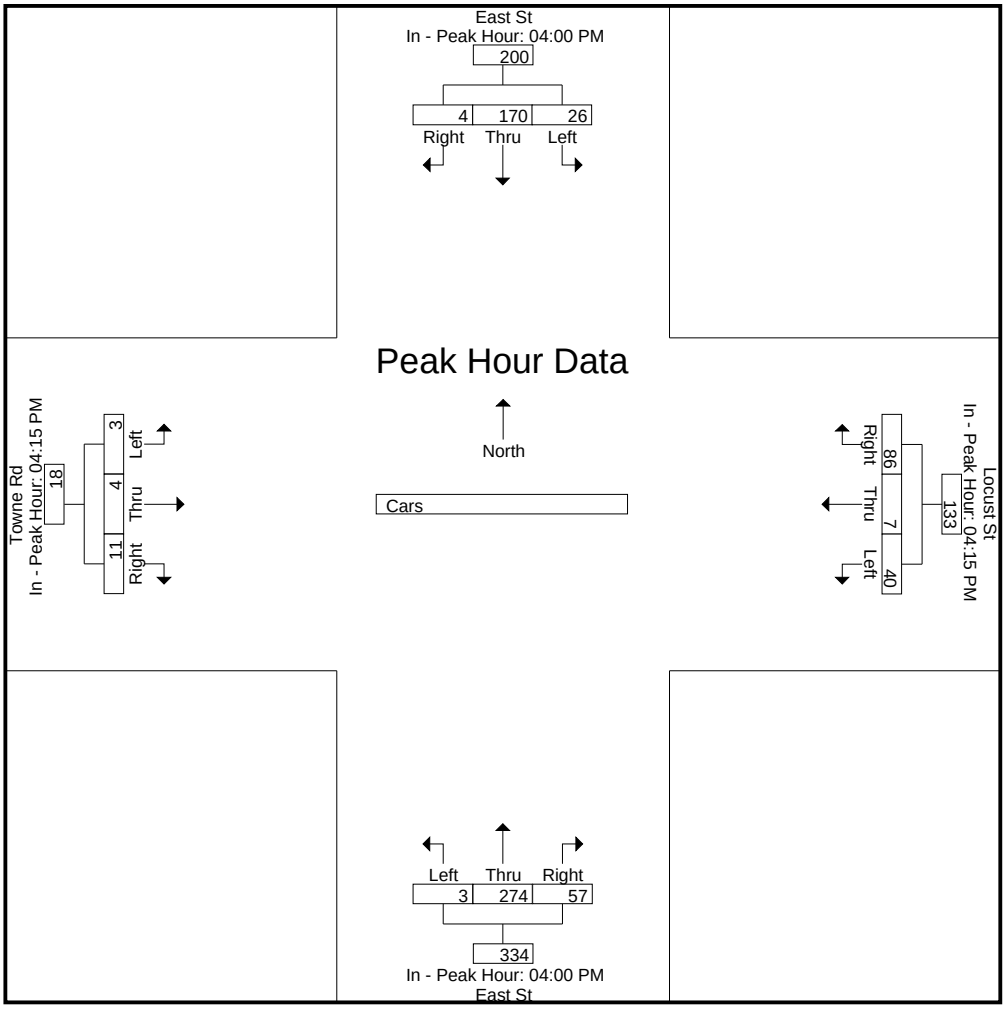
	04:00 PM				04:15 PM				04:00 PM				04:15 PM			
+0 mins.	5	42	**2**	49	7	**3**	20	30	**1**	66	15	82	0	0	0	0
+15 mins.	**11**	42	0	**53**	**14**	1	17	32	1	**73**	8	82	**2**	**2**	**6**	**10**
+30 mins.	5	**45**	1	51	8	0	20	28	1	67	**18**	**86**	0	0	4	4
+45 mins.	5	41	1	47	11	3	**29**	**43**	0	68	16	84	1	2	1	4
Total Volume	26	170	4	200	40	7	86	133	3	274	57	334	3	4	11	18
% App. Total	13	85	2		30.1	5.3	64.7		0.9	82	17.1		16.7	22.2	61.1	
PHF	.591	.944	.500	.943	.714	.583	.741	.773	.750	.938	.792	.971	.375	.500	.458	.450

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 6



Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025

Groups Printed- Trucks

	East St From North			Locust St From East			East St From South			Towne Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
04:30 PM	0	1	0	0	0	0	0	1	1	0	0	0	3
04:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	3	0	0	0	0	0	4	1	0	0	0	8
05:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	2	0	0	0	0	2
Grand Total	0	3	0	0	0	0	0	6	1	0	0	0	10
Apprch %	0	100	0	0	0	0	0	85.7	14.3	0	0	0	
Total %	0	30	0	0	0	0	0	60	10	0	0	0	

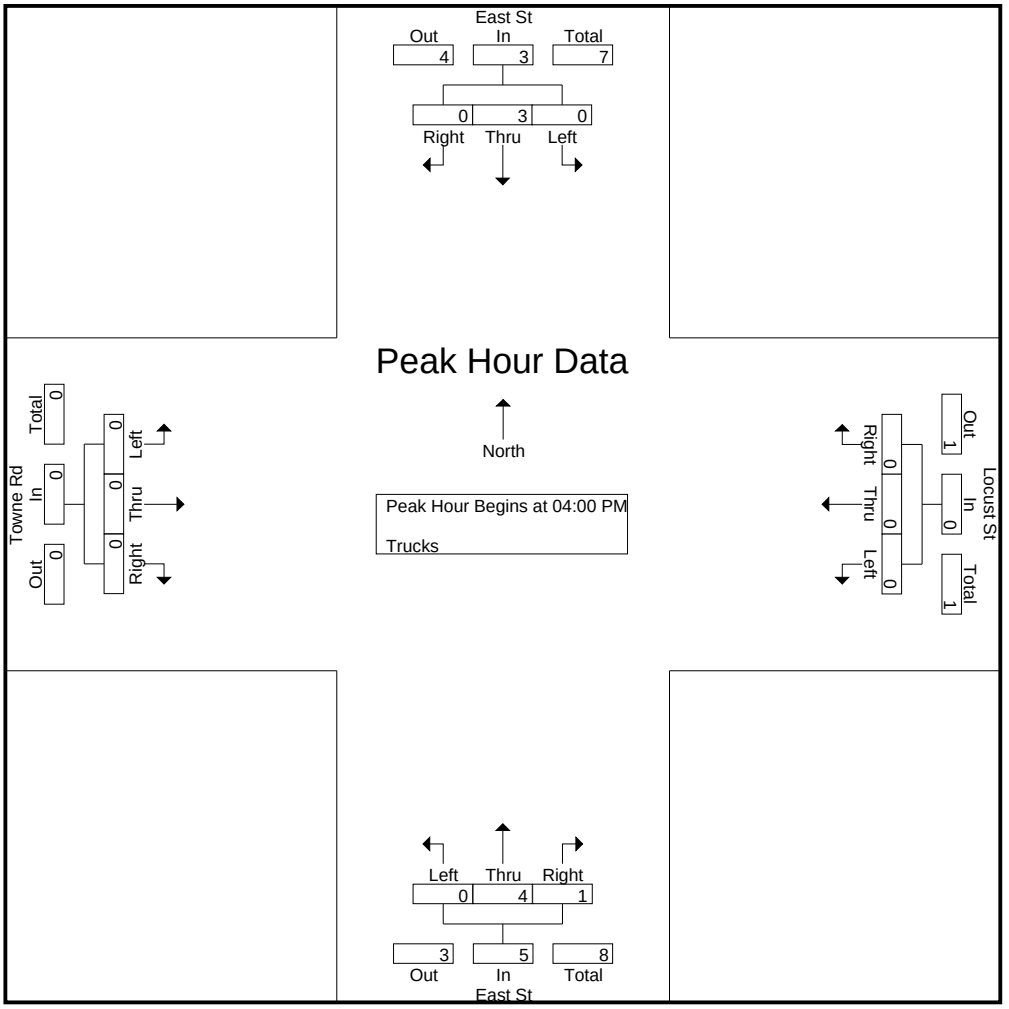
	East St From North				Locust St From East				East St From South				Towne Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**1**	0	**1**	0	0	0	0	0	1	0	1	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	**2**	0	**2**	0	0	0	0	2
04:30 PM	0	1	0	1	0	0	0	0	0	1	**1**	2	0	0	0	0	**3**
04:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	3	0	3	0	0	0	0	0	4	1	5	0	0	0	0	8
% App. Total	0	100	0		0	0	0		0	80	20		0	0	0		
PHF	.000	.750	.000	.750	.000	.000	.000	.000	.000	.500	.250	.625	.000	.000	.000	.000	.667

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

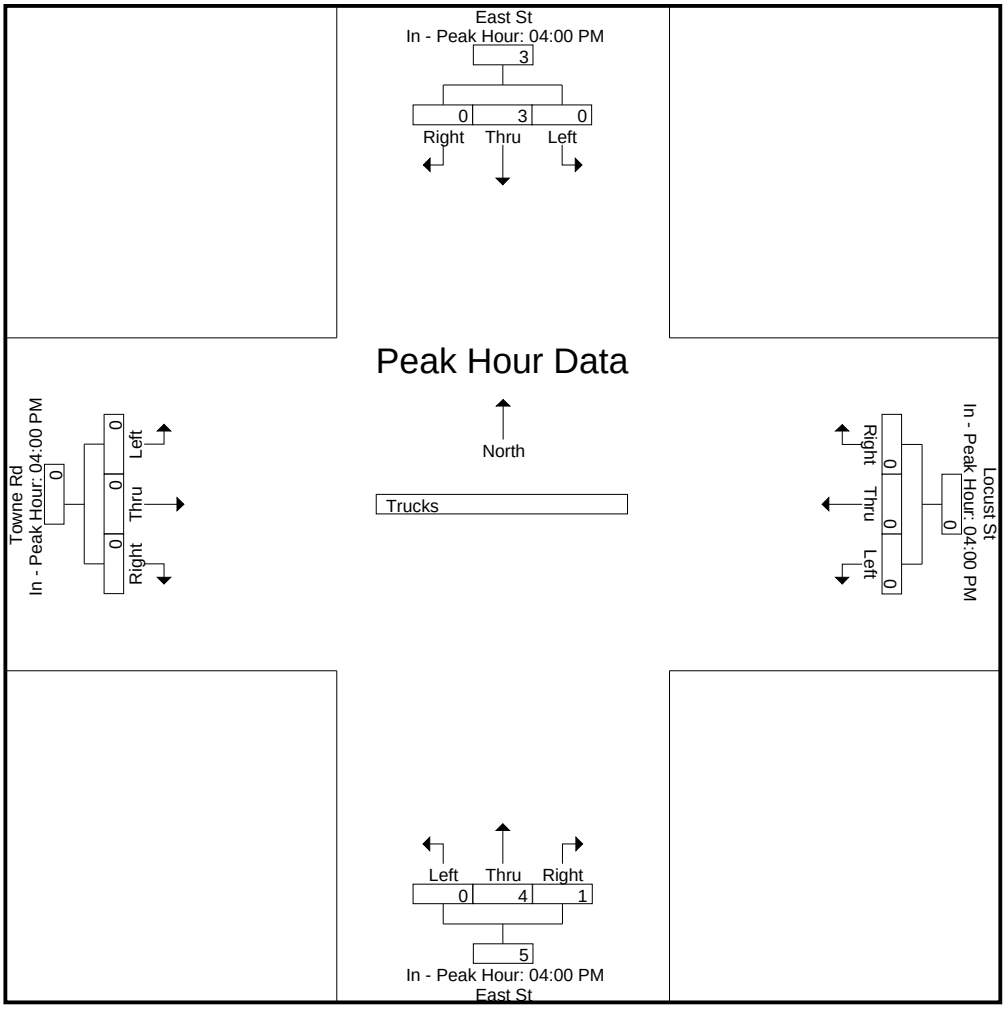
	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	**1**	0	**1**	0	0	0	0	0	1	0	1	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	**2**	0	**2**	0	0	0	0
+30 mins.	0	1	0	1	0	0	0	0	0	1	**1**	2	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	3	0	3	0	0	0	0	0	4	1	5	0	0	0	0
% App. Total	0	100	0		0	0	0		0	80	20		0	0	0	
PHF	.000	.750	.000	.750	.000	.000	.000	.000	.000	.500	.250	.625	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 9



Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025

Groups Printed- Bikes Peds

	East St From North				Locust St From East				East St From South				Towne Rd From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	3	0	3
05:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Grand Total	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	4	0	4
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

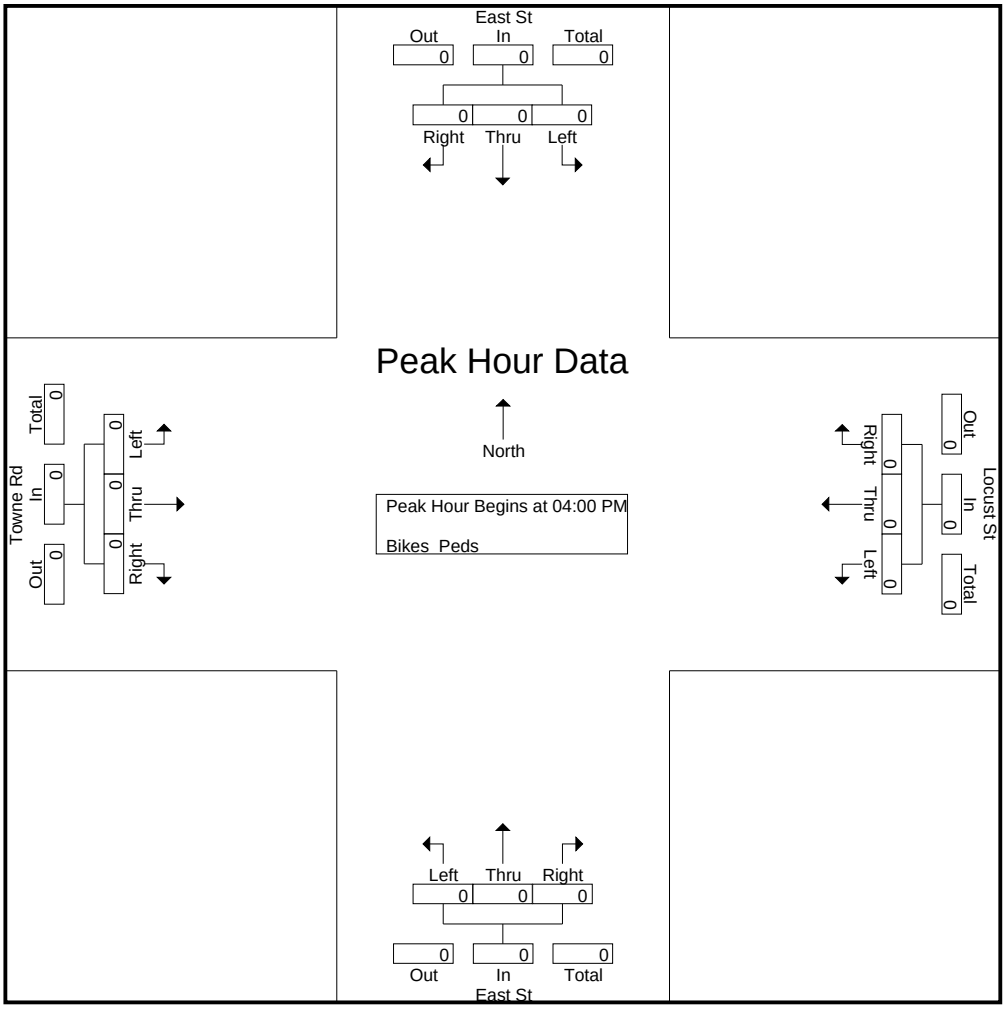
	East St From North				Locust St From East				East St From South				Towne Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

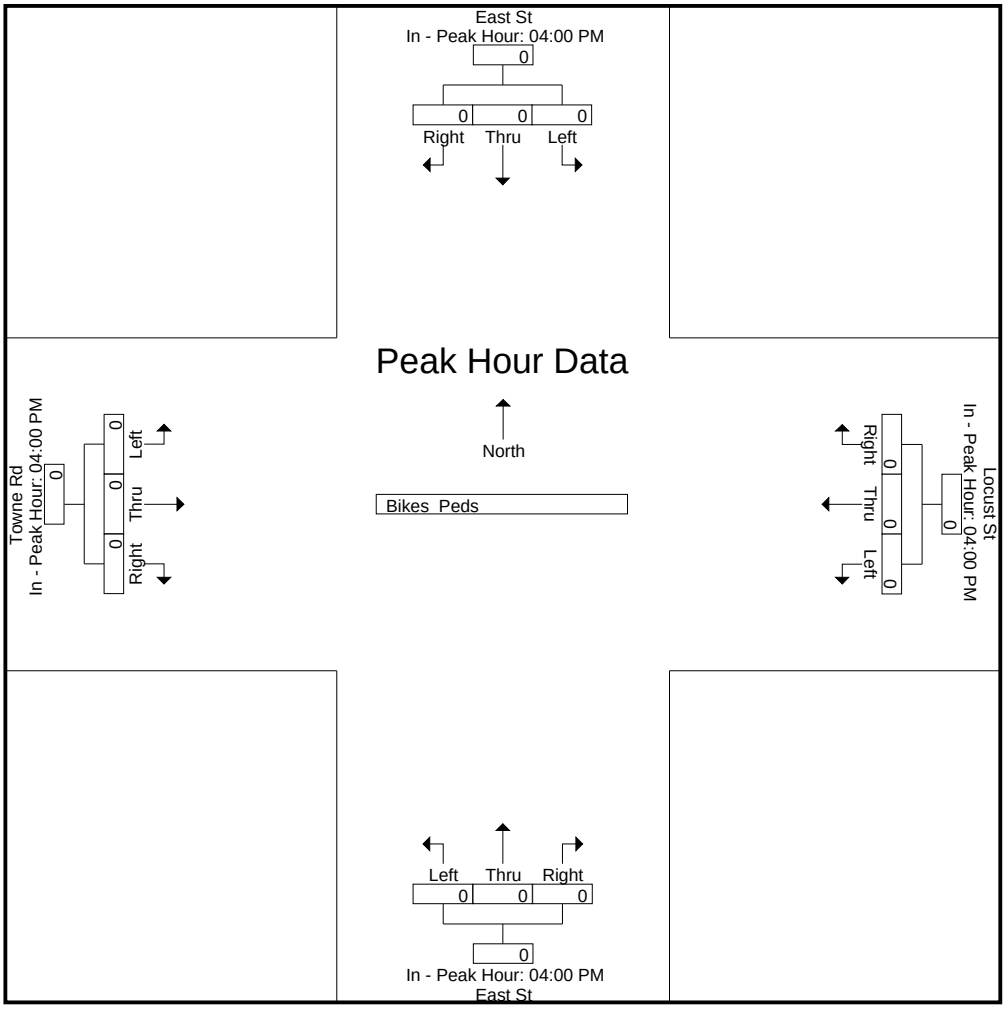
	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	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

Accurate Counts

978-664-2565

N/S Street : East Street
E/W Street : Locust St / Towne Rd
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255001
Site Code : 10255001
Start Date : 6/17/2025
Page No : 12



Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 1

Groups Printed- Cars - Trucks

	Village Rd From East		35 Village Rd From South		Village Rd From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	5	10	1	0	18	7	41
07:15 AM	9	4	0	0	18	3	34
07:30 AM	15	9	0	0	15	3	42
07:45 AM	18	16	0	1	20	4	59
Total	47	39	1	1	71	17	176
08:00 AM	21	16	0	1	26	3	67
08:15 AM	15	14	4	2	28	7	70
08:30 AM	25	13	0	1	29	6	74
08:45 AM	11	15	1	1	25	3	56
Total	72	58	5	5	108	19	267
Grand Total	119	97	6	6	179	36	443
Apprch %	55.1	44.9	50	50	83.3	16.7	
Total %	26.9	21.9	1.4	1.4	40.4	8.1	
Cars	119	93	6	6	177	36	437
% Cars	100	95.9	100	100	98.9	100	98.6
Trucks	0	4	0	0	2	0	6
% Trucks	0	4.1	0	0	1.1	0	1.4

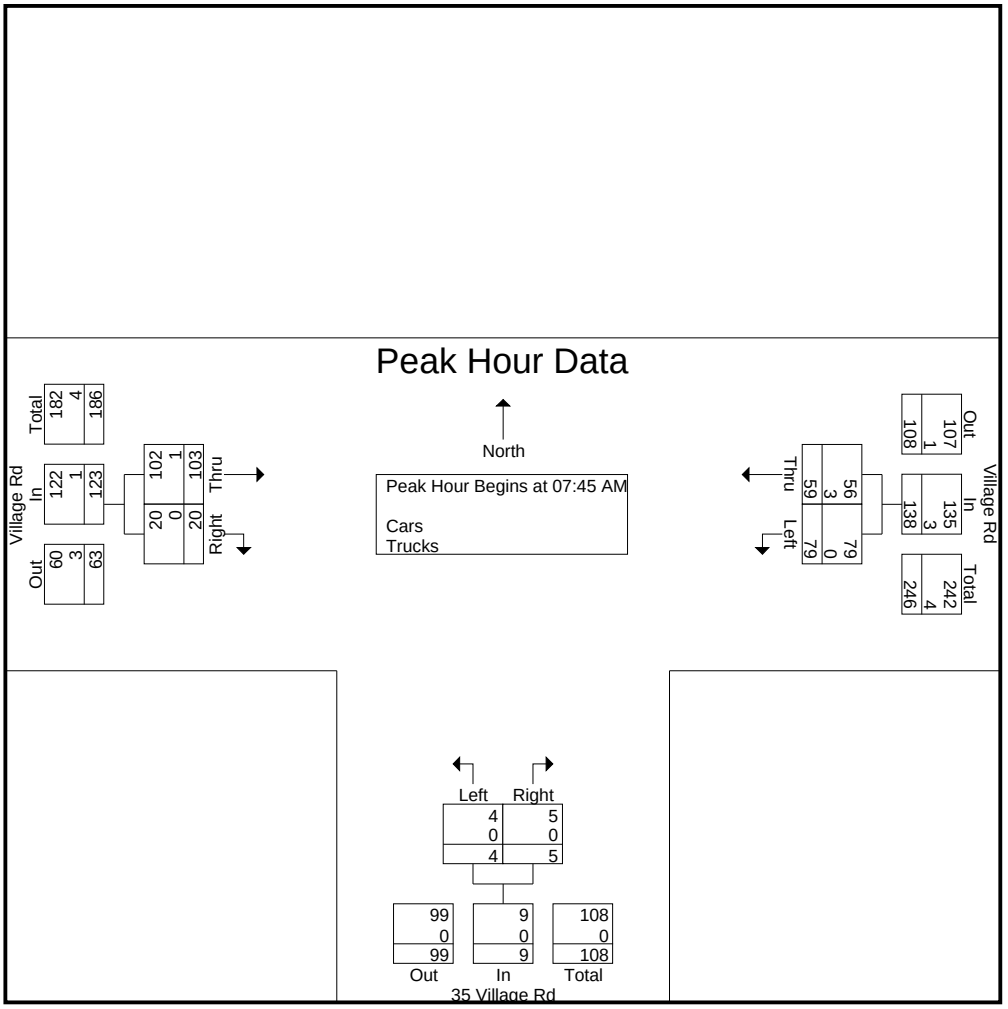
	Village Rd From East			35 Village Rd From South			Village Rd From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	18	**16**	34	0	1	1	20	4	24	59
08:00 AM	21	16	37	0	1	1	26	3	29	67
08:15 AM	15	14	29	**4**	**2**	**6**	28	**7**	**35**	70
08:30 AM	**25**	13	**38**	0	1	1	**29**	6	35	**74**
Total Volume	79	59	138	4	5	9	103	20	123	270
% App. Total	57.2	42.8		44.4	55.6		83.7	16.3		
PHF	.790	.922	.908	.250	.625	.375	.888	.714	.879	.912
Cars	79	56	135	4	5	9	102	20	122	266
% Cars	100	94.9	97.8	100	100	100	99.0	100	99.2	98.5
Trucks	0	3	3	0	0	0	1	0	1	4
% Trucks	0	5.1	2.2	0	0	0	1.0	0	0.8	1.5

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
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:

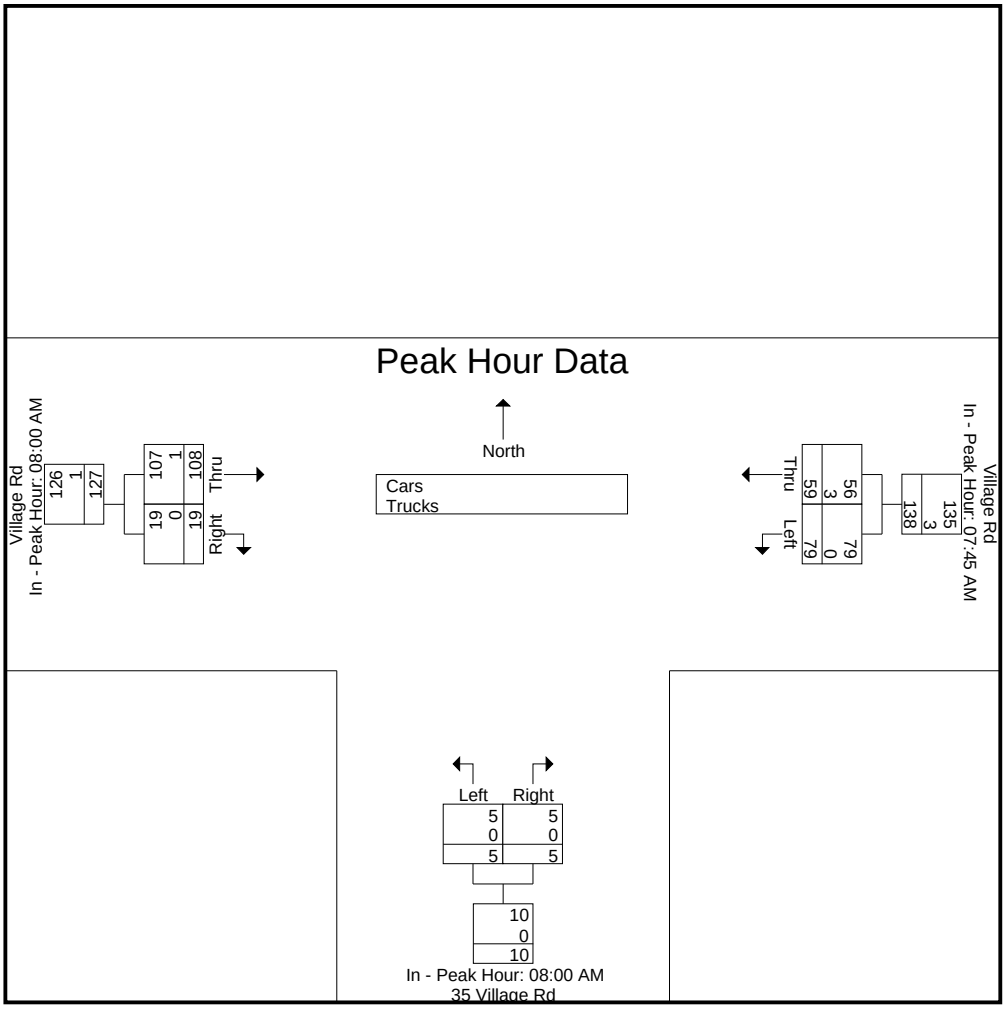
	07:45 AM			08:00 AM			08:00 AM		
+0 mins.	18	**16**	34	0	1	1	26	3	29
+15 mins.	21	16	37	**4**	**2**	**6**	28	**7**	**35**
+30 mins.	15	14	29	0	1	1	**29**	6	35
+45 mins.	**25**	13	**38**	1	1	2	25	3	28
Total Volume	79	59	138	5	5	10	108	19	127
% App. Total	57.2	42.8		50	50		85	15	
PHF	.790	.922	.908	.313	.625	.417	.931	.679	.907
Cars	79	56	135	5	5	10	107	19	126
% Cars	100	94.9	97.8	100	100	100	99.1	100	99.2
Trucks	0	3	3	0	0	0	1	0	1
% Trucks	0	5.1	2.2	0	0	0	0.9	0	0.8

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 3



Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 4

Groups Printed- Cars

	Village Rd From East		35 Village Rd From South		Village Rd From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	5	9	1	0	18	7	40
07:15 AM	9	4	0	0	17	3	33
07:30 AM	15	9	0	0	15	3	42
07:45 AM	18	15	0	1	20	4	58
Total	47	37	1	1	70	17	173
08:00 AM	21	14	0	1	26	3	65
08:15 AM	15	14	4	2	27	7	69
08:30 AM	25	13	0	1	29	6	74
08:45 AM	11	15	1	1	25	3	56
Total	72	56	5	5	107	19	264
Grand Total	119	93	6	6	177	36	437
Apprch %	56.1	43.9	50	50	83.1	16.9	
Total %	27.2	21.3	1.4	1.4	40.5	8.2	

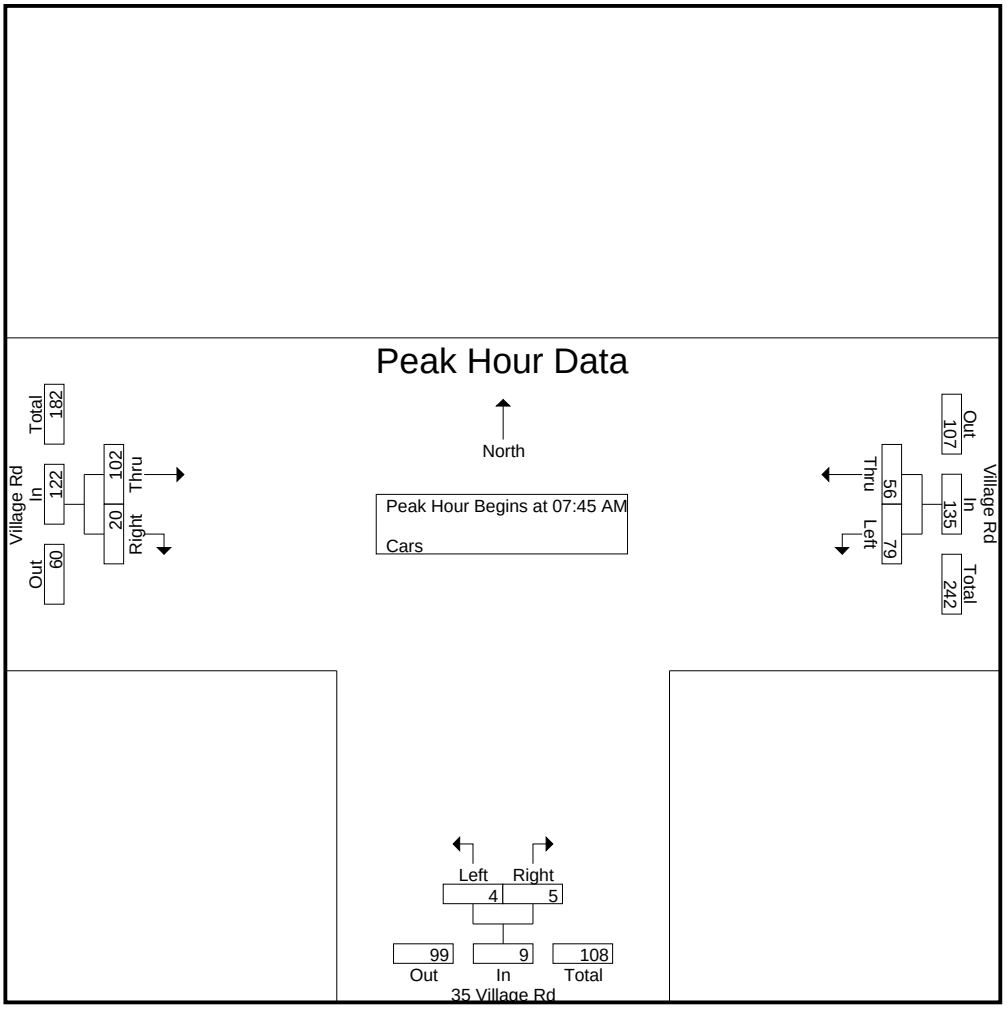
	Village Rd From East			35 Village Rd From South			Village Rd From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	18	**15**	33	0	1	1	20	4	24	58
08:00 AM	21	14	35	0	1	1	26	3	29	65
08:15 AM	15	14	29	**4**	**2**	**6**	27	**7**	34	69
08:30 AM	**25**	13	**38**	0	1	1	**29**	6	**35**	**74**
Total Volume	79	56	135	4	5	9	102	20	122	266
% App. Total	58.5	41.5		44.4	55.6		83.6	16.4		
PHF	.790	.933	.888	.250	.625	.375	.879	.714	.871	.899

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
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:

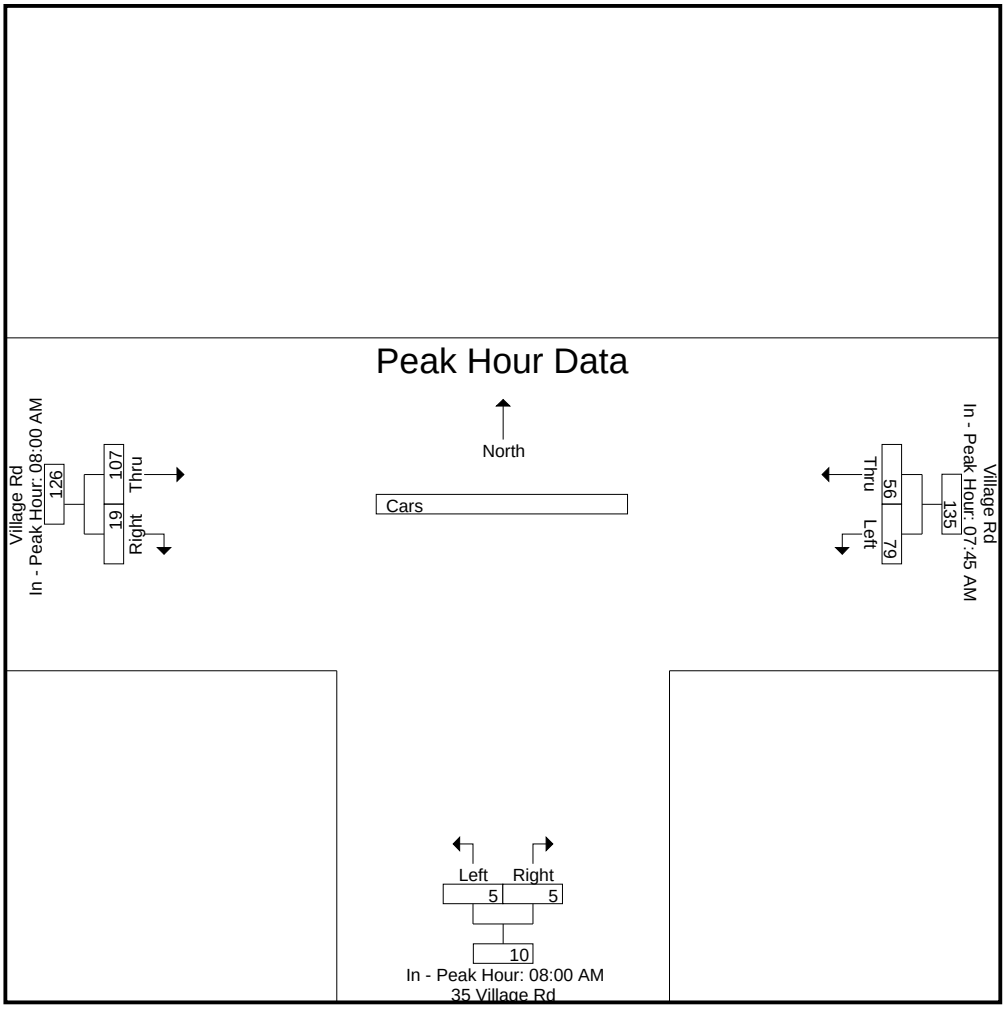
	07:45 AM			08:00 AM			08:00 AM		
+0 mins.	18	**15**	33	0	1	1	26	3	29
+15 mins.	21	14	35	**4**	**2**	**6**	27	**7**	34
+30 mins.	15	14	29	0	1	1	**29**	6	**35**
+45 mins.	**25**	13	**38**	1	1	2	25	3	28
Total Volume	79	56	135	5	5	10	107	19	126
% App. Total	58.5	41.5		50	50		84.9	15.1	
PHF	.790	.933	.888	.313	.625	.417	.922	.679	.900

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 6



Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 7

Groups Printed- Trucks

	Village Rd From East		35 Village Rd From South		Village Rd From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	1	0	0	0	0	1
07:15 AM	0	0	0	0	1	0	1
07:30 AM	0	0	0	0	0	0	0
07:45 AM	0	1	0	0	0	0	1
Total	0	2	0	0	1	0	3
08:00 AM	0	2	0	0	0	0	2
08:15 AM	0	0	0	0	1	0	1
08:30 AM	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0
Total	0	2	0	0	1	0	3
Grand Total	0	4	0	0	2	0	6
Apprch %	0	100	0	0	100	0	
Total %	0	66.7	0	0	33.3	0	

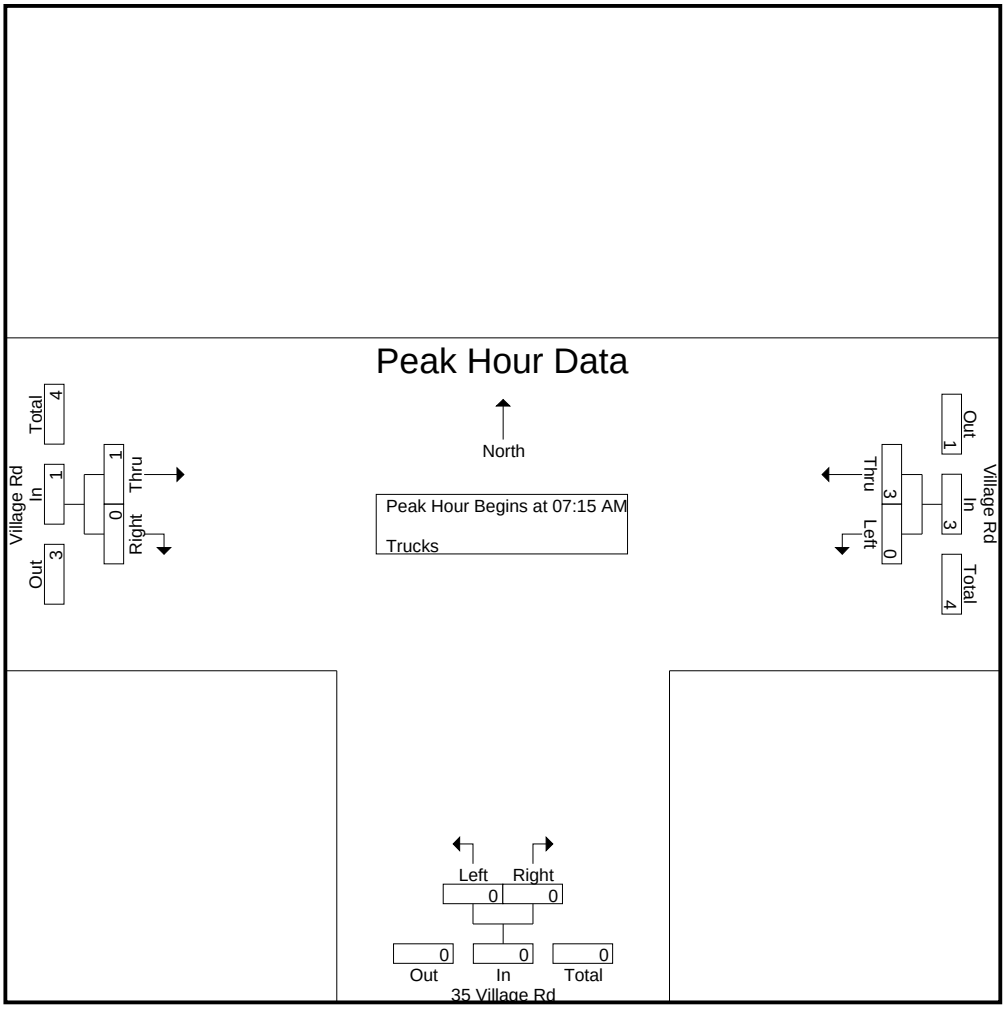
	Village Rd From East			35 Village Rd From South			Village Rd From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	0	0	0	**1**	0	**1**	1
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	1	0	0	0	0	0	0	1
08:00 AM	0	**2**	**2**	0	0	0	0	0	0	**2**
Total Volume	0	3	3	0	0	0	1	0	1	4
% App. Total	0	100		0	0		100	0		
PHF	.000	.375	.375	.000	.000	.000	.250	.000	.250	.500

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 8



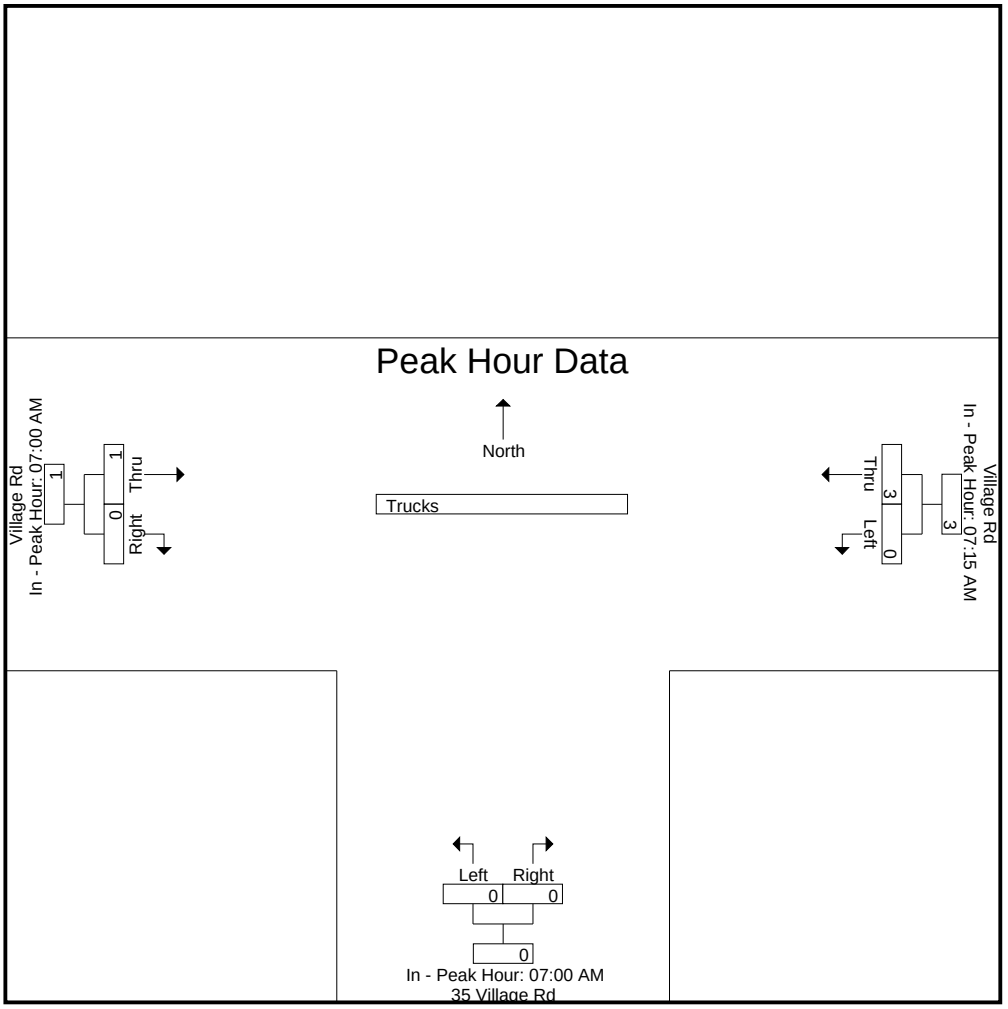
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	**1**	0	**1**
+30 mins.	0	1	1	0	0	0	0	0	0
+45 mins.	0	**2**	**2**	0	0	0	0	0	0
Total Volume	0	3	3	0	0	0	1	0	1
% App. Total	0	100		0	0		100	0	
PHF	.000	.375	.375	.000	.000	.000	.250	.000	.250

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 9



Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025

Groups Printed- Bikes Peds

	Village Rd From East			35 Village Rd From South			Village Rd From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0				
Total %										0	0	

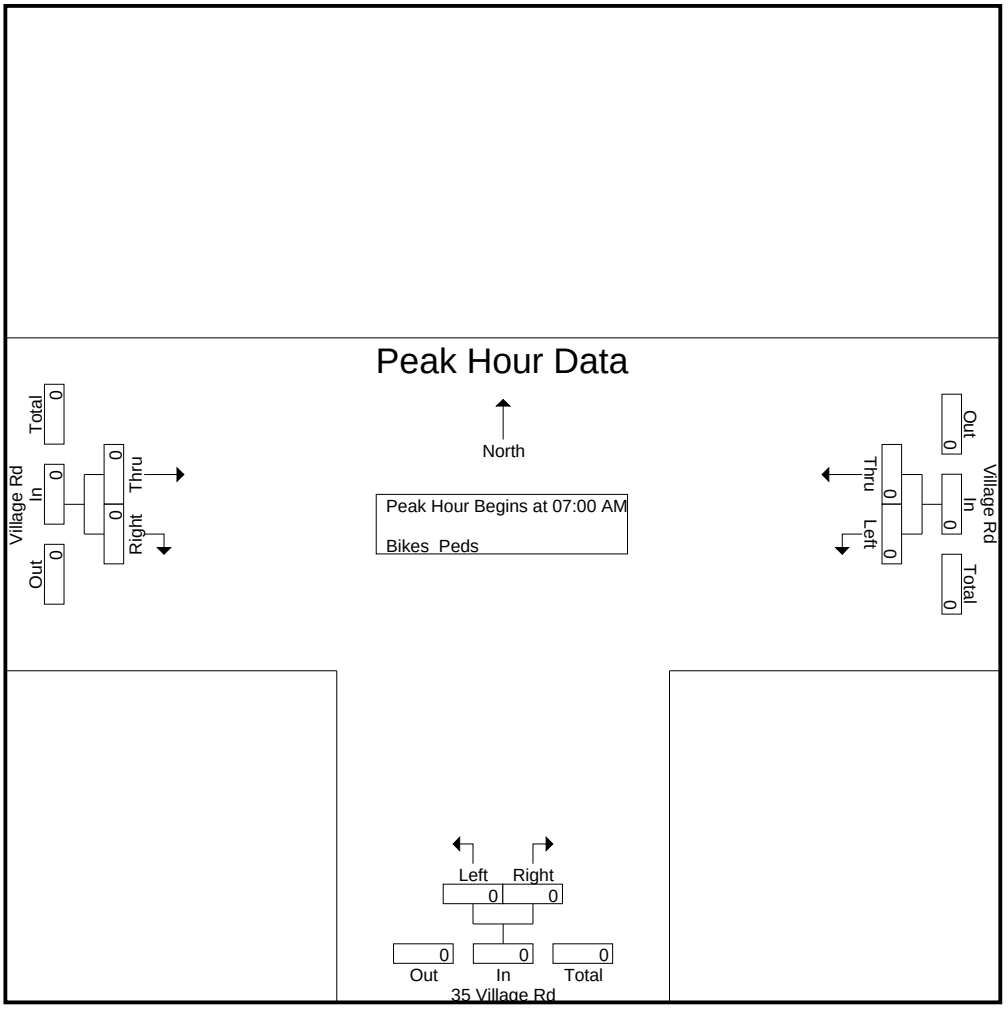
	Village Rd From East			35 Village Rd From South			Village Rd From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 11



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

Peak Hour for Each Approach Begins at:

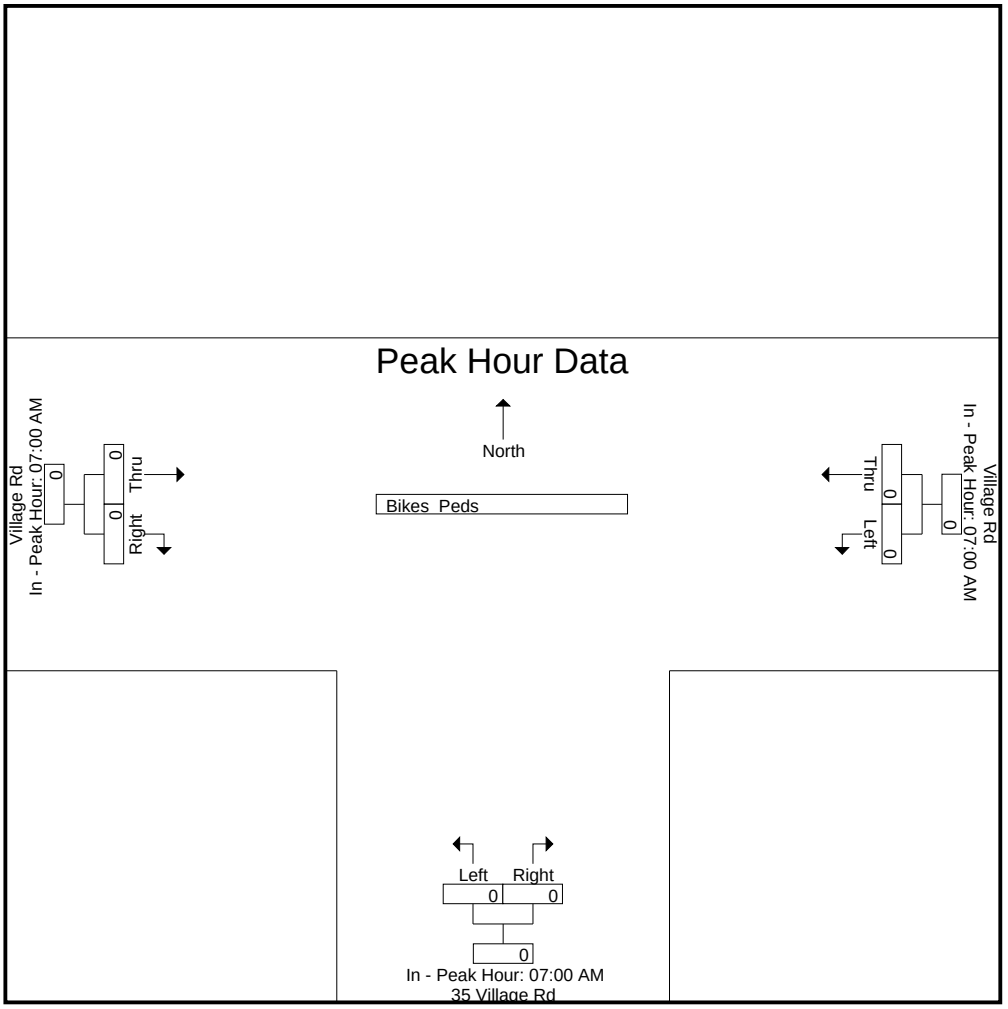
	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 12



Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 1

Groups Printed- Cars - Trucks

	Village Rd From East		35 Village Rd From South		Village Rd From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	2	29	5	12	22	1	71
04:15 PM	4	24	5	11	20	0	64
04:30 PM	1	29	7	12	21	1	71
04:45 PM	2	30	8	14	24	2	80
Total	9	112	25	49	87	4	286
05:00 PM	1	24	10	13	22	0	70
05:15 PM	2	20	2	14	10	0	48
05:30 PM	0	22	1	4	19	1	47
05:45 PM	0	19	1	3	16	0	39
Total	3	85	14	34	67	1	204
Grand Total	12	197	39	83	154	5	490
Apprch %	5.7	94.3	32	68	96.9	3.1	
Total %	2.4	40.2	8	16.9	31.4	1	
Cars	10	197	39	82	154	4	486
% Cars	83.3	100	100	98.8	100	80	99.2
Trucks	2	0	0	1	0	1	4
% Trucks	16.7	0	0	1.2	0	20	0.8

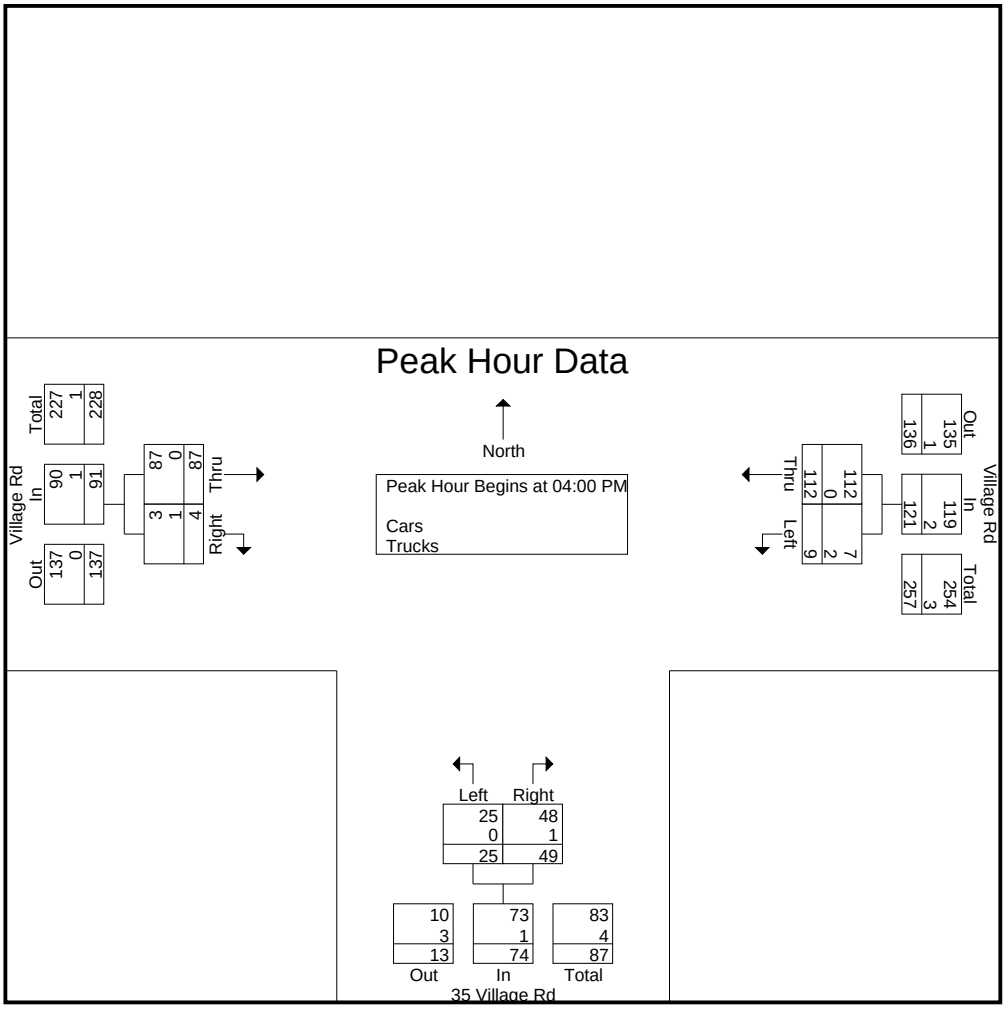
	Village Rd From East			35 Village Rd From South			Village Rd From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	2	29	31	5	12	17	22	1	23	71
04:15 PM	**4**	24	28	5	11	16	20	0	20	64
04:30 PM	1	29	30	7	12	19	21	1	22	71
04:45 PM	2	**30**	**32**	**8**	**14**	**22**	**24**	**2**	**26**	**80**
Total Volume	9	112	121	25	49	74	87	4	91	286
% App. Total	7.4	92.6		33.8	66.2		95.6	4.4		
PHF	.563	.933	.945	.781	.875	.841	.906	.500	.875	.894
Cars	7	112	119	25	48	73	87	3	90	282
% Cars	77.8	100	98.3	100	98.0	98.6	100	75.0	98.9	98.6
Trucks	2	0	2	0	1	1	0	1	1	4
% Trucks	22.2	0	1.7	0	2.0	1.4	0	25.0	1.1	1.4

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

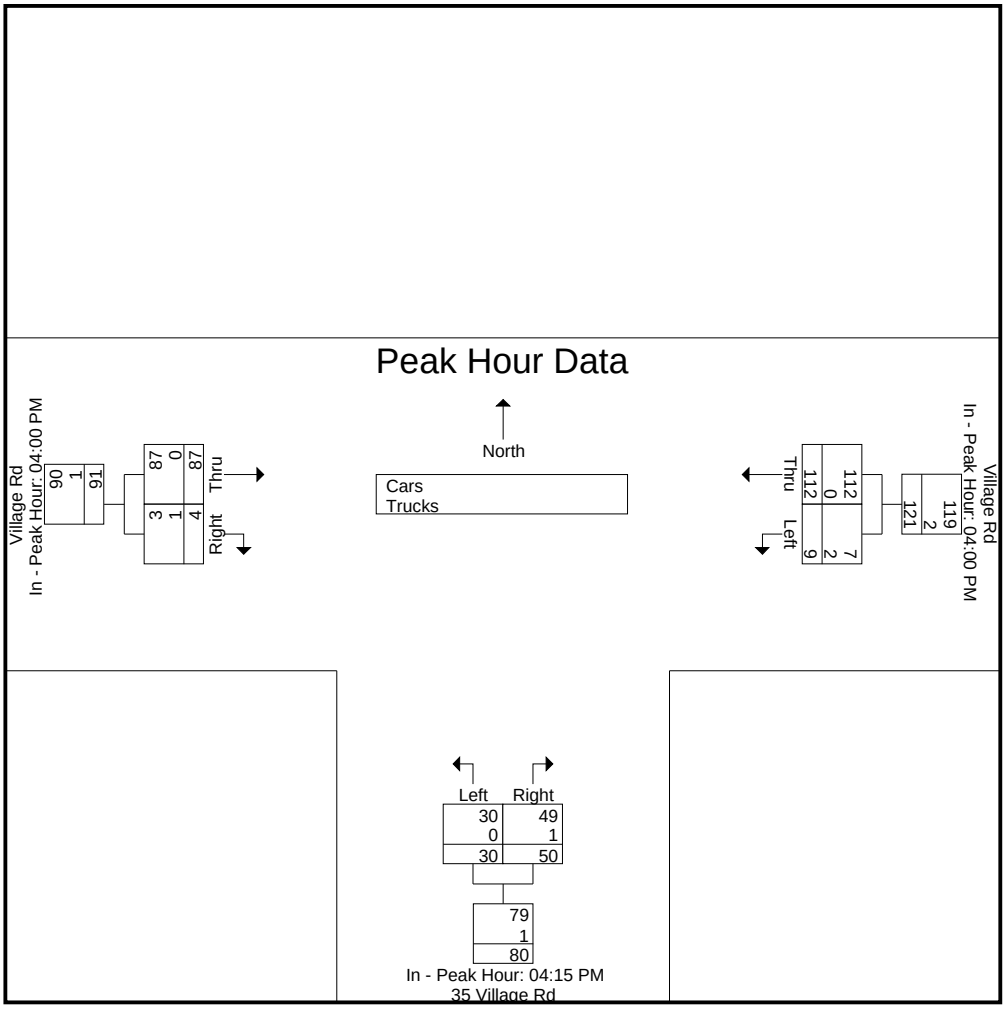
	04:00 PM			04:15 PM			04:00 PM		
+0 mins.	2	29	31	5	11	16	22	1	23
+15 mins.	**4**	24	28	7	12	19	20	0	20
+30 mins.	1	29	30	8	**14**	22	21	1	22
+45 mins.	2	**30**	**32**	**10**	13	**23**	**24**	**2**	**26**
Total Volume	9	112	121	30	50	80	87	4	91
% App. Total	7.4	92.6		37.5	62.5		95.6	4.4	
PHF	.563	.933	.945	.750	.893	.870	.906	.500	.875
Cars	7	112	119	30	49	79	87	3	90
% Cars	77.8	100	98.3	100	98	98.8	100	75	98.9
Trucks	2	0	2	0	1	1	0	1	1
% Trucks	22.2	0	1.7	0	2	1.2	0	25	1.1

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 3



Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 4

Groups Printed- Cars

	Village Rd From East		35 Village Rd From South		Village Rd From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	2	29	5	12	22	1	71
04:15 PM	2	24	5	11	20	0	62
04:30 PM	1	29	7	12	21	0	70
04:45 PM	2	30	8	13	24	2	79
Total	7	112	25	48	87	3	282
05:00 PM	1	24	10	13	22	0	70
05:15 PM	2	20	2	14	10	0	48
05:30 PM	0	22	1	4	19	1	47
05:45 PM	0	19	1	3	16	0	39
Total	3	85	14	34	67	1	204
Grand Total	10	197	39	82	154	4	486
Apprch %	4.8	95.2	32.2	67.8	97.5	2.5	
Total %	2.1	40.5	8	16.9	31.7	0.8	

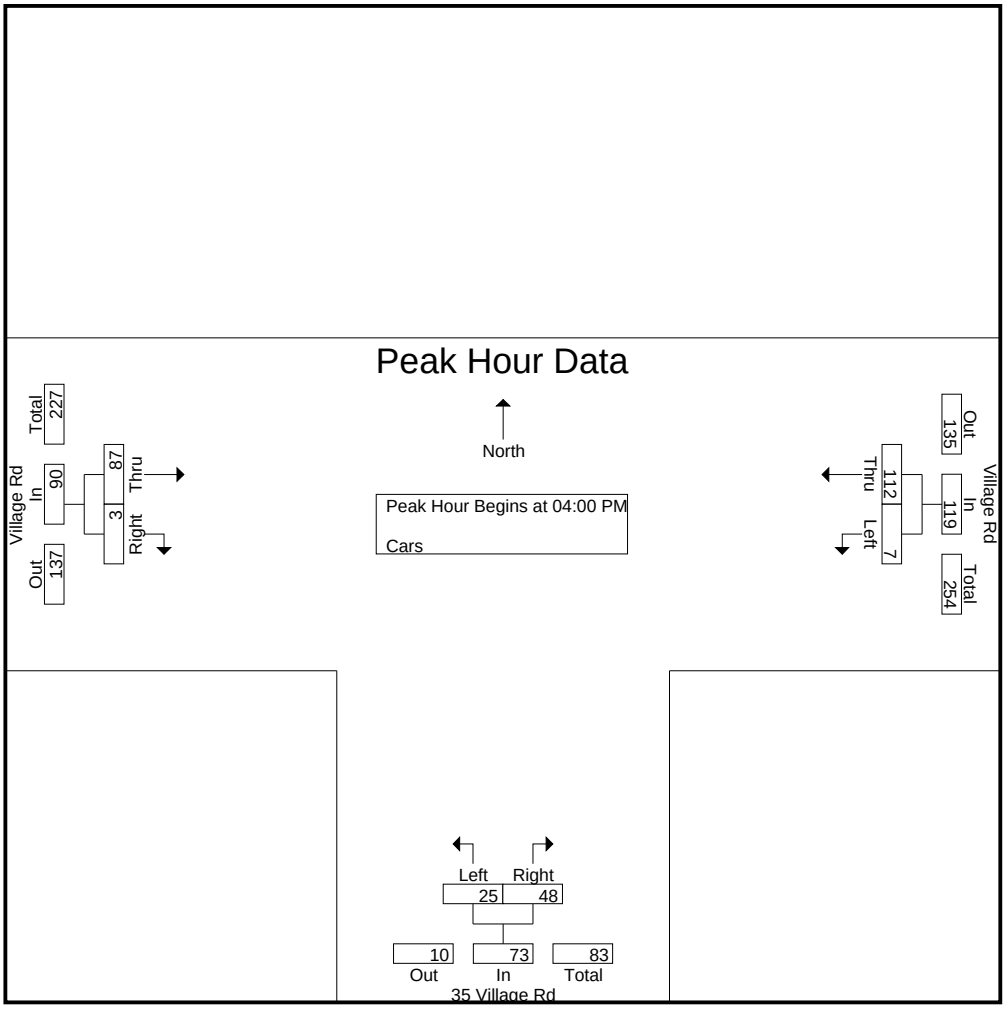
	Village Rd From East			35 Village Rd From South			Village Rd From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**2**	29	31	5	12	17	22	1	23	71
04:15 PM	2	24	26	5	11	16	20	0	20	62
04:30 PM	1	29	30	7	12	19	21	0	21	70
04:45 PM	2	**30**	**32**	**8**	**13**	**21**	**24**	**2**	**26**	**79**
Total Volume	7	112	119	25	48	73	87	3	90	282
% App. Total	5.9	94.1		34.2	65.8		96.7	3.3		
PHF	.875	.933	.930	.781	.923	.869	.906	.375	.865	.892

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 5



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

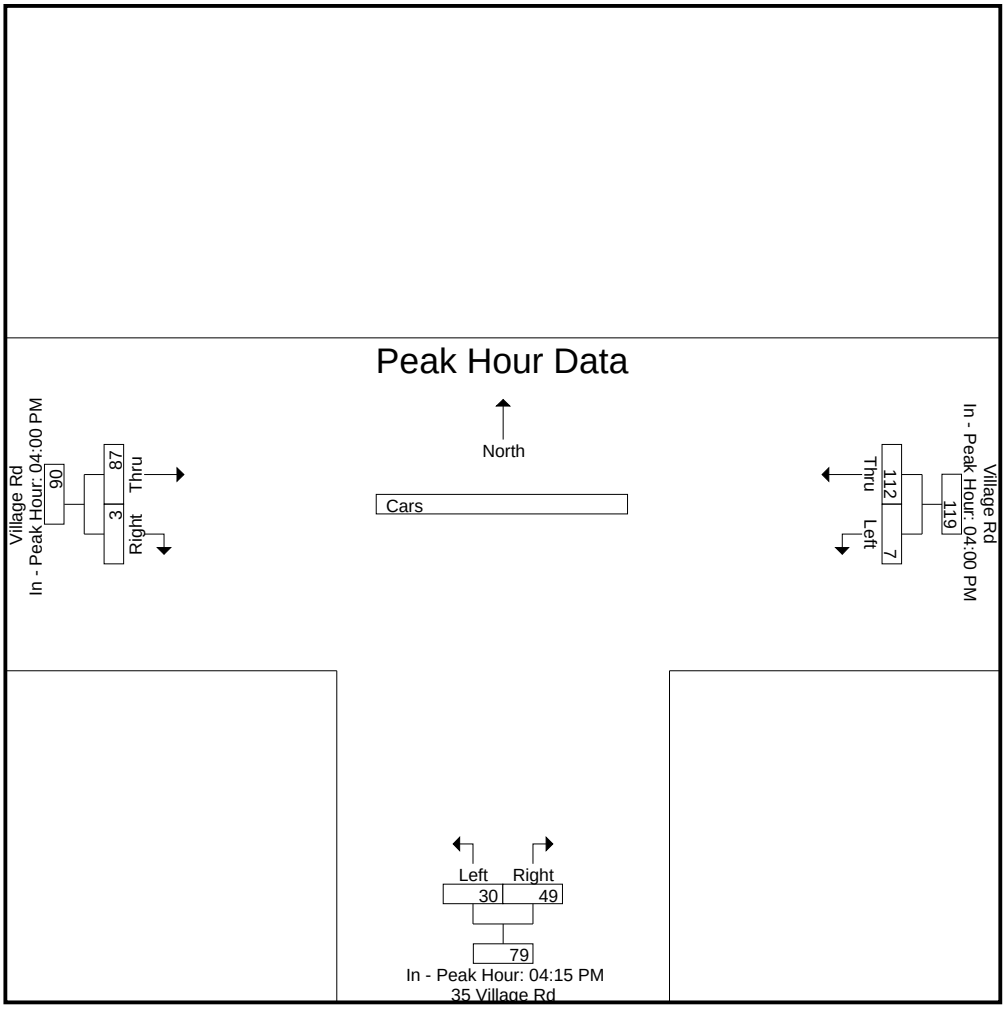
	04:00 PM			04:15 PM			04:00 PM		
+0 mins.	**2**	29	31	5	11	16	22	1	23
+15 mins.	2	24	26	7	12	19	20	0	20
+30 mins.	1	29	30	8	**13**	21	21	0	21
+45 mins.	2	**30**	**32**	**10**	13	**23**	**24**	**2**	**26**
Total Volume	7	112	119	30	49	79	87	3	90
% App. Total	5.9	94.1		38	62		96.7	3.3	
PHF	.875	.933	.930	.750	.942	.859	.906	.375	.865

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 6



Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 7

Groups Printed- Trucks

	Village Rd From East		35 Village Rd From South		Village Rd From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0
04:15 PM	2	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	1	1
04:45 PM	0	0	0	1	0	0	1
Total	2	0	0	1	0	1	4
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	2	0	0	1	0	1	4
Apprch %	100	0	0	100	0	100	
Total %	50	0	0	25	0	25	

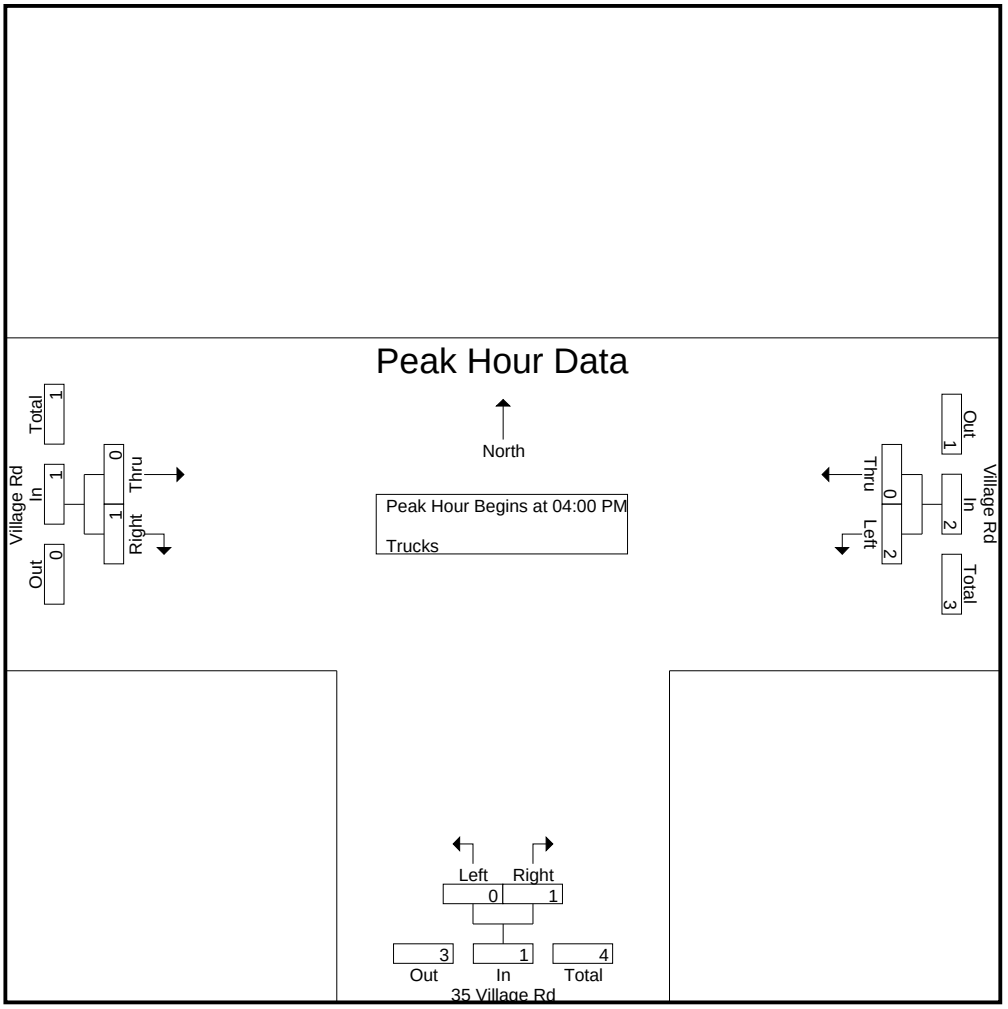
	Village Rd From East			35 Village Rd From South			Village Rd From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	**2**	0	**2**	0	0	0	0	0	0	**2**
04:30 PM	0	0	0	0	0	0	0	**1**	**1**	1
04:45 PM	0	0	0	0	**1**	**1**	0	0	0	1
Total Volume	2	0	2	0	1	1	0	1	1	4
% App. Total	100	0		0	100		0	100		
PHF	.250	.000	.250	.000	.250	.250	.000	.250	.250	.500

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

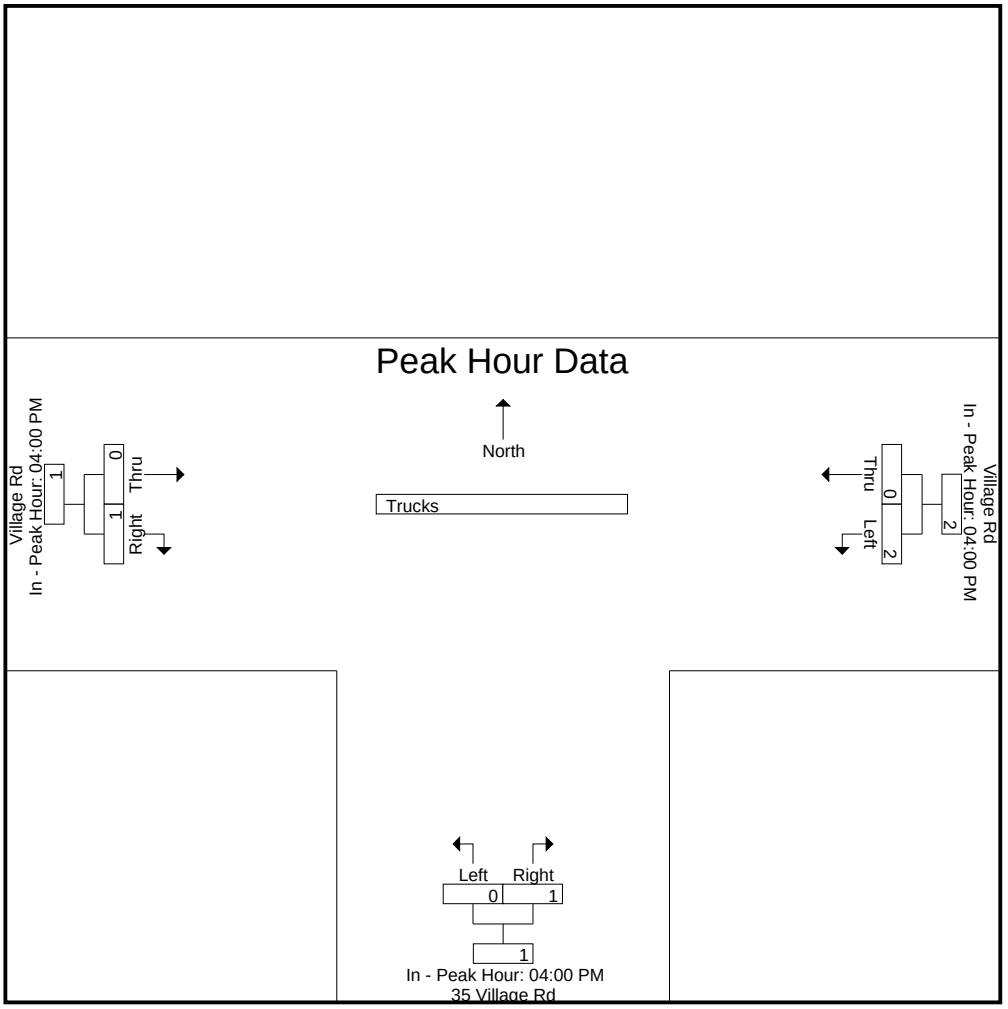
	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	**2**	0	**2**	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	**1**	**1**
+45 mins.	0	0	0	0	**1**	**1**	0	0	0
Total Volume	2	0	2	0	1	1	0	1	1
% App. Total	100	0		0	100		0	100	
PHF	.250	.000	.250	.000	.250	.250	.000	.250	.250

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 9



Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 10

Groups Printed- Bikes Peds

	Village Rd From East			35 Village Rd From South			Village Rd From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0				
Total %										0	0	

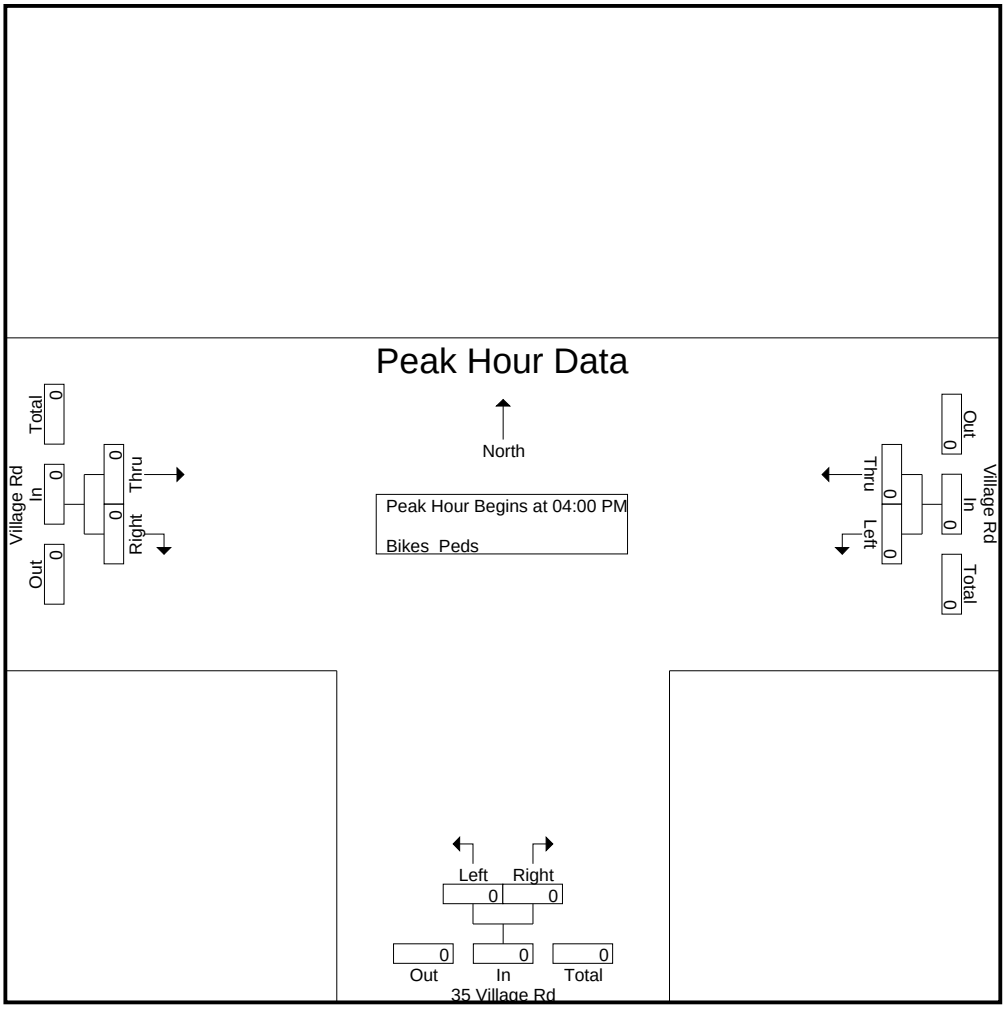
	Village Rd From East			35 Village Rd From South			Village Rd From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

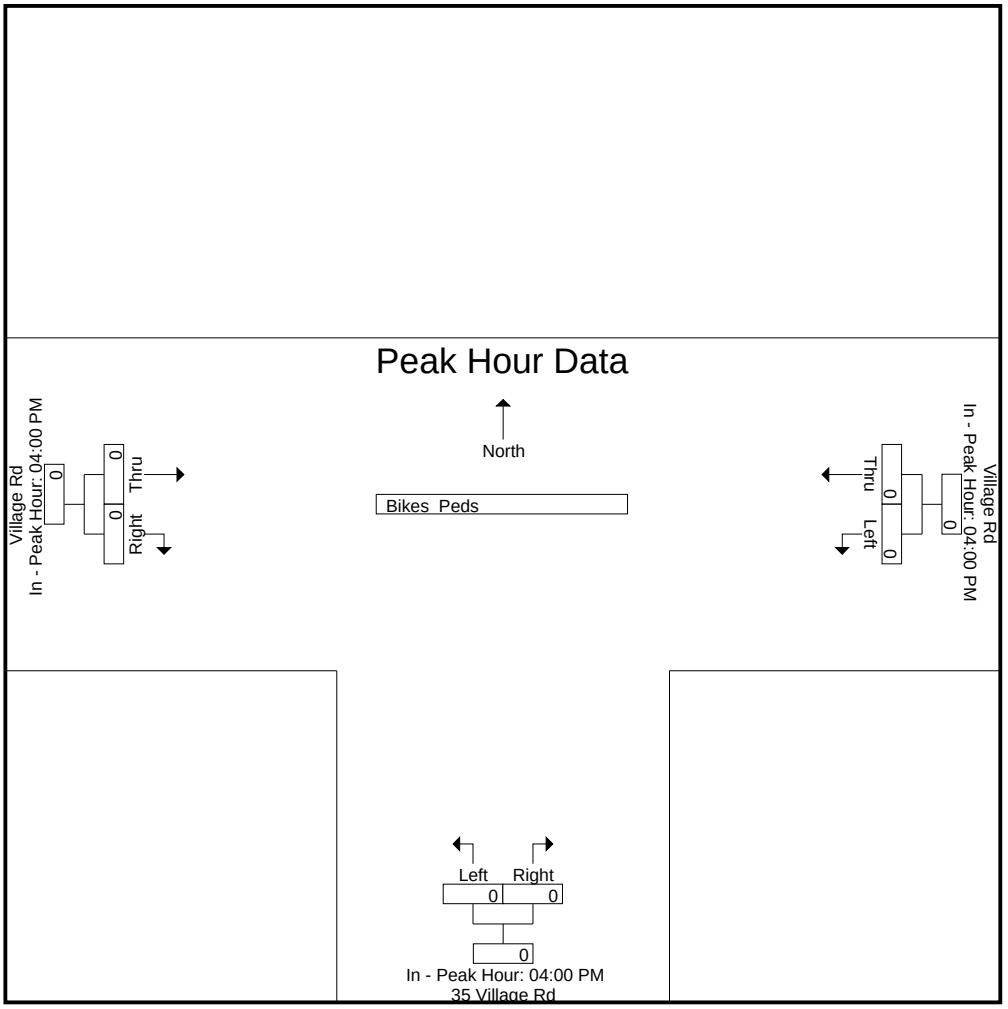
	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : 35 Village Road
E/W Street : Village Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255002
Site Code : 10255002
Start Date : 6/17/2025
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 1

Groups Printed- Cars - Trucks

	Route 1 From North		Route 1 From South		Ferncroft Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	306	17	0	0	0	23	346
07:15 AM	345	36	0	0	0	27	408
07:30 AM	428	39	0	0	0	23	490
07:45 AM	488	64	0	0	0	31	583
Total	1567	156	0	0	0	104	1827
08:00 AM	393	64	0	0	0	31	488
08:15 AM	416	67	0	0	0	40	523
08:30 AM	394	72	0	0	0	36	502
08:45 AM	358	93	0	0	0	39	490
Total	1561	296	0	0	0	146	2003
Grand Total	3128	452	0	0	0	250	3830
Apprch %	87.4	12.6	0	0	0	100	
Total %	81.7	11.8	0	0	0	6.5	
Cars	3064	450	0	0	0	244	3758
% Cars	98	99.6	0	0	0	97.6	98.1
Trucks	64	2	0	0	0	6	72
% Trucks	2	0.4	0	0	0	2.4	1.9

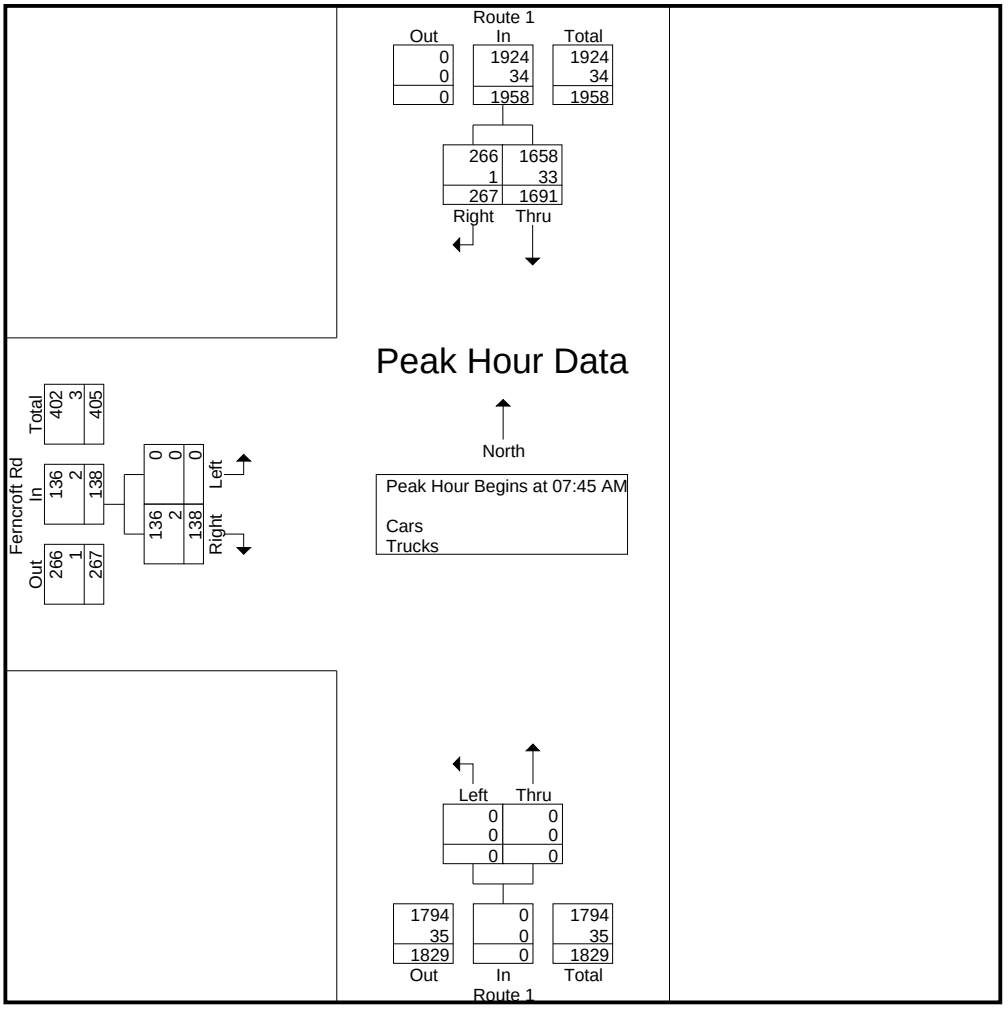
	Route 1 From North			Route 1 From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	**488**	64	**552**	0	0	0	0	31	31	**583**
08:00 AM	393	64	457	0	0	0	0	31	31	488
08:15 AM	416	67	483	0	0	0	0	**40**	**40**	523
08:30 AM	394	**72**	466	0	0	0	0	36	36	502
Total Volume	1691	267	1958	0	0	0	0	138	138	2096
% App. Total	86.4	13.6		0	0		0	100		
PHF	.866	.927	.887	.000	.000	.000	.000	.863	.863	.899
Cars	1658	266	1924	0	0	0	0	136	136	2060
% Cars	98.0	99.6	98.3	0	0	0	0	98.6	98.6	98.3
Trucks	33	1	34	0	0	0	0	2	2	36
% Trucks	2.0	0.4	1.7	0	0	0	0	1.4	1.4	1.7

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 2



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

Peak Hour for Each Approach Begins at:

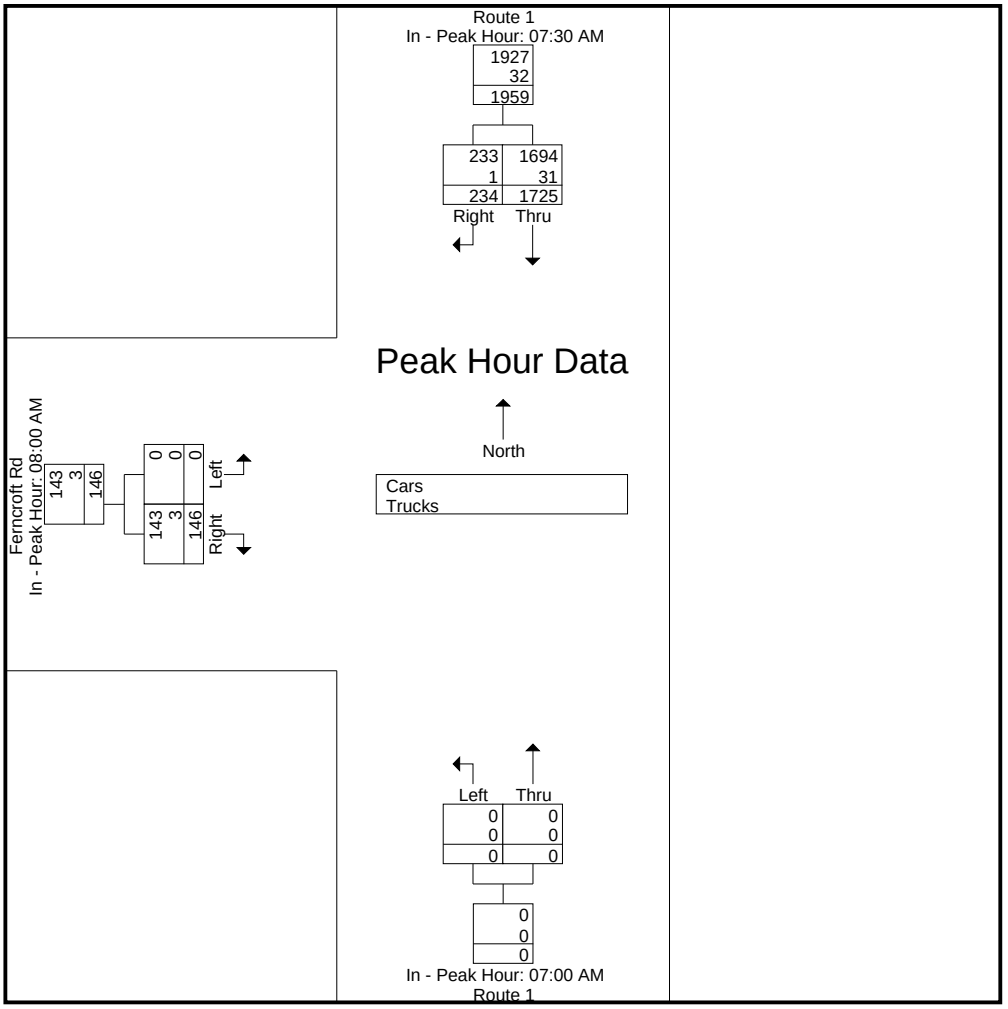
	07:30 AM			07:00 AM			08:00 AM		
+0 mins.	428	39	467	0	0	0	0	31	31
+15 mins.	**488**	64	**552**	0	0	0	0	**40**	**40**
+30 mins.	393	64	457	0	0	0	0	36	36
+45 mins.	416	**67**	483	0	0	0	0	39	39
Total Volume	1725	234	1959	0	0	0	0	146	146
% App. Total	88.1	11.9		0	0		0	100	
PHF	.884	.873	.887	.000	.000	.000	.000	.913	.913
Cars	1694	233	1927	0	0	0	0	143	143
% Cars	98.2	99.6	98.4	0	0	0	0	97.9	97.9
Trucks	31	1	32	0	0	0	0	3	3
% Trucks	1.8	0.4	1.6	0	0	0	0	2.1	2.1

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025

Groups Printed- Cars

	Route 1 From North		Route 1 From South		Ferncroft Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	300	16	0	0	0	23	339
07:15 AM	341	36	0	0	0	26	403
07:30 AM	421	39	0	0	0	22	482
07:45 AM	479	64	0	0	0	30	573
Total	1541	155	0	0	0	101	1797
08:00 AM	384	63	0	0	0	31	478
08:15 AM	410	67	0	0	0	39	516
08:30 AM	385	72	0	0	0	36	493
08:45 AM	344	93	0	0	0	37	474
Total	1523	295	0	0	0	143	1961
Grand Total	3064	450	0	0	0	244	3758
Apprch %	87.2	12.8	0	0	0	100	
Total %	81.5	12	0	0	0	6.5	

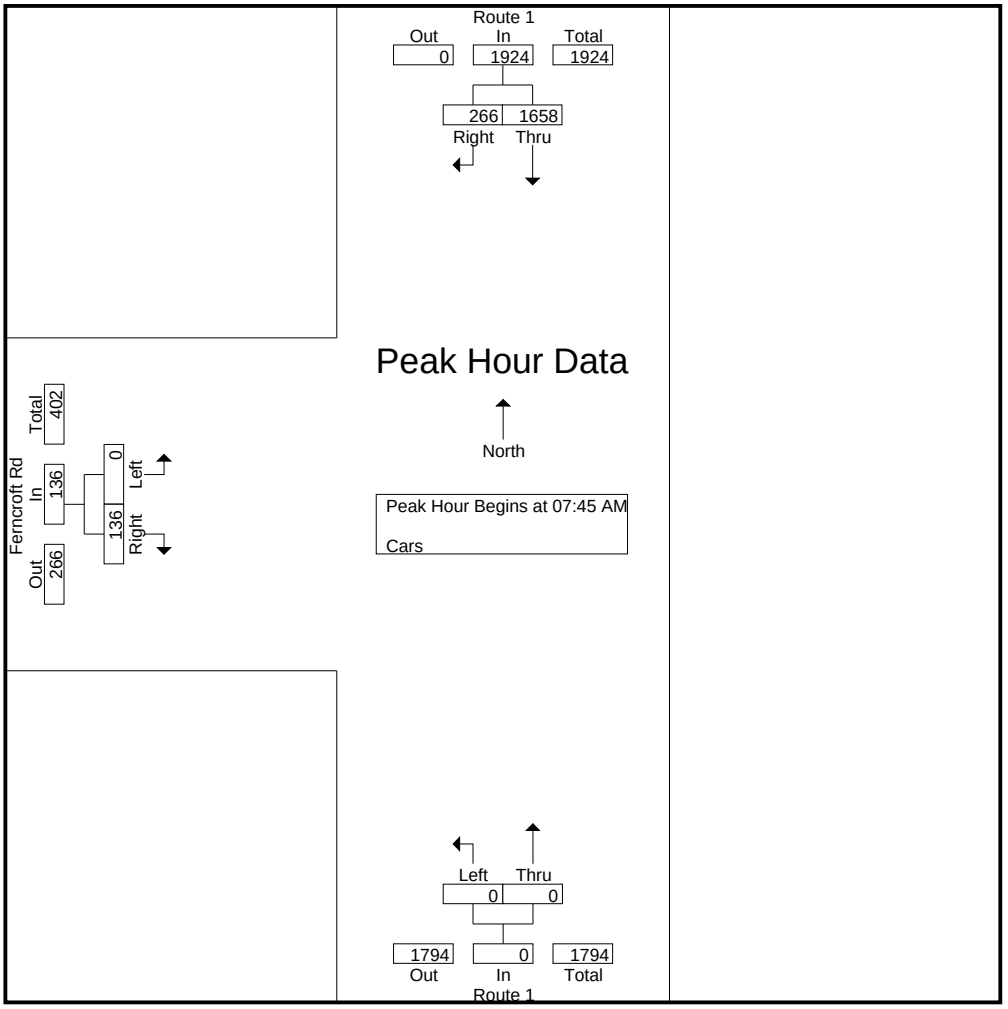
	Route 1 From North			Route 1 From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	**479**	64	**543**	0	0	0	0	30	30	**573**
08:00 AM	384	63	447	0	0	0	0	31	31	478
08:15 AM	410	67	477	0	0	0	0	**39**	**39**	516
08:30 AM	385	**72**	457	0	0	0	0	36	36	493
Total Volume	1658	266	1924	0	0	0	0	136	136	2060
% App. Total	86.2	13.8		0	0		0	100		
PHF	.865	.924	.886	.000	.000	.000	.000	.872	.872	.899

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
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:

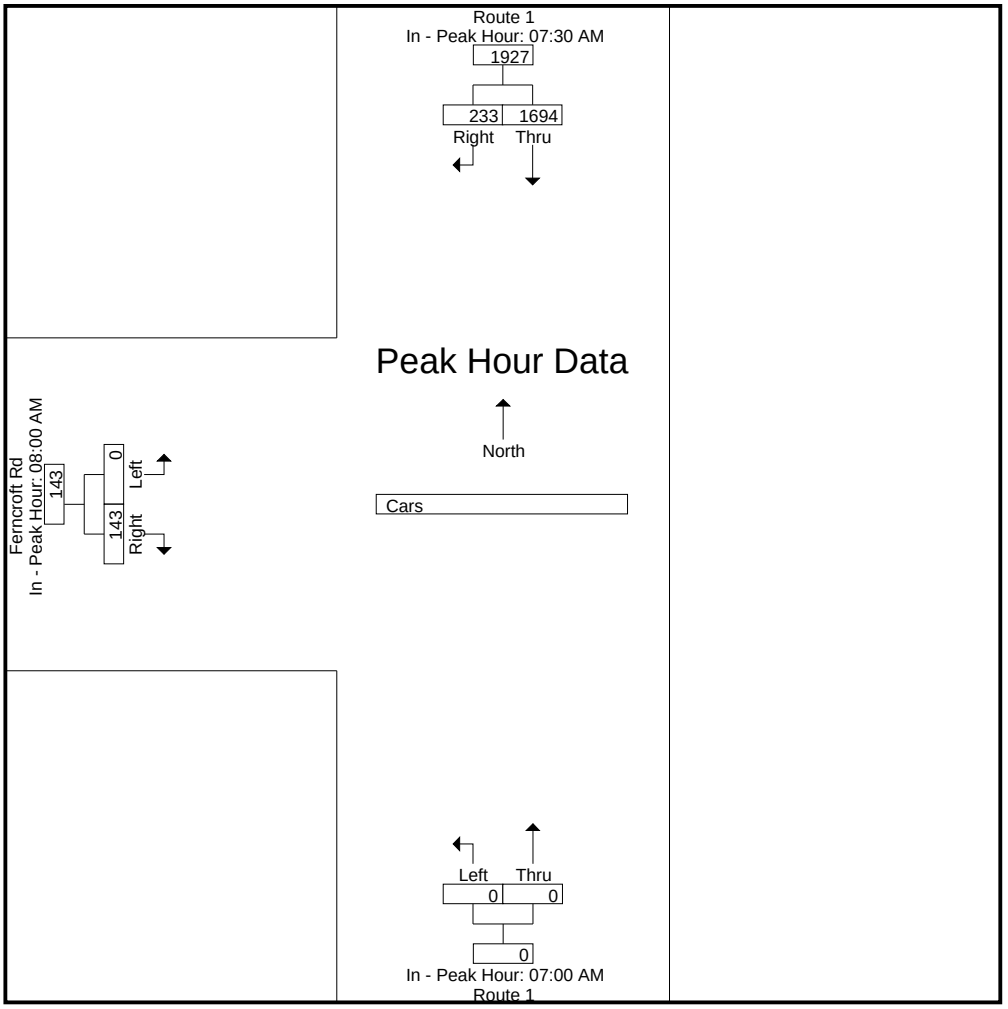
	07:30 AM			07:00 AM			08:00 AM		
+0 mins.	421	39	460	0	0	0	0	31	31
+15 mins.	**479**	64	**543**	0	0	0	0	**39**	**39**
+30 mins.	384	63	447	0	0	0	0	36	36
+45 mins.	410	**67**	477	0	0	0	0	37	37
Total Volume	1694	233	1927	0	0	0	0	143	143
% App. Total	87.9	12.1		0	0		0	100	
PHF	.884	.869	.887	.000	.000	.000	.000	.917	.917

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025

Groups Printed- Trucks

	Route 1 From North		Route 1 From South		Ferncroft Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	6	1	0	0	0	0	7
07:15 AM	4	0	0	0	0	1	5
07:30 AM	7	0	0	0	0	1	8
07:45 AM	9	0	0	0	0	1	10
Total	26	1	0	0	0	3	30
08:00 AM	9	1	0	0	0	0	10
08:15 AM	6	0	0	0	0	1	7
08:30 AM	9	0	0	0	0	0	9
08:45 AM	14	0	0	0	0	2	16
Total	38	1	0	0	0	3	42
Grand Total	64	2	0	0	0	6	72
Apprch %	97	3	0	0	0	100	
Total %	88.9	2.8	0	0	0	8.3	

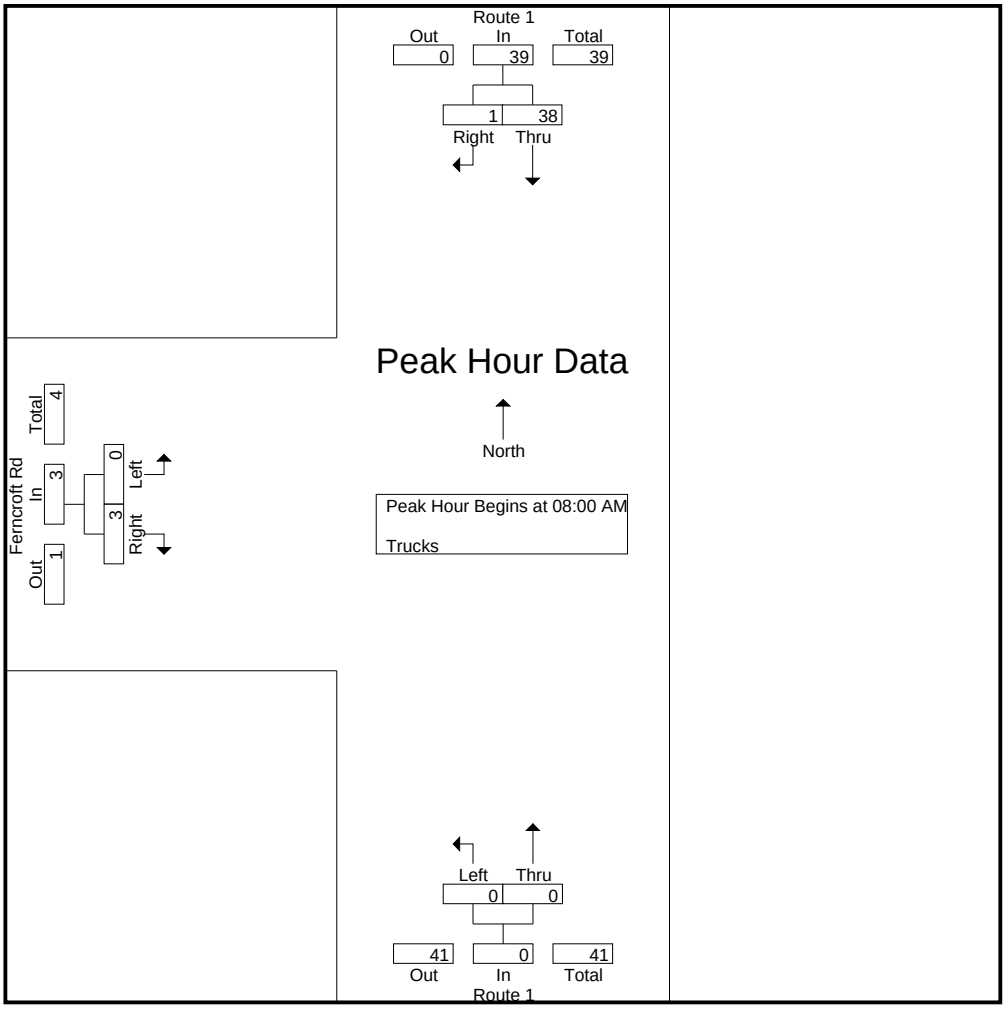
	Route 1 From North			Route 1 From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	9	**1**	10	0	0	0	0	0	0	10
08:15 AM	6	0	6	0	0	0	0	1	1	7
08:30 AM	9	0	9	0	0	0	0	0	0	9
08:45 AM	**14**	0	**14**	0	0	0	0	**2**	**2**	**16**
Total Volume	38	1	39	0	0	0	0	3	3	42
% App. Total	97.4	2.6		0	0		0	100		
PHF	.679	.250	.696	.000	.000	.000	.000	.375	.375	.656

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
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:

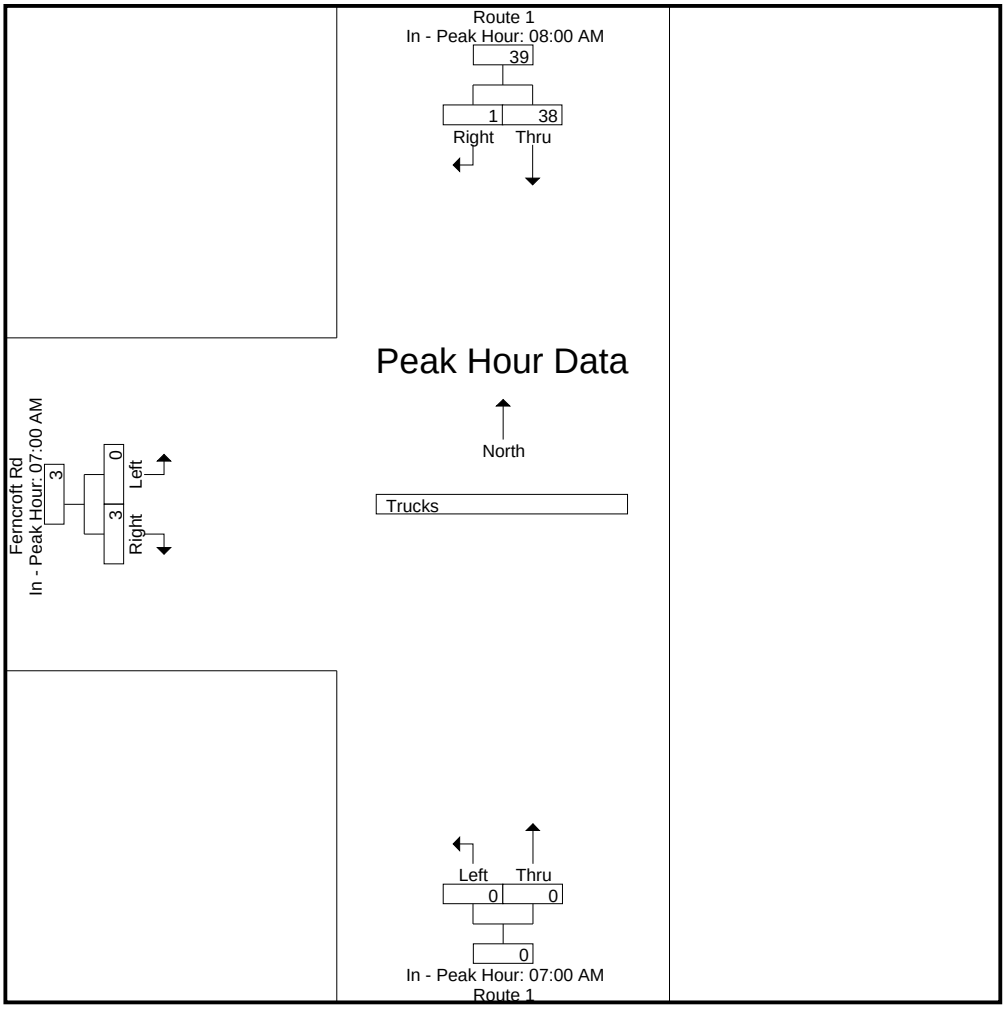
	08:00 AM			07:00 AM			07:00 AM		
+0 mins.	9	**1**	10	0	0	0	0	0	0
+15 mins.	6	0	6	0	0	0	0	**1**	**1**
+30 mins.	9	0	9	0	0	0	0	1	1
+45 mins.	**14**	0	**14**	0	0	0	0	1	1
Total Volume	38	1	39	0	0	0	0	3	3
% App. Total	97.4	2.6		0	0		0	100	
PHF	.679	.250	.696	.000	.000	.000	.000	.750	.750

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025

Groups Printed- Bikes Peds

	Route 1 From North			Route 1 From South			Ferncroft Rd From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0				
Total %										0	0	

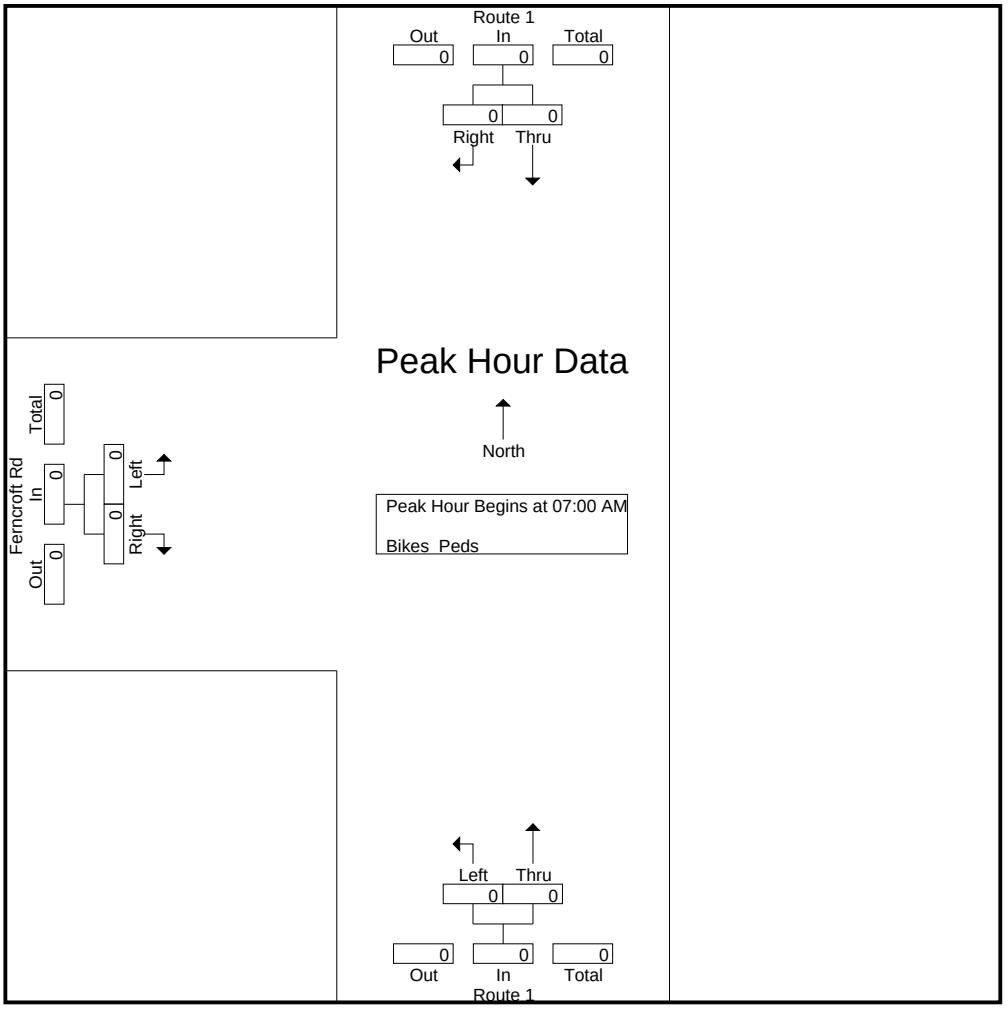
	Route 1 From North			Route 1 From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0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

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 11



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

Peak Hour for Each Approach Begins at:

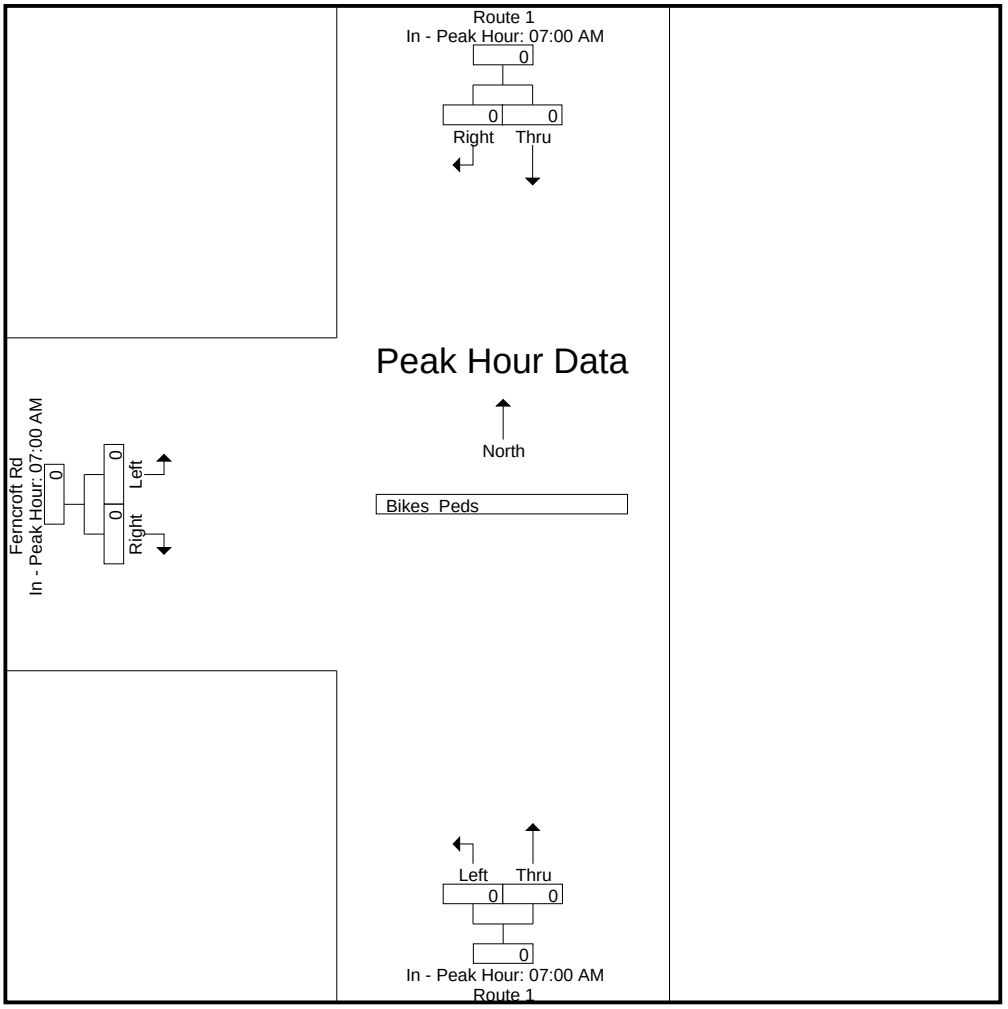
	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 1

Groups Printed- Cars - Trucks

	Route 1 From North		Route 1 From South		Ferncroft Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	308	36	0	0	0	87	431
04:15 PM	329	45	0	0	0	48	422
04:30 PM	318	40	0	0	0	59	417
04:45 PM	319	44	0	0	0	52	415
Total	1274	165	0	0	0	246	1685
05:00 PM	322	42	0	0	0	63	427
05:15 PM	314	48	0	0	0	40	402
05:30 PM	262	40	0	0	0	43	345
05:45 PM	278	48	0	0	0	38	364
Total	1176	178	0	0	0	184	1538
Grand Total	2450	343	0	0	0	430	3223
Apprch %	87.7	12.3	0	0	0	100	
Total %	76	10.6	0	0	0	13.3	
Cars	2433	342	0	0	0	429	3204
% Cars	99.3	99.7	0	0	0	99.8	99.4
Trucks	17	1	0	0	0	1	19
% Trucks	0.7	0.3	0	0	0	0.2	0.6

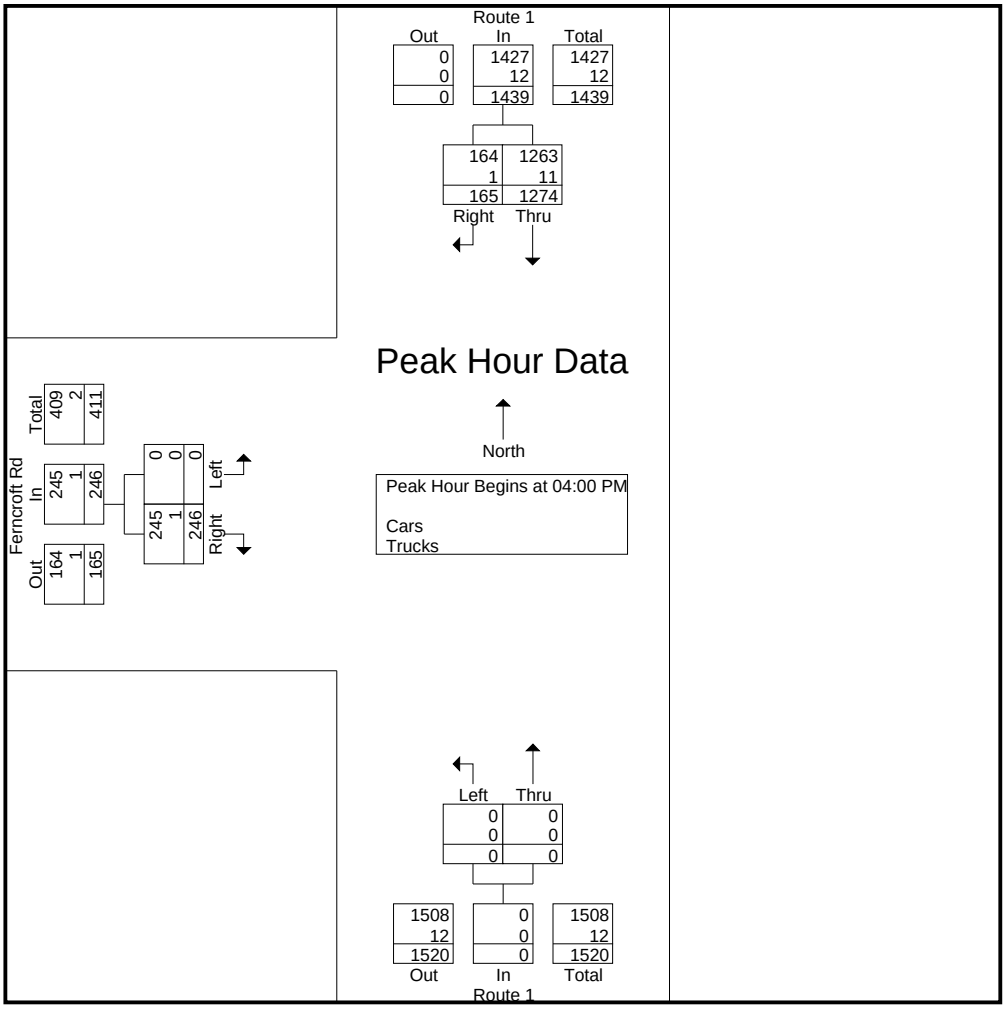
	Route 1 From North			Route 1 From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	308	36	344	0	0	0	0	**87**	**87**	**431**
04:15 PM	**329**	**45**	**374**	0	0	0	0	48	48	422
04:30 PM	318	40	358	0	0	0	0	59	59	417
04:45 PM	319	44	363	0	0	0	0	52	52	415
Total Volume	1274	165	1439	0	0	0	0	246	246	1685
% App. Total	88.5	11.5		0	0		0	100		
PHF	.968	.917	.962	.000	.000	.000	.000	.707	.707	.977
Cars	1263	164	1427	0	0	0	0	245	245	1672
% Cars	99.1	99.4	99.2	0	0	0	0	99.6	99.6	99.2
Trucks	11	1	12	0	0	0	0	1	1	13
% Trucks	0.9	0.6	0.8	0	0	0	0	0.4	0.4	0.8

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

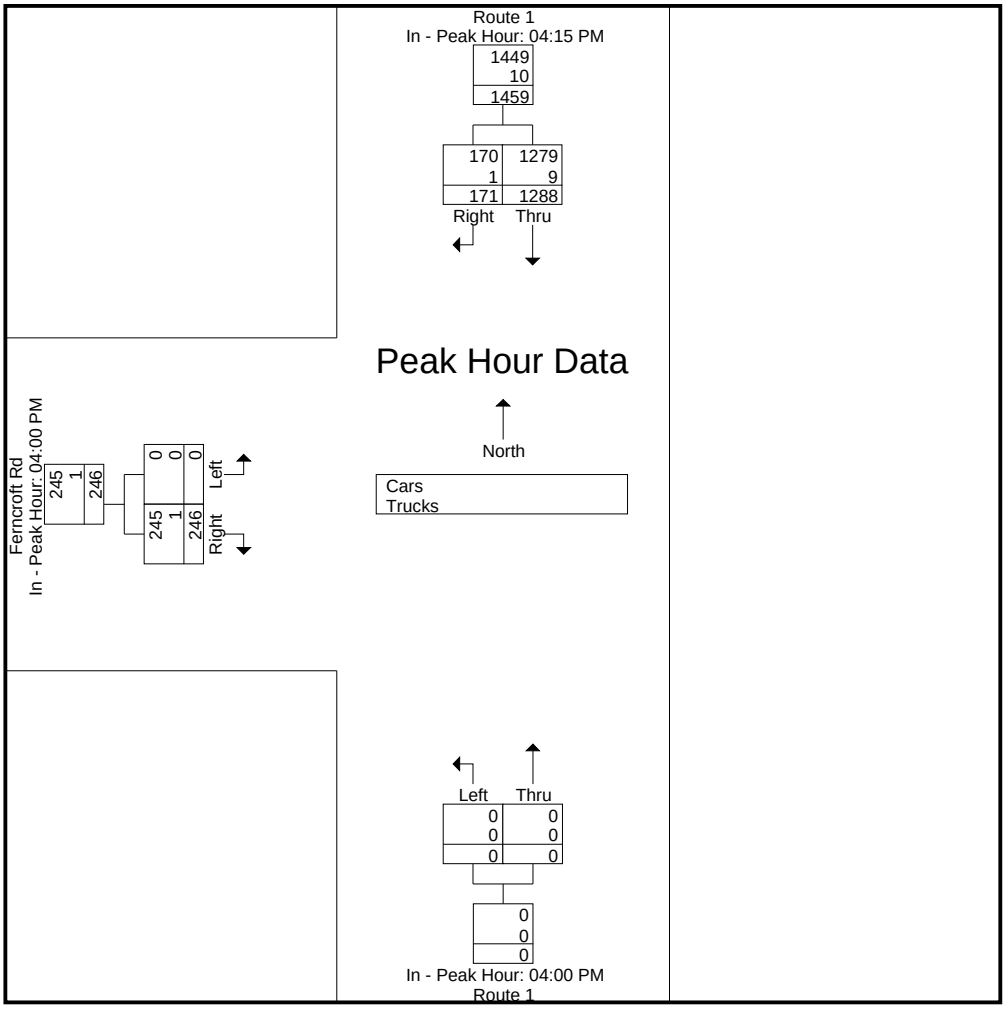
	04:15 PM			04:00 PM			04:00 PM		
+0 mins.	**329**	**45**	**374**	0	0	0	0	**87**	**87**
+15 mins.	318	40	358	0	0	0	0	48	48
+30 mins.	319	44	363	0	0	0	0	59	59
+45 mins.	322	42	364	0	0	0	0	52	52
Total Volume	1288	171	1459	0	0	0	0	246	246
% App. Total	88.3	11.7		0	0		0	100	
PHF	.979	.950	.975	.000	.000	.000	.000	.707	.707
Cars	1279	170	1449	0	0	0	0	245	245
% Cars	99.3	99.4	99.3	0	0	0	0	99.6	99.6
Trucks	9	1	10	0	0	0	0	1	1
% Trucks	0.7	0.6	0.7	0	0	0	0	0.4	0.4

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025

Groups Printed- Cars

	Route 1 From North		Route 1 From South		Ferncroft Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	305	36	0	0	0	87	428
04:15 PM	324	44	0	0	0	48	416
04:30 PM	317	40	0	0	0	59	416
04:45 PM	317	44	0	0	0	51	412
Total	1263	164	0	0	0	245	1672
05:00 PM	321	42	0	0	0	63	426
05:15 PM	312	48	0	0	0	40	400
05:30 PM	261	40	0	0	0	43	344
05:45 PM	276	48	0	0	0	38	362
Total	1170	178	0	0	0	184	1532
Grand Total	2433	342	0	0	0	429	3204
Apprch %	87.7	12.3	0	0	0	100	
Total %	75.9	10.7	0	0	0	13.4	

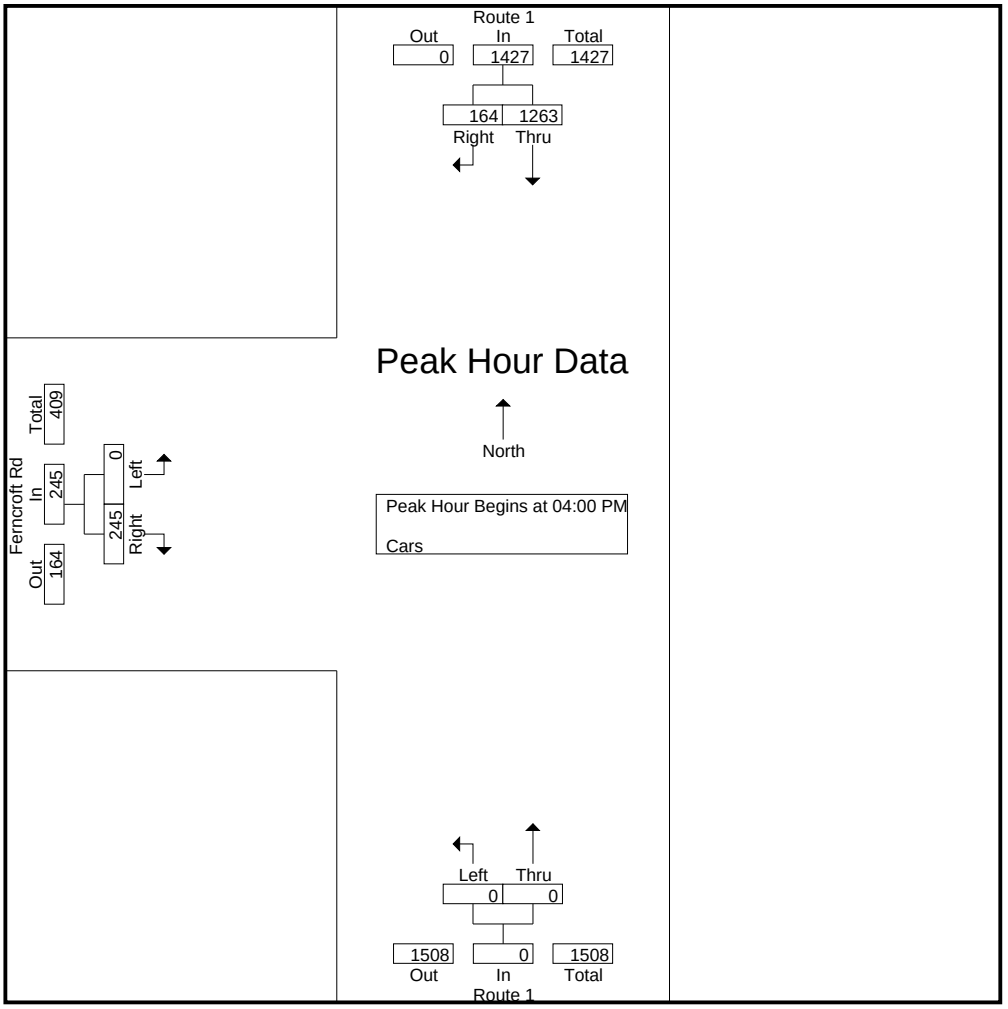
	Route 1 From North			Route 1 From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	305	36	341	0	0	0	0	**87**	**87**	**428**
04:15 PM	**324**	**44**	**368**	0	0	0	0	48	48	416
04:30 PM	317	40	357	0	0	0	0	59	59	416
04:45 PM	317	44	361	0	0	0	0	51	51	412
Total Volume	1263	164	1427	0	0	0	0	245	245	1672
% App. Total	88.5	11.5		0	0		0	100		
PHF	.975	.932	.969	.000	.000	.000	.000	.704	.704	.977

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 5



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

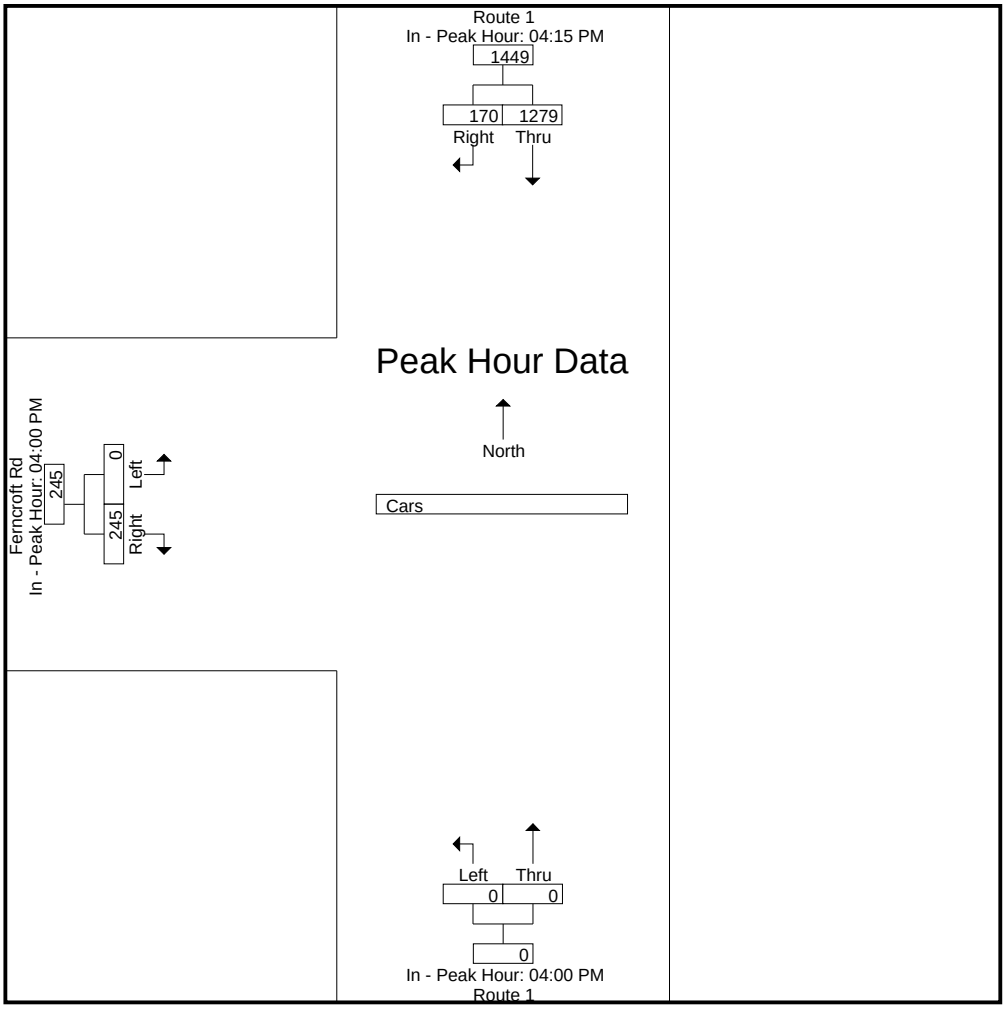
	04:15 PM			04:00 PM			04:00 PM		
+0 mins.	**324**	**44**	**368**	0	0	0	0	**87**	**87**
+15 mins.	317	40	357	0	0	0	0	48	48
+30 mins.	317	44	361	0	0	0	0	59	59
+45 mins.	321	42	363	0	0	0	0	51	51
Total Volume	1279	170	1449	0	0	0	0	245	245
% App. Total	88.3	11.7		0	0		0	100	
PHF	.987	.966	.984	.000	.000	.000	.000	.704	.704

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025

Groups Printed- Trucks

	Route 1 From North		Route 1 From South		Ferncroft Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	3	0	0	0	0	0	3
04:15 PM	5	1	0	0	0	0	6
04:30 PM	1	0	0	0	0	0	1
04:45 PM	2	0	0	0	0	1	3
Total	11	1	0	0	0	1	13
05:00 PM	1	0	0	0	0	0	1
05:15 PM	2	0	0	0	0	0	2
05:30 PM	1	0	0	0	0	0	1
05:45 PM	2	0	0	0	0	0	2
Total	6	0	0	0	0	0	6
Grand Total	17	1	0	0	0	1	19
Apprch %	94.4	5.6	0	0	0	100	
Total %	89.5	5.3	0	0	0	5.3	

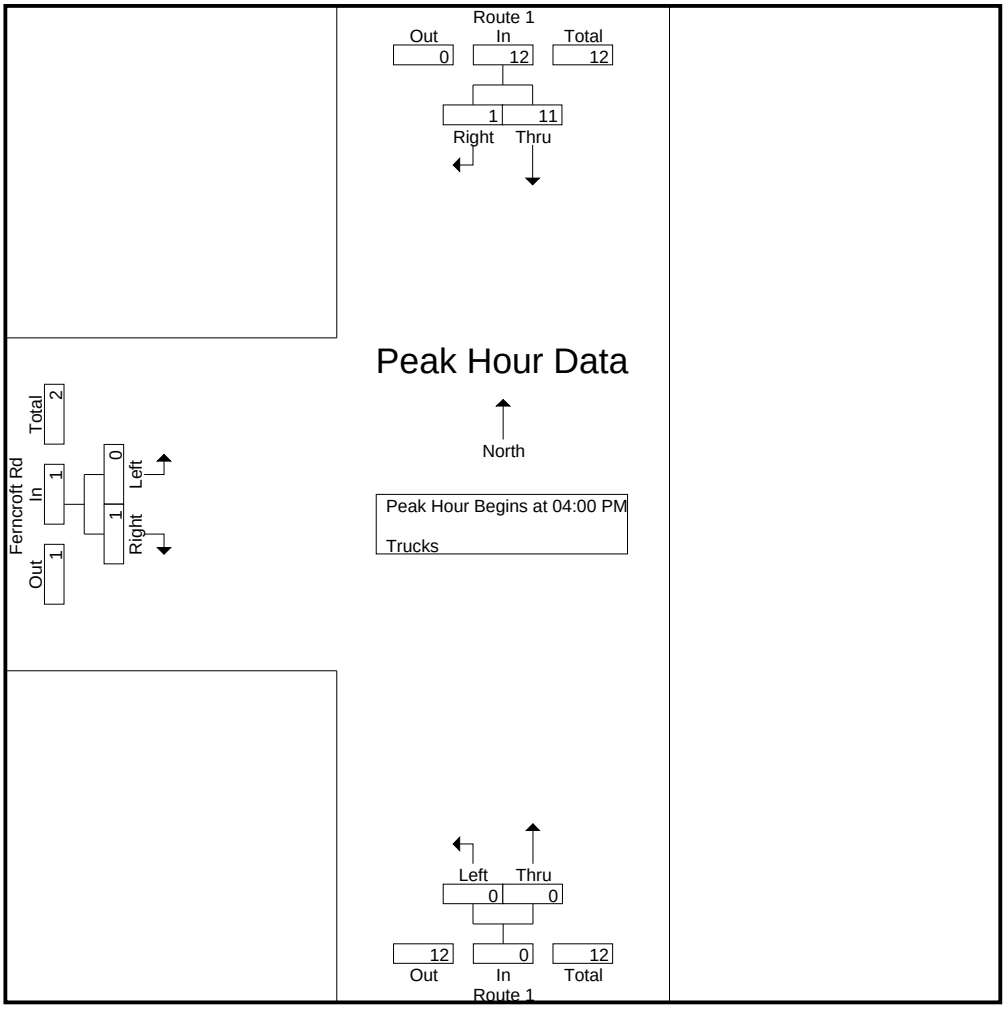
	Route 1 From North			Route 1 From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	3	0	3	0	0	0	0	0	0	3
04:15 PM	**5**	**1**	**6**	0	0	0	0	0	0	**6**
04:30 PM	1	0	1	0	0	0	0	0	0	1
04:45 PM	2	0	2	0	0	0	0	**1**	**1**	3
Total Volume	11	1	12	0	0	0	0	1	1	13
% App. Total	91.7	8.3		0	0		0	100		
PHF	.550	.250	.500	.000	.000	.000	.000	.250	.250	.542

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

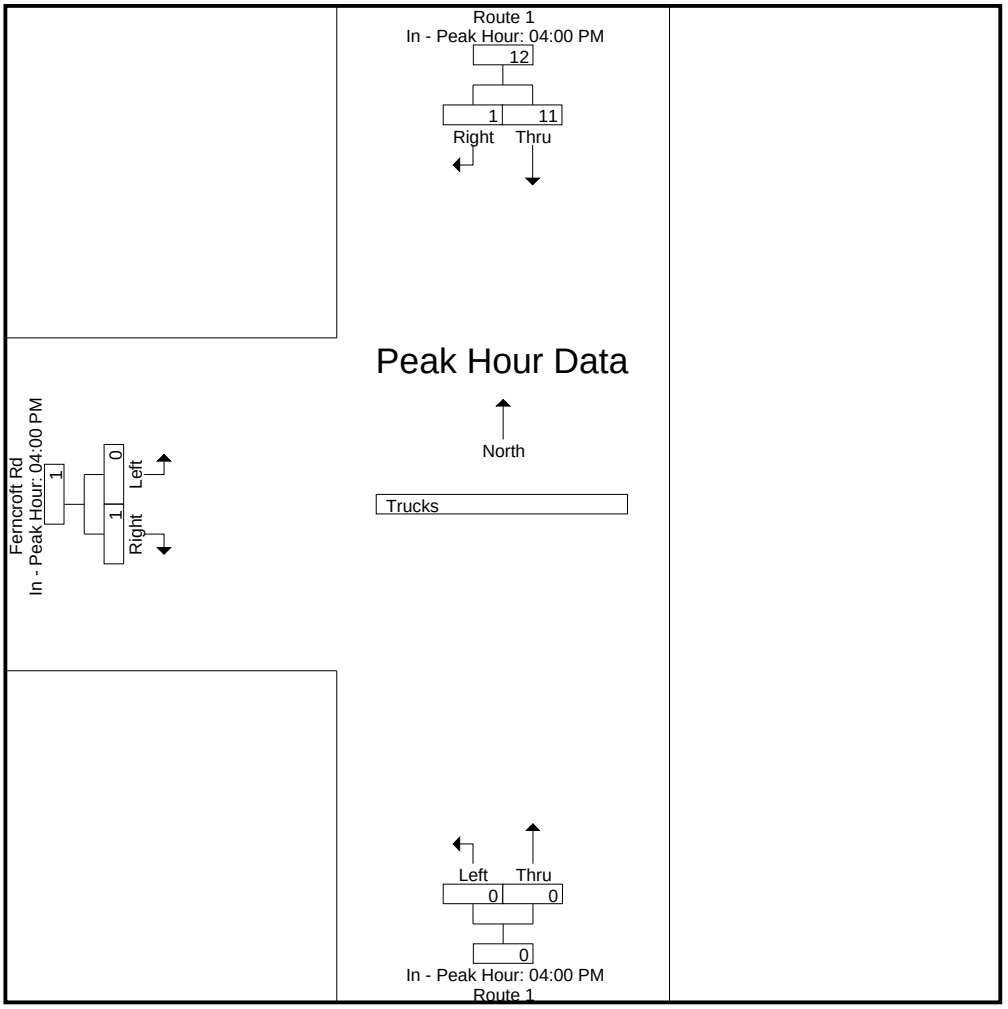
	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	3	0	3	0	0	0	0	0	0
+15 mins.	**5**	**1**	**6**	0	0	0	0	0	0
+30 mins.	1	0	1	0	0	0	0	0	0
+45 mins.	2	0	2	0	0	0	0	**1**	**1**
Total Volume	11	1	12	0	0	0	0	1	1
% App. Total	91.7	8.3		0	0		0	100	
PHF	.550	.250	.500	.000	.000	.000	.000	.250	.250

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025

Groups Printed- Bikes Peds

	Route 1 From North			Route 1 From South			Ferncroft Rd From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0				
Total %										0	0	

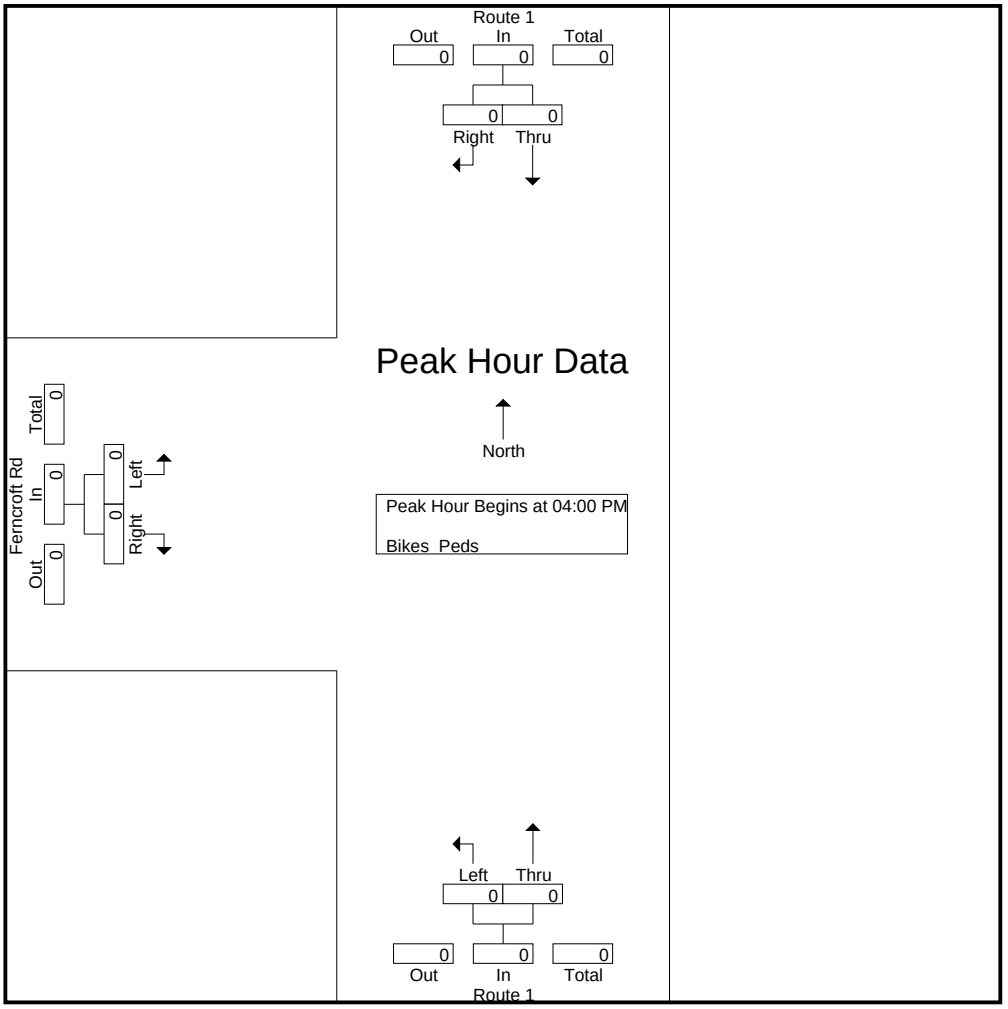
	Route 1 From North			Route 1 From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

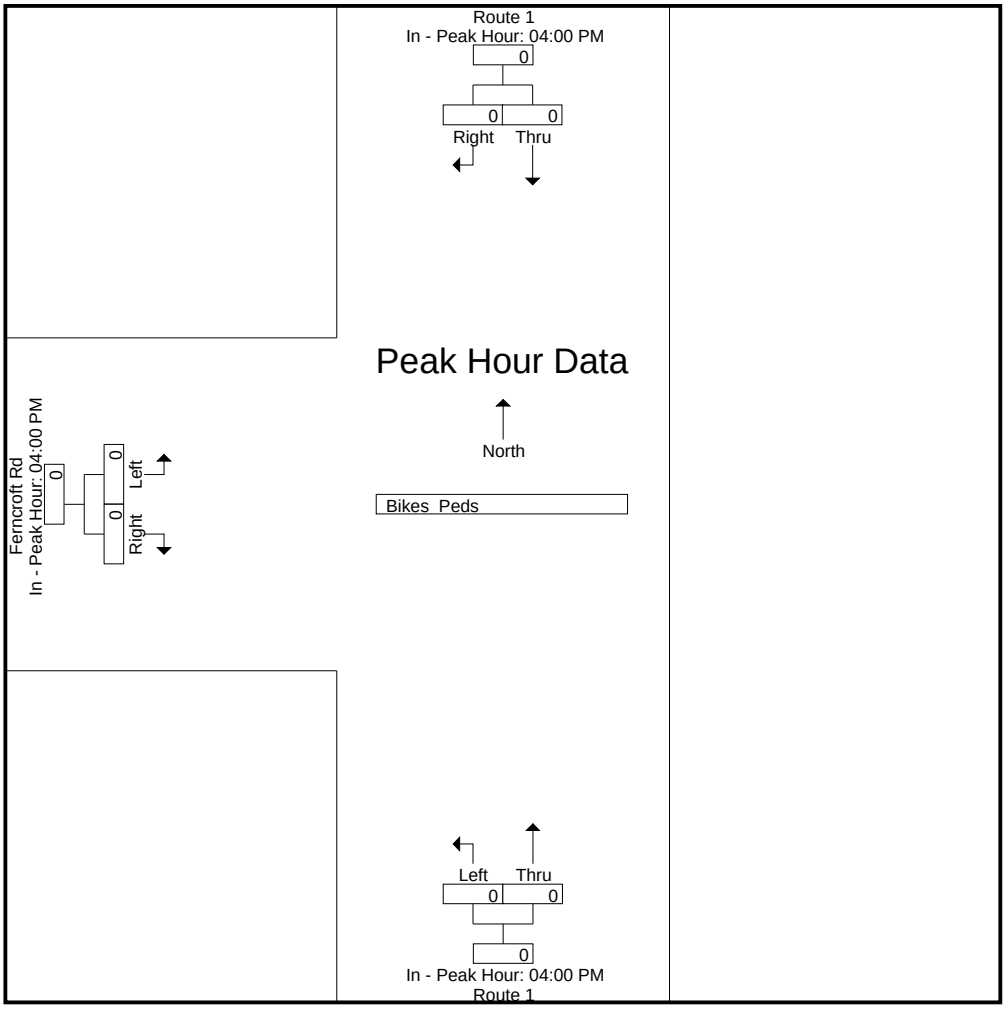
	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Route 1 SB
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Cloudy / Rain

File Name : 10255003
Site Code : 10255003
Start Date : 6/17/2025
Page No : 12



October 2025

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 1

Groups Printed- Cars - Trucks

	Village Rd From North		Village Rd From South		Ferncroft Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	20	0	2	12	1	2	37
07:15 AM	24	1	6	21	0	4	56
07:30 AM	40	0	3	24	0	5	72
07:45 AM	30	0	6	34	1	2	73
Total	114	1	17	91	2	13	238
08:00 AM	37	0	7	35	0	5	84
08:15 AM	44	0	9	29	1	7	90
08:30 AM	32	0	10	45	0	4	91
08:45 AM	37	0	10	38	0	3	88
Total	150	0	36	147	1	19	353
Grand Total	264	1	53	238	3	32	591
Apprch %	99.6	0.4	18.2	81.8	8.6	91.4	
Total %	44.7	0.2	9	40.3	0.5	5.4	
Cars	261	1	52	234	0	31	579
% Cars	98.9	100	98.1	98.3	0	96.9	98
Trucks	3	0	1	4	3	1	12
% Trucks	1.1	0	1.9	1.7	100	3.1	2

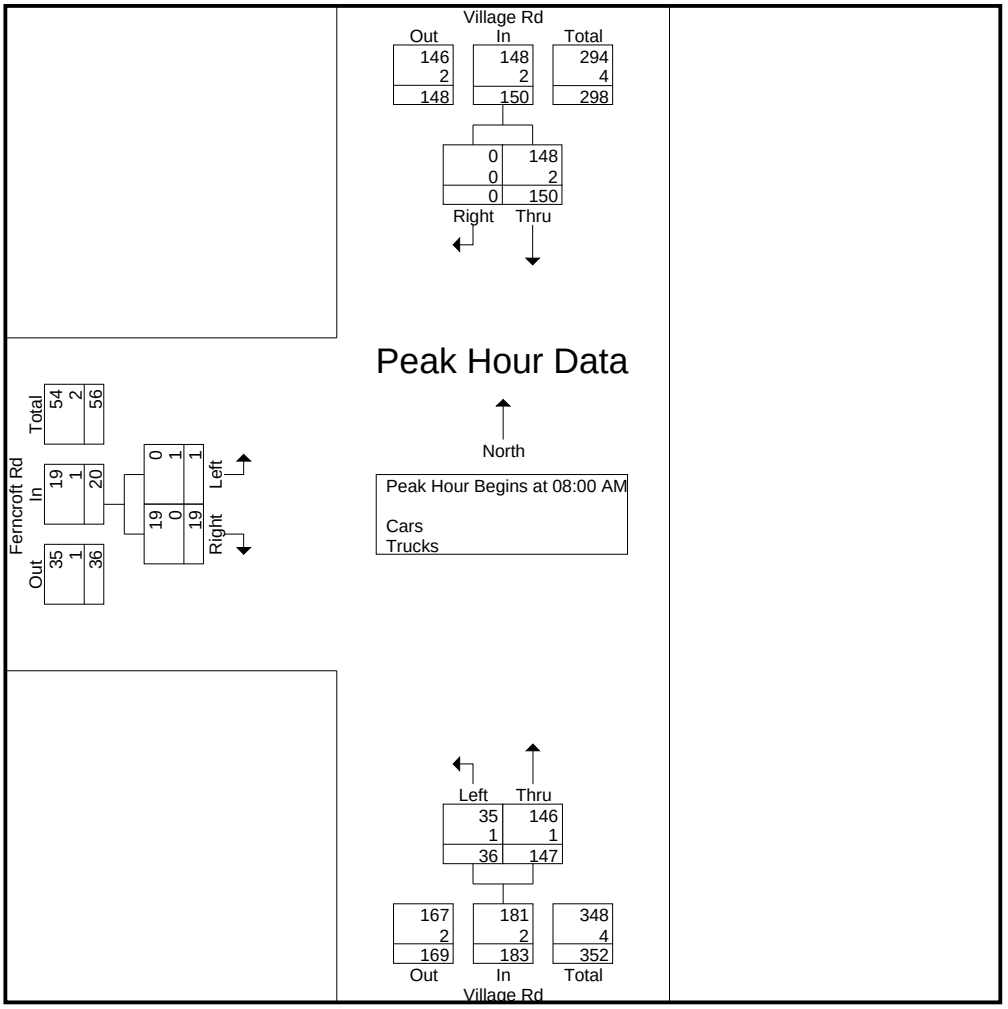
	Village Rd From North			Village Rd From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	37	0	37	7	35	42	0	5	5	84
08:15 AM	**44**	0	**44**	9	29	38	**1**	**7**	**8**	90
08:30 AM	32	0	32	**10**	**45**	**55**	0	4	4	**91**
08:45 AM	37	0	37	10	38	48	0	3	3	88
Total Volume	150	0	150	36	147	183	1	19	20	353
% App. Total	100	0		19.7	80.3		5	95		
PHF	.852	.000	.852	.900	.817	.832	.250	.679	.625	.970
Cars	148	0	148	35	146	181	0	19	19	348
% Cars	98.7	0	98.7	97.2	99.3	98.9	0	100	95.0	98.6
Trucks	2	0	2	1	1	2	1	0	1	5
% Trucks	1.3	0	1.3	2.8	0.7	1.1	100	0	5.0	1.4

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 2



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

Peak Hour for Each Approach Begins at:

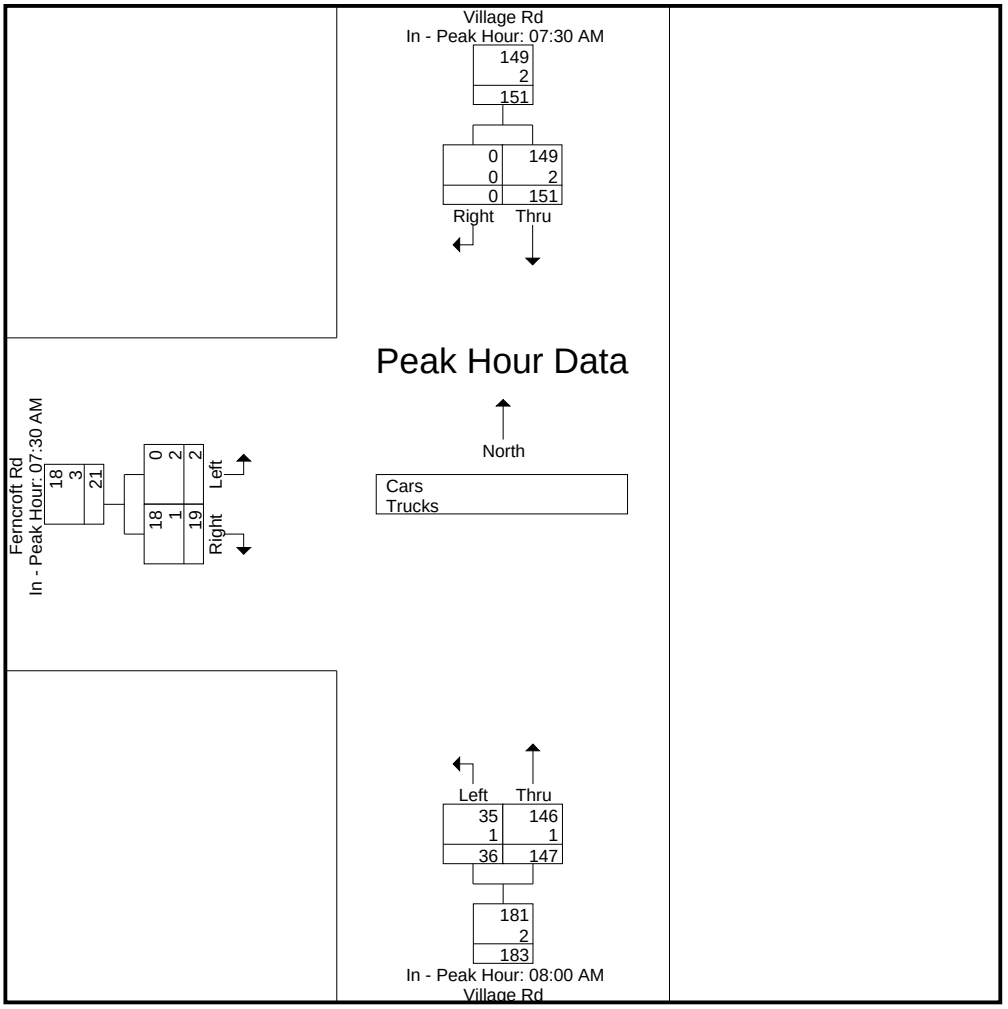
	07:30 AM			08:00 AM			07:30 AM		
+0 mins.	40	0	40	7	35	42	0	5	5
+15 mins.	30	0	30	9	29	38	**1**	2	3
+30 mins.	37	0	37	**10**	**45**	**55**	0	5	5
+45 mins.	**44**	0	**44**	10	38	48	1	**7**	**8**
Total Volume	151	0	151	36	147	183	2	19	21
% App. Total	100	0		19.7	80.3		9.5	90.5	
PHF	.858	.000	.858	.900	.817	.832	.500	.679	.656
Cars	149	0	149	35	146	181	0	18	18
% Cars	98.7	0	98.7	97.2	99.3	98.9	0	94.7	85.7
Trucks	2	0	2	1	1	2	2	1	3
% Trucks	1.3	0	1.3	2.8	0.7	1.1	100	5.3	14.3

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 4

Groups Printed- Cars

	Village Rd From North		Village Rd From South		Ferncroft Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	20	0	2	12	0	2	36
07:15 AM	23	1	6	19	0	4	53
07:30 AM	40	0	3	23	0	4	70
07:45 AM	30	0	6	34	0	2	72
Total	113	1	17	88	0	12	231
08:00 AM	35	0	7	35	0	5	82
08:15 AM	44	0	9	29	0	7	89
08:30 AM	32	0	9	45	0	4	90
08:45 AM	37	0	10	37	0	3	87
Total	148	0	35	146	0	19	348
Grand Total	261	1	52	234	0	31	579
Apprch %	99.6	0.4	18.2	81.8	0	100	
Total %	45.1	0.2	9	40.4	0	5.4	

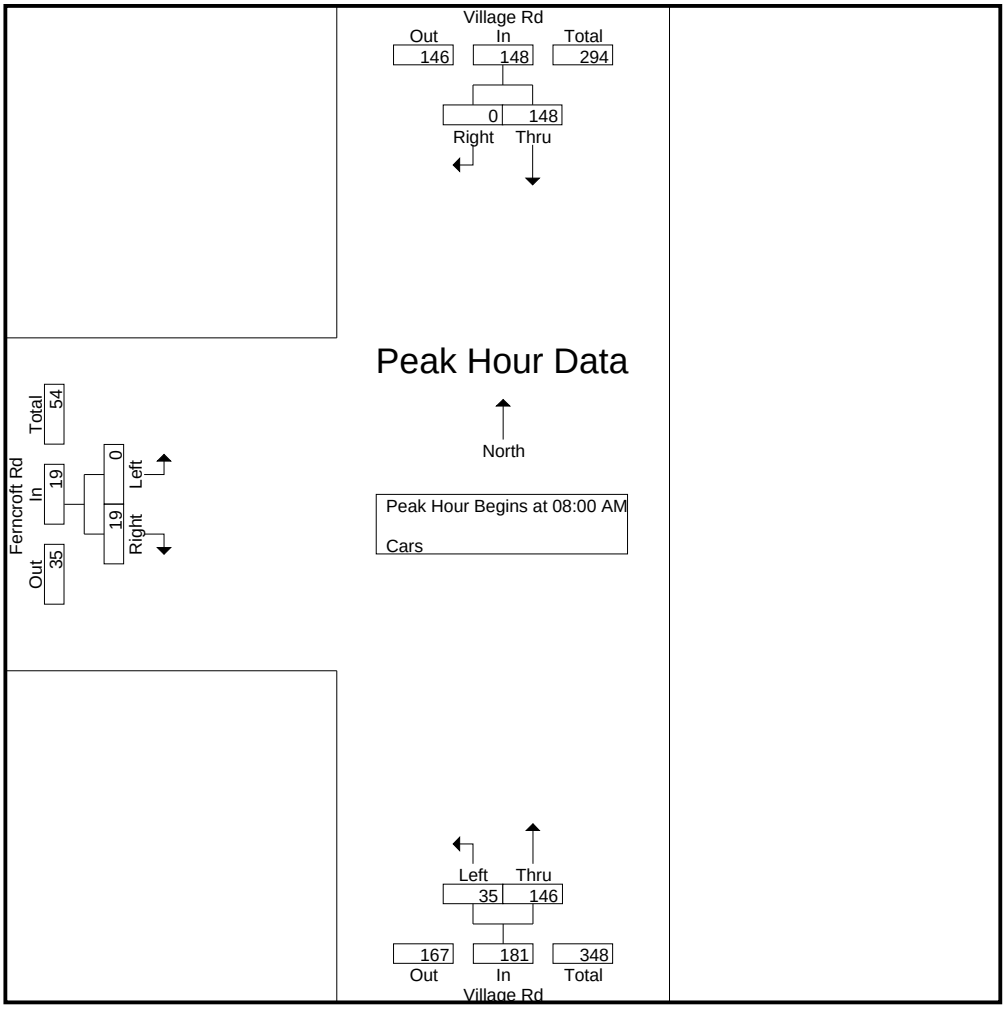
	Village Rd From North			Village Rd From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	35	0	35	7	35	42	0	5	5	82
08:15 AM	**44**	0	**44**	9	29	38	0	**7**	**7**	89
08:30 AM	32	0	32	9	**45**	**54**	0	4	4	**90**
08:45 AM	37	0	37	**10**	37	47	0	3	3	87
Total Volume	148	0	148	35	146	181	0	19	19	348
% App. Total	100	0		19.3	80.7		0	100		
PHF	.841	.000	.841	.875	.811	.838	.000	.679	.679	.967

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
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:

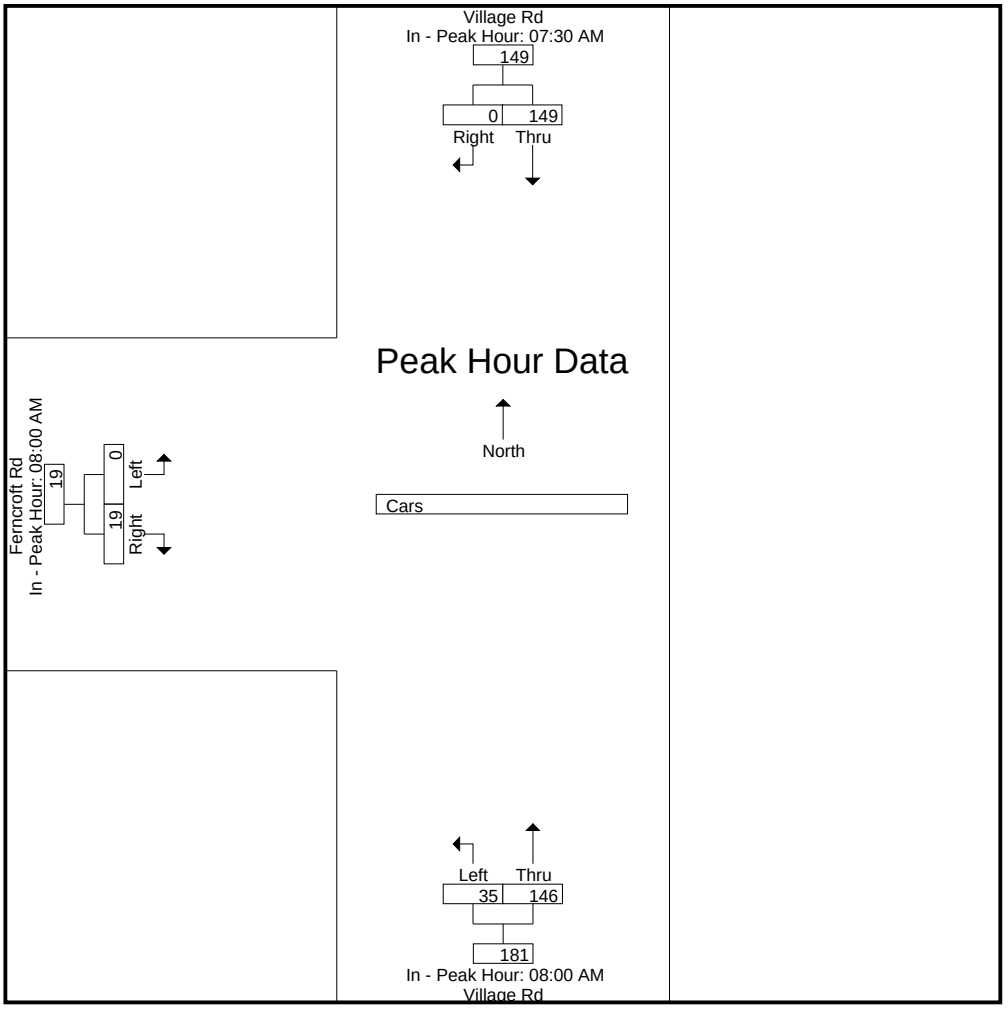
	07:30 AM			08:00 AM			08:00 AM		
+0 mins.	40	0	40	7	35	42	0	5	5
+15 mins.	30	0	30	9	29	38	0	**7**	**7**
+30 mins.	35	0	35	9	**45**	**54**	0	4	4
+45 mins.	**44**	0	**44**	**10**	37	47	0	3	3
Total Volume	149	0	149	35	146	181	0	19	19
% App. Total	100	0		19.3	80.7		0	100	
PHF	.847	.000	.847	.875	.811	.838	.000	.679	.679

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025

Groups Printed- Trucks

	Village Rd From North		Village Rd From South		Ferncroft Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	0	0	0	0	1	0	1
07:15 AM	1	0	0	2	0	0	3
07:30 AM	0	0	0	1	0	1	2
07:45 AM	0	0	0	0	1	0	1
Total	1	0	0	3	2	1	7
08:00 AM	2	0	0	0	0	0	2
08:15 AM	0	0	0	0	1	0	1
08:30 AM	0	0	1	0	0	0	1
08:45 AM	0	0	0	1	0	0	1
Total	2	0	1	1	1	0	5
Grand Total	3	0	1	4	3	1	12
Apprch %	100	0	20	80	75	25	
Total %	25	0	8.3	33.3	25	8.3	

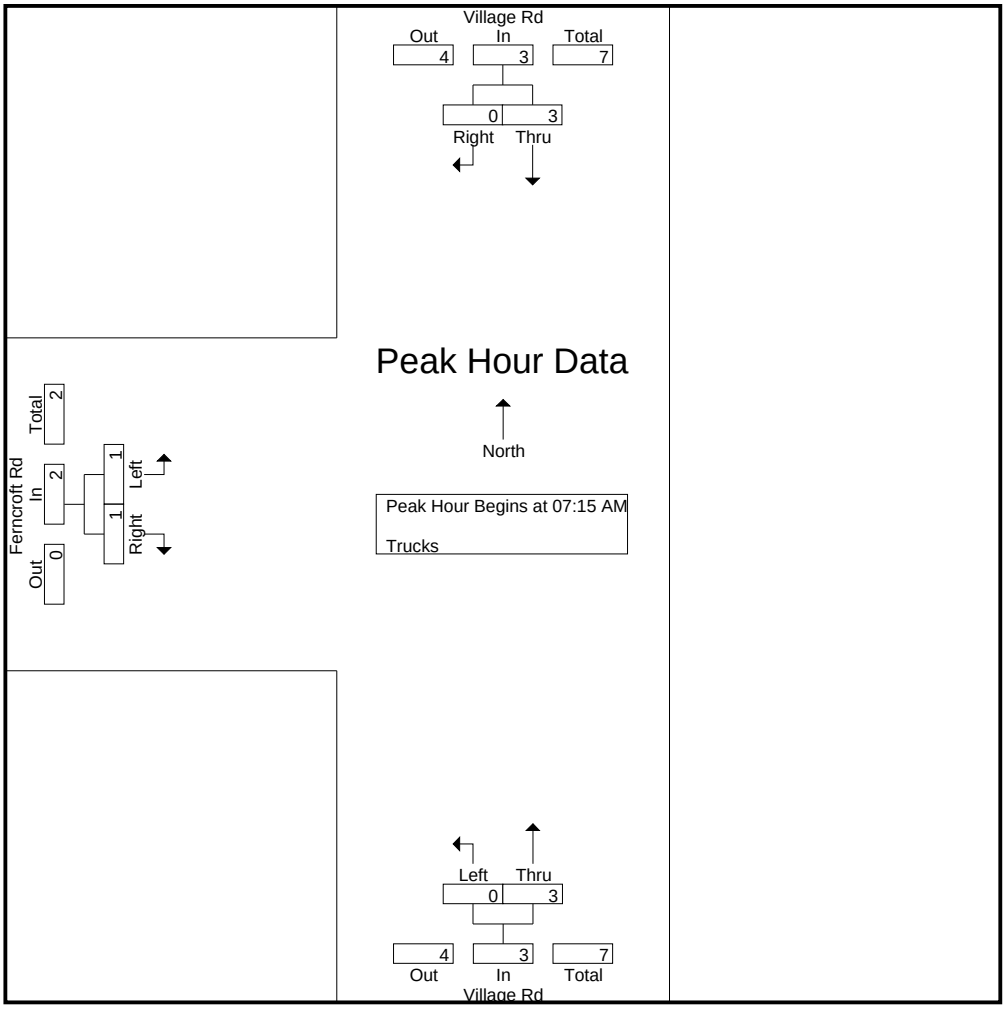
	Village Rd From North			Village Rd From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	1	0	1	0	**2**	**2**	0	0	0	**3**
07:30 AM	0	0	0	0	1	1	0	**1**	**1**	2
07:45 AM	0	0	0	0	0	0	**1**	0	1	1
08:00 AM	**2**	0	**2**	0	0	0	0	0	0	2
Total Volume	3	0	3	0	3	3	1	1	2	8
% App. Total	100	0		0	100		50	50		
PHF	.375	.000	.375	.000	.375	.375	.250	.250	.500	.667

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 8



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

Peak Hour for Each Approach Begins at:

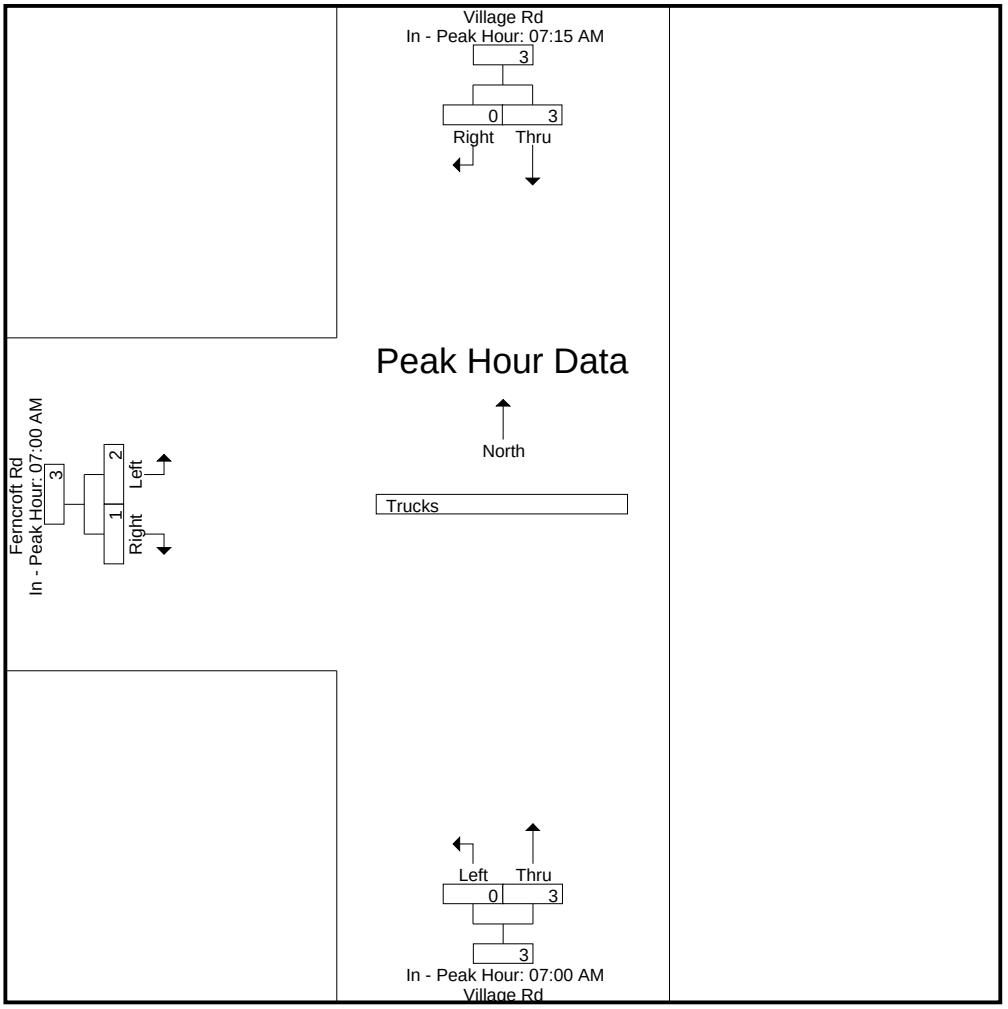
	07:15 AM			07:00 AM			07:00 AM		
+0 mins.	1	0	1	0	0	0	**1**	0	**1**
+15 mins.	0	0	0	0	**2**	**2**	0	0	0
+30 mins.	0	0	0	0	1	1	0	**1**	1
+45 mins.	**2**	0	**2**	0	0	0	1	0	1
Total Volume	3	0	3	0	3	3	2	1	3
% App. Total	100	0		0	100		66.7	33.3	
PHF	.375	.000	.375	.000	.375	.375	.500	.250	.750

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025

Groups Printed- Bikes Peds

	Village Rd From North			Village Rd From South			Ferncroft Rd From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0				
Total %										0	0	

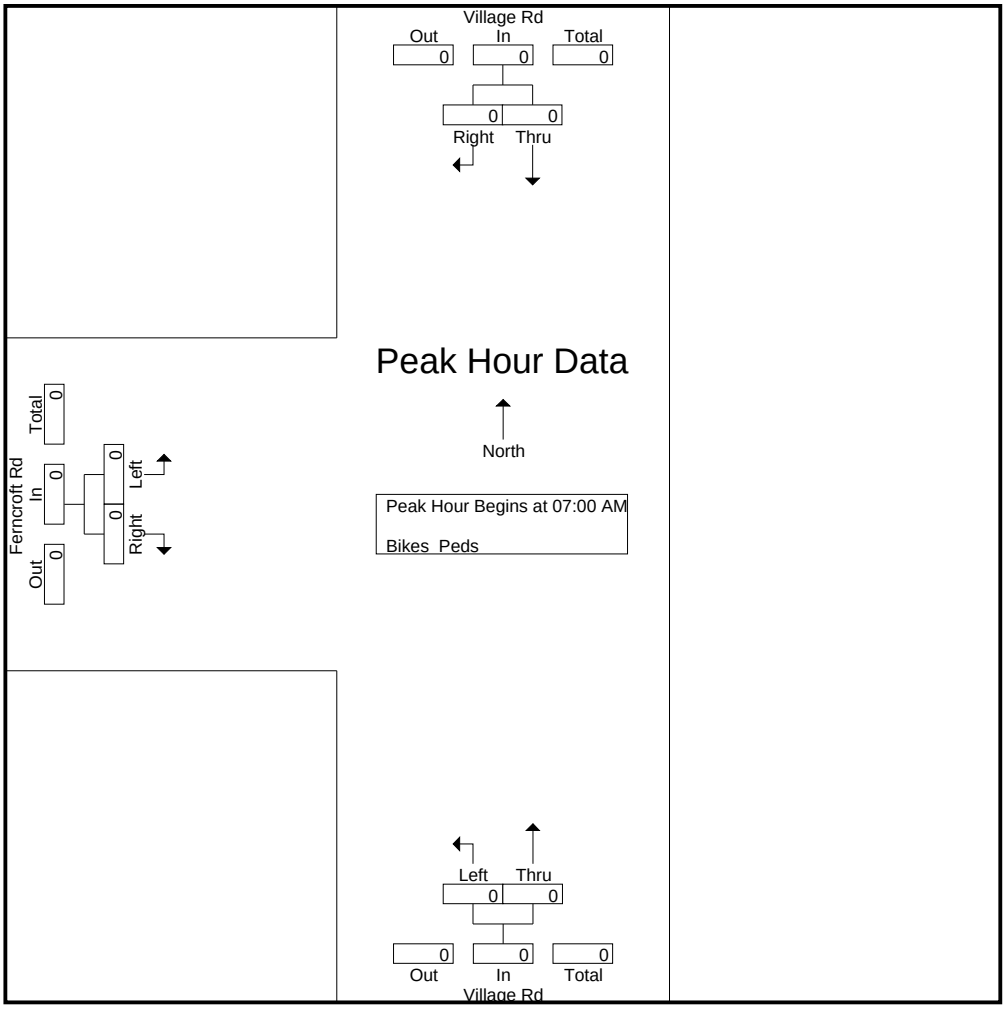
	Village Rd From North			Village Rd From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM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

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 11



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

Peak Hour for Each Approach Begins at:

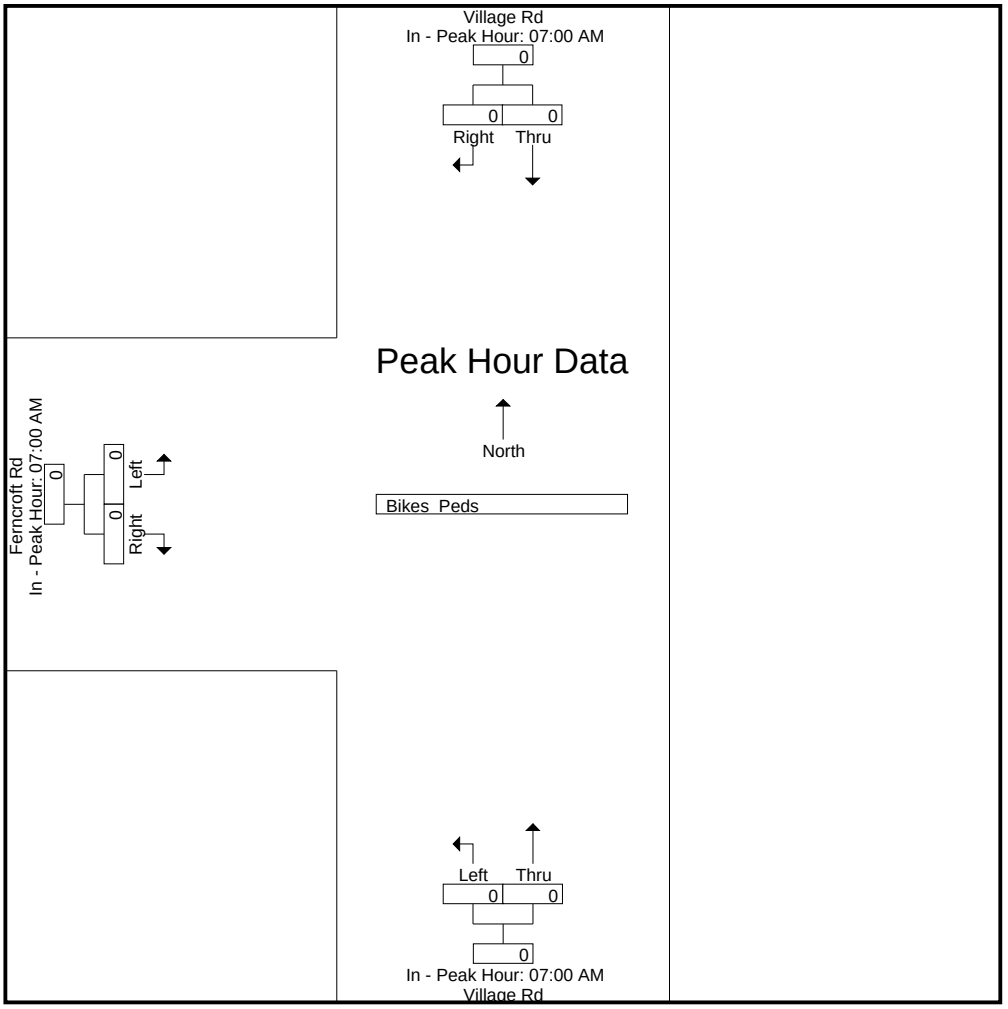
	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 1

Groups Printed- Cars - Trucks

	Village Rd From North		Village Rd From South		Ferncroft Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	33	0	4	27	0	4	68
04:15 PM	36	0	6	33	1	4	80
04:30 PM	46	0	9	36	0	3	94
04:45 PM	42	1	3	30	0	11	87
Total	157	1	22	126	1	22	329
05:00 PM	83	2	7	44	0	10	146
05:15 PM	51	0	4	22	0	12	89
05:30 PM	31	0	8	39	0	4	82
05:45 PM	30	0	5	26	1	6	68
Total	195	2	24	131	1	32	385
Grand Total	352	3	46	257	2	54	714
Apprch %	99.2	0.8	15.2	84.8	3.6	96.4	
Total %	49.3	0.4	6.4	36	0.3	7.6	
Cars	351	3	46	256	2	54	712
% Cars	99.7	100	100	99.6	100	100	99.7
Trucks	1	0	0	1	0	0	2
% Trucks	0.3	0	0	0.4	0	0	0.3

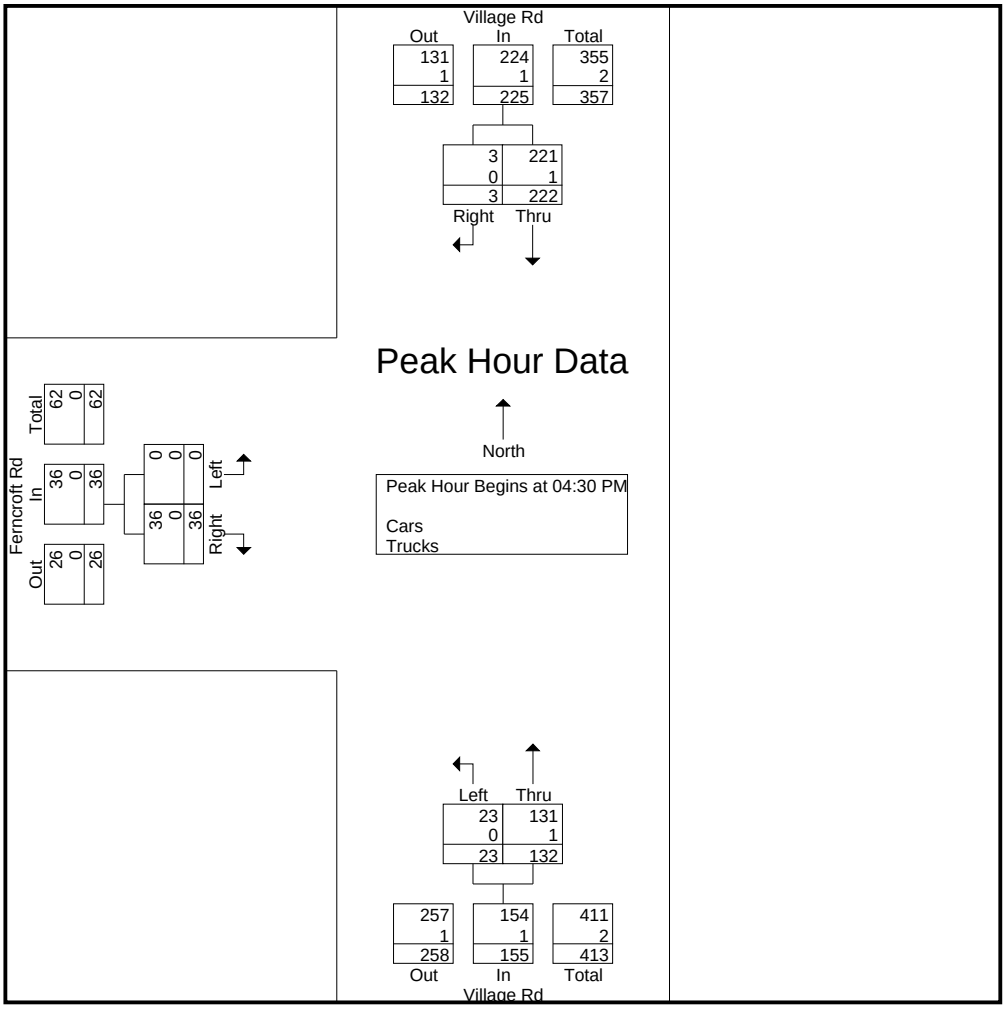
	Village Rd From North			Village Rd From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	46	0	46	**9**	36	45	0	3	3	94
04:45 PM	42	1	43	3	30	33	0	11	11	87
05:00 PM	**83**	**2**	**85**	7	**44**	**51**	0	10	10	**146**
05:15 PM	51	0	51	4	22	26	0	**12**	**12**	89
Total Volume	222	3	225	23	132	155	0	36	36	416
% App. Total	98.7	1.3		14.8	85.2		0	100		
PHF	.669	.375	.662	.639	.750	.760	.000	.750	.750	.712
Cars	221	3	224	23	131	154	0	36	36	414
% Cars	99.5	100	99.6	100	99.2	99.4	0	100	100	99.5
Trucks	1	0	1	0	1	1	0	0	0	2
% Trucks	0.5	0	0.4	0	0.8	0.6	0	0	0	0.5

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

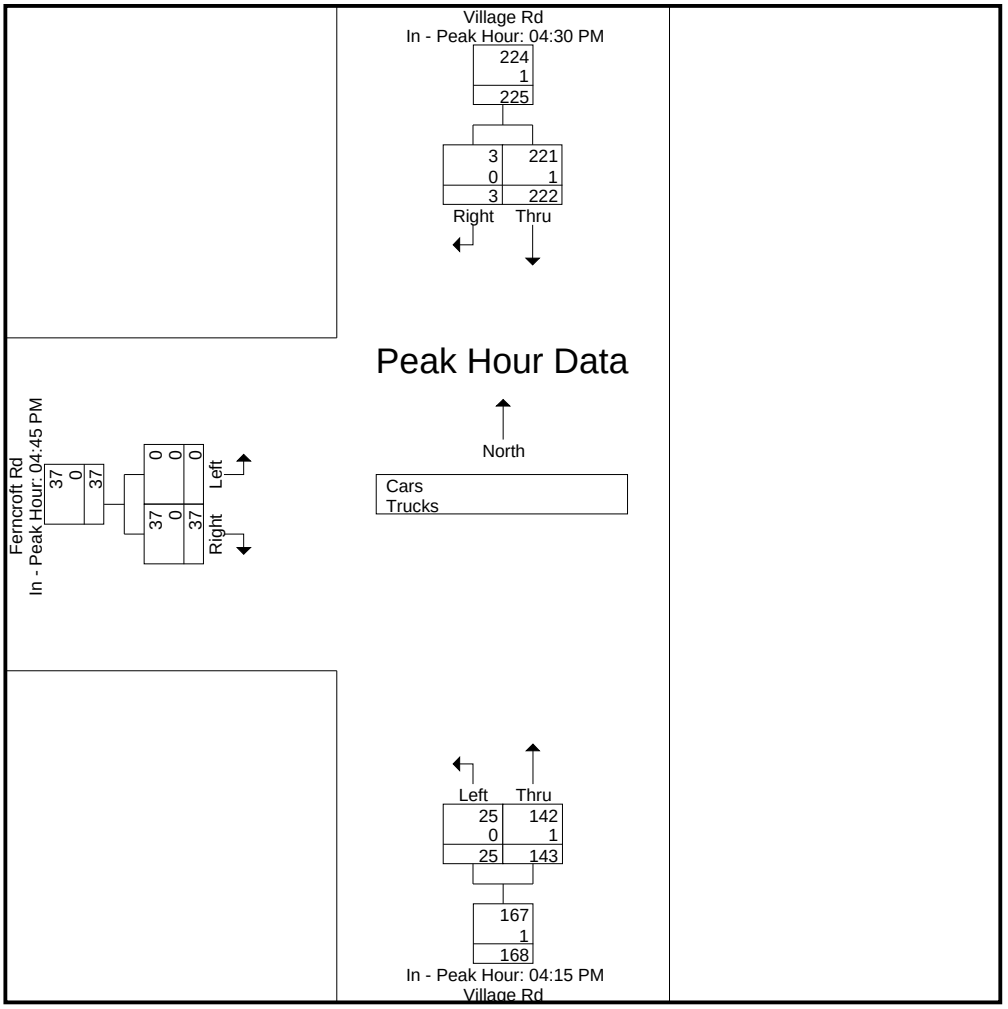
	04:30 PM			04:15 PM			04:45 PM		
+0 mins.	46	0	46	6	33	39	0	11	11
+15 mins.	42	1	43	**9**	36	45	0	10	10
+30 mins.	**83**	**2**	**85**	3	30	33	0	**12**	**12**
+45 mins.	51	0	51	7	**44**	**51**	0	4	4
Total Volume	222	3	225	25	143	168	0	37	37
% App. Total	98.7	1.3		14.9	85.1		0	100	
PHF	.669	.375	.662	.694	.813	.824	.000	.771	.771
Cars	221	3	224	25	142	167	0	37	37
% Cars	99.5	100	99.6	100	99.3	99.4	0	100	100
Trucks	1	0	1	0	1	1	0	0	0
% Trucks	0.5	0	0.4	0	0.7	0.6	0	0	0

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 4

Groups Printed- Cars

	Village Rd From North		Village Rd From South		Ferncroft Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	33	0	4	27	0	4	68
04:15 PM	36	0	6	33	1	4	80
04:30 PM	46	0	9	36	0	3	94
04:45 PM	41	1	3	29	0	11	85
Total	156	1	22	125	1	22	327
05:00 PM	83	2	7	44	0	10	146
05:15 PM	51	0	4	22	0	12	89
05:30 PM	31	0	8	39	0	4	82
05:45 PM	30	0	5	26	1	6	68
Total	195	2	24	131	1	32	385
Grand Total	351	3	46	256	2	54	712
Apprch %	99.2	0.8	15.2	84.8	3.6	96.4	
Total %	49.3	0.4	6.5	36	0.3	7.6	

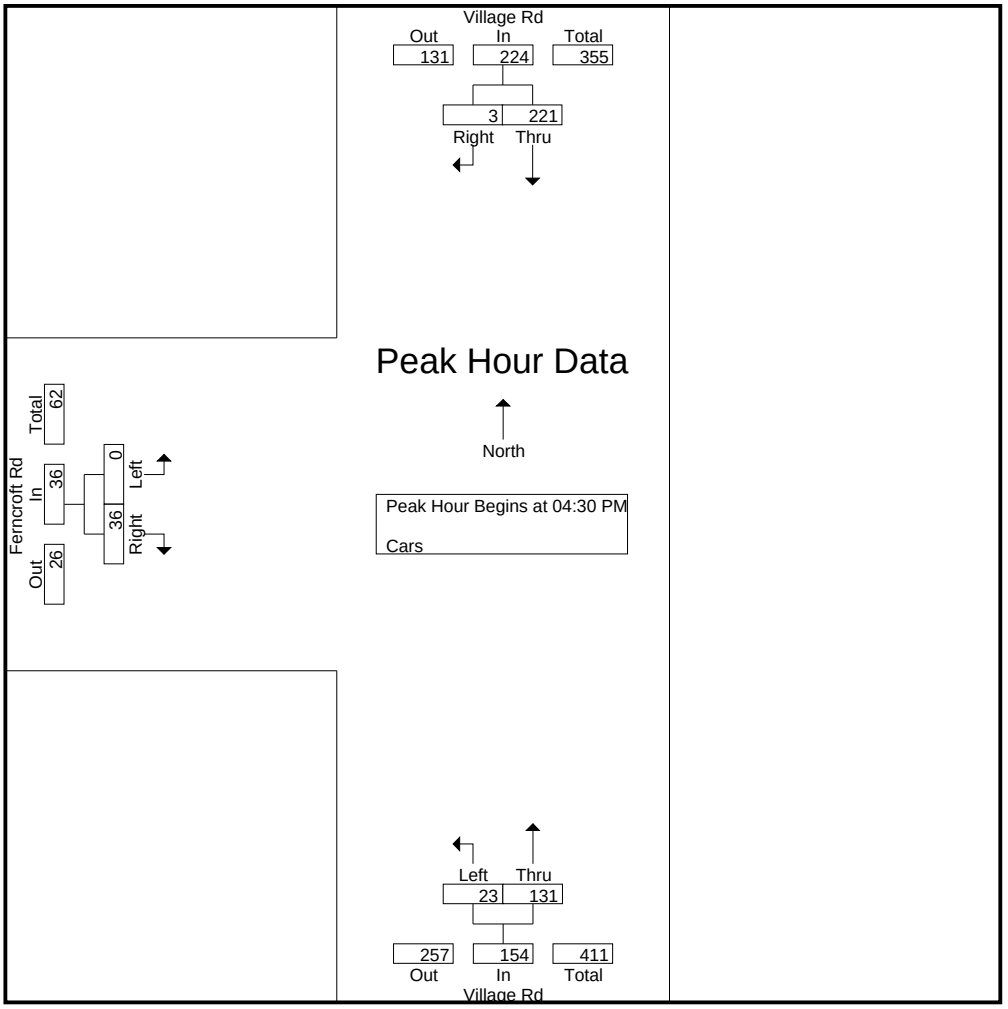
	Village Rd From North			Village Rd From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	46	0	46	**9**	36	45	0	3	3	94
04:45 PM	41	1	42	3	29	32	0	11	11	85
05:00 PM	**83**	**2**	**85**	7	**44**	**51**	0	10	10	**146**
05:15 PM	51	0	51	4	22	26	0	**12**	**12**	89
Total Volume	221	3	224	23	131	154	0	36	36	414
% App. Total	98.7	1.3		14.9	85.1		0	100		
PHF	.666	.375	.659	.639	.744	.755	.000	.750	.750	.709

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 5



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

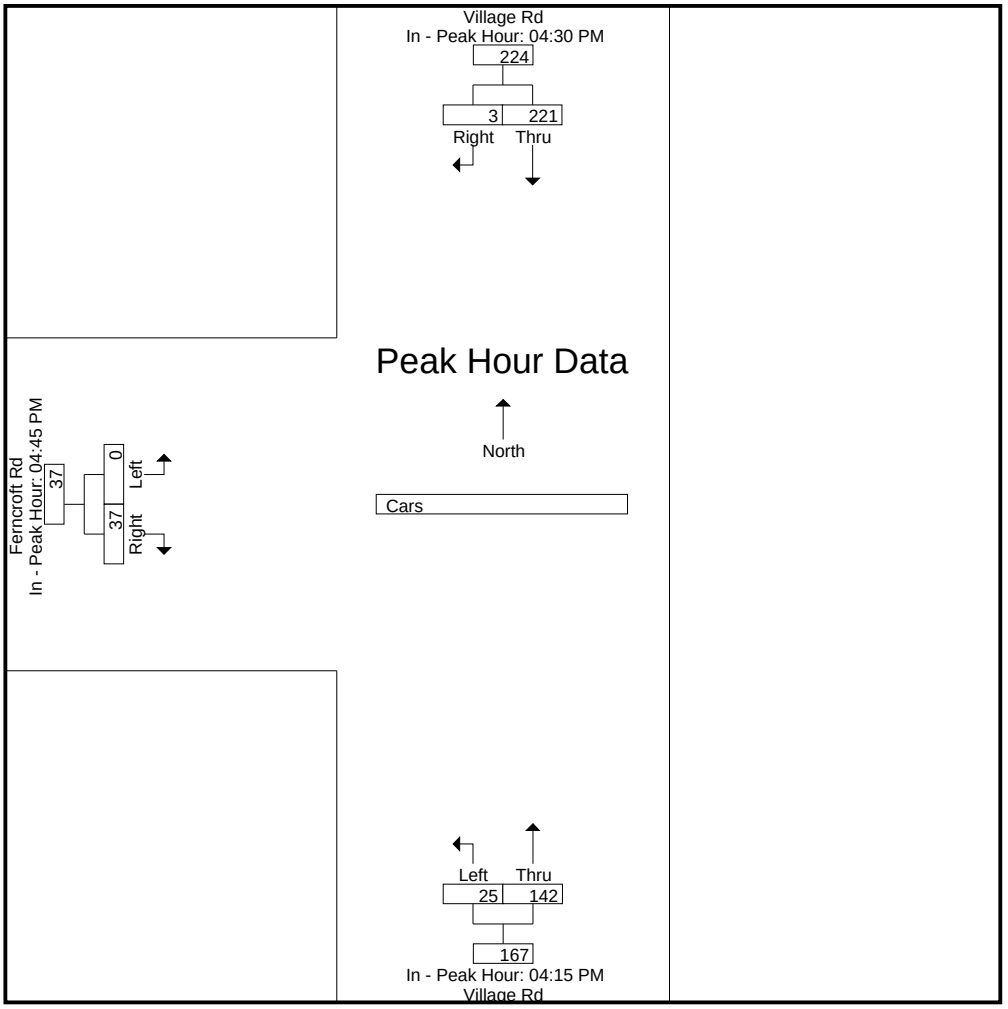
	04:30 PM			04:15 PM			04:45 PM		
+0 mins.	46	0	46	6	33	39	0	11	11
+15 mins.	41	1	42	**9**	36	45	0	10	10
+30 mins.	**83**	**2**	**85**	3	29	32	0	**12**	**12**
+45 mins.	51	0	51	7	**44**	**51**	0	4	4
Total Volume	221	3	224	25	142	167	0	37	37
% App. Total	98.7	1.3		15	85		0	100	
PHF	.666	.375	.659	.694	.807	.819	.000	.771	.771

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025

Groups Printed- Trucks

	Village Rd From North		Village Rd From South		Ferncroft Rd From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0
04:45 PM	1	0	0	1	0	0	2
Total	1	0	0	1	0	0	2
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0
Grand Total	1	0	0	1	0	0	2
Apprch %	100	0	0	100	0	0	
Total %	50	0	0	50	0	0	

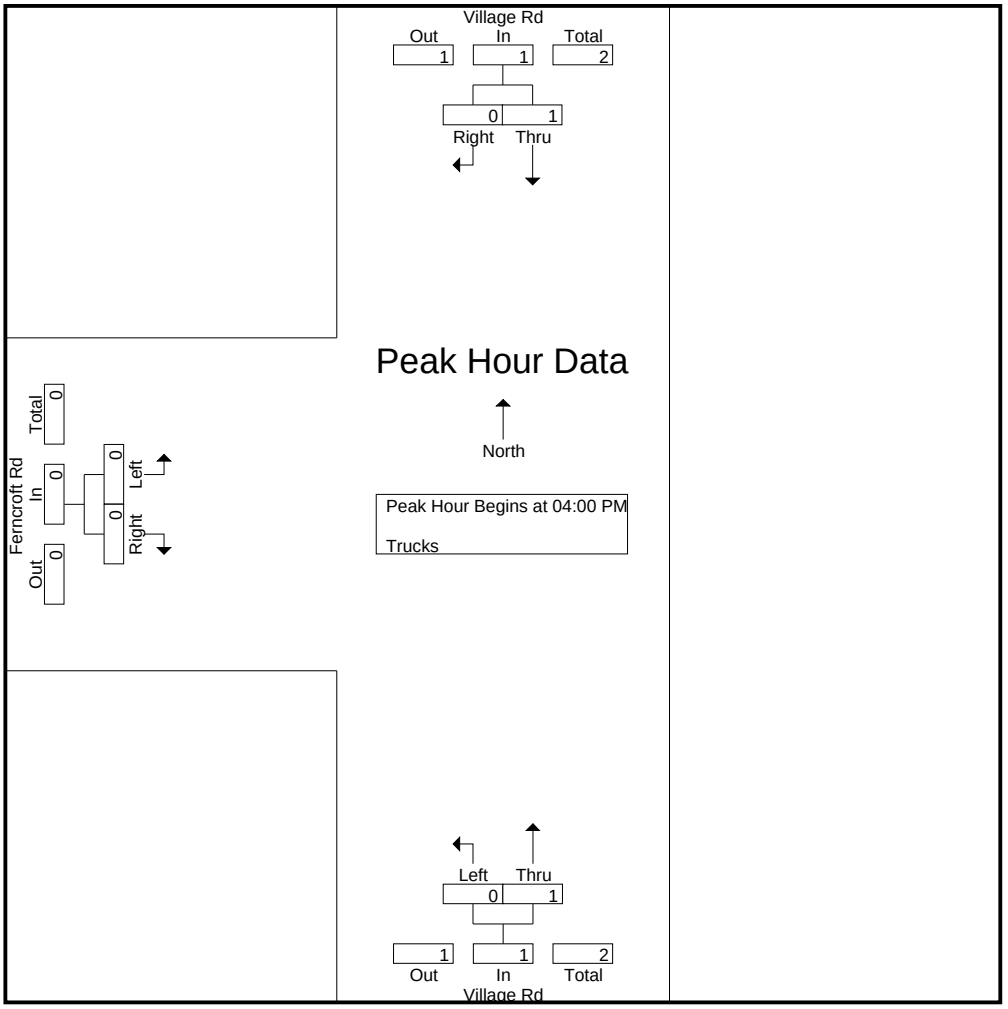
	Village Rd From North			Village Rd From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM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

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

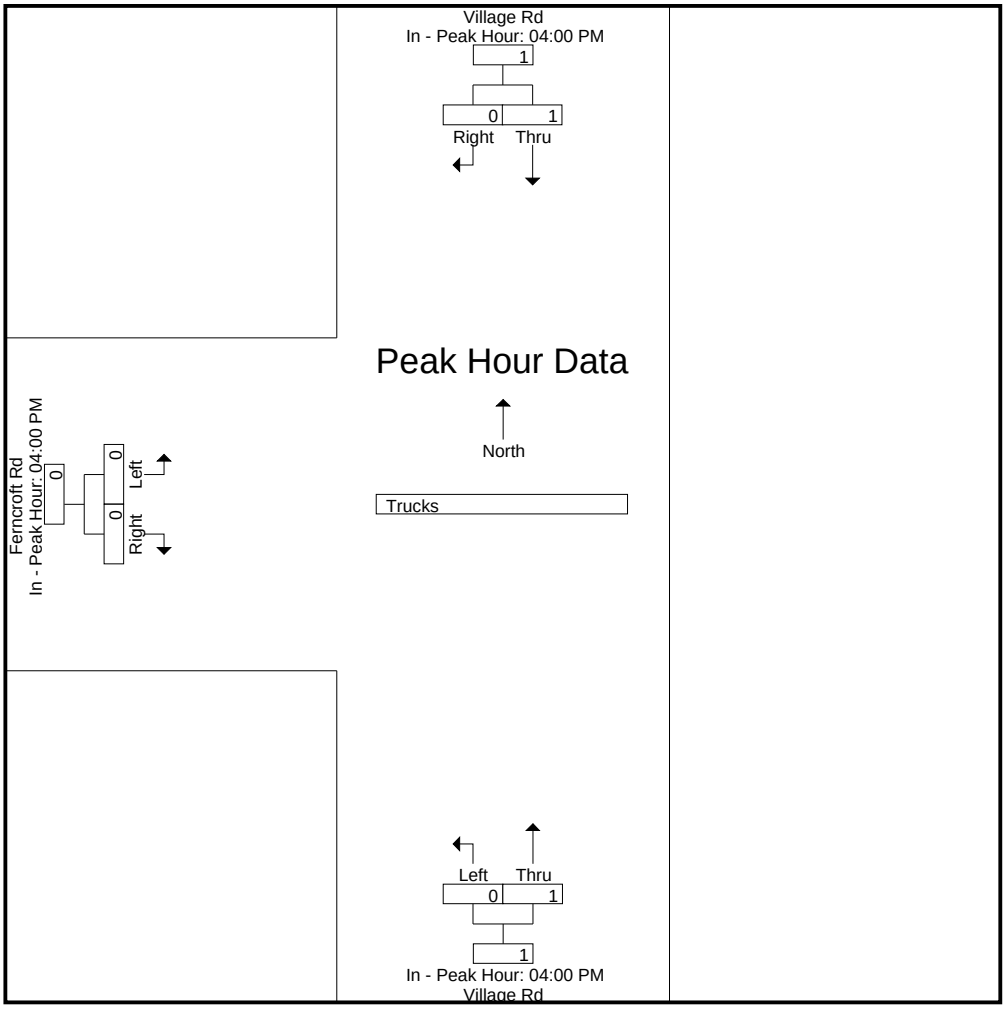
	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	**1**	0	**1**	0	**1**	**1**	0	0	0
Total Volume	1	0	1	0	1	1	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.250	.000	.250	.000	.250	.250	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025

Groups Printed- Bikes Peds

	Village Rd From North			Village Rd From South			Ferncroft Rd From West					
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0				
Total %										0	0	

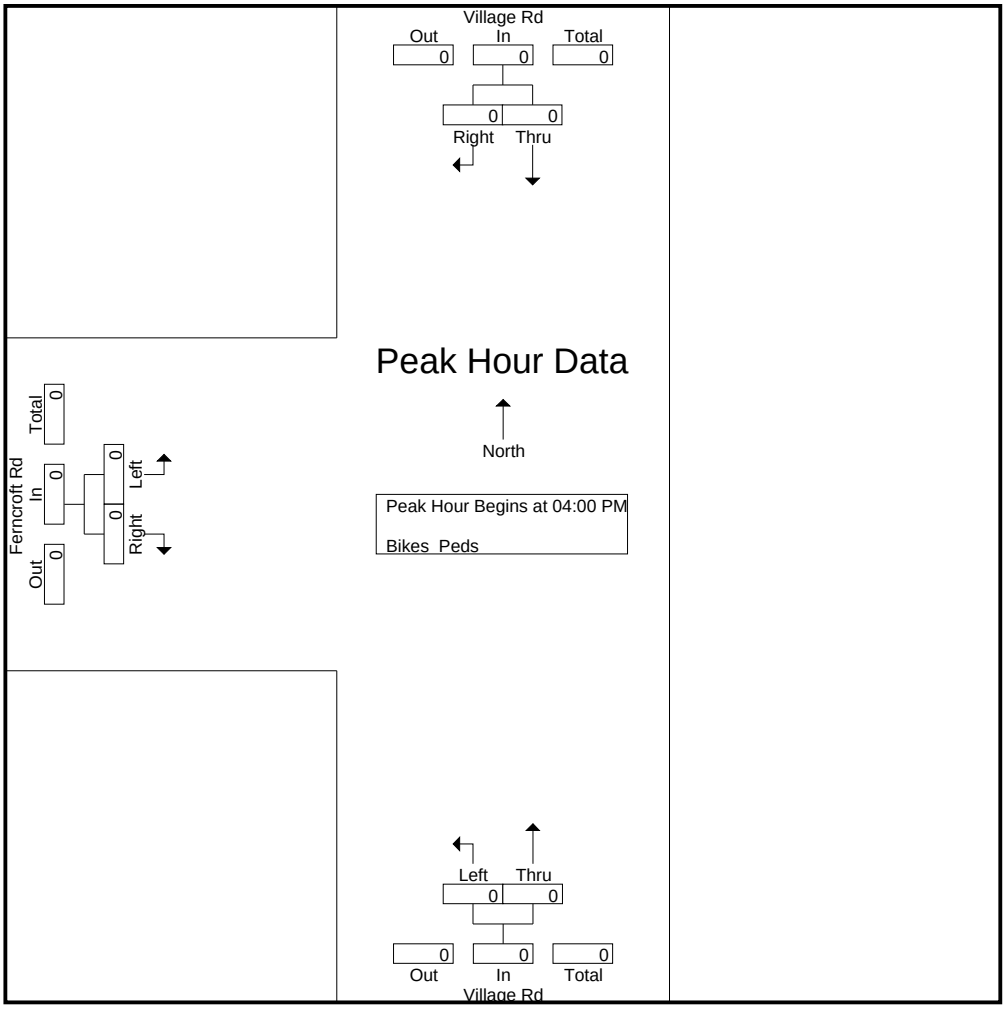
	Village Rd From North			Village Rd From South			Ferncroft Rd From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

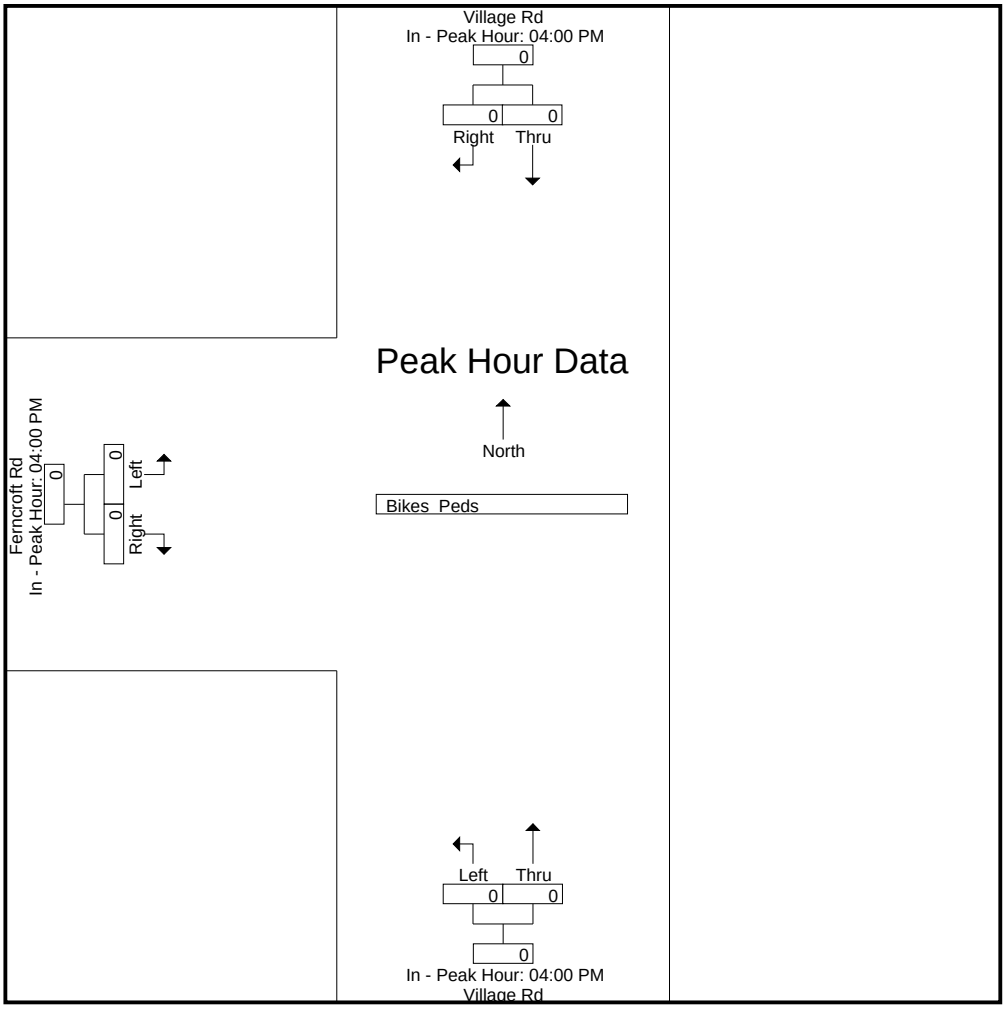
	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Village Road
E/W Street : Ferncroft Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255001
Site Code : 10255001
Start Date : 10/8/2025
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025

Groups Printed- Cars - Trucks

	Augusta Way From North			Village Rd From East			Locust St From South			Village Rd 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	12	0	5	0	0	0	13	2	32
07:15 AM	0	0	0	0	9	1	4	0	0	0	19	2	35
07:30 AM	0	0	0	0	19	0	2	0	0	0	23	2	46
07:45 AM	1	0	0	0	14	0	4	0	0	0	21	4	44
Total	1	0	0	0	54	1	15	0	0	0	76	10	157
08:00 AM	0	0	0	0	13	0	3	0	0	0	23	4	43
08:15 AM	0	0	0	0	10	0	4	0	0	0	34	3	51
08:30 AM	1	0	0	0	16	1	3	0	1	0	14	4	40
08:45 AM	0	0	0	0	16	0	0	0	0	0	24	3	43
Total	1	0	0	0	55	1	10	0	1	0	95	14	177
Grand Total	2	0	0	0	109	2	25	0	1	0	171	24	334
Apprch %	100	0	0	0	98.2	1.8	96.2	0	3.8	0	87.7	12.3	
Total %	0.6	0	0	0	32.6	0.6	7.5	0	0.3	0	51.2	7.2	
Cars	2	0	0	0	101	2	25	0	1	0	169	21	321
% Cars	100	0	0	0	92.7	100	100	0	100	0	98.8	87.5	96.1
Trucks	0	0	0	0	8	0	0	0	0	0	2	3	13
% Trucks	0	0	0	0	7.3	0	0	0	0	0	1.2	12.5	3.9

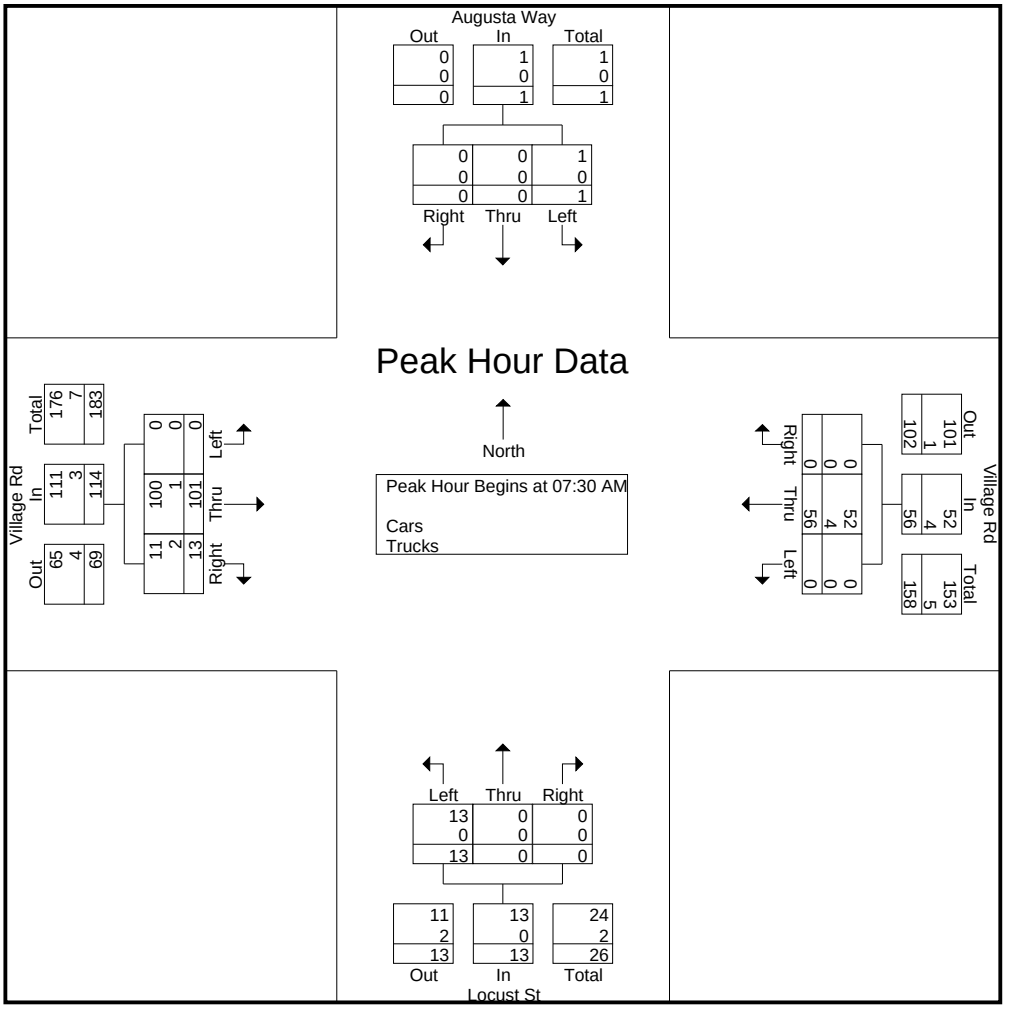
	Augusta Way From North				Village Rd From East				Locust St From South				Village Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	**19**	0	**19**	2	0	0	2	0	23	2	25	46
07:45 AM	**1**	0	0	**1**	0	14	0	14	**4**	0	0	**4**	0	21	**4**	25	44
08:00 AM	0	0	0	0	0	13	0	13	3	0	0	3	0	23	4	27	43
08:15 AM	0	0	0	0	0	10	0	10	4	0	0	4	0	**34**	3	**37**	**51**
Total Volume	1	0	0	1	0	56	0	56	13	0	0	13	0	101	13	114	184
% App. Total	100	0	0		0	100	0		100	0	0		0	88.6	11.4		
PHF	.250	.000	.000	.250	.000	.737	.000	.737	.813	.000	.000	.813	.000	.743	.813	.770	.902
Cars	1	0	0	1	0	52	0	52	13	0	0	13	0	100	11	111	177
% Cars	100	0	0	100	0	92.9	0	92.9	100	0	0	100	0	99.0	84.6	97.4	96.2
Trucks	0	0	0	0	0	4	0	4	0	0	0	0	0	1	2	3	7
% Trucks	0	0	0	0	0	7.1	0	7.1	0	0	0	0	0	1.0	15.4	2.6	3.8

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
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:

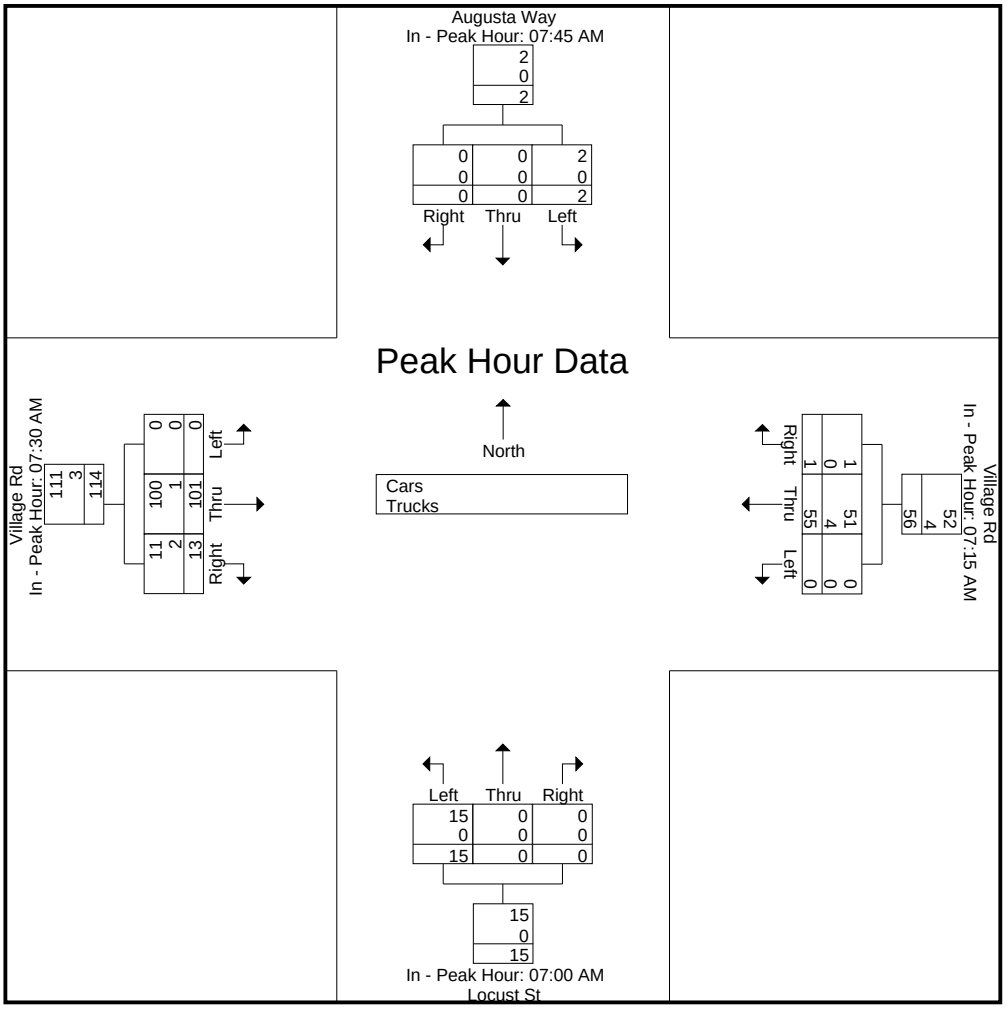
	07:45 AM				07:15 AM				07:00 AM				07:30 AM			
+0 mins.	**1**	0	0	**1**	0	9	**1**	10	**5**	0	0	**5**	0	23	2	25
+15 mins.	0	0	0	0	0	**19**	0	**19**	4	0	0	4	0	21	**4**	25
+30 mins.	0	0	0	0	0	14	0	14	2	0	0	2	0	23	4	27
+45 mins.	1	0	0	1	0	13	0	13	4	0	0	4	0	**34**	3	**37**
Total Volume	2	0	0	2	0	55	1	56	15	0	0	15	0	101	13	114
% App. Total	100	0	0		0	98.2	1.8		100	0	0		0	88.6	11.4	
PHF	.500	.000	.000	.500	.000	.724	.250	.737	.750	.000	.000	.750	.000	.743	.813	.770
Cars	2	0	0	2	0	51	1	52	15	0	0	15	0	100	11	111
% Cars	100	0	0	100	0	92.7	100	92.9	100	0	0	100	0	99	84.6	97.4
Trucks	0	0	0	0	0	4	0	4	0	0	0	0	0	1	2	3
% Trucks	0	0	0	0	0	7.3	0	7.1	0	0	0	0	0	1	15.4	2.6

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025

Groups Printed- Cars

	Augusta Way From North			Village Rd From East			Locust St From South			Village Rd 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	10	0	5	0	0	0	13	1	29
07:15 AM	0	0	0	0	8	1	4	0	0	0	18	2	33
07:30 AM	0	0	0	0	19	0	2	0	0	0	23	2	46
07:45 AM	1	0	0	0	11	0	4	0	0	0	21	3	40
Total	1	0	0	0	48	1	15	0	0	0	75	8	148
08:00 AM	0	0	0	0	13	0	3	0	0	0	22	4	42
08:15 AM	0	0	0	0	9	0	4	0	0	0	34	2	49
08:30 AM	1	0	0	0	16	1	3	0	1	0	14	4	40
08:45 AM	0	0	0	0	15	0	0	0	0	0	24	3	42
Total	1	0	0	0	53	1	10	0	1	0	94	13	173
Grand Total	2	0	0	0	101	2	25	0	1	0	169	21	321
Apprch %	100	0	0	0	98.1	1.9	96.2	0	3.8	0	88.9	11.1	
Total %	0.6	0	0	0	31.5	0.6	7.8	0	0.3	0	52.6	6.5	

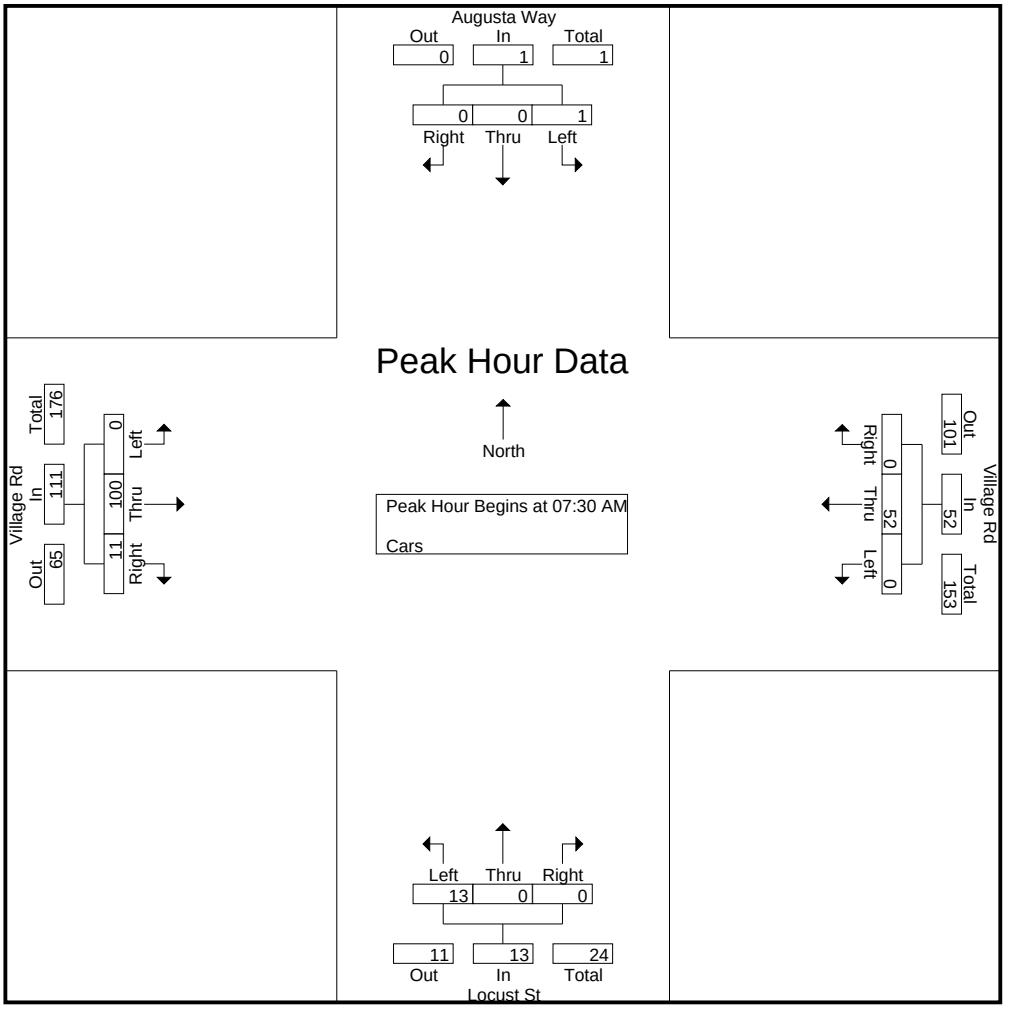
	Augusta Way From North				Village Rd From East				Locust St From South				Village Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	**19**	0	**19**	2	0	0	2	0	23	2	25	46
07:45 AM	**1**	0	0	**1**	0	11	0	11	**4**	0	0	**4**	0	21	3	24	40
08:00 AM	0	0	0	0	0	13	0	13	3	0	0	3	0	22	**4**	26	42
08:15 AM	0	0	0	0	0	9	0	9	4	0	0	4	0	**34**	2	**36**	**49**
Total Volume	1	0	0	1	0	52	0	52	13	0	0	13	0	100	11	111	177
% App. Total	100	0	0		0	100	0		100	0	0		0	90.1	9.9		
PHF	.250	.000	.000	.250	.000	.684	.000	.684	.813	.000	.000	.813	.000	.735	.688	.771	.903

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
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:

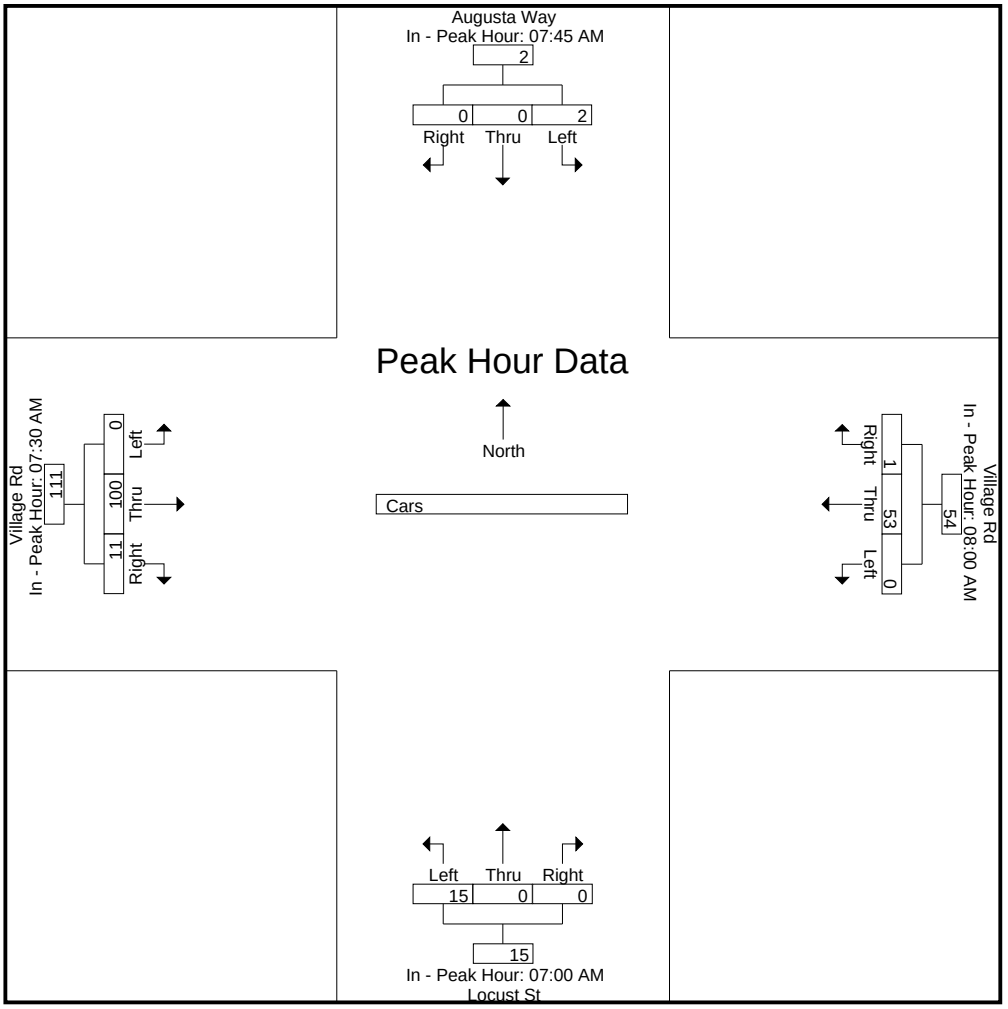
	07:45 AM				08:00 AM				07:00 AM				07:30 AM			
+0 mins.	**1**	0	0	**1**	0	13	0	13	**5**	0	0	**5**	0	23	2	25
+15 mins.	0	0	0	0	0	9	0	9	4	0	0	4	0	21	3	24
+30 mins.	0	0	0	0	0	**16**	**1**	**17**	2	0	0	2	0	22	**4**	26
+45 mins.	1	0	0	1	0	15	0	15	4	0	0	4	0	**34**	2	**36**
Total Volume	2	0	0	2	0	53	1	54	15	0	0	15	0	100	11	111
% App. Total	100	0	0		0	98.1	1.9		100	0	0		0	90.1	9.9	
PHF	.500	.000	.000	.500	.000	.828	.250	.794	.750	.000	.000	.750	.000	.735	.688	.771

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025

Groups Printed- Trucks

	Augusta Way From North			Village Rd From East			Locust St From South			Village Rd 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	0	1	3
07:15 AM	0	0	0	0	1	0	0	0	0	0	1	0	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	3	0	0	0	0	0	0	1	4
Total	0	0	0	0	6	0	0	0	0	0	1	2	9
08:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
08:15 AM	0	0	0	0	1	0	0	0	0	0	0	1	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	0	0	0	2	0	0	0	0	0	1	1	4
Grand Total	0	0	0	0	8	0	0	0	0	0	2	3	13
Apprch %	0	0	0	0	100	0	0	0	0	0	40	60	
Total %	0	0	0	0	61.5	0	0	0	0	0	15.4	23.1	

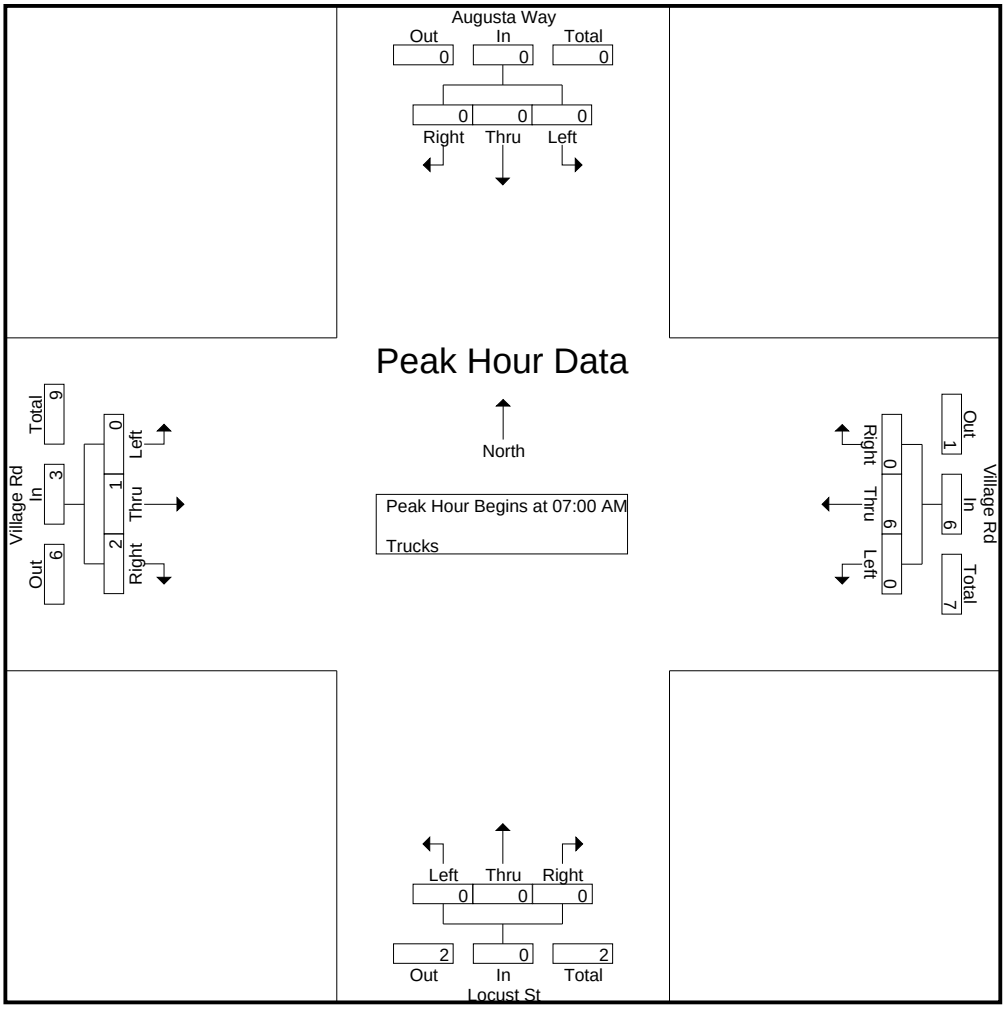
	Augusta Way From North				Village Rd From East				Locust St From South				Village Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	**1**	**1**	3
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	**1**	0	1	2
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	**3**	0	**3**	0	0	0	0	0	0	1	1	**4**
Total Volume	0	0	0	0	0	6	0	6	0	0	0	0	0	1	2	3	9
% App. Total	0	0	0		0	100	0		0	0	0		0	33.3	66.7		
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.250	.500	.750	.563

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
Page No : 8



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

Peak Hour for Each Approach Begins at:

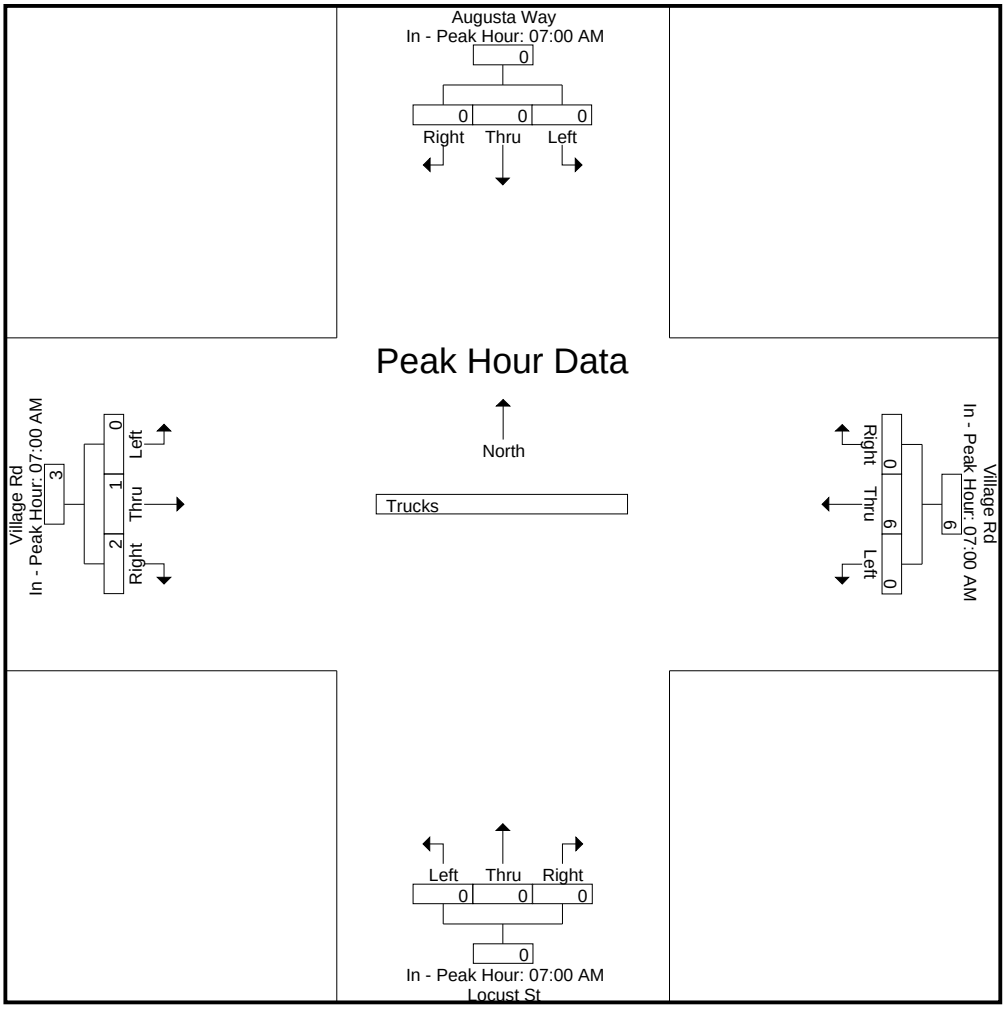
	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	0	**1**	**1**
+15 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	**1**	0	1
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	**3**	0	**3**	0	0	0	0	0	0	1	1
Total Volume	0	0	0	0	0	6	0	6	0	0	0	0	0	1	2	3
% App. Total	0	0	0		0	100	0		0	0	0		0	33.3	66.7	
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.250	.500	.750

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025

Groups Printed- Bikes Peds

	Augusta Way From North				Village Rd From East				Locust St From South				Village Rd From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	6	0	6
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5
Total	0	0	0	5	0	0	0	0	0	0	0	3	0	0	0	3	11	0	11
08:00 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
08:15 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	4	0	0	0	0	0	0	0	1	0	0	0	0	5	0	5
Grand Total	0	0	0	9	0	0	0	0	0	0	0	4	0	0	0	3	16	0	16
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

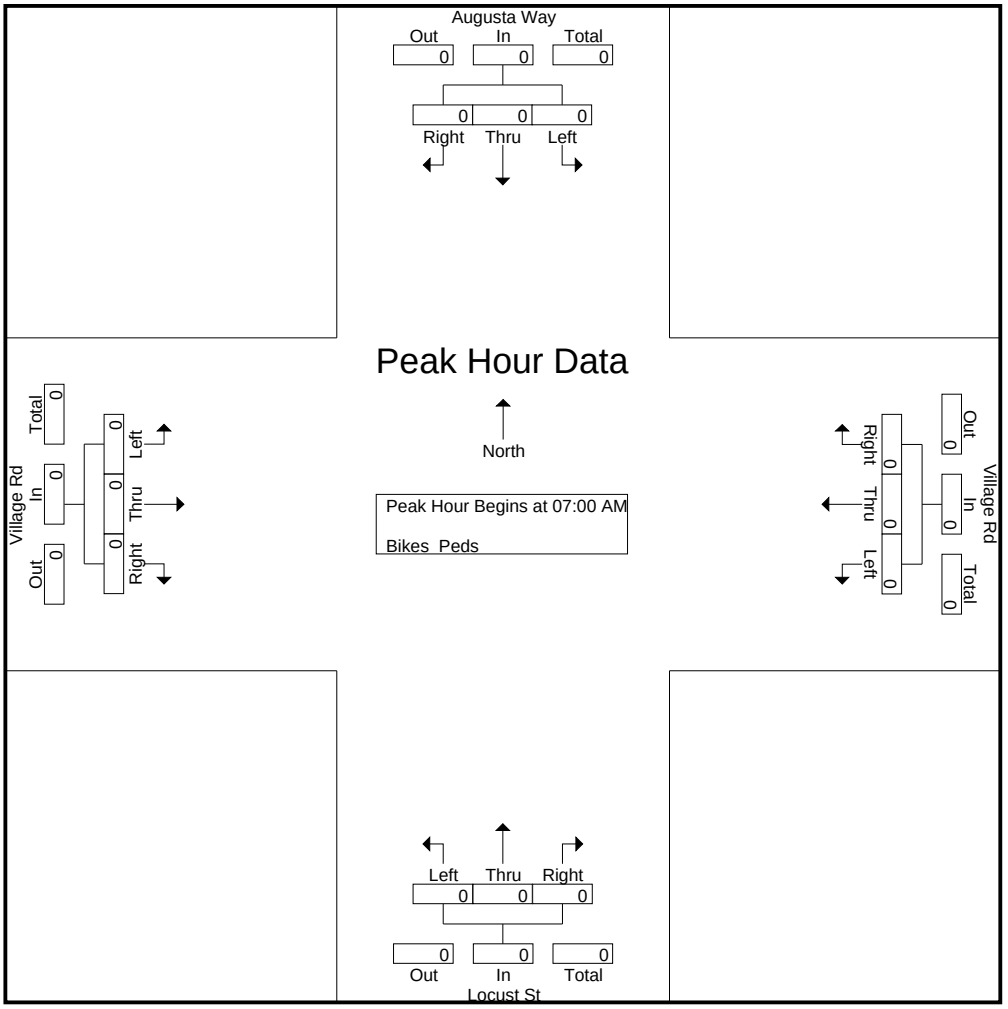
	Augusta Way From North				Village Rd From East				Locust St From South				Village Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													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

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
Page No : 11



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

Peak Hour for Each Approach Begins at:

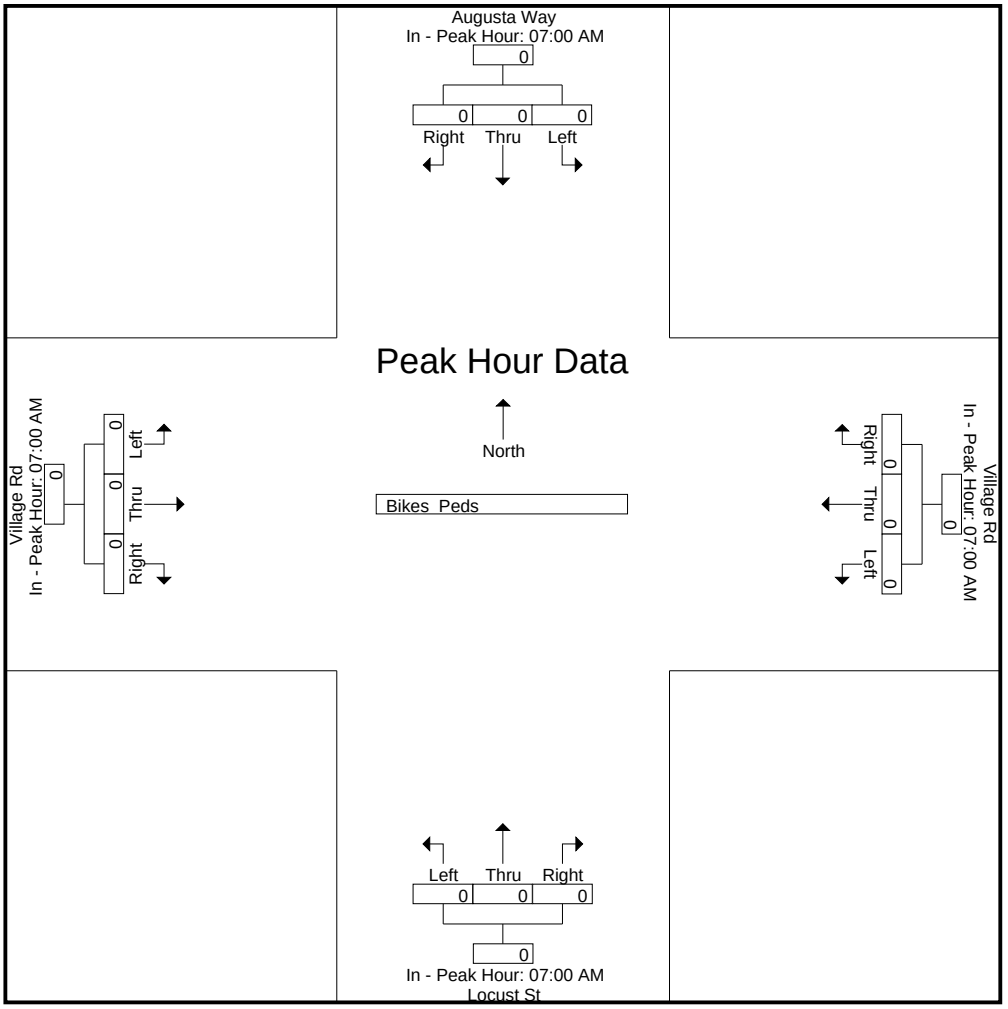
	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	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

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025

Groups Printed- Cars - Trucks

	Augusta Way From North			Village Rd From East			Locust St From South			Village Rd 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	24	0	4	0	1	0	11	1	41
04:15 PM	1	0	0	0	15	0	0	0	1	0	24	3	44
04:30 PM	0	0	0	0	42	0	2	1	0	0	19	3	67
04:45 PM	0	0	0	1	24	1	7	0	0	0	14	0	47
Total	1	0	0	1	105	1	13	1	2	0	68	7	199
05:00 PM	0	0	0	1	61	0	9	0	0	0	19	4	94
05:15 PM	0	0	0	0	32	0	3	0	0	0	22	3	60
05:30 PM	0	0	0	0	32	0	3	0	0	0	18	1	54
05:45 PM	0	0	0	1	15	0	1	0	1	0	14	2	34
Total	0	0	0	2	140	0	16	0	1	0	73	10	242
Grand Total	1	0	0	3	245	1	29	1	3	0	141	17	441
Apprch %	100	0	0	1.2	98.4	0.4	87.9	3	9.1	0	89.2	10.8	
Total %	0.2	0	0	0.7	55.6	0.2	6.6	0.2	0.7	0	32	3.9	
Cars	1	0	0	3	245	1	29	1	3	0	141	17	441
% Cars	100	0	0	100	100	100	100	100	100	0	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0

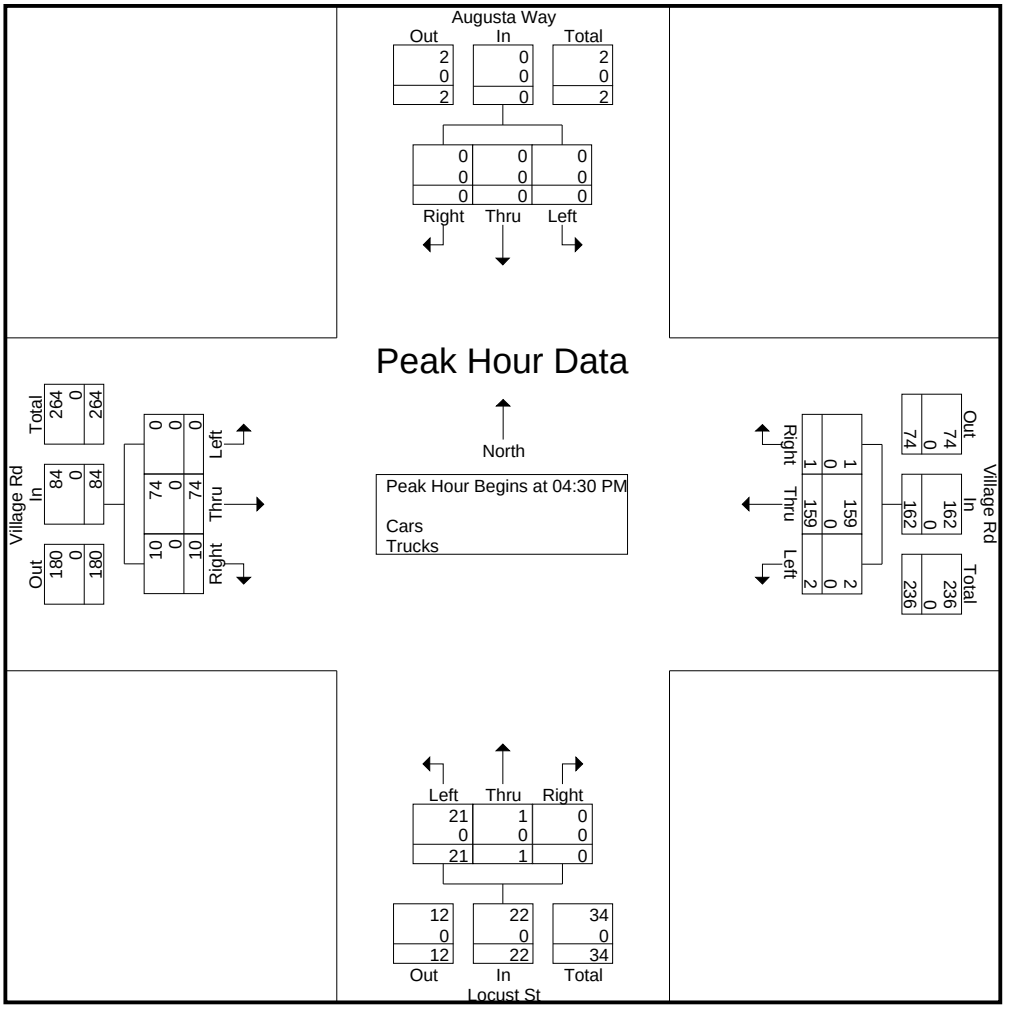
	Augusta Way From North				Village Rd From East				Locust St From South				Village Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	42	0	42	2	**1**	0	3	0	19	3	22	67
04:45 PM	0	0	0	0	**1**	24	**1**	26	7	0	0	7	0	14	0	14	47
05:00 PM	0	0	0	0	1	**61**	0	**62**	**9**	0	0	**9**	0	19	**4**	23	**94**
05:15 PM	0	0	0	0	0	32	0	32	3	0	0	3	0	**22**	3	**25**	60
Total Volume	0	0	0	0	2	159	1	162	21	1	0	22	0	74	10	84	268
% App. Total	0	0	0		1.2	98.1	0.6		95.5	4.5	0		0	88.1	11.9		
PHF	.000	.000	.000	.000	.500	.652	.250	.653	.583	.250	.000	.611	.000	.841	.625	.840	.713
Cars	0	0	0	0	2	159	1	162	21	1	0	22	0	74	10	84	268
% Cars	0	0	0	0	100	100	100	100	100	100	0	100	0	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

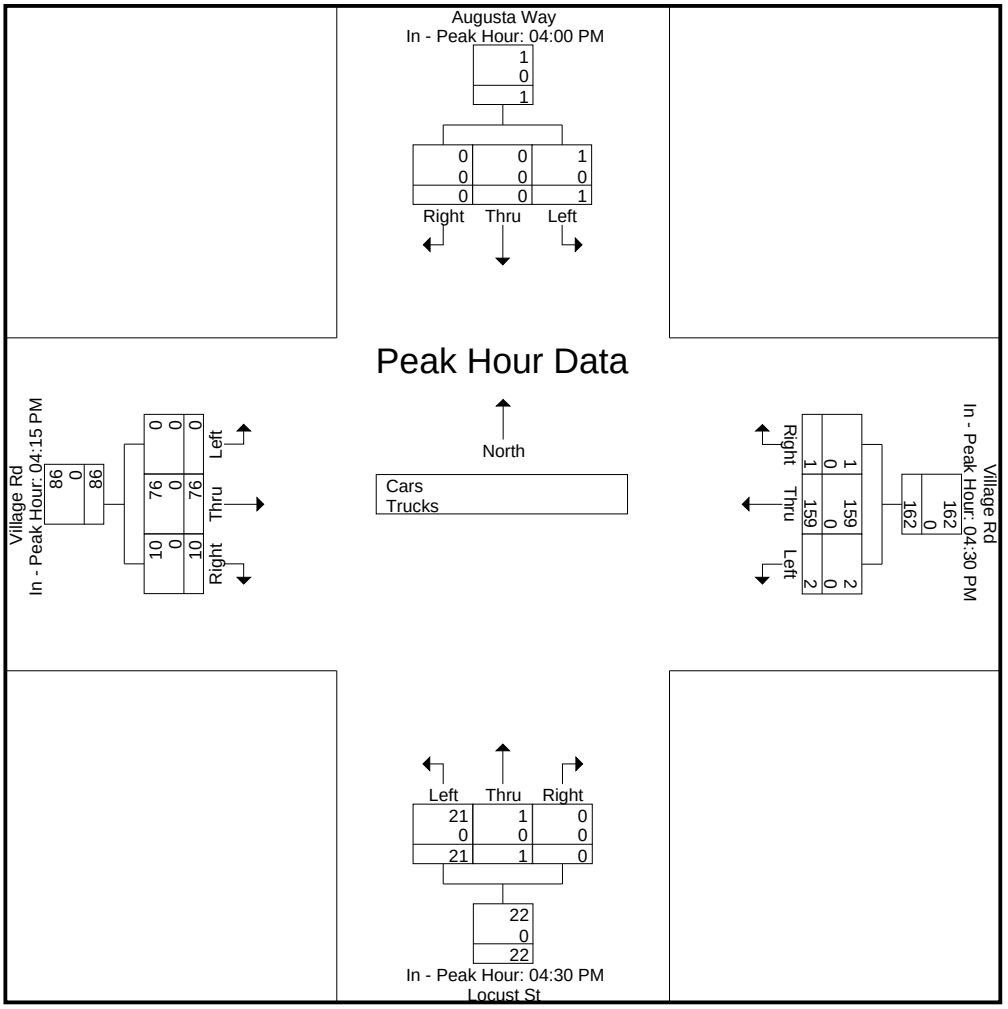
	04:00 PM				04:30 PM				04:30 PM				04:15 PM			
+0 mins.	0	0	0	0	0	42	0	42	2	**1**	0	3	0	**24**	3	**27**
+15 mins.	**1**	0	0	**1**	**1**	24	**1**	26	7	0	0	7	0	19	3	22
+30 mins.	0	0	0	0	1	**61**	0	**62**	**9**	0	0	**9**	0	14	0	14
+45 mins.	0	0	0	0	0	32	0	32	3	0	0	3	0	19	**4**	23
Total Volume	1	0	0	1	2	159	1	162	21	1	0	22	0	76	10	86
% App. Total	100	0	0		1.2	98.1	0.6		95.5	4.5	0		0	88.4	11.6	
PHF	.250	.000	.000	.250	.500	.652	.250	.653	.583	.250	.000	.611	.000	.792	.625	.796
Cars	1	0	0	1	2	159	1	162	21	1	0	22	0	76	10	86
% Cars	100	0	0	100	100	100	100	100	100	100	0	100	0	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025

Groups Printed- Cars

	Augusta Way From North			Village Rd From East			Locust St From South			Village Rd 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	24	0	4	0	1	0	11	1	41
04:15 PM	1	0	0	0	15	0	0	0	1	0	24	3	44
04:30 PM	0	0	0	0	42	0	2	1	0	0	19	3	67
04:45 PM	0	0	0	1	24	1	7	0	0	0	14	0	47
Total	1	0	0	1	105	1	13	1	2	0	68	7	199
05:00 PM	0	0	0	1	61	0	9	0	0	0	19	4	94
05:15 PM	0	0	0	0	32	0	3	0	0	0	22	3	60
05:30 PM	0	0	0	0	32	0	3	0	0	0	18	1	54
05:45 PM	0	0	0	1	15	0	1	0	1	0	14	2	34
Total	0	0	0	2	140	0	16	0	1	0	73	10	242
Grand Total	1	0	0	3	245	1	29	1	3	0	141	17	441
Apprch %	100	0	0	1.2	98.4	0.4	87.9	3	9.1	0	89.2	10.8	
Total %	0.2	0	0	0.7	55.6	0.2	6.6	0.2	0.7	0	32	3.9	

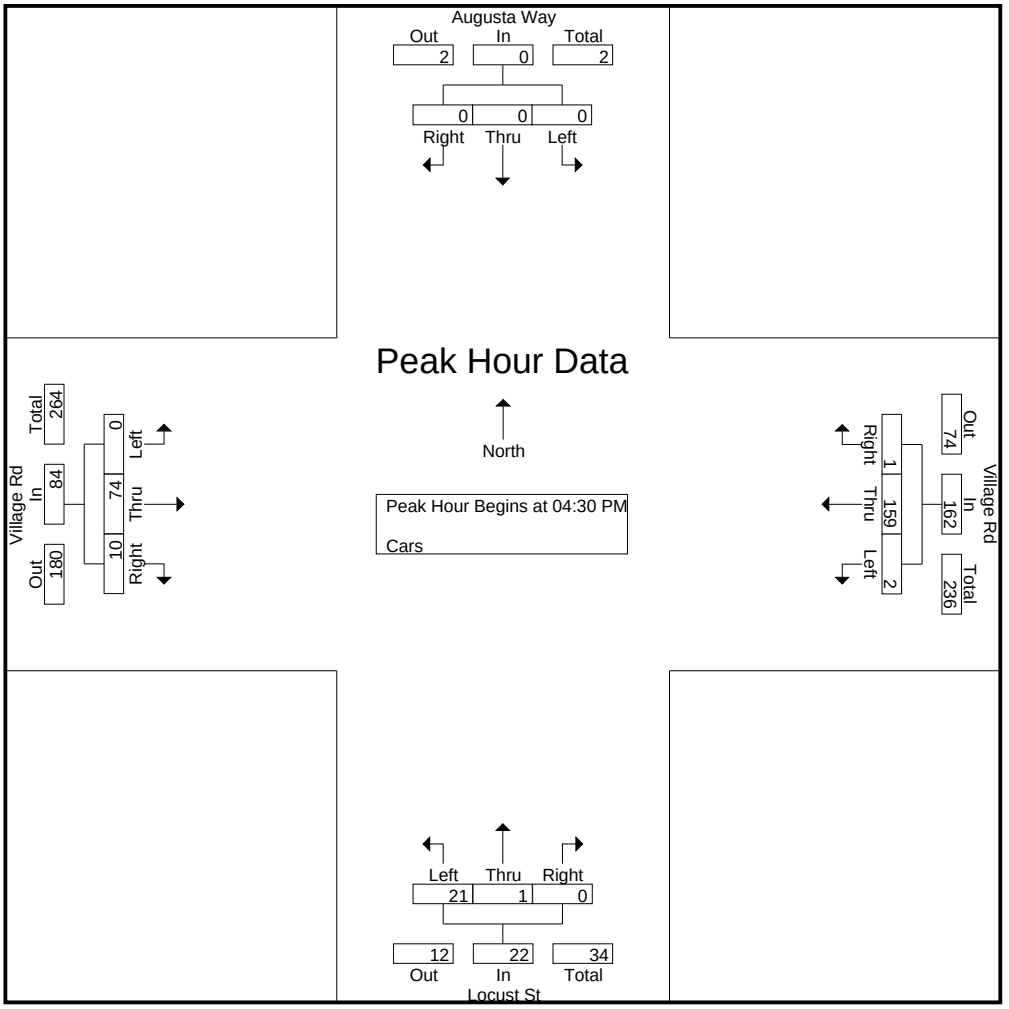
	Augusta Way From North				Village Rd From East				Locust St From South				Village Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	42	0	42	2	**1**	0	3	0	19	3	22	67
04:45 PM	0	0	0	0	**1**	24	**1**	26	7	0	0	7	0	14	0	14	47
05:00 PM	0	0	0	0	1	**61**	0	**62**	**9**	0	0	**9**	0	19	**4**	23	**94**
05:15 PM	0	0	0	0	0	32	0	32	3	0	0	3	0	**22**	3	**25**	60
Total Volume	0	0	0	0	2	159	1	162	21	1	0	22	0	74	10	84	268
% App. Total	0	0	0		1.2	98.1	0.6		95.5	4.5	0		0	88.1	11.9		
PHF	.000	.000	.000	.000	.500	.652	.250	.653	.583	.250	.000	.611	.000	.841	.625	.840	.713

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
Page No : 5



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

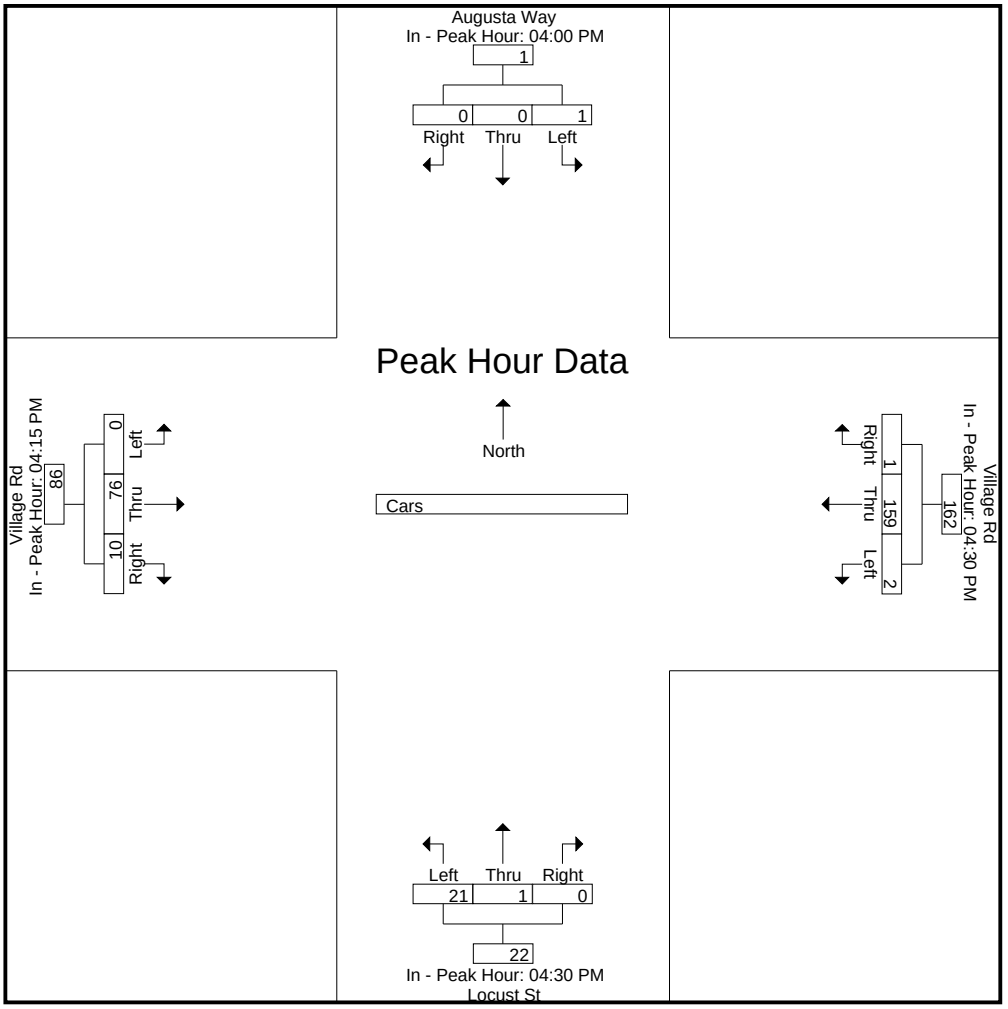
	04:00 PM				04:30 PM				04:30 PM				04:15 PM			
+0 mins.	0	0	0	0	0	42	0	42	2	**1**	0	3	0	**24**	3	**27**
+15 mins.	**1**	0	0	**1**	**1**	24	**1**	26	7	0	0	7	0	19	3	22
+30 mins.	0	0	0	0	1	**61**	0	**62**	**9**	0	0	**9**	0	14	0	14
+45 mins.	0	0	0	0	0	32	0	32	3	0	0	3	0	19	**4**	23
Total Volume	1	0	0	1	2	159	1	162	21	1	0	22	0	76	10	86
% App. Total	100	0	0		1.2	98.1	0.6		95.5	4.5	0		0	88.4	11.6	
PHF	.250	.000	.000	.250	.500	.652	.250	.653	.583	.250	.000	.611	.000	.792	.625	.796

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025

Groups Printed- Trucks

	Augusta Way From North			Village Rd From East			Locust St From South			Village Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	
Total %													

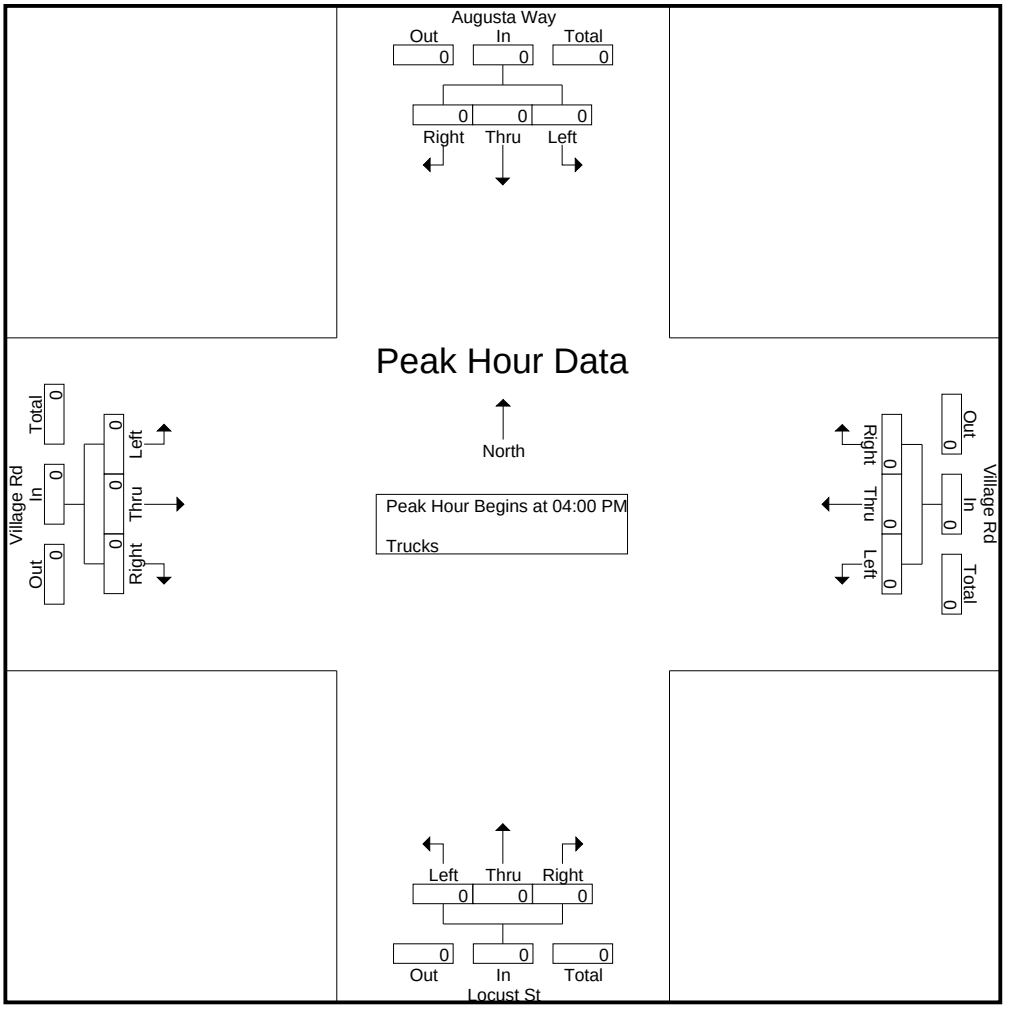
	Augusta Way From North				Village Rd From East				Locust St From South				Village Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

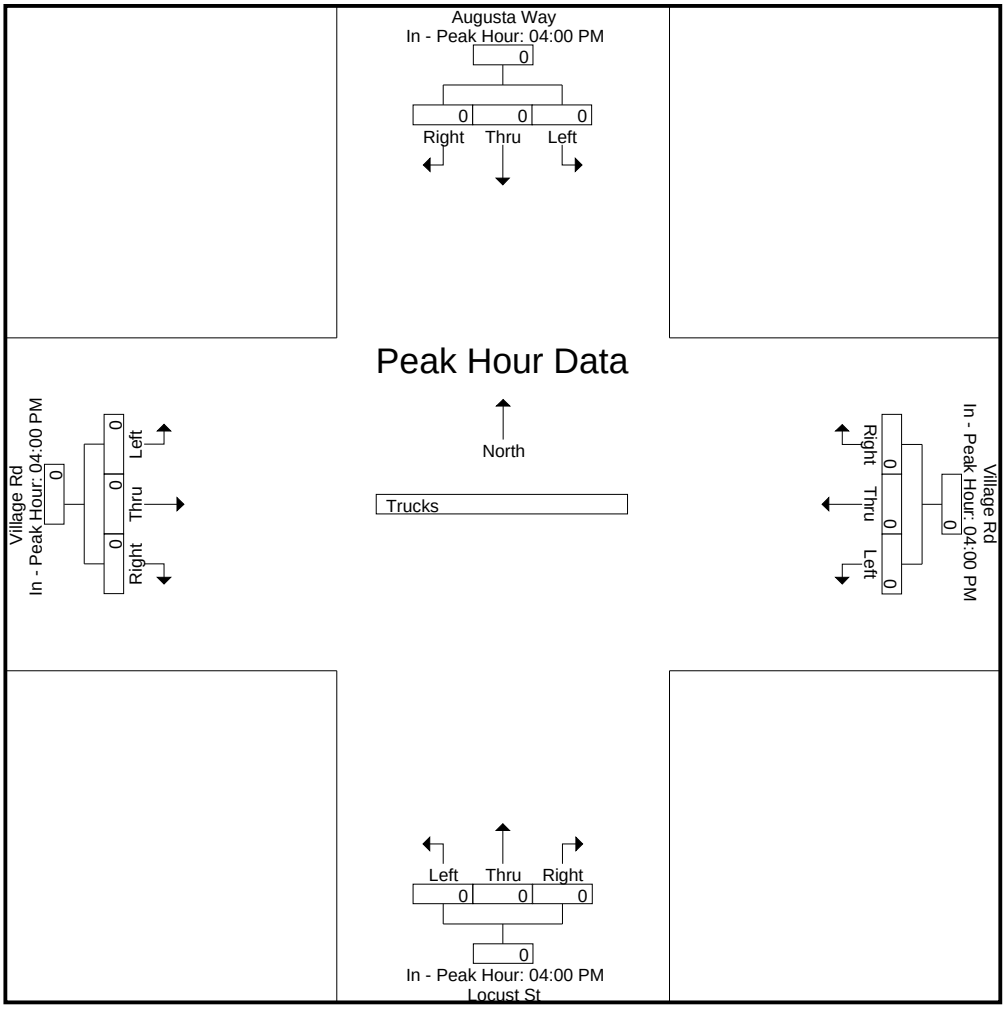
	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	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

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025

Groups Printed- Bikes Peds

	Augusta Way From North				Village Rd From East				Locust St From South				Village Rd From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
04:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
04:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
04:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Total	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Grand Total	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

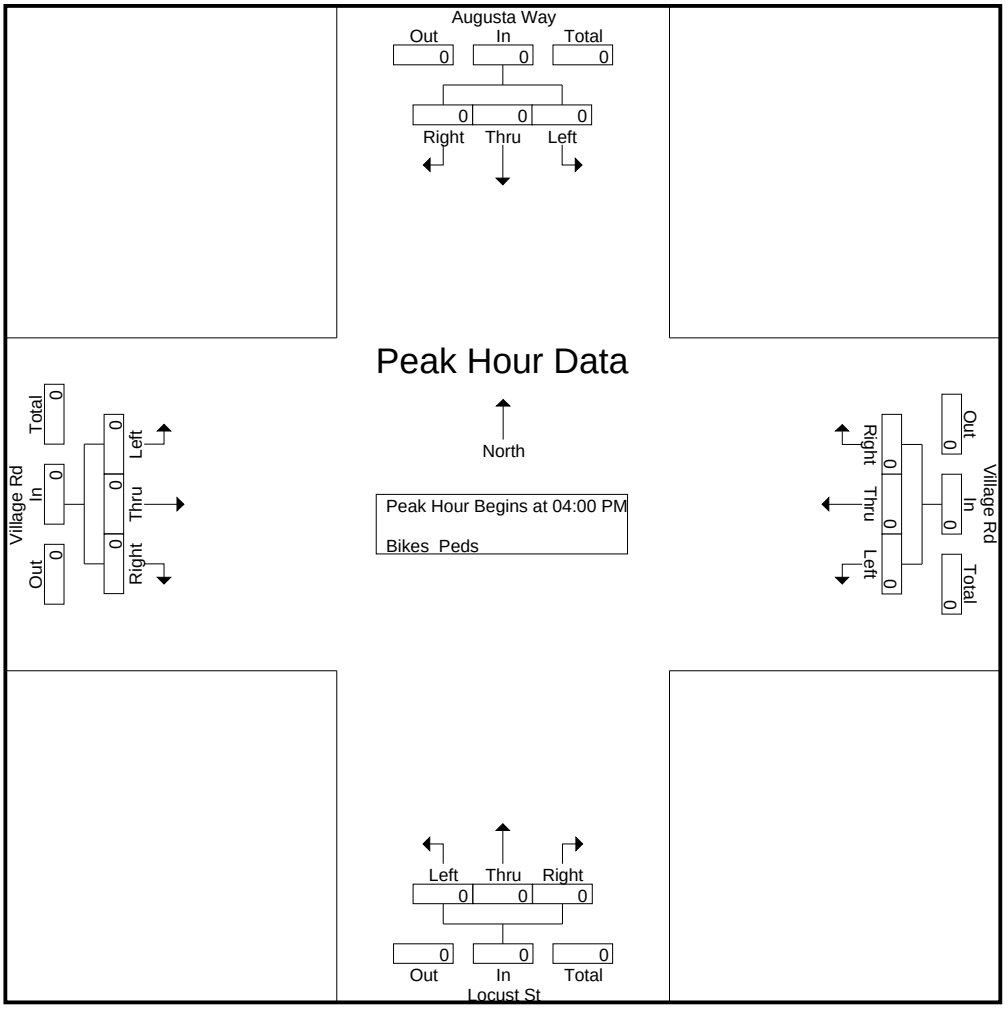
	Augusta Way From North				Village Rd From East				Locust St From South				Village Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

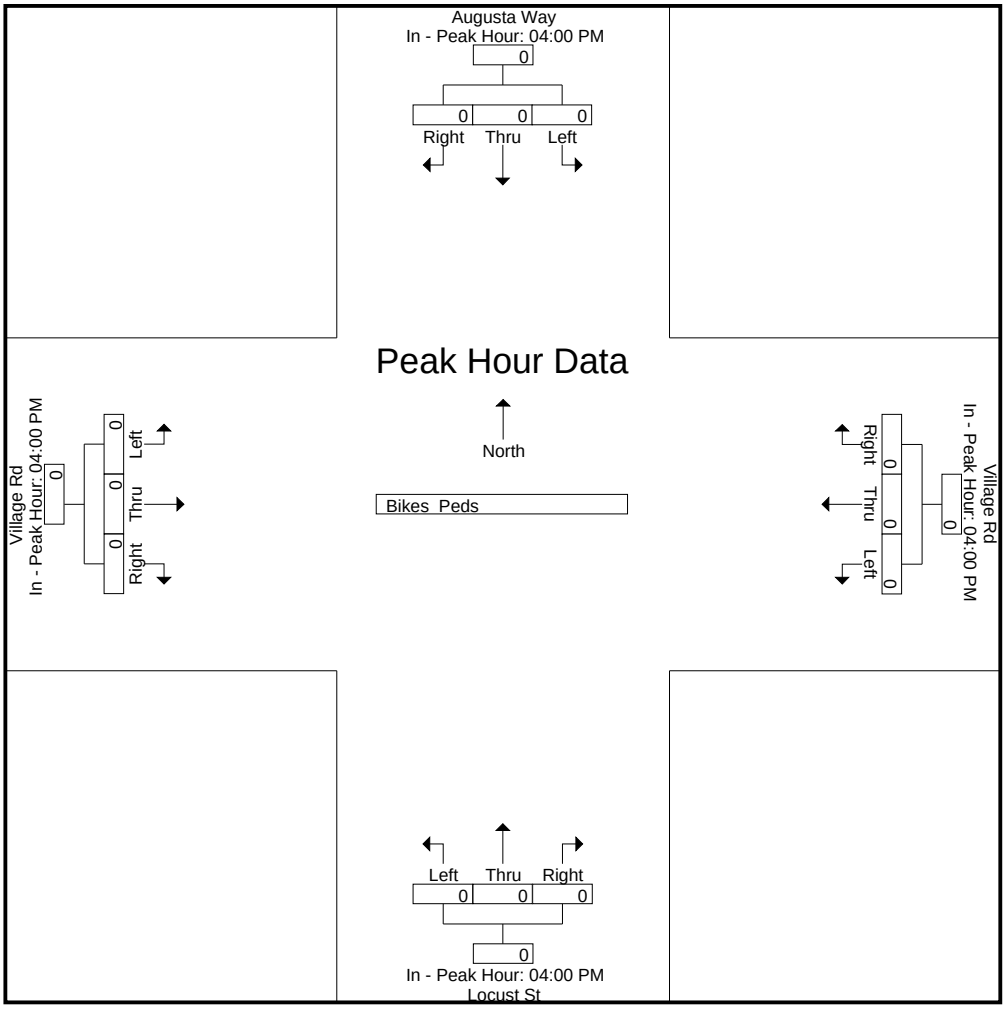
	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	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

Accurate Counts

978-664-2565

N/S Street : Augusta Way / Locust St
E/W Street : Village Road
City/State : Middleton, MA
Weather : Rain

File Name : 10255002
Site Code : 10255002
Start Date : 10/8/2025
Page No : 12



SEASONAL ADJUSTMENT DATA

Massachusetts Highway Department
Statewide Traffic Data Collection
2024 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.17	1.12	1.11	1.06	1.00	0.96	0.94	0.92	1.00	0.98	1.06	1.07	0.78
R3	1.10	1.04	1.04	1.02	0.91	0.88	0.88	0.87	0.92	0.92	0.99	1.01	0.98
R4-R7	1.16	1.12	1.08	1.03	0.92	0.89	0.88	0.89	0.92	0.94	1.04	1.10	0.98
U1-Boston	1.07	1.03	0.98	0.97	0.94	0.91	0.94	0.91	0.94	0.94	0.98	1.02	0.94
U1-Essex	1.13	1.09	1.06	1.04	0.95	0.89	0.88	0.87	0.95	0.95	1.03	1.05	0.96
U1-Southeast	1.14	1.10	1.04	0.99	0.93	0.86	0.87	0.85	0.91	0.93	0.99	1.02	0.96
U1-West	1.10	1.02	0.98	0.96	0.95	0.92	0.94	0.91	0.91	0.91	0.96	1.00	0.83
U1-Worcester	1.08	1.03	0.99	0.98	0.94	0.91	0.93	0.91	0.92	0.91	0.95	1.00	0.93
U3	1.06	1.02	0.98	0.96	0.93	0.91	0.95	0.94	0.93	0.93	0.96	1.00	0.98
U4-U7	1.04	1.02	0.96	0.95	0.91	0.90	0.94	0.94	0.93	0.94	0.98	1.02	0.99
UR2	1.08	1.02	0.98	0.97	0.93	0.90	0.93	0.90	0.92	0.92	0.97	1.01	0.98
Rec - East	1.21	1.20	1.09	1.01	0.91	0.81	0.77	0.79	0.91	0.95	1.05	1.13	0.99
Rec - West	1.46	1.38	1.32	1.06	0.94	0.79	0.59	0.69	0.97	0.99	1.18	1.28	0.99

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

U = Urban
R = Rural

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

UR2 Group - Combination of Urban Freeways and Expressways and Rural Freeways and Expressways.

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

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

VEHICLE TRAVEL SPEED DATA

June 2025
October 2025

June 2025

Accurate Counts
978-664-2565

Location : Village Road WB
Location : East of 35 Village Road
City/State: Middleton, MA
Direction: WB,

Site Code: 102551WB

6/17/2025 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	1	1	0	0	1	1	0	0	0	0	0	0	0	4
1:00	2	0	0	0	2	0	0	0	0	0	0	0	0	4
2:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1
3:00	0	1	1	0	1	0	1	0	0	0	0	0	0	4
4:00	0	0	1	0	1	2	0	0	0	0	0	0	0	4
5:00	0	0	1	2	3	2	3	3	0	0	0	0	0	14
6:00	0	2	2	4	11	5	3	0	0	0	0	0	0	27
7:00	3	2	2	19	33	19	5	3	0	0	0	0	0	86
8:00	3	4	3	19	60	34	6	2	1	0	0	0	0	132
9:00	2	0	1	16	27	33	3	2	0	0	0	0	0	84
10:00	2	3	2	13	36	40	17	2	1	0	0	0	0	116
11:00	2	1	0	15	30	21	12	1	0	0	0	0	0	82
12:00 PM	3	2	0	22	32	31	7	1	0	0	0	0	0	98
1:00	0	3	2	24	25	33	9	2	0	0	0	0	0	98
2:00	4	3	3	11	38	38	11	0	0	0	0	0	0	108
3:00	2	3	1	14	28	44	7	1	0	0	0	0	0	100
4:00	4	2	6	12	30	38	23	2	0	0	0	0	0	117
5:00	2	2	0	5	36	29	12	0	1	1	0	0	0	88
6:00	3	2	0	9	17	21	9	1	0	0	0	0	0	62
7:00	2	3	1	5	12	24	11	2	0	0	0	0	0	60
8:00	3	1	7	2	15	14	7	0	0	0	0	0	0	49
9:00	5	4	3	1	9	14	1	0	0	0	0	0	0	37
10:00	0	0	0	0	4	1	2	0	0	0	0	0	0	7
11:00	2	1	2	0	2	3	0	0	0	0	0	0	0	10
Total	45	40	38	193	454	447	149	22	3	1	0	0	0	1392

	Percentile	15th	50th	85th	95th
	Speed	27	33	39	41
Mean Speed (Average)		33.9			
10 MPH Pace Speed		31-40			
Number in Pace		901			
Percent in Pace		65.0%			
Number > 35 MPH		622			
Percent > 35 MPH		44.7%			

Accurate Counts
978-664-2565

Location : Village Road EB
Location : East of 35 Village Road
City/State: Middleton, MA
Direction: EB,

Site Code: 102551EB

6/17/2025 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	1	1	0	1	0	0	0	0	0	0	3
1:00	0	1	0	0	0	1	0	0	0	0	0	0	0	2
2:00	0	1	0	0	0	0	1	0	0	0	0	0	0	2
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	2	4	0	2	1	0	0	0	0	0	0	9
5:00	2	1	3	3	12	3	1	1	0	0	0	0	0	26
6:00	1	1	4	6	10	9	6	1	0	0	0	0	0	38
7:00	0	2	4	19	30	11	7	0	0	0	0	0	0	73
8:00	1	3	11	32	47	11	6	0	0	0	0	0	0	111
9:00	3	11	16	20	35	10	2	0	0	0	0	0	0	97
10:00	0	7	9	25	29	14	1	1	0	0	0	0	0	86
11:00	1	12	17	24	21	13	2	1	0	0	0	0	0	91
12:00 PM	3	25	20	34	35	10	2	0	0	0	0	0	0	129
1:00	0	14	13	29	35	12	4	0	0	0	0	0	0	107
2:00	3	16	19	26	26	10	1	1	0	0	0	0	0	102
3:00	1	23	7	27	28	11	2	0	0	0	0	0	1	100
4:00	2	35	26	17	33	18	4	1	0	0	0	0	0	136
5:00	1	28	9	17	26	17	4	0	0	0	0	0	0	102
6:00	0	13	3	12	11	8	3	0	0	0	0	0	0	50
7:00	1	4	7	17	9	6	2	0	0	0	0	0	0	46
8:00	0	4	7	9	7	2	0	0	0	0	0	0	0	29
9:00	1	6	4	7	4	1	0	0	0	0	0	0	0	23
10:00	1	2	2	3	2	0	0	0	0	0	0	0	0	10
11:00	0	1	2	1	0	2	0	0	0	0	0	0	0	6
Total	21	210	185	333	401	171	50	6	0	0	0	0	1	1378

Percentile	15th	50th	85th	95th
Speed	19	28	34	38

Mean Speed (Average)	28.9
10 MPH Pace Speed	26-35
Number in Pace	734
Percent in Pace	53.0%
Number > 30 MPH	629
Percent > 30 MPH	45.6%

Accurate Counts
978-664-2565

Location : Village Road EB
Location : East of 35 Village Road
City/State: Middleton, MA
Direction: EB,

Site Code: 102551EB

6/18/2025 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	1	1	0	1	1	0	0	0	0	0	0	0	0	4
1:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2:00	0	0	0	1	0	0	1	0	0	0	0	0	0	2
3:00	0	0	0	2	0	0	0	0	0	0	0	0	0	2
4:00	0	0	2	2	2	0	1	0	0	0	0	0	0	7
5:00	0	0	1	8	10	2	0	0	0	0	0	0	0	21
6:00	1	4	3	11	15	9	6	0	0	0	0	0	0	49
7:00	0	1	9	22	20	7	5	1	0	0	0	0	0	65
8:00	2	12	9	33	25	13	2	0	0	0	0	0	0	96
9:00	4	12	18	36	24	8	2	1	0	1	0	0	0	106
10:00	3	12	14	32	28	13	1	0	0	0	0	0	0	103
11:00	3	15	15	20	18	13	3	0	0	0	0	0	0	87
12:00 PM	1	29	31	38	34	4	1	0	0	0	0	1	0	139
1:00	4	24	28	29	33	10	0	0	0	0	1	0	0	129
2:00	4	31	17	20	20	6	0	0	0	0	0	0	0	98
3:00	7	15	12	21	32	10	1	0	0	0	0	0	0	98
4:00	4	48	29	28	33	13	1	1	0	0	0	0	0	157
5:00	3	30	23	13	25	16	6	1	0	0	0	0	0	117
6:00	1	11	11	8	24	10	3	1	0	0	0	0	0	69
7:00	1	7	14	10	16	12	2	0	0	0	0	0	0	62
8:00	3	8	10	12	14	8	3	1	0	0	0	0	0	59
9:00	1	11	6	8	11	5	0	0	0	0	0	0	0	42
10:00	5	6	5	1	5	2	0	0	0	0	0	0	0	24
11:00	0	2	2	1	0	0	0	0	0	0	0	0	0	5
Total	48	280	259	357	390	161	38	6	0	1	1	1	0	1542
			Percentile	15th	50th	85th	95th							
			Speed	18	27	34	38							
			Mean Speed (Average)	27.6										
			10 MPH Pace Speed	26-35										
			Number in Pace	740										
			Percent in Pace	49.0%										
			Number > 30 MPH	598										
			Percent > 30 MPH	38.8%										
Grand Total	69	490	444	690	791	332	88	12	0	1	1	1	1	2920
Stats			Percentile	15th	50th	85th	95th							
			Speed	18	28	34	38							
			Mean Speed (Average)	28.2										
			10 MPH Pace Speed	26-35										
			Number in Pace	1480										
			Percent in Pace	51.0%										
			Number > 30 MPH	1227										
			Percent > 30 MPH	42.0%										

Accurate Counts
978-664-2565

Location : Village Road WB
Location : East of 35 Village Road
City/State: Middleton, MA
Direction: WB,

Site Code: 102551WB

6/18/2025 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	3	0	0	1	1	0	0	0	0	0	0	0	0	5
1:00	0	0	1	0	2	0	0	0	0	0	0	0	0	3
2:00	0	0	0	1	0	0	0	1	0	0	0	0	0	2
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	1	0	0	1	0	0	0	0	0	2
5:00	0	1	1	3	3	4	1	2	0	0	0	0	0	15
6:00	1	1	0	6	7	6	4	2	0	0	0	0	0	27
7:00	0	1	3	11	30	24	4	1	1	0	0	0	0	75
8:00	4	1	9	38	53	28	4	0	0	0	0	0	0	137
9:00	9	4	9	21	40	24	8	0	0	0	0	0	0	115
10:00	5	11	6	21	25	14	3	1	0	0	0	0	0	86
11:00	4	2	15	17	42	24	7	2	0	2	0	0	0	115
12:00 PM	2	1	10	20	30	39	11	1	0	0	0	0	0	114
1:00	5	1	4	19	29	38	7	0	0	0	0	0	0	103
2:00	12	8	6	16	29	19	9	0	0	1	0	0	0	100
3:00	4	3	8	8	26	32	17	4	3	0	0	0	0	105
4:00	4	4	6	13	38	52	17	3	0	0	0	0	0	137
5:00	4	3	1	10	30	37	18	1	0	0	0	0	0	104
6:00	10	5	2	7	17	31	12	1	0	0	0	0	0	85
7:00	1	5	4	8	17	17	6	2	0	0	0	0	0	60
8:00	5	4	1	5	23	18	6	1	0	0	0	0	0	63
9:00	6	2	1	6	10	14	6	2	0	0	0	0	0	47
10:00	3	1	1	1	1	10	2	1	0	0	0	0	0	20
11:00	3	1	4	0	6	3	3	0	0	0	0	0	0	20
Total	85	59	92	232	460	434	145	26	4	3	0	0	0	1540
			Percentile	15th	50th	85th	95th							
			Speed	24	33	38	42							
			Mean Speed (Average)	32.6										
			10 MPH Pace Speed	31-40										
			Number in Pace	874										
			Percent in Pace	58.0%										
			Number > 35 MPH	612										
			Percent > 35 MPH	39.7%										
Grand Total	130	99	130	425	914	881	294	48	7	4	0	0	0	2932
Stats			Percentile	15th	50th	85th	95th							
			Speed	26	33	38	42							
			Mean Speed (Average)	33.2										
			10 MPH Pace Speed	31-40										
			Number in Pace	1786										
			Percent in Pace	61.0%										
			Number > 35 MPH	1234										
			Percent > 35 MPH	42.1%										

October 2025

Accurate Counts
978-664-2565

Location : Locust Street
Location : North of Nichols Lane
City/State: Middleton, MA
Direction: SB,

Site Code: 10255001

10/8/2025 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
6:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
7:00	2	3	4	0	0	0	0	0	0	0	0	0	0	9
8:00	0	6	3	3	0	0	0	0	0	0	0	0	0	12
9:00	0	2	3	0	0	0	0	0	0	0	0	0	0	5
10:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	1	3	1	0	0	0	0	0	0	0	0	0	5
1:00	2	2	4	0	0	0	0	0	0	0	0	0	0	8
2:00	0	2	3	1	0	0	0	0	0	0	0	0	0	6
3:00	3	2	1	0	0	0	0	0	0	0	0	0	0	6
4:00	0	1	5	0	0	0	0	0	0	0	0	0	0	6
5:00	0	1	4	2	1	0	0	0	0	0	0	0	0	8
6:00	0	7	1	1	0	0	0	0	0	0	0	0	0	9
7:00	0	1	4	0	0	0	0	0	0	0	0	0	0	5
8:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
9:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
10:00	0	0	2	0	0	0	0	0	0	0	0	0	0	2
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	7	40	42	8	1	0	0	0	0	0	0	0	0	98

Percentile	15th	50th	85th	95th
Speed	16	20	23	26

Mean Speed (Average)	20.3
10 MPH Pace Speed	15-24
Number in Pace	84
Percent in Pace	86.0%
Number > 20 MPH	51
Percent > 20 MPH	52.0%

Accurate Counts
978-664-2565

Location : Locust Street
Location : North of Nichols Lane
City/State: Middleton, MA
Direction: SB,

Site Code: 10255001

10/9/2025 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
6:00	0	0	2	1	0	0	0	0	0	0	0	0	0	3
7:00	2	3	5	0	1	0	0	0	0	0	0	0	0	11
8:00	0	7	2	1	0	0	0	0	0	0	0	0	0	10
9:00	1	3	2	1	0	0	0	0	0	0	0	0	0	7
10:00	1	0	2	0	0	0	0	0	0	0	0	0	0	3
11:00	1	2	2	2	0	0	0	0	0	0	0	0	0	7
12:00 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	2
1:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2:00	0	3	2	1	0	0	0	0	0	0	0	0	0	6
3:00	3	3	0	1	0	0	0	0	0	0	0	0	0	7
4:00	1	5	2	1	1	0	1	0	0	0	0	0	0	11
5:00	1	4	1	1	0	0	0	0	0	0	0	0	0	7
6:00	1	1	2	2	0	0	0	0	0	0	0	0	0	6
7:00	0	1	2	2	0	0	0	0	0	0	0	0	0	5
8:00	0	1	2	0	0	0	0	0	0	0	0	0	0	3
9:00	0	1	1	1	0	0	0	0	0	0	0	0	0	3
10:00	1	2	0	1	0	0	0	0	0	0	0	0	0	4
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	12	39	27	16	2	0	1	0	0	0	0	0	0	97
			Percentile	15th	50th	85th	95th							
			Speed	16	19	24	27							
		Mean Speed (Average)		20.3										
		10 MPH Pace Speed		14-23										
		Number in Pace		72										
		Percent in Pace		77.0%										
		Number > 20 MPH		46										
		Percent > 20 MPH		47.4%										
Grand Total	19	79	69	24	3	0	1	0	0	0	0	0	0	195
Stats			Percentile	15th	50th	85th	95th							
			Speed	16	20	24	28							
		Mean Speed (Average)		20.3										
		10 MPH Pace Speed		15-24										
		Number in Pace		158										
		Percent in Pace		81.0%										
		Number > 20 MPH		97										
		Percent > 20 MPH		49.7%										

Accurate Counts
978-664-2565

Location : Locust Street
Location : North of Nichols Lane
City/State: Middleton, MA
Direction: NB,

Site Code: 10255001

10/8/2025 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	1	2	0	0	0	0	0	0	0	0	0	3
7:00	0	1	7	3	2	0	0	0	0	0	0	0	0	13
8:00	1	0	4	3	1	0	0	0	0	0	0	0	0	9
9:00	0	1	3	1	0	0	0	0	0	0	0	0	0	5
10:00	1	1	2	1	0	0	0	0	0	0	0	0	0	5
11:00	0	1	1	3	0	0	0	0	0	0	0	0	0	5
12:00 PM	0	0	2	1	1	0	0	0	0	0	0	0	0	4
1:00	1	0	5	3	1	0	0	0	0	0	0	0	0	10
2:00	0	0	2	4	0	0	0	0	0	0	0	0	0	6
3:00	0	1	4	4	1	0	0	0	0	0	0	0	0	10
4:00	0	0	6	7	1	0	0	0	0	0	0	0	0	14
5:00	0	0	5	9	1	0	1	0	0	0	0	0	0	16
6:00	0	1	3	4	1	1	0	0	0	0	0	0	0	10
7:00	0	0	4	1	0	0	0	0	0	0	0	0	0	5
8:00	0	1	2	1	0	0	0	0	0	0	0	0	0	4
9:00	0	1	0	2	0	0	0	0	0	0	0	0	0	3
10:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	8	51	51	9	1	1	0	0	0	0	0	0	124

Percentile	15th	50th	85th	95th
Speed	20	24	28	31

Mean Speed (Average)	25.0
10 MPH Pace Speed	20-29
Number in Pace	106
Percent in Pace	85.0%
Number > 20 MPH	113
Percent > 20 MPH	91.1%

Accurate Counts
978-664-2565

Location : Locust Street
Location : North of Nichols Lane
City/State: Middleton, MA
Direction: NB,

Site Code: 10255001

10/9/2025 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	2	0	0	0	0	0	0	0	0	0	2
7:00	0	4	6	2	1	0	0	0	0	0	0	0	0	13
8:00	0	3	3	5	2	0	0	0	0	0	0	0	0	13
9:00	0	3	3	2	1	0	0	0	0	0	0	0	0	9
10:00	0	2	3	2	0	0	0	0	0	0	0	0	0	7
11:00	0	0	4	1	0	0	0	0	0	0	0	0	0	5
12:00 PM	0	0	5	2	2	0	0	0	0	0	0	0	0	9
1:00	2	5	0	0	0	0	0	0	0	0	0	0	0	7
2:00	0	1	2	1	0	0	0	0	0	0	0	0	0	4
3:00	0	1	5	3	0	0	0	0	0	0	0	0	0	9
4:00	0	1	8	5	2	0	0	0	0	0	0	0	0	16
5:00	0	2	5	9	0	0	0	0	0	0	0	0	0	16
6:00	0	1	1	3	1	0	0	0	0	0	0	0	0	6
7:00	1	0	1	2	0	0	0	0	0	0	0	0	0	4
8:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
9:00	0	0	1	2	2	0	0	0	0	0	0	0	0	5
10:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	23	48	43	11	0	0	0	0	0	0	0	0	128
			Percentile	15th	50th	85th	95th							
			Speed	19	23	28	31							
		Mean Speed (Average)		24.0										
		10 MPH Pace Speed		20-29										
		Number in Pace		94										
		Percent in Pace		74.0%										
		Number > 20 MPH		102										
		Percent > 20 MPH		79.7%										
Grand Total	6	31	99	94	20	1	1	0	0	0	0	0	0	252
Stats			Percentile	15th	50th	85th	95th							
			Speed	20	24	28	31							
		Mean Speed (Average)		24.5										
		10 MPH Pace Speed		20-29										
		Number in Pace		201										
		Percent in Pace		80.0%										
		Number > 20 MPH		215										
		Percent > 20 MPH		85.3%										

Accurate Counts
978-664-2565

Location : Locust Street
Location : North of Nichols Lane
City/State: Middleton, MA
Direction: Combined

Site Code: 10255001

10/8/2025 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
6:00	0	2	3	2	0	0	0	0	0	0	0	0	0	7
7:00	2	4	11	3	2	0	0	0	0	0	0	0	0	22
8:00	1	6	7	6	1	0	0	0	0	0	0	0	0	21
9:00	0	3	6	1	0	0	0	0	0	0	0	0	0	10
10:00	1	2	3	1	0	0	0	0	0	0	0	0	0	7
11:00	0	1	1	3	0	0	0	0	0	0	0	0	0	5
12:00 PM	0	1	5	2	1	0	0	0	0	0	0	0	0	9
1:00	3	2	9	3	1	0	0	0	0	0	0	0	0	18
2:00	0	2	5	5	0	0	0	0	0	0	0	0	0	12
3:00	3	3	5	4	1	0	0	0	0	0	0	0	0	16
4:00	0	1	11	7	1	0	0	0	0	0	0	0	0	20
5:00	0	1	9	11	2	0	1	0	0	0	0	0	0	24
6:00	0	8	4	5	1	1	0	0	0	0	0	0	0	19
7:00	0	1	8	1	0	0	0	0	0	0	0	0	0	10
8:00	0	6	3	1	0	0	0	0	0	0	0	0	0	10
9:00	0	3	0	2	0	0	0	0	0	0	0	0	0	5
10:00	0	0	2	1	0	0	0	0	0	0	0	0	0	3
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	10	48	93	59	10	1	1	0	0	0	0	0	0	222

Percentile	15th	50th	85th	95th
Speed	17	22	27	29

Mean Speed (Average)	23.0
10 MPH Pace Speed	19-28
Number in Pace	168
Percent in Pace	76.0%
Number > 20 MPH	164
Percent > 20 MPH	73.9%

Accurate Counts
978-664-2565

Location : Locust Street
Location : North of Nichols Lane
City/State: Middleton, MA
Direction: Combined

Site Code: 10255001

10/9/2025 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
6:00	0	0	2	3	0	0	0	0	0	0	0	0	0	5
7:00	2	7	11	2	2	0	0	0	0	0	0	0	0	24
8:00	0	10	5	6	2	0	0	0	0	0	0	0	0	23
9:00	1	6	5	3	1	0	0	0	0	0	0	0	0	16
10:00	1	2	5	2	0	0	0	0	0	0	0	0	0	10
11:00	1	2	6	3	0	0	0	0	0	0	0	0	0	12
12:00 PM	0	2	5	2	2	0	0	0	0	0	0	0	0	11
1:00	2	6	0	0	0	0	0	0	0	0	0	0	0	8
2:00	0	4	4	2	0	0	0	0	0	0	0	0	0	10
3:00	3	4	5	4	0	0	0	0	0	0	0	0	0	16
4:00	1	6	10	6	3	0	1	0	0	0	0	0	0	27
5:00	1	6	6	10	0	0	0	0	0	0	0	0	0	23
6:00	1	2	3	5	1	0	0	0	0	0	0	0	0	12
7:00	1	1	3	4	0	0	0	0	0	0	0	0	0	9
8:00	0	1	3	0	0	0	0	0	0	0	0	0	0	4
9:00	0	1	2	3	2	0	0	0	0	0	0	0	0	8
10:00	1	2	0	2	0	0	0	0	0	0	0	0	0	5
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	15	62	75	59	13	0	1	0	0	0	0	0	0	225
			Percentile	15th	50th	85th	95th							
			Speed	17	22	27	30							
		Mean Speed (Average)		22.4										
		10 MPH Pace Speed		18-27										
		Number in Pace		151										
		Percent in Pace		69.0%										
		Number > 20 MPH		148										
		Percent > 20 MPH		65.8%										
Grand Total	25	110	168	118	23	1	2	0	0	0	0	0	0	447
Stats			Percentile	15th	50th	85th	95th							
			Speed	17	22	27	29							
		Mean Speed (Average)		22.7										
		10 MPH Pace Speed		19-28										
		Number in Pace		316										
		Percent in Pace		71.0%										
		Number > 20 MPH		312										
		Percent > 20 MPH		69.8%										

MASSDOT CRASH DATA

East Street at Locust Street and Towne Road

Crash Number	City Town Name	Crash Date	Day	Crash Severity	Crash Status	Crash Time	Crash Year	Driver Contributing Circumstances (All Drivers)	First Harmful Event	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Traffic Control Device Type	Trafficway Description	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Travel Directions (All Vehicles)
4497774	MIDDLETON	02/07/2018	Wed	Property damage only (none injured)	Closed	12:13 PM	2018	D1: (No improper driving) / D2: (No improper driving)	Collision with motor vehicle in traffic	Daylight	Sideswipe, opposite direction	Ice	Unknown	No controls	Unknown	V1: Travelling straight ahead / V2: Travelling straight ahead	V1: S / V2: W
4613087	MIDDLETON	10/22/2018	Mon	Property damage only (none injured)	Closed	11:09 AM	2018	D1: (Distracted)	Collision with ditch	Daylight	Single vehicle crash	Dry	Not at junction	No controls	Two-way, divided, unprotected median	V1: Travelling straight ahead	V1: E
4749117	MIDDLETON	09/10/2019	Tue	Non-fatal injury	Closed	7:00 PM	2019	D1: (No improper driving) / D2: (Failed to yield right of way),(Other improper action)	Collision with motor vehicle in traffic	Dark - lighted roadway	Angle	Dry	Four-way intersection	Stop signs	Two-way, not divided	V1: Travelling straight ahead / V2: Entering traffic lane	V1: N / V2: E
4981251	MIDDLETON	07/06/2021	Tue	Property damage only (none injured)	Closed	3:49 PM	2021	D1: (Failure to keep in proper lane or running off road)	Collision with ditch	Daylight	Single vehicle crash	Dry	T-intersection	No controls	Two-way, divided, unprotected median	V1: Turning right	V1: E
5122124	MIDDLETON	06/30/2022	Thu	Property damage only (none injured)	Closed	8:25 PM	2022	D1: (No improper driving) / D2: (Failed to yield right of way)	Collision with motor vehicle in traffic	Dark - lighted roadway	Angle	Dry	Four-way intersection	No controls	Two-way, not divided	V1: Travelling straight ahead / V2: Turning left	V1: E / V2: N

East Street at Locust Street and Towne Road

Crash Number	City Town Name	Crash Date	Weather Conditions	First Harmful Event Location	Geocoding Method	Most Harmful Event (All Vehicles)	Road Contributing Circumstance	Traffic Control Device Function	Vehicle Sequence of Events (All Vehicles)	Street Number	Roadway
4497774	MIDDLETON	02/07/2018	Snow/Sleet, hail (freezing rain or drizzle)	Roadway	At Intersection	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	Road surface condition (wet, icy, snow, slush, etc.)	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		EAST ST / LOCUST ST
4613087	MIDDLETON	10/22/2018	Clear	Outside roadway	At Intersection	V1:(Invalid Code Specified)	None	Not reported	V1:(Ran off road right)		EAST ST / LOCUST ST
4749117	MIDDLETON	09/10/2019	Clear	Roadway	At Intersection	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	Yes, device functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		EAST ST / LOCUST ST
4981251	MIDDLETON	07/06/2021	Clear	Outside roadway	At Address	V1:(Collision with ditch)	None	Not reported	V1:(Collision with ditch)	85	EAST ST
5122124	MIDDLETON	06/30/2022	Clear	Roadway	At Intersection	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		EAST ST / LOCUST ST

Village Road at 35 Village Road Driveway

Crash Number	City Town Name	Crash Date	Day	Crash Severity	Crash Status	Crash Time	Crash Year	Driver Contributing Circumstances (All Drivers)	Driver Distracted By (All Vehicles)	First Harmful Event	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Traffic Control Device Type	Trafficway Description	Vehicle Actions Prior to Crash (All Vehicles)
4950264	MIDDLETON	03/16/2021	Tue	Property damage only (none injured)	Closed	5:18 PM	2021	D1: (No improper driving) / D2: (No improper driving)	D1: Not Distracted / D2: Not Distracted	Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Dry	Not at junction	No controls	Two-way, not divided	V1: Parked / V2: Travelling straight ahead

Village Road at 35 Village Road Driveway

Crash Number	City Town Name	Crash Date	Vehicle Travel Directions (All Vehicles)	Weather Conditions	First Harmful Event Location	Geocoding Method	Most Harmful Event (All Vehicles)	Road Contributing Circumstance	Traffic Control Device Function	Vehicle Sequence of Events (All Vehicles)	Street Number	Roadway
4950264	MIDDLETON	03/16/2021	V1: E / V2: W	Clear	Roadway	At Address	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	51	VILLAGE RD

Ferncroft Road at Route 1

Crash Number	City Town Name	Crash Date	Day	Crash Severity	Crash Status	Crash Time	Crash Year	Driver Contributing Circumstances (All Drivers)	Driver Distracted By (All Vehicles)	First Harmful Event	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Traffic Control Device Type	Trafficway Description	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Travel Directions (All Vehicles)
4506763	DANVERS	02/22/2018	Thu	Property damage only (none injured)	Closed	9:08 AM	2018	D1: (Followed too closely) / D2: (No improper driving)	D2: Not Distracted	Collision with motor vehicle in traffic	Daylight	Rear-end	Dry	On-ramp	Yield signs	Two-way, divided, positive median barrier	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1: S / V2: S
4512826	DANVERS	02/22/2018	Thu	Property damage only (none injured)	Closed	5:48 PM	2018	D1: (Inattention) / D2: (No improper driving)	D1: Not Distracted / D2: Not Distracted	Collision with motor vehicle in traffic	Dark - lighted roadway	Sideswipe, same direction	Wet	Not at junction	No controls	One-way, not divided	V1: Changing lanes / V2: Travelling straight ahead	V1: S / V2: S
4821419	DANVERS	02/11/2020	Tue	Non-fatal injury	Closed	12:29 PM	2020	D1: (No improper driving)	D1: Not Distracted	Collision with motor vehicle in traffic	Daylight	Head-on	Wet	T-intersection	No controls	Two-way, divided, positive median barrier	V1: Travelling straight ahead / V2: Turning right	V1: E / V2: S
4888265	DANVERS	10/09/2020	Fri	Non-fatal injury	Closed	12:25 PM	2020	D1: (Inattention) / D2: (No improper driving)	D1: Not Distracted / D2: Not Distracted	Collision with motor vehicle in traffic	Daylight	Rear-end	Dry	On-ramp	Yield signs	Two-way, not divided	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1: S / V2: S
4959965	DANVERS	04/29/2021	Thu	Property damage only (none injured)	Closed	5:29 PM	2021			Collision with other movable object	Daylight	Single vehicle crash	Wet	Not at junction	No controls	Two-way, not divided	V1: Turning right	V1: W
5059200	DANVERS	01/09/2022	Sun	Property damage only (none injured)	Closed	8:33 AM	2022	D1: (No improper driving)	D1: Not Distracted	Other	Daylight	Single vehicle crash	Ice	Off-ramp	Warning signs	Two-way, divided, unprotected median	V1: Travelling straight ahead	V1: S
5151786	DANVERS	09/14/2022	Wed	Property damage only (none injured)	Closed	12:03 PM	2022	D1: (Inattention) / D2: (No improper driving)	D1: Not Distracted / D2: Not Distracted	Collision with motor vehicle in traffic	Daylight	Sideswipe, same direction	Dry	On-ramp	Yield signs	Two-way, divided, positive median barrier	V1: Entering traffic lane / V2: Travelling straight ahead / V3: Travelling straight ahead	V1: S / V2: S / V3: S
5185234	DANVERS	12/01/2022	Thu	Property damage only (none injured)	Closed	9:25 AM	2022	D1: (Failure to keep in proper lane or running off road)	D1: Not Distracted	Collision with motor vehicle in traffic	Daylight	Single vehicle crash	Dry	Not at junction	No controls	Two-way, not divided	V1: Travelling straight ahead	V1: E

Ferncroft Road at Route 1

Crash Number	City Town Name	Crash Date	Weather Conditions	First Harmful Event Location	Geocoding Method	Most Harmful Event (All Vehicles)	Road Contributing Circumstance	Traffic Control Device Function	Vehicle Sequence of Events (All Vehicles)	Street Number	Roadway	Near Intersection Roadway
4506763	DANVERS	02/22/2018	Cloudy	Roadway	Operator Designated	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	Yes, device functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		FERNCROFT ROAD	NEWBURY STREET Rte 1 S
4512826	DANVERS	02/22/2018	Snow	Roadway	Operator Designated	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		NEWBURY STREET Rte 1 S	FERNCROFT ROAD
4821419	DANVERS	02/11/2020	Rain	Roadway	At Intersection	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	Yes, device functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		FERNCROFT RD / ROUTE 1	
4888265	DANVERS	10/09/2020	Cloudy	Roadway	Operator Designated	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	Yes, device functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)		FERNCROFT ROAD	NEWBURY STREET Rte US1
4959965	DANVERS	04/29/2021	Rain	Outside roadway	Operator Designated	V1:(Collision with other movable object)	Road surface condition (wet, icy, snow, slush, etc.)	No, device not functioning	V1:(Ran off road left),(Collision with other movable object)		FERNCROFT ROAD	Rte US1 S
5059200	DANVERS	01/09/2022	Rain/Sleet, hail (freezing rain or drizzle)	Shoulder - unpaved	Off Intersection	V1:(Other)	Road surface condition (wet, icy, snow, slush, etc.)	Yes, device functioning	V1:(Ran off road right),(Collision with highway traffic sign post)		NEWBURY STREET Rte US1 S	FERNCROFT ROAD
5151786	DANVERS	09/14/2022	Clear	Roadway	At Intersection	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic) / V3:(Collision with motor vehicle in traffic)	None	Yes, device functioning	V1:(Collision with motor vehicle in traffic) V2:(Other non-collision) V3:(Collision with motor vehicle in traffic)		/ Rte US1 S / FERNCROFT ROAD	
5185234	DANVERS	12/01/2022	Clear	Roadway	Operator Designated	V1:(Invalid Code Specified)	None	Not reported	V1:(Ran off road right)		FERNCROFT ROAD Rte US1 N	

MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAP

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Middleton COUNT DATE : 6/17/2025

DISTRICT : 4 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : East Street

MINOR STREET(S) : Locust Street

Towne Road

INTERSECTION DIAGRAM
(Label Approaches)

↑ *North*

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	18	133	331	199		**681**

" K " FACTOR : **0.090**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **7,567**

TOTAL # OF CRASHES : 5

OF YEARS : 5

AVERAGE # OF CRASHES PER YEAR (**A**) : **1.00**

CRASH RATE CALCULATION : **0.36**

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

Comments : Below Statewide and District average crash rates

Project Title & Date: 10255 - Proposed Multifamily Residential Development

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Middleton COUNT DATE : 6/17/2025

DISTRICT : 4 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Village Road

MINOR STREET(S) : 35 Village Road Driveway

INTERSECTION DIAGRAM (Label Approaches)

↑ *North*

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB			
PEAK HOURLY VOLUMES (PM) :	91	121	74			**286**

" K " FACTOR : **0.090**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **3,178**

TOTAL # OF CRASHES : 1

OF YEARS : 5

AVERAGE # OF CRASHES PER YEAR (**A**) : **0.20**

CRASH RATE CALCULATION : **0.17**

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

Comments : Below Statewide and District average crash rates

Project Title & Date: 10255 - Proposed Multifamily Residential Development

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Middleton COUNT DATE : 6/17/2025

DISTRICT : 4 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Newbury Street (Route 1)

MINOR STREET(S) : Ferncroft Road

INTERSECTION DIAGRAM (Label Approaches)

↑ *North*

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	SB				
PEAK HOURLY VOLUMES (PM) :	246	1,439				**1,685**

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **18,722**

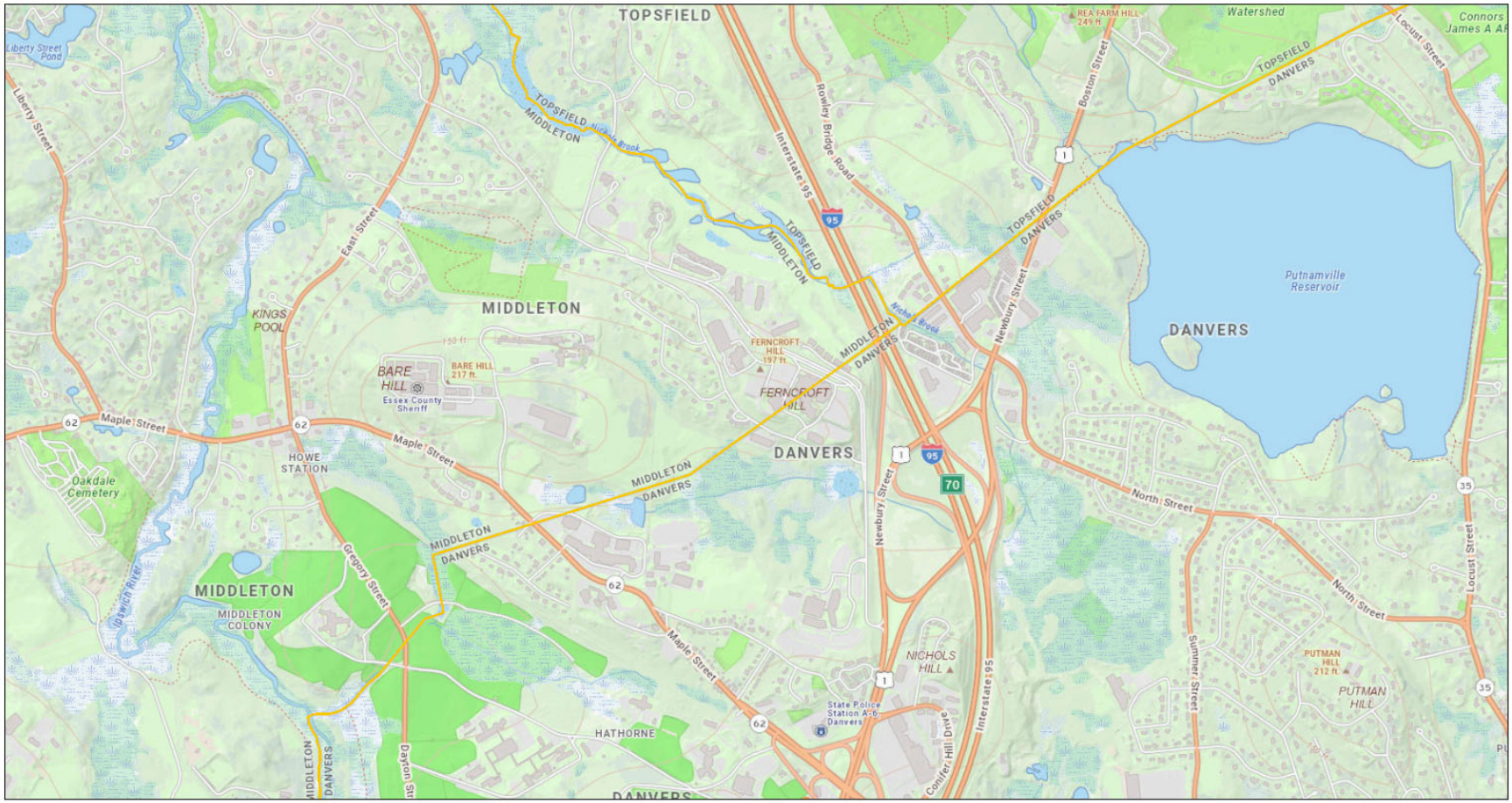
TOTAL # OF CRASHES : 8 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.60**

CRASH RATE CALCULATION : **0.23** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : Below Statewide and District average crash rates

Project Title & Date: 10255 - Proposed Multifamily Residential Development

HSIP Map



November 13, 2025

1:18,979

0 0.17 0.35 0.7 mi

0 0.28 0.55 1.1 km

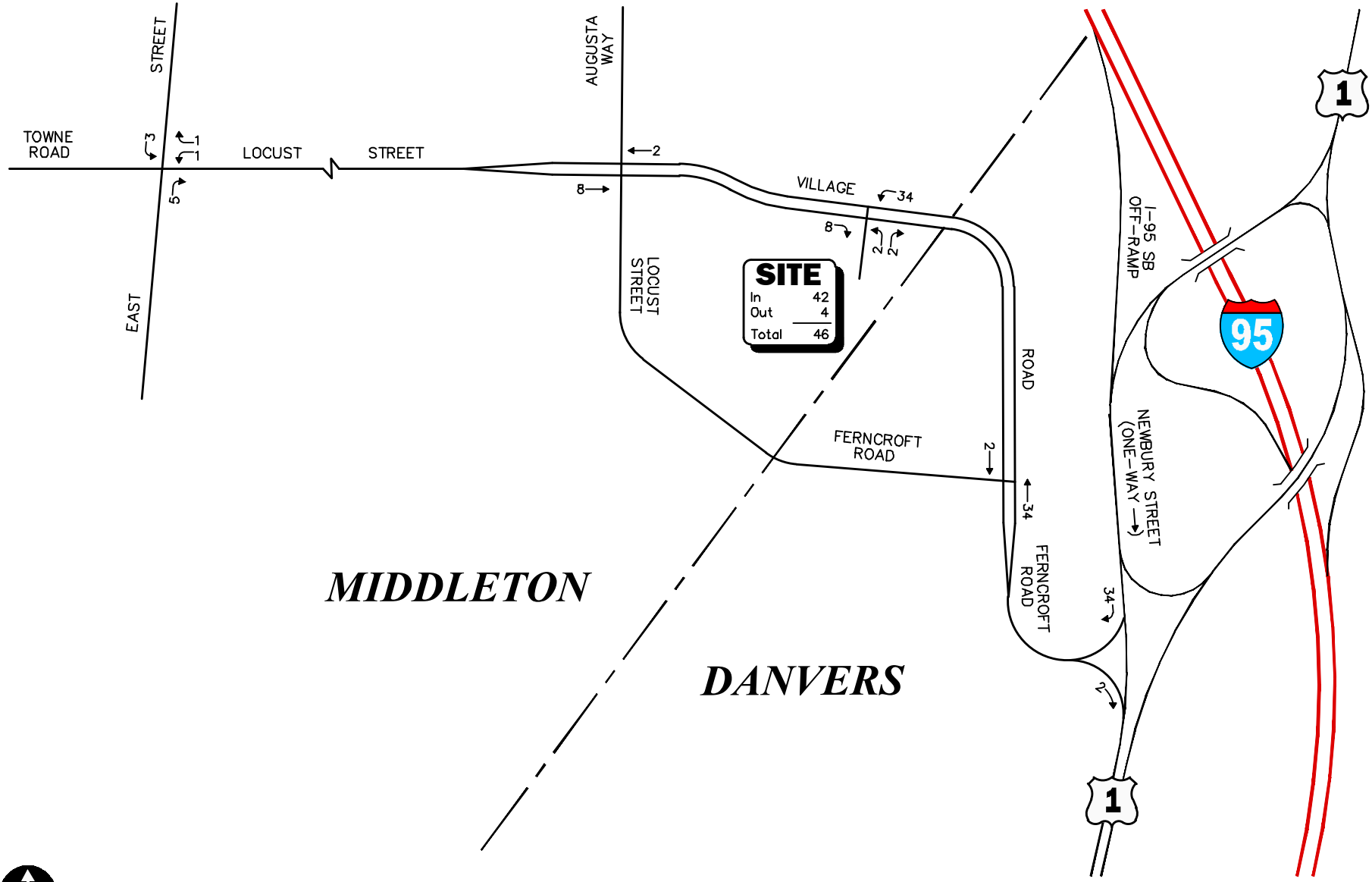
MassGIS

GENERAL BACKGROUND TRAFFIC GROWTH

General Background Traffic Growth - Daily Traffic Volumes

CITY/TOWN	ROUTE/STREET	LOCATION	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Annual Growth
Danvers	I-95	Ramp-RT 62 to RT 95 SB	75,393	72,992	75,381	85,079	77,200	76,737	79,120	83,789	84,656	87,814	87,282	**1.63%**
Middleton	Route 114	South of Orchard Circle										21,621	21,707	**0.40%**
Middleton	North Main Street/ Route 114	West of Lakeview Ave.	17,325	25,400	25,559	26,114	24,920	26,291	26,580	26,926	27,222	27,603	27,713	**5.56%**
North Reading	Park Street/Route 62	West of Haverhill Street	11,759	11,657	11,755	11,982	12,097	13,079	13,380	14,210	12,241	12,278	12,229	**0.55%**
North Andover	Turnpike Street/Route 114	East of Hillside Road	24,880	25,000	21,391	21,028	21,388	21,279	21,513	21,793	21,392	21,691	21,778	**-1.21%**
Danvers	I-95	North of Maple Street	72,878	74,244	72,142	74,666	73,735	73,293	81,105	79,951	80,477	79,139	82,502	**1.32%**
Danvers	I-95	North of Route 1	78,819	82,348	78,499	85,021	89,261	93,168	84,116	84,808	82,872	86,152	87,968	**1.24%**
Boxford	I-95	Between Endicott & Topsfield Roads	79,402	80,422	78,974	85,254	79,145	81,046	85,713	85,636	86,037	86,887	87,635	**1.07%**
Boxford	I-95	North of Topsfield Road	76,773	61,287	76,353	76,525	77,120	78,477	80,535	83,276	83,520	84,342	87,159	**1.78%**
Peabody	I-95	South of RTE. 114	79,459	72,400	78,757	79,335	78,179	77,710	79,575	81,564	82,135	83,285	84,201	**0.67%**
Peabody	I-95	North of RTE. 128	50,240	50,000	52,873				48,976	50,200	50,551	51,259	51,823	**1.83%**
Danvers	Newbury Street/Route 1	At Peabody City Line	41,123	43,700	44,649	47,372	45,618	45,594	45,819	45,226	44,981	46,284	44,960	**0.95%**
														1.31%

BACKGROUND DEVELOPMENT NETWORKS

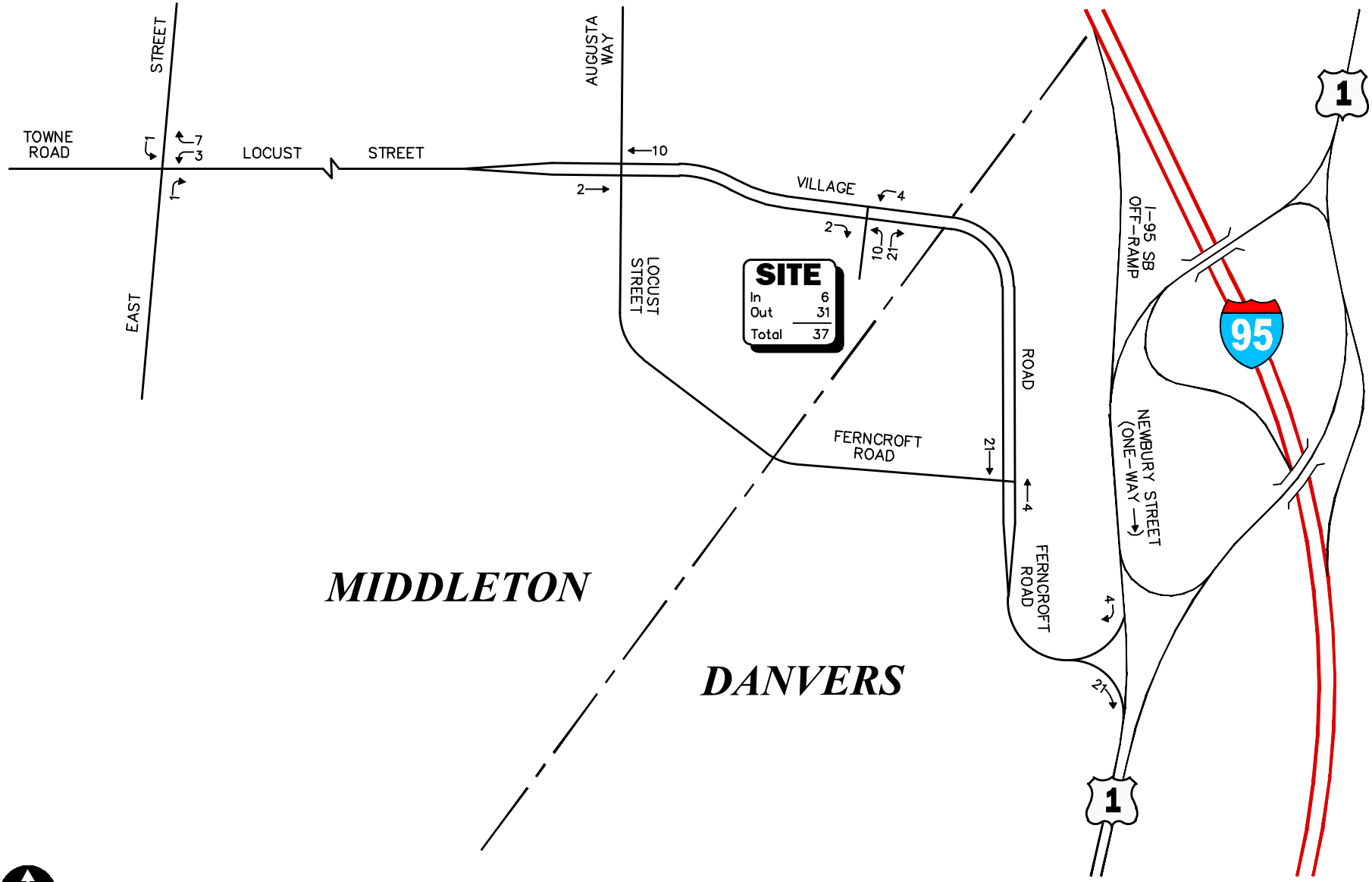


Not To Scale

Figure A-1

2032 No-Build
Weekday Morning
Peak-Hour Traffic Volumes
Fully Occupied Office Site Trips

Vanasse & Associates inc



Not To Scale

Figure A-2

2032 No-Build
Weekday Evening
Peak-Hour Traffic Volumes
Fully Occupied Office Site Trips

Vanasse & Associates inc

TRIP DISTRIBUTION DATA

Proposed Multifamily Residential Development
Middleton, Massachusetts

Residence	Workplace	Number	East Street (North)		East Street (South)		Route 1 (South)	
Middleton, MA	Boston, MA	822		0		0	100%	822
Middleton, MA	Middleton, MA	452		0	50%	226	50%	226
Middleton, MA	Danvers, MA	302		0		0	100%	302
Middleton, MA	Peabody, MA	261		0		0	100%	261
Middleton, MA	Beverly, MA	177		0		0	100%	177
Middleton, MA	Woburn, MA	144		0		0	100%	144
Middleton, MA	Lynn, MA	125		0		0	100%	125
Middleton, MA	Salem, MA	121		0		0	100%	121
Middleton, MA	Burlington, MA	120		0		0	100%	120
Middleton, MA	Cambridge, MA	118		0		0	100%	118
Middleton, MA	Wakefield, MA	91		0		0	100%	91
Middleton, MA	Andover, MA	88		0	100%	88		0
Middleton, MA	Waltham, MA	74		0		0	100%	74
Middleton, MA	Lynnfield, MA	72		0	20%	14	80%	58
Middleton, MA	North Andover, MA	72	40%	29	60%	43		0
Middleton, MA	Wilmington, MA	59		0	25%	15	75%	44
Middleton, MA	Somerville, MA	58		0		0	100%	58
Middleton, MA	Chelsea, MA	56		0		0	100%	56
Middleton, MA	Saugus, MA	56		0		0	100%	56
Middleton, MA	Lawrence, MA	53	25%	13	75%	40		0
Middleton, MA	Malden, MA	51		0		0	100%	51
		3,372		42		426		2,904
				1.2%		12.6%		86.1%
		SAY		**1%**		**13%**		**86%**

TRIP-GENERATION CALCULATIONS

Graph Look Up

Query | Filter

DATA SOURCE:
Trip Generation Manual, 12th Ed

SEARCH BY LAND USE CODE:
221

LAND USE GROUP:
(200-299) Residential

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

LAND USE SUBCATEGORY:
Not Close to Rail Transit

SETTING/LOCATION:
General Urban/Suburban

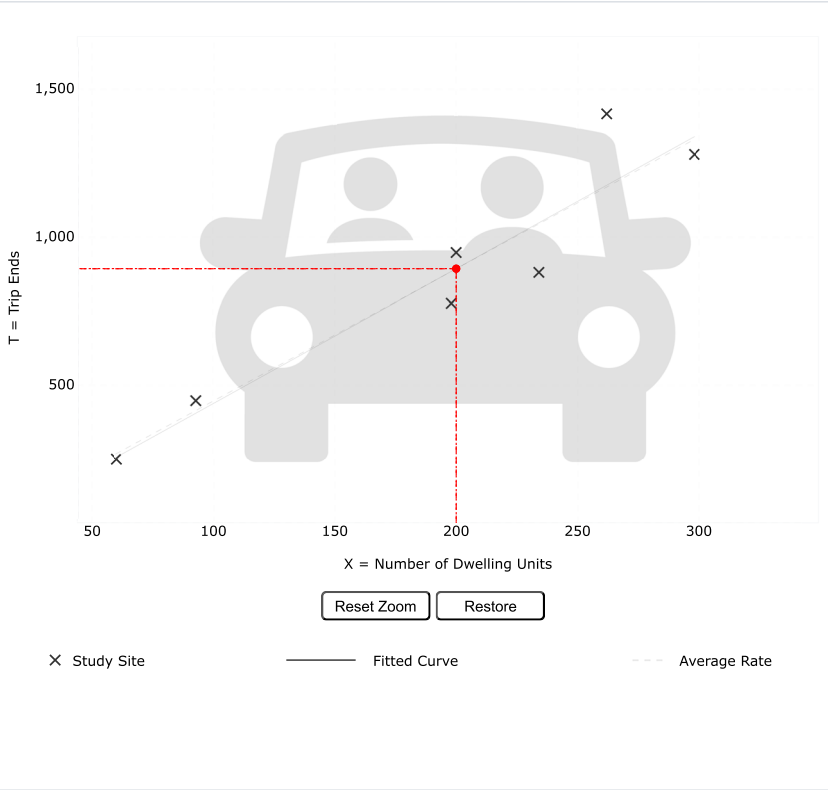
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
200 Calculate

Data Plot and Equation



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

DATA STATISTICS

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

Independent Variable:
Dwelling Units

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
7

Avg. Num. of Dwelling Units:
192

Average Rate:
4.46

Range of Rates:
3.76 - 5.40

Standard Deviation:
0.62

Fitted Curve Equation:
T = 4.55(X) - 17.52

R^2:
0.90

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 892 (Total), 446 (Entry), 446 (Exit)
Fitted Curve: 892 (Total), 446 (Entry), 446 (Exit)

Graph Look Up

Query | Filter

DATA SOURCE: Trip Generation Manual, 12th Ed

SEARCH BY LAND USE CODE: 221

LAND USE GROUP: (200-299) Residential

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

LAND USE SUBCATEGORY: Not Close to Rail Transit

SETTING/LOCATION: General Urban/Suburban

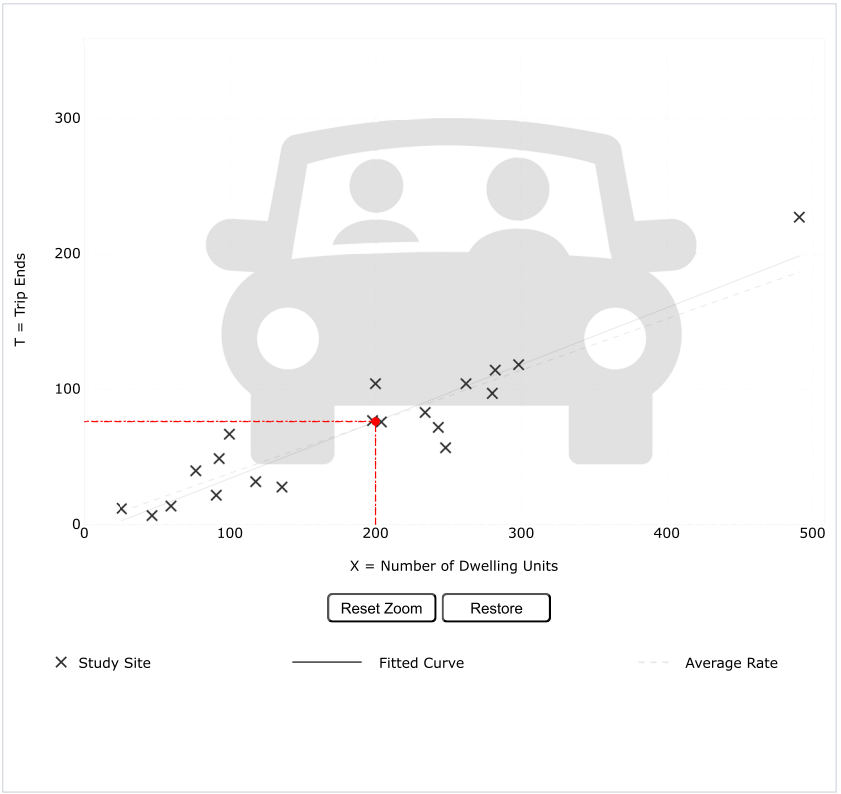
INDEPENDENT VARIABLE (IV): Dwelling Units

TIME PERIOD: Weekday, Peak Hour of Adjacent Stre

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 200 Calculate

Data Plot and Equation



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

DATA STATISTICS

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

Independent Variable:
Dwelling Units

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

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
20

Avg. Num. of Dwelling Units:
184

Average Rate:
0.38

Range of Rates:
0.15 - 0.67

Standard Deviation:
0.10

Fitted Curve Equation:
T = 0.42(X) - 7.77

R^2:
0.87

Directional Distribution:
23% entering, 77% exiting

Calculated Trip Ends:
Average Rate: 76 (Total), 17 (Entry), 59 (Exit)
Fitted Curve: 76 (Total), 18 (Entry), 58 (Exit)

Graph Look Up

Query | Filter

DATA SOURCE: Trip Generation Manual, 12th Ed

SEARCH BY LAND USE CODE: 221

LAND USE GROUP: (200-299) Residential

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

LAND USE SUBCATEGORY: Not Close to Rail Transit

SETTING/LOCATION: General Urban/Suburban

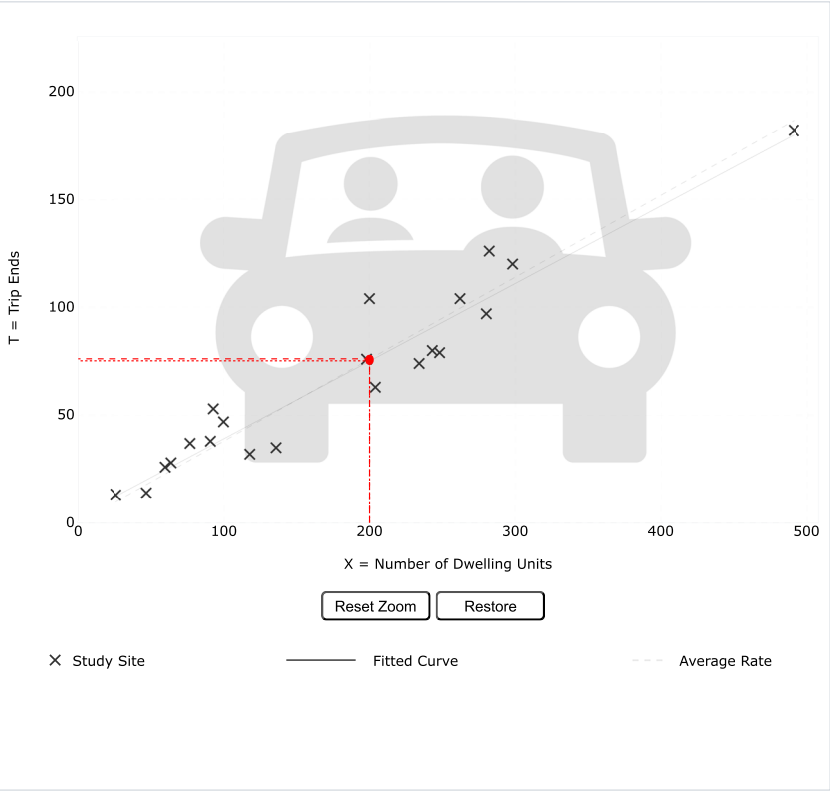
INDEPENDENT VARIABLE (IV): Dwelling Units

TIME PERIOD: Weekday, Peak Hour of Adjacent Stre

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 200 Calculate

Data Plot and Equation



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

DATA STATISTICS

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

Independent Variable:
Dwelling Units

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

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
21

Avg. Num. of Dwelling Units:
179

Average Rate:
0.38

Range of Rates:
0.26 - 0.57

Standard Deviation:
0.07

Fitted Curve Equation:
T = 0.36(X) + 3.07

R^2:
0.92

Directional Distribution:
64% entering, 36% exiting

Calculated Trip Ends:
Average Rate: 76 (Total), 49 (Entry), 27 (Exit)
Fitted Curve: 75 (Total), 48 (Entry), 27 (Exit)

PARKING DATA

Graph Look Up

Query | Filter

DATA SOURCE:
Parking Generation Manual, 6th Ed

SEARCH BY LAND USE CODE:
221

LAND USE GROUP:
(200-299) Residential

LAND USE:
221 - Multifamily Housing - 2+ BR (Mid-Rise)

LAND USE SUBCATEGORY:
Not Close to Rail Transit

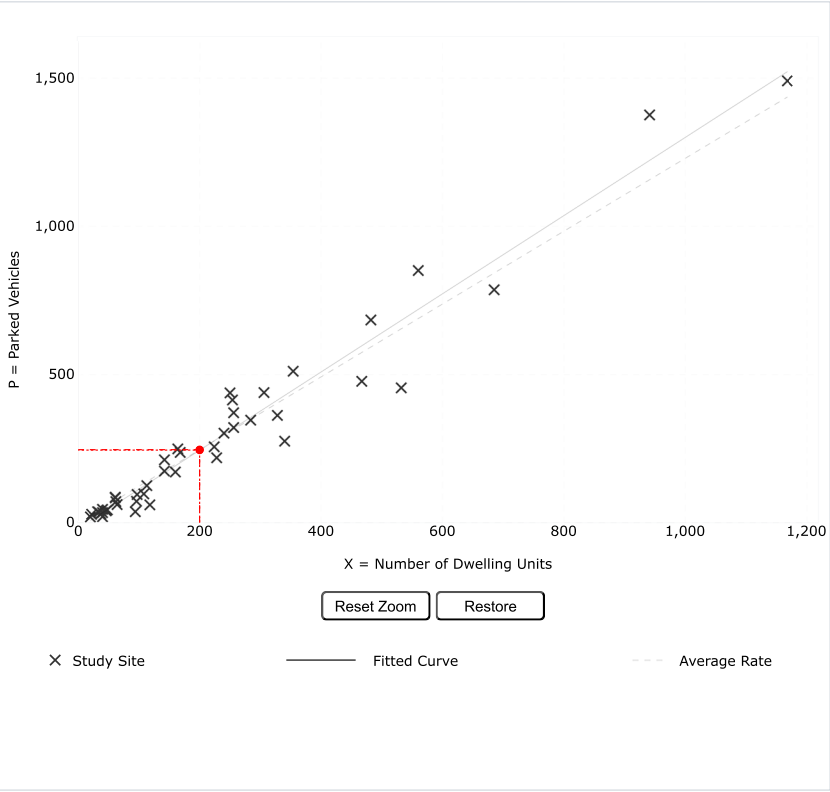
SETTING/LOCATION:
General Urban/Suburban

INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday (Monday - Friday)

ENTER IV VALUE TO CALCULATE PARKING DEMAND:
200 Calculate

Data Plot and Equation



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

DATA STATISTICS

Land Use:
Multifamily Housing - 2+ BR (Mid-Rise) - Not Close to Rail Transit (221) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday (Monday - Friday)

Setting/Location:
General Urban/Suburban

Number of Studies:
44

Avg. Num. of Dwelling Units:
231

Average Rate:
1.23

Range of Rates:
0.39 - 1.75

33rd / 85th Percentile:
0.98 / 1.45

95% Confidence Interval:
1.15 - 1.31

Standard Deviation:
0.27

Coefficient of Variation:
22%

Fitted Curve Equation:
P = 1.32(X) - 19.46

R^2:
0.96

Calculated Parking Demand:
Weighted Average: 246
Fitted Curve: 245
85th Percentile: 290

Graph Look Up

Query | Filter

DATA SOURCE:
Parking Generation Manual, 6th Ed

SEARCH BY LAND USE CODE:
710

LAND USE GROUP:
(700-799) Office

LAND USE:
710 - General Office Building

LAND USE SUBCATEGORY:
All Sites

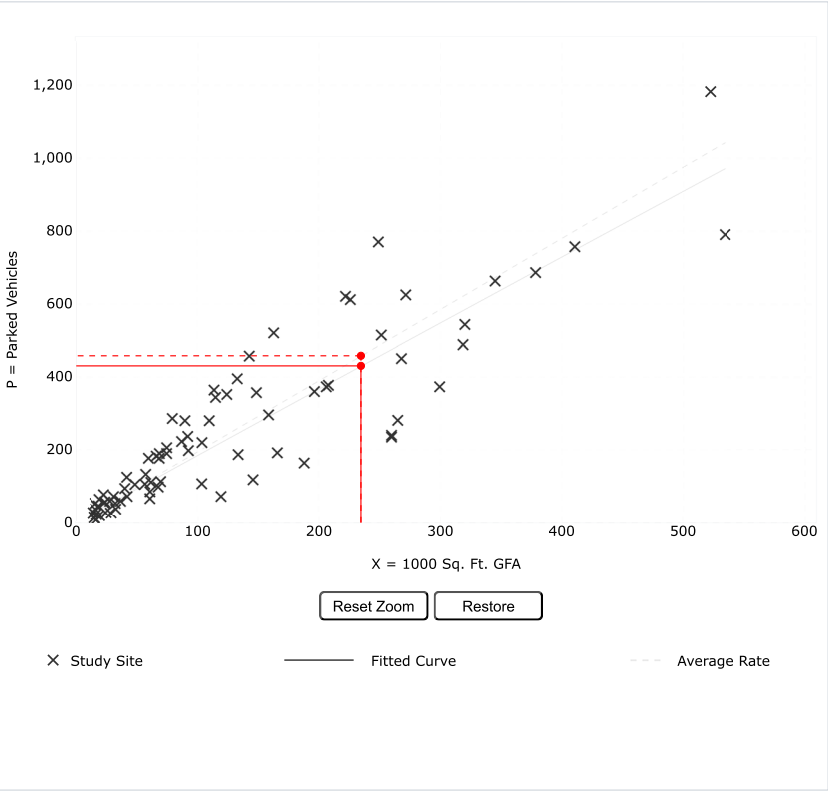
SETTING/LOCATION:
General Urban/Suburban

INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday (Monday - Friday)

ENTER IV VALUE TO CALCULATE PARKING DEMAND:
234.56 Calculate

Data Plot and Equation



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

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday (Monday - Friday)

Setting/Location:
General Urban/Suburban

Number of Studies:
77

Avg. 1000 Sq. Ft. GFA:
131

Average Rate:
1.95

Range of Rates:
0.50 - 3.60

33rd / 85th Percentile:
1.68 / 2.98

95% Confidence Interval:
1.79 - 2.11

Standard Deviation:
0.70

Coefficient of Variation:
36%

Fitted Curve Equation:
Ln(P) = 0.99 Ln(X) + 0.66

R^2:
0.83

Calculated Parking Demand:
Weighted Average: 457
Fitted Curve: 430
85th Percentile: 699

Sovereign/Middleton - 35 Village Road

Shared Parking Analysis - 85th Percentile Peak Parking Demand

28-May-25

Land Use	Size	Variable	85% Peak Demand	Peak Demand
Residential	200	units	1.45	290
Office	234,556	sf	2.98	699

	Residential		Office		
Hour Beginning	% of Peak	Demand	% of Peak	Demand	Total
12:00 - 4:00 AM	100%	290	0%	0	290
5:00	96%	279	0%	0	279
6:00	86%	250	0%	0	250
7:00	77%	224	13%	91	315
8:00	66%	192	47%	329	521
9:00	60%	174	87%	609	783
10:00	57%	166	99%	693	859
11:00	55%	160	100%	699	859
12:00	52%	151	86%	602	753
1:00	50%	145	84%	588	733
2:00	52%	151	93%	651	802
3:00	51%	148	93%	651	799
4:00	57%	166	85%	595	761
5:00	62%	180	57%	399	579
6:00	65%	189	21%	147	336
7:00	68%	198	0%	0	198
8:00	75%	218	0%	0	218
9:00	82%	238	0%	0	238
10:00	87%	253	0%	0	253
11:00	91%	264	0%	0	264

CAPACITY ANALYSIS WORKSHEETS

2025 Existing
2032 No-Build
2032 Build

2025 Existing

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	3	5	50	5	27	6	138	47	35	236	2
Future Vol, veh/h	1	3	5	50	5	27	6	138	47	35	236	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	56	56	56	76	76	76	88	88	88	82	82	82
Heavy Vehicles, %	0	0	0	0	0	7	0	4	2	0	1	0
Mvmt Flow	2	5	9	66	7	36	7	157	53	43	288	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	548	598	289	573	573	184	290	0	0	210	0	0
Stage 1	374	374	-	197	197	-	-	-	-	-	-	-
Stage 2	174	224	-	376	376	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.27	4.1	-	-	4.1	-	-
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	3.5	4	3.3	3.5	4	3.363	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	450	418	755	433	433	846	1283	-	-	1372	-	-
Stage 1	651	621	-	809	742	-	-	-	-	-	-	-
Stage 2	833	722	-	650	620	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	406	400	755	405	414	846	1283	-	-	1372	-	-
Mov Cap-2 Maneuver	406	400	-	405	414	-	-	-	-	-	-	-
Stage 1	627	598	-	804	737	-	-	-	-	-	-	-
Stage 2	786	718	-	612	597	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	11.83	14.43	0.25	0.99
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	54	-	-	543	489	230	-	-
HCM Lane V/C Ratio	0.005	-	-	0.03	0.22	0.031	-	-
HCM Ctrl Dly (s/v)	7.8	0	-	11.8	14.4	7.7	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.8	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	101	13	0	56	0	3	0	0	1	0	0
Future Vol, veh/h	0	101	13	0	56	0	3	0	0	1	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	77	77	77	74	74	74	81	81	81	25	25	25
Heavy Vehicles, %	0	1	15	0	7	0	0	0	0	0	0	0
Mvmt Flow	0	131	17	0	76	0	4	0	0	4	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	76	0	0	148	0	0	215	215	140	207	224	76
Stage 1	-	-	-	-	-	-	140	140	-	76	76	-
Stage 2	-	-	-	-	-	-	76	76	-	131	148	-
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	1536	-	-	1446	-	-	746	686	914	755	679	991
Stage 1	-	-	-	-	-	-	868	785	-	938	836	-
Stage 2	-	-	-	-	-	-	938	836	-	877	778	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1536	-	-	1446	-	-	746	686	914	755	679	991
Mov Cap-2 Maneuver	-	-	-	-	-	-	746	686	-	755	679	-
Stage 1	-	-	-	-	-	-	868	785	-	938	836	-
Stage 2	-	-	-	-	-	-	938	836	-	877	778	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	0	9.85	9.79
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	746	1536	-	-	1446	-	-	755
HCM Lane V/C Ratio	0.005	-	-	-	-	-	-	0.005
HCM Ctrl Dly (s/v)	9.9	0	-	-	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	103	20	79	59	4	5
Future Vol, veh/h	103	20	79	59	4	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	91	91	38	38
Heavy Vehicles, %	1	0	0	5	0	0
Mvmt Flow	117	23	87	65	11	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	140	0	367	128
Stage 1	-	-	-	-	128	-
Stage 2	-	-	-	-	238	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1456	-	637	927
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	806	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1456	-	598	927
Mov Cap-2 Maneuver	-	-	-	-	598	-
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	756	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	4.37	9.99
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	745	-	-	1030	-
HCM Lane V/C Ratio	0.032	-	-	0.06	-
HCM Ctrl Dly (s/v)	10	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.2	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	19	36	147	150	0
Future Vol, veh/h	1	19	36	147	150	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	89	89	85	85
Heavy Vehicles, %	100	0	3	1	1	0
Mvmt Flow	2	30	40	165	176	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	423	176	176	0	-	0
Stage 1	176	-	-	-	-	-
Stage 2	246	-	-	-	-	-
Critical Hdwy	7.4	6.2	4.13	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.3	2.227	-	-	-
Pot Cap-1 Maneuver	440	872	1394	-	-	-
Stage 1	665	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	427	872	1394	-	-	-
Mov Cap-2 Maneuver	427	-	-	-	-	-
Stage 1	645	-	-	-	-	-
Stage 2	612	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.52	1.51	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1394	-	829	-	-
HCM Lane V/C Ratio	0.029	-	0.038	-	-
HCM Ctrl Dly (s/v)	7.7	-	9.5	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	138	0	0	0	0	0	0	0	1691	267
Future Vol, veh/h	0	0	138	0	0	0	0	0	0	0	1691	267
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	0	-	-	-	-	-	-	-	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	92	92	92	92	92	92	89	89	89
Heavy Vehicles, %	0	0	1	2	2	2	2	2	2	0	2	1
Mvmt Flow	0	0	160	0	0	0	0	0	0	0	1900	300

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	-	950	950	1900	-			-	-	0
Stage 1	-	-	-	0	0	-			-	-	-
Stage 2	-	-	-	950	1900	-			-	-	-
Critical Hdwy	-	-	6.92	7.54	6.54	-			-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-			-	-	-
Follow-up Hdwy	-	-	3.31	3.52	4.02	-			-	-	-
Pot Cap-1 Maneuver	0	0	263	215	68	0			0	-	0
Stage 1	0	0	-	-	-	0			0	-	0
Stage 2	0	0	-	280	116	0			0	-	0
Platoon blocked, %										-	
Mov Cap-1 Maneuver	-	-	263	84	68	-			-	-	-
Mov Cap-2 Maneuver	-	-	-	84	68	-			-	-	-
Stage 1	-	-	-	-	-	-			-	-	-
Stage 2	-	-	-	109	116	-			-	-	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	38.09	0	0
HCM LOS	E	A	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBT
Capacity (veh/h)	263	-	-
HCM Lane V/C Ratio	0.611	-	-
HCM Ctrl Dly (s/v)	38.1	0	-
HCM Lane LOS	E	A	-
HCM 95th %tile Q(veh)	3.7	-	-

HCS Freeway Merge Report

Project Information			
Analyst	ZAB	Date	11/18/2025
Agency	Vanasse & Associates	Analysis Year	2025
Jurisdiction	MassDOT	Time Analyzed	Existing Weekday Morning Peak-Hour
Project Description	10255 - Middleton, MA	Units	U.S. Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	36.9	30.0
Segment Length (L) / Acceleration Lane Length (LA), ft	2000	400
Terrain Type	Specific Grade	Level
Percent Grade, %	2.00	-
Segment Type / Ramp Type	Freeway	Left-Sided One-Lane

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs (CAF_{CAV})	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1958	138
Peak Hour Factor (PHF)	0.89	0.86
Total Trucks, %	2.00	1.00
Heavy Vehicle Adjustment Factor (f_{HV})	0.948	0.990
Demand Flow Rate (v_i), pc/h | Total Flow Rate (v_{FO}), pc/h	2321 | 2483	162
Capacity (c_{md}), pc/h	4500	1900
Adjusted Capacity (c_{mda}), pc/h	4500	1900
Volume-to-Capacity Ratio (v/c)	0.55	0.09

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Downstream Equilibrium Distance (L_{EQ}), ft	-	On-Ramp Infl. Area Speed (S_R), mi/h	38.7
Flow in Lanes 1 and 2 (v_{12}), pc/h	2321	Outer Lanes Freeway Speed (S_O), mi/h	36.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2483	Ramp Junction Speed (S), mi/h	38.7
Number of Outer Lanes on Freeway (N_O), ln	0	Average Density (D), pc/mi/ln	32.1
Level of Service (LOS)	C	Density in Ramp Influence Area (D_R), pc/mi/ln	22.3

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	4	11	40	7	86	4	275	52	29	168	2
Future Vol, veh/h	3	4	11	40	7	86	4	275	52	29	168	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	45	45	45	77	77	77	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	2	2	0	1	0
Mvmt Flow	7	9	24	52	9	112	4	293	55	31	179	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	547	598	180	574	571	320	181	0	0	348	0	0
Stage 1	241	241	-	329	329	-	-	-	-	-	-	-
Stage 2	306	356	-	245	243	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
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	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	451	419	868	433	433	725	1407	-	-	1222	-	-
Stage 1	766	710	-	688	650	-	-	-	-	-	-	-
Stage 2	708	632	-	763	709	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	362	405	868	399	420	725	1407	-	-	1222	-	-
Mov Cap-2 Maneuver	362	405	-	399	420	-	-	-	-	-	-	-
Stage 1	745	690	-	686	648	-	-	-	-	-	-	-
Stage 2	589	630	-	712	689	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	11.62	14.16	0.09	1.17
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	21	-	-	584	565	262	-	-
HCM Lane V/C Ratio	0.003	-	-	0.069	0.306	0.025	-	-
HCM Ctrl Dly (s/v)	7.6	0	-	11.6	14.2	8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	1.3	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	74	10	2	159	1	21	1	0	0	0	0
Future Vol, veh/h	0	74	10	2	159	1	21	1	0	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	84	84	84	65	65	65	61	61	61	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	88	12	3	245	2	34	2	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	246	0	0	100	0	0	345	346	94	340	352	245
Stage 1	-	-	-	-	-	-	94	94	-	252	252	-
Stage 2	-	-	-	-	-	-	251	252	-	89	100	-
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	1332	-	-	1505	-	-	613	580	968	617	576	798
Stage 1	-	-	-	-	-	-	918	821	-	757	702	-
Stage 2	-	-	-	-	-	-	758	702	-	924	816	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1332	-	-	1505	-	-	612	579	968	614	575	798
Mov Cap-2 Maneuver	-	-	-	-	-	-	612	579	-	614	575	-
Stage 1	-	-	-	-	-	-	918	821	-	755	701	-
Stage 2	-	-	-	-	-	-	756	700	-	922	816	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	0.09	11.27	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	610	1332	-	-	22	-	-	-
HCM Lane V/C Ratio	0.059	-	-	-	0.002	-	-	-
HCM Ctrl Dly (s/v)	11.3	0	-	-	7.4	0	-	0
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	87	4	9	112	25	49
Future Vol, veh/h	87	4	9	112	25	49
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	88	88	95	95	84	84
Heavy Vehicles, %	0	25	22	0	0	2
Mvmt Flow	99	5	9	118	30	58

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	103	0	238	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	137	-
Critical Hdwy	-	-	4.32	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.398	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1372	-	755	954
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	895	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1372	-	749	954
Mov Cap-2 Maneuver	-	-	-	-	749	-
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	888	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.57	9.58
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	873	-	-	134	-
HCM Lane V/C Ratio	0.101	-	-	0.007	-
HCM Ctrl Dly (s/v)	9.6	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	36	23	132	222	3
Future Vol, veh/h	0	36	23	132	222	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	76	76	66	66
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	48	30	174	336	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	573	339	341	0	-	0
Stage 1	339	-	-	-	-	-
Stage 2	234	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	484	708	1229	-	-	-
Stage 1	726	-	-	-	-	-
Stage 2	809	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	473	708	1229	-	-	-
Mov Cap-2 Maneuver	473	-	-	-	-	-
Stage 1	709	-	-	-	-	-
Stage 2	809	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.45	1.19	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1229	-	708	-	-
HCM Lane V/C Ratio	0.025	-	0.068	-	-
HCM Ctrl Dly (s/v)	8	-	10.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	246	0	0	0	0	0	0	0	1274	165
Future Vol, veh/h	0	0	246	0	0	0	0	0	0	0	1274	165
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Yield	Yield	Yield	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	0	-	-	-	-	-	-	-	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	92	92	92	92	92	92	96	96	96
Heavy Vehicles, %	0	0	1	2	2	2	2	2	2	0	1	1
Mvmt Flow	0	0	346	0	0	0	0	0	0	0	1327	172

Major/Minor	Minor1			Major2		
Conflicting Flow All	664	1327	-	-	-	0
Stage 1	0	0	-	-	-	-
Stage 2	664	1327	-	-	-	-
Critical Hdwy	6.84	6.54	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-	-	-	-
Follow-up Hdwy	3.52	4.02	-	-	-	-
Pot Cap-1 Maneuver	394	154	0	0	-	0
Stage 1	-	-	0	0	-	0
Stage 2	474	223	0	0	-	0
Platoon blocked, %					-	
Mov Cap-1 Maneuver	394	0	-	-	-	-
Mov Cap-2 Maneuver	394	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	474	0	-	-	-	-

Approach	WB	SB
HCM Ctrl Dly, s/v	0	0
HCM LOS	A	

Minor Lane/Major Mvmt	WBLn1	SBT
Capacity (veh/h)	-	-
HCM Lane V/C Ratio	-	-
HCM Ctrl Dly (s/v)	0	-
HCM Lane LOS	A	-
HCM 95th %tile Q(veh)	-	-

HCS Freeway Merge Report

Project Information			
Analyst	ZAB	Date	11/18/2025
Agency	Vanasse & Associates	Analysis Year	2025
Jurisdiction	MassDOT	Time Analyzed	Existing Weekday Evening Peak-Hour
Project Description	10255 - Middleton, MA	Units	U.S. Customary

Geometric Data		
	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	36.9	30.0
Segment Length (L) / Acceleration Lane Length (LA), ft	2000	400
Terrain Type	Specific Grade	Level
Percent Grade, %	2.00	-
Segment Type / Ramp Type	Freeway	Left-Sided One-Lane

Adjustment Factors		
Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs (CAF_{CAV})	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1439	246
Peak Hour Factor (PHF)	0.96	0.71
Total Trucks, %	1.00	1.00
Heavy Vehicle Adjustment Factor (f_{HV})	0.974	0.990
Demand Flow Rate (v_i), pc/h | Total Flow Rate (v_{FO}), pc/h	1539 | 1889	350
Capacity (c_{md}), pc/h	4500	1900
Adjusted Capacity (c_{mda}), pc/h	4500	1900
Volume-to-Capacity Ratio (v/c)	0.42	0.18

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Downstream Equilibrium Distance (L_{EQ}), ft	-	On-Ramp Infl. Area Speed (S_R), mi/h	38.5
Flow in Lanes 1 and 2 (v_{12}), pc/h	1539	Outer Lanes Freeway Speed (S_O), mi/h	36.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1889	Ramp Junction Speed (S), mi/h	38.5
Number of Outer Lanes on Freeway (N_O), ln	0	Average Density (D), pc/mi/ln	24.5
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	17.6

2032 No-Build

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	3	6	56	6	31	7	153	57	42	262	2
Future Vol, veh/h	1	3	6	56	6	31	7	153	57	42	262	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	56	56	56	76	76	76	88	88	88	82	82	82
Heavy Vehicles, %	0	0	0	0	0	7	0	4	2	0	1	0
Mvmt Flow	2	5	11	74	8	41	8	174	65	51	320	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	617	678	321	647	647	206	322	0	0	239	0	0
Stage 1	423	423	-	222	222	-	-	-	-	-	-	-
Stage 2	194	255	-	425	424	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.27	4.1	-	-	4.1	-	-
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	3.5	4	3.3	3.5	4	3.363	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	405	377	725	387	393	822	1249	-	-	1340	-	-
Stage 1	613	591	-	785	723	-	-	-	-	-	-	-
Stage 2	813	700	-	611	590	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	357	357	725	356	372	822	1249	-	-	1340	-	-
Mov Cap-2 Maneuver	357	357	-	356	372	-	-	-	-	-	-	-
Stage 1	584	563	-	779	718	-	-	-	-	-	-	-
Stage 2	758	695	-	569	563	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	12.27	16.3	0.25	1.07
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	55	-	-	513	440	247	-	-
HCM Lane V/C Ratio	0.006	-	-	0.035	0.278	0.038	-	-
HCM Ctrl Dly (s/v)	7.9	0	-	12.3	16.3	7.8	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.1	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	120	14	0	64	0	3	0	0	1	0	0
Future Vol, veh/h	0	120	14	0	64	0	3	0	0	1	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	77	77	77	74	74	74	81	81	81	25	25	25
Heavy Vehicles, %	0	1	15	0	7	0	0	0	0	0	0	0
Mvmt Flow	0	156	18	0	86	0	4	0	0	4	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	86	0	0	174	0	0	251	251	165	242	261	86
Stage 1	-	-	-	-	-	-	165	165	-	86	86	-
Stage 2	-	-	-	-	-	-	86	86	-	156	174	-
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	1522	-	-	1415	-	-	706	655	885	716	648	978
Stage 1	-	-	-	-	-	-	842	766	-	926	827	-
Stage 2	-	-	-	-	-	-	926	827	-	851	759	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1522	-	-	1415	-	-	706	655	885	716	648	978
Mov Cap-2 Maneuver	-	-	-	-	-	-	706	655	-	716	648	-
Stage 1	-	-	-	-	-	-	842	766	-	926	827	-
Stage 2	-	-	-	-	-	-	926	827	-	851	759	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	0	10.13	10.06
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	706	1522	-	-	1415	-	-	716
HCM Lane V/C Ratio	0.005	-	-	-	-	-	-	0.006
HCM Ctrl Dly (s/v)	10.1	0	-	-	0	-	-	10.1
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	114	28	113	65	6	7
Future Vol, veh/h	114	28	113	65	6	7
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	88	88	91	91	38	38
Heavy Vehicles, %	1	0	0	5	0	0
Mvmt Flow	130	32	124	71	16	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	161	0	465	145
Stage 1	-	-	-	-	145	-
Stage 2	-	-	-	-	320	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1430	-	559	907
Stage 1	-	-	-	-	887	-
Stage 2	-	-	-	-	741	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1430	-	509	907
Mov Cap-2 Maneuver	-	-	-	-	509	-
Stage 1	-	-	-	-	887	-
Stage 2	-	-	-	-	674	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	4.92	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	666	-	-	1143	-
HCM Lane V/C Ratio	0.051	-	-	0.087	-
HCM Ctrl Dly (s/v)	10.7	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.3	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	21	40	197	168	0
Future Vol, veh/h	1	21	40	197	168	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	89	89	85	85
Heavy Vehicles, %	100	0	3	1	1	0
Mvmt Flow	2	33	45	221	198	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	509	198	198	0	-	0
Stage 1	198	-	-	-	-	-
Stage 2	311	-	-	-	-	-
Critical Hdwy	7.4	6.2	4.13	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.3	2.227	-	-	-
Pot Cap-1 Maneuver	386	849	1369	-	-	-
Stage 1	648	-	-	-	-	-
Stage 2	566	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	373	849	1369	-	-	-
Mov Cap-2 Maneuver	373	-	-	-	-	-
Stage 1	627	-	-	-	-	-
Stage 2	566	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.69	1.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1369	-	802	-	-
HCM Lane V/C Ratio	0.033	-	0.044	-	-
HCM Ctrl Dly (s/v)	7.7	-	9.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	155	0	0	0	0	0	0	0	1877	330
Future Vol, veh/h	0	0	155	0	0	0	0	0	0	0	1877	330
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Yield	Yield	Yield	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	0	-	-	-	-	-	-	-	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	92	92	92	92	92	92	89	89	89
Heavy Vehicles, %	0	0	1	2	2	2	2	2	2	0	2	1
Mvmt Flow	0	0	180	0	0	0	0	0	0	0	2109	371

Major/Minor	Minor1			Major2		
Conflicting Flow All	1054	2109	-	-	-	0
Stage 1	0	0	-	-	-	-
Stage 2	1054	2109	-	-	-	-
Critical Hdwy	6.84	6.54	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-	-	-	-
Follow-up Hdwy	3.52	4.02	-	-	-	-
Pot Cap-1 Maneuver	221	51	0	0	-	0
Stage 1	-	-	0	0	-	0
Stage 2	296	91	0	0	-	0
Platoon blocked, %					-	
Mov Cap-1 Maneuver	221	0	-	-	-	-
Mov Cap-2 Maneuver	221	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	296	0	-	-	-	-

Approach	WB	SB
HCM Ctrl Dly, s/v	0	0
HCM LOS	A	

Minor Lane/Major Mvmt	WBLn1	SBT
Capacity (veh/h)	-	-
HCM Lane V/C Ratio	-	-
HCM Ctrl Dly (s/v)	0	-
HCM Lane LOS	A	-
HCM 95th %tile Q(veh)	-	-

HCS Freeway Merge Report

Project Information

Analyst	ZAB	Date	11/18/2025
Agency	Vanasse & Associates	Analysis Year	2032
Jurisdiction	MassDOT	Time Analyzed	No-Build Weekday Morning Peak-Hour
Project Description	10255 - Middleton, MA	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	36.9	30.0
Segment Length (L) / Acceleration Lane Length (LA), ft	2000	400
Terrain Type	Specific Grade	Level
Percent Grade, %	2.00	-
Segment Type / Ramp Type	Freeway	Left-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs (CAF_{CAV})	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i), veh/h	2207	155
Peak Hour Factor (PHF)	0.89	0.86
Total Trucks, %	2.00	1.00
Heavy Vehicle Adjustment Factor (f_{HV})	0.948	0.990
Demand Flow Rate (v_i), pc/h | Total Flow Rate (v_{FO}), pc/h	2616 | 2798	182
Capacity (c_{md}), pc/h	4500	1900
Adjusted Capacity (c_{mda}), pc/h	4500	1900
Volume-to-Capacity Ratio (v/c)	0.62	0.10

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Downstream Equilibrium Distance (L_{EQ}), ft	-	On-Ramp Infl. Area Speed (S_R), mi/h	38.7
Flow in Lanes 1 and 2 (v_{12}), pc/h	2616	Outer Lanes Freeway Speed (S_O), mi/h	36.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2798	Ramp Junction Speed (S), mi/h	38.7
Number of Outer Lanes on Freeway (N_O), ln	0	Average Density (D), pc/mi/ln	36.1
Level of Service (LOS)	C	Density in Ramp Influence Area (D_R), pc/mi/ln	24.8

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	4	12	47	8	102	4	305	59	33	186	2
Future Vol, veh/h	3	4	12	47	8	102	4	305	59	33	186	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	45	45	45	77	77	77	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	2	2	0	1	0
Mvmt Flow	7	9	27	61	10	132	4	324	63	35	198	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	607	665	199	637	635	356	200	0	0	387	0	0
Stage 1	269	269	-	364	364	-	-	-	-	-	-	-
Stage 2	338	396	-	273	270	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
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	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	411	383	847	393	399	693	1384	-	-	1182	-	-
Stage 1	741	690	-	659	627	-	-	-	-	-	-	-
Stage 2	680	608	-	738	689	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	312	369	847	358	384	693	1384	-	-	1182	-	-
Mov Cap-2 Maneuver	312	369	-	358	384	-	-	-	-	-	-	-
Stage 1	716	667	-	656	625	-	-	-	-	-	-	-
Stage 2	539	605	-	682	666	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	12.11	16.17	0.08	1.22
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	19	-	-	549	524	268	-	-
HCM Lane V/C Ratio	0.003	-	-	0.077	0.389	0.03	-	-
HCM Ctrl Dly (s/v)	7.6	0	-	12.1	16.2	8.1	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	1.8	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	84	11	2	186	1	23	1	0	0	0	0
Future Vol, veh/h	0	84	11	2	186	1	23	1	0	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	84	84	84	65	65	65	61	61	61	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	100	13	3	286	2	38	2	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	288	0	0	113	0	0	399	400	107	394	406	287
Stage 1	-	-	-	-	-	-	107	107	-	293	293	-
Stage 2	-	-	-	-	-	-	292	294	-	101	113	-
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	1286	-	-	1489	-	-	565	541	953	569	537	757
Stage 1	-	-	-	-	-	-	904	811	-	719	674	-
Stage 2	-	-	-	-	-	-	720	673	-	910	806	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1286	-	-	1489	-	-	564	540	953	566	536	757
Mov Cap-2 Maneuver	-	-	-	-	-	-	564	540	-	566	536	-
Stage 1	-	-	-	-	-	-	904	811	-	718	672	-
Stage 2	-	-	-	-	-	-	718	672	-	908	806	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	0.08	11.88	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	563	1286	-	-	19	-	-	-
HCM Lane V/C Ratio	0.07	-	-	-	0.002	-	-	-
HCM Ctrl Dly (s/v)	11.9	0	-	-	7.4	0	-	0
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	97	6	13	124	35	70
Future Vol, veh/h	97	6	13	124	35	70
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	88	88	95	95	84	84
Heavy Vehicles, %	0	25	22	0	0	2
Mvmt Flow	110	7	14	131	42	83

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	117	0	272	114
Stage 1	-	-	-	-	114	-
Stage 2	-	-	-	-	158	-
Critical Hdwy	-	-	4.32	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.398	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1356	-	722	939
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	876	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1356	-	714	939
Mov Cap-2 Maneuver	-	-	-	-	714	-
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	866	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.73	9.96
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	850	-	-	171	-
HCM Lane V/C Ratio	0.147	-	-	0.01	-
HCM Ctrl Dly (s/v)	10	-	-	7.7	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	40	26	150	267	3
Future Vol, veh/h	0	40	26	150	267	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	76	76	66	66
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	53	34	197	405	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	673	407	409	0	-	0
Stage 1	407	-	-	-	-	-
Stage 2	266	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	424	649	1161	-	-	-
Stage 1	677	-	-	-	-	-
Stage 2	783	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	411	649	1161	-	-	-
Mov Cap-2 Maneuver	411	-	-	-	-	-
Stage 1	657	-	-	-	-	-
Stage 2	783	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	11.05	1.21	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1161	-	649	-	-
HCM Lane V/C Ratio	0.029	-	0.082	-	-
HCM Ctrl Dly (s/v)	8.2	-	11	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	294	0	0	0	0	0	0	0	1414	187
Future Vol, veh/h	0	0	294	0	0	0	0	0	0	0	1414	187
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Yield	Yield	Yield	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	0	-	-	-	-	-	-	-	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	92	92	92	92	92	92	96	96	96
Heavy Vehicles, %	0	0	1	2	2	2	2	2	2	0	1	1
Mvmt Flow	0	0	414	0	0	0	0	0	0	0	1473	195

Major/Minor	Minor1			Major2		
Conflicting Flow All	736	1473	-	-	-	0
Stage 1	0	0	-	-	-	-
Stage 2	736	1473	-	-	-	-
Critical Hdwy	6.84	6.54	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-	-	-	-
Follow-up Hdwy	3.52	4.02	-	-	-	-
Pot Cap-1 Maneuver	354	126	0	0	-	0
Stage 1	-	-	0	0	-	0
Stage 2	434	189	0	0	-	0
Platoon blocked, %					-	
Mov Cap-1 Maneuver	354	0	-	-	-	-
Mov Cap-2 Maneuver	354	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	434	0	-	-	-	-

Approach	WB	SB
HCM Ctrl Dly, s/v	0	0
HCM LOS	A	

Minor Lane/Major Mvmt	WBLn1	SBT
Capacity (veh/h)	-	-
HCM Lane V/C Ratio	-	-
HCM Ctrl Dly (s/v)	0	-
HCM Lane LOS	A	-
HCM 95th %tile Q(veh)	-	-

HCS Freeway Merge Report

Project Information

Analyst	ZAB	Date	11/18/2025
Agency	Vanasse & Associates	Analysis Year	2032
Jurisdiction	MassDOT	Time Analyzed	No-Build Weekday Evening Peak-Hour
Project Description	10255 - Middleton, MA	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	36.9	30.0
Segment Length (L) / Acceleration Lane Length (LA), ft	2000	400
Terrain Type	Specific Grade	Level
Percent Grade, %	2.00	-
Segment Type / Ramp Type	Freeway	Left-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs (CAF_{CAV})	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i), veh/h	1601	294
Peak Hour Factor (PHF)	0.96	0.71
Total Trucks, %	1.00	1.00
Heavy Vehicle Adjustment Factor (f_{HV})	0.974	0.990
Demand Flow Rate (v_i), pc/h | Total Flow Rate (v_{FO}), pc/h	1712 | 2130	418
Capacity (c_{md}), pc/h	4500	1900
Adjusted Capacity (c_{mda}), pc/h	4500	1900
Volume-to-Capacity Ratio (v/c)	0.47	0.22

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Downstream Equilibrium Distance (L_{EQ}), ft	-	On-Ramp Infl. Area Speed (S_R), mi/h	38.6
Flow in Lanes 1 and 2 (v_{12}), pc/h	1712	Outer Lanes Freeway Speed (S_O), mi/h	36.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2130	Ramp Junction Speed (S), mi/h	38.6
Number of Outer Lanes on Freeway (N_O), ln	0	Average Density (D), pc/mi/ln	27.6
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	19.5

2032 Build

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	3	6	63	6	32	7	153	59	43	262	2
Future Vol, veh/h	1	3	6	63	6	32	7	153	59	43	262	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	56	56	56	76	76	76	88	88	88	82	82	82
Heavy Vehicles, %	0	0	0	0	0	7	0	4	2	0	1	0
Mvmt Flow	2	5	11	83	8	42	8	174	67	52	320	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	619	682	321	650	650	207	322	0	0	241	0	0
Stage 1	426	426	-	223	223	-	-	-	-	-	-	-
Stage 2	194	257	-	427	427	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.27	4.1	-	-	4.1	-	-
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	3.5	4	3.3	3.5	4	3.363	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	404	374	725	385	391	821	1249	-	-	1338	-	-
Stage 1	611	590	-	784	723	-	-	-	-	-	-	-
Stage 2	813	699	-	610	589	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	355	354	725	353	369	821	1249	-	-	1338	-	-
Mov Cap-2 Maneuver	355	354	-	353	369	-	-	-	-	-	-	-
Stage 1	581	561	-	778	717	-	-	-	-	-	-	-
Stage 2	757	694	-	566	561	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	12.3	16.98	0.25	1.09
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	55	-	-	511	432	252	-	-
HCM Lane V/C Ratio	0.006	-	-	0.035	0.307	0.039	-	-
HCM Ctrl Dly (s/v)	7.9	0	-	12.3	17	7.8	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.3	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	123	14	0	72	0	3	0	0	1	0	0
Future Vol, veh/h	0	123	14	0	72	0	3	0	0	1	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	77	77	77	74	74	74	81	81	81	25	25	25
Heavy Vehicles, %	0	1	15	0	7	0	0	0	0	0	0	0
Mvmt Flow	0	160	18	0	97	0	4	0	0	4	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	97	0	0	178	0	0	266	266	169	257	275	97
Stage 1	-	-	-	-	-	-	169	169	-	97	97	-
Stage 2	-	-	-	-	-	-	97	97	-	160	178	-
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	1509	-	-	1410	-	-	691	643	880	700	636	964
Stage 1	-	-	-	-	-	-	838	763	-	914	818	-
Stage 2	-	-	-	-	-	-	914	818	-	847	756	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1509	-	-	1410	-	-	691	643	880	700	636	964
Mov Cap-2 Maneuver	-	-	-	-	-	-	691	643	-	700	636	-
Stage 1	-	-	-	-	-	-	838	763	-	914	818	-
Stage 2	-	-	-	-	-	-	914	818	-	847	756	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	0	10.24	10.17
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	691	1509	-	-	1410	-	-	700
HCM Lane V/C Ratio	0.005	-	-	-	-	-	-	0.006
HCM Ctrl Dly (s/v)	10.2	0	-	-	0	-	-	10.2
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	5.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	114	31	128	65	14	57
Future Vol, veh/h	114	31	128	65	14	57
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	88	88	91	91	38	38
Heavy Vehicles, %	1	0	0	5	0	0
Mvmt Flow	130	35	141	71	37	150

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	165	0	500	147
Stage 1	-	-	-	-	147	-
Stage 2	-	-	-	-	353	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1426	-	534	905
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	716	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1426	-	479	905
Mov Cap-2 Maneuver	-	-	-	-	479	-
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	642	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	5.17	11.17
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	770	-	-	1194	-
HCM Lane V/C Ratio	0.243	-	-	0.099	-
HCM Ctrl Dly (s/v)	11.2	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.3	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	21	40	212	218	0
Future Vol, veh/h	1	21	40	212	218	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	89	89	85	85
Heavy Vehicles, %	100	0	3	1	1	0
Mvmt Flow	2	33	45	238	256	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	585	256	256	0	-	0
Stage 1	256	-	-	-	-	-
Stage 2	328	-	-	-	-	-
Critical Hdwy	7.4	6.2	4.13	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.3	2.227	-	-	-
Pot Cap-1 Maneuver	344	787	1303	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	554	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	332	787	1303	-	-	-
Mov Cap-2 Maneuver	332	-	-	-	-	-
Stage 1	583	-	-	-	-	-
Stage 2	554	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.1	1.25	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1303	-	741	-	-
HCM Lane V/C Ratio	0.035	-	0.047	-	-
HCM Ctrl Dly (s/v)	7.9	-	10.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

HCS Freeway Merge Report

Project Information

Analyst	ZAB	Date	12/16/2025
Agency	Vanasse & Associates	Analysis Year	2032
Jurisdiction	MassDOT	Time Analyzed	Build Weekday Morning Peak-Hour
Project Description	10255 - Middleton, MA	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	36.9	30.0
Segment Length (L) / Acceleration Lane Length (LA), ft	2000	400
Terrain Type	Specific Grade	Level
Percent Grade, %	2.00	-
Segment Type / Ramp Type	Freeway	Left-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs (CAF_{CAV})	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i), veh/h	2222	205
Peak Hour Factor (PHF)	0.89	0.86
Total Trucks, %	2.00	1.00
Heavy Vehicle Adjustment Factor (f_{HV})	0.948	0.990
Demand Flow Rate (v_i), pc/h | Total Flow Rate (v_{FO}), pc/h	2634 | 2875	241
Capacity (c_{md}), pc/h	4500	1900
Adjusted Capacity (c_{mda}), pc/h	4500	1900
Volume-to-Capacity Ratio (v/c)	0.64	0.13

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Downstream Equilibrium Distance (L_{EQ}), ft	-	On-Ramp Infl. Area Speed (S_R), mi/h	38.8
Flow in Lanes 1 and 2 (v_{12}), pc/h	2634	Outer Lanes Freeway Speed (S_O), mi/h	36.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2875	Ramp Junction Speed (S), mi/h	38.8
Number of Outer Lanes on Freeway (N_O), ln	0	Average Density (D), pc/mi/ln	37.0
Level of Service (LOS)	C	Density in Ramp Influence Area (D_R), pc/mi/ln	25.4

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	4	12	51	8	102	4	305	65	34	186	2
Future Vol, veh/h	3	4	12	51	8	102	4	305	65	34	186	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	45	45	45	77	77	77	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	2	2	0	1	0
Mvmt Flow	7	9	27	66	10	132	4	324	69	36	198	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	609	673	199	642	640	359	200	0	0	394	0	0
Stage 1	271	271	-	368	368	-	-	-	-	-	-	-
Stage 2	338	402	-	275	272	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
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	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	410	379	847	390	396	690	1384	-	-	1176	-	-
Stage 1	739	689	-	656	625	-	-	-	-	-	-	-
Stage 2	680	604	-	736	688	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	310	364	847	354	381	690	1384	-	-	1176	-	-
Mov Cap-2 Maneuver	310	364	-	354	381	-	-	-	-	-	-	-
Stage 1	713	665	-	654	623	-	-	-	-	-	-	-
Stage 2	538	601	-	679	664	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	12.15	16.7	0.08	1.25
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	19	-	-	546	515	275	-	-
HCM Lane V/C Ratio	0.003	-	-	0.077	0.406	0.031	-	-
HCM Ctrl Dly (s/v)	7.6	0	-	12.1	16.7	8.2	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	2	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	91	11	2	190	1	23	1	0	0	0	0
Future Vol, veh/h	0	91	11	2	190	1	23	1	0	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	84	84	84	65	65	65	61	61	61	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	108	13	3	292	2	38	2	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	294	0	0	121	0	0	413	415	115	408	421	293
Stage 1	-	-	-	-	-	-	115	115	-	299	299	-
Stage 2	-	-	-	-	-	-	298	300	-	109	121	-
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	1279	-	-	1479	-	-	553	531	943	557	527	751
Stage 1	-	-	-	-	-	-	895	804	-	714	670	-
Stage 2	-	-	-	-	-	-	715	669	-	901	799	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1279	-	-	1479	-	-	551	530	943	554	526	751
Mov Cap-2 Maneuver	-	-	-	-	-	-	551	530	-	554	526	-
Stage 1	-	-	-	-	-	-	895	804	-	712	668	-
Stage 2	-	-	-	-	-	-	713	668	-	899	799	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	0.08	12.04	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	550	1279	-	-	19	-	-	-
HCM Lane V/C Ratio	0.071	-	-	-	0.002	-	-	-
HCM Ctrl Dly (s/v)	12	0	-	-	7.4	0	-	0
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	97	13	54	124	39	93
Future Vol, veh/h	97	13	54	124	39	93
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	88	88	95	95	84	84
Heavy Vehicles, %	0	25	22	0	0	2
Mvmt Flow	110	15	57	131	46	111

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	125	0	362	118
Stage 1	-	-	-	-	118	-
Stage 2	-	-	-	-	244	-
Critical Hdwy	-	-	4.32	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.398	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1347	-	641	934
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	801	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1347	-	612	934
Mov Cap-2 Maneuver	-	-	-	-	612	-
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	765	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	2.36	10.52
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	809	-	-	546	-
HCM Lane V/C Ratio	0.194	-	-	0.042	-
HCM Ctrl Dly (s/v)	10.5	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	40	26	191	290	3
Future Vol, veh/h	0	40	26	191	290	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	76	76	66	66
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	53	34	251	439	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	761	442	444	0	-	0
Stage 1	442	-	-	-	-	-
Stage 2	320	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	376	620	1127	-	-	-
Stage 1	652	-	-	-	-	-
Stage 2	741	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	365	620	1127	-	-	-
Mov Cap-2 Maneuver	365	-	-	-	-	-
Stage 1	632	-	-	-	-	-
Stage 2	741	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	11.35	0.99	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1127	-	620	-	-
HCM Lane V/C Ratio	0.03	-	0.086	-	-
HCM Ctrl Dly (s/v)	8.3	-	11.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

HCS Freeway Merge Report

Project Information

Analyst	ZAB	Date	12/9/2025
Agency	Vanasse & Associates	Analysis Year	2032
Jurisdiction	MassDOT	Time Analyzed	Build Weekday Morning Peak-Hour
Project Description	10255 - Middleton, MA	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	36.9	30.0
Segment Length (L) / Acceleration Lane Length (LA), ft	2000	400
Terrain Type	Specific Grade	Level
Percent Grade, %	2.00	-
Segment Type / Ramp Type	Freeway	Left-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs (CAF_{CAV})	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i), veh/h	1642	317
Peak Hour Factor (PHF)	0.96	0.71
Total Trucks, %	1.00	1.00
Heavy Vehicle Adjustment Factor (f_{HV})	0.974	0.990
Demand Flow Rate (v_i), pc/h | Total Flow Rate (v_{FO}), pc/h	1756 | 2207	451
Capacity (c_{md}), pc/h	4500	1900
Adjusted Capacity (c_{mda}), pc/h	4500	1900
Volume-to-Capacity Ratio (v/c)	0.49	0.24

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Downstream Equilibrium Distance (L_{EQ}), ft	-	On-Ramp Infl. Area Speed (S_R), mi/h	38.6
Flow in Lanes 1 and 2 (v_{12}), pc/h	1756	Outer Lanes Freeway Speed (S_O), mi/h	36.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2207	Ramp Junction Speed (S), mi/h	38.6
Number of Outer Lanes on Freeway (N_O), ln	0	Average Density (D), pc/mi/ln	28.6
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	20.0