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PRINCIPALS
Robert J. Michaud, P.E.
Daniel J. Mills, P.E., PTOE

M E M O R A N D U M

DATE: May 23, 2025

TO: Metrowest YMCA
280 Old Connecticut Path
Framingham, MA 01701

FROM: Robert J. Michaud, P.E. – Managing Principal
Daniel A. Dumais, P.E. – Senior Project Manager

RE: **Proposed YMCA Facility**
30 Memorial Drive, Ashland, Massachusetts

MDM Transportation Consultants, Inc. (MDM) has conducted a Transportation Impact Assessment (TIA) for a proposed YMCA Facility to be located at 30 Memorial Drive in Ashland, Massachusetts. The location of the Site relative to adjacent roadways is shown in **Figure 1.** This TIA documents baseline traffic volumes, projected Site trip generation and parking characteristics, quantifies incremental traffic impacts of the Site development on area roadways, and evaluates safety-related conditions at key study locations that provide access to the Site.

Key findings of the assessment are as follows:

- *Baseline Traffic Volumes.* Memorial Drive carries approximately 2,390 vehicles per day (vpd) on a weekday and 2,090 vpd on a Saturday. Peak hour traffic flow on Memorial Drive is approximately 170 to 290 vehicles per hour (vph) which represents approximately 8 to 12 percent of daily traffic flow. The traffic flow on Memorial Drive is skewed in the southbound direction during the peak hours.

- *Safety Review.* Based on an extensive review of MassDOT crash data, the study intersections experienced crash rates that are below the MassDOT District 3 average and none of the intersections are listed as high crash locations (HSIP eligible) by MassDOT. The available sight lines at the proposed site driveway intersections with Memorial Drive exceed the safety-based sight line requirements published by AASHTO. Any new plantings (shrubs, bushes) or physical landscape features to be located within driveway sight lines should also be maintained at a height of 2 feet or less above the adjacent existing roadway grade to ensure unobstructed lines of sight.

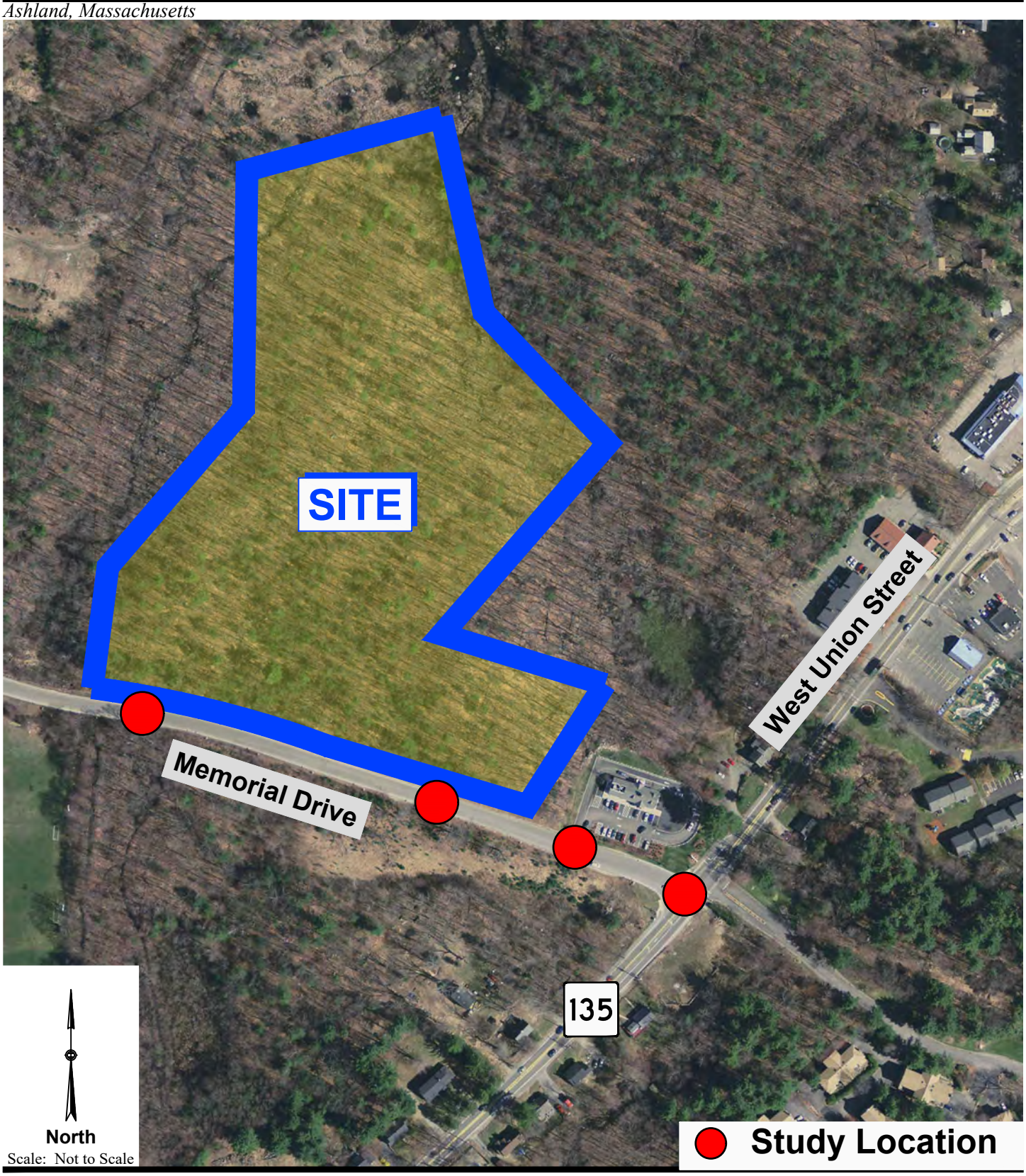

Figure 1

Site Location

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- *Traffic Generation*. Based on ITE trip statistics, the proposed development is estimated to generate approximately 205 vehicle trips (125 entering and 80 exiting) during the weekday morning peak hour, 277 vehicle trips (137 entering and 140 exiting) during the weekday evening peak hour, 150 vehicle trips (76 entering and 74 exiting) during the Saturday midday peak hour. On a daily basis, the proposed development is estimated to generate approximately 2,446 daily vehicle trips on a weekday, and approximately 1,408 vehicle trips on a Saturday with 50 percent entering and exiting.

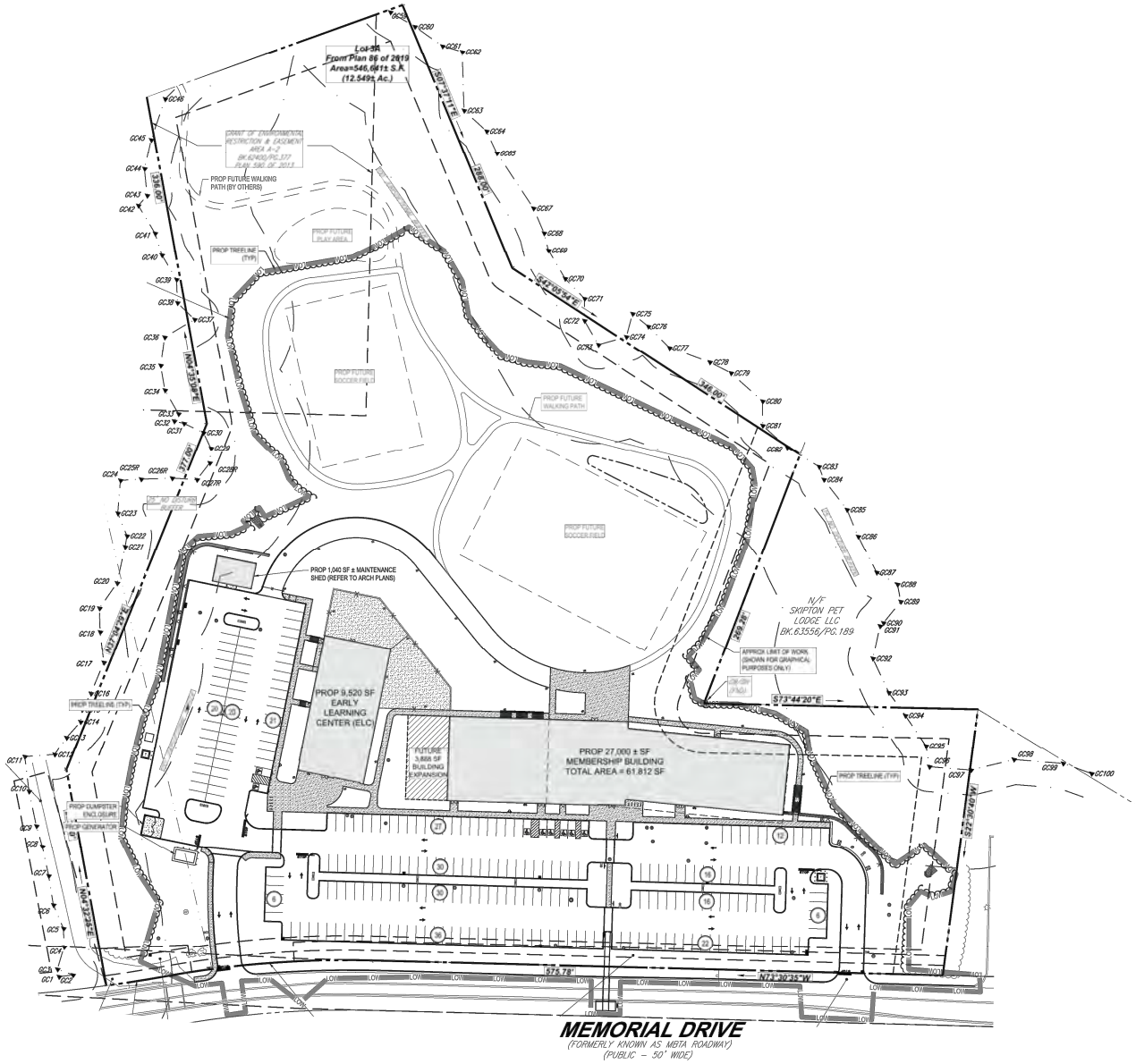
- *Adequate Capacity.* The proposed development is expected to have minimal impact on the study area intersections and will not result in any notable changes in traffic operations in the study area relative to No-Build conditions. The study intersections will continue to operate below capacity at LOS C or better during the peak hours.

- *Parking Demand.* The project currently provides 262 parking spaces exclusive of paved area that is to be reserved for a snow storage zone, which meets average peak parking demands for employees and patrons based on empirical parking demand characteristics of other YMCA facilities in the area. Additional parking capacity of 30± spaces designated for snow storage may augment on-site parking supply during non-winter months to accommodate specific programmed use of outdoor fields and/or the early learning center (ELC) facilities, bringing the total effective parking supply to approximately 292 spaces – a supply that is in line with other similar YMCA facilities.

In summary, MDM finds that incremental traffic associated with the proposed development is not expected to materially impact operating conditions at the study intersections and ample roadway capacity will be available to support the project. There will be no degradation in the level of service at any of the study intersections due to the project. Implementation of access/egress improvements, pedestrian and bicycle accommodations, and a TDM program as outlined under *Recommendations and Conclusions* will establish a framework of minimizing Site traffic impacts. Proposed access/egress along Memorial Drive will be designed to ensure adequate maneuverability for the design vehicles and that adequate sight lines are provided in accordance with AASHTO criteria based on ambient travel speeds.

PROJECT DESCRIPTION

The Site consists of approximately 12.55± acres of undeveloped land. Under the proposed Site programming, the property will be developed into a 65,700± YMCA Facility, a 9,520 Early Learning Center, and 2 outdoor recreational fields. Access/egress will be provided by way of two new curb cuts along Memorial Drive. The project will include approximately 262 total marked surface parking spaces, including 8 handicapped parking spaces. Paved area to be reserved for a snow storage zone may augment the parking supply by up to 30 additional spaces during non-winter months. The preliminary site layout plan prepared by Bohler Engineering is shown in **Figure 2**.



Bohler Engineering

Figure 2

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Preliminary Site Plan

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BASELINE TRAFFIC & SAFETY CHARATERISTICS

This section describes the existing traffic characteristics of roadways and intersections within the study area. Specifically, this section presents an overview of the traffic data collection program, existing traffic volumes, safety issues and alternative transportation systems serving the area.

Study Area

This TIA evaluates transportation characteristics of roadways and intersections that provide a primary means of access to the Site, and that are likely to sustain a measurable level of traffic impact from the development. The study area includes the following intersections as shown in **Figure 1**:

- West Union Street (Rt 135) at Memorial Drive – Unsignalized
- Memorial Drive at Dunkin Driveway – Unsignalized
- Memorial Drive at Site Driveways (2) – Unsignalized

Roadways

West Union Street (Rt 135)

West Union Street is classified by the Massachusetts Department of Transportation (MassDOT) as an Urban Other Principal Arterial roadway under local (Town) jurisdiction within the site vicinity. West Union Street is generally an east-west roadway within the site vicinity and connects East Main Street (Route 135) in the Town of Ashland to the west and Union Street (Route 135) to the east. West Union Street generally provides one travel lane in each direction with additional turn lanes provided at its major intersections. A sidewalk is provided along the northern side of West Union Street. The regulatory speed limit is 35 mph with the exception of a 20-mph school zone designated for the section of roadway adjacent to Ashland Middle School. Land use along West Union Street in the study area consists of a mix of commercial and residential uses. Non-residential uses include the Ashland Middle School, Dunkin Donuts, the Town of Ashland Community Center, two pharmacies and several retail/restaurant plazas to the east of the MBTA Access Road.

Memorial Drive

Memorial Drive is a north-south roadway classified by MassDOT as a local roadway under local (Town) jurisdiction that connects West Union Street (Route 135) to the south with the Ashland Commuter Rail Station to the north. Memorial Drive provides a single 15-foot-wide travel lane in each direction with additional turn lanes provided at Route 135. The regulatory speed limit is 30 mph in both directions and no sidewalks are provided. A multi-use path is provided along the western side of Memorial Drive. Land use along Memorial Drive includes undeveloped parcels that are part of the Town of Ashland Commuter Rail Transit Zoning District (RTD), Cirrus Apartments, a Dunkin, a solar panel field, the Ashland MBTA Commuter Rail Station, and athletic fields at the Ashland Middle School.

Alternative Transportation Options

This section provides an overview of area public transportation options as well as pedestrian and bicycle accommodation within the study area as shown in **Figure 3**.

MBTA Commuter Rail – Framingham/Worcester Line

The Massachusetts Bay Transit Authority (MBTA) operates the Framingham/Worcester Commuter Rail Line with a stop at Ashland Station located approximately 4,500 feet from the site. The Framingham/Worcester Commuter Rail Line runs from South Station to Worcester Union Station, with a stop in the immediate area at Ashland Station at the end of Memorial Drive. Service generally runs Monday through Friday from 4:30 AM to 1:30 AM and Saturday and Sunday from 5:00 AM to 1:00 AM. Headways are approximately 60 minutes on weekdays and 120 minutes on Saturdays and Sundays.

Metro-West Regional Transportation Authority (MWRTA) Bus Route

MWRTA operates a fixed-schedule bus service (Route 5) that serves Blandin Hub in Framingham and Price Chopper in Hopkinton. The route travels on Route 135 and makes scheduled stops at the Cirrus Apartments and the Ashland MBTA Commuter Rail Station, which are currently the closest stops to the Site.

Pedestrian and Bicycle Accommodations

A sidewalk is provided along the northern side of West Union Street and a multi-use path is provided on the western side of Memorial Drive with pedestrian crossings at the signalized intersection of West Union Street and Memorial Drive and at the entrance to the Trolly Bike Trail with rectangular rapid flashing beacons (RRFB) to enhance visibility. The multi-use path provides a connection to the Ashland MBTA Commuter Rail Station to the North with Route 135 and the Trolly Bike Trail to the south. The Trolly Bike Trail connects the multi-use path along Memorial Drive and travels through a wooded area adjacent to the Site and terminates at Megunko Road.

Baseline Traffic Data

Peak Hour Traffic

Turning Movement Counts (TMCs) for study area intersections were collected in October 2024. The TMCs were collected during weekday morning (7:00 AM to 9:00 AM), weekday evening (4:00 PM to 6:00 PM), and Saturday Midday (11:00 AM to 1:00 PM) peak periods. Review of MassDOT permanent count station data indicates that October has above average traffic by approximately 4% with an area background growth rate of 0.2 percent per year. Therefore, the traffic volumes with no adjustments conservatively represent 2025 Baseline average conditions.

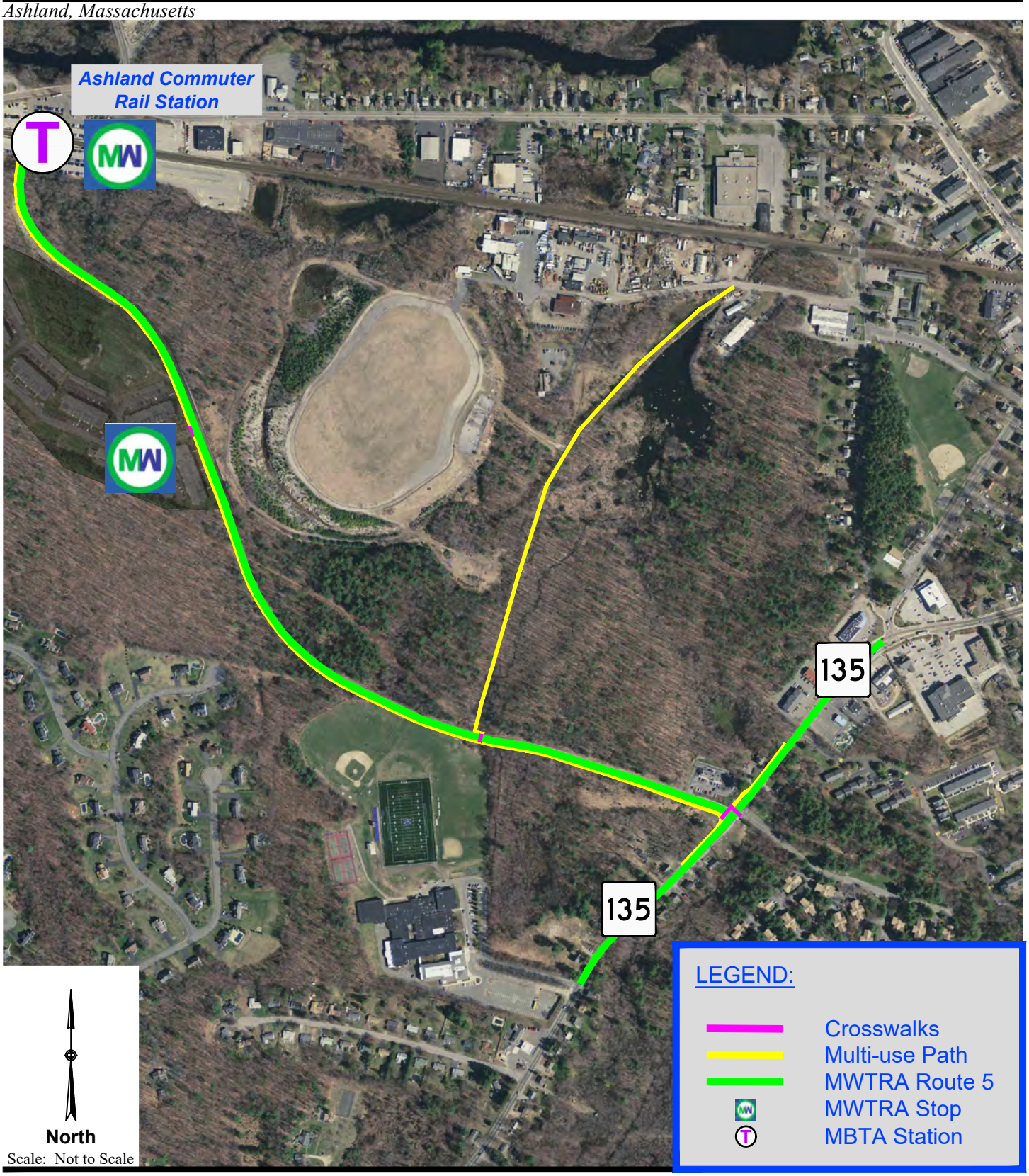

Figure 3

Alternative Transportation Options

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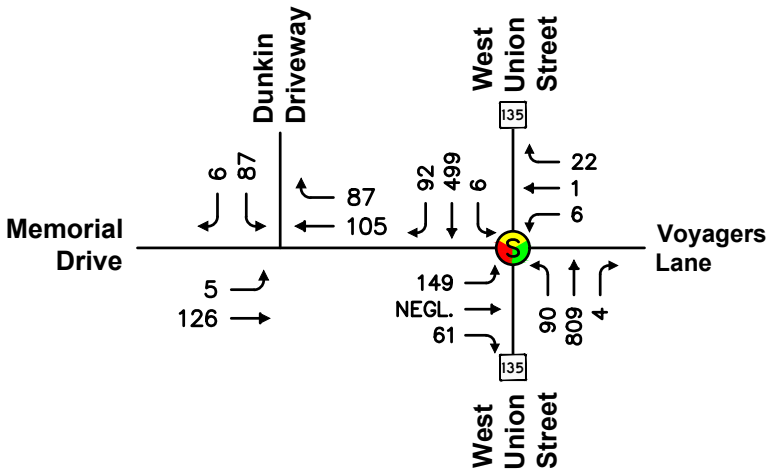
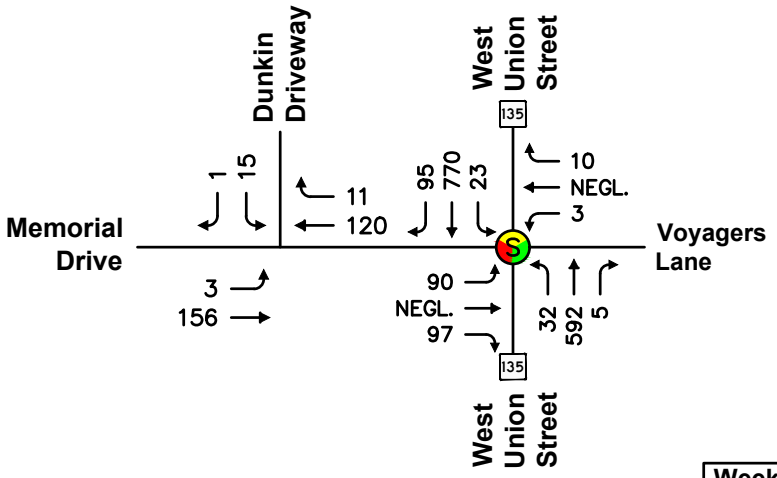
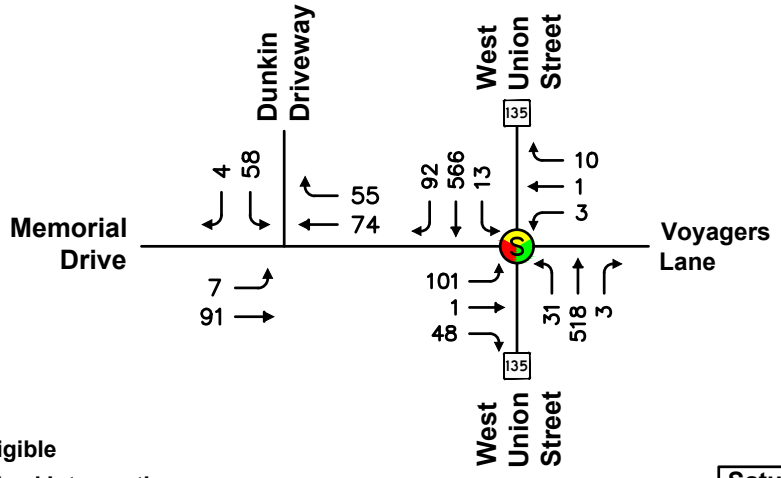


Weekday Morning Peak Hour



Weekday Evening Peak Hour



North
Scale: Not to Scale

NOTES:
NEGL. = Negligible
S = Signalized Intersection

Saturday Midday Peak Hour

Figure 4

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2025 Baseline Conditions
Weekday & Saturday Peak Hour Volumes

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The resulting 2025 Baseline weekday morning, weekday evening, and Saturday midday peak hour traffic volumes for the study intersections are shown in **Figure 4**. Traffic count data, and MassDOT permanent count station data are provided in the **Attachments**.

Daily Traffic Counts

In addition to TMC data described above, daily traffic volumes were obtained using a radar-based traffic recorder along Memorial Drive just north of Dunkin Donuts driveway in October 2024. The results of the ATR counts are summarized in **Table 1** and are discussed below.

TABLE 1
ROADWAY TRAFFIC-VOLUME SUMMARY
MEMORIAL DRIVE NORTH OF DUNKIN DONUTS

Time Period	Daily Volume (vpd)[1]	Percent Daily Traffic[2]	Peak Hour Volume (vph)[3]	Peak Flow Direction[4]	Peak Hour Directional Volume (vph)
Weekday Morning Peak Hour	2,390	11%	242	54% SB	131
Weekday Evening Peak Hour	2,390	12%	280	57% SB	159
Saturday Midday Peak Hour	2,090	8%	176	56% SB	98

[1]Two-way daily traffic expressed in vehicles per day with no seasonal adjustment.
[2]The percent of daily traffic that occurs during the peak hour.
[3]Two-way peak-hour volume expressed in vehicles per hour.
[4]NB = Northbound, SB = Southbound.

As summarized in **Table 1**, Memorial Drive to the north of the Dunkin Donuts driveway carries approximately 2,390 vehicles per day (vpd) on a weekday and 2,090 vpd on a Saturday. Peak hour traffic flow on Memorial Drive is approximately 170 to 290 vehicles per hour (vph) which represents approximately 8 to 12 percent of daily traffic flow. The traffic flow on Memorial Drive is skewed in the southbound direction during the peak hours.

Measured Travel Speeds

Vehicle speeds were obtained for Memorial Drive using a radar recorder device over a 4-day period (Wednesday through Saturday). These measured travel speeds provide a basis for determining sight line requirements at the Proposed Site Driveway intersections with Memorial Drive. **Table 2** presents a summary of the travel speed data collected along Memorial Drive to the north of the Dunkin Donuts driveway with respect to the regulatory speed limit of 30 mph. Detailed speed data is provided in the **Attachments**.

TABLE 2
SPEED STUDY RESULTS – MEMORIAL DRIVE

Travel Direction	Regulatory Speed Limit[1]	Travel Speed	
		Mean[2]	85th Percentile[3]
Northbound	30	31	37
Southbound	30	32	38

[1]Regulatory speed limit in mph.
[2]Arithmetic mean in mph.
[3]The speed at or below which 85 percent of the vehicles are traveling in mph.

As summarized in **Table 2**, the mean (average) travel speed on Memorial Drive was observed to be 31 mph for the northbound direction and 32 mph in the southbound direction; the 85th percentile travel speed was observed to be 37 mph in the northbound direction and 38 mph in the southbound direction. The observed 85th percentile speeds are 7 to 8 mph faster than the regulatory speed limit of 30 mph along Memorial Drive. For analysis purposes, the regulatory and 85th percentile observed speeds were used in the sight line evaluations which are presented in a subsequent section of this report.

Sight Line Evaluation

An evaluation of sight lines was conducted at the site driveway locations to ensure that minimum recommended sight lines are available to safely exit onto Memorial Drive. The evaluation documents existing sight lines for vehicles as they relate to Memorial Drive with comparison to recommended guidelines for the statutory speed limit (30 mph) in the absence of a posted regulatory speed limit.

The American Association of State Highway and Transportation Officials' (AASHTO) standards[1] reference two types of sight distance which are relevant at the proposed site driveway intersection on the site driveway approach to Memorial Drive: stopping sight distance (SSD) and intersection sight distance (ISD). Sight lines for critical vehicle movements at the proposed site driveway intersection with Memorial Drive were reviewed with respect to the regulatory speeds in the immediate Site vicinity.

[1] *A policy on Geometric Design of Highways and Streets*, American Association of State Highway and Transportation Officials (AASHTO), 2018.

Stopping Sight Distance

Sight distance is the length of roadway visible to the motorist to a fixed object. The minimum sight distance available on a roadway should be sufficiently long enough to enable a below-average operator, traveling at or near a regulatory speed limit, to stop safely before reaching a stationary object in its path, in this case, a vehicle entering or exiting the site driveways onto Memorial Drive. The SSD criteria are defined by AASHTO based on design and operating speeds, anticipated driver behavior and vehicle performance, as well as physical roadway conditions. SSD includes the length of roadway traveled during the perception and reaction time of a driver to an object, and the distance traveled during brake application on wet level pavement. Adjustment factors are applied to account for roadway grades where applicable.

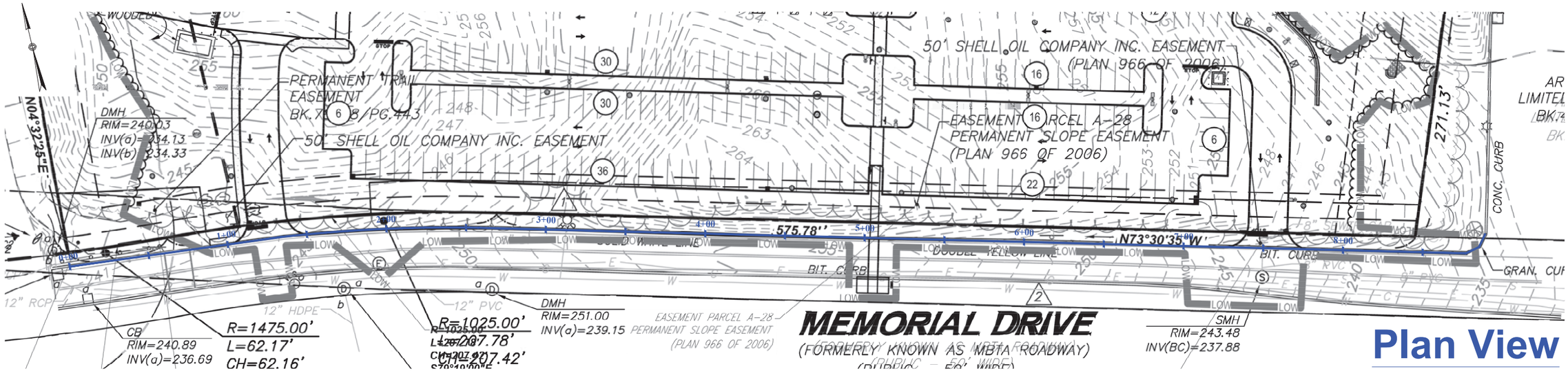
SSD was estimated in the field using AASHTO standards for driver's eye (3.5 feet) and object height equivalent to the taillight height of a passenger car (2.0 feet) for the northbound and southbound Memorial Drive approaches to the intersections. **Table 3** presents a summary of the available SSD for the Memorial Drive approaches and AASHTO's recommended SSD which are also graphically shown in **Figure 5**.

TABLE 3
STOPPING SIGHT DISTANCE SUMMARY
MEMORIAL DRIVE APPROACHES

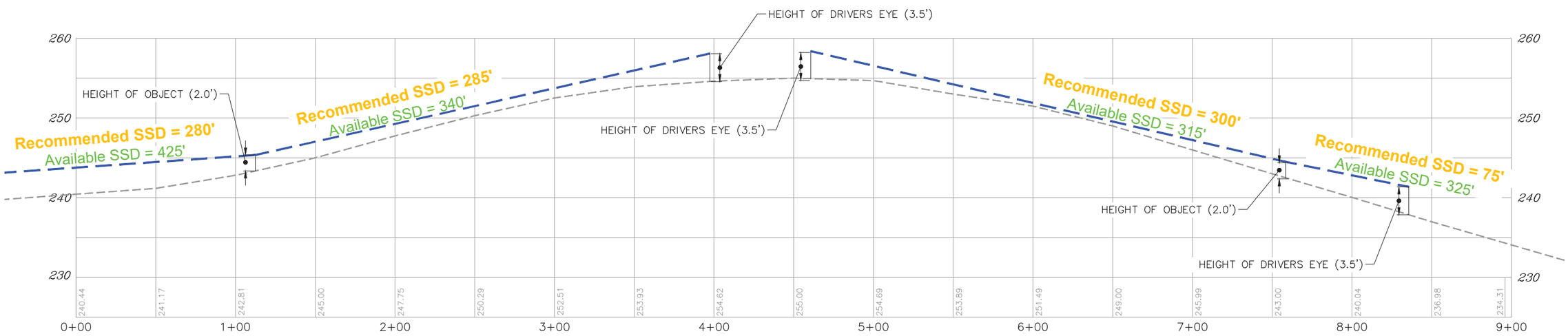
Approach/ Travel Direction	Available SSD	AASHTO Recommended[1]	
		Regulatory Speed[2]	85th Percentile Speed[3]
Memorial Drive Approach to Northern Site Driveway			
Northbound	340± Feet	210 Feet	285 Feet
Southbound	425± Feet	200 Feet	280 Feet
Memorial Drive Approach to Southern Site Driveway			
Northbound	325± Feet	75 Feet[4]	75 Feet[4]
Southbound	315± Feet	210 Feet	300 Feet

[1]Recommended sight distance based on AASHTO, A Policy on Geometric Design of Highways and Streets. Based on driver height of eye of 3.5 feet to object height of 2.0 feet and adjustments for roadway grade.
[2]Based on Posted Speed Limit of 30 mph on Memorial Drive
[3]85th Percentile travel speed is 37 mph NB and 38 mph SB on Memorial Drive.
[4]Based on 15 mile per hour travel speed for vehicles turning from the Route 135/Memorial Drive intersection.

As summarized in **Table 3** and graphically shown in **Figure 5**, analysis results indicate that the available sight lines exceed AASHTO's recommended SSD criteria for the Memorial Drive approaches to the site driveways based on the regulatory and observed travel speeds along Memorial Drive.



Plan View



Profile View

Site Plan Source: Allen & Major Associates, Inc.

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28 Lord Road, Suite 280
Marlborough, MA 01752

Scale: As Noted
DWG No. 1377 Sight Distance.dwg

Date: May 2025
Project No. 1377

Proposed Development
Ashland, Massachusetts

SCALE
0 15 30 60 90 FEET
0 3 6 12 18

Figure 5
Stopping Sight Distance Analysis

Intersection Sight Distance

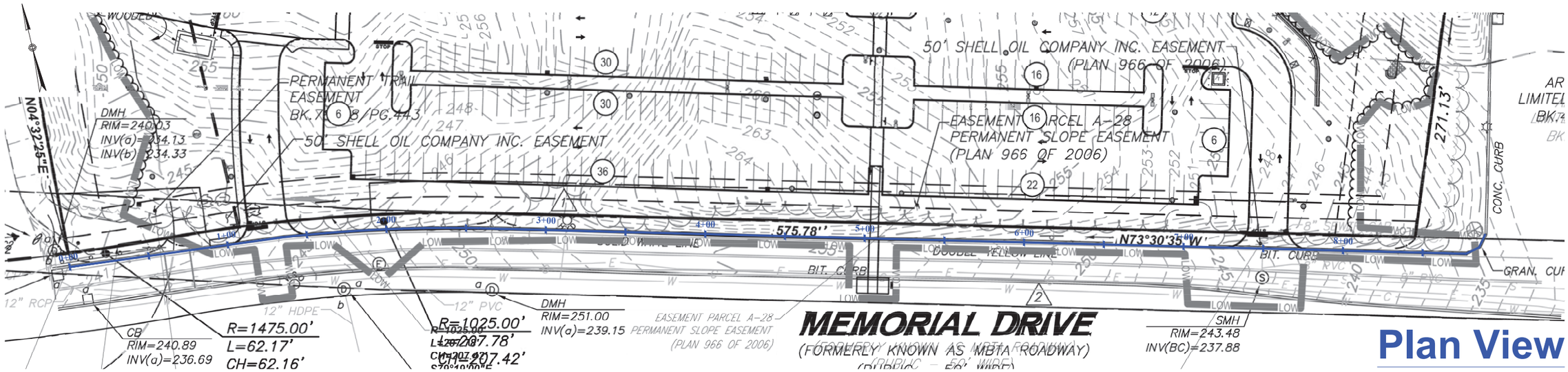
Clear sight lines provide sufficient sight distance for a stopped driver on a minor-road approach to depart from the intersection and enter or cross the major road. As stated under AASHTO's Intersection Sight Distance (ISD) considerations, "*…If the available sight distance for an entering …vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to avoid collisions…To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road*." AASHTO's ISD criteria are defined into several "cases". For the proposed unsignalized site driveway location, which is proposed to be under STOP sign control, the ISD in question relates to the ability to turn left or right from the site driveway at the intersections with Memorial Drive.

Available ISD was estimated in the field using AASHTO standards for driver's eye (3.5 feet), object height (3.5 feet) and decision point (between 8 and 10 feet from the edge of the travel way) for the northbound and southbound directions along Memorial Drive. **Table 4** presents a summary of the available ISD for the departure from the proposed site driveway and AASHTO's minimum and ideal ISD recommendations which are also graphically shown in **Figure 6**.

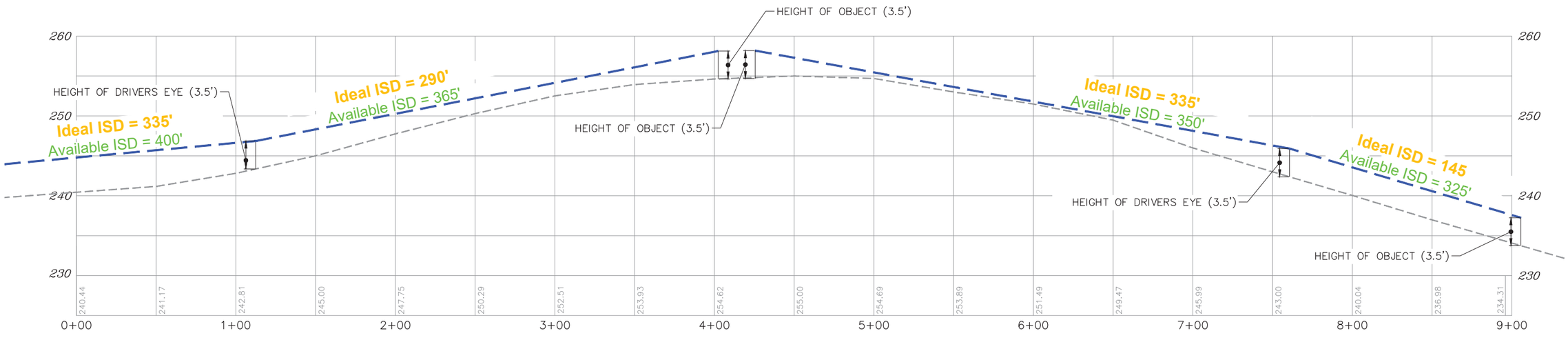
TABLE 4
INTERSECTION SIGHT DISTANCE SUMMARY
DEPARTURES TO MEMORIAL DRIVE

View Direction	Available ISD	AASHTO Minimum[1] 85th Percentile Speed[3]	AASHTO Ideal[1] Regulatory Speed[2]
Northern Site Driveway Departure to Memorial Drive			
Looking North	400± Feet	280 Feet	335 Feet
Looking South	365± Feet	285 Feet	290 Feet
Southern Site Driveway Departure to Memorial Drive			
Looking North	350± Feet	210 Feet	335 Feet
Looking South	325± Feet	75 Feet[4]	145 Feet[4]

[1]Recommended sight distance based on AASHTO, A Policy on Geometric Design of Highways and Streets. Based on driver height of eye of 3.5 feet and an object height of 3.5 feet. Minimum value as noted represents SSD per AASHTO guidance.
[2]Based on Posted Speed Limit of 30 mph on Memorial Drive
[3]85th Percentile travel speed is 37 mph NB and 38 mph SB on Memorial Drive.
[4]Based on 15 mile per hour travel speed for vehicles turning from the Route 135/Memorial Drive intersection.



Plan View



Profile View

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Planners & Engineers
28 Lord Road, Suite 280
Marlborough, MA 01752

Scale: As Noted
DWG No. 1377 Sight Distance.dwg

Date: May 2025
Project No. 1377

Proposed Development
Ashland, Massachusetts

SCALE
0 15 30 60 90 FEET
0 3 6 12 18

Figure 6
Ideal Intersection Sight Distance Analysis

The results of the ISD analysis presented in **Table 4** and graphically shown in **Figure 6**, indicate that the available sight lines looking north and south from the site driveway onto Memorial Drive will exceed the recommended minimum and ideal sight line criteria from AASHTO. While the driveway satisfies all the sight line requirements, it may be desirable to convert the southern site driveway to an enter only driveway which would reduce conflict points along Memorial Drive approaching the Dunkin Donuts driveway and Route 135. MDM further recommends that any new plantings (shrubs, bushes) or physical landscape features to be located within driveway sight lines should also be maintained at a height of 2 feet or less above the adjacent existing roadway grade to ensure unobstructed lines of sight.

Intersection Crash History

In order to identify crash trends and safety characteristics for study area intersections, crash data were obtained from MassDOT for the Town of Ashland for the five-year period covering 2019-2023. A summary of the crash data with crash rates for the study intersections with reported crashes is provided in **Table 5** with detailed data provided in the **Attachments.**

Crash rates were calculated for the study intersections as reported in **Table 5**. These rates quantify the number of crashes per million entering vehicles. MassDOT has determined the official District 3 (which includes the Town of Ashland) crash rate to be 0.89 for signalized intersections and 0.61 for unsignalized intersections. This rate represents MassDOT's "average" crash experience for District 3 communities and serves as a basis for comparing reported crash rates for the study intersections. Where calculated crash rates notably exceed the district average, some form of safety countermeasures may be warranted. A review of Highway Safety Improvement Project (HSIP) locations was also conducted.

TABLE 5
INTERSECTION CRASH SUMMARY
2019 THROUGH 2023[1]

	STUDY LOCATION West Union Street (Rt 135) at Memorial Drive
Traffic Control	Signalized
Crash Rate[2]	**0.16**
MassDOT Avg. Rate[3]	0.89
Above Avg. Rate?	**No**
Year:	
2019	1
2020	1
2021	1
2022	0
2023	1
Total	**4**
Type:	
Angle	0
Rear-End	4
Head-On	0
Sideswipe	0
Fixed Object	0
Pedestrian/Bicyclist	0
Other/Unknown	0
Severity:	
P. Damage Only	3
Personal Injury	1
Fatality	0
Other/Unknown	0
Conditions:	
Dry	3
Wet	1
Snow/Ice	0
Other/Not Reported	0
Time:	
7:00 to 9:00 AM	0
4:00 to 6:00 PM	2
11:00 AM to 1:00 PM	0
Rest of Day	2

[1]Source: MassDOT Crash Database
[2]Crashes per million entering vehicles
[3]District 3 Average Crash Rate

As summarized in **Table 5**:

- *West Union Street (Rt 135) at Memorial Drive.* Four (4) crashes were reported at the signalized study intersection during the five-year study period, resulting in a crash rate of 0.16, which is well below the District 3 average. All four (4) crashes were rear-end type collisions that resulted in three (3) property damage only type crashes (75%) and one personal injury type collision. Three (3) crashes occurred under dry roadway conditions (75%) with three (3) of the crashes occurring during the weekday evening peak commuter travel times (75%). No fatalities or pedestrian-related incidents were reported during the study period.

- *Memorial Drive at Dunkin Driveway.* There were no crashes reported at the Memorial Drive at Dunkin Driveway unsignalized intersection over the five-year study period.

In summary, based on extensive review of MassDOT crash data, the study intersections experienced crash rates that are below the MassDOT District 3 average and none of the intersections are classified as high crash locations (HSIP eligible) by MassDOT. Therefore, no improvement strategies are required at the study area intersections based on the crash history.

PROJECTED FUTURE TRAFFIC CONDITIONS

Evaluation of the proposed development impacts requires the establishment of a future baseline analysis condition. This section estimates future roadway and traffic conditions with and without the proposed development. To be consistent with EEA/MassDOT guidelines, a seven-year planning horizon was selected.

To determine the impact of Site-generated traffic volumes on the roadway network under future conditions, baseline traffic volumes in the study area were projected to a future year condition. Traffic volumes on the roadway network at that time, in the absence of the development (that is, the No-Build condition), would include existing traffic, new traffic due to general background traffic growth, and traffic related to specific development by others that is currently under review at the local and/or state level. Consideration of these factors resulted in the development of No-Build traffic volumes. Anticipated Site-generated traffic volumes were then superimposed upon these No-Build traffic-flow networks to develop future Build conditions.

The following sections provide an overview of future No-Build traffic volumes and projected Build traffic volumes.

Background Traffic Growth

Background traffic includes demand generated by other planned developments in the area as well as demand increases caused by external factors. External factors are general increases in traffic not attributable to a specific development and are determined using historical data.

Historical Area Growth

Nearby permanent count station data published by MassDOT indicates a 0.2 percent per year growth rate. For purposes of this evaluation, a 0.5 percent compounded annual growth rate was used (3.6 percent increase over a 7-year horizon). This growth rate is higher than historic rates and is also expected to account for any small fluctuation in hourly traffic as may occur from time to time in the study area and traffic associated with other potential small developments or vacancies in the area. MassDOT permanent count station data and background growth calculations are provided in the **Attachments.**

Development-Related Growth

Development of future No-Build traffic volumes also considers traffic generated through the study area from other specific area developments. Review of Massachusetts Environmental Policy Act (MEPA) files and correspondence with the Town of Ashland Planning staff indicates that there are several Site-specific development projects in the area that may increase Baseline traffic at the study intersections as follows:

- *100-130 Chestnut Street:* This project consists of the redevelopment of three commercial buildings totaling 12,000± sf into a mixed-use development including a 200-unit mid-rise apartment complex and 4,200± sf of neighborhood commercial space. Based on the traffic study prepared for the project, the trips associated with the project were generated using industry- and application-standard ITE data for the Land Use Code (LUC) 221 – Multifamily Residential Development (Mid-Rise) and distributed based on US Census Journey to Work data. For reference, the Site-specific trip tracings are provided in the **Attachments**.

- *Sanctuary at Ashland Mills:* This 40B project consists of the redevelopment of a commercial property into a mixed-use development including 250 multifamily residential units and 15,565± square feet of commercial space to be located at 10-60 Main Street. Trips associated with the project were generated using industry- and application-standard ITE data for LUC 221 – Multifamily Residential Development (Mid-Rise) and distributed based on US Census Journey to Work data. A review of the traffic report submitted for the project; this methodology results in a slightly conservative estimate of project impacts. For reference, the Site-specific trip tracings are provided in the **Attachments**.

- *61 Waverly Street*: This is a potential 40B project that is estimated to consist of a 226-unit residential development to be located at 61 Waverly Street. No formal plans have been submitted at this time; therefore, no site-specific trips were included in the analysis.

- *501 Pond Street:* This project consists of a 120-unit, four story, multifamily residential building including 6,800± sf of office space located at 501 Pond Street. Given the lack of proximity to the Site, any traffic increases are considered marginal and have been accounted for in the general yearly growth rate.

- *750 Concord Street:* This is a potential residential project in the Town of Holliston at the Putts and More facility located along Converse Way. Given the lack of proximity to the Site any traffic increases are expected to be marginal and have been accounted for in the general yearly growth rate.

- *9-49 Homer Avenue:* This project consists of a mixed-use development containing 29 residential units and 8,550± square feet of retail/commercial space to be located along Homer Avenue. Due to lack of proximity to the site, any traffic increases are considered marginal and accounted for in the general yearly growth.

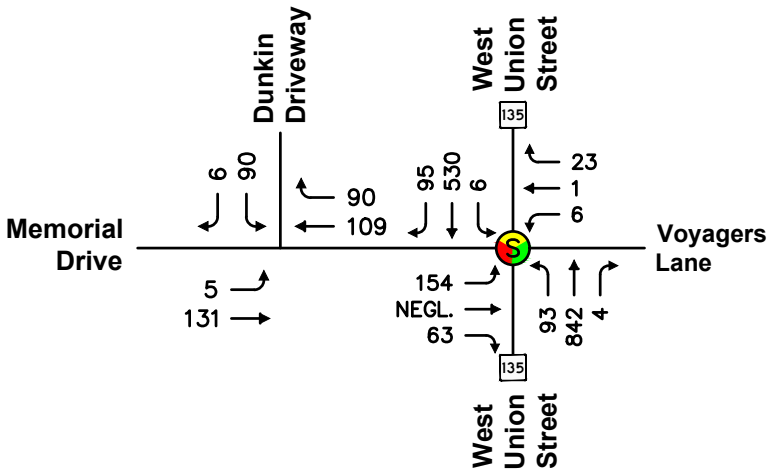
2032 No-Build Traffic Volume Networks

In summary, to account for future traffic growth in the study area, future No-Build traffic volumes are developed by increasing the Baseline (2025) volumes by approximately 3.6 percent (0.5 percent compounded annually over 7 years) and then adding trips associated with the background project listed above. The resulting 2032 No-Build traffic volumes are displayed in **Figure 7**.

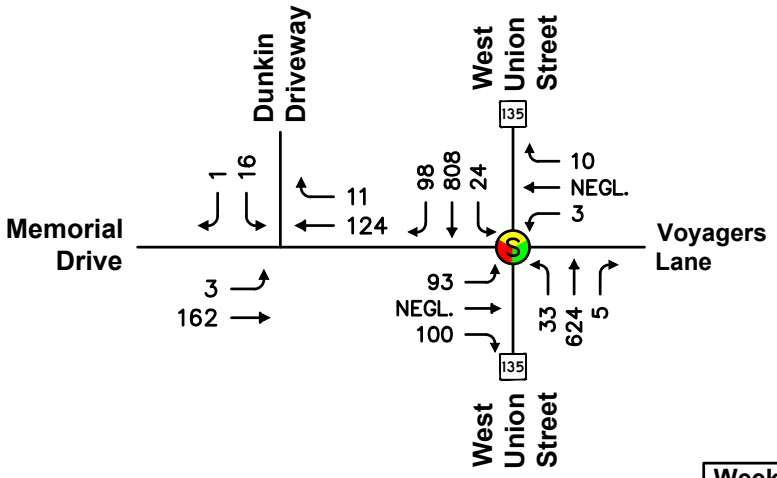
Trip Generation

The trip generation estimates for the proposed development are provided for the weekday morning, weekday evening, and Saturday midday, which correspond to the critical analysis periods for the proposed uses and adjacent street traffic flow. New traffic generated by the project was estimated using trip rates published in ITE's *Trip Generation*[2] for LUC 495 – Recreational Community Center, LUC 565 – Day Care Center, and LUC 488 – Soccer Complex. While the YMCA use, Early Learning Cetner and sports fields are synergistic the trip generation for the various uses were conservatively calculated individually for planning purposes. **Table 6** presents the trip-generation summary for the proposed development based on ITE methodology.

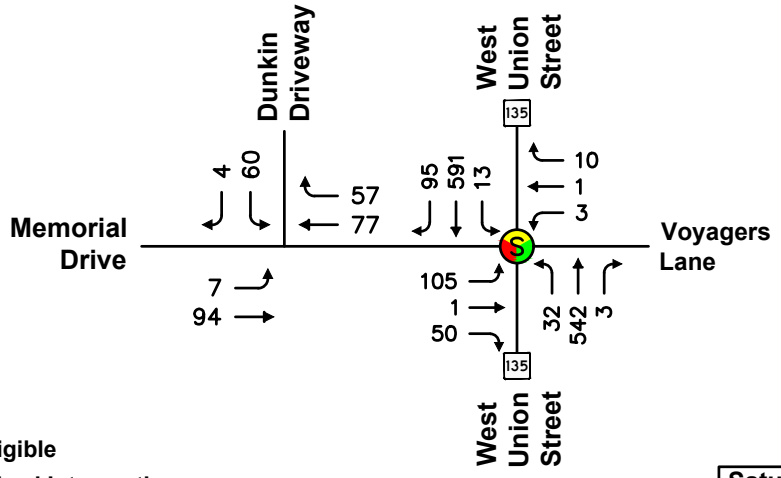
[2]*Trip Generation,* 11th Edition; Institute of Transportation Engineers; Washington, DC; 2021.



Weekday Morning Peak Hour



Weekday Evening Peak Hour



North
Scale: Not to Scale

NOTES:
NEGL. = Negligible
S = Signalized Intersection

Saturday Midday Peak Hour

Figure 7

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2032 No-Build Conditions
Weekday & Saturday Peak Hour Volumes

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TABLE 6
TRIP-GENERATION SUMMARY

Period/Direction	Recreational Community Center (65.7 ksf)[1]	Early Learning Center (100 Students)[2]	Sports Fields (2 Fields)[3]	Total
Weekday Morning Peak Hour:				
Entering	83	41	1	**125**
Exiting	42	37	1	**80**
Total	125	78	2	**205**
Weekday Evening Peak Hour:				
Entering	77	38	22	**137**
Exiting	87	42	11	**140**
Total	164	80	33	**277**
Saturday Midday Peak Hour:				
Entering	38	0	38	**76**
Exiting	32	0	42	**74**
Total	70	0	80	**150**
Weekday	1,894	410	142	**2,446**
Saturday	598	0	810	**1,408**

[1]Based on ITE rates for LUC 495 – Recreational Community Center applied to 65.7 ksf.
[2]Based on ITE rates for LUC 565 – Day Care Center applied to 100 students.
[3]Based on ITE rates for LUC 488 – Soccer Complex applied to 2 fields (non-tournament)

As summarized in **Table 6**, based on ITE trip statistics, the proposed development is estimated to generate approximately 205 vehicle trips (125 entering and 80 exiting) during the weekday morning peak hour, 277 vehicle trips (137 entering and 140 exiting) during the weekday evening peak hour, 150 vehicle trips (76 entering and 74 exiting) during the Saturday midday peak hour. On a daily basis, the proposed development is estimated to generate approximately 2,446 daily vehicle trips on a weekday, and approximately 1,408 vehicle trips on a Saturday with 50 percent entering and exiting.

The trip estimates presented in **Table 6** were then adjusted to reflect pass-by and diverted traffic, which represents the portion of site-generated trips that is drawn from the existing traffic stream and that is not "new" traffic to area roadways. Pass-by/diverted trip data as published by ITE in the *Trip Generation Handbook* indicates an average pass-by rate of 44 percent for the Early Learning Center use planned for the Site. For this study, the total pass-by/diverted trip factor was held at the pass-by percentages with the remaining trips assumed as new trips. **Table 7** presents a breakdown of total trips to the proposed development.

TABLE 7
TRIP-GENERATION
(Net Trips)

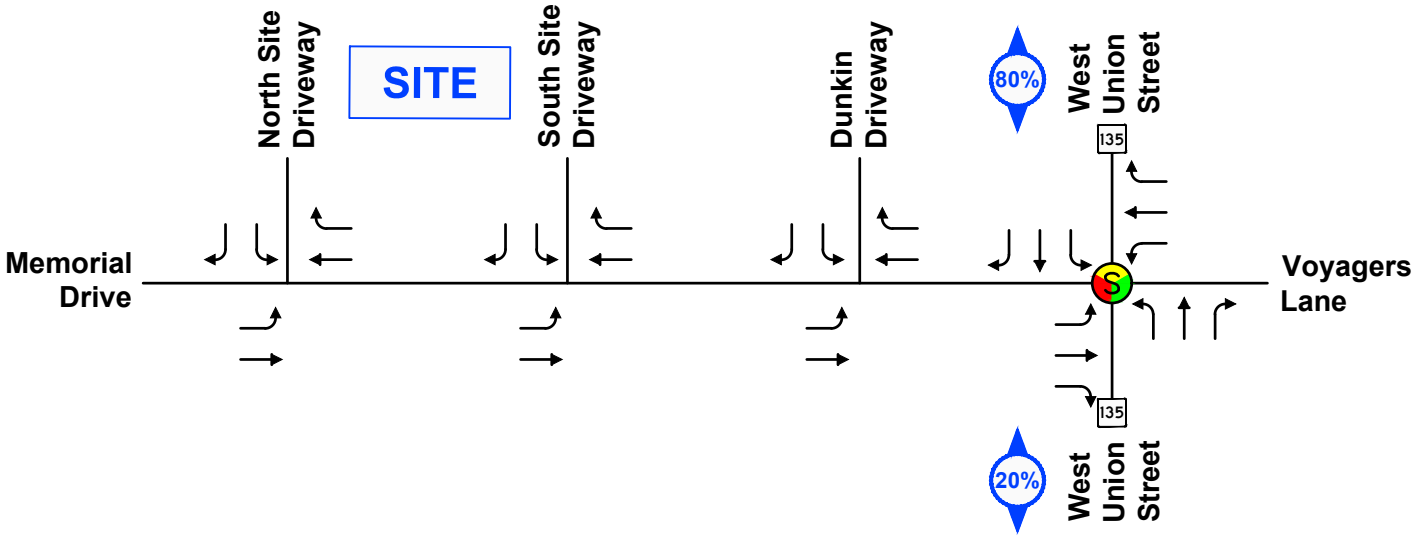
Period/Direction		Site Trips		
		Total[1]	Pass-By/ Diverted[2]	Net New Trips[3]
Weekday Morning Peak Hour				
	Entering	125	-17	108
	Exiting	80	-17	63
	Total	205	-34	171
Weekday Evening Peak Hour				
	Entering	137	-17	120
	Exiting	140	-17	123
	Total	277	-34	243
Saturday Midday Peak Hour				
	Entering	76	-0	76
	Exiting	74	-0	74
	Total	150	-0	150
	Weekday	2,446	-180	2,266
	Saturday	1,408	-0	1,408

[1]Total Trips as shown in **Table 6**.
[2]Pass-by = 44% Daycare Center pass-by per ITE Trip Generation Handbook. Diverted trips were assigned direction based on volumes along Route 135 compared to Memorial Drive.
[3]Net New Trips to the project area.

As summarized in **Table 7,** the proposed development is estimated to generate approximately 171 new vehicle trips (108 entering and 63 exiting) during the weekday morning peak hour, 243 new vehicle trips (120 entering and 123 exiting) during the weekday evening peak hour, 150 new vehicle trips (76 entering and 74 exiting) during the Saturday midday peak hour. On a daily basis, the proposed development is estimated to generate approximately 2,266 new vehicle trips on weekdays and 1,408 new vehicle trips on Saturday with 50 percent entering and exiting.

Trip Distribution

The directional distribution of development-generated trips on the roadway network is a function of a number of variables including local area populations and the efficiency of the roadways leading to the Site. Area population centers for the core communities in the area Ashland, Sherborn, Holliston, Hopkinton, Framingham, and Southborough (approximate 15 to 20-minute drive of the Site with adjustments for competing YMCA locations) serve as the primary basis for determining the trip distribution pattern for the facility. The distribution of the site generated trips is displayed in **Figure 8**. Trip distribution calculations are provided in the **Attachments**.



North

Scale: Not to Scale

NOTES:
NEGL. = Negligible
S = Signalized Intersection

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Figure 8

Trip Distribution

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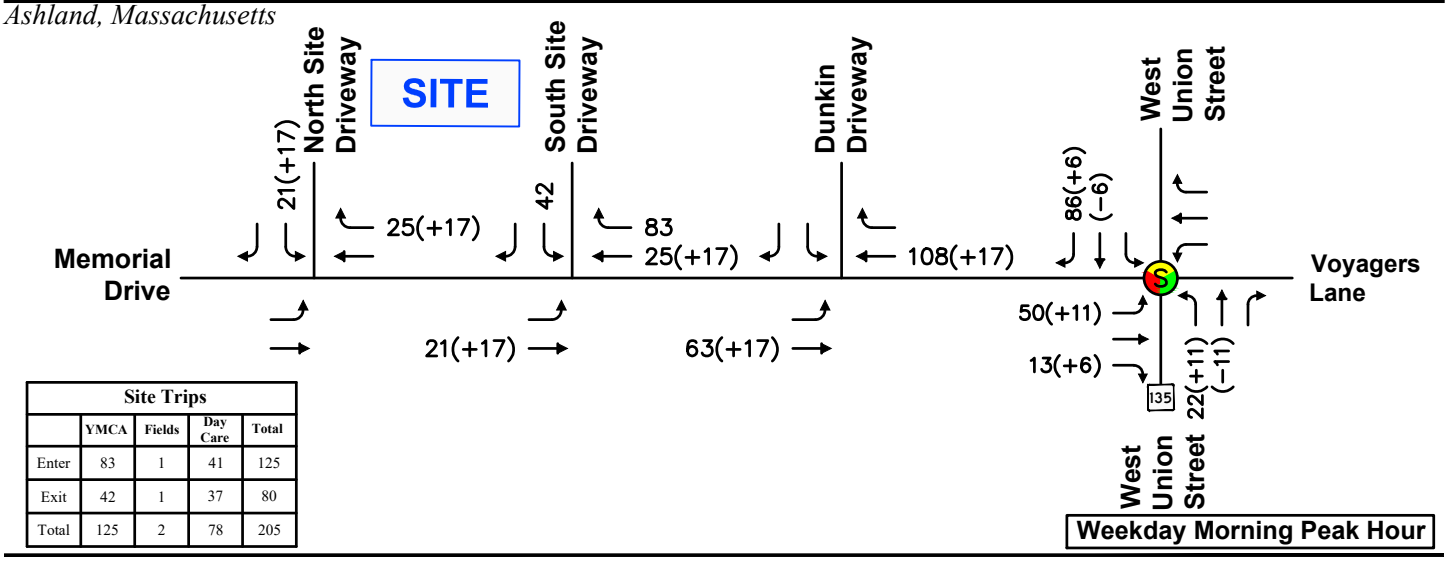
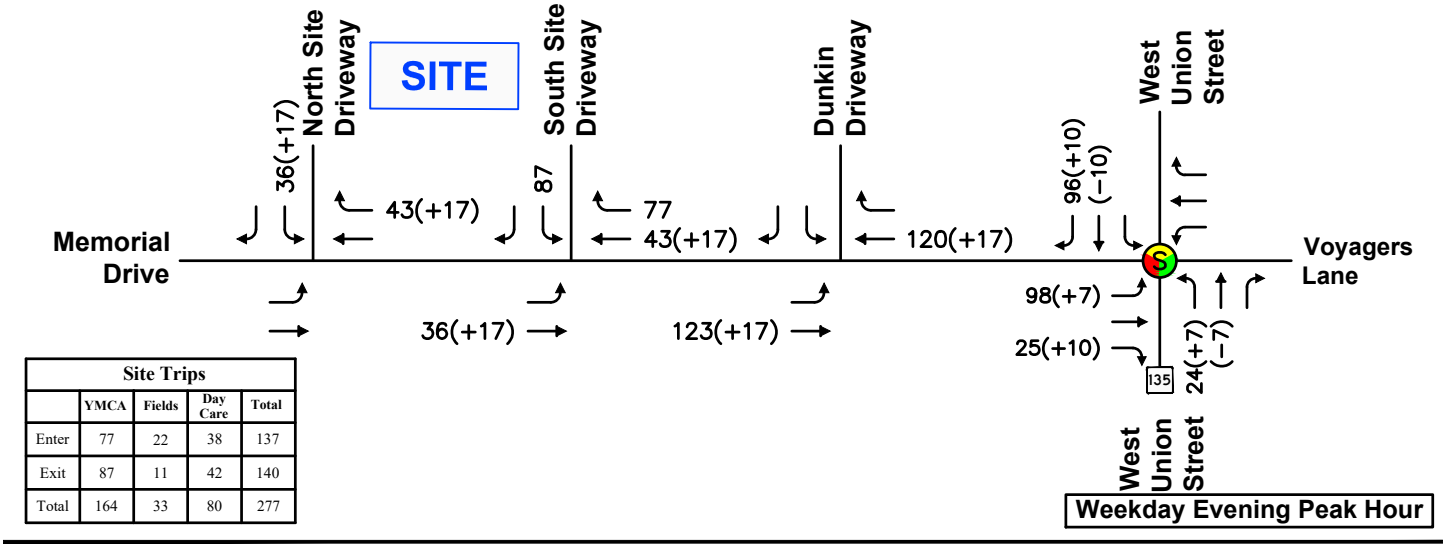
Development-related trips for the proposed development are assigned to the roadway network using the trip-generation estimates shown in **Table 6** and the distribution patterns presented in **Figure 8**. Development-related trips at each intersection approach for the weekday morning, weekday evening, and Saturday midday peak hours are quantified in **Figure 9**.

2032 Build Traffic Conditions

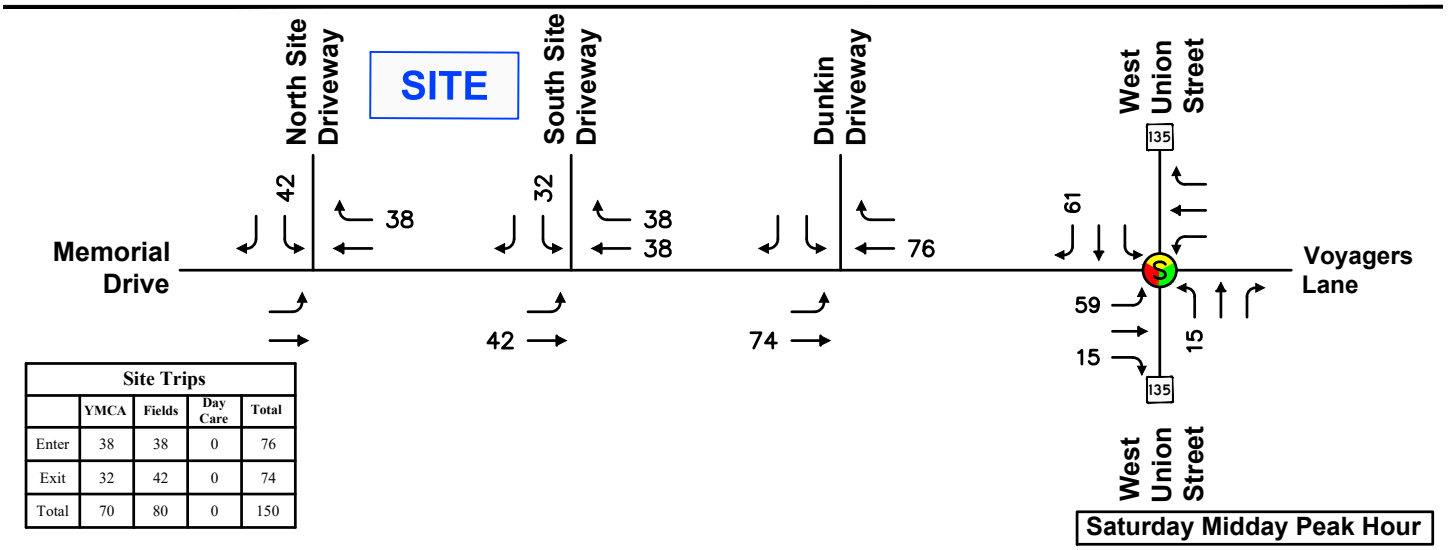
2032 Build condition traffic volumes are derived by adding the incremental traffic increases for the proposed YMCA, Early Learning Center, and recreational fields use of the Site to the 2032 No-Build conditions. **Figure 10** presents the 2032 Build condition traffic-volume networks for the weekday morning, weekday evening, and Saturday midday peak hours.



Site Trips				
	YMCA	Fields	Day Care	Total
Enter	83	1	41	125
Exit	42	1	37	80
Total	125	2	78	205



Site Trips				
	YMCA	Fields	Day Care	Total
Enter	77	22	38	137
Exit	87	11	42	140
Total	164	33	80	277



Site Trips				
	YMCA	Fields	Day Care	Total
Enter	38	38	0	76
Exit	32	42	0	74
Total	70	80	0	150

Figure 9

MDM TRANSPORTATION CONSULTANTS, INC.
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Trip Generation
Weekday & Saturday Peak Hour Volumes

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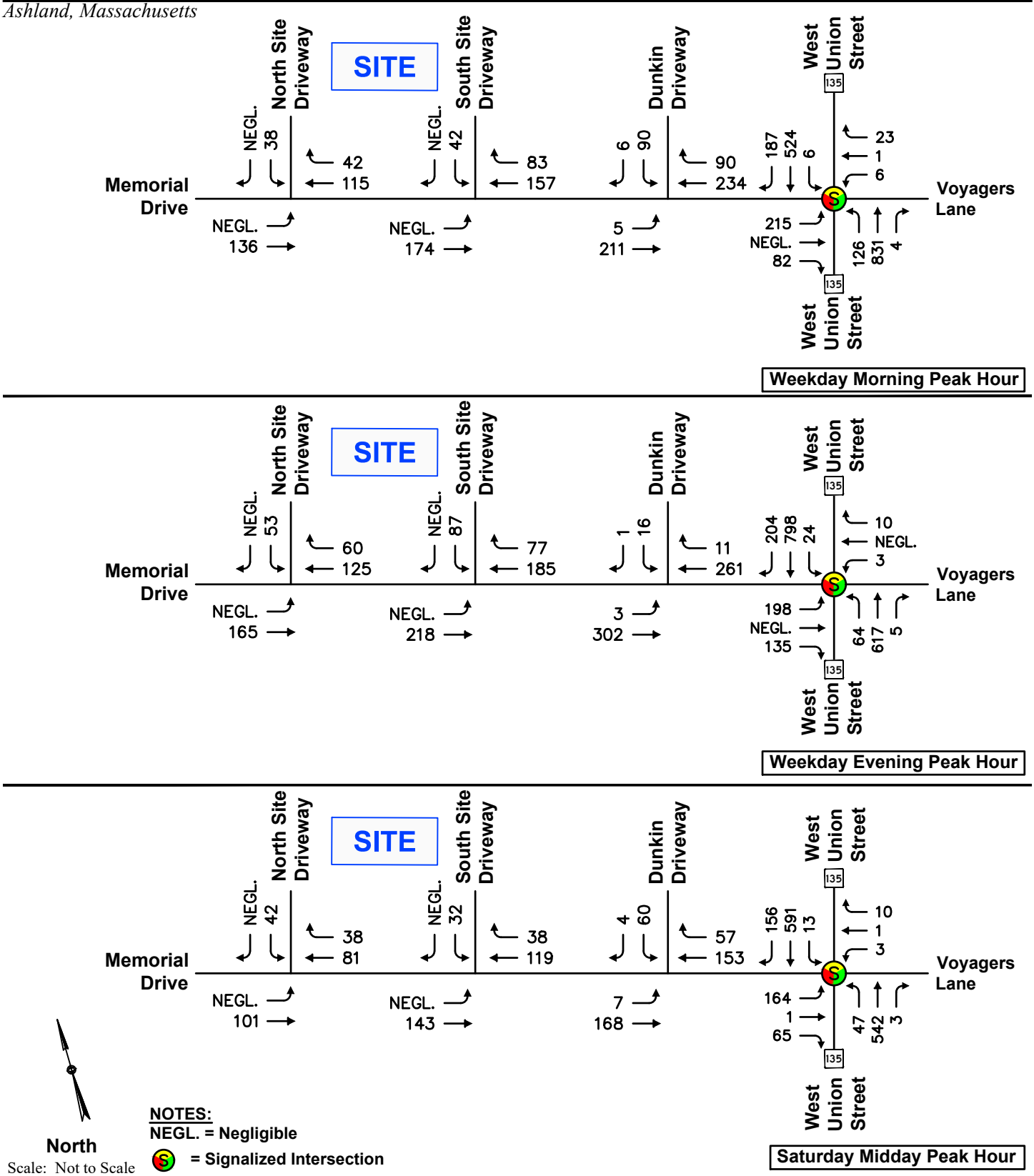

Figure 10

MDM TRANSPORTATION CONSULTANTS, INC.
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2032 Build Conditions
Weekday & Saturday Peak Hour Volumes

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OPERATIONS ANALYSIS

This section provides an overview of operational analysis methodology, and an assessment of intersection operations under Baseline and projected future No-Build and Build conditions.

Analysis Methodology

Intersection capacity analyses are presented in this section for the Baseline, No-Build, and Build traffic-volume conditions. Capacity analyses, conducted in accordance with EEA/MassDOT guidelines, provide an index of how well the roadway facilities serve the traffic demands placed upon them. The operational results provide the basis for recommended access and roadway improvements in the following section.

Capacity analysis of intersections is developed using the Synchro® computer software, which implements the methods of the Highway Capacity Manual (HCM) 6th Edition. The resulting analysis presents a level-of-service (LOS) designation for individual intersection movements. The LOS is a letter designation that provides a qualitative measure of operating conditions based on several factors including roadway geometry, speeds, ambient traffic volumes, traffic controls, and driver characteristics. Since the LOS of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of LOS, depending on the time of day, day of week, or period of year. A range of six levels of service are defined on the basis of average delay, ranging from LOS A (the least delay) to LOS F (delays greater than 50 seconds for unsignalized movements and delays greater than 80 seconds for signalized movements). The specific control delays and associated LOS designations are presented in the **Attachments**.

Intersection Capacity and Queue Analysis Results

Level-of-Service (LOS) analyses were conducted for the Baseline, No-Build, and Build conditions for the study intersections. The results of the intersection capacity are summarized below in **Tables 7-9** for the weekday morning, weekday evening peak hours, and Saturday midday peak hours, respectively. Vehicle queue results are presented for the signalized intersection in the study area. These vehicle queues are compared to available storage lengths, which are defined as lengths of exclusive turn lanes or the distance to the nearest major intersection for through lanes. Vehicle queue results from the capacity analysis are summarized in **Table 10**. Detailed analysis is presented in the **Attachments**.

TABLE 7
INTERSECTION CAPACITY ANALYSIS RESULTS
WEEKDAY MORNING PEAK HOUR

		2025 Baseline			2032 No-Build			2032 Build		
Period	Approach	v/c[1]	Delay[2]	LOS[3]	v/c	Delay	LOS	v/c	Delay	LOS
West Union St (Rt 135)	Eastbound	0.77	17	B	0.79	18	B	0.79	19	B
at Memorial Drive	Westbound	0.63	19	B	0.70	22	C	0.72	22	C
	Northbound	0.08	12	B	0.08	12	B	0.08	13	B
	Southbound	0.43	28	C	0.45	30	C	0.57	32	C
	OVERALL	**0.77**	**19**	**B**	**0.79**	**21**	**C**	**0.79**	**22**	**C**
Memorial Drive at	Northbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
Dunkin Driveway	Southbound	0.01	<5	A	0.01	<5	A	0.01	<5	A
	WB Exit	0.23	12	B	0.24	12	B	0.34	17	C
Memorial Drive at	Northbound	n/a	n/a	n/a	n/a	n/a	n/a	0.00	<5	A
Northern Driveway	Southbound	n/a	n/a	n/a	n/a	n/a	n/a	0.00	<5	A
	WB Exit	n/a	n/a	n/a	n/a	n/a	n/a	0.06	11	B
Memorial Drive at	Northbound	n/a	n/a	n/a	n/a	n/a	n/a	0.00	<5	A
Southern Driveway	Southbound	n/a	n/a	n/a	n/a	n/a	n/a	0.00	<5	A
	WB Exit	n/a	n/a	n/a	n/a	n/a	n/a	0.08	11	B

[1]Volume-to-capacity ratio
[2]Average control delay per vehicle (in seconds)
[3]Level of service
[4]n/a = not applicable

TABLE 8
INTERSECTION CAPACITY ANALYSIS RESULTS
WEEKDAY EVENING PEAK HOUR

		2025 Baseline			2032 No-Build			2032 Build		
Period	Approach	v/c[1]	Delay[2]	LOS[3]	v/c	Delay	LOS	v/c	Delay	LOS
West Union St (Rt 135)	Eastbound	0.47	7	A	0.49	8	A	0.52	11	B
at Memorial Drive	Westbound	0.79	21	C	0.81	22	B	0.87	28	C
	Northbound	0.04	10	B	0.04	10	A	0.04	11	B
	Southbound	0.38	24	C	0.41	25	C	0.63	31	C
	OVERALL	**0.79**	**16**	**B**	**0.81**	17	**B**	**0.87**	22	**C**
Memorial Drive at	Northbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
Dunkin Driveway	Southbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
	WB Exit	0.03	10	A	0.03	10	A	0.05	13	B
Memorial Drive at	Northbound	n/a	n/a	n/a	n/a	n/a	n/a	0.00	<5	A
Northern Driveway	Southbound	n/a	n/a	n/a	n/a	n/a	n/a	0.00	<5	A
	WB Exit	n/a	n/a	n/a	n/a	n/a	n/a	0.09	11	B
Memorial Drive at	Northbound	n/a	n/a	n/a	n/a	n/a	n/a	0.00	<5	A
Southern Driveway	Southbound	n/a	n/a	n/a	n/a	n/a	n/a	0.00	<5	A
	WB Exit	n/a	n/a	n/a	n/a	n/a	n/a	0.17	13	B

[1]Volume-to-capacity ratio
[2]Average control delay per vehicle (in seconds)
[3]Level of service
[4]n/a = not applicable

TABLE 9
INTERSECTION CAPACITY ANALYSIS RESULTS
SATURDAY MIDDAY PEAK HOUR

		2025 Baseline			2032 No-Build			2032 Build		
Period	Approach	v/c[1]	Delay[2]	LOS[3]	v/c	Delay	LOS	v/c	Delay	LOS
West Union St (Rt 135)	Eastbound	0.42	8	A	0.44	8	A	0.50	10	A
at Memorial Drive	Westbound	0.57	15	B	0.60	16	B	0.69	19	B
	Northbound	0.03	11	B	0.03	10	A	0.03	13	B
	Southbound	0.29	24	C	0.31	22	C	0.44	28	C
	OVERALL	**0.57**	**13**	**B**	**0.60**	**14**	**B**	**0.69**	**17**	**B**
Memorial Drive at	Northbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
Dunkin Driveway	Southbound	0.01	<5	A	0.01	<5	A	0.01	<5	A
	WB Exit	0.08	10	A	0.09	10	A	0.10	11	B
Memorial Drive at	Northbound	n/a	n/a	n/a	n/a	n/a	n/a	0.00	<5	A
Northern Driveway	Southbound	n/a	n/a	n/a	n/a	n/a	n/a	0.00	<5	A
	WB Exit	n/a	n/a	n/a	n/a	n/a	n/a	0.06	10	A
Memorial Drive at	Northbound	n/a	n/a	n/a	n/a	n/a	n/a	0.00	<5	A
Southern Driveway	Southbound	n/a	n/a	n/a	n/a	n/a	n/a	0.00	<5	A
	WB Exit	n/a	n/a	n/a	n/a	n/a	n/a	0.05	11	B

[1]Volume-to-capacity ratio
[2]Average control delay per vehicle (in seconds)
[3]Level of service
[4]n/a = not applicable

TABLE 10
VEHICLE QUEUE ANALYSIS SUMMARY
WEST UNION STREET (RT 135) AT MEMORIAL DRIVE

Approach	Storage Length (feet)	2025 Baseline Average Queue Length[1]	2025 Baseline 95th Percentile Queue Length[1]	2032 No-Build Average Queue Length	2032 No-Build 95th Percentile Queue Length	2032 Build Average Queue Length	2032 Build 95th Percentile Queue Length
Weekday Morning Peak Hour							
Eastbound L	200±	<25	49	<25	51	34	68
Eastbound T/R	>1000	341	630	380	695	420	697
Westbound L/T	>1000	239	414	295	510	289	456
Westbound R	50±	<25	<25	<25	<25	25	70
Northbound L/T	200±	<25	<25	<25	<25	<25	<25
Northbound R	>500	<25	<25	<25	<25	<25	<25
Southbound L/T	>1000	77	179	88	185	132	254
Southbound R	325±	<25	<25	<25	<25	<25	30
Weekday Evening Peak Hour							
Eastbound L	200±	<25	<25	<25	<25	<25	39
Eastbound T/R	>1000	96	309	106	337	156	410
Westbound L/T	>1000	314	828	346	896	450	998
Westbound R	50±	<25	<25	<25	<25	25	85
Northbound L/T	200±	<25	<25	<25	<25	<25	<25
Northbound R	>500	<25	<25	<25	<25	<25	<25
Southbound L/T	>1000	54	119	57	121	133	239
Southbound R	325±	<25	34	<25	34	<25	38
Saturday Midday Peak Hour							
Eastbound L	200±	<25	<25	<25	<25	<25	30
Eastbound T/R	>1000	74	260	79	275	101	326
Westbound L/T	>1000	170	437	180	461	211	524
Westbound R	50±	<25	<25	<25	<25	<25	52
Northbound L/T	200±	<25	<25	<25	<25	<25	<25
Northbound R	>500	<25	<25	<25	<25	<25	<25
Southbound L/T	>1000	36	123	39	109	68	197
Southbound R	325±	<25	<25	<25	<25	<25	<25

[1] Average and 95th percentile queue lengths are reported in feet per lane.

As summarized in **Tables 7 – 10,** the proposed development is expected to result in no material change in operations, delays, and queue lengths at the study area intersections relative to No-Build conditions. Specifically, the study intersections will continue to operate below capacity at LOS C or better and the average and 95th percentile vehicle queues at the signalized study intersections will generally be contained within available storage lanes during the peak hours with the proposed YMCA Facility in place.

PARKING ANALYSIS

Under the master plan conditions, the proposed YMCA Facility will include an Early Learning Center and two (2) recreational fields with approximately 262 total parking spaces including 8 handicapped parking spaces. The plan is also includes paved area that may accommodate up to approximately 30 additional parked vehicles during non-winter months, but is otherwise to be reserved for snow storage.

Empirical Shared Parking Demand

The proposed parking supply of 262 spaces is compared to peak parking demand rates based on empirical data collected from similar uses (YMCA, Early Learning Center, and Recreational Fields). **Table 11** summarizes the parking demand rates and parking supply for the 65,700 square foot YMCA, 100-student Early Learning Center (ELC), and 2-field recreational complex project with no adjustment for alternative transportation (rail, transit or rideshare). Although the ELC is inherently included in other area YMCA facilities (and hence the parking rate), as a conservative measure the ELC facility in this case is assumed to independently generate additional parking activity as a "standalone" childcare center. Time-of-day factors were used to model hourly parking demands at the Site for the three uses (YMCA, Early Learning Center, and Recreational Fields). **Figure 11** and **Figure 12** provide graphical summaries of projected hourly parking demands at the Site based on the time-of-day factors and use of the peak parking rates for the project with an adjustment for internal parking capture between the uses as shown in **Table 11**.

TABLE 11
PARKING DEMAND COMPARISON – EMPIRICAL DATA

Land-Use	Size/Units	Average Rate	Average Demand[1]	85th Percentile Rate	85th Percentile Demand
Weekday					
YMCA[1]	65,700 SF	3.64	240	4.16	274
Daycare[2]	100 Students	0.27	27	0.27	27
Fields[3]	2 Fields	22.00	44	27.00	54
Unadjusted Demand[4]			311		355
Shared Parking Demand[5]			**226**		**259**
Saturday					
YMCA[1]	65,700 SF	4.16	274	4.60	303
Daycare[2]	100 Students	0.00	0	0.00	0
Fields[3]	2 Fields	22.00	44	27.00	54
Unadjusted Demand[4]			318		357
Shared Parking Demand[5]			**268**		**301**

[1]YMCA peak parking demand rate for suburban locations in MA (Framingham, Westborough, and Woburn).
[2]Daycare peak parking rate per empirical data from the Goddard School of Lexington, MA.
[3]Soccer field rates for non-tournaments with non-overlapping field use.
[4]Unadjusted Parking Demand= raw sum of each use.
[5]Shared Parking Demand = sum of each use adjusted for shared parking.

As summarized in **Table 11, Figure 11** and **Figure 12,** based on empirical data, the proposed development is estimated to have an average peak parking demand of 226 vehicles on a weekday and 268 vehicles on a Saturday. Likewise, the proposed development is estimated to have a peak parking demand of 259 vehicles on a weekday and 301 vehicles on a Saturday. *These parking numbers explicitly assume that the recreational field use will be managed to provide non-overlapping and non-tournament use during the critical parking periods.* The parking data indicates that the facility will have adequate parking to account for typical average parking demands.

The project currently provides 262 parking spaces, which has been shown to be adequate for average on-site parking demands for employees and patrons based on empirical rates; however, field use and programming may need to be actively managed to avoid overlap of peak parking demands on weekends so that effective on-site parking supply during non-winter periods (approximately 292 spaces) is not exceeded. Parking supply during non-winter periods of up to 292 spaces would utilize the proposed snow storage zone, which may effectively provide additional parking capacity for approximately 30 vehicles.

RECOMMENDATIONS AND CONCLUSIONS

In summary, adequate capacity is available at the study intersections to accommodate the traffic increases that may occur at the Site. The proposed YMCA Facility is estimated to generate approximately 243 vehicle trips during the weekday morning peak hour, 312 vehicle trips during the weekday evening peak hour, and 149 vehicle trips during the Saturday midday peak hour. MDM recommends the following access/egress improvements, pedestrian and bicycle accommodations, parking management plan, and TDM elements to enhancements operations, safety, and traffic flow:

Access/Egress Improvements

- *Driveway Design.* The final driveway alignment, widths and curb radii shall be designed to achieve (a) approximate perpendicular orientation with Memorial Drive and (b) and (b) curb radii as required to accommodate the design vehicle for the Site as well as the Town of Ashland Ladder truck. The driveway grading, orientation, signage, and landscaping should meet or exceed the minimum recommended stopping sight distance presented herein.

- *Signs and Pavement Markings.* A STOP sign (R1-1) and STOP line pavement marking should be installed on the site driveway approaches to Memorial Drive that conform to Manual on Uniform Traffic Control Devices (MUTCD) standards.

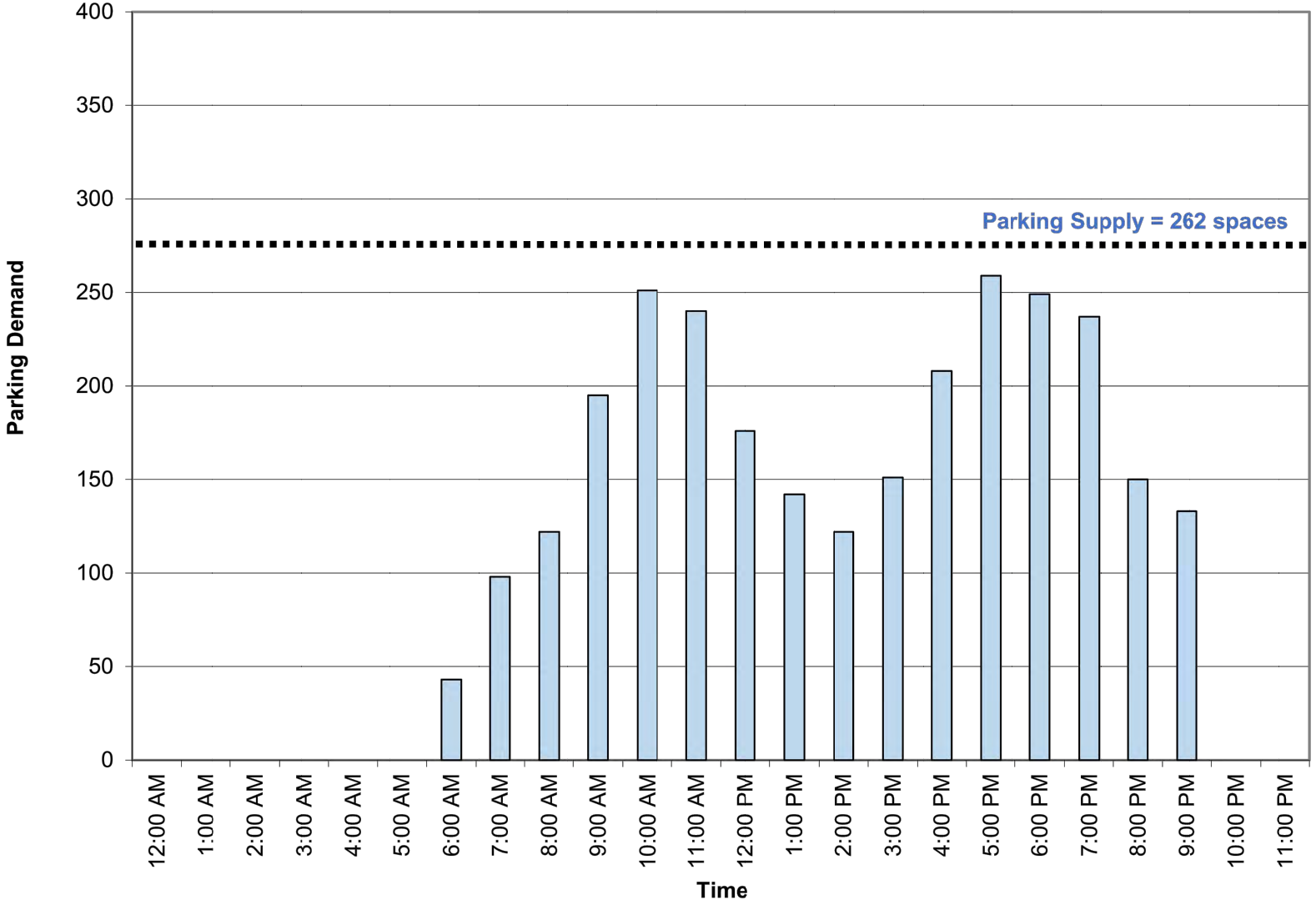

Figure 11

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Hourly Shared Parking Demand
Weekday 85th Percentile

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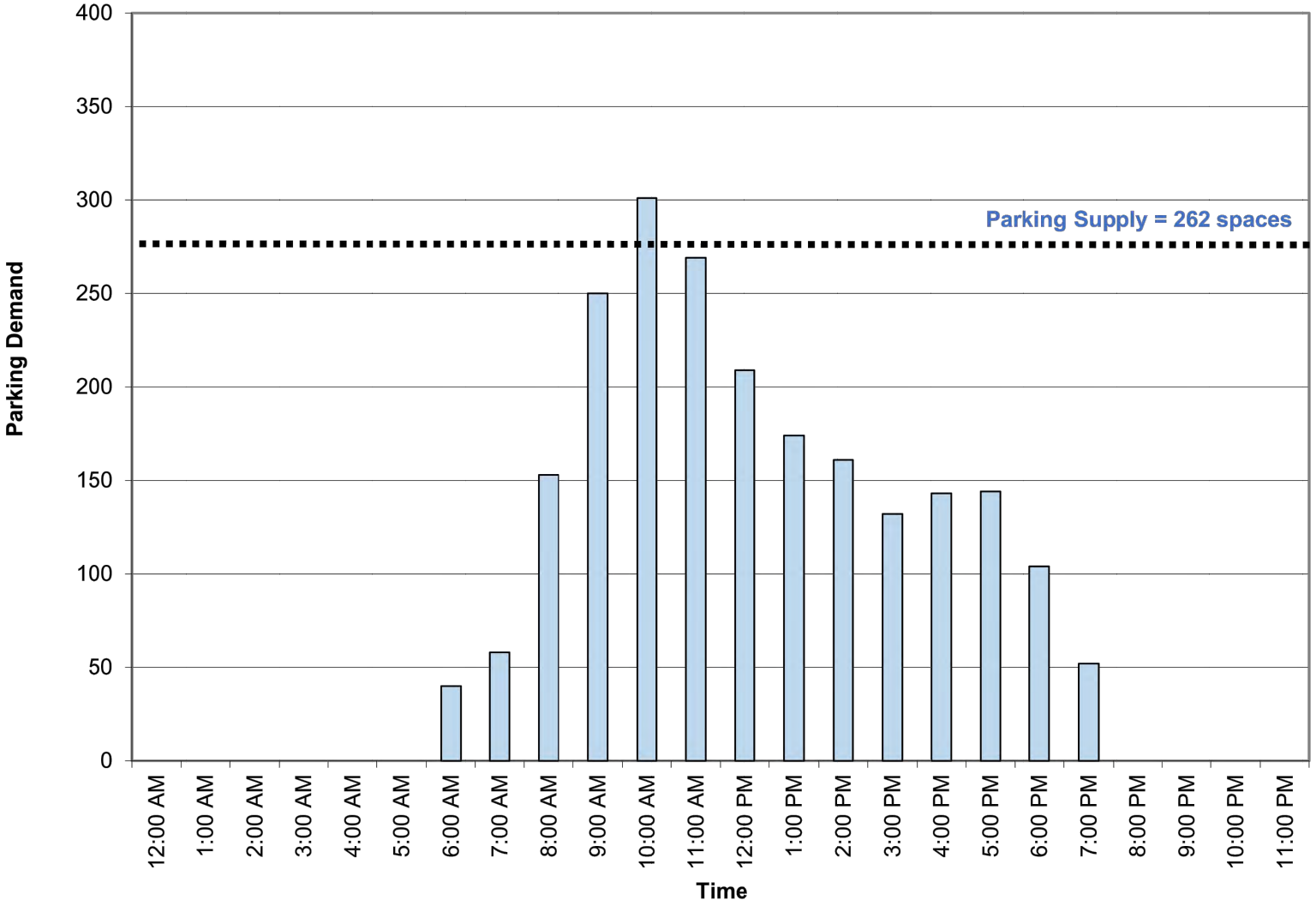

Figure 12

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Planners & Engineers

Hourly Shared Parking Demand
Saturday 85th Percentile

Date: May 2025
Dwg No. 1377 TIA.dwg
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- *Sight Line Maintenance.* The proponent commits that clearing and grading the sight lines along Memorial Drive in such a manner that sight distance requirements cited herein for the proposed driveways are achieved. Any new plantings (shrubs, bushes) or physical landscape features to be located within driveway sight lines should also be maintained at a height of 2 feet or less above the adjacent existing roadway grade to ensure unobstructed lines of sight.

Pedestrian and Bicycle Accommodations

- *Pedestrian Accommodation.* The design shall incorporate sidewalks that connect the proposed building entrances and recreational fields with the proposed parking areas and with the existing multi-use path along Memorial Drive and existing Trolley Bike Trail. Additionally, the Proponent should install an ADA compliant pedestrian connection with crosswalk and rectangular rapid flashing pedestrian beacon (RRFB) along the central portion of the Site to provide a connection to the existing multi-use path along the western side of Memorial Drive which would accommodate pedestrian and bicycle activity to/from south. A review sight lines for the proposed crosswalk location along Memorial Drive indicate that adequate stopping sight distance (SSD) will be available. The crosswalk location will also be enhanced with RRFB's to enhance visibility and awareness of a pedestrian crossing.

- *Bicycle Amenities*. The Proponent shall incorporate secure bike racks near the building entranceways and recreational fields and to the extent feasible weather-protected bicycle racks to encourage and facilitate this mode of transportation to/from the Site by employees and patrons.

Parking Management Plan

- MDM recommends that the YMCA provide a parking management plan and monitor of the parking supply as the programming is constructed and comes online so that the parking activity is adequately accommodated on-site. This plan should consider use of the designated snow storage area to augment parking supply during non-winter periods, providing capacity for up to 30 additional vehicles if needed.

Transportation Demand Management (TDM)

The Proponent is committed to reduce Site trip generation by employees and patrons by implementing a Transportation Demand Management (TDM) program. These elements present means of reducing and minimizing single occupant vehicle travel and incentivizing use of alternative travel modes to/from the Site. A preliminary list of potential TDM program elements may include the following, subject to refinement of the development program and further evaluation by the Proponent:

- *Vehicle Charging Outlets.* Electric vehicle charging outlets will be provided within the parking area for the use of employees and patrons.

- *Bicycle Facilities*. Provide secure bike racks near the building entranceways and recreational fields and to the extent feasible weather-protected bicycle racks to encourage and facilitate this mode of transportation to/from the Site by employees and patrons.

- *Pick-Up/Drop-Off Lane.* An area for quick trips (rideshares, package deliveries, and pick-ups/drop-offs) will be provided near the main building entranceway.

- *Pedestrian Infrastructure*. The design shall incorporate sidewalks that connect the proposed building entrances and recreational fields with the proposed parking areas and with the existing multi-use path along Memorial Drive and existing Trolley Bike Trail.

CONCLUSIONS

In summary, MDM finds that incremental traffic associated with the proposed development is not expected to materially impact operating conditions at the study intersections and ample roadway capacity will be available to support the project. There will be no degradation in the level of service at any of the study intersections due to the project. Implementation of access/egress improvements, pedestrian and bicycle accommodations, and a TDM program as outlined under *Recommendations and Conclusions* will establish a framework of minimizing Site traffic impacts. Proposed access/egress along Memorial Drive will be designed to ensure adequate maneuverability for the design vehicles and that adequate sight lines are provided in accordance with AASHTO criteria based on ambient travel speeds.

ATTACHMENTS

- □ Traffic Volume Data
- □ Speed Data
- □ Alternative Transportation Information
- □ Sight Distance Calculations
- □ Crash Data
- □ Seasonal/Yearly Growth Data
- □ Trip Generation Calculations
- □ Trip Distribution Calculations
- □ Capacity Analysis
- □ Parking Analysis

- Traffic Volume Data

MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA 01752

N/S: Memorial Drive
North of Dunkin Donuts
Ashland, MA

Site Code: 1377
Station ID:
1377

Start Time	23-Oct-24 Wed	Southbound		Hour Totals		Northbound				Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		2	8			0	15				
12:15		0	18			1	13				
12:30		1	9			2	10				
12:45		0	13	3	48	3	12	6	50	9	98
01:00		2	11			2	9				
01:15		0	10			0	5				
01:30		0	4			1	12				
01:45		1	9	3	34	1	14	4	40	7	74
02:00		0	13			1	15				
02:15		0	13			0	17				
02:30		0	17			0	18				
02:45		0	11	0	54	1	15	2	65	2	119
03:00		1	14			0	12				
03:15		0	11			1	17				
03:30		0	7			0	22				
03:45		0	21	1	53	1	17	2	68	3	121
04:00		0	11			0	29				
04:15		3	26			0	12				
04:30		0	10			1	22				
04:45		1	12	4	59	1	30	2	93	6	152
05:00		3	62			0	26				
05:15		6	13			2	28				
05:30		4	21			4	37				
05:45		7	75	20	171	1	29	7	120	27	291
06:00		5	19			21	27				
06:15		16	22			12	31				
06:30		21	51			3	30				
06:45		28	9	70	101	32	25	68	113	138	214
07:00		28	31			27	28				
07:15		28	8			19	20				
07:30		39	10			79	23				
07:45		44	11	139	60	22	16	147	87	286	147
08:00		21	9			5	19				
08:15		23	5			12	23				
08:30		28	3			43	15				
08:45		24	7	96	24	17	10	77	67	173	91
09:00		18	6			8	9				
09:15		9	7			13	11				
09:30		14	5			8	10				
09:45		14	3	55	21	8	15	37	45	92	66
10:00		17	5			8	5				
10:15		17	2			7	2				
10:30		8	1			10	6				
10:45		13	1	55	9	8	3	33	16	88	25
11:00		9	2			8	5				
11:15		9	3			5	7				
11:30		12	3			9	4				
11:45		5	4	35	12	8	6	30	22	65	34
Total		481	646			415	786			896	1432
Percent		42.7%	57.3%			34.6%	65.4%			38.5%	61.5%
Combined Total		1127				1201				2328	

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28 Lord Road, Suite 280
Marlborough, MA 01752

N/S: Memorial Drive
North of Dunkin Donuts
Ashland, MA

Site Code: 1377
Station ID:
1377

Start Time	24-Oct-24 Thu	Southbound		Hour Totals		Northbound				Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		0	7			1	6				
12:15		1	10			1	16				
12:30		0	9			0	11				
12:45		0	13	1	39	1	13	3	46	4	85
01:00		0	11			2	12				
01:15		0	9			0	12				
01:30		1	5			1	8				
01:45		0	8	1	33	0	18	3	50	4	83
02:00		0	8			0	14				
02:15		0	14			0	20				
02:30		1	14			1	11				
02:45		0	15	1	51	0	21	1	66	2	117
03:00		0	11			0	15				
03:15		0	10			1	18				
03:30		0	16			1	23				
03:45		0	28	0	65	0	29	2	85	2	150
04:00		1	13			0	31				
04:15		2	10			0	25				
04:30		3	9			1	27				
04:45		1	28	7	60	0	28	1	111	8	171
05:00		1	40			0	33				
05:15		5	20			6	28				
05:30		7	41			2	28				
05:45		7	74	20	175	1	28	9	117	29	292
06:00		6	19			18	33				
06:15		14	67			12	35				
06:30		18	24			3	28				
06:45		29	9	67	119	24	24	57	120	124	239
07:00		23	26			39	19				
07:15		33	13			13	22				
07:30		38	3			72	16				
07:45		43	5	137	47	20	18	144	75	281	122
08:00		30	4			14	15				
08:15		26	7			18	13				
08:30		22	7			22	17				
08:45		31	10	109	28	11	23	65	68	174	96
09:00		15	9			9	12				
09:15		14	4			7	19				
09:30		9	4			9	4				
09:45		20	1	58	18	7	12	32	47	90	65
10:00		17	3			17	10				
10:15		13	6			11	14				
10:30		14	1			11	6				
10:45		13	2	57	12	11	6	50	36	107	48
11:00		12	1			4	1				
11:15		9	3			15	4				
11:30		14	0			9	1				
11:45		12	1	47	5	6	3	34	9	81	14
Total		505	652			401	830			906	1482
Percent		43.6%	56.4%			32.6%	67.4%			37.9%	62.1%
Combined Total		1157				1231				2388	

MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA 01752

N/S: Memorial Drive
North of Dunkin Donuts
Ashland, MA

Site Code: 1377
Station ID:
1377

Start Time	25-Oct-24 Fri	Southbound		Hour Totals		Northbound				Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		0	13			1	4				
12:15		1	9			1	17				
12:30		1	18			0	13				
12:45		1	13	3	53	6	12	8	46	11	99
01:00		1	12			1	12				
01:15		1	16			0	16				
01:30		0	10			0	13				
01:45		0	15	2	53	1	15	2	56	4	109
02:00		0	13			1	11				
02:15		0	15			0	20				
02:30		0	15			0	6				
02:45		0	18	0	61	0	17	1	54	1	115
03:00		0	16			0	17				
03:15		0	19			0	23				
03:30		1	18			0	22				
03:45		0	18	1	71	0	23	0	85	1	156
04:00		1	14			0	26				
04:15		1	14			1	27				
04:30		3	24			0	27				
04:45		4	11	9	63	1	27	2	107	11	170
05:00		3	36			1	18				
05:15		3	20			3	32				
05:30		5	44			4	43				
05:45		8	34	19	134	0	25	8	118	27	252
06:00		9	19			9	37				
06:15		15	26			11	24				
06:30		10	32			1	31				
06:45		25	16	59	93	17	28	38	120	97	213
07:00		27	16			16	15				
07:15		22	11			13	20				
07:30		32	13			36	20				
07:45		28	11	109	51	14	18	79	73	188	124
08:00		21	10			8	18				
08:15		33	13			18	17				
08:30		32	15			20	25				
08:45		29	7	115	45	18	24	64	84	179	129
09:00		9	4			11	15				
09:15		14	7			12	15				
09:30		15	9			6	12				
09:45		9	1	47	21	7	12	36	54	83	75
10:00		8	4			8	7				
10:15		13	8			8	8				
10:30		19	2			3	8				
10:45		12	3	52	17	11	7	30	30	82	47
11:00		10	1			12	2				
11:15		10	5			12	9				
11:30		13	5			10	3				
11:45		13	4	46	15	7	11	41	25	87	40
Total		462	677			309	852			771	1529
Percent		40.6%	59.4%			26.6%	73.4%			33.5%	66.5%
Combined Total		1139				1161				2300	

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28 Lord Road, Suite 280
Marlborough, MA 01752

N/S: Memorial Drive
North of Dunkin Donuts
Ashland, MA

Site Code: 1377
Station ID:
1377

Start Time	26-Oct-24 Sat	Southbound		Hour Totals		Northbound				Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		1	20			1	13				
12:15		4	32			4	23				
12:30		1	21			4	21				
12:45		1	17	7	90	6	16	15	73	22	163
01:00		0	22			5	23				
01:15		2	20			1	33				
01:30		2	18			3	21				
01:45		0	20	4	80	4	21	13	98	17	178
02:00		0	14			0	20				
02:15		0	17			3	18				
02:30		1	26			2	20				
02:45		0	24	1	81	1	20	6	78	7	159
03:00		0	22			1	24				
03:15		0	21			1	18				
03:30		0	21			0	8				
03:45		0	13	0	77	1	21	3	71	3	148
04:00		1	14			0	8				
04:15		1	14			1	13				
04:30		0	11			0	18				
04:45		3	15	5	54	1	15	2	54	7	108
05:00		0	11			0	17				
05:15		2	16			2	16				
05:30		5	19			3	24				
05:45		2	15	9	61	0	23	5	80	14	141
06:00		1	11			1	15				
06:15		4	25			2	22				
06:30		3	10			2	23				
06:45		6	7	14	53	2	14	7	74	21	127
07:00		8	9			2	15				
07:15		9	11			6	23				
07:30		19	17			11	17				
07:45		11	10	47	47	10	16	29	71	76	118
08:00		18	7			6	13				
08:15		15	6			8	13				
08:30		22	7			9	14				
08:45		14	2	69	22	11	8	34	48	103	70
09:00		11	10			7	10				
09:15		24	7			12	20				
09:30		18	9			16	19				
09:45		24	3	77	29	14	13	49	62	126	91
10:00		17	4			12	8				
10:15		26	1			20	4				
10:30		15	5			10	7				
10:45		23	5	81	15	17	4	59	23	140	38
11:00		23	4			24	10				
11:15		24	5			14	6				
11:30		17	6			25	9				
11:45		25	2	89	17	16	6	79	31	168	48
Total		403	626			301	763			704	1389
Percent		39.2%	60.8%			28.3%	71.7%			33.6%	66.4%
Combined Total		1029				1064				2093	

MDM Transportation Consultants, Inc.

28 Lord Rd, Suite 280
Marlborough, MA, 01752

N/S: Route 135
West: Memorial Drive
Ashland, MA

File Name : 1377 rt 135 at memorial wed
Site Code : 1377
Start Date : 10/23/2024
Page No : 1

Groups Printed- Lights - Mediums - Articulated Trucks

	Route 135 From North				Route 135 From South				Memorial Drive From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
07:00 AM	5	97	0	102	152	15	0	167	17	28	0	45	314
07:15 AM	20	77	0	97	181	33	0	214	10	37	0	47	358
07:30 AM	39	112	0	151	197	50	0	247	21	43	1	65	463
07:45 AM	17	123	0	140	221	13	0	234	16	39	4	59	433
Total	81	409	0	490	751	111	0	862	64	147	5	216	1568
08:00 AM	19	166	0	185	202	10	0	212	12	30	5	47	444
08:15 AM	18	104	0	122	193	17	0	210	12	37	1	50	382
08:30 AM	31	95	0	126	147	24	0	171	11	28	0	39	336
08:45 AM	18	87	0	105	150	11	0	161	9	24	2	35	301
Total	86	452	0	538	692	62	0	754	44	119	8	171	1463
04:00 PM	22	163	0	185	142	6	0	148	3	15	4	22	355
04:15 PM	14	194	0	208	138	6	0	144	6	29	2	37	389
04:30 PM	25	212	0	237	139	5	0	144	2	12	0	14	395
04:45 PM	25	167	0	192	157	6	0	163	34	27	4	65	420
Total	86	736	0	822	576	23	0	599	45	83	10	138	1559
05:00 PM	19	216	0	235	141	7	0	148	12	18	0	30	413
05:15 PM	26	211	1	238	125	11	1	137	2	15	0	17	392
05:30 PM	25	179	1	205	174	8	1	183	49	30	1	80	468
05:45 PM	28	186	0	214	152	9	0	161	10	20	2	32	407
Total	98	792	2	892	592	35	2	629	73	83	3	159	1680
Grand Total	351	2389	2	2742	2611	231	2	2844	226	432	26	684	6270
Apprch %	12.8	87.1	0.1		91.8	8.1	0.1		33	63.2	3.8		
Total %	5.6	38.1	0	43.7	41.6	3.7	0	45.4	3.6	6.9	0.4	10.9	
Lights	345	2298	2	2645	2514	223	2	2739	223	424	26	673	6057
% Lights	98.3	96.2	100	96.5	96.3	96.5	100	96.3	98.7	98.1	100	98.4	96.6
Mediums	6	77	0	83	93	8	0	101	3	6	0	9	193
% Mediums	1.7	3.2	0	3	3.6	3.5	0	3.6	1.3	1.4	0	1.3	3.1
Articulated Trucks	0	14	0	14	4	0	0	4	0	2	0	2	20
% Articulated Trucks	0	0.6	0	0.5	0.2	0	0	0.1	0	0.5	0	0.3	0.3

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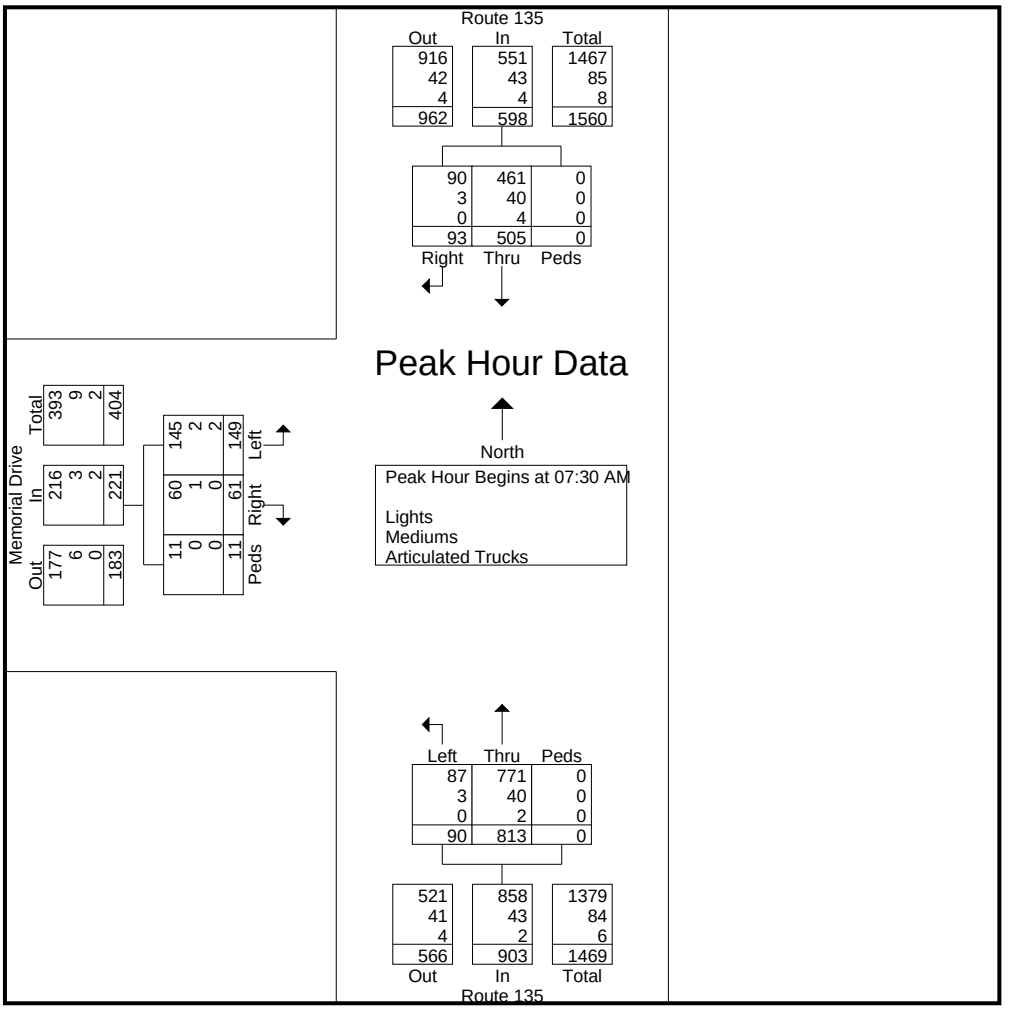
28 Lord Rd, Suite 280
Marlborough, MA, 01752

N/S: Route 135
West: Memorial Drive
Ashland, MA

File Name : 1377 rt 135 at memorial wed
Site Code : 1377
Start Date : 10/23/2024
Page No : 2

	Route 135 From North				Route 135 From South				Memorial Drive From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	**39**	112	0	151	197	**50**	0	**247**	**21**	**43**	1	**65**	**463**
07:45 AM	**17**	**123**	**0**	**140**	**221**	13	0	234	16	39	4	59	433
08:00 AM	19	**166**	0	**185**							**5**	47	444
08:15 AM	18	104	0	122	193	17	0	210	12	37	1	50	382
Total Volume	93	505	0	598	813	90	0	903	61	149	11	221	1722
% App. Total	15.6	84.4	0		90	10	0		27.6	67.4	5		
PHF	.596	.761	.000	.808	.920	.450	.000	.914	.726	.866	.550	.850	.930
Lights	90	461	0	551	771	87	0	858	60	145	11	216	1625
% Lights	96.8	91.3	0	92.1	94.8	96.7	0	95.0	98.4	97.3	100	97.7	94.4
Mediums	3	40	0	43	40	3	0	43	1	2	0	3	89
% Mediums	3.2	7.9	0	7.2	4.9	3.3	0	4.8	1.6	1.3	0	1.4	5.2
Articulated Trucks	0	4	0	4	2	0	0	2	0	2	0	2	8
% Articulated Trucks	0	0.8	0	0.7	0.2	0	0	0.2	0	1.3	0	0.9	0.5



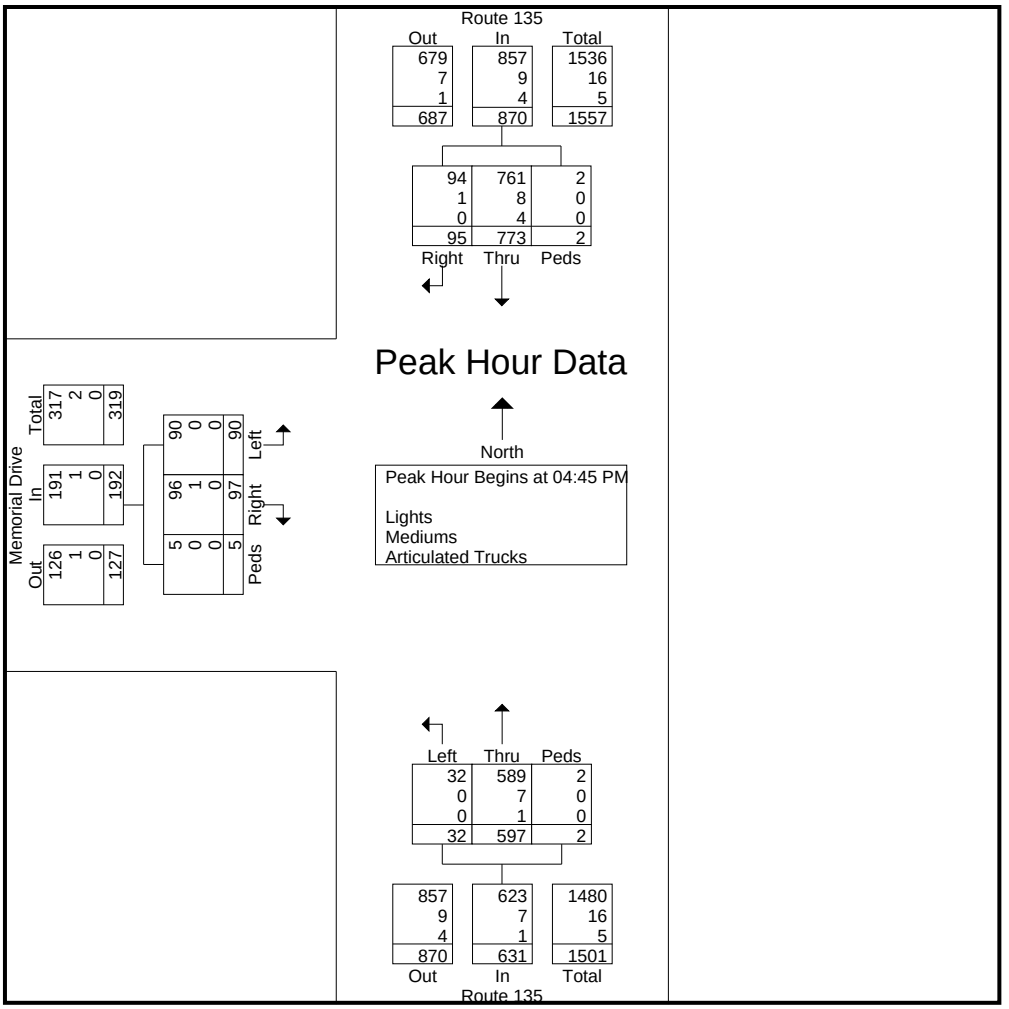
MDM Transportation Consultants, Inc.

28 Lord Rd, Suite 280
Marlborough, MA, 01752

N/S: Route 135
West: Memorial Drive
Ashland, MA

File Name : 1377 rt 135 at memorial wed
Site Code : 1377
Start Date : 10/23/2024
Page No : 3

	Route 135 From North				Route 135 From South				Memorial Drive From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	25	167	0	192	157	6	0	163	34	27	**4**	65	420
05:00 PM	19	**216**	0	235	141	7	0	148	12	18	0	30	413
05:15 PM	**26**	211	**1**	**238**		**11**	**1**	137	2	15	0	17	392
05:30 PM	25	179	1	205	**174**	8	1	**183**	**49**	**30**	1	**80**	**468**
Total Volume	**95**	**773**	**2**	**870**	**597**	**32**	**2**	**631**	**97**	**90**	**5**	**192**	**1693**
% App. Total	**10.9**	**88.9**	**0.2**		**94.6**	**5.1**	**0.3**		**50.5**	**46.9**	**2.6**		
PHF	**.913**	**.895**	**.500**	**.914**	**.858**	**.727**	**.500**	**.862**	**.495**	**.750**	**.313**	**.600**	**.904**
Lights	**94**	**761**	**2**	**857**	**589**	**32**	**2**	**623**	**96**	**90**	**5**	**191**	**1671**
% Lights	**98.9**	**98.4**	**100**	**98.5**	**98.7**	**100**	**100**	**98.7**	**99.0**	**100**	**100**	**99.5**	**98.7**
Mediums	**1**	**8**	**0**	**9**	**7**	**0**	**0**	**7**	**1**	**0**	**0**	**1**	**17**
% Mediums	**1.1**	**1.0**	**0**	**1.0**	**1.2**	**0**	**0**	**1.1**	**1.0**	**0**	**0**	**0.5**	**1.0**
Articulated Trucks	0	4	0	4	1	0	0	1	0	0	0	0	5
% Articulated Trucks	0	0.5	0	0.5	0.2	0	0	0.2	0	0	0	0	0.3



MDM Transportation Consultants, Inc.

28 Lord Rd, Suite 280
Marlborough, MA, 01752

N/S: Route 135
West: Memorial Drive
Ashland, MA

File Name : 1377 Rt 135 at Memorial Sat
Site Code : 1377
Start Date : 10/26/2024
Page No : 1

Groups Printed- Lights - Mediums - Articulated Trucks

	Route 135 From North				Route 135 From South				Memorial Drive From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
11:00 AM	29	110	0	139	152	11	0	163	15	20	1	36	338
11:15 AM	17	111	0	128	119	11	0	130	17	21	2	40	298
11:30 AM	29	163	0	192	137	5	0	142	14	21	0	35	369
11:45 AM	18	126	0	144	116	10	0	126	11	27	2	40	310
Total	93	510	0	603	524	37	0	561	57	89	5	151	1315
12:00 PM	25	149	0	174	144	7	0	151	12	33	3	48	373
12:15 PM	21	131	0	152	124	9	0	133	11	21	1	33	318
12:30 PM	18	133	0	151	137	6	0	143	9	21	0	30	324
12:45 PM	16	116	0	132	133	10	0	143	10	16	0	26	301
Total	80	529	0	609	538	32	0	570	42	91	4	137	1316
01:00 PM	25	130	0	155	106	13	0	119	6	25	1	32	306
01:15 PM	30	163	0	193	117	6	0	123	11	18	1	30	346
01:30 PM	12	135	0	147	112	14	0	126	11	16	1	28	301
01:45 PM	25	141	3	169	153	11	3	167	9	14	2	25	361
Total	92	569	3	664	488	44	3	535	37	73	5	115	1314
Grand Total	265	1608	3	1876	1550	113	3	1666	136	253	14	403	3945
Apprch %	14.1	85.7	0.2		93	6.8	0.2		33.7	62.8	3.5		
Total %	6.7	40.8	0.1	47.6	39.3	2.9	0.1	42.2	3.4	6.4	0.4	10.2	
Lights	265	1585	3	1853	1525	111	3	1639	134	252	14	400	3892
% Lights	100	98.6	100	98.8	98.4	98.2	100	98.4	98.5	99.6	100	99.3	98.7
Mediums	0	19	0	19	24	2	0	26	2	1	0	3	48
% Mediums	0	1.2	0	1	1.5	1.8	0	1.6	1.5	0.4	0	0.7	1.2
Articulated Trucks	0	4	0	4	1	0	0	1	0	0	0	0	5
% Articulated Trucks	0	0.2	0	0.2	0.1	0	0	0.1	0	0	0	0	0.1

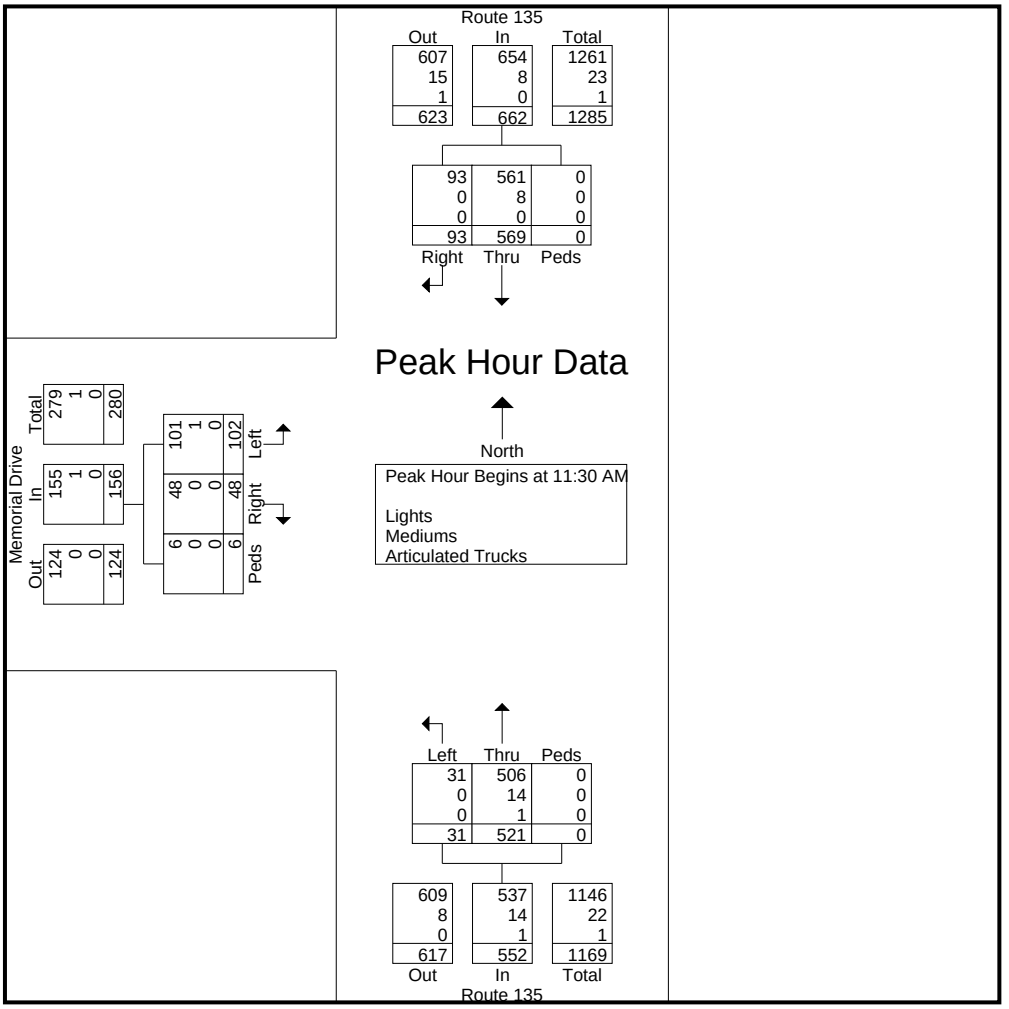
MDM Transportation Consultants, Inc.

28 Lord Rd, Suite 280
Marlborough, MA, 01752

N/S: Route 135
West: Memorial Drive
Ashland, MA

File Name : 1377 Rt 135 at Memorial Sat
Site Code : 1377
Start Date : 10/26/2024

	Route 135 From North				Route 135 From South				Memorial Drive From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:30 AM													
11:30 AM	**29**	**163**	0	**192**					**14**	21	0	35	369
11:45 AM	18	126	0	144	116	**10**	0	126	11	27	2	40	310
12:00 PM	25	149	0	174	**144**	7	0	**151**		**33**	**3**	**48**	**373**
12:15 PM	**21**	**131**	**0**	**152**	**124**	**9**	**0**	**133**	**11**	**21**	**1**	**33**	**318**
Total Volume	**93**	**569**	**0**	**662**	**521**	**31**	**0**	**552**	**48**	**102**	**6**	**156**	**1370**
% App. Total	**14**	**86**	**0**		**94.4**	**5.6**	**0**		**30.8**	**65.4**	**3.8**		
PHF	**.802**	**.873**	**.000**	**.862**	**.905**	**.775**	**.000**	**.914**	**.857**	**.773**	**.500**	**.813**	**.918**
Lights	**93**	**561**	**0**	**654**	**506**	**31**	**0**	**537**	**48**	**101**	**6**	**155**	**1346**
% Lights	**100**	**98.6**	**0**	**98.8**	**97.1**	**100**	**0**	**97.3**	**100**	**99.0**	**100**	**99.4**	**98.2**
Mediums	**0**	**8**	**0**	**8**	**14**	**0**	**0**	**14**	**0**	**1**	**0**	**1**	**23**
% Mediums	**0**	**1.4**	**0**	**1.2**	**2.7**	**0**	**0**	**2.5**	**0**	**1.0**	**0**	**0.6**	**1.7**
Articulated Trucks	0	0	0	0	1	0	0	1	0	0	0	0	1
% Articulated Trucks	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0.1



MDM Transportation Consultants, Inc.

28 Lord Rd, Suite 280
Marlborough, MA, 01752

North: Dunkin Driveway
E/W: Memorial Drive
Ashland, MA

File Name : 1377 memorial at dunkin wed
Site Code : 1377
Start Date : 10/23/2024
Page No : 1

Groups Printed- Lights - Mediums - Articulated Trucks

	Dunkin Driveway From North				Memorial Drive From East				Memorial Drive From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	10	1	11	13	7	0	20	33	3	0	36	67
07:15 AM	1	18	0	19	17	26	0	43	27	3	0	30	92
07:30 AM	2	25	0	27	18	73	0	91	41	3	0	44	162
07:45 AM	2	20	0	22	23	15	0	38	34	2	0	36	96
Total	5	73	1	79	71	121	0	192	135	11	0	146	417
08:00 AM	0	20	0	20	24	4	0	28	22	0	0	22	70
08:15 AM	2	22	0	24	22	13	0	35	29	0	0	29	88
08:30 AM	2	13	0	15	14	41	0	55	20	3	0	23	93
08:45 AM	1	17	0	18	15	14	0	29	24	1	0	25	72
Total	5	72	0	77	75	72	0	147	95	4	0	99	323
04:00 PM	1	1	0	2	7	26	0	33	10	1	0	11	46
04:15 PM	0	9	1	10	6	13	0	19	30	0	0	30	59
04:30 PM	0	4	0	4	4	22	0	26	12	0	0	12	42
04:45 PM	0	5	0	5	3	30	1	34	46	0	0	46	85
Total	1	19	1	21	20	91	1	112	98	1	0	99	232
05:00 PM	0	4	0	4	4	25	0	29	35	0	0	35	68
05:15 PM	0	2	0	2	2	32	0	34	17	2	0	19	55
05:30 PM	1	4	0	5	2	33	0	35	58	1	0	59	99
05:45 PM	1	2	0	3	4	31	0	35	43	0	0	43	81
Total	2	12	0	14	12	121	0	133	153	3	0	156	303
Grand Total	13	176	2	191	178	405	1	584	481	19	0	500	1275
Apprch %	6.8	92.1	1		30.5	69.3	0.2		96.2	3.8	0		
Total %	1	13.8	0.2	15	14	31.8	0.1	45.8	37.7	1.5	0	39.2	
Lights	13	174	2	189	176	394	1	571	473	19	0	492	1252
% Lights	100	98.9	100	99	98.9	97.3	100	97.8	98.3	100	0	98.4	98.2
Mediums	0	2	0	2	2	11	0	13	8	0	0	8	23
% Mediums	0	1.1	0	1	1.1	2.7	0	2.2	1.7	0	0	1.6	1.8
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0

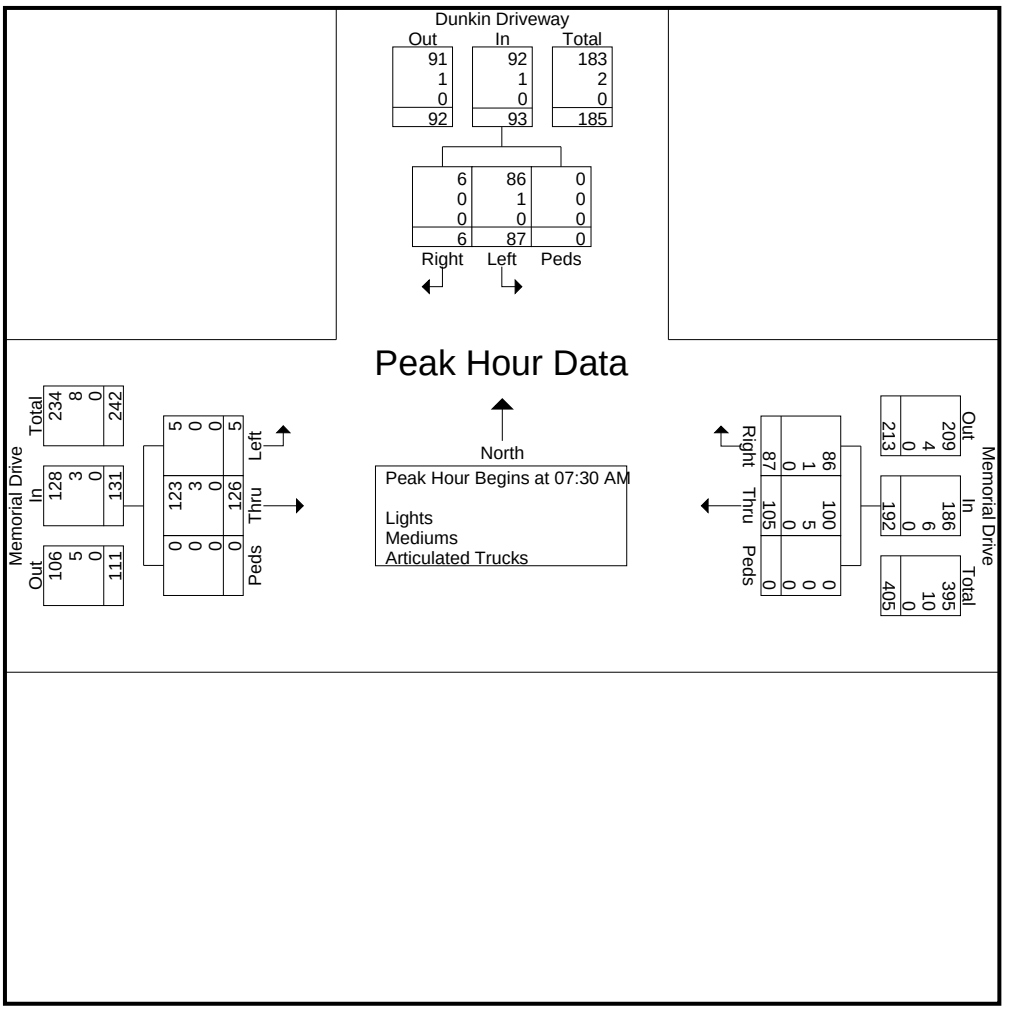
MDM Transportation Consultants, Inc.

28 Lord Rd, Suite 280
Marlborough, MA, 01752

North: Dunkin Driveway
E/W: Memorial Drive
Ashland, MA

File Name : 1377 memorial at dunkin wed
Site Code : 1377
Start Date : 10/23/2024
Page No : 2

	Dunkin Driveway From North				Memorial Drive From East				Memorial Drive From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	**2**	**25**	0	**27**		**73**	0	**91**	**41**	**3**	0	**44**	**162**
07:45 AM	**2**	**20**	**0**	**22**	**23**	**15**	**0**	**38**	**34**	**2**	**0**	**36**	**96**
08:00 AM	**0**	**20**	**0**	**20**	**24**	4	0	28	22	0	0	22	70
08:15 AM	2	22	0	24	22	13	0	35	29	0	0	29	88
Total Volume	6	87	0	93	87	105	0	192	126	5	0	131	416
% App. Total	6.5	93.5	0		45.3	54.7	0		96.2	3.8	0		
PHF	.750	.870	.000	.861	.906	.360	.000	.527	.768	.417	.000	.744	.642
Lights	6	86	0	92	86	100	0	186	123	5	0	128	406
% Lights	100	98.9	0	98.9	98.9	95.2	0	96.9	97.6	100	0	97.7	97.6
Mediums	0	1	0	1	1	5	0	6	3	0	0	3	10
% Mediums	0	1.1	0	1.1	1.1	4.8	0	3.1	2.4	0	0	2.3	2.4
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0



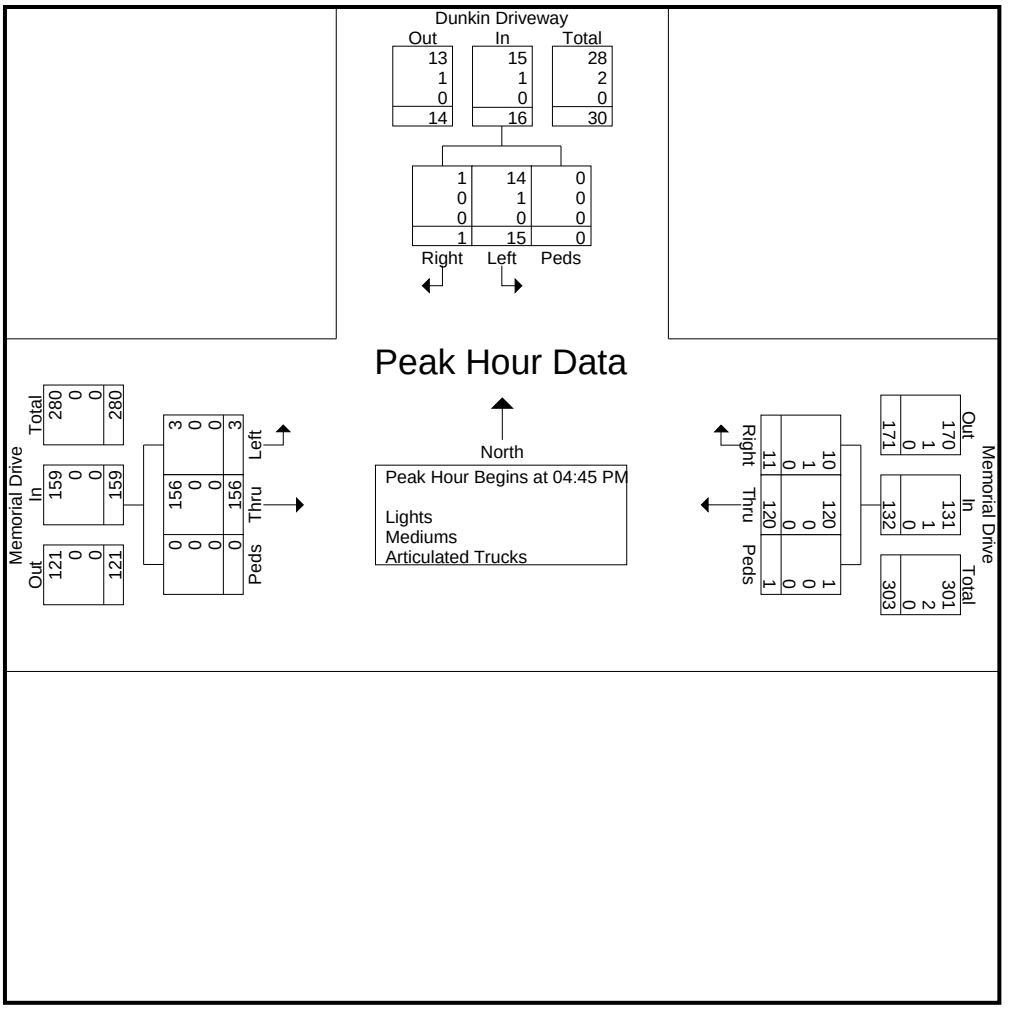
MDM Transportation Consultants, Inc.

28 Lord Rd, Suite 280
Marlborough, MA, 01752

North: Dunkin Driveway
E/W: Memorial Drive
Ashland, MA

File Name : 1377 memorial at dunkin wed
Site Code : 1377
Start Date : 10/23/2024

	Dunkin Driveway From North				Memorial Drive From East				Memorial Drive From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	0	**5**	0	**5**			**1**	34	46	0	0	46	85
05:00 PM	0	4	0	4	**4**	25	0	29	35	0	0	35	68
05:15 PM	0	2	0	2	2	32	0	34	17	**2**	0	19	55
05:30 PM	**1**	4	0	5	2	**33**	0	**35**	**58**	1	0	**59**	**99**
Total Volume	**1**	**15**	**0**	**16**	**11**	**120**	**1**	**132**	**156**	**3**	**0**	**159**	**307**
% App. Total	**6.2**	**93.8**	**0**		**8.3**	**90.9**	**0.8**		**98.1**	**1.9**	**0**		
PHF	**.250**	**.750**	**.000**	**.800**	**.688**	**.909**	**.250**	**.943**	**.672**	**.375**	**.000**	**.674**	**.775**
Lights	**1**	**14**	**0**	**15**	**10**	**120**	**1**	**131**	**156**	**3**	**0**	**159**	**305**
% Lights	**100**	**93.3**	**0**	**93.8**	**90.9**	**100**	**100**	**99.2**	**100**	**100**	**0**	**100**	**99.3**
Mediums	**0**	**1**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**2**
% Mediums	**0**	**6.7**	**0**	**6.3**	**9.1**	**0**	**0**	**0.8**	**0**	**0**	**0**	**0**	**0.7**
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0



MDM Transportation Consultants, Inc.

28 Lord Rd, Suite 280
Marlborough, MA, 01752

North: Dunkin Driveway
E/W: Memorial Drive
Ashland, MA

File Name : 1377 memorial at dunkin sat
Site Code : 1377
Start Date : 10/26/2024
Page No : 1

Groups Printed- Lights - Mediums - Articulated Trucks

	Dunkin Driveway From North				Memorial Drive From East				Memorial Drive From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	2	10	3	15	19	20	0	39	23	0	0	23	77
11:15 AM	4	16	3	23	14	10	0	24	22	0	0	22	69
11:30 AM	1	18	0	19	15	24	0	39	15	3	0	18	76
11:45 AM	1	13	0	14	12	15	0	27	28	0	0	28	69
Total	8	57	6	71	60	69	0	129	88	3	0	91	291
12:00 PM	0	17	0	17	17	18	0	35	23	2	0	25	77
12:15 PM	2	10	0	12	11	17	0	28	25	2	0	27	67
12:30 PM	1	13	0	14	7	18	0	25	17	3	0	20	59
12:45 PM	0	8	0	8	8	17	0	25	19	0	0	19	52
Total	3	48	0	51	43	70	0	113	84	7	0	91	255
01:00 PM	1	6	0	7	7	31	0	38	24	2	0	26	71
01:15 PM	1	11	0	12	8	30	0	38	21	1	0	22	72
01:30 PM	0	7	0	7	6	19	0	25	19	1	0	20	52
01:45 PM	0	8	0	8	11	22	0	33	16	0	0	16	57
Total	2	32	0	34	32	102	0	134	80	4	0	84	252
Grand Total	13	137	6	156	135	241	0	376	252	14	0	266	798
Apprch %	8.3	87.8	3.8		35.9	64.1	0		94.7	5.3	0		
Total %	1.6	17.2	0.8	19.5	16.9	30.2	0	47.1	31.6	1.8	0	33.3	
Lights	13	134	6	153	132	240	0	372	251	13	0	264	789
% Lights	100	97.8	100	98.1	97.8	99.6	0	98.9	99.6	92.9	0	99.2	98.9
Mediums	0	3	0	3	2	1	0	3	1	1	0	2	8
% Mediums	0	2.2	0	1.9	1.5	0.4	0	0.8	0.4	7.1	0	0.8	1
Articulated Trucks	0	0	0	0	1	0	0	1	0	0	0	0	1
% Articulated Trucks	0	0	0	0	0.7	0	0	0.3	0	0	0	0	0.1

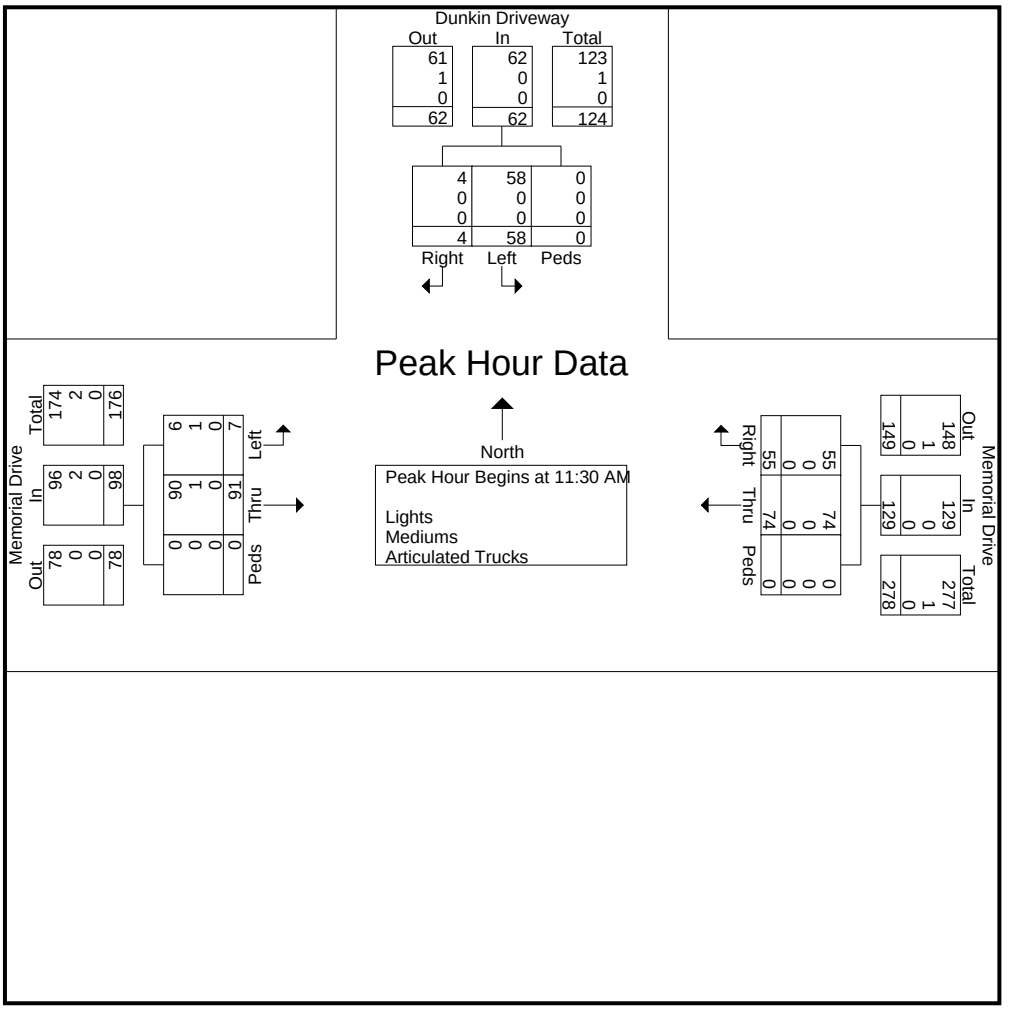
MDM Transportation Consultants, Inc.

28 Lord Rd, Suite 280
Marlborough, MA, 01752

North: Dunkin Driveway
E/W: Memorial Drive
Ashland, MA

File Name : 1377 memorial at dunkin sat
Site Code : 1377
Start Date : 10/26/2024
Page No : 2

	Dunkin Driveway From North				Memorial Drive From East				Memorial Drive From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:30 AM to 01:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:30 AM													
11:30 AM	1	**18**	0	**19**		**24**	0	**39**		**3**	0	18	76
11:45 AM	1	13	0	14	12	15	0	27	**28**	0	0	**28**	69
12:00 PM	0	17	0	17	**17**	18	0	35	23	2	0	25	**77**
12:15 PM	**2**	10	0	12	11	17	0	28	25	2	0	27	67
Total Volume	4	58	0	62	55	74	0	129	91	7	0	98	289
% App. Total	6.5	93.5	0		42.6	57.4	0		92.9	7.1	0		
PHF	.500	.806	.000	.816	.809	.771	.000	.827	.813	.583	.000	.875	.938
Lights	4	58	0	62	55	74	0	129	90	6	0	96	287
% Lights	100	100	0	100	100	100	0	100	98.9	85.7	0	98.0	99.3
Mediums	0	0	0	0	0	0	0	0	1	1	0	2	2
% Mediums	0	0	0	0	0	0	0	0	1.1	14.3	0	2.0	0.7
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0



- □ Speed Data

MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA 01752

N/S: Memorial Drive
North of Dunkin Donuts
Ashland, MA

Site Code: 1377
Station ID:

Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/23/24	0	0	0	2	1	0	0	0	0	0	0	0	0	0	3	32	34
01:00	0	0	0	1	2	0	0	0	0	0	0	0	0	0	3	33	34
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	29	29
04:00	0	0	0	1	2	1	0	0	0	0	0	0	0	0	4	37	39
05:00	0	0	2	3	7	7	1	0	0	0	0	0	0	0	20	38	40
06:00	0	0	1	15	33	15	6	0	0	0	0	0	0	0	70	38	42
07:00	0	0	**3**	**33**	**61**	**32**	**10**	0	0	0	0	0	0	0	**139**	38	41
08:00	0	0	2	12	48	26	4	**4**	0	0	0	0	0	0	96	38	44
09:00	0	0	0	10	24	18	3	0	0	0	0	0	0	0	55	38	40
10:00	0	0	1	8	24	13	9	0	0	0	0	0	0	0	55	40	43
11:00	0	0	0	4	16	13	2	0	0	0	0	0	0	0	35	38	40
12 PM	0	0	**4**	5	22	15	2	0	0	0	0	0	0	0	48	38	39
13:00	0	0	1	7	16	9	1	0	0	0	0	0	0	0	34	37	39
14:00	0	0	0	14	20	15	**5**	0	0	0	0	0	0	0	54	38	42
15:00	0	0	2	16	24	8	3	0	0	0	0	0	0	0	53	36	40
16:00	0	0	2	15	27	14	1	0	0	0	0	0	0	0	59	37	39
17:00	0	0	0	24	**110**	**32**	5	0	0	0	0	0	0	0	**171**	36	39
18:00	0	0	4	**36**	45	15	1	0	0	0	0	0	0	0	101	35	38
19:00	0	0	1	15	29	13	1	**1**	0	0	0	0	0	0	60	37	39
20:00	0	0	3	5	12	3	1	0	0	0	0	0	0	0	24	35	39
21:00	0	0	1	4	12	3	1	0	0	0	0	0	0	0	21	36	39
22:00	0	0	0	3	3	2	1	0	0	0	0	0	0	0	9	39	42
23:00	0	0	0	5	1	4	2	0	0	0	0	0	0	0	12	40	43
Total	0	0	27	239	539	258	59	5	0	0	0	0	0	0	1127		
Percent	0.0%	0.0%	2.4%	21.2%	47.8%	22.9%	5.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak			07:00	07:00	07:00	07:00	07:00	08:00							07:00		
Vol.			3	33	61	32	10	4							139		
PM Peak			12:00	18:00	17:00	17:00	14:00	19:00							17:00		
Vol.			4	36	110	32	5	1							171		

MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA 01752

N/S: Memorial Drive
North of Dunkin Donuts
Ashland, MA

Site Code: 1377
Station ID:

Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/24/24	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	34	34
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	34	34
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	29	29
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	2	2	2	1	0	0	0	0	0	0	0	7	39	43
05:00	0	0	1	2	12	4	1	0	0	0	0	0	0	0	20	37	40
06:00	0	0	2	16	32	15	2	0	0	0	0	0	0	0	67	37	39
07:00	0	0	**4**	**26**	**71**	28	**8**	0	0	0	0	0	0	0	**137**	37	40
08:00	0	0	1	23	50	**31**	3	**1**	0	0	0	0	0	0	109	38	39
09:00	0	0	0	10	28	18	1	1	0	0	0	0	0	0	58	38	39
10:00	0	0	2	13	27	13	2	0	0	0	0	0	0	0	57	37	39
11:00	0	0	2	9	20	14	2	0	0	0	0	0	0	0	47	38	39
12 PM	0	0	3	9	12	15	0	0	0	0	0	0	0	0	39	38	39
13:00	0	0	1	6	12	10	4	0	0	0	0	0	0	0	33	39	42
14:00	0	0	2	8	22	11	**7**	**1**	0	0	0	0	0	0	51	40	43
15:00	0	0	4	13	24	20	4	0	0	0	0	0	0	0	65	38	40
16:00	0	0	2	9	30	12	7	0	0	0	0	0	0	0	60	39	42
17:00	**2**	**3**	**7**	**65**	**74**	21	2	0	0	**1**	0	0	0	0	**175**	34	38
18:00	0	0	3	41	51	**22**	2	0	0	0	0	0	0	0	119	36	39
19:00	0	0	3	11	22	10	1	0	0	0	0	0	0	0	47	36	39
20:00	0	0	0	9	12	7	0	0	0	0	0	0	0	0	28	36	39
21:00	0	0	0	4	8	5	1	0	0	0	0	0	0	0	18	38	40
22:00	0	0	1	1	8	1	1	0	0	0	0	0	0	0	12	35	41
23:00	0	0	0	0	3	0	2	0	0	0	0	0	0	0	5	43	44
Total	2	3	38	278	522	259	51	3	0	1	0	0	0	0	1157		
Percent	0.2%	0.3%	3.3%	24.0%	45.1%	22.4%	4.4%	0.3%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak			07:00	07:00	07:00	08:00	07:00	08:00							07:00		
Vol.			4	26	71	31	8	1							137		
PM Peak	17:00	17:00	17:00	17:00	17:00	18:00	14:00	14:00		17:00					17:00		
Vol.	2	3	7	65	74	22	7	1		1					175		

MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA 01752

N/S: Memorial Drive
North of Dunkin Donuts
Ashland, MA

Site Code: 1377
Station ID:

Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/25/24	0	0	0	1	1	1	0	0	0	0	0	0	0	0	3	37	39
01:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	33	34
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	34	34
04:00	0	0	1	2	4	1	1	0	0	0	0	0	0	0	9	38	42
05:00	0	0	1	3	7	8	0	0	0	0	0	0	0	0	19	38	39
06:00	0	0	2	8	28	15	5	**1**	0	0	0	0	0	0	59	39	43
07:00	0	0	**5**	**26**	**47**	26	5	0	0	0	0	0	0	0	109	37	39
08:00	0	**1**	4	22	40	**35**	**12**	1	0	0	0	0	0	0	**115**	39	43
09:00	0	0	0	8	15	14	9	1	0	0	0	0	0	0	47	41	44
10:00	0	0	0	11	23	12	5	1	0	0	0	0	0	0	52	39	43
11:00	0	0	1	8	15	17	5	0	0	0	0	0	0	0	46	39	42
12 PM	0	0	1	3	29	15	5	0	0	0	0	0	0	0	53	39	42
13:00	0	0	0	9	22	15	4	**3**	0	0	0	0	0	0	53	39	45
14:00	0	0	1	6	29	19	5	1	0	0	0	0	0	0	61	39	42
15:00	0	0	1	15	22	25	**7**	1	0	0	0	0	0	0	71	39	43
16:00	0	0	4	13	25	20	0	1	0	0	0	0	0	0	63	37	39
17:00	0	0	**6**	25	**66**	**30**	7	0	0	0	0	0	0	0	**134**	37	40
18:00	0	0	3	**28**	47	12	3	0	0	0	0	0	0	0	93	35	39
19:00	0	0	4	10	23	12	1	1	0	0	0	0	0	0	51	37	39
20:00	0	0	2	10	20	11	2	0	0	0	0	0	0	0	45	37	39
21:00	0	0	1	6	7	3	4	0	0	0	0	0	0	0	21	41	43
22:00	0	0	2	6	6	3	0	0	0	0	0	0	0	0	17	35	38
23:00	0	0	0	4	5	2	2	2	0	0	0	0	0	0	15	44	48
Total	0	1	39	225	483	296	82	13	0	0	0	0	0	0	1139		
Percent	0.0%	0.1%	3.4%	19.8%	42.4%	26.0%	7.2%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		08:00	07:00	07:00	07:00	08:00	08:00	06:00							08:00		
Vol.		1	5	26	47	35	12	1							115		
PM Peak			17:00	18:00	17:00	17:00	15:00	13:00							17:00		
Vol.			6	28	66	30	7	3							134		

MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA 01752

N/S: Memorial Drive
North of Dunkin Donuts
Ashland, MA

Site Code: 1377
Station ID:

Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/26/24	0	0	0	2	1	4	0	0	0	0	0	0	0	0	7	38	39
01:00	0	0	0	1	2	0	1	0	0	0	0	0	0	0	4	42	44
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	34	34
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	1	1	1	2	0	0	0	0	0	0	0	0	5	38	39
05:00	0	0	2	3	1	1	2	0	0	0	0	0	0	0	9	41	43
06:00	0	0	1	5	6	1	1	0	0	0	0	0	0	0	14	34	41
07:00	0	0	2	11	18	13	3	0	0	0	0	0	0	0	47	38	41
08:00	0	0	2	9	32	19	4	**3**	0	0	0	0	0	0	69	39	44
09:00	0	0	1	14	36	19	**7**	0	0	0	0	0	0	0	77	38	42
10:00	0	0	2	**15**	40	19	4	1	0	0	0	0	0	0	81	38	41
11:00	0	0	**3**	15	**44**	**21**	6	0	0	0	0	0	0	0	**89**	38	41
12 PM	0	0	4	23	34	**24**	5	0	0	0	0	0	0	0	**90**	38	40
13:00	0	0	1	10	**39**	23	6	**1**	0	0	0	0	0	0	80	38	42
14:00	0	0	**6**	**27**	24	20	4	0	0	0	0	0	0	0	81	37	39
15:00	0	0	5	20	31	17	4	0	0	0	0	0	0	0	77	37	40
16:00	0	0	2	7	22	13	**9**	1	0	0	0	0	0	0	54	41	44
17:00	0	0	2	10	26	18	5	0	0	0	0	0	0	0	61	38	41
18:00	0	0	3	18	17	13	2	0	0	0	0	0	0	0	53	37	39
19:00	0	0	0	10	17	18	1	1	0	0	0	0	0	0	47	38	39
20:00	0	0	0	2	12	5	3	0	0	0	0	0	0	0	22	39	43
21:00	0	0	3	5	11	10	0	0	0	0	0	0	0	0	29	37	39
22:00	0	0	0	4	7	3	1	0	0	0	0	0	0	0	15	37	41
23:00	0	0	0	2	11	2	0	1	**1**	0	0	0	0	0	17	38	50
Total	0	0	40	214	433	265	68	8	1	0	0	0	0	0	1029		
Percent	0.0%	0.0%	3.9%	20.8%	42.1%	25.8%	6.6%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak			11:00	10:00	11:00	11:00	09:00	08:00							11:00		
Vol.			3	15	44	21	7	3							89		
PM Peak			14:00	14:00	13:00	12:00	16:00	13:00	23:00						12:00		
Vol.			6	27	39	24	9	1	1						90		
Grand Total	2	4	144	956	1977	1078	260	29	1	1	0	0	0	0	4452		
Percent	0.0%	0.1%	3.2%	21.5%	44.4%	24.2%	5.8%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 27 MPH
50th Percentile : 32 MPH
85th Percentile : 38 MPH
95th Percentile : 41 MPH

Statistics

10 MPH Pace Speed : 31-40 MPH
Number in Pace : 3055
Percent in Pace : 68.6%
Number of Vehicles > 25 MPH : 4302
Percent of Vehicles > 25 MPH : 96.6%
Mean Speed(Average) : 33 MPH

MDM Transportation Consultants, Inc.

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N/S: Memorial Drive
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Station ID:

Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/23/24	0	0	0	2	3	1	0	0	0	0	0	0	0	0	6	35	38
01:00	0	0	1	0	3	0	0	0	0	0	0	0	0	0	4	34	34
02:00	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2	43	44
03:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	34	34
04:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	33	34
05:00	0	0	0	2	0	4	0	1	0	0	0	0	0	0	7	39	48
06:00	0	0	2	16	37	7	5	1	0	0	0	0	0	0	68	36	42
07:00	**1**	**3**	**5**	19	**70**	**35**	**12**	**2**	0	0	0	0	0	0	**147**	38	42
08:00	0	0	3	**22**	26	23	3	0	0	0	0	0	0	0	77	38	39
09:00	0	0	2	11	17	6	1	0	0	0	0	0	0	0	37	36	39
10:00	0	1	3	10	14	4	1	0	0	0	0	0	0	0	33	35	39
11:00	0	0	0	10	19	1	0	0	0	0	0	0	0	0	30	34	34
12 PM	**1**	0	1	16	25	6	1	0	0	0	0	0	0	0	50	34	38
13:00	0	0	2	10	16	9	2	1	0	0	0	0	0	0	40	38	42
14:00	0	0	3	19	26	14	3	0	0	0	0	0	0	0	65	37	39
15:00	1	0	**6**	19	30	9	2	1	0	0	0	0	0	0	68	35	39
16:00	0	0	0	28	44	17	4	0	0	0	0	0	0	0	93	37	39
17:00	0	0	1	28	**61**	**29**	0	1	0	0	0	0	0	0	**120**	37	39
18:00	0	0	3	**29**	52	18	**7**	**3**	0	0	**1**	0	0	0	113	38	43
19:00	0	0	3	27	42	13	2	0	0	0	0	0	0	0	87	35	39
20:00	0	0	3	24	28	11	1	0	0	0	0	0	0	0	67	35	38
21:00	0	**1**	1	14	25	4	0	0	0	0	0	0	0	0	45	34	37
22:00	0	0	0	5	7	3	1	0	0	0	0	0	0	0	16	37	40
23:00	0	0	0	2	8	8	2	2	0	0	0	0	0	0	22	41	47
Total	3	5	39	315	556	222	48	12	0	0	1	0	0	0	1201		
Percent	0.2%	0.4%	3.2%	26.2%	46.3%	18.5%	4.0%	1.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	08:00	07:00	07:00	07:00	07:00							07:00		
Vol.	1	3	5	22	70	35	12	2							147		
PM Peak	12:00	21:00	15:00	18:00	17:00	17:00	18:00	18:00			18:00				17:00		
Vol.	1	1	6	29	61	29	7	3			1				120		

MDM Transportation Consultants, Inc.

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Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/24/24	0	0	0	1	1	0	0	**1**	0	0	0	0	0	0	3	47	49
01:00	0	0	0	0	1	2	0	0	0	0	0	0	0	0	3	38	39
02:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	44	44
03:00	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2	48	49
04:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	34	34
05:00	0	0	0	2	5	2	0	0	0	0	0	0	0	0	9	36	38
06:00	0	0	3	14	33	5	1	1	0	0	0	0	0	0	57	34	39
07:00	0	**2**	1	**36**	**76**	**23**	**5**	0	**1**	0	0	0	0	0	**144**	36	39
08:00	0	0	**7**	16	29	10	2	1	0	0	0	0	0	0	65	36	39
09:00	0	0	3	10	11	6	2	0	0	0	0	0	0	0	32	37	41
10:00	0	1	3	18	18	10	0	0	0	0	0	0	0	0	50	36	38
11:00	0	0	1	11	16	4	1	1	0	0	0	0	0	0	34	36	41
12 PM	**1**	0	0	17	20	5	3	0	0	0	0	0	0	0	46	36	41
13:00	0	0	1	9	21	18	1	0	0	0	0	0	0	0	50	38	39
14:00	0	0	5	9	30	19	2	1	0	0	0	0	0	0	66	38	39
15:00	0	**2**	8	26	37	10	1	1	0	0	0	0	0	0	85	34	38
16:00	0	1	**9**	32	47	17	2	**3**	0	0	0	0	0	0	111	36	39
17:00	0	1	5	**44**	46	17	**4**	0	0	0	0	0	0	0	117	36	39
18:00	0	0	2	43	**49**	**24**	1	1	0	0	0	0	0	0	**120**	36	39
19:00	0	0	1	20	38	12	4	0	0	0	0	0	0	0	75	36	40
20:00	0	0	2	29	27	10	0	0	0	0	0	0	0	0	68	34	38
21:00	0	0	1	14	22	8	1	1	0	0	0	0	0	0	47	36	39
22:00	0	0	1	13	14	6	2	0	0	0	0	0	0	0	36	37	40
23:00	0	0	0	0	8	1	0	0	0	0	0	0	0	0	9	34	37
Total	1	7	53	365	550	209	33	12	1	0	0	0	0	0	1231		
Percent	0.1%	0.6%	4.3%	29.7%	44.7%	17.0%	2.7%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		07:00	08:00	07:00	07:00	07:00	07:00	00:00	07:00						07:00		
Vol.		2	7	36	76	23	5	1	1						144		
PM Peak	12:00	15:00	16:00	17:00	18:00	18:00	17:00	16:00							18:00		
Vol.	1	2	9	44	49	24	4	3							120		

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Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/25/24	0	0	0	0	6	1	0	0	**1**	0	0	0	0	0	8	38	52
01:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	38	39
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	29	29
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	**1**	0	1	0	0	0	0	0	0	0	0	0	0	2	28	29
05:00	0	0	0	1	1	5	1	0	0	0	0	0	0	0	8	39	42
06:00	0	0	0	18	13	6	1	0	0	0	0	0	0	0	38	36	39
07:00	0	0	3	19	**44**	**11**	2	0	0	0	0	0	0	0	**79**	35	39
08:00	0	0	**9**	**21**	22	7	**3**	**1**	1	0	0	0	0	0	64	36	43
09:00	0	0	0	8	19	7	2	0	0	0	0	0	0	0	36	37	40
10:00	0	0	1	7	14	8	0	0	0	0	0	0	0	0	30	37	39
11:00	0	0	1	9	18	10	2	0	1	0	0	0	0	0	41	38	42
12 PM	0	0	2	9	20	10	4	1	0	0	0	0	0	0	46	39	43
13:00	0	0	4	13	21	14	3	1	0	0	0	0	0	0	56	38	42
14:00	**1**	0	2	11	30	7	3	0	0	0	0	0	0	0	54	36	40
15:00	0	1	7	13	43	17	2	1	0	**1**	0	0	0	0	85	37	39
16:00	0	0	5	25	52	19	4	**2**	0	0	0	0	0	0	107	37	40
17:00	0	0	**8**	31	44	**26**	**8**	0	0	1	0	0	0	0	118	38	41
18:00	0	0	4	**40**	**57**	18	1	0	0	0	0	0	0	0	**120**	35	38
19:00	0	0	0	20	45	3	5	0	0	0	0	0	0	0	73	34	41
20:00	0	**2**	2	32	33	12	2	1	0	0	0	0	0	0	84	35	39
21:00	0	0	2	20	25	6	0	1	0	0	0	0	0	0	54	34	38
22:00	0	0	1	8	13	7	1	0	0	0	0	0	0	0	30	37	39
23:00	0	0	0	7	14	2	1	1	0	0	0	0	0	0	25	35	43
Total	1	4	51	314	535	197	45	9	3	2	0	0	0	0	1161		
Percent	0.1%	0.3%	4.4%	27.0%	46.1%	17.0%	3.9%	0.8%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak		04:00	08:00	08:00	07:00	07:00	08:00	08:00	00:00						07:00		
Vol.		1	9	21	44	11	3	1	1						79		
PM Peak	14:00	20:00	17:00	18:00	18:00	17:00	17:00	16:00		15:00					18:00		
Vol.	1	2	8	40	57	26	8	2		1					120		

MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA 01752

N/S: Memorial Drive
North of Dunkin Donuts
Ashland, MA

Site Code: 1377
Station ID:

Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/26/24	0	0	0	7	2	3	**2**	1	0	0	0	0	0	0	15	41	46
01:00	0	0	2	2	6	2	1	0	0	0	0	0	0	0	13	37	41
02:00	0	0	0	0	3	1	1	1	0	0	0	0	0	0	6	45	48
03:00	0	0	2	0	0	1	0	0	0	0	0	0	0	0	3	37	39
04:00	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	43	44
05:00	0	0	0	1	2	1	1	0	0	0	0	0	0	0	5	41	43
06:00	0	0	0	3	4	0	0	0	0	0	0	0	0	0	7	33	34
07:00	0	0	0	8	14	6	1	0	0	0	0	0	0	0	29	37	39
08:00	0	**1**	2	10	15	6	0	0	0	0	0	0	0	0	34	35	38
09:00	0	0	1	14	25	5	2	**2**	0	0	0	0	0	0	49	36	43
10:00	**1**	1	3	20	22	11	1	0	0	0	0	0	0	0	59	36	39
11:00	0	0	**7**	**31**	**28**	**12**	1	0	0	0	0	0	0	0	**79**	35	38
12 PM	**1**	0	3	14	39	11	4	1	0	0	0	0	0	0	73	37	41
13:00	0	0	2	22	**50**	**22**	2	0	0	0	0	0	0	0	**98**	37	39
14:00	1	1	2	**29**	32	9	4	0	0	0	0	0	0	0	78	35	40
15:00	0	0	1	14	36	18	1	1	0	0	0	0	0	0	71	37	39
16:00	1	**2**	1	9	23	12	**5**	0	**1**	0	0	0	0	0	54	39	43
17:00	0	0	0	23	41	13	1	**2**	0	0	0	0	0	0	80	36	39
18:00	0	0	1	25	35	10	3	0	0	0	0	0	0	0	74	35	39
19:00	0	1	1	15	41	11	2	0	0	0	0	0	0	0	71	36	39
20:00	0	0	0	10	25	10	2	1	0	0	0	0	0	0	48	37	41
21:00	0	0	**4**	11	28	12	3	2	1	**1**	0	0	0	0	62	39	47
22:00	0	0	0	8	7	6	2	0	0	0	0	0	0	0	23	38	42
23:00	0	0	2	4	14	6	1	2	1	1	0	0	0	0	31	41	52
Total	4	6	34	280	493	188	41	13	3	2	0	0	0	0	1064		
Percent	0.4%	0.6%	3.2%	26.3%	46.3%	17.7%	3.9%	1.2%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	08:00	11:00	11:00	11:00	11:00	00:00	09:00							11:00		
Vol.	1	1	7	31	28	12	2	2							79		
PM Peak	12:00	16:00	21:00	14:00	13:00	13:00	16:00	17:00	16:00	21:00					13:00		
Vol.	1	2	4	29	50	22	5	2	1	1					98		
Grand Total	9	22	177	1274	2134	816	167	46	7	4	1	0	0	0	4657		
Percent	0.2%	0.5%	3.8%	27.4%	45.8%	17.5%	3.6%	1.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%			

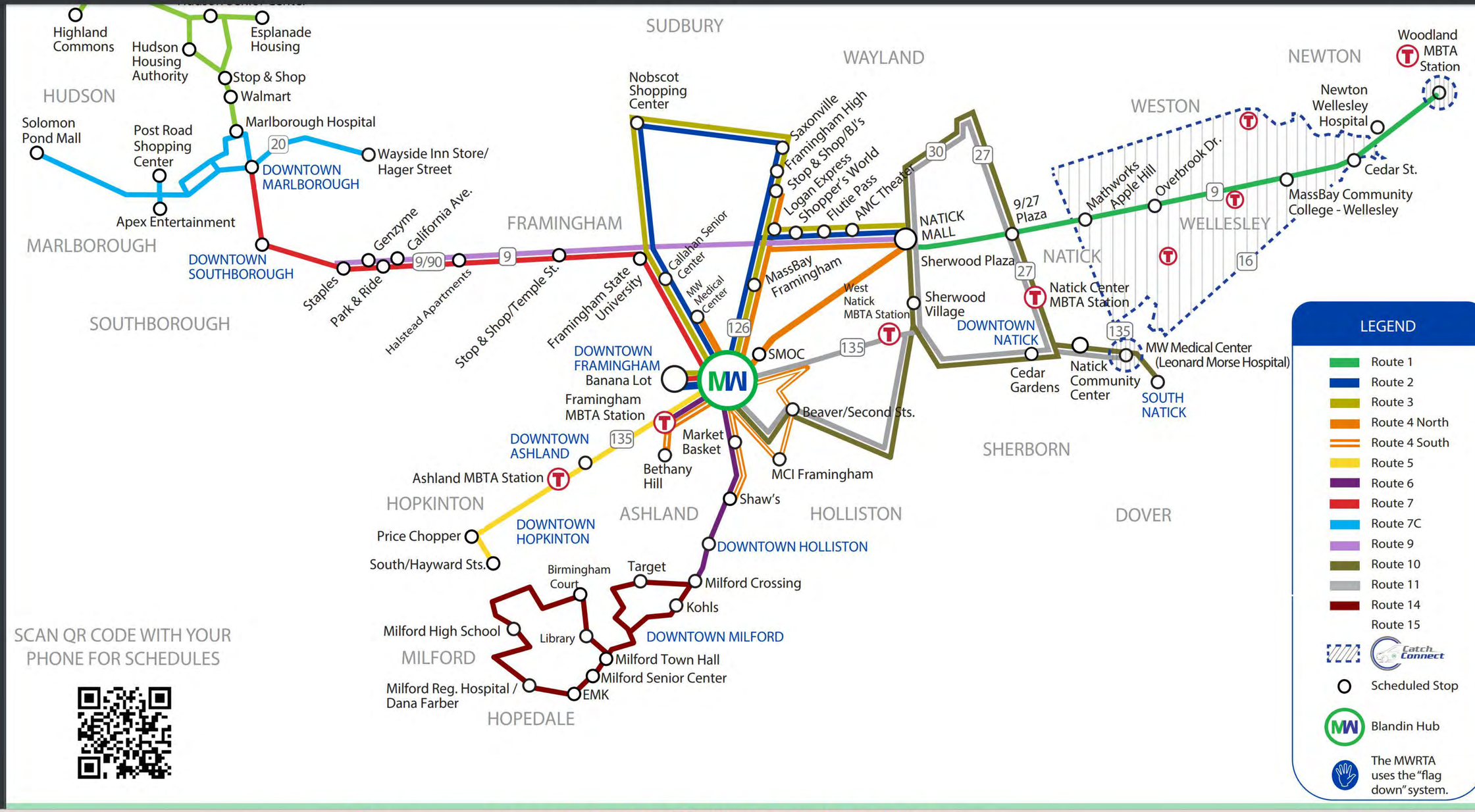
15th Percentile :	26 MPH
50th Percentile :	31 MPH
85th Percentile :	37 MPH
95th Percentile :	39 MPH

Statistics

10 MPH Pace Speed :	26-35 MPH
Number in Pace :	3408
Percent in Pace :	73.2%
Number of Vehicles > 25 MPH :	4449
Percent of Vehicles > 25 MPH :	95.5%
Mean Speed(Average) :	33 MPH

- Alternative Transportation Information

1



50°F Sunny
Search
8:53 AM 11/8/2024

FRAMINGHAM / WORCESTER LINE

SPRING/SUMMER SCHEDULE

Effective May 20, 2024

Monday to Friday

Inbound to Boston

		AM													PM													
ZONE	STATION	TRAIN #	500	502	504	582	506	584	508	552	586	510	512	514	516	518	520	522	524	526	592	528	594	530	598	532	534	536	538
	Bikes Allowed		🚲										🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲
8	Worcester	♿	4:15	5:00	5:45	-	6:30	-	7:07	7:40	-	8:13	9:05	10:00	11:00	12:00	1:05	2:00	3:00	3:47	-	4:30	-	5:45	-	6:35	7:55	8:55	10:50
8	Grafton	♿	4:28	5:13	5:58	-	6:43	-	7:20	-	-	8:26	9:18	10:13	11:13	12:13	1:18	2:13	3:13	4:00	-	4:43	-	5:58	-	6:48	8:08	9:08	11:03
7	Westborough	♿	4:32	5:17	6:02	-	6:47	-	7:24	-	-	8:30	9:22	10:17	11:17	12:17	1:22	2:17	3:17	4:04	-	4:47	-	6:02	-	6:52	8:12	9:12	11:07
6	Southborough	♿	4:41	5:26	6:11	-	6:56	-	7:33	-	-	8:39	9:31	10:26	11:26	12:26	1:31	2:26	3:26	4:13	-	4:56	-	6:11	-	7:01	8:21	9:21	11:16
6	Ashland	♿	4:45	5:30	6:16	-	7:01	-	7:38	-	-	8:43	9:35	10:30	11:30	12:30	1:35	2:30	3:30	4:17	-	5:00	-	6:15	-	7:05	8:25	9:25	11:20
5	Framingham	♿	4:55	5:40	6:26	6:35	7:11	7:25	7:48	8:06	8:15	8:53	9:45	10:40	11:40	12:40	1:45	2:40	3:40	4:27	4:40	5:10	5:20	6:25	6:55	7:15	8:35	9:35	11:30
4	West Natick	♿	5:00	5:45	6:32	6:40	7:17	7:30	7:54	-	8:20	8:58	9:50	10:45	11:45	12:45	1:50	2:45	3:45	-	4:45	-	5:25	6:30	7:00	7:20	8:40	9:40	11:35
4	Natick Center		5:05	5:50	-	6:45	-	7:35	-	-	8:25	9:03	9:55	10:50	11:50	12:50	1:55	2:50	3:50	-	4:50	-	5:30	6:35	7:05	7:25	8:45	9:45	11:40
3	Wellesley Square		5:09	5:54	-	6:50	-	7:40	-	-	8:29	9:07	10:00	10:55	11:55	12:55	2:00	2:55	3:55	-	4:54	-	5:34	6:39	7:09	7:29	8:49	9:49	11:44
3	Wellesley Hills		5:13	5:58	-	6:54	-	7:44	-	-	8:33	9:11	10:03	10:58	11:58	12:58	2:03	2:58	3:58	-	4:57	-	5:37	6:42	7:12	7:32	8:52	9:52	11:47
3	Wellesley Farms		5:16	6:01	-	6:57	-	7:47	-	-	8:36	9:14	10:06	11:01	12:01	1:01	2:06	3:01	4:01	-	5:00	-	5:40	6:45	7:15	7:35	8:55	9:55	11:50
2	Auburndale		5:21	6:06	-	7:02	-	7:52	-	-	8:41	9:19	10:11	11:06	-	1:06	-	-	4:06	-	-	-	5:45	-	7:20	-	9:00	10:00	-
2	West Newton		5:24	6:09	-	7:05	-	7:55	-	-	8:44	9:22	10:14	11:09	-	1:09	-	-	4:09	-	-	-	5:48	-	7:23	-	9:03	10:03	-
1	Newtonville		5:27	6:13	-	7:09	-	7:59	-	-	8:48	9:26	10:17	11:12	-	1:12	-	-	4:12	-	-	-	5:51	-	7:26	-	9:06	10:06	-
1A	Boston Landing	♿	5:32	6:18	6:49	7:14	7:35	8:04	8:12	-	8:53	9:31	10:22	11:17	12:12	1:17	2:17	3:12	4:17	4:44	5:11	5:27	5:56	6:55	7:31	7:45	9:11	10:11	11:59
1A	Lansdowne	♿	5:37	6:23	6:54	7:19	7:40	8:09	8:17	8:30	8:58	9:36	10:27	11:22	12:17	1:22	2:22	3:17	4:22	4:49	5:16	5:32	6:01	7:00	7:36	7:50	9:16	10:16	12:04
1A	Back Bay	♿	**L 5:44**	**L 6:30**	**L 7:04**	**L 7:27**	**L 7:50**	**L 8:17**	**L 8:27**	**L 8:39**	**L 9:05**	**L 9:43**	**L 10:37**	**L 11:32**	**L 12:27**	**L 1:32**	**L 2:32**	**L 3:27**	**L 4:33**	**L 5:01**	**L 5:23**	**L 5:44**	**L 6:07**	**L 7:07**	**L 7:42**	**L 7:57**	**L 9:25**	**L 10:25**	**L 12:12**
1A	South Station	♿	5:50	6:36	7:10	7:33	7:56	8:23	8:33	8:45	9:11	9:49	10:43	11:38	12:33	1:38	2:38	3:33	4:39	5:07	5:29	5:50	6:13	7:13	7:48	8:03	9:30	10:30	12:18

Monday to Friday

Outbound from Boston

		AM												PM														
ZONE	STATION	TRAIN #	501	503	505	583	549	585	507	509	511	513	515	517	519	521	523	591	525	593	527	595	529	597	531	533	535	537	539	541
	Bikes Allowed		🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲									🚲	🚲	🚲	🚲
1A	South Station	♿	4:45	5:25	6:02	6:15	6:52	7:10	7:30	7:55	8:55	9:50	10:50	11:45	12:55	1:45	2:40	3:25	4:00	4:10	4:45	4:55	5:30	5:45	6:15	6:35	7:35	9:00	10:00	11:45
1A	Back Bay	♿	4:51	5:31	6:08	6:21	6:58	7:16	7:36	8:01	9:01	9:56	10:56	11:51	1:01	1:51	2:46	3:31	4:06	4:16	4:51	5:01	5:36	5:51	6:21	6:41	7:41	9:06	10:06	11:51
1A	Lansdowne	♿	4:56	5:36	6:13	6:26	7:03	7:21	7:41	8:06	9:06	10:01	11:01	11:56	1:06	1:56	2:51	3:36	4:11	4:21	4:56	5:06	5:41	5:56	6:26	6:46	7:46	9:11	10:11	11:56
1A	Boston Landing	♿	5:01	5:41	6:18	6:31	-	7:26	7:46	8:11	9:12	10:07	11:07	12:02	1:12	2:02	2:56	3:41	4:16	4:26	5:01	5:11	5:46	6:01	6:31	6:51	7:51	9:16	10:16	12:01
1	Newtonville		-	-	-	6:35	-	-	-	8:16	-	-	-	12:07	-	2:07	3:01	3:46	-	4:31	-	5:17	-	6:06	-	6:56	7:56	9:21	10:21	12:06
2	West Newton		-	-	-	6:38	-	-	-	8:19	-	-	-	12:10	-	2:10	3:04	3:50	-	4:35	-	5:21	-	6:10	-	7:00	7:59	9:24	10:24	12:09
2	Auburndale		-	-	-	6:41	-	-	-	8:22	-	-	-	12:13	-	2:13	3:07	3:53	-	4:38	-	5:24	-	6:13	-	7:03	8:02	9:27	10:27	12:12
3	Wellesley Farms		5:11	5:51	-	6:46	-	7:36	-	8:27	9:22	10:17	11:17	12:17	1:22	2:17	3:11	3:57	-	4:42	-	5:29	-	6:17	-	7:06	8:06	9:31	10:31	12:16
3	Wellesley Hills		5:13	5:53	-	6:48	-	7:38	-	8:29	9:24	10:19	11:19	12:19	1:24	2:19	3:13	4:00	-	4:45	-	5:32	-	6:20	-	7:08	8:08	9:33	10:33	12:18
3	Wellesley Square		5:16	5:56	6:31	6:51	-	7:41	-	8:32	9:27	10:22	11:22	12:22	1:27	2:22	3:16	4:03	-	4:48	-	5:36	-	6:23	-	7:11	8:11	9:36	10:36	12:21
4	Natick Center		5:20	6:00	-	6:55	-	7:45	-	8:37	9:32	10:27	11:27	12:27	1:32	2:27	3:20	4:07	-	4:52	-	5:41	-	6:27	-	7:15	8:15	9:40	10:40	12:25
4	West Natick	♿	5:25	6:05	-	7:00	-	7:50	-	8:42	9:37	10:32	11:32	12:32	1:37	2:32	3:25	4:12	4:33	4:57	5:18	5:46	6:03	6:32	6:48	7:20	8:20	9:45	10:45	12:30
5	Framingham	♿	5:30	6:10	6:43	7:07	7:26	7:57	8:07	8:47	9:42	10:37	11:37	12:37	1:42	2:37	3:30	4:19	4:38	5:04	5:23	5:54	6:08	6:40	6:53	7:25	8:25	9:50	10:50	12:35
6	Ashland	♿	5:36	6:16	6:49	-	-	-	8:13	8:53	9:48	10:43	11:43	12:43	1:48	2:43	3:36	-	4:44	-	5:29	-	6:14	-	6:59	7:31	8:31	9:56	10:56	12:41
6	Southborough	♿	5:41	6:21	6:54	-	-	-	8:18	8:58	9:53	10:48	11:48	12:48	1:53	2:48	3:41	-	4:49	-	5:34	-	6:19	-	7:04	7:36	8:36	10:01	11:01	12:46
7	Westborough	♿	5:50	6:30	7:03	-	-	-	8:27	9:07	10:02	10:57	11:57	12:57	2:02	2:57	3:50	-	4:58	-	5:43	-	6:28	-	7:13	7:45	8:45	10:10	11:10	12:55
8	Grafton	♿	5:55	6:35	7:08	-	-	-	8:32	9:12	10:07	11:02	12:02	1:02	2:07	3:02	3:55	-	5:04	-	5:49	-	6:34	-	7:19	7:50	8:50	10:15	11:15	1:00
8	Worcester	♿	6:11	6:52	7:25	-	7:58	-	8:49	9:31	10:26	11:21	12:21	1:21	2:26	3:21	4:14	-	5:24	-	6:10	-	6:55	-	7:39	8:10	9:09	10:34	11:34	1:19

Weekend

Inbound to Boston

		AM				PM					
	SATURDAY TRAIN #	1500	1502	1504	1506	1508	1510	1512	1514	1516	1518
	SUNDAY TRAIN #	2500	2502	2504	2506	2508	2510	2512	2514	2516	2518
ZONE	Bikes Allowed	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲
8	Worcester ♿	5:10	7:10	9:10	11:10	1:10	3:10	5:10	6:55	9:10	11:25
8	Grafton ♿	5:23	7:23	9:23	11:23	1:23	3:23	5:23	7:08	9:23	11:38
7	Westborough ♿	5:27	7:27	9:27	11:27	1:27	3:27	5:27	7:12	9:27	11:42
6	Southborough ♿	5:36	7:36	9:36	11:36	1:36	3:36	5:36	7:21	9:36	11:51
6	Ashland ♿	5:40	7:40	9:40	11:40	1:40	3:40	5:40	7:25	9:40	11:55
5	Framingham ♿	5:50	7:50	9:50	11:50	1:50	3:50	5:50	7:35	9:50	12:05
4	West Natick ♿	5:55	7:55	9:55	11:55	1:55	3:55	5:55	7:40	9:55	12:10
4	Natick Center	6:00	8:00	10:00	12:00	2:00	4:00	6:00	7:45	10:00	12:15
3	Wellesley Square	6:04	8:04	10:04	12:04	2:04	4:04	6:04	7:49	10:04	12:19
3	Wellesley Hills	6:07	8:07	10:07	12:07	2:07	4:07	6:07	7:52	10:07	12:22
3	Wellesley Farms	6:10	8:10	10:10	12:10	2:10	4:10	6:10	7:55	10:10	12:25
2	Auburndale	6:15	8:15	10:15	12:15	2:15	4:15	6:15	8:00	10:15	12:30
2	West Newton	6:18	8:18	10:18	12:18	2:18	4:18	6:18	8:03	10:18	12:33
1	Newtonville	6:21	8:21	10:21	12:21	2:21	4:21	6:21	8:06	10:21	12:36
1A	Boston Landing ♿	6:26	8:26	10:26	12:26	2:26	4:26	6:26	8:11	10:26	12:41
1A	Lansdowne ♿	6:31	8:31	10:31	12:31	2:31	4:31	6:31	8:16	10:31	12:46
1A	Back Bay ♿	**L 6:40**	**L 8:40**	**L 10:40**	**L 12:40**	**L 2:40**	**L 4:40**	**L 6:40**	**L 8:25**	**L 10:40**	**L 12:55**
1A	South Station ♿	6:45	8:45	10:45	12:45	2:45	4:45	6:45	8:30	10:45	1:00

Weekend

Outbound from Boston

		AM				PM					
	SATURDAY TRAIN #	1501	1503	1505	1507	1509	1511	1513	1515	1517	1519
	SUNDAY TRAIN #	2501	2503	2505	2507	2509	2511	2513	2515	2517	2519
ZONE	Bikes Allowed	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲
1A	South Station ♿	5:00	7:00	9:00	11:00	1:00	3:00	5:00	6:45	9:00	11:15
1A	Back Bay ♿	5:06	7:06	9:06	11:06	1:06	3:06	5:06	6:51	9:06	11:21
1A	Lansdowne ♿	5:11	7:11	9:11	11:11	1:11	3:11	5:11	6:56	9:11	11:26
1A	Boston Landing ♿	5:16	7:16	9:16	11:16	1:16	3:16	5:16	7:01	9:16	11:31
1	Newtonville	5:21	7:21	9:21	11:21	1:21	3:21	5:21	7:06	9:21	11:36
2	West Newton	5:24	7:24	9:24	11:24	1:24	3:24	5:24	7:09	9:24	11:39
2	Auburndale	5:27	7:27	9:27	11:27	1:27	3:27	5:27	7:12	9:27	11:42
3	Wellesley Farms	5:31	7:31	9:31	11:31	1:31	3:31	5:31	7:16	9:31	11:46
3	Wellesley Hills	5:33	7:33	9:33	11:33	1:33	3:33	5:33	7:18	9:33	11:48
3	Wellesley Square	5:36	7:36	9:36	11:36	1:36	3:36	5:36	7:21	9:36	11:51
4	Natick Center	5:40	7:40	9:40	11:40	1:40	3:40	5:40	7:25	9:40	11:55
4	West Natick ♿	5:45	7:45	9:45	11:45	1:45	3:45	5:45	7:30	9:45	12:00
5	Framingham ♿	5:50	7:50	9:50	11:50	1:50	3:50	5:50	7:35	9:50	12:05
6	Ashland ♿	5:56	7:56	9:56	11:56	1:56	3:56	5:56	7:41	9:56	12:11
6	Southborough ♿	6:01	8:01	10:01	12:01	2:01	4:01	6:01	7:46	10:01	12:16
7	Westborough ♿	6:10	8:10	10:10	12:10	2:10	4:10	6:10	7:55	10:10	12:25
8	Grafton ♿	6:15	8:15	10:15	12:15	2:15	4:15	6:15	8:00	10:15	12:30
8	Worcester ♿	6:35	8:35	10:35	12:35	2:35	4:35	6:35	8:20	10:35	12:49

Keep in Mind:

This schedule will be effective from May 20, 2024 and will replace the schedule of December 23, 2023.

HOLIDAY SERVICE:
On Monday, May 27th (Memorial Day), Thursday, July 4th (Independence Day) and Monday, September 2nd (Labor Day), all lines will operate on a weekend schedule.

On Wednesday, June 19th (Juneteenth), Friday, July 5th (Day after Independence Day), and Monday, October 14th (Columbus Day), all lines will operate on a regular weekday schedule.

For all holiday schedules, please check MBTA.com/holidays or call 617-222-3200.

Times in blue indicate an early departure (L stop): The train may leave ahead of schedule at these stops.

Bikes: Bicycles are allowed on trains with the bicycle symbol shown below the train number.

High level platform and bridge plate available. Visit **mbta.com/accessibility** for more information.

□ Sight Distance Calculations

Intersection Sight Distance Calculations

Source: *A Policy on Geometric Design of Highways and Street, 7th Edition;* AASHTO; 2018.

Passenger Car
ISD = 1.47 * V * t

V = speed
t = time gap

t = 7.5 s for a passenger car for Left Turn from a Stop
t = 6.5 s for a passenger car for Right Turn from a Stop

STREET NAME Site Driveway E

		Speed Limit		Ideal ISD	SAY	
APPROACH NAME (left-turn from a stop)	ISD = 1.47*	30	* 7.5 =	330.75	**335 feet**	Looking W
APPROACH NAME (right-turn from a stop)	ISD = 1.47*	30	* 6.5 =	286.65	**290 feet**	Looking E

Intersection Sight Distance Calculations

Source: *A Policy on Geometric Design of Highways and Street, 7th Edition;* AASHTO; 2018.

Passenger Car
ISD = 1.47 * V * t

V = speed
t = time gap

t = 7.5 s for a passenger car for Left Turn from a Stop
t = 6.5 s for a passenger car for Right Turn from a Stop

STREET NAME Site Driveway E

		Speed Limit		Ideal ISD	SAY	
APPROACH NAME (left-turn from a stop)	ISD = 1.47*	38	* 7.5 =	418.95	**420 feet**	Looking W
APPROACH NAME (right-turn from a stop)	ISD = 1.47*	37	* 6.5 =	353.535	**355 feet**	Looking E

Intersection Sight Distance Calculations

Source: *A Policy on Geometric Design of Highways and Street, 7th Edition;* AASHTO; 2018.

Passenger Car
ISD = 1.47 * V * t

V = speed
t = time gap

t = 7.5 s for a passenger car for Left Turn from a Stop
t = 6.5 s for a passenger car for Right Turn from a Stop

STREET NAME Site Driveway W

		Speed Limit		Ideal ISD	SAY	
APPROACH NAME (left-turn from a stop)	ISD = 1.47*	30	* 7.5 =	330.75	**335 feet**	Looking W
APPROACH NAME (right-turn from a stop)	ISD = 1.47*	30	* 6.5 =	286.65	**290 feet**	Looking E

Intersection Sight Distance Calculations

Source: *A Policy on Geometric Design of Highways and Street, 7th Edition;* AASHTO; 2018.

Passenger Car
ISD = 1.47 * V * t

V = speed
t = time gap

t = 7.5 s for a passenger car for Left Turn from a Stop
t = 6.5 s for a passenger car for Right Turn from a Stop

STREET NAME Site Driveway W

		Speed Limit		Ideal ISD	SAY	
APPROACH NAME (left-turn from a stop)	ISD = 1.47*	38	* 7.5 =	418.95	**420 feet**	Looking W
APPROACH NAME (right-turn from a stop)	ISD = 1.47*	37	* 6.5 =	353.535	**355 feet**	Looking E

Stopping Sight Distance - Posted

Site Driveway E

		SPEED (MPH)	BRAKE REACTION DISTANCE (FT)	BRAKING DISTANCE (FT)	CALCULATED STOPPING SIGHT DISTANCE (FT)
Direction 1	EB	30	110.25	86.3	196.5
Direction 2	WB	30	110.25	86.3	196.5

INPUTS	Direction 1	Direction 2
Travel Direction	EB	WB
Speed	30	30
Grade	0	0
t	2.5	2.5
a	11.2	11.2

Stopping Sight Distance (SSD) - Source: AASHTO

SSD = Reaction Distance + Brake Distance

Reaction Distance = 1.47 x t x V

Brake Distance = V^2 / (30 x ((a/32.2)+G))

Where:
t = reaction time (sec)
V = travel speed (mph)
G= roadway grade
a - deceleration rate (ft/sec^2)

Stopping Sight Distance - Mean

Liberty Lane

		SPEED (MPH)	BRAKE REACTION DISTANCE (FT)	BRAKING DISTANCE (FT)	CALCULATED STOPPING SIGHT DISTANCE (FT)
Direction 1	EB	38	139.65	138.4	278.0
Direction 2	WB	39	143.325	145.8	289.1

INPUTS	Direction 1	Direction 2
Travel Direction	EB	WB
Speed	38	39
Grade	0	0
t	2.5	2.5
a	11.2	11.2

Stopping Sight Distance (SSD) - Source: AASHTO

SSD = Reaction Distance + Brake Distance

Reaction Distance = 1.47 x t x V

Brake Distance = V^2 / (30 x ((a/32.2)+G))

Where:
t = reaction time (sec)
V = travel speed (mph)
G= roadway grade
a - deceleration rate (ft/sec^2)

Stopping Sight Distance - 85th Percentile

Site Driveway E

		SPEED (MPH)	BRAKE REACTION DISTANCE (FT)	BRAKING DISTANCE (FT)	CALCULATED STOPPING SIGHT DISTANCE (FT)
Direction 1	EB	38	139.65	138.4	278.0
Direction 2	WB	37	135.975	131.2	267.2

INPUTS	Direction 1	Direction 2
Travel Direction	EB	WB
Speed	38	37
Grade	0	0
t	2.5	2.5
a	11.2	11.2

Stopping Sight Distance (SSD) - Source: AASHTO

SSD = Reaction Distance + Brake Distance

Reaction Distance = 1.47 x t x V

Brake Distance = V^2 / (30 x ((a/32.2)+G))

Where:
t = reaction time (sec)
V = travel speed (mph)
G= roadway grade
a - deceleration rate (ft/sec^2)

Stopping Sight Distance - Posted

Site Driveway W

		SPEED (MPH)	BRAKE REACTION DISTANCE (FT)	BRAKING DISTANCE (FT)	CALCULATED STOPPING SIGHT DISTANCE (FT)
Direction 1	EB	30	110.25	86.3	196.5
Direction 2	WB	30	110.25	86.3	196.5

INPUTS	Direction 1	Direction 2
Travel Direction	EB	WB
Speed	30	30
Grade	0	0
t	2.5	2.5
a	11.2	11.2

Stopping Sight Distance (SSD) - Source: AASHTO

SSD = Reaction Distance + Brake Distance

Reaction Distance = 1.47 x t x V

Brake Distance = V^2 / (30 x ((a/32.2)+G))

Where:
t = reaction time (sec)
V = travel speed (mph)
G= roadway grade
a - deceleration rate (ft/sec^2)

Stopping Sight Distance - Mean

Liberty Lane

		SPEED (MPH)	BRAKE REACTION DISTANCE (FT)	BRAKING DISTANCE (FT)	CALCULATED STOPPING SIGHT DISTANCE (FT)
Direction 1	EB	38	139.65	138.4	278.0
Direction 2	WB	39	143.325	145.8	289.1

INPUTS	Direction 1	Direction 2
Travel Direction	EB	WB
Speed	38	39
Grade	0	0
t	2.5	2.5
a	11.2	11.2

Stopping Sight Distance (SSD) - Source: AASHTO

SSD = Reaction Distance + Brake Distance

Reaction Distance = 1.47 x t x V

Brake Distance = V^2 / (30 x ((a/32.2)+G))

Where:
t = reaction time (sec)
V = travel speed (mph)
G= roadway grade
a - deceleration rate (ft/sec^2)

Stopping Sight Distance - 85th Percentile

Site Driveway W

		SPEED (MPH)	BRAKE REACTION DISTANCE (FT)	BRAKING DISTANCE (FT)	CALCULATED STOPPING SIGHT DISTANCE (FT)
Direction 1	EB	38	139.65	138.4	278.0
Direction 2	WB	37	135.975	131.2	267.2

INPUTS	Direction 1	Direction 2
Travel Direction	EB	WB
Speed	38	37
Grade	0	0
t	2.5	2.5
a	11.2	11.2

Stopping Sight Distance (SSD) - Source: AASHTO

SSD = Reaction Distance + Brake Distance

Reaction Distance = 1.47 x t x V

Brake Distance = V^2 / (30 x ((a/32.2)+G))

Where:
t = reaction time (sec)
V = travel speed (mph)
G= roadway grade
a - deceleration rate (ft/sec^2)

Stopping Sight Distance - 85th Percentile

Central Proposed Crosswalk

		SPEED (MPH)	BRAKE REACTION DISTANCE (FT)	BRAKING DISTANCE (FT)	CALCULATED STOPPING SIGHT DISTANCE (FT)
Direction 1	SB	38	139.65	124.1	263.8
Direction 2	NB	37	135.975	114.7	250.7

INPUTS	Direction 1	Direction 2
Travel Direction	SB	NB
Speed	38	37
Grade	0.04	0.05
t	2.5	2.5
a	11.2	11.2

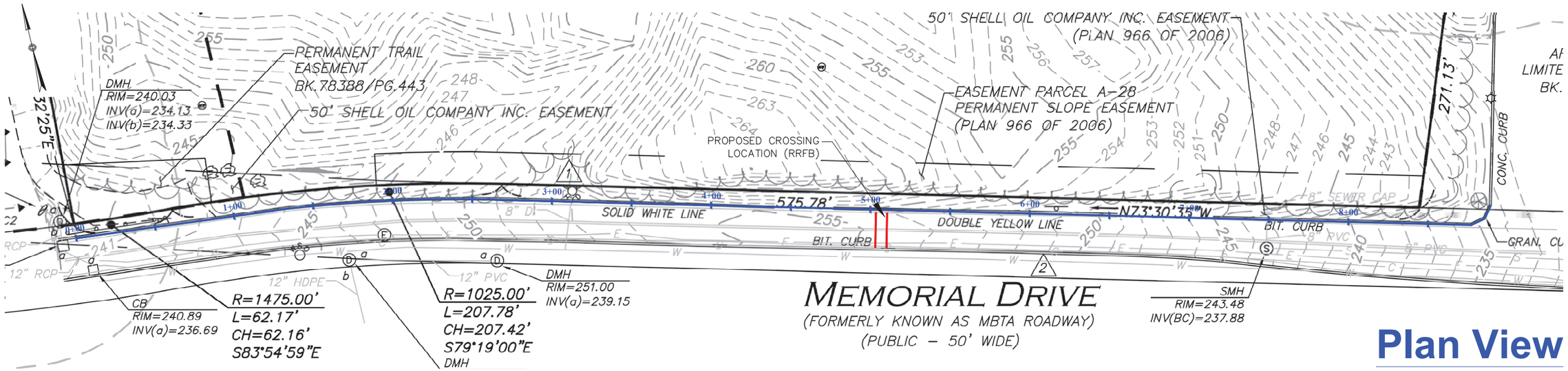
Stopping Sight Distance (SSD) - Source: AASHTO

SSD = Reaction Distance + Brake Distance

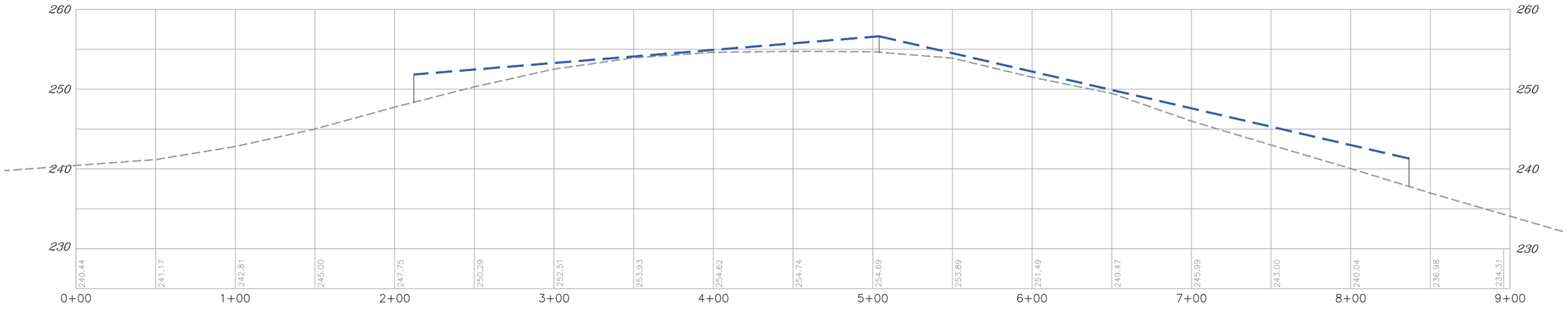
Reaction Distance = 1.47 x t x V

Brake Distance = V^2 / (30 x ((a/32.2)+G))

Where:
t = reaction time (sec)
V = travel speed (mph)
G= roadway grade
a - deceleration rate (ft/sec^2)



Plan View



Profile View

Roadway Plan Source: Allen & Major Associates, Inc.

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers
28 Lord Road, Suite 280
Marlborough, MA 01752

Scale: As Noted
DWG No. 1377 Sight Distance - Crosswalk.dwg

Date: May 2025
Project No. 1377

Proposed YMCA
Ashland, Massachusetts

SCALE
0 15 30 60 90 FEET
0 3 6 12 18

Proposed Crosswalk Stopping Sight Distance Analysis

- Crash Data

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Ashland, MA COUNT DATE : Nov-24

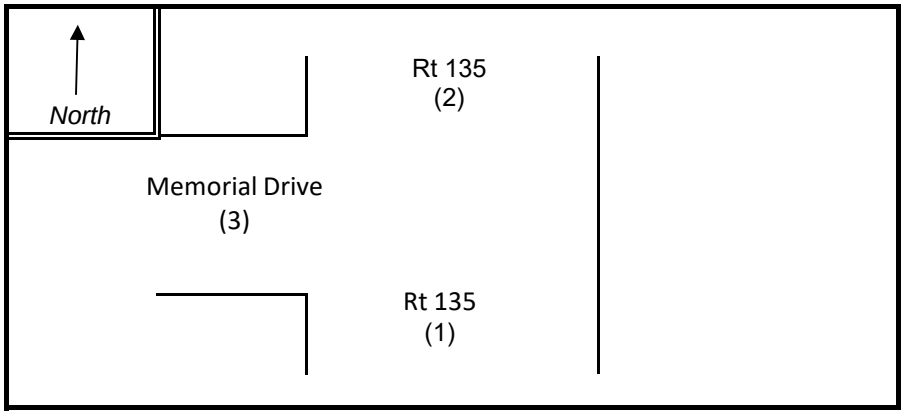
DISTRICT : 3 UNSIGNALIZED : SIGNALIZED : X

~ INTERSECTION DATA ~

MAJOR STREET : Rt 135 (West Union Street)

MINOR STREET(S) : Memorial Drive

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	629	868	0	187		1,684

" K " FACTOR : **0.122** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **13,803**

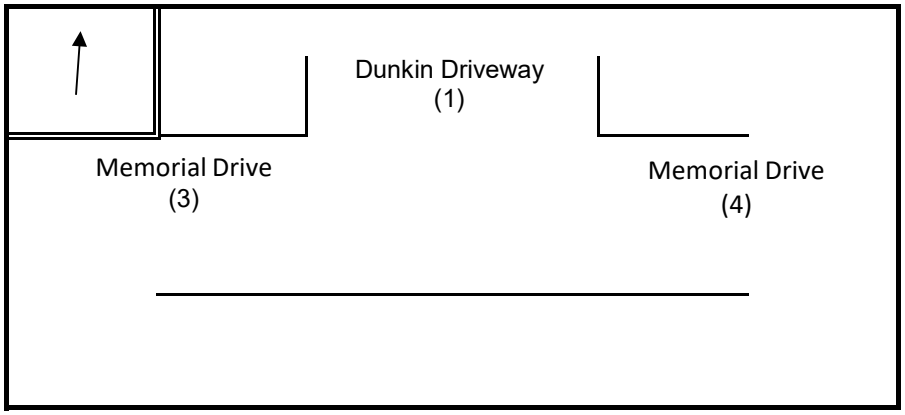
TOTAL # OF CRASHES : 4 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.80**

CRASH RATE CALCULATION : **0.16** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : MassDOT District 3 Avg: Signalized = 0.89; Unsignalized = 0.61

Project Title & Date: 1377 - Ashland

No Crashes



Crash Num	City Town	Crash Date	Crash Severity	Crash Stat	Crash Tim	Crash Year	Max Injury	Number o	Police Age	State Polic	Age of Dri	Age of Dri	Age of Vul	Age of Vul	Crash Hou	Driver Con	Driver Dist	First Harm	Is Geocod	Light Cond	Manner of	Mass	DOT	Vulnerable	Vulnerable	Vulnerable	RMV Docu	Road Surfa	X	Y	Latitude	Longitude
4659849	ASHLAND	43489	Property damage only (none injured)	Closed	4:40 PM	2019	No injury	3	Local polic		35-44	55-64			04:00PM t	D1: (No im	D1: Not Di	Collision w	Yes	Daylight	Rear-end		3				PW20190	Wet	202508.8	889187.7	42.25315	-71.4696
4892860	ASHLAND	44043	Property damage only (none injured)	Closed	5:12 PM	2020	No Appare	2	Local polic		45-54	65-74			05:00PM t	D1: (No im	D1: Not Di	Collision w	Yes	Daylight	Rear-end		3				PW20203	Dry	202508.8	889187.7	42.25315	-71.4696
4980606	ASHLAND	44276	Non-fatal injury	Open	3:09 PM	2021	Suspected	2	Local polic		21-24	45-54			03:00PM t	D1: (No im	D1: Not Di	Collision w	Yes	Daylight	Rear-end		3				PW20211	Dry	202496.6	889171.8	42.25301	-71.4697
5312092	ASHLAND	45085	Property damage only (none injured)	Open	6:00 PM	2023	No Appare	3	Local polic		18-20	65-74			06:00PM t	D1: (Unkn		Collision w	Yes	Daylight	Front to R		3				PW20234	Dry	202508.8	889187.7	42.25315	-71.4696

Data Level CRASH
Query Typ Spatial
Criteria: If you conducted an Advanced Query your SQL statement will be listed here

Crash Query and Visualization

Welcome, Guest User

ver 1.0.27

1. Select Fields | 2. Query Type | 3. Define Query | 4. Visualize Results

Basic Search | Spatial Search | Advanced Search

Reset All Filters | Data Level:Crash | Visualize Results

Reset Spatial Filters

Join Basic Filter | Join Advanced Filter

crash date from: 01/01/2019 | crash date to: 12/31/2023

Find | Draw | Address

Step 1: Draw Shape Type — Reset Draw

Point | Line | Area

Step 2: Define Buffer (Optional)

buffer distance: 1 | buffer units: Feet

Buffer

Step 3: Run Query

Click the "Visualize results" button above

Zero features found in the spatial selection dismiss

71°F Windy

Search

3:55 PM 11/1/2024

□ Seasonal/Yearly Growth Data

SECTION I - CONTINUOUS COUNTING STATION MONTHLY AVERAGE DAILY TRAFFIC

STATION 307 - WESTBOROUGH - RTE.9 - EAST OF NORTHBOROUGH T.L.

YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
07	47,505	47,283	49,268	49,136	*50,000*	*52,000*	*53,000*	52,322	49,031	50,571	49,662	47,007	49,732
	-4%	-2%	-3%	1%	1%	-4%	-8%	-7%	-1%	-3%	-4%	-1%	-3.0%
08	45,614	46,112	47,829	49,816	*50,518*	*49,936*	*48,629*	48,759	48,531	49,009	47,490	46,696	48,245
	-3%	1%	-3%	-2%	-2%	0%	-2%	-3%	-2%	-1%	0%	2%	-1.3%
09	44,103	46,434	46,455	49,049	*49,474*	*49,934*	*47,638*	47,056	47,762	48,663	47,379	47,564	47,626
	-1%	0%	2%	0%	0%	1%	-1%	1%	1%	1%	2%	2%	0.6%
11	43,244	46,150	48,016	48,943	*49,781*	*50,525*	*46,812*	48,234	48,825	49,198	49,151	49,888	48,231
	7%	2%	1%	-1%	1%	-1%	3%	4%	0%	2%	2%	-5%	1.2%
12	46,381	46,883	48,608	48,662	*50,126*	*49,961*	*48,380*	49,941	48,882	50,056	50,015	47,600	48,791
	0%	-1%	-2%	1%	1%	-9%	3%	-1%	2%	0%	-1%	2%	-0.5%
13	46,393	46,220	47,421	49,359	*50,657*	*45,623*	*49,797*	49,223	49,935	50,021	49,651	48,441	48,562
	1%	1%	2%	1%	1%	6%	0%	1%	0%	1%	1%	1%	1.3%
16	47,447	47,570	50,342	50,977	*52,259*	*53,476*	*49,724*	50,789	50,057	51,035	51,749	50,442	50,489
	-1.1%	-1.2%	-1.3%	-0.9%	-0.8%	-1.0%	-0.7%	-0.7%	-0.8%	-0.8%	-1.2%	-1.1%	-1.0%
23	43,754	43,487	45,855	47,741	*49,238*	*49,643*	*47,280*	48,283	47,363	48,242	47,582	46,694	47,097
Seasonal Adjustment Factor (to average month)	1.07	1.05	1.01	0.99	0.97	0.97	0.99	0.99	1.00	0.98	0.99	1.01	
												Growth	**-0.37%**

STATION AET09 - FRAMINGHAM - I-90/ EAST OF I-495

YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
17	101,451	98,919	106,101	115,894	118,225	113,384	113,033	*119,402*	116,066	118,183	114,587	105,753	111,750
	-4%	6%	-1%	1%	1%	6%	2%	1%	1%	0%	0%	3%	1%
18	97,265	104,694	104,758	116,945	119,749	120,311	114,772	*120,269*	117,743	118,539	114,293	108,839	113,181
	2%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	-1%	0%
19	103,242	105,833	110,627	118,889	*118,583*	*120,696*	*116,694*	122,292	119,348	120,903	115,029	106,330	114,872
	-4.7%	-4.8%	-3.0%	-3.2%	-2.1%	-2.2%	-2.3%	-2.5%	-2.2%	-1.9%	-1.7%	-1.3%	-2.6%
22	88,701	90,472	100,678	107,482	111,175	112,846	108,495	113,219	111,629	114,148	109,112	102,088	105,837
	8%	8%	5%	5%	5%	4%	3%	4%	1%	2%	4%	4%	4%
23	96,225	98,146	105,304	113,012	117,197	116,894	111,558	117,558	112,396	116,749	113,449	106,273	110,397
Seasonal Adjustment Factor (to average month)	1.14	1.12	1.05	0.97	0.95	0.95	0.98	0.94	0.96	0.94	0.98	1.05	
												Growth	**0.84%**
Average Seasonal Adjustment Factor (to average month)	1.11	1.08	1.03	0.98	0.96	0.96	0.99	0.96	0.98	0.96	0.99	1.03	

Average Yearly Growth Calculated 0.2%

Yearly Growth Factor Used 0.5%

ITALICS = ESTIMATED DATA

MADT

□ Trip Generation Calculations

1377 Trip Generation Calculation
MW YMCA Ashland

	Recreational LUC 495 65.7k sf	Institutional LUC 565 100 Students	Recreational LUC 488 2 Fields	Total Trips
Weekday Morning Peak Hour				
Entering	83	41	1	125
Exiting	42	37	1	80
Total	125	78	2	205
Weekday Evening Peak Hour				
Entering	77	38	22	137
Exiting	87	42	11	140
Total	164	80	33	277
Saturday Midday Peak Hour				
Entering	38	0	38	76
Exiting	32	0	42	74
Total	70	0	80	150
Weekday Daily	1894	410	142	2446
Saturday Daily	598	0	810	1408

Institute of Transportation Engineers (ITE) 10th Edition

Land Use Code (LUC) 488 - Soccer Complex

Average Vehicle Trips Ends vs: Number of Fields
Independent Variable (X): 2

AVERAGE WEEKDAY DAILY

T = 71.33 * (X)
T = 71.33 * 2
T = 142.66
T = 142 vehicle trips
with 50% (**71** vpd) entering and 50% (**71** vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.99 * (X)
T = 0.99 * 2
T = 1.98
T = 2 vehicle trips
with 61% (**1** vph) entering and 39% (**1** vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 16.43 * (X)
T = 16.43 * 2
T = 32.86
T = 33 vehicle trips
with 66% (**22** vph) entering and 34% (**11** vph) exiting.

SATURDAY DAILY

T = 404.88 * (X)
T = 404.88 * 0
T = 809.76
T = 810 vehicle trips
with 50% (**405** vpd) entering and 50% (**405** vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

T = 40.10 * (X)
T = 30.34 * 2
T = 80.20
T = 80 vehicle trips
with 48% (**38** vph) entering and 52% (**42** vph) exiting.

Institute of Transportation Engineers (ITE) 11th Edition
Land Use Code (LUC) 495 - Recreational Community Center

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 65.7

AVERAGE WEEKDAY DAILY

T = 28.82 * (X)
T = 28.82 * 65.7
T = 1893.47
T = 1,894 vehicle trips
with 50% (947 vpd) entering and 50% (947 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 1.91 * (X)
T = 1.91 * 65.7
T = 125.49
T = 125 vehicle trips
with 66% (83 vph) entering and 34% (42 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 2.50* (X)
T = 2.50* 65.7
T = 164.25
T = 164 vehicle trips
with 47% (77 vph) entering and 53% (87 vph) exiting.

SATURDAY DAILY

T = 9.10 * (X)
T = 9.10 * 65.7
T = 597.87
T = 598 vehicle trips
with 50% (299 vpd) entering and 50% (299 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

T = 1.07 * (X)
T = 1.07 * 65.7
T = 70.30
T = 70 vehicle trips
with 54% (38 vph) entering and 46% (32 vph) exiting.

Institute of Transportation Engineers (ITE) 10th Edition
Land Use Code (LUC) 565 - Day Care Center

Average Vehicle Trips Ends vs: Students
Independent Variable (X): 100

AVERAGE WEEKDAY DAILY

T = 4.09 * (X)
T = 4.09 * 100.00
T = 409.00
T = 410 vehicle trips
with 50% (205 vpd) entering and 50% (205 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.78 (X)
T = 0.78* 100.00
T = 78.00
T = 78 vehicle trips
with 53% (41 vpd) entering and 47% (37 vpd) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.79 (X)
T = 0.79* 100.00
T = 79.00
T = 80 vehicle trips
with 47% (38 vpd) entering and 53% (42 vpd) exiting.

SATURDAY DAILY

T = 0.39 * (X)
T = 0.39 * 100
T = 39.00
T = 40 vehicle trips
with 50% (20 vpd) entering and 50% (20 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

T = 0.11 * (X)
T = 0.11 * 100
T = 11.00
T = 11 vehicle trips
with 63% (7 vph) entering and 37% (4 vph) exiting.

□ Trip Distribution Calculations

2020 Census Data

City/Town	Population	Multiplier	**Use**		RT 135 NB	RT 135 SB
Ashland	18,832	1	18,832		25%	75%
Sherborn	4,401	1	4,401			100%
Holliston	14,996	1	14,996			100%
Hopkinton	18,758	1	18,758		75%	25%
Framingham	72,362	0.5	36,181			100%
Southborough	10,450	0.5	5,225		50%	50%

	NB Total	SB Total	
Population	21,389	77,004	
% of Pop.	0.2173834	0.782617	
% Used	20%	80%	<- YMCA Facility and Soccer Fields

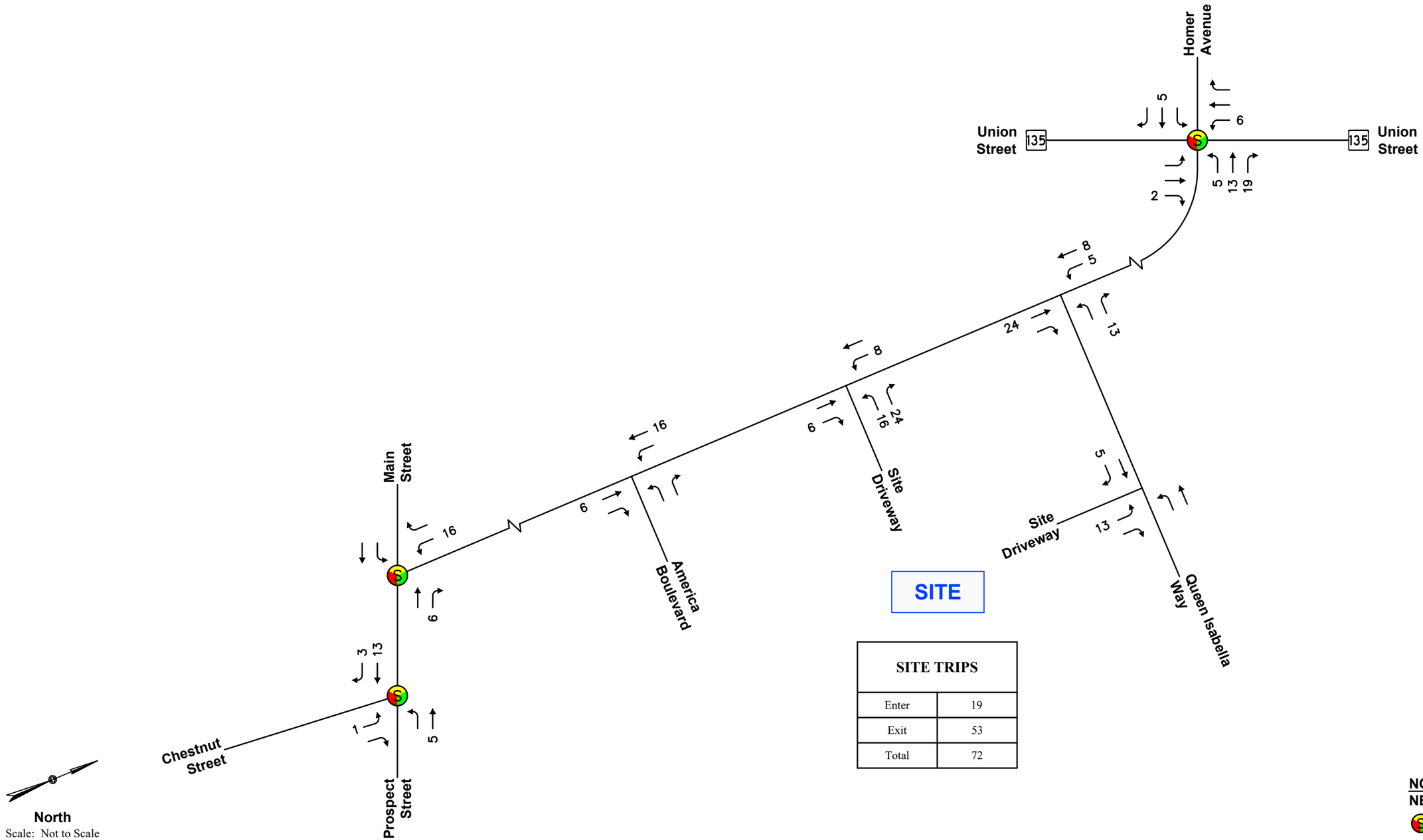
Journey-to-Work Distribution

US Census Journey-to-Work Data

Residence Town Name	Workplace Town Name	All Workers	% of Total Rounded
Ashland town	Framingham town	1,510	16.3%
Ashland town	Ashland town	1,362	14.7%
Ashland town	Boston city	1,301	14.0%
Ashland town	Natick town	637	6.9%
Ashland town	Newton city	348	3.8%
Ashland town	Wellesley town	325	3.5%
Ashland town	Marlborough city	265	2.9%
Ashland town	Hopkinton town	186	2.0%
Ashland town	Milford town	165	1.8%
Ashland town	Worcester city	159	1.7%
Ashland town	Cambridge city	129	1.4%
Ashland town	Waltham city	128	1.4%
Ashland town	Brookline town	117	1.3%
Ashland town	Westborough town	111	1.2%
Ashland town	Holliston town	90	1.0%
Ashland town	Needham town	86	0.9%
Ashland town	Canton town	80	0.9%
Ashland town	Southborough town	78	0.8%
Ashland town	Wayland town	77	0.8%
Ashland town	Franklin Town city	74	0.8%
Ashland town	Concord town	68	0.7%
Ashland town	Plainville town	66	0.7%
Ashland town	Lowell city	65	0.7%
Ashland town	Watertown Town city	64	0.7%
Ashland town	Burlington town	60	0.6%
Ashland town	Weston town	57	0.6%
Ashland town	Malden city	56	0.6%
Ashland town	Woburn city	54	0.6%
Ashland town	Chelsea city	51	0.6%
Ashland town	Maynard town	48	0.5%
Ashland town	Tewksbury town	47	0.5%
	Sub-Total	**7,865**	**85%**
	Other	1,403	15%
	Total	**9,268**	**100%**

	To/From Routes										
	Route 135 (To/From West)		Route 135 (To/From East)		Homer Street (To/From North)		Prospect Street (To/From South)		Chestnut Street (To/From West)		Total
Workplace											
Framingham town		0.0%	50%	8.1%		0.0%	50%	8.1%		0.0%	16.3%
Ashland town	30%	4.4%	15%	2.2%	10%	1.5%	30%	4.4%	15%	2.2%	14.7%
Boston city		0.0%	50%	7.0%	50%	7.0%		0.0%		0.0%	14.0%
Natick town		0.0%	50%	3.4%		0.0%	50%	3.4%		0.0%	6.9%
Newton city		0.0%	50%	1.9%	50%	1.9%		0.0%		0.0%	3.8%
Wellesley town		0.0%	50%	1.8%		0.0%	50%	1.8%		0.0%	3.5%
Marlborough city		0.0%		0.0%	100%	2.9%		0.0%		0.0%	2.9%
Hopkinton town	100%	2.0%		0.0%		0.0%		0.0%		0.0%	2.0%
Milford town	50%	0.9%		0.0%		0.0%		0.0%	50%	0.9%	1.8%
Worcester city		0.0%		0.0%	100%	1.7%		0.0%		0.0%	1.7%
Cambridge city		0.0%	50%	0.7%	50%	0.7%		0.0%		0.0%	1.4%
Waltham city		0.0%		0.0%	100%	1.4%		0.0%		0.0%	1.4%
Brookline town		0.0%		0.0%	100%	1.3%		0.0%		0.0%	1.3%
Westborough town	50%	0.6%		0.0%	50%	0.6%		0.0%		0.0%	1.2%
Holliston town		0.0%		0.0%		0.0%	50%	0.5%	50%	0.5%	1.0%
Needham town		0.0%	50%	0.5%		0.0%	50%	0.5%		0.0%	0.9%
Canton town		0.0%		0.0%		0.0%	100%	0.9%		0.0%	0.9%
Southborough town		0.0%		0.0%	100%	0.8%		0.0%		0.0%	0.8%
Wayland town		0.0%	100%	0.8%		0.0%		0.0%		0.0%	0.8%
Franklin Town city		0.0%		0.0%		0.0%	50%	0.4%	50%	0.4%	0.8%
Concord town		0.0%	75%	0.6%	25%	0.2%		0.0%		0.0%	0.7%
Plainville town		0.0%		0.0%		0.0%	100%	0.7%		0.0%	0.7%
Lowell city		0.0%		0.0%	100%	0.7%		0.0%		0.0%	0.7%
Watertown Town city		0.0%	25%	0.2%	50%	0.3%	25%	0.2%		0.0%	0.7%
Burlington town		0.0%	50%	0.3%	50%	0.3%		0.0%		0.0%	0.6%
Weston town		0.0%	100%	0.6%		0.0%		0.0%		0.0%	0.6%
Malden city		0.0%		0.0%	100%	0.6%		0.0%		0.0%	0.6%
Woburn city		0.0%		0.0%	100%	0.6%		0.0%		0.0%	0.6%
Chelsea city		0.0%		0.0%	100%	0.6%		0.0%		0.0%	0.6%
Maynard town		0.0%	100%	0.5%		0.0%		0.0%		0.0%	0.5%
Tewksbury town		0.0%		0.0%	100%	0.5%		0.0%		0.0%	0.5%
Sub-Total		7.9%		28.6%		23.5%		20.8%		4.0%	84.9%
Other		1.4%		5.1%		4.2%		3.7%		0.7%	15.1%
Total		9.3%		33.7%		27.7%		24.6%		4.7%	100.0%
	SAY	10%		35%		25%		25%		5%	100%

G:\Projects\1377 - Ashland (MW YMCA)\Excel\Trip Generation\1140 - Journey to Work (For BK)



SITE TRIPS	
Enter	19
Exit	53
Total	72

NOTES:
NEGL. = Negligible
S = Signalized Intersection

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Attachment 1

Trip Generation
Weekday Morning Peak Hour Traffic Volumes

Date: May 2021
Dwg No. 1140 TIAS.dwg
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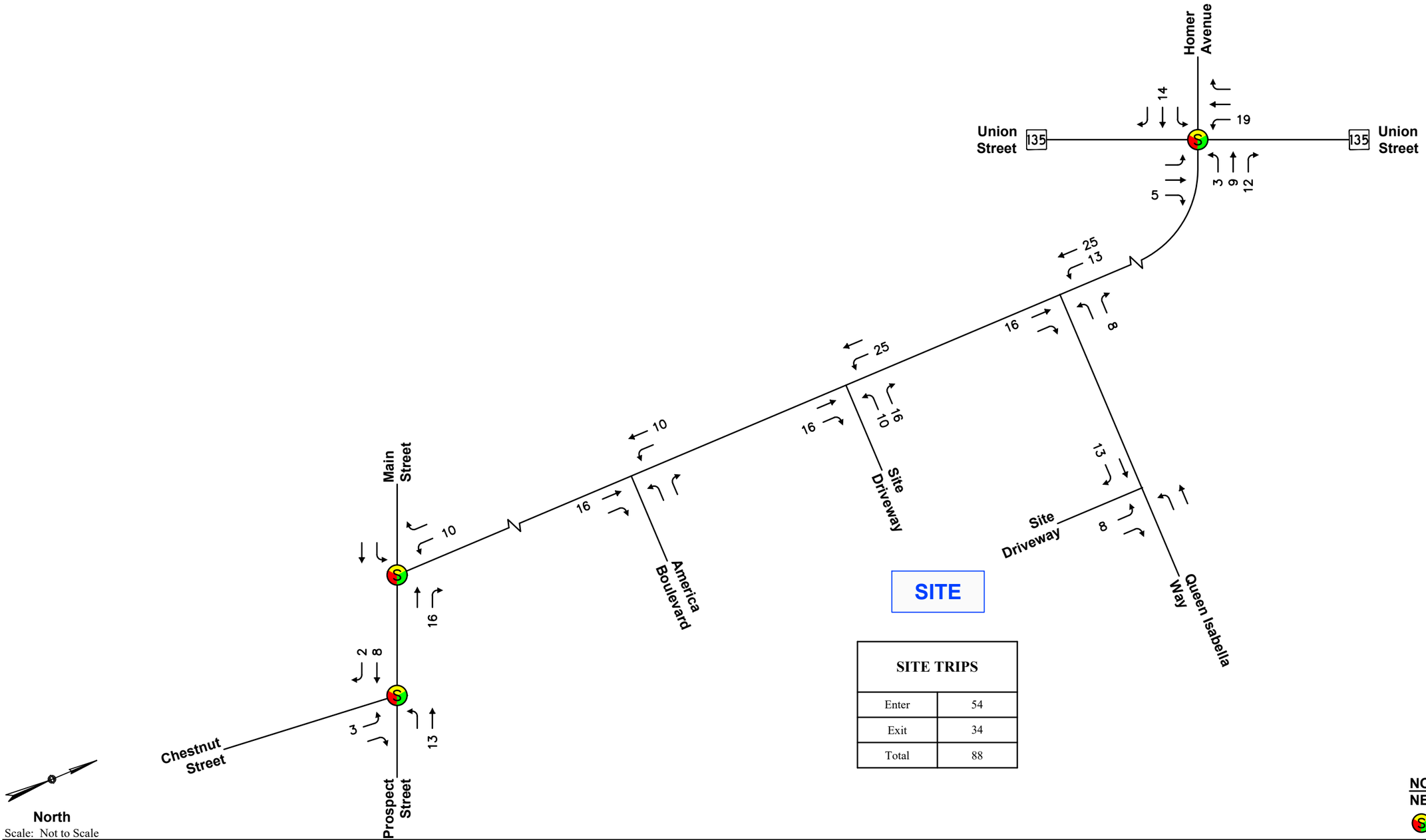

SITE TRIPS	
Enter	54
Exit	34
Total	88

NOTES:
NEGL. = Negligible
S = Signalized Intersection

Attachment 2

Trip Generation
Weekday Evening Peak Hour Traffic Volumes

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Date: May 2021
Dwg No. 1140 TIAS.dwg
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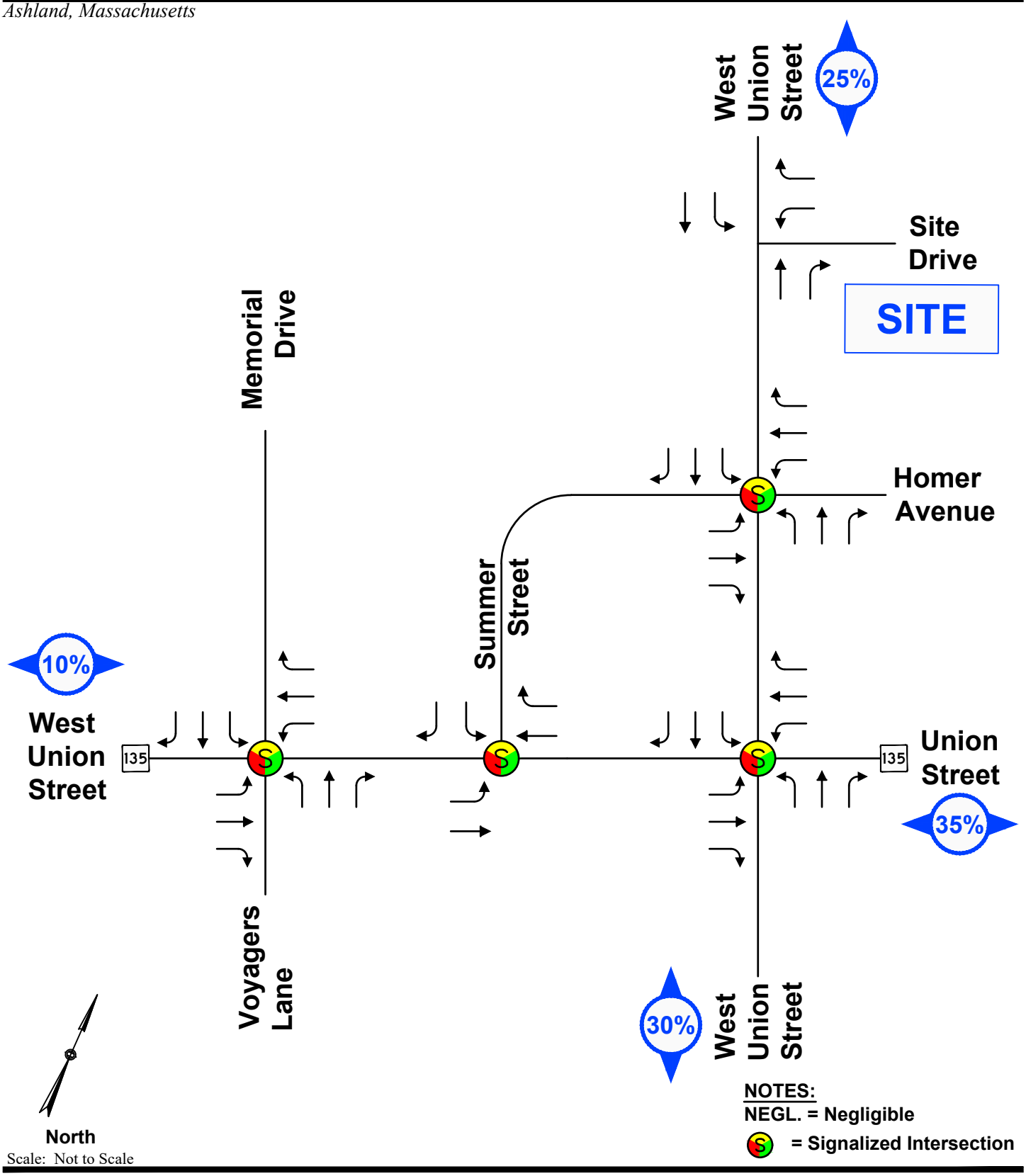

Attachment 3

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Trip Distribution
Weekday & Saturday Peak Hours

Date: November 2024
Dwg No. 1377 TIA.dwg
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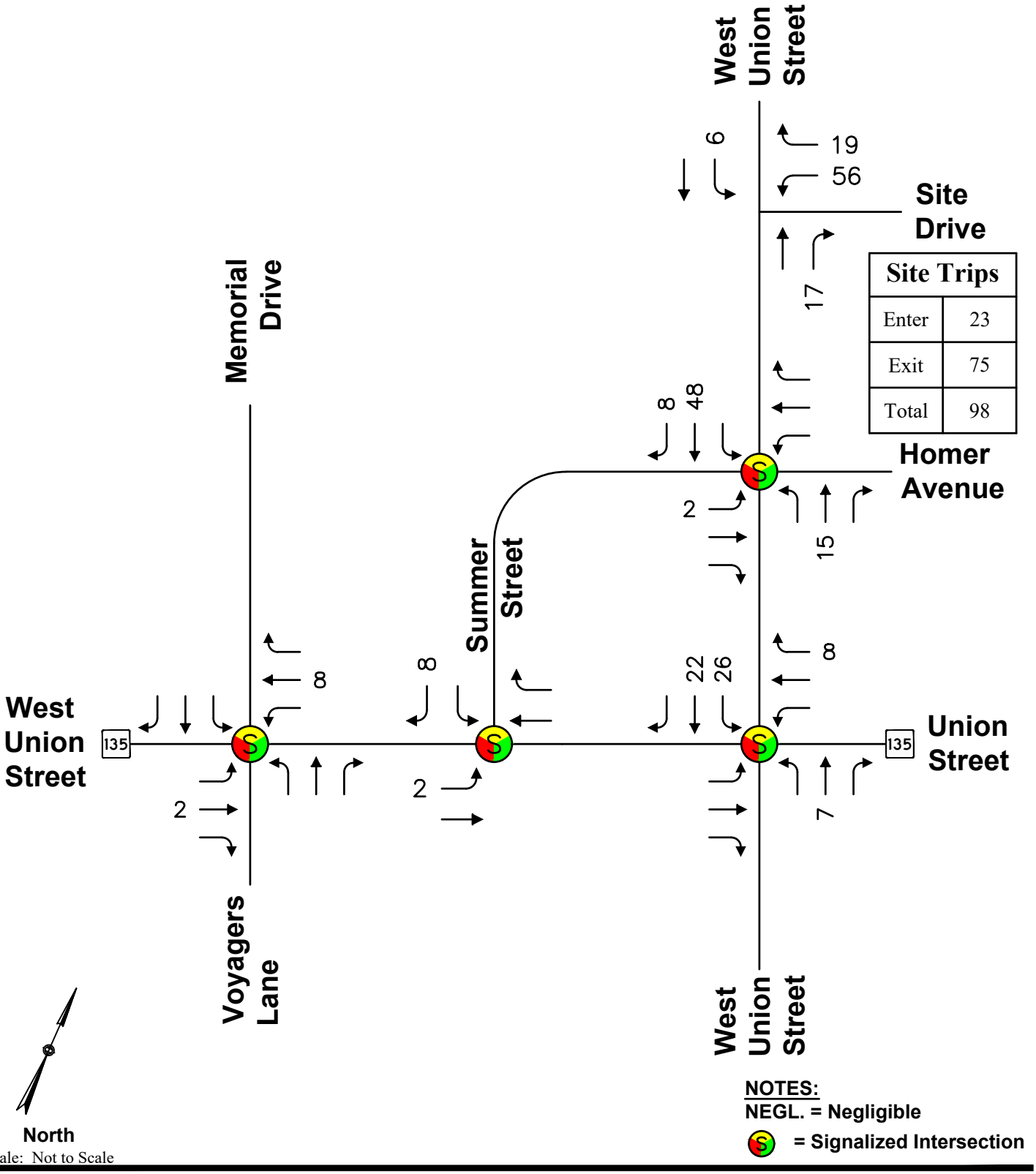

Attachment 4

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Sanctuary Ashland Trip Generation
Weekday Morning Peak Hour Volumes

Date: November 2024
Dwg No. 1377 TIA.dwg
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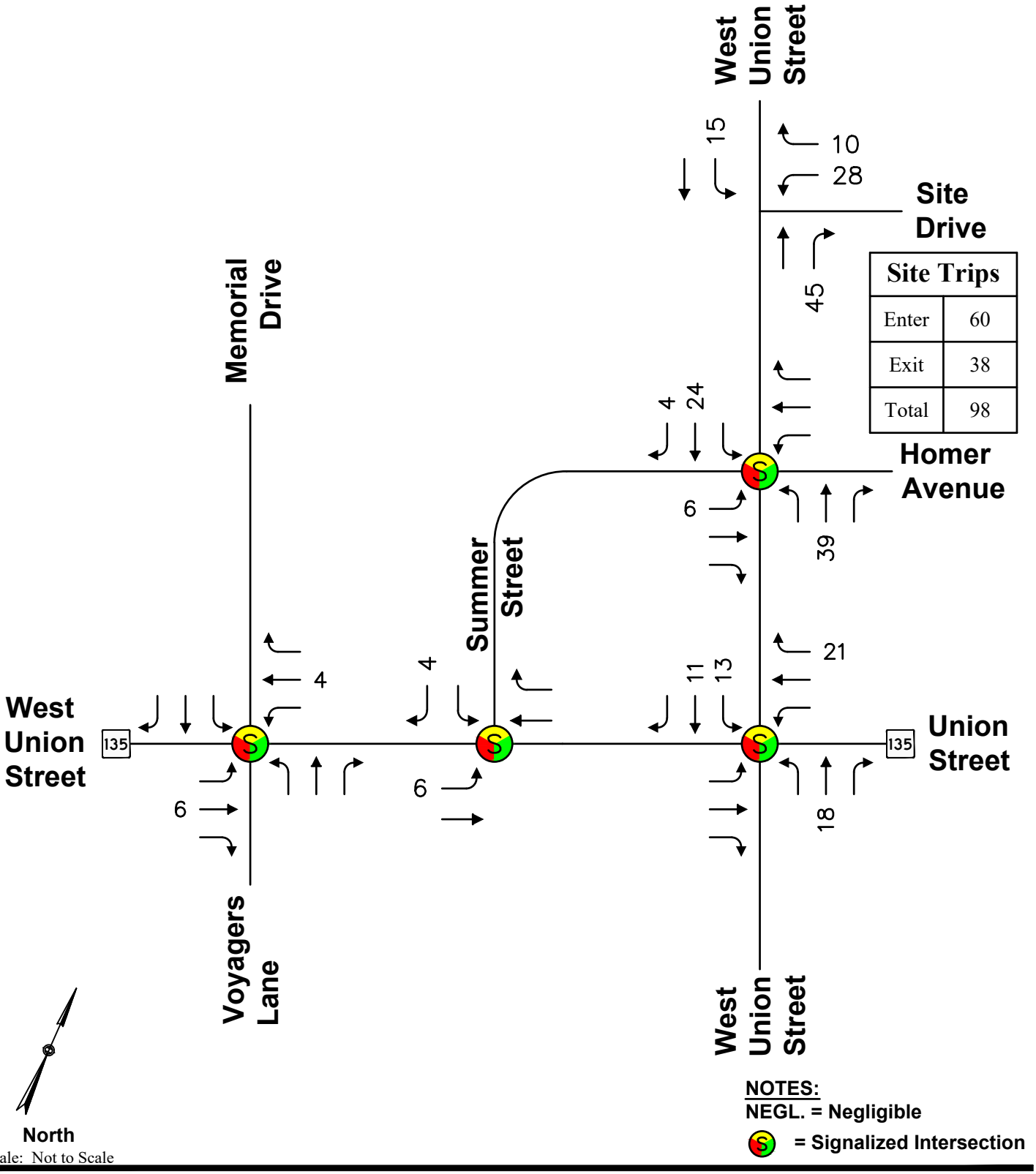

Attachment 5

MDM TRANSPORTATION CONSULTANTS, INC.
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Sanctuary Ashland Trip Generation
Weekday Evening Peak Hour Volumes

Date: November 2024
Dwg No. 1377 TIA.dwg
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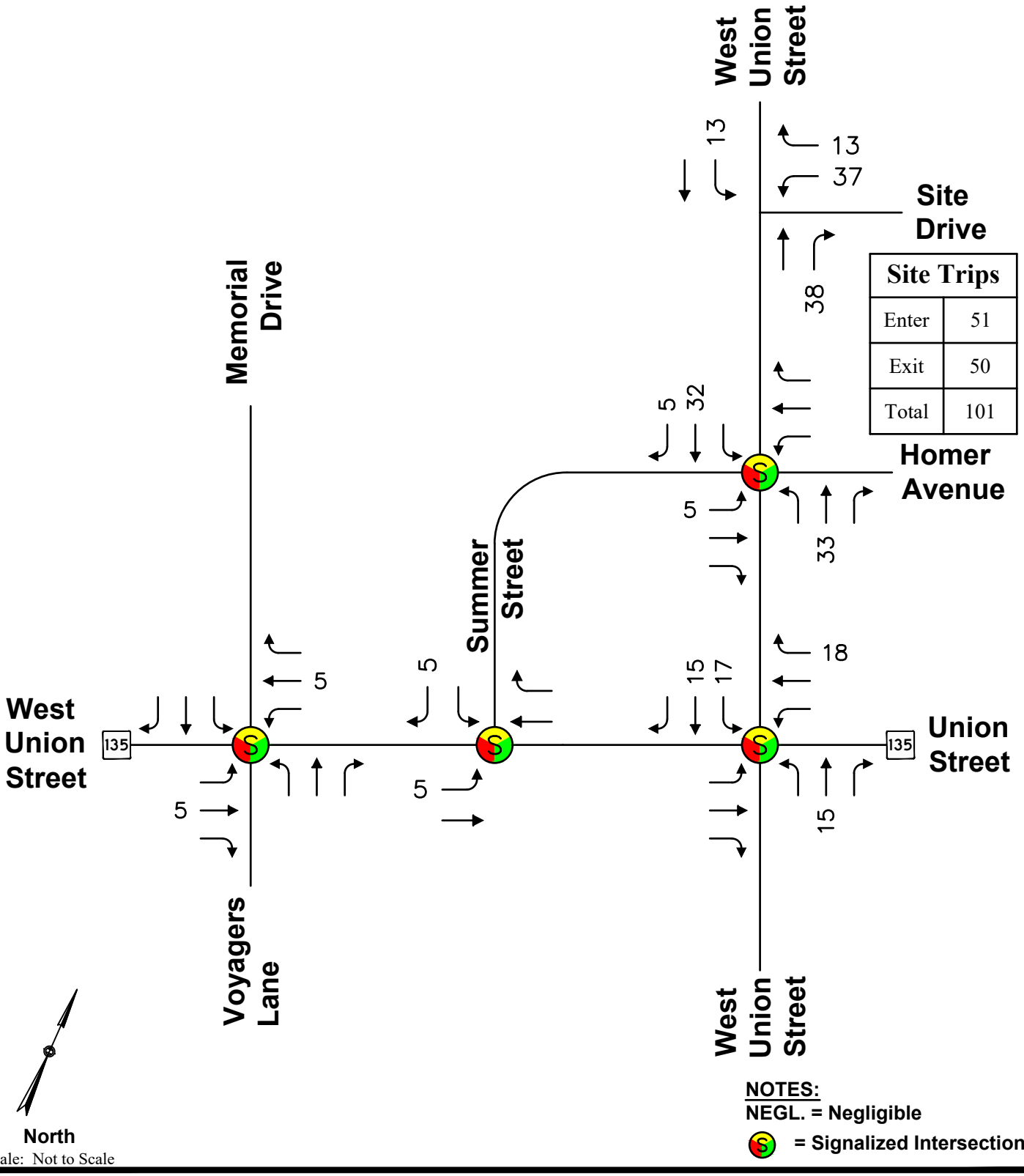

Attachment 6

MDM TRANSPORTATION CONSULTANTS, INC.
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Sanctuary Ashland Trip Generation
Saturday Midday Peak Hour Volumes

Date: November 2024
Dwg No. 1377 TIA.dwg
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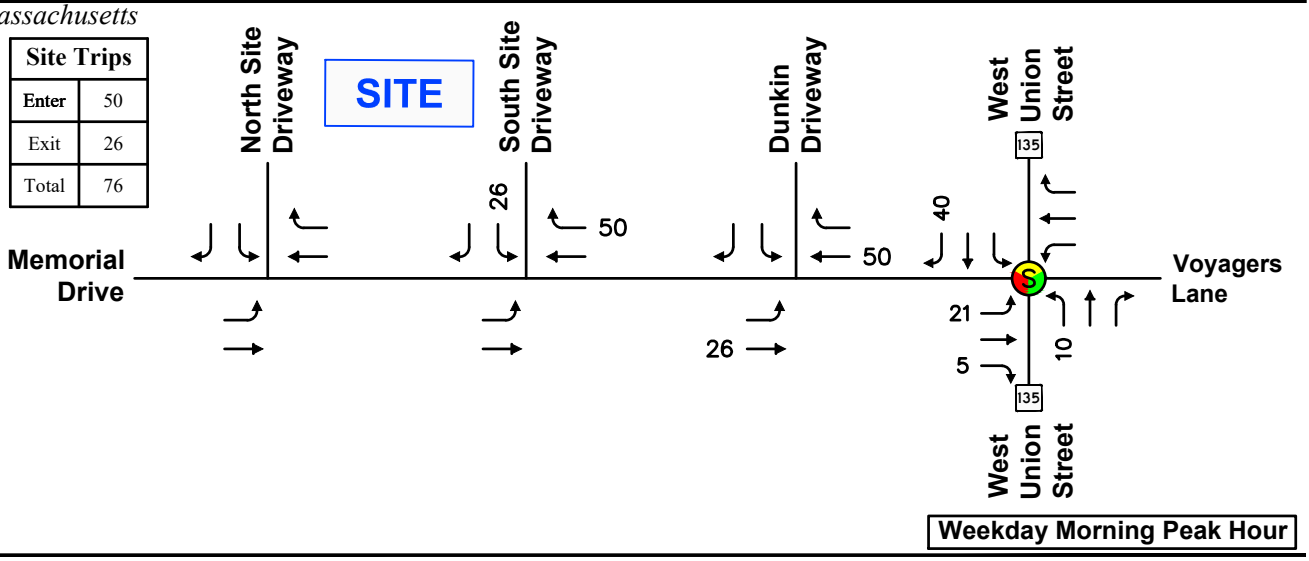

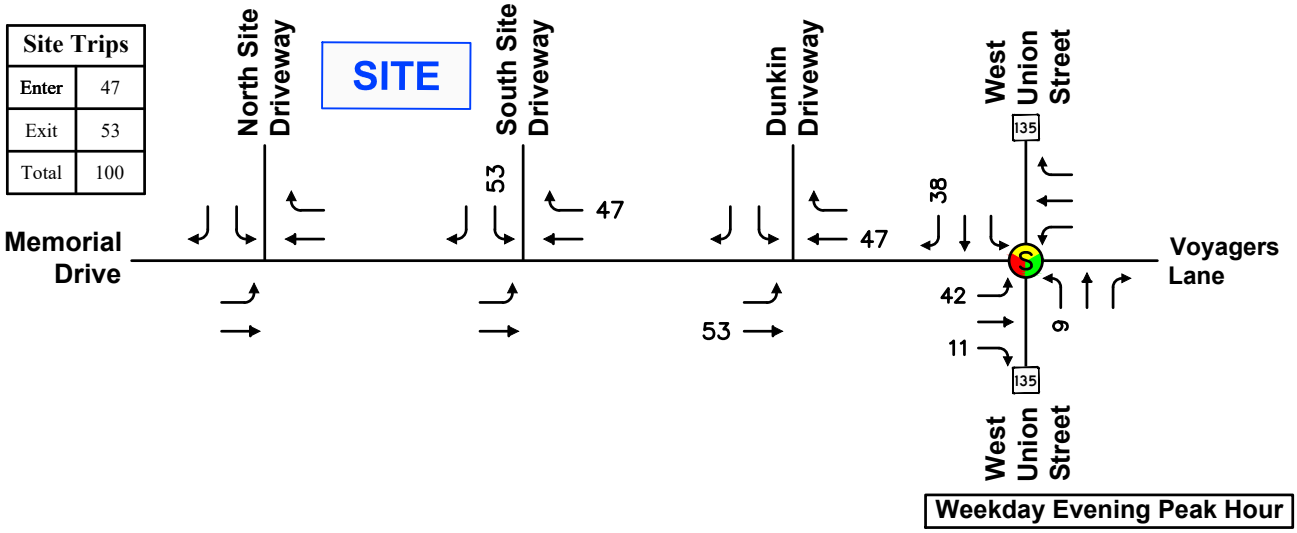

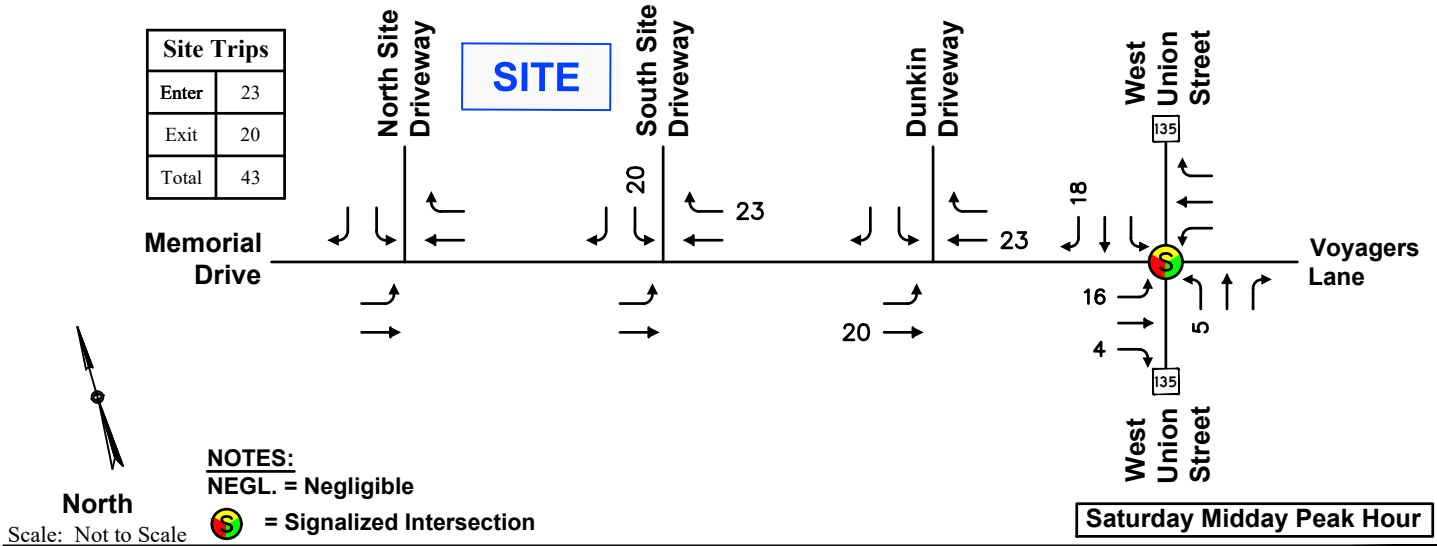

Attachment 7

MDM TRANSPORTATION CONSULTANTS, INC.
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YMCA Trip Generation
Weekday & Saturday Peak Hour Volumes

Date: November 2024
Dwg No. 1377 TIA.dwg
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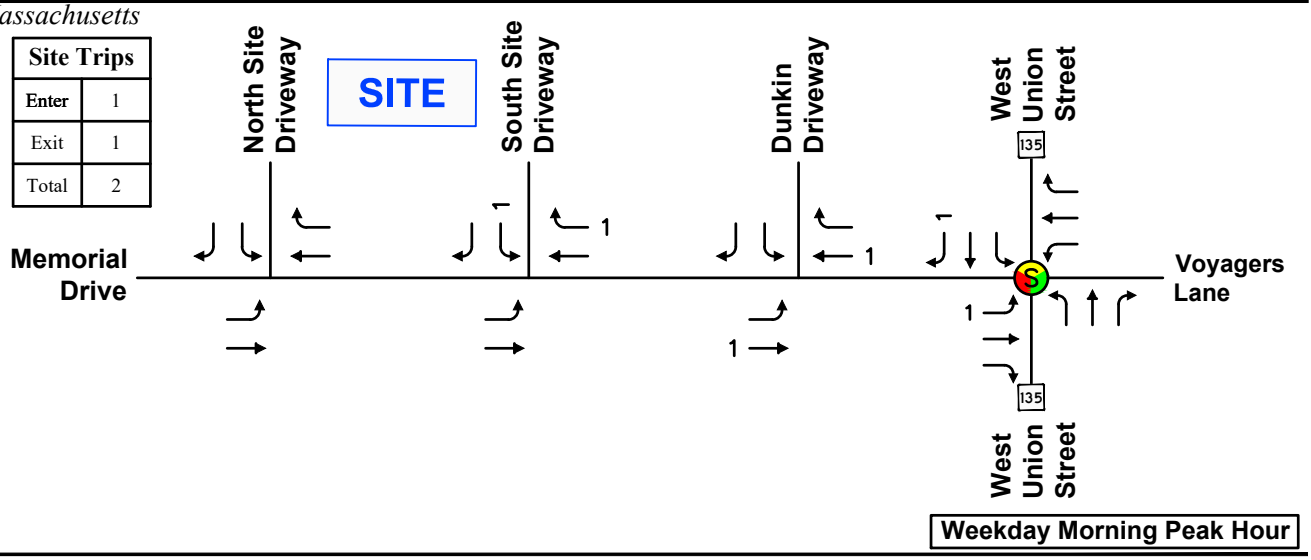

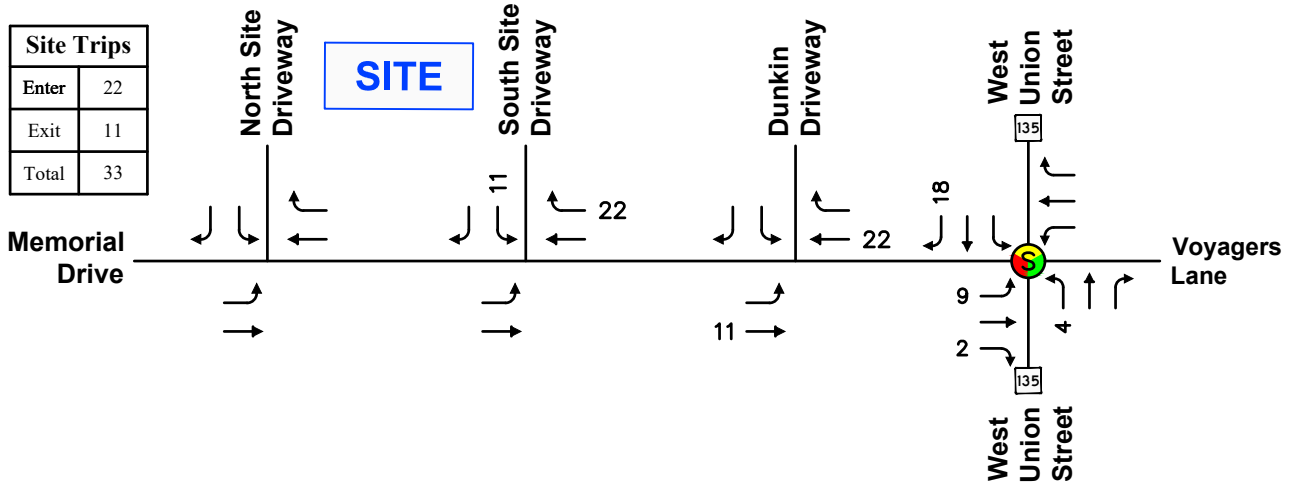

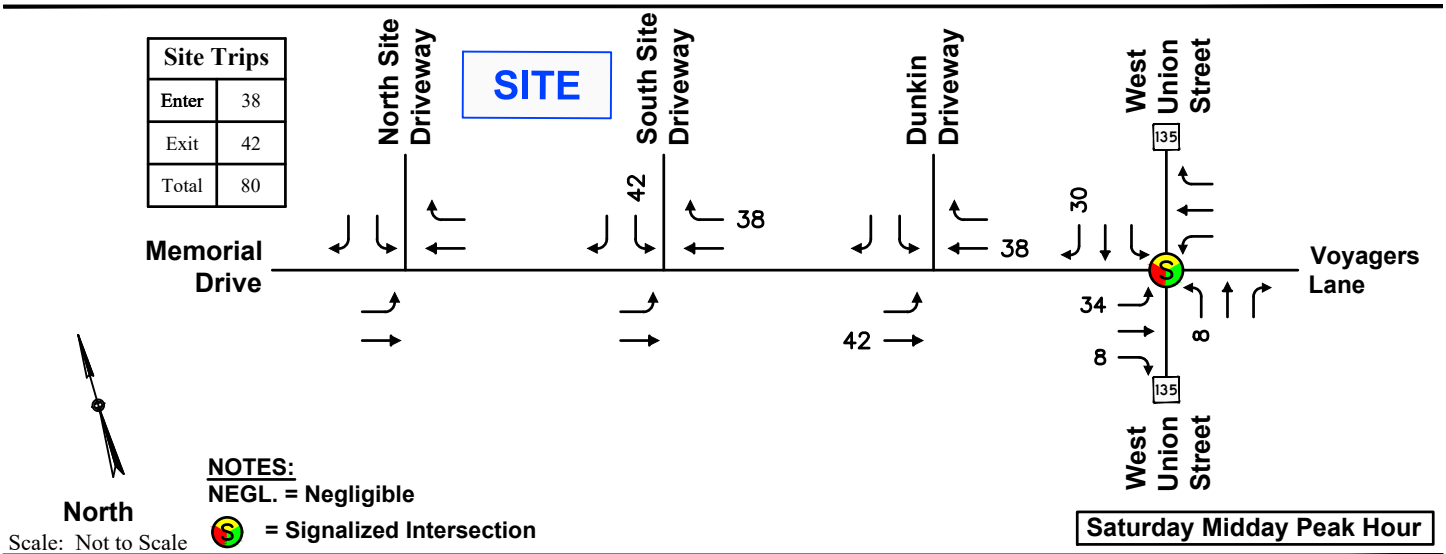

Attachment 8

MDM TRANSPORTATION CONSULTANTS, INC.
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Soccer Fields Trip Generation
Weekday & Saturday Peak Hour Volumes

Date: November 2024
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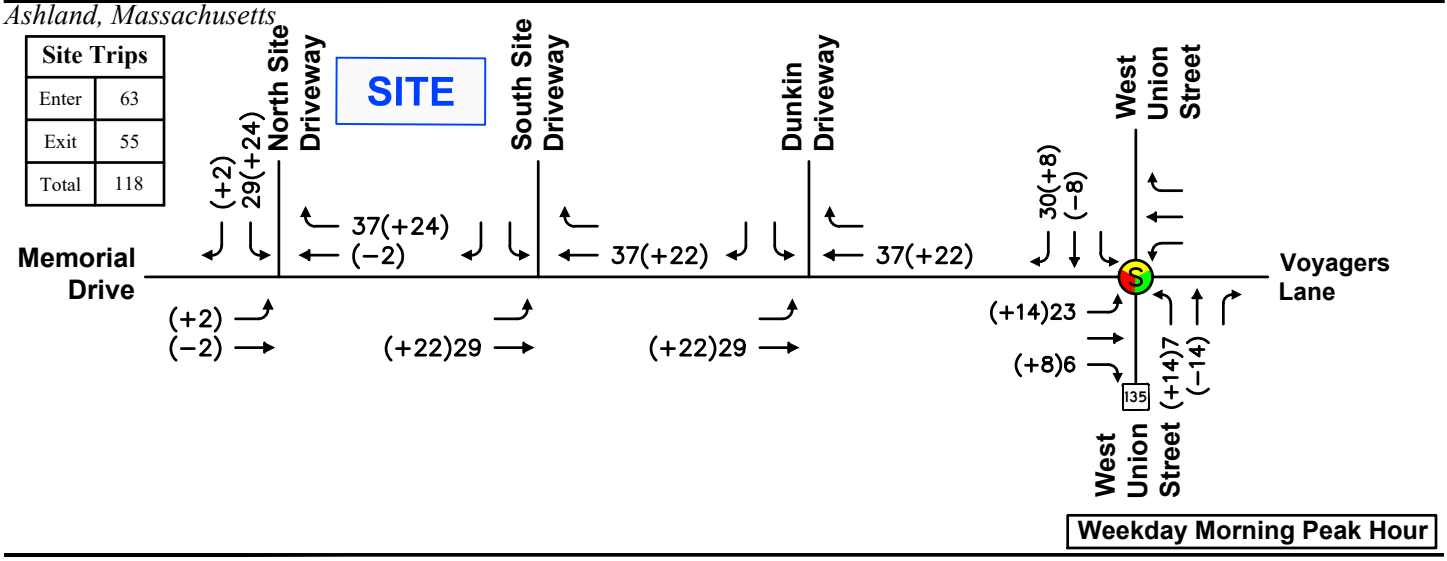

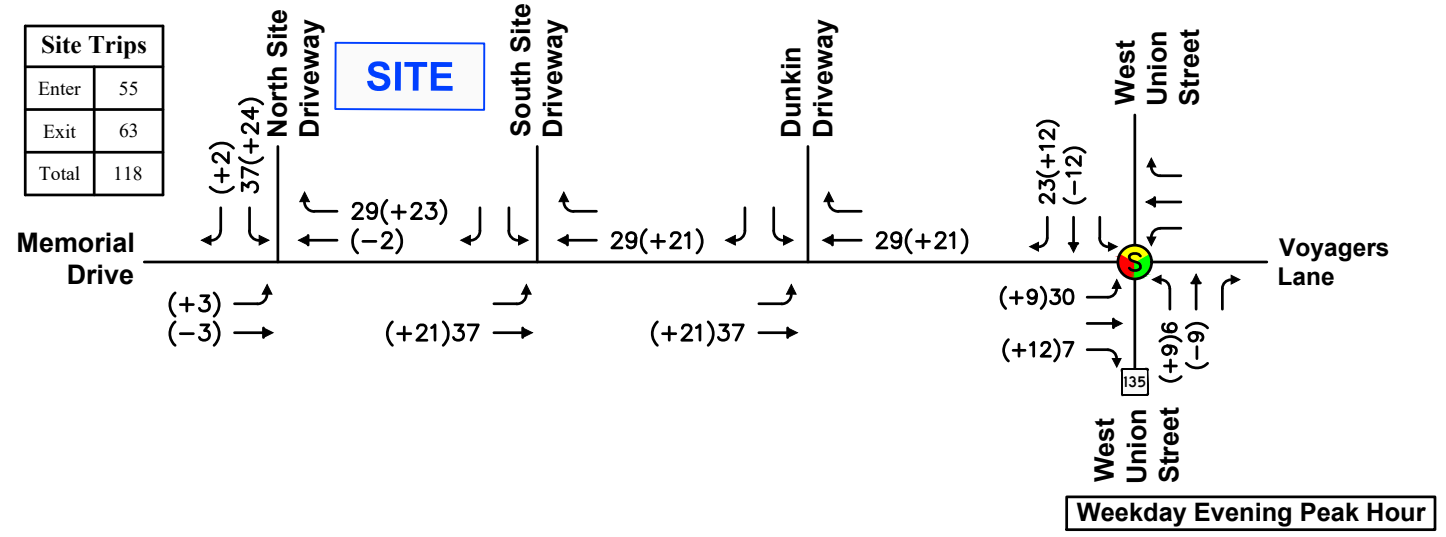

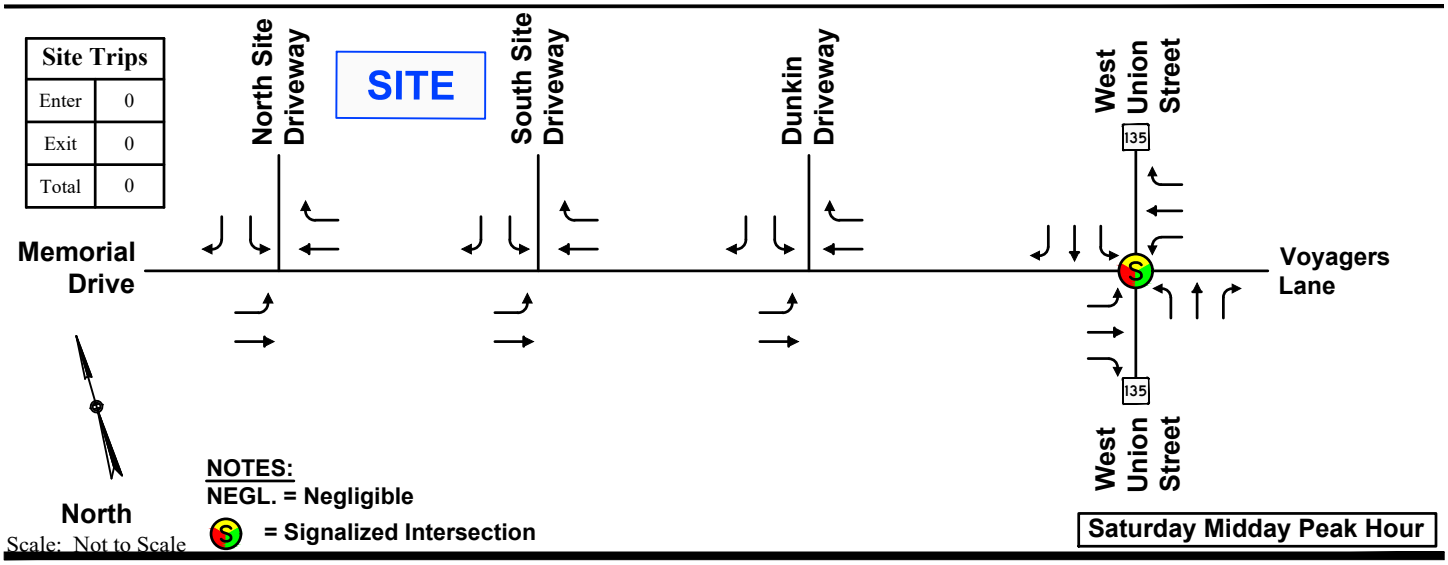

Scale: Not to Scale

Attachment 9

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Day Care & Pass By Trip Generation
Weekday & Saturday Peak Hour Volumes

Date: November 2024
Dwg No. 1377 TIA.dwg
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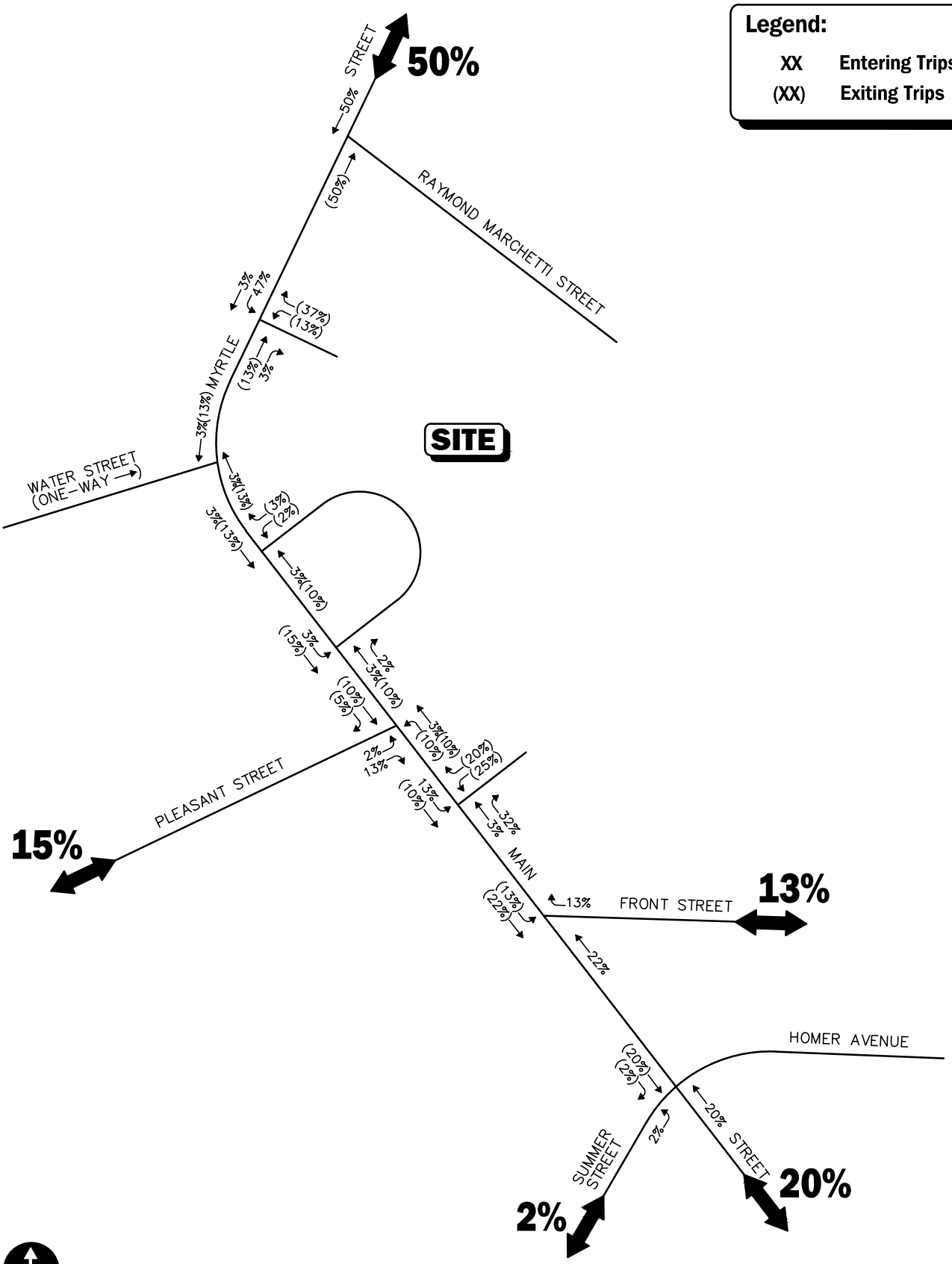
Table 5
TRIP-GENERATION SUMMARY

	Vehicle Trips										
	Residential Component[a]			Restaurant Component[b]			Retail Component[c]			**Project Total**	
Time Period/Direction	(A) Automobile Trips (90%)	(B) Transit Trips (8%)	(C) Pedestrian/ Bicycle Trips (2%)	(D) Net Trips	(E) Pass-By Trips[d]	(F = D – E) New Trips	(G) Net Trips	(H) Pass-By Trips[e]	(I = G – H) New Trips	**(J = E + H) Total Pass-By Trips**	**(K = A + F + I) Total New Trips**
Average Weekday Daily:											
Entering	455	41	10	375	161	214	191	59	132	220	801
Exiting	455	41	10	375	161	214	191	59	132	220	801
Total	910	82	20	750	322	428	382	118	264	440	1,602
Weekday Morning Peak-Hour:											
Entering	21	2	0	40	15	25	11	0	11	15	57
Exiting	66	6	2	33	15	18	7	0	7	15	91
Total	87	8	2	73	30	43	18	0	18	30	148
Weekday Evening Peak-Hour:											
Entering	40	4	1	39	12	27	29	11	18	23	85
Exiting	27	2	0	19	12	7	25	11	14	23	48
Total	67	6	1	58	24	34	54	22	32	46	133

[a]Based on ITE LUC 221, *Multifamily Housing (Mid-Rise)*, (250 Units).
[b]Based on ITE LUC 932, *High-Turnover (Sit-Down) Restaurant*, (7,783 sf)
[c]Based on ITE LUC 822, *Strip Retail Plaza (<40k)*, (7,782 sf).
[d]Pass-by trip rates were obtained from ITE LUC 932, *High-Turnover (Sit-Down) Restaurant*, and were applied as follows: average weekday daily, weekday morning peak-hour, and weekday evening peak-hour = 43 percent.
[e]Pass-by trip rates were obtained from ITE LUC 821, *Shopping Plaza (40-150k),* and were applied as follows: average weekday daily = 31 percent; weekday morning peak-hour = 0 percent; and weekday evening peak-hour = 40 percent.



Not To Scale

Figure 7

Trip Distribution Map
Residential

Vanasse & Associates inc

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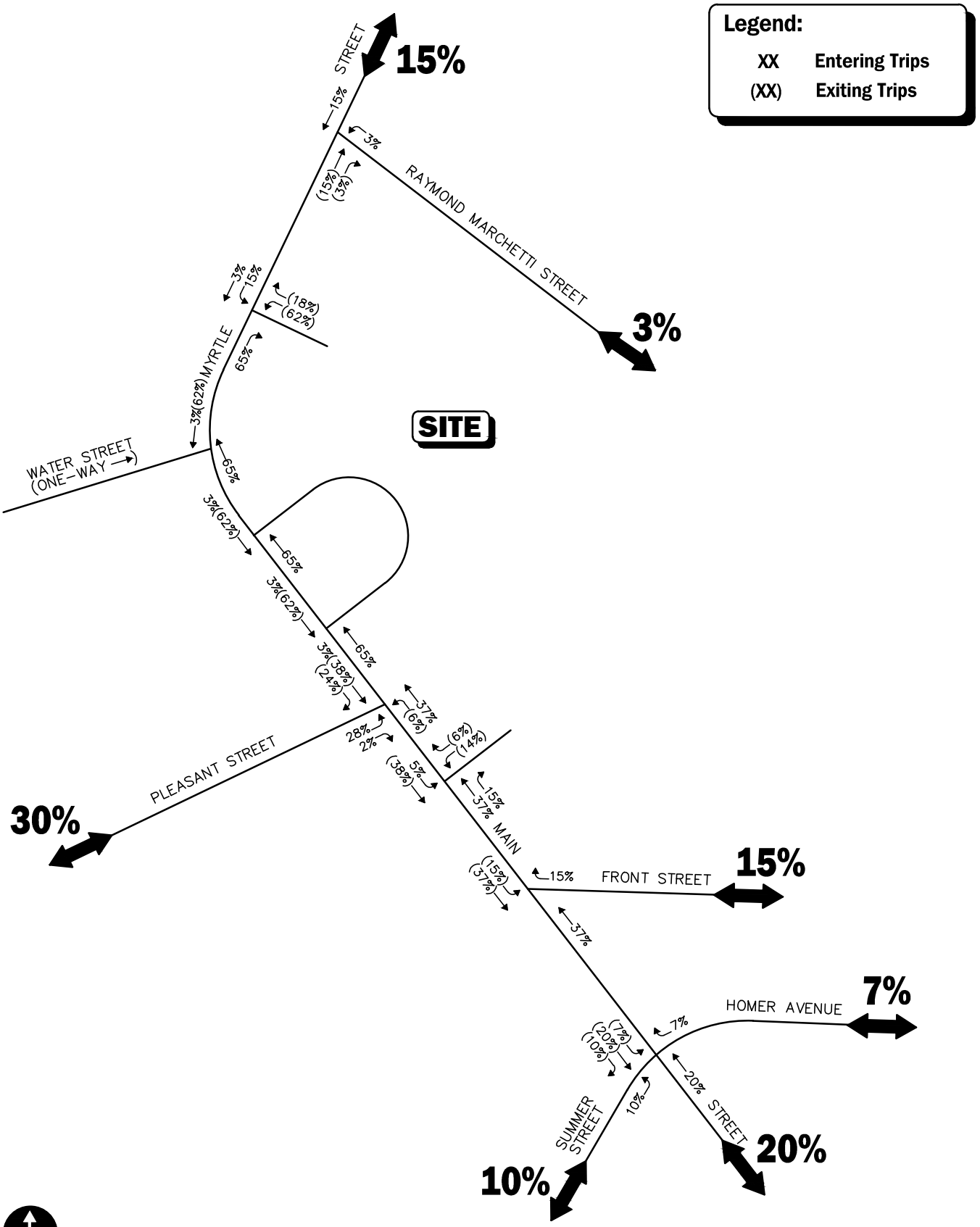

Not To Scale

Figure 8

Trip Distribution Map
Commercial

Vanasse & Associates inc

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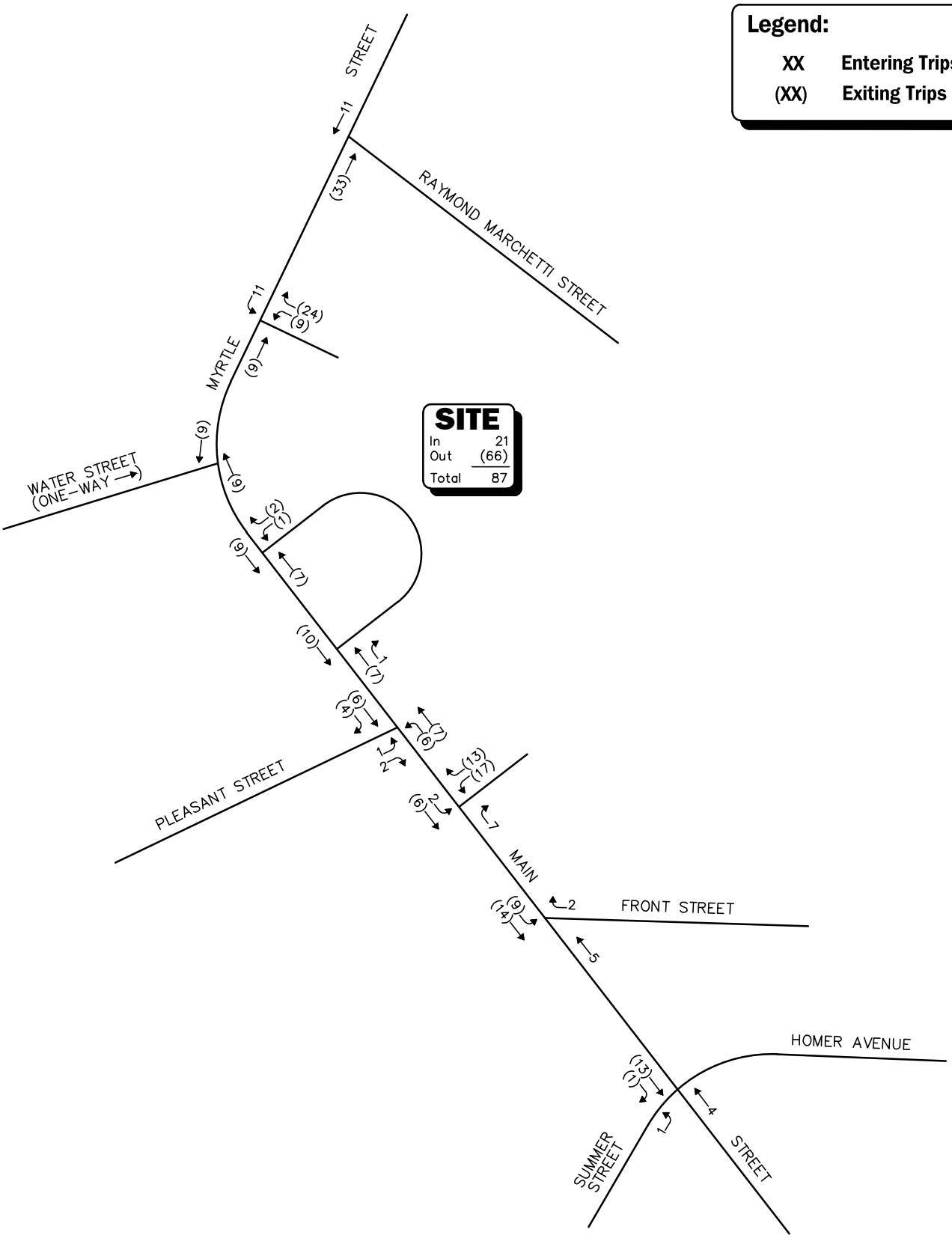

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Figure 9

Project-Generated Residential Weekday Morning Peak-Hour Traffic Volumes

Vanasse & Associates inc

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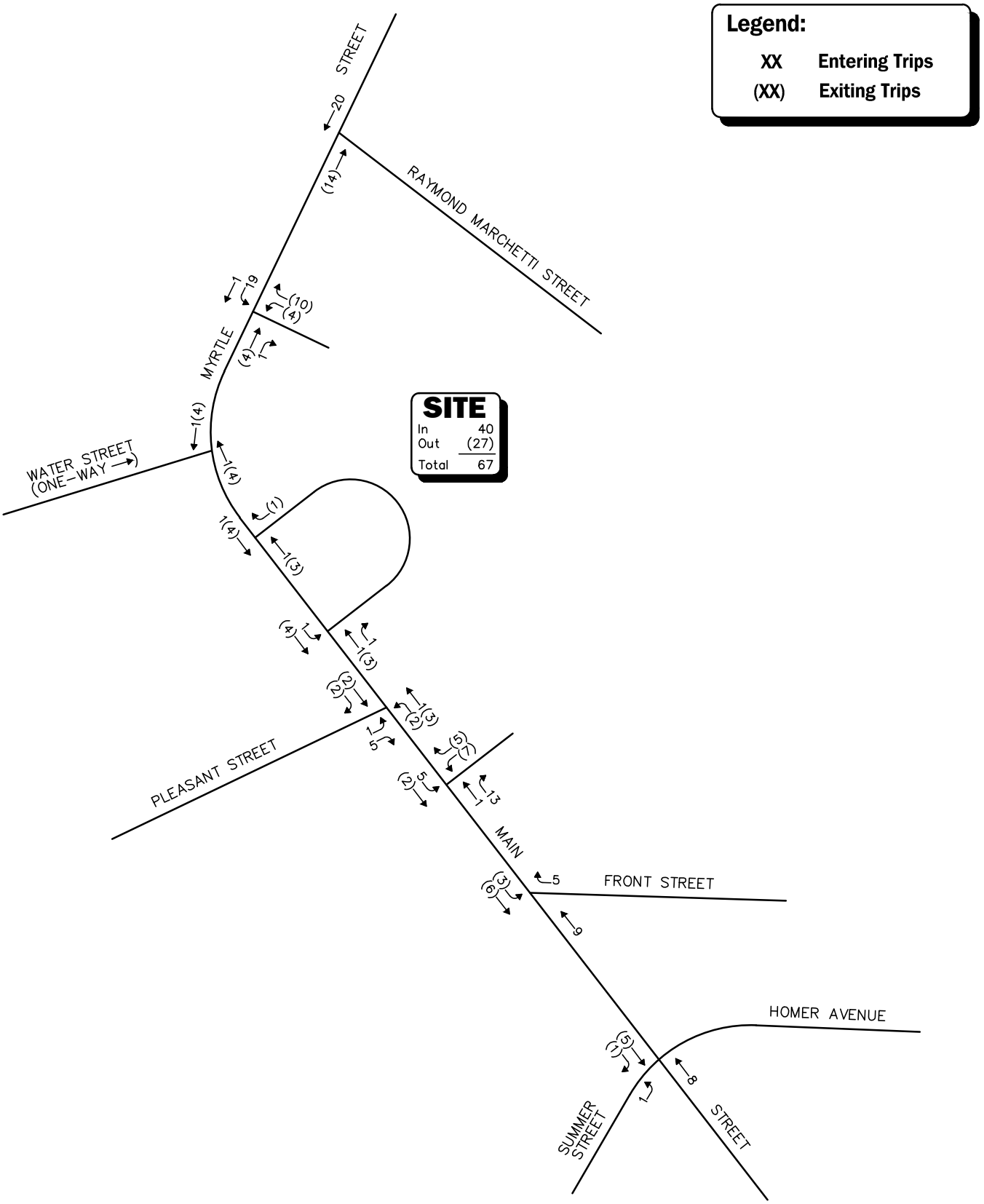

Not To Scale

Figure 10

Project-Generated Residential Weekday Evening Peak-Hour Traffic Volumes

Vanasse & Associates inc

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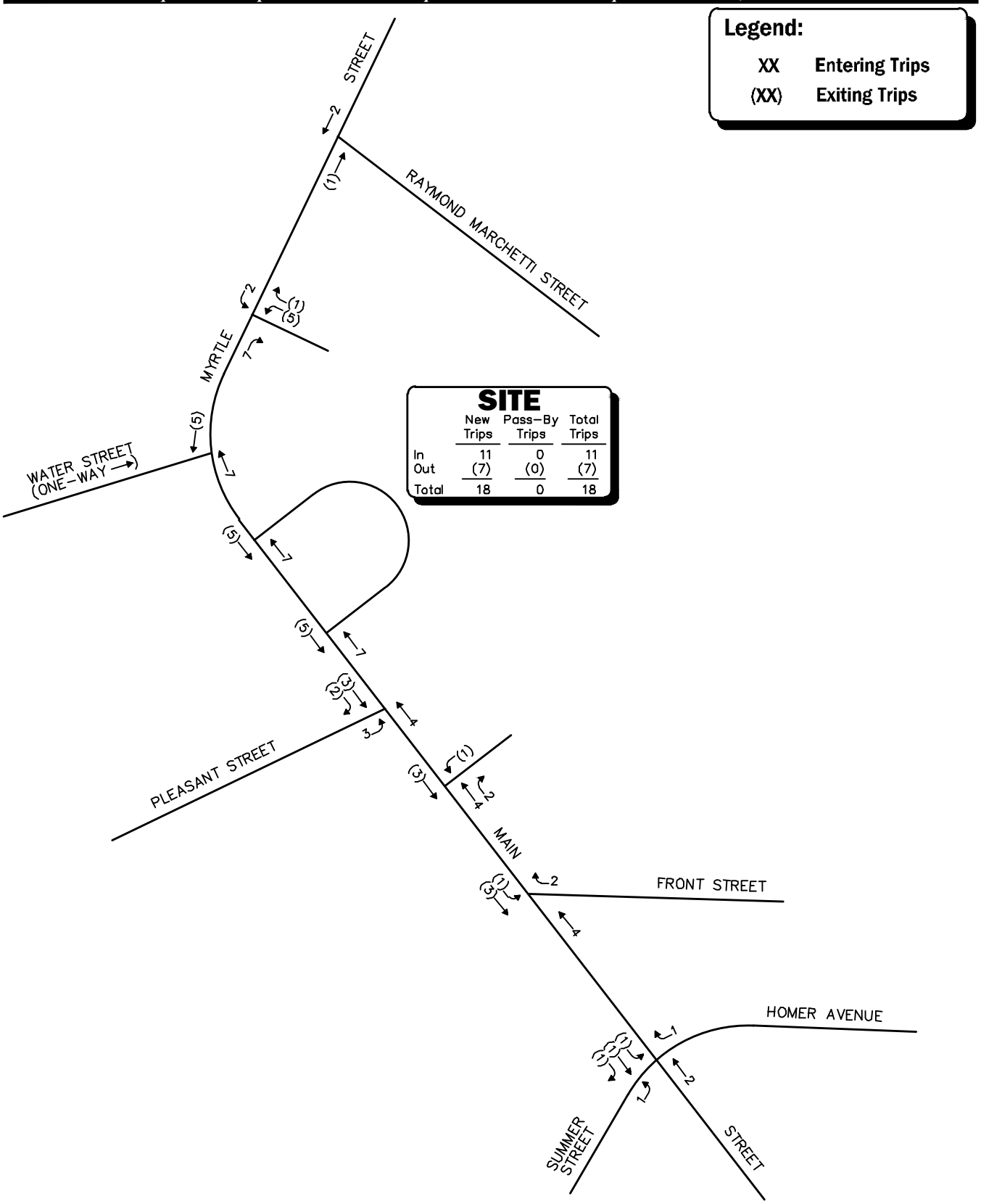

Not To Scale

Figure 11

Project-Generated Retail Weekday Morning Peak-Hour Traffic Volumes

Vanasse & Associates inc

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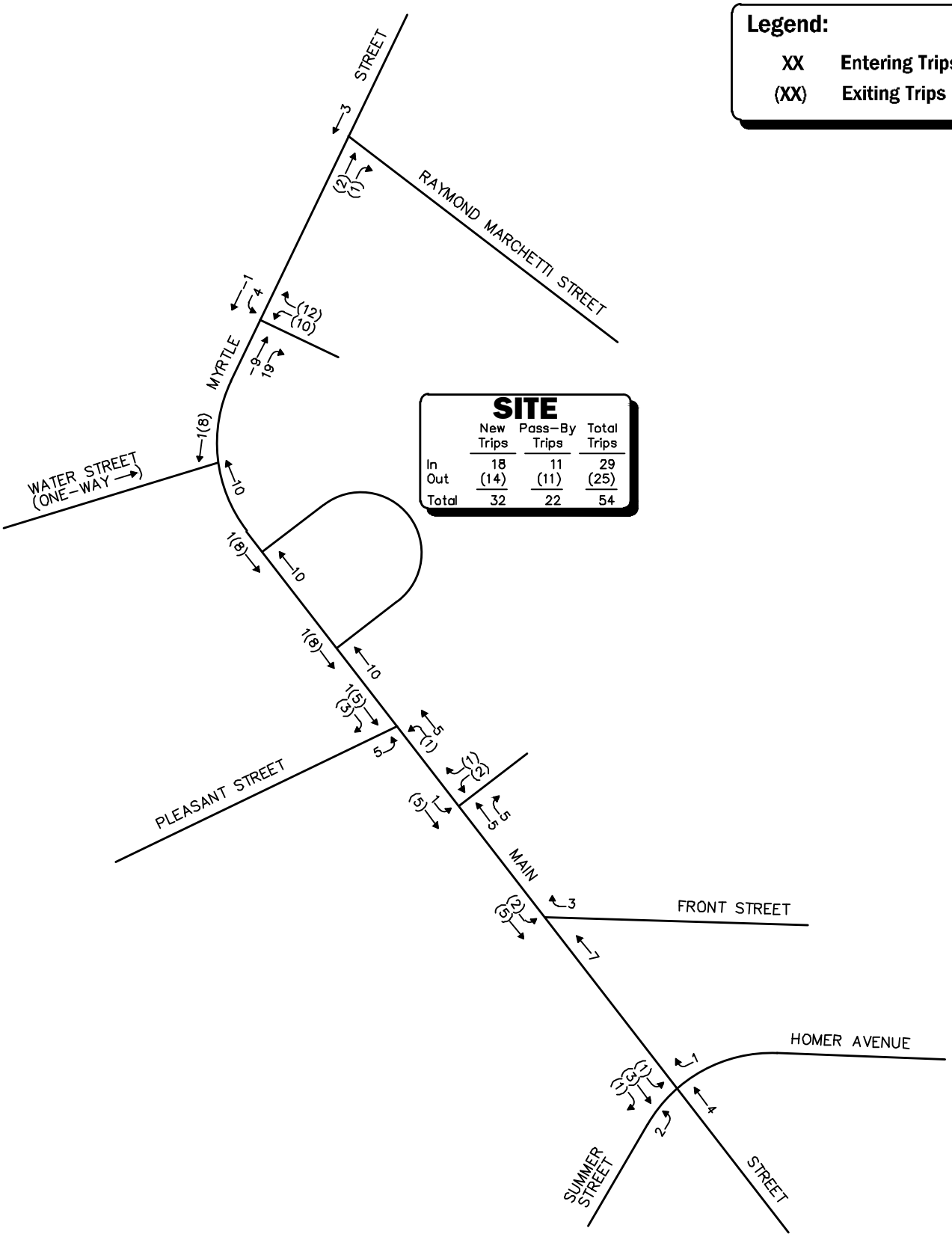

Not To Scale

Figure 12

Project-Generated Retail Weekday Evening Peak-Hour Traffic Volumes

Vanasse & Associates inc

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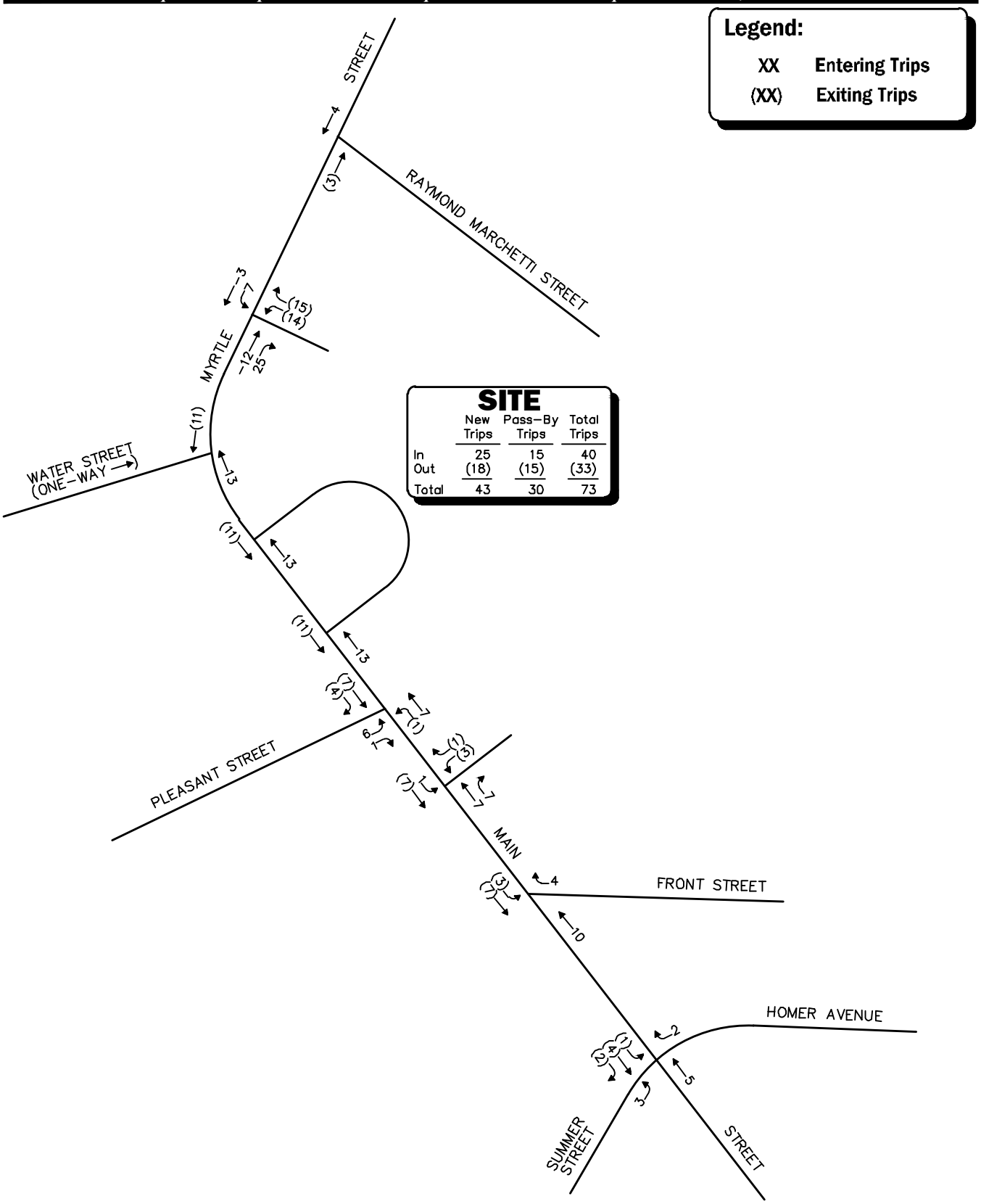

Not To Scale

Figure 13

Project-Generated Restaurant Weekday Morning Peak-Hour Traffic Volumes

Vanasse & Associates inc

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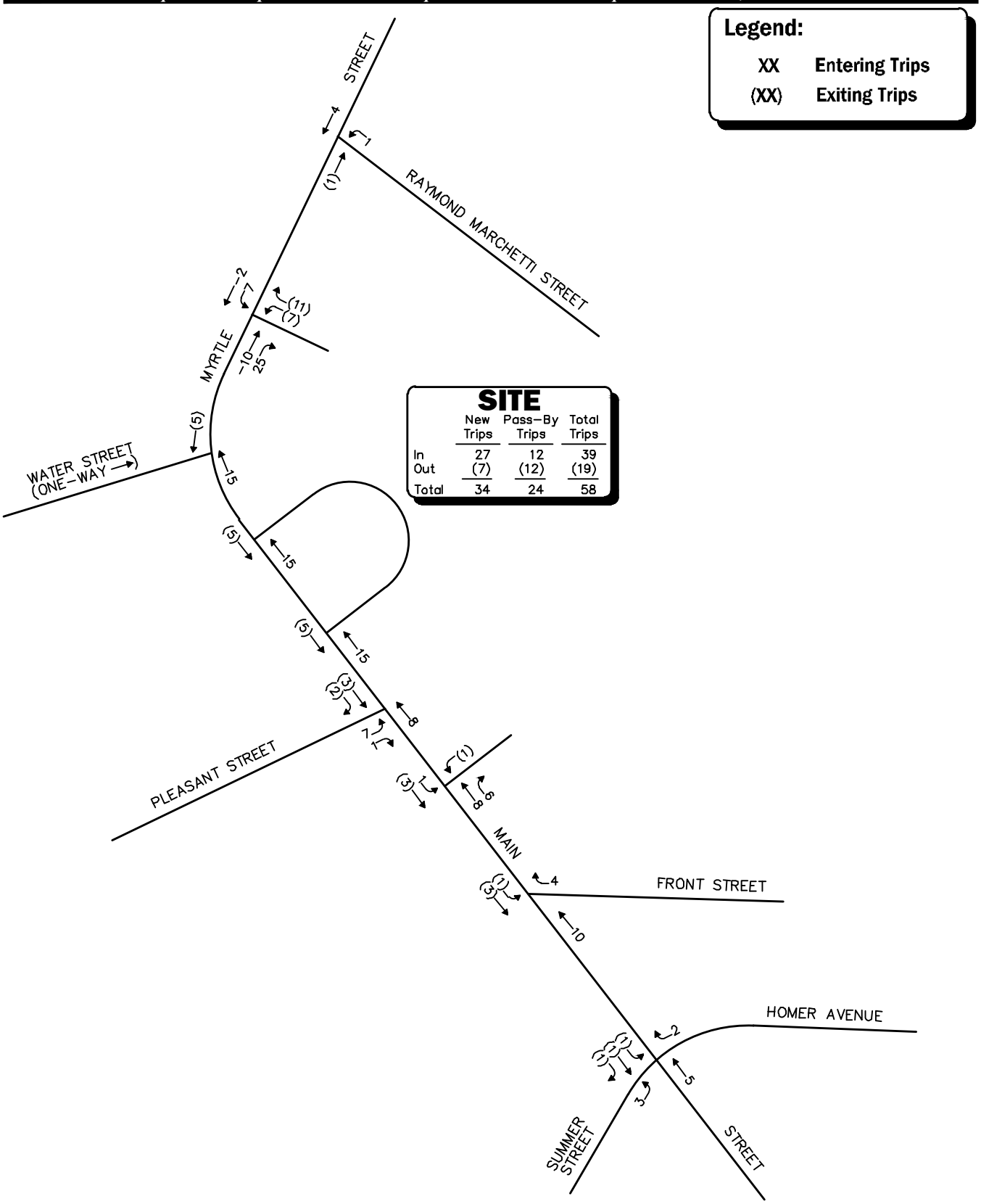

Figure 14

Project-Generated Restaurant Weekday Evening Peak-Hour Traffic Volumes

Vanasse & Associates inc

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- [ ] Capacity Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	809	4	6	499	92	6	1	22	149	0	61
Future Volume (vph)	90	809	4	6	499	92	6	1	22	149	0	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		50	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850			0.850			0.850
Flt Protected	0.950				0.999			0.958			0.950	
Satd. Flow (prot)	1752	1808	0	0	1743	1568	0	1820	1615	0	1752	1583
Flt Permitted	0.258				0.989			0.958			0.950	
Satd. Flow (perm)	476	1808	0	0	1726	1568	0	1820	1615	0	1752	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						131			131			79
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			250			225	
Travel Time (s)		11.4			11.4			5.7			5.1	
Peak Hour Factor	0.93	0.93	0.92	0.92	0.93	0.93	0.92	0.92	0.92	0.93	0.92	0.93
Heavy Vehicles (%)	3%	5%	0%	0%	9%	3%	0%	0%	0%	3%	0%	2%
Adj. Flow (vph)	97	870	4	7	537	99	7	1	24	160	0	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	874	0	0	544	99	0	8	24	0	160	66
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	Prot	Split	NA	pt+ov
Protected Phases	5	2			6		8	8	8	4	4	4 5

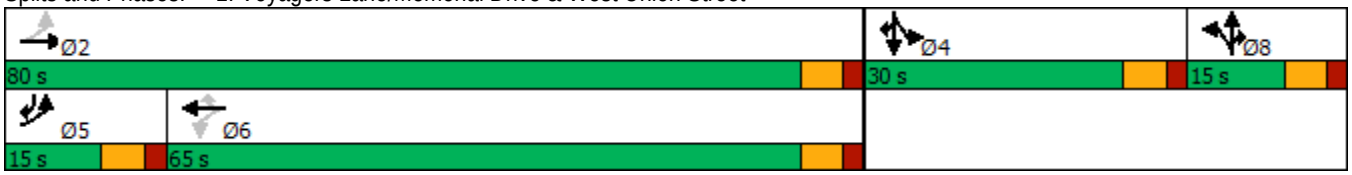
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6						
Detector Phase	5	2		6	6	6	8	8	8	4	4	4 5
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	12.0	16.0		16.0	16.0	16.0	12.0	12.0	12.0	12.0	12.0	
Total Split (s)	15.0	80.0		65.0	65.0	65.0	15.0	15.0	15.0	30.0	30.0	
Total Split (%)	12.0%	64.0%		52.0%	52.0%	52.0%	12.0%	12.0%	12.0%	24.0%	24.0%	
Maximum Green (s)	9.0	74.0		59.0	59.0	59.0	9.0	9.0	9.0	24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-3.0	-3.0			-3.0	-3.0		-3.0	-3.0		-3.0	
Total Lost Time (s)	3.0	3.0			3.0	3.0		3.0	3.0		3.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min		Min	Min	Min	None	None	None	None	None	
Act Effct Green (s)	52.5	52.5			41.5	41.5		10.4	10.4		17.7	31.4
Actuated g/C Ratio	0.63	0.63			0.50	0.50		0.13	0.13		0.21	0.38
v/c Ratio	0.20	0.77			0.63	0.12		0.04	0.08		0.43	0.10
Control Delay	8.6	18.1			22.2	1.5		46.4	0.5		38.3	3.9
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	8.6	18.1			22.2	1.5		46.4	0.5		38.3	3.9
LOS	A	B			C	A		D	A		D	A
Approach Delay		17.1			19.0			11.9			28.3	
Approach LOS		B			B			B			C	
90th %ile Green (s)	9.0	74.0		59.0	59.0	59.0	7.2	7.2	7.2	22.1	22.1	
90th %ile Term Code	Max	Max		Hold	Hold	Hold	Gap	Gap	Gap	Gap	Gap	
70th %ile Green (s)	9.0	60.6		45.6	45.6	45.6	6.4	6.4	6.4	17.6	17.6	
70th %ile Term Code	Max	Gap		Hold	Hold	Hold	Gap	Gap	Gap	Gap	Gap	
50th %ile Green (s)	8.2	48.1		33.9	33.9	33.9	6.0	6.0	6.0	14.0	14.0	
50th %ile Term Code	Gap	Gap		Hold	Hold	Hold	Min	Min	Min	Gap	Gap	
30th %ile Green (s)	7.2	35.4		22.2	22.2	22.2	0.0	0.0	0.0	10.4	10.4	
30th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Skip	Skip	Skip	Gap	Gap	
10th %ile Green (s)	0.0	27.9		27.9	27.9	27.9	0.0	0.0	0.0	7.8	7.8	
10th %ile Term Code	Skip	Dwell		Dwell	Dwell	Dwell	Skip	Skip	Skip	Gap	Gap	
Queue Length 50th (ft)	21	341			239	0		4	0		77	0
Queue Length 95th (ft)	49	630			414	14		22	0		179	20
Internal Link Dist (ft)		420			420			170			145	
Turn Bay Length (ft)	200					50						
Base Capacity (vph)	508	1547			1324	1233		296	372		642	744
Starvation Cap Reductn	0	0			0	0		0	0		0	0
Spillback Cap Reductn	0	0			0	0		0	0		0	0
Storage Cap Reductn	0	0			0	0		0	0		0	0
Reduced v/c Ratio	0.19	0.56			0.41	0.08		0.03	0.06		0.25	0.09

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 83.1

Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 19.0
Intersection LOS: B
Intersection Capacity Utilization 94.3%
ICU Level of Service F
Analysis Period (min) 15
90th %ile Actuated Cycle: 121.3
70th %ile Actuated Cycle: 102.6
50th %ile Actuated Cycle: 86.1
30th %ile Actuated Cycle: 57.8
10th %ile Actuated Cycle: 47.7

Splits and Phases: 1: Voyagers Lane/Memorial Drive & West Union Street



Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	87	6	105	87	5	126
Future Vol, veh/h	87	6	105	87	5	126
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	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	1	0	5	1	0	2
Mvmt Flow	136	9	164	136	8	197

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	347	232	0	0	300	0
Stage 1	232	-	-	-	-	-
Stage 2	115	-	-	-	-	-
Critical Hdwy	6.615	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	639	812	-	-	1273	-
Stage 1	809	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	635	812	-	-	1273	-
Mov Cap-2 Maneuver	635	-	-	-	-	-
Stage 1	809	-	-	-	-	-
Stage 2	895	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.2	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	644	1273	-
HCM Lane V/C Ratio	-	-	0.226	0.006	-
HCM Control Delay (s)	-	-	12.2	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	592	5	23	770	95	3	0	10	90	0	97
Future Volume (vph)	32	592	5	23	770	95	3	0	10	90	0	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		50	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850			0.850			0.850
Flt Protected	0.950				0.999			0.950			0.950	
Satd. Flow (prot)	1805	1879	0	0	1862	1599	0	1805	1615	0	1805	1599
Flt Permitted	0.124				0.972			0.950			0.950	
Satd. Flow (perm)	236	1879	0	0	1812	1599	0	1805	1615	0	1805	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				131			131			108
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			250			225	
Travel Time (s)		11.4			11.4			5.7			5.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	0%	0%	0%	2%	1%
Adj. Flow (vph)	36	658	6	26	856	106	3	0	11	100	0	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	664	0	0	882	106	0	3	11	0	100	108
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	Prot	Split	NA	pt+ov
Protected Phases	5	2			6		8	8	8	4	4	4 5

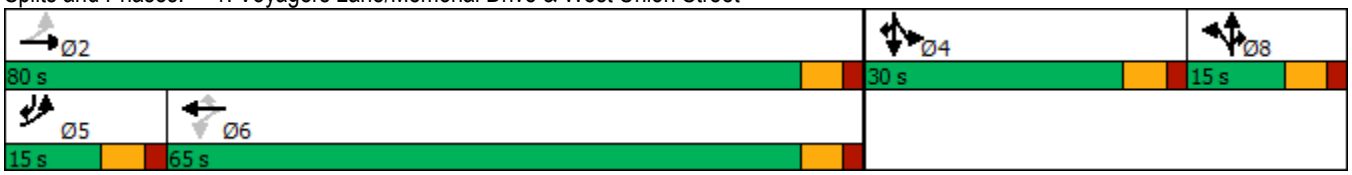
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6						
Detector Phase	5	2		6	6	6	8	8	8	4	4	4 5
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	12.0	16.0		16.0	16.0	16.0	12.0	12.0	12.0	12.0	12.0	
Total Split (s)	15.0	80.0		65.0	65.0	65.0	15.0	15.0	15.0	30.0	30.0	
Total Split (%)	12.0%	64.0%		52.0%	52.0%	52.0%	12.0%	12.0%	12.0%	24.0%	24.0%	
Maximum Green (s)	9.0	74.0		59.0	59.0	59.0	9.0	9.0	9.0	24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-3.0	-3.0			-3.0	-3.0		-3.0	-3.0		-3.0	
Total Lost Time (s)	3.0	3.0			3.0	3.0		3.0	3.0		3.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min		Min	Min	Min	None	None	None	None	None	
Act Effct Green (s)	72.6	72.6			59.5	59.5		9.2	9.2		13.9	26.0
Actuated g/C Ratio	0.75	0.75			0.61	0.61		0.09	0.09		0.14	0.27
v/c Ratio	0.11	0.47			0.79	0.10		0.02	0.04		0.39	0.21
Control Delay	5.5	7.4			23.1	1.5		46.7	0.3		44.4	5.5
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	5.5	7.4			23.1	1.5		46.7	0.3		44.4	5.5
LOS	A	A			C	A		D	A		D	A
Approach Delay		7.3			20.8			10.2			24.2	
Approach LOS		A			C			B			C	
90th %ile Green (s)	8.4	73.4		59.0	59.0	59.0	6.4	6.4	6.4	15.7	15.7	
90th %ile Term Code	Gap	Hold		Max	Max	Max	Gap	Gap	Gap	Gap	Gap	
70th %ile Green (s)	7.7	72.7		59.0	59.0	59.0	6.0	6.0	6.0	13.0	13.0	
70th %ile Term Code	Gap	Hold		Max	Max	Max	Min	Min	Min	Gap	Gap	
50th %ile Green (s)	6.9	70.6		57.7	57.7	57.7	0.0	0.0	0.0	10.5	10.5	
50th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Skip	Skip	Skip	Gap	Gap	
30th %ile Green (s)	6.2	64.6		52.4	52.4	52.4	0.0	0.0	0.0	9.0	9.0	
30th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Skip	Skip	Skip	Gap	Gap	
10th %ile Green (s)	6.0	63.3		51.3	51.3	51.3	0.0	0.0	0.0	7.1	7.1	
10th %ile Term Code	Min	Dwell		Dwell	Dwell	Dwell	Skip	Skip	Skip	Gap	Gap	
Queue Length 50th (ft)	3	96			316	0		2	0		54	0
Queue Length 95th (ft)	19	309			#831	16		12	0		119	34
Internal Link Dist (ft)		420			420			170			145	
Turn Bay Length (ft)	200					50						
Base Capacity (vph)	374	1519			1179	1086		227	318		511	599
Starvation Cap Reductn	0	0			0	0		0	0		0	0
Spillback Cap Reductn	0	0			0	0		0	0		0	0
Storage Cap Reductn	0	0			0	0		0	0		0	0
Reduced v/c Ratio	0.10	0.44			0.75	0.10		0.01	0.03		0.20	0.18

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 96.9

Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 16.1 Intersection LOS: B
Intersection Capacity Utilization 77.4% ICU Level of Service D
Analysis Period (min) 15
90th %ile Actuated Cycle: 113.5
70th %ile Actuated Cycle: 109.7
50th %ile Actuated Cycle: 93.1
30th %ile Actuated Cycle: 85.6
10th %ile Actuated Cycle: 82.4
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Voyagers Lane/Memorial Drive & West Union Street



Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	1	120	11	3	156
Future Vol, veh/h	15	1	120	11	3	156
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	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	7	0	0	9	0	0
Mvmt Flow	19	1	156	14	4	203

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	273	163	0	0	170	0
Stage 1	163	-	-	-	-	-
Stage 2	110	-	-	-	-	-
Critical Hdwy	6.705	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.505	-	-	-	-	-
Critical Hdwy Stg 2	5.905	-	-	-	-	-
Follow-up Hdwy	3.5665	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	693	887	-	-	1420	-
Stage 1	852	-	-	-	-	-
Stage 2	890	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	691	887	-	-	1420	-
Mov Cap-2 Maneuver	691	-	-	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	887	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	701	1420	-
HCM Lane V/C Ratio	-	-	0.03	0.003	-
HCM Control Delay (s)	-	-	10.3	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	518	3	13	566	92	3	1	10	101	1	48
Future Volume (vph)	31	518	3	13	566	92	3	1	10	101	1	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		50	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850			0.850			0.850
Flt Protected	0.950				0.999			0.964			0.953	
Satd. Flow (prot)	1805	1843	0	0	1880	1615	0	1832	1615	0	1793	1615
Flt Permitted	0.230				0.986			0.964			0.953	
Satd. Flow (perm)	437	1843	0	0	1855	1615	0	1832	1615	0	1793	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						131			131			79
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			250			225	
Travel Time (s)		11.4			11.4			5.7			5.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	0%	0%	1%	0%	0%	0%	0%	1%	0%	0%
Adj. Flow (vph)	34	563	3	14	615	100	3	1	11	110	1	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	566	0	0	629	100	0	4	11	0	111	52
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	Prot	Split	NA	pt+ov
Protected Phases	5	2			6		8	8	8	4	4	4 5

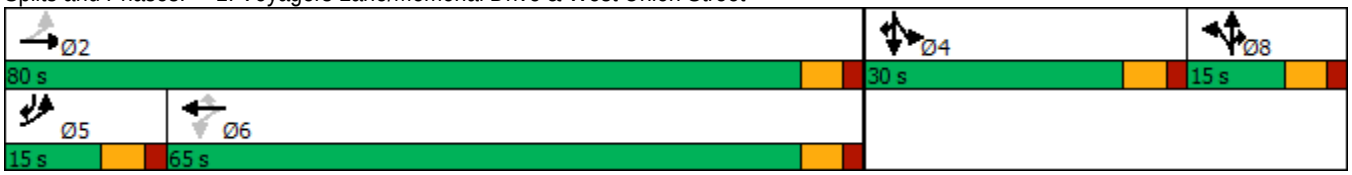
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6						
Detector Phase	5	2		6	6	6	8	8	8	4	4	4 5
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	12.0	16.0		16.0	16.0	16.0	12.0	12.0	12.0	12.0	12.0	
Total Split (s)	15.0	80.0		65.0	65.0	65.0	15.0	15.0	15.0	30.0	30.0	
Total Split (%)	12.0%	64.0%		52.0%	52.0%	52.0%	12.0%	12.0%	12.0%	24.0%	24.0%	
Maximum Green (s)	9.0	74.0		59.0	59.0	59.0	9.0	9.0	9.0	24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-3.0	-3.0			-3.0	-3.0		-3.0	-3.0		-3.0	
Total Lost Time (s)	3.0	3.0			3.0	3.0		3.0	3.0		3.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min		Min	Min	Min	None	None	None	None	None	
Act Effct Green (s)	50.3	51.5			41.6	41.6		10.6	10.6		14.9	23.9
Actuated g/C Ratio	0.71	0.73			0.59	0.59		0.15	0.15		0.21	0.34
v/c Ratio	0.06	0.42			0.57	0.10		0.01	0.03		0.29	0.09
Control Delay	6.1	7.9			17.6	1.5		40.8	0.2		33.5	2.3
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	6.1	7.9			17.6	1.5		40.8	0.2		33.5	2.3
LOS	A	A			B	A		D	A		C	A
Approach Delay		7.8			15.3			11.0			23.6	
Approach LOS		A			B			B			C	
90th %ile Green (s)	8.6	68.2		53.6	53.6	53.6	6.5	6.5	6.5	16.8	16.8	
90th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Gap	Gap	Gap	Gap	Gap	
70th %ile Green (s)	7.4	54.5		41.1	41.1	41.1	6.0	6.0	6.0	13.1	13.1	
70th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Min	Min	Min	Gap	Gap	
50th %ile Green (s)	6.6	40.2		27.6	27.6	27.6	0.0	0.0	0.0	10.0	10.0	
50th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Skip	Skip	Skip	Gap	Gap	
30th %ile Green (s)	6.0	34.3		22.3	22.3	22.3	0.0	0.0	0.0	8.4	8.4	
30th %ile Term Code	Min	Hold		Gap	Gap	Gap	Skip	Skip	Skip	Gap	Gap	
10th %ile Green (s)	0.0	28.7		28.7	28.7	28.7	0.0	0.0	0.0	0.0	0.0	
10th %ile Term Code	Skip	Dwell		Dwell	Dwell	Dwell	Skip	Skip	Skip	Skip	Skip	
Queue Length 50th (ft)	3	74			170	0		1	0		36	0
Queue Length 95th (ft)	19	260			437	15		14	0		123	12
Internal Link Dist (ft)		420			420			170			145	
Turn Bay Length (ft)	200					50						
Base Capacity (vph)	585	1675			1573	1389		365	427		806	848
Starvation Cap Reductn	0	0			0	0		0	0		0	0
Spillback Cap Reductn	0	0			0	0		0	0		0	0
Storage Cap Reductn	0	0			0	0		0	0		0	0
Reduced v/c Ratio	0.06	0.34			0.40	0.07		0.01	0.03		0.14	0.06

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 70.5

Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 13.2
Intersection LOS: B
Intersection Capacity Utilization 59.2%
ICU Level of Service B
Analysis Period (min) 15
90th %ile Actuated Cycle: 109.5
70th %ile Actuated Cycle: 91.6
50th %ile Actuated Cycle: 62.2
30th %ile Actuated Cycle: 54.7
10th %ile Actuated Cycle: 34.7

Splits and Phases: 1: Voyagers Lane/Memorial Drive & West Union Street



Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	58	4	74	55	7	91
Future Vol, veh/h	58	4	74	55	7	91
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	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	10	1	0	0	0	0
Mvmt Flow	62	4	79	59	7	97

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	172	109	0	0	138	0
Stage 1	109	-	-	-	-	-
Stage 2	63	-	-	-	-	-
Critical Hdwy	6.75	6.215	-	-	4.1	-
Critical Hdwy Stg 1	5.55	-	-	-	-	-
Critical Hdwy Stg 2	5.95	-	-	-	-	-
Follow-up Hdwy	3.595	3.3095	-	-	2.2	-
Pot Cap-1 Maneuver	789	947	-	-	1458	-
Stage 1	893	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	785	947	-	-	1458	-
Mov Cap-2 Maneuver	785	-	-	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	926	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	794	1458	-
HCM Lane V/C Ratio	-	-	0.083	0.005	-
HCM Control Delay (s)	-	-	9.9	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	842	4	6	530	95	6	1	23	154	0	63
Future Volume (vph)	93	842	4	6	530	95	6	1	23	154	0	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		50	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.997	0.850			0.850			0.850
Flt Protected	0.950				0.999			0.958			0.950	
Satd. Flow (prot)	1752	1808	0	0	1653	1490	0	1820	1615	0	1752	1583
Flt Permitted	0.214				0.990			0.958			0.950	
Satd. Flow (perm)	395	1808	0	0	1638	1490	0	1820	1615	0	1752	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1	131			131			79
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			250			225	
Travel Time (s)		11.4			11.4			5.7			5.1	
Peak Hour Factor	0.93	0.93	0.92	0.92	0.93	0.93	0.92	0.92	0.92	0.93	0.92	0.93
Heavy Vehicles (%)	3%	5%	0%	0%	9%	3%	0%	0%	0%	3%	0%	2%
Adj. Flow (vph)	100	905	4	7	570	102	7	1	25	166	0	68
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	100	909	0	0	587	92	0	8	25	0	166	68
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	Prot	Split	NA	pt+ov
Protected Phases	5	2			6		8	8	8	4	4	4 5

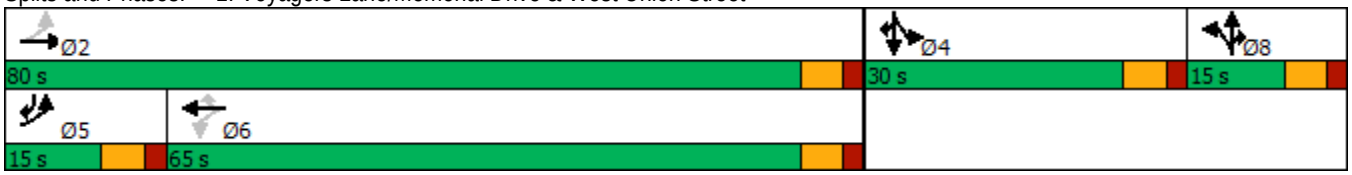
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6						
Detector Phase	5	2		6	6	6	8	8	8	4	4	4 5
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	12.0	16.0		16.0	16.0	16.0	12.0	12.0	12.0	12.0	12.0	
Total Split (s)	15.0	80.0		65.0	65.0	65.0	15.0	15.0	15.0	30.0	30.0	
Total Split (%)	12.0%	64.0%		52.0%	52.0%	52.0%	12.0%	12.0%	12.0%	24.0%	24.0%	
Maximum Green (s)	9.0	74.0		59.0	59.0	59.0	9.0	9.0	9.0	24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-3.0	-3.0			-3.0	-3.0		-3.0	-3.0		-3.0	
Total Lost Time (s)	3.0	3.0			3.0	3.0		3.0	3.0		3.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min		Min	Min	Min	None	None	None	None	None	
Act Effct Green (s)	55.5	55.5			44.5	44.5		10.4	10.4		18.3	32.2
Actuated g/C Ratio	0.64	0.64			0.51	0.51		0.12	0.12		0.21	0.37
v/c Ratio	0.23	0.79			0.70	0.11		0.04	0.08		0.45	0.11
Control Delay	8.9	19.2			24.7	1.3		48.1	0.5		40.0	4.1
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	8.9	19.2			24.7	1.3		48.1	0.5		40.0	4.1
LOS	A	B			C	A		D	A		D	A
Approach Delay		18.2			21.5			12.1			29.6	
Approach LOS		B			C			B			C	
90th %ile Green (s)	9.0	74.0		59.0	59.0	59.0	7.2	7.2	7.2	22.8	22.8	
90th %ile Term Code	Max	Max		Max	Max	Max	Gap	Gap	Gap	Gap	Gap	
70th %ile Green (s)	9.0	65.6		50.6	50.6	50.6	6.5	6.5	6.5	18.6	18.6	
70th %ile Term Code	Max	Gap		Hold	Hold	Hold	Gap	Gap	Gap	Gap	Gap	
50th %ile Green (s)	8.4	53.8		39.4	39.4	39.4	6.0	6.0	6.0	14.9	14.9	
50th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Min	Min	Min	Gap	Gap	
30th %ile Green (s)	7.3	39.1		25.8	25.8	25.8	0.0	0.0	0.0	10.9	10.9	
30th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Skip	Skip	Skip	Gap	Gap	
10th %ile Green (s)	0.0	27.9		27.9	27.9	27.9	0.0	0.0	0.0	8.0	8.0	
10th %ile Term Code	Skip	Dwell		Dwell	Dwell	Dwell	Skip	Skip	Skip	Gap	Gap	
Queue Length 50th (ft)	22	380			295	0		4	0		88	0
Queue Length 95th (ft)	51	695			510	11		22	0		185	22
Internal Link Dist (ft)		420			420			170			145	
Turn Bay Length (ft)	200					50						
Base Capacity (vph)	464	1508			1227	1149		284	363		616	719
Starvation Cap Reductn	0	0			0	0		0	0		0	0
Spillback Cap Reductn	0	0			0	0		0	0		0	0
Storage Cap Reductn	0	0			0	0		0	0		0	0
Reduced v/c Ratio	0.22	0.60			0.48	0.08		0.03	0.07		0.27	0.09

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 86.7

Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 20.6
Intersection LOS: C
Intersection Capacity Utilization 99.2%
ICU Level of Service F
Analysis Period (min) 15
90th %ile Actuated Cycle: 122
70th %ile Actuated Cycle: 108.7
50th %ile Actuated Cycle: 92.7
30th %ile Actuated Cycle: 62
10th %ile Actuated Cycle: 47.9

Splits and Phases: 1: Voyagers Lane/Memorial Drive & West Union Street



Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	90	6	109	90	5	131
Future Vol, veh/h	90	6	109	90	5	131
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	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	1	0	5	1	0	2
Mvmt Flow	141	9	170	141	8	205

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	360	241	0	0	311	0
Stage 1	241	-	-	-	-	-
Stage 2	119	-	-	-	-	-
Critical Hdwy	6.615	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	628	803	-	-	1261	-
Stage 1	801	-	-	-	-	-
Stage 2	896	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	624	803	-	-	1261	-
Mov Cap-2 Maneuver	624	-	-	-	-	-
Stage 1	801	-	-	-	-	-
Stage 2	890	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	633	1261	-
HCM Lane V/C Ratio	-	-	0.237	0.006	-
HCM Control Delay (s)	-	-	12.4	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	624	5	24	808	98	3	0	10	93	0	100
Future Volume (vph)	33	624	5	24	808	98	3	0	10	93	0	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		50	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850			0.850			0.850
Flt Protected	0.950				0.999			0.950			0.950	
Satd. Flow (prot)	1805	1879	0	0	1862	1599	0	1805	1615	0	1805	1599
Flt Permitted	0.111				0.971			0.950			0.950	
Satd. Flow (perm)	211	1879	0	0	1810	1599	0	1805	1615	0	1805	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				131			131			111
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			250			225	
Travel Time (s)		11.4			11.4			5.7			5.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	0%	0%	0%	0%	1%
Adj. Flow (vph)	37	693	6	27	898	109	3	0	11	103	0	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	699	0	0	925	109	0	3	11	0	103	111
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	Prot	Split	NA	pt+ov
Protected Phases	5	2			6		8	8	8	4	4	4 5

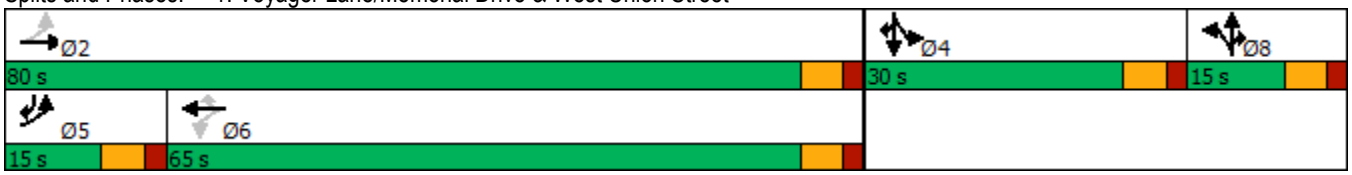
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6						
Detector Phase	5	2		6	6	6	8	8	8	4	4	4 5
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	12.0	16.0		16.0	16.0	16.0	12.0	12.0	12.0	12.0	12.0	
Total Split (s)	15.0	80.0		65.0	65.0	65.0	15.0	15.0	15.0	30.0	30.0	
Total Split (%)	12.0%	64.0%		52.0%	52.0%	52.0%	12.0%	12.0%	12.0%	24.0%	24.0%	
Maximum Green (s)	9.0	74.0		59.0	59.0	59.0	9.0	9.0	9.0	24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-3.0	-3.0			-3.0	-3.0		-3.0	-3.0		-3.0	
Total Lost Time (s)	3.0	3.0			3.0	3.0		3.0	3.0		3.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min		Min	Min	Min	None	None	None	None	None	
Act Effct Green (s)	76.6	76.6			63.5	63.5		9.1	9.1		14.1	26.0
Actuated g/C Ratio	0.76	0.76			0.63	0.63		0.09	0.09		0.14	0.26
v/c Ratio	0.12	0.49			0.81	0.10		0.02	0.04		0.41	0.22
Control Delay	5.6	7.6			24.2	1.6		46.7	0.3		45.7	5.5
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	5.6	7.6			24.2	1.6		46.7	0.3		45.7	5.5
LOS	A	A			C	A		D	A		D	A
Approach Delay		7.5			21.8			10.2			24.9	
Approach LOS		A			C			B			C	
90th %ile Green (s)	8.4	73.4		59.0	59.0	59.0	6.4	6.4	6.4	16.0	16.0	
90th %ile Term Code	Gap	Hold		Max	Max	Max	Gap	Gap	Gap	Gap	Gap	
70th %ile Green (s)	7.6	72.6		59.0	59.0	59.0	6.0	6.0	6.0	13.2	13.2	
70th %ile Term Code	Gap	Hold		Max	Max	Max	Min	Min	Min	Gap	Gap	
50th %ile Green (s)	6.9	71.9		59.0	59.0	59.0	0.0	0.0	0.0	10.7	10.7	
50th %ile Term Code	Gap	Hold		Max	Max	Max	Skip	Skip	Skip	Gap	Gap	
30th %ile Green (s)	6.2	71.2		59.0	59.0	59.0	0.0	0.0	0.0	9.1	9.1	
30th %ile Term Code	Gap	Hold		Max	Max	Max	Skip	Skip	Skip	Gap	Gap	
10th %ile Green (s)	6.0	76.1		64.1	64.1	64.1	0.0	0.0	0.0	7.1	7.1	
10th %ile Term Code	Min	Dwell		Dwell	Dwell	Dwell	Skip	Skip	Skip	Gap	Gap	
Queue Length 50th (ft)	4	106			350	0		2	0		57	0
Queue Length 95th (ft)	19	338			#903	18		12	0		121	34
Internal Link Dist (ft)		420			420			170			145	
Turn Bay Length (ft)	200					50						
Base Capacity (vph)	350	1449			1137	1053		215	308		485	580
Starvation Cap Reductn	0	0			0	0		0	0		0	0
Spillback Cap Reductn	0	0			0	0		0	0		0	0
Storage Cap Reductn	0	0			0	0		0	0		0	0
Reduced v/c Ratio	0.11	0.48			0.81	0.10		0.01	0.04		0.21	0.19

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 101.1

Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 16.8 Intersection LOS: B
Intersection Capacity Utilization 80.4% ICU Level of Service D
Analysis Period (min) 15
90th %ile Actuated Cycle: 113.8
70th %ile Actuated Cycle: 109.8
50th %ile Actuated Cycle: 94.6
30th %ile Actuated Cycle: 92.3
10th %ile Actuated Cycle: 95.2
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Voyager Lane/Memorial Drive & West Union Street



Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	1	124	11	3	162
Future Vol, veh/h	16	1	124	11	3	162
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	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	7	0	0	9	0	0
Mvmt Flow	21	1	161	14	4	210

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	281	168	0	0	175	0
Stage 1	168	-	-	-	-	-
Stage 2	113	-	-	-	-	-
Critical Hdwy	6.705	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.505	-	-	-	-	-
Critical Hdwy Stg 2	5.905	-	-	-	-	-
Follow-up Hdwy	3.5665	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	685	881	-	-	1414	-
Stage 1	847	-	-	-	-	-
Stage 2	886	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	683	881	-	-	1414	-
Mov Cap-2 Maneuver	683	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	883	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	692	1414	-
HCM Lane V/C Ratio	-	-	0.032	0.003	-
HCM Control Delay (s)	-	-	10.4	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	542	3	13	591	95	3	1	10	105	1	50
Future Volume (vph)	32	542	3	13	591	95	3	1	10	105	1	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		50	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850			0.850			0.850
Flt Protected	0.950				0.999			0.964			0.953	
Satd. Flow (prot)	1805	1843	0	0	1880	1615	0	1832	1615	0	1793	1615
Flt Permitted	0.206				0.986			0.964			0.953	
Satd. Flow (perm)	391	1843	0	0	1855	1615	0	1832	1615	0	1793	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						164			164			98
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			250			225	
Travel Time (s)		11.4			11.4			5.7			5.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	0%	0%	1%	0%	0%	0%	0%	1%	0%	0%
Adj. Flow (vph)	35	589	3	14	642	103	3	1	11	114	1	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	592	0	0	656	103	0	4	11	0	115	54
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	Prot	Split	NA	pt+ov
Protected Phases	5	2			6		8	8	8	4	4	4 5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6						
Detector Phase	5	2		6	6	6	8	8	8	4	4	4 5
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	12.0	16.0		16.0	16.0	16.0	12.0	12.0	12.0	12.0	12.0	
Total Split (s)	15.0	60.0		45.0	45.0	45.0	15.0	15.0	15.0	25.0	25.0	
Total Split (%)	15.0%	60.0%		45.0%	45.0%	45.0%	15.0%	15.0%	15.0%	25.0%	25.0%	
Maximum Green (s)	9.0	54.0		39.0	39.0	39.0	9.0	9.0	9.0	19.0	19.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-3.0	-3.0			-3.0	-3.0		-3.0	-3.0		-3.0	
Total Lost Time (s)	3.0	3.0			3.0	3.0		3.0	3.0		3.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min		Min	Min	Min	None	None	None	None	None	
Act Effct Green (s)	48.0	49.2			39.7	39.7		10.2	10.2		14.1	22.7
Actuated g/C Ratio	0.71	0.73			0.59	0.59		0.15	0.15		0.21	0.33
v/c Ratio	0.07	0.44			0.60	0.10		0.01	0.03		0.31	0.09
Control Delay	6.4	8.4			18.8	0.8		35.8	0.1		31.1	1.1
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	6.4	8.4			18.8	0.8		35.8	0.1		31.1	1.1
LOS	A	A			B	A		D	A		C	A
Approach Delay		8.3			16.3			9.6			21.5	
Approach LOS		A			B			A			C	
90th %ile Green (s)	7.8	52.8		39.0	39.0	39.0	6.4	6.4	6.4	15.3	15.3	
90th %ile Term Code	Gap	Hold		Max	Max	Max	Gap	Gap	Gap	Gap	Gap	
70th %ile Green (s)	7.2	52.2		39.0	39.0	39.0	6.0	6.0	6.0	12.5	12.5	
70th %ile Term Code	Gap	Hold		Max	Max	Max	Min	Min	Min	Gap	Gap	
50th %ile Green (s)	6.5	42.3		29.8	29.8	29.8	0.0	0.0	0.0	10.0	10.0	
50th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Skip	Skip	Skip	Gap	Gap	
30th %ile Green (s)	6.0	37.1		25.1	25.1	25.1	0.0	0.0	0.0	8.5	8.5	
30th %ile Term Code	Min	Hold		Gap	Gap	Gap	Skip	Skip	Skip	Gap	Gap	
10th %ile Green (s)	0.0	29.9		29.9	29.9	29.9	0.0	0.0	0.0	0.0	0.0	
10th %ile Term Code	Skip	Dwell		Dwell	Dwell	Dwell	Skip	Skip	Skip	Skip	Skip	
Queue Length 50th (ft)	3	79			180	0		1	0		39	0
Queue Length 95th (ft)	19	275			461	7		13	0		109	5
Internal Link Dist (ft)		420			420			170			145	
Turn Bay Length (ft)	200					50						
Base Capacity (vph)	558	1524			1228	1124		364	452		653	783
Starvation Cap Reductn	0	0			0	0		0	0		0	0
Spillback Cap Reductn	0	0			0	0		0	0		0	0
Storage Cap Reductn	0	0			0	0		0	0		0	0
Reduced v/c Ratio	0.06	0.39			0.53	0.09		0.01	0.02		0.18	0.07

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 67.8

Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 13.6
Intersection LOS: B
Intersection Capacity Utilization 60.7%
ICU Level of Service B
Analysis Period (min) 15
90th %ile Actuated Cycle: 92.5
70th %ile Actuated Cycle: 88.7
50th %ile Actuated Cycle: 64.3
30th %ile Actuated Cycle: 57.6
10th %ile Actuated Cycle: 35.9

Splits and Phases: 1: Voyagers Lane/Memorial Drive & West Union Street

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	60	4	77	57	7	94
Future Vol, veh/h	60	4	77	57	7	94
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	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	10	1	0	0	0	0
Mvmt Flow	64	4	82	61	7	100

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	177	113	0	0	143	0
Stage 1	113	-	-	-	-	-
Stage 2	64	-	-	-	-	-
Critical Hdwy	6.75	6.215	-	-	4.1	-
Critical Hdwy Stg 1	5.55	-	-	-	-	-
Critical Hdwy Stg 2	5.95	-	-	-	-	-
Follow-up Hdwy	3.595	3.3095	-	-	2.2	-
Pot Cap-1 Maneuver	784	942	-	-	1452	-
Stage 1	890	-	-	-	-	-
Stage 2	930	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	780	942	-	-	1452	-
Mov Cap-2 Maneuver	780	-	-	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	925	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	788	1452	-
HCM Lane V/C Ratio	-	-	0.086	0.005	-
HCM Control Delay (s)	-	-	10	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	831	4	6	524	187	6	1	23	215	0	82
Future Volume (vph)	126	831	4	6	524	187	6	1	23	215	0	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		50	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850			0.850			0.850
Flt Protected	0.950				0.999			0.958			0.950	
Satd. Flow (prot)	1752	1808	0	0	1743	1568	0	1820	1615	0	1752	1583
Flt Permitted	0.217				0.989			0.958			0.950	
Satd. Flow (perm)	400	1808	0	0	1726	1568	0	1820	1615	0	1752	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						131			131			88
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			250			225	
Travel Time (s)		11.4			11.4			5.7			5.1	
Peak Hour Factor	0.93	0.93	0.92	0.92	0.93	0.93	0.92	0.92	0.92	0.93	0.92	0.93
Heavy Vehicles (%)	3%	5%	0%	0%	9%	3%	0%	0%	0%	3%	0%	2%
Adj. Flow (vph)	135	894	4	7	563	201	7	1	25	231	0	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	135	898	0	0	570	201	0	8	25	0	231	88
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	Prot	Split	NA	pt+ov
Protected Phases	5	2			6		8	8	8	4	4	4 5

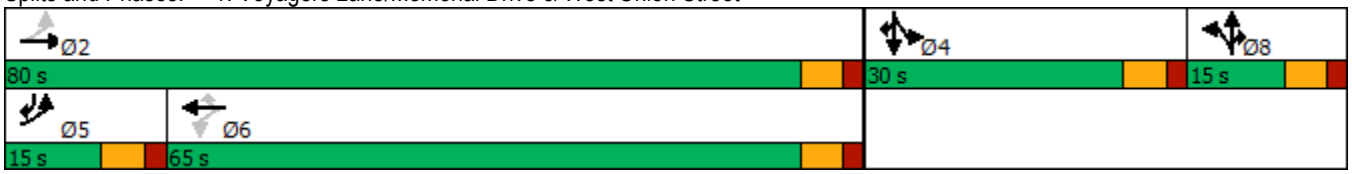
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6						
Detector Phase	5	2		6	6	6	8	8	8	4	4	4 5
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	12.0	16.0		16.0	16.0	16.0	12.0	12.0	12.0	12.0	12.0	
Total Split (s)	15.0	80.0		65.0	65.0	65.0	15.0	15.0	15.0	30.0	30.0	
Total Split (%)	12.0%	64.0%		52.0%	52.0%	52.0%	12.0%	12.0%	12.0%	24.0%	24.0%	
Maximum Green (s)	9.0	74.0		59.0	59.0	59.0	9.0	9.0	9.0	24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-3.0	-3.0			-3.0	-3.0		-3.0	-3.0		-3.0	
Total Lost Time (s)	3.0	3.0			3.0	3.0		3.0	3.0		3.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min		Min	Min	Min	None	None	None	None	None	
Act Effct Green (s)	58.1	58.1			42.4	42.4		10.3	10.3		21.3	35.5
Actuated g/C Ratio	0.63	0.63			0.46	0.46		0.11	0.11		0.23	0.39
v/c Ratio	0.31	0.79			0.72	0.25		0.04	0.08		0.57	0.13
Control Delay	10.4	20.7			26.8	7.2		50.6	0.6		42.6	5.0
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	10.4	20.7			26.8	7.2		50.6	0.6		42.6	5.0
LOS	B	C			C	A		D	A		D	A
Approach Delay		19.3			21.7			12.7			32.2	
Approach LOS		B			C			B			C	
90th %ile Green (s)	9.0	74.0		59.0	59.0	59.0	7.2	7.2	7.2	24.0	24.0	
90th %ile Term Code	Max	Max		Max	Max	Max	Gap	Gap	Gap	Max	Max	
70th %ile Green (s)	9.0	70.1		55.1	55.1	55.1	6.5	6.5	6.5	24.0	24.0	
70th %ile Term Code	Max	Gap		Hold	Hold	Hold	Gap	Gap	Gap	Max	Max	
50th %ile Green (s)	9.0	56.5		41.5	41.5	41.5	6.0	6.0	6.0	18.9	18.9	
50th %ile Term Code	Max	Gap		Hold	Hold	Hold	Min	Min	Min	Gap	Gap	
30th %ile Green (s)	8.2	40.9		26.7	26.7	26.7	0.0	0.0	0.0	13.5	13.5	
30th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Skip	Skip	Skip	Gap	Gap	
10th %ile Green (s)	6.7	31.8		19.1	19.1	19.1	0.0	0.0	0.0	9.7	9.7	
10th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Skip	Skip	Skip	Gap	Gap	
Queue Length 50th (ft)	34	420			289	25		5	0		132	0
Queue Length 95th (ft)	68	697			456	70		23	0		254	30
Internal Link Dist (ft)		420			420			170			145	
Turn Bay Length (ft)	200					50						
Base Capacity (vph)	447	1464			1237	1161		263	346		570	695
Starvation Cap Reductn	0	0			0	0		0	0		0	0
Spillback Cap Reductn	0	0			0	0		0	0		0	0
Storage Cap Reductn	0	0			0	0		0	0		0	0
Reduced v/c Ratio	0.30	0.61			0.46	0.17		0.03	0.07		0.41	0.13

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 92.2

Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 22.0
Intersection LOS: C
Intersection Capacity Utilization 100.5%
ICU Level of Service G
Analysis Period (min) 15
90th %ile Actuated Cycle: 123.2
70th %ile Actuated Cycle: 118.6
50th %ile Actuated Cycle: 99.4
30th %ile Actuated Cycle: 66.4
10th %ile Actuated Cycle: 53.5

Splits and Phases: 1: Voyagers Lane/Memorial Drive & West Union Street



Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	90	6	234	90	5	211
Future Vol, veh/h	90	6	234	90	5	211
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	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	1	0	5	1	0	2
Mvmt Flow	141	9	366	141	8	330

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	618	437	0	0	507	0
Stage 1	437	-	-	-	-	-
Stage 2	181	-	-	-	-	-
Critical Hdwy	6.615	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	439	624	-	-	1068	-
Stage 1	653	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	435	624	-	-	1068	-
Mov Cap-2 Maneuver	435	-	-	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	827	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.2	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	443	1068	-
HCM Lane V/C Ratio	-	-	0.339	0.007	-
HCM Control Delay (s)	-	-	17.2	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.5	0	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	0	115	42	0	136
Future Vol, veh/h	38	0	115	42	0	136
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	5	0	0	2
Mvmt Flow	41	0	125	46	0	148

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	296	148	0	0	171	0
Stage 1	148	-	-	-	-	-
Stage 2	148	-	-	-	-	-
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	699	904	-	-	1418	-
Stage 1	884	-	-	-	-	-
Stage 2	884	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	699	904	-	-	1418	-
Mov Cap-2 Maneuver	699	-	-	-	-	-
Stage 1	884	-	-	-	-	-
Stage 2	884	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	699	1418	-
HCM Lane V/C Ratio	-	-	0.059	-	-
HCM Control Delay (s)	-	-	10.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	42	0	157	83	0	174
Future Vol, veh/h	42	0	157	83	0	174
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	5	0	0	2
Mvmt Flow	46	0	171	90	0	189

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	405	216	0	0	261	0
Stage 1	216	-	-	-	-	-
Stage 2	189	-	-	-	-	-
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	606	829	-	-	1315	-
Stage 1	825	-	-	-	-	-
Stage 2	848	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	606	829	-	-	1315	-
Mov Cap-2 Maneuver	606	-	-	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	848	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	606	1315	-
HCM Lane V/C Ratio	-	-	0.075	-	-
HCM Control Delay (s)	-	-	11.4	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	617	5	24	798	204	3	0	10	198	0	135
Future Volume (vph)	64	617	5	24	798	204	3	0	10	198	0	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		50	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850			0.850			0.850
Flt Protected	0.950				0.999			0.950			0.950	
Satd. Flow (prot)	1805	1879	0	0	1862	1599	0	1805	1615	0	1805	1599
Flt Permitted	0.075				0.970			0.950			0.950	
Satd. Flow (perm)	142	1879	0	0	1808	1599	0	1805	1615	0	1805	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				131			131			150
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			250			225	
Travel Time (s)		11.4			11.4			5.7			5.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	0%	0%	0%	0%	1%
Adj. Flow (vph)	71	686	6	27	887	227	3	0	11	220	0	150
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	692	0	0	914	227	0	3	11	0	220	150
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	Prot	Split	NA	pt+ov
Protected Phases	5	2			6		8	8	8	4	4	4 5

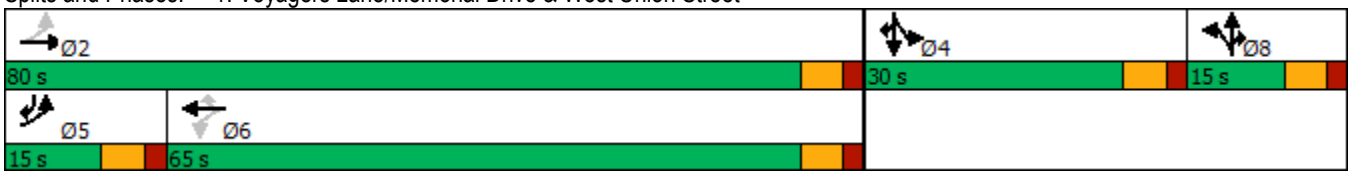
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6						
Detector Phase	5	2		6	6	6	8	8	8	4	4	4 5
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	12.0	16.0		16.0	16.0	16.0	12.0	12.0	12.0	12.0	12.0	
Total Split (s)	15.0	80.0		65.0	65.0	65.0	15.0	15.0	15.0	30.0	30.0	
Total Split (%)	12.0%	64.0%		52.0%	52.0%	52.0%	12.0%	12.0%	12.0%	24.0%	24.0%	
Maximum Green (s)	9.0	74.0		59.0	59.0	59.0	9.0	9.0	9.0	24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-3.0	-3.0			-3.0	-3.0		-3.0	-3.0		-3.0	
Total Lost Time (s)	3.0	3.0			3.0	3.0		3.0	3.0		3.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min		Min	Min	Min	None	None	None	None	None	
Act Effct Green (s)	76.7	76.7			62.7	62.7		9.2	9.2		20.8	33.8
Actuated g/C Ratio	0.71	0.71			0.58	0.58		0.09	0.09		0.19	0.31
v/c Ratio	0.26	0.52			0.87	0.23		0.02	0.04		0.63	0.25
Control Delay	9.2	10.7			32.6	6.7		51.3	0.3		49.7	4.4
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	9.2	10.7			32.6	6.7		51.3	0.3		49.7	4.4
LOS	A	B			C	A		D	A		D	A
Approach Delay		10.5			27.5			11.2			31.3	
Approach LOS		B			C			B			C	
90th %ile Green (s)	9.0	74.0		59.0	59.0	59.0	6.4	6.4	6.4	24.0	24.0	
90th %ile Term Code	Max	Hold		Max	Max	Max	Gap	Gap	Gap	Max	Max	
70th %ile Green (s)	9.0	74.0		59.0	59.0	59.0	6.0	6.0	6.0	22.4	22.4	
70th %ile Term Code	Max	Hold		Max	Max	Max	Min	Min	Min	Gap	Gap	
50th %ile Green (s)	8.5	73.5		59.0	59.0	59.0	0.0	0.0	0.0	17.5	17.5	
50th %ile Term Code	Gap	Hold		Max	Max	Max	Skip	Skip	Skip	Gap	Gap	
30th %ile Green (s)	7.5	72.5		59.0	59.0	59.0	0.0	0.0	0.0	14.9	14.9	
30th %ile Term Code	Gap	Hold		Max	Max	Max	Skip	Skip	Skip	Gap	Gap	
10th %ile Green (s)	6.0	71.0		59.0	59.0	59.0	0.0	0.0	0.0	11.4	11.4	
10th %ile Term Code	Min	Hold		Max	Max	Max	Skip	Skip	Skip	Gap	Gap	
Queue Length 50th (ft)	11	156			450	25		2	0		133	0
Queue Length 95th (ft)	39	410			#1000	85		12	0		239	38
Internal Link Dist (ft)		420			420			170			145	
Turn Bay Length (ft)	200					50						
Base Capacity (vph)	287	1355			1050	983		202	297		456	622
Starvation Cap Reductn	0	0			0	0		0	0		0	0
Spillback Cap Reductn	0	0			0	0		0	0		0	0
Storage Cap Reductn	0	0			0	0		0	0		0	0
Reduced v/c Ratio	0.25	0.51			0.87	0.23		0.01	0.04		0.48	0.24

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 107.9

Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 22.3 Intersection LOS: C
Intersection Capacity Utilization 85.7% ICU Level of Service E
Analysis Period (min) 15
90th %ile Actuated Cycle: 122.4
70th %ile Actuated Cycle: 120.4
50th %ile Actuated Cycle: 103
30th %ile Actuated Cycle: 99.4
10th %ile Actuated Cycle: 94.4
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Voyagers Lane/Memorial Drive & West Union Street



Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	1	261	11	3	302
Future Vol, veh/h	16	1	261	11	3	302
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	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	7	0	0	9	0	0
Mvmt Flow	21	1	339	14	4	392

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	550	346	0	0	353	0
Stage 1	346	-	-	-	-	-
Stage 2	204	-	-	-	-	-
Critical Hdwy	6.705	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.505	-	-	-	-	-
Critical Hdwy Stg 2	5.905	-	-	-	-	-
Follow-up Hdwy	3.5665	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	470	702	-	-	1217	-
Stage 1	702	-	-	-	-	-
Stage 2	798	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	468	702	-	-	1217	-
Mov Cap-2 Maneuver	468	-	-	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	795	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.9	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	477	1217	-
HCM Lane V/C Ratio	-	-	0.046	0.003	-
HCM Control Delay (s)	-	-	12.9	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	53	0	125	60	0	165
Future Vol, veh/h	53	0	125	60	0	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	58	0	136	65	0	179

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	348	169	0	0	201	0
Stage 1	169	-	-	-	-	-
Stage 2	179	-	-	-	-	-
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	653	880	-	-	1383	-
Stage 1	866	-	-	-	-	-
Stage 2	857	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	653	880	-	-	1383	-
Mov Cap-2 Maneuver	653	-	-	-	-	-
Stage 1	866	-	-	-	-	-
Stage 2	857	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	653	1383	-
HCM Lane V/C Ratio	-	-	0.088	-	-
HCM Control Delay (s)	-	-	11	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	87	0	185	77	0	218
Future Vol, veh/h	87	0	185	77	0	218
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	95	0	201	84	0	237

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	480	243	0	0	285	0
Stage 1	243	-	-	-	-	-
Stage 2	237	-	-	-	-	-
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	548	801	-	-	1289	-
Stage 1	802	-	-	-	-	-
Stage 2	807	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	548	801	-	-	1289	-
Mov Cap-2 Maneuver	548	-	-	-	-	-
Stage 1	802	-	-	-	-	-
Stage 2	807	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	548	1289	-
HCM Lane V/C Ratio	-	-	0.173	-	-
HCM Control Delay (s)	-	-	12.9	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	542	3	13	591	156	3	1	10	164	1	65
Future Volume (vph)	47	542	3	13	591	156	3	1	10	164	1	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		50	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850			0.850			0.850
Flt Protected	0.950				0.999			0.964			0.953	
Satd. Flow (prot)	1805	1843	0	0	1880	1615	0	1832	1615	0	1793	1615
Flt Permitted	0.178				0.985			0.964			0.953	
Satd. Flow (perm)	338	1843	0	0	1853	1615	0	1832	1615	0	1793	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						131			131			79
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			250			225	
Travel Time (s)		11.4			11.4			5.7			5.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	0%	0%	1%	0%	0%	0%	0%	1%	0%	0%
Adj. Flow (vph)	51	589	3	14	642	170	3	1	11	178	1	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	592	0	0	656	170	0	4	11	0	179	71
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA	Prot	Split	NA	pt+ov
Protected Phases	5	2			6		8	8	8	4	4	4 5

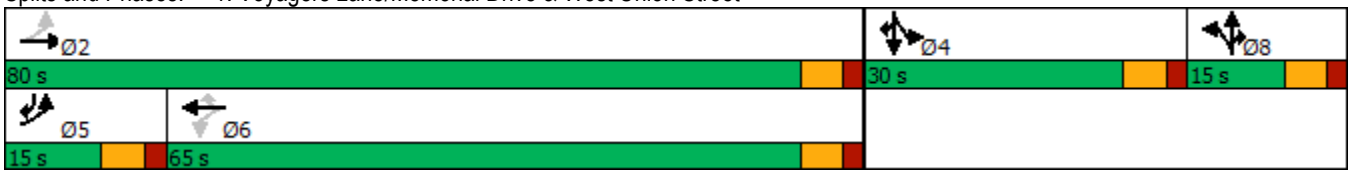
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6						
Detector Phase	5	2		6	6	6	8	8	8	4	4	4 5
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	12.0	16.0		16.0	16.0	16.0	12.0	12.0	12.0	12.0	12.0	
Total Split (s)	15.0	80.0		65.0	65.0	65.0	15.0	15.0	15.0	30.0	30.0	
Total Split (%)	12.0%	64.0%		52.0%	52.0%	52.0%	12.0%	12.0%	12.0%	24.0%	24.0%	
Maximum Green (s)	9.0	74.0		59.0	59.0	59.0	9.0	9.0	9.0	24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-3.0	-3.0			-3.0	-3.0		-3.0	-3.0		-3.0	
Total Lost Time (s)	3.0	3.0			3.0	3.0		3.0	3.0		3.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Min		Min	Min	Min	None	None	None	None	None	
Act Effct Green (s)	51.6	51.6			41.2	41.2		10.5	10.5		18.4	32.6
Actuated g/C Ratio	0.64	0.64			0.51	0.51		0.13	0.13		0.23	0.40
v/c Ratio	0.12	0.50			0.69	0.19		0.02	0.03		0.44	0.10
Control Delay	7.5	10.4			22.2	5.1		46.8	0.2		36.8	4.3
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	7.5	10.4			22.2	5.1		46.8	0.2		36.8	4.3
LOS	A	B			C	A		D	A		D	A
Approach Delay		10.2			18.7			12.6			27.6	
Approach LOS		B			B			B			C	
90th %ile Green (s)	9.0	74.0		59.0	59.0	59.0	6.6	6.6	6.6	23.3	23.3	
90th %ile Term Code	Max	Hold		Max	Max	Max	Gap	Gap	Gap	Gap	Gap	
70th %ile Green (s)	8.5	62.7		48.2	48.2	48.2	6.0	6.0	6.0	18.4	18.4	
70th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Min	Min	Min	Gap	Gap	
50th %ile Green (s)	7.3	46.0		32.7	32.7	32.7	0.0	0.0	0.0	13.6	13.6	
50th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Skip	Skip	Skip	Gap	Gap	
30th %ile Green (s)	6.4	38.8		26.4	26.4	26.4	0.0	0.0	0.0	11.1	11.1	
30th %ile Term Code	Gap	Hold		Gap	Gap	Gap	Skip	Skip	Skip	Gap	Gap	
10th %ile Green (s)	0.0	21.7		21.7	21.7	21.7	0.0	0.0	0.0	8.1	8.1	
10th %ile Term Code	Skip	Dwell		Dwell	Dwell	Dwell	Skip	Skip	Skip	Gap	Gap	
Queue Length 50th (ft)	6	101			211	8		2	0		68	0
Queue Length 95th (ft)	30	326			524	52		15	0		197	23
Internal Link Dist (ft)		420			420			170			145	
Turn Bay Length (ft)	200					50						
Base Capacity (vph)	469	1609			1469	1307		315	386		695	769
Starvation Cap Reductn	0	0			0	0		0	0		0	0
Spillback Cap Reductn	0	0			0	0		0	0		0	0
Storage Cap Reductn	0	0			0	0		0	0		0	0
Reduced v/c Ratio	0.11	0.37			0.45	0.13		0.01	0.03		0.26	0.09

Intersection Summary

Area Type: Other
Cycle Length: 125
Actuated Cycle Length: 80.5

Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 16.8
Intersection LOS: B
Intersection Capacity Utilization 64.0%
ICU Level of Service C
Analysis Period (min) 15
90th %ile Actuated Cycle: 121.9
70th %ile Actuated Cycle: 105.1
50th %ile Actuated Cycle: 71.6
30th %ile Actuated Cycle: 61.9
10th %ile Actuated Cycle: 41.8

Splits and Phases: 1: Voyagers Lane/Memorial Drive & West Union Street



Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	60	4	153	57	7	168
Future Vol, veh/h	60	4	153	57	7	168
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	-	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	10	1	0	0	0	0
Mvmt Flow	64	4	163	61	7	179

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	298	194	0	0	224	0
Stage 1	194	-	-	-	-	-
Stage 2	104	-	-	-	-	-
Critical Hdwy	6.75	6.215	-	-	4.1	-
Critical Hdwy Stg 1	5.55	-	-	-	-	-
Critical Hdwy Stg 2	5.95	-	-	-	-	-
Follow-up Hdwy	3.595	3.3095	-	-	2.2	-
Pot Cap-1 Maneuver	662	850	-	-	1357	-
Stage 1	817	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	658	850	-	-	1357	-
Mov Cap-2 Maneuver	658	-	-	-	-	-
Stage 1	817	-	-	-	-	-
Stage 2	883	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	667	1357	-
HCM Lane V/C Ratio	-	-	0.102	0.005	-
HCM Control Delay (s)	-	-	11	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	42	0	81	38	0	101
Future Vol, veh/h	42	0	81	38	0	101
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	46	0	88	41	0	110

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	219	109	0	0	129	0
Stage 1	109	-	-	-	-	-
Stage 2	110	-	-	-	-	-
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	774	950	-	-	1469	-
Stage 1	921	-	-	-	-	-
Stage 2	920	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	774	950	-	-	1469	-
Mov Cap-2 Maneuver	774	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	920	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	774	1469	-
HCM Lane V/C Ratio	-	-	0.059	-	-
HCM Control Delay (s)	-	-	9.9	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	32	0	119	38	0	143
Future Vol, veh/h	32	0	119	38	0	143
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	35	0	129	41	0	155

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	305	150	0	0	170	0
Stage 1	150	-	-	-	-	-
Stage 2	155	-	-	-	-	-
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	691	902	-	-	1420	-
Stage 1	883	-	-	-	-	-
Stage 2	878	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	691	902	-	-	1420	-
Mov Cap-2 Maneuver	691	-	-	-	-	-
Stage 1	883	-	-	-	-	-
Stage 2	878	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	691	1420	-
HCM Lane V/C Ratio	-	-	0.05	-	-
HCM Control Delay (s)	-	-	10.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

- [ ] Parking Analysis

Proposed Ashland YMCA

AVERAGE PARKING DEMAND ESTIMATES

Weekday - Individual Land Uses

Land Use	Size	Units	Avg Rate	Parking Demand	
YMCA	65.7	ksf	3.64	240	
Daycare	100	Students	0.27	27	
Fields	2	per field	22.00	44	**Available**
			Total	**311**	262
	-		-		

Saturday - Individual Land Uses

Land Use	Size	Units	Avg Rate	Parking Demand	
YMCA	65.7	ksf	4.16	274	
Daycare	100	Students	0.00	0	
Fields	2	per field	22.00	44	**Available**
			Total	**318**	262
	-		-		

Notes:
-YMCA: based on observed rates for Metrowest, Westoborough and Woburn branch facilities

-Daycare: based on observed rates of a Goddard school of 150± students and 25± staff at the time of counts

-Fields: based on observed rates (non-tournament, no overlap)

Weekday Hourly Parking Distribution

50th% Demand	YMCA 240	Daycare 27	Fields 44
12:00 AM	0.00	0.00	0.00
1:00 AM	0.00	0.00	0.00
2:00 AM	0.00	0.00	0.00
3:00 AM	0.00	0.00	0.00
4:00 AM	0.00	0.00	0.00
5:00 AM	0.00	0.00	0.00
6:00 AM	0.18	0.00	0.00
7:00 AM	0.36	0.55	0.00
8:00 AM	0.43	0.88	0.00
9:00 AM	0.74	0.90	0.00
10:00 AM	1.00	0.75	0.00
11:00 AM	0.95	0.75	0.00
12:00 PM	0.68	0.68	0.00
1:00 PM	0.55	0.55	0.00
2:00 PM	0.47	0.50	0.00
3:00 PM	0.41	0.33	1.00
4:00 PM	0.64	0.60	0.91
5:00 PM	0.82	1.00	0.93
6:00 PM	0.86	0.08	0.95
7:00 PM	0.84	0.00	0.84
8:00 PM	0.53	0.00	0.53
9:00 PM	0.47	0.00	0.47
10:00 PM	0.00	0.00	0.00
11:00 PM	0.00	0.00	0.00

Saturday Hourly Parking Distribution

50th% Demand	YMCA 274	Daycare 0	Fields 44
12:00 AM	0.00	0.00	0.00
1:00 AM	0.00	0.00	0.00
2:00 AM	0.00	0.00	0.00
3:00 AM	0.00	0.00	0.00
4:00 AM	0.00	0.00	0.00
5:00 AM	0.00	0.00	0.00
6:00 AM	0.15	0.00	0.00
7:00 AM	0.15	0.00	0.38
8:00 AM	0.41	0.00	0.98
9:00 AM	0.81	0.00	0.85
10:00 AM	1.00	0.00	0.91
11:00 AM	0.87	0.00	0.93
12:00 PM	0.63	0.00	1.00
1:00 PM	0.51	0.00	0.90
2:00 PM	0.49	0.00	0.71
3:00 PM	0.49	0.00	0.09
4:00 PM	0.54	0.00	0.05
5:00 PM	0.55	0.00	0.03
6:00 PM	0.40	0.00	0.00
7:00 PM	0.20	0.00	0.00
8:00 PM	0.00	0.00	0.00
9:00 PM	0.00	0.00	0.00
10:00 PM	0.00	0.00	0.00
11:00 PM	0.00	0.00	0.00

Unadjusted Weekday Hourly Parking Demand

50th% Demand	YMCA 240	Daycare 27	Fields 44	Total
12:00 AM	0	0	0	0
1:00 AM	0	0	0	0
2:00 AM	0	0	0	0
3:00 AM	0	0	0	0
4:00 AM	0	0	0	0
5:00 AM	0	0	0	0
6:00 AM	44	0	0	44
7:00 AM	87	15	0	102
8:00 AM	104	24	0	128
9:00 AM	178	25	0	203
10:00 AM	240	21	0	261
11:00 AM	228	21	0	249
12:00 PM	164	19	0	183
1:00 PM	132	15	0	147
2:00 PM	113	14	0	127
3:00 PM	99	9	44	152
4:00 PM	154	17	41	212
5:00 PM	197	27	41	265
6:00 PM	207	3	42	252
7:00 PM	202	0	37	239
8:00 PM	128	0	24	152
9:00 PM	113	0	21	134
10:00 PM	0	0	0	0
11:00 PM	0	0	0	0
			Max	**265**

Unadjusted Saturday Hourly Parking Demand

50th% Demand	YMCA 274	Daycare 0	Fields 44	Total
12:00 AM	0	0	0	0
1:00 AM	0	0	0	0
2:00 AM	0	0	0	0
3:00 AM	0	0	0	0
4:00 AM	0	0	0	0
5:00 AM	0	0	0	0
6:00 AM	42	0	0	42
7:00 AM	42	0	17	59
8:00 AM	113	0	44	157
9:00 AM	222	0	38	260
10:00 AM	274	0	41	315
11:00 AM	239	0	41	280
12:00 PM	173	0	44	217
1:00 PM	140	0	40	180
2:00 PM	135	0	32	167
3:00 PM	135	0	4	139
4:00 PM	148	0	3	151
5:00 PM	151	0	2	153
6:00 PM	110	0	0	110
7:00 PM	55	0	0	55
8:00 PM	0	0	0	0
9:00 PM	0	0	0	0
10:00 PM	0	0	0	0
11:00 PM	0	0	0	0
			Max	**315**

YMCA, Daycare, Fields Weekday Hourly Parking Demand

50th% Demand	YMCA 240	Daycare 27	Fields 44	Total
12:00 AM	0	0	0	0
1:00 AM	0	0	0	0
2:00 AM	0	0	0	0
3:00 AM	0	0	0	0
4:00 AM	0	0	0	0
5:00 AM	0	0	0	0
6:00 AM	38	0	0	38
7:00 AM	74	13	0	87
8:00 AM	89	21	0	110
9:00 AM	152	22	0	174
10:00 AM	204	18	0	222
11:00 AM	194	18	0	212
12:00 PM	140	17	0	157
1:00 PM	113	13	0	126
2:00 PM	97	12	0	109
3:00 PM	85	8	38	131
4:00 PM	131	15	35	181
5:00 PM	168	23	35	226
6:00 PM	176	3	36	215
7:00 PM	172	0	32	204
8:00 PM	109	0	21	130
9:00 PM	97	0	18	115
10:00 PM	0	0	0	0
11:00 PM	0	0	0	0
Adjustment Factor =	0.85		**Max**	**226**

YMCA, Daycare, Fields Weekday Hourly Parking Demand

50th% Demand	YMCA 274	Daycare 0	Fields 44	Total
12:00 AM	0	0	0	0
1:00 AM	0	0	0	0
2:00 AM	0	0	0	0
3:00 AM	0	0	0	0
4:00 AM	0	0	0	0
5:00 AM	0	0	0	0
6:00 AM	36	0	0	36
7:00 AM	36	0	15	51
8:00 AM	97	0	38	135
9:00 AM	189	0	33	222
10:00 AM	233	0	35	268
11:00 AM	204	0	35	239
12:00 PM	148	0	38	186
1:00 PM	119	0	34	153
2:00 PM	115	0	28	143
3:00 PM	115	0	4	119
4:00 PM	126	0	3	129
5:00 PM	129	0	2	131
6:00 PM	94	0	0	94
7:00 PM	47	0	0	47
8:00 PM	0	0	0	0
9:00 PM	0	0	0	0
10:00 PM	0	0	0	0
11:00 PM	0	0	0	0
Adjustment Factor =	0.85		**Max**	**268**

Proposed Ashland YMCA

85th PERCENTILE PARKING DEMAND ESTIMATES

Weekday - Individual Land Uses

Land Use	Size	Units	85th Rate	Parking Demand	
YMCA	65.7	ksf	4.16	274	
Daycare	100	Students	0.27	27	
Fields	2	per field	27.00	54	Available
			Total	**355**	262
	-		-		

Saturday - Individual Land Uses

Land Use	Size	Units	85th Rate	Parking Demand	
YMCA	65.7	ksf	4.60	303	
Daycare	100	Students	0.00	0	
Fields	2	per field	27.00	54	Available
			Total	**357**	262
	-		-		

Notes:
-YMCA: based on observed rates for Metrowest, Westoborough and Woburn branch facilities

-Daycare: based on observed rates of a Goddard school of 150± students and 25± staff at the time of counts

-Fields: based on observed rates (non-tournament, no overlap)

Weekday Hourly Parking Distribution

85th% Demand	YMCA 274	Daycare 27	Fields 54
12:00 AM	0.00	0.00	0.00
1:00 AM	0.00	0.00	0.00
2:00 AM	0.00	0.00	0.00
3:00 AM	0.00	0.00	0.00
4:00 AM	0.00	0.00	0.00
5:00 AM	0.00	0.00	0.00
6:00 AM	0.18	0.00	0.00
7:00 AM	0.36	0.55	0.00
8:00 AM	0.43	0.88	0.00
9:00 AM	0.74	0.90	0.00
10:00 AM	1.00	0.75	0.00
11:00 AM	0.95	0.75	0.00
12:00 PM	0.68	0.68	0.00
1:00 PM	0.55	0.55	0.00
2:00 PM	0.47	0.50	0.00
3:00 PM	0.41	0.33	1.00
4:00 PM	0.64	0.60	0.91
5:00 PM	0.82	1.00	0.93
6:00 PM	0.86	0.08	0.95
7:00 PM	0.84	0.00	0.84
8:00 PM	0.53	0.00	0.53
9:00 PM	0.47	0.00	0.47
10:00 PM	0.00	0.00	0.00
11:00 PM	0.00	0.00	0.00

Saturday Hourly Parking Distribution

85th% Demand	YMCA 303	Daycare 0	Fields 54
12:00 AM	0.00	0.00	0.00
1:00 AM	0.00	0.00	0.00
2:00 AM	0.00	0.00	0.00
3:00 AM	0.00	0.00	0.00
4:00 AM	0.00	0.00	0.00
5:00 AM	0.00	0.00	0.00
6:00 AM	0.15	0.00	0.00
7:00 AM	0.15	0.00	0.38
8:00 AM	0.41	0.00	0.98
9:00 AM	0.81	0.00	0.85
10:00 AM	1.00	0.00	0.91
11:00 AM	0.87	0.00	0.93
12:00 PM	0.63	0.00	1.00
1:00 PM	0.51	0.00	0.90
2:00 PM	0.49	0.00	0.71
3:00 PM	0.49	0.00	0.09
4:00 PM	0.54	0.00	0.05
5:00 PM	0.55	0.00	0.03
6:00 PM	0.40	0.00	0.00
7:00 PM	0.20	0.00	0.00
8:00 PM	0.00	0.00	0.00
9:00 PM	0.00	0.00	0.00
10:00 PM	0.00	0.00	0.00
11:00 PM	0.00	0.00	0.00

Unadjusted Weekday Hourly Parking Demand

85th% Demand	YMCA 274	Daycare 27	Fields 54	Total
12:00 AM	0	0	0	0
1:00 AM	0	0	0	0
2:00 AM	0	0	0	0
3:00 AM	0	0	0	0
4:00 AM	0	0	0	0
5:00 AM	0	0	0	0
6:00 AM	50	0	0	50
7:00 AM	99	15	0	114
8:00 AM	118	24	0	142
9:00 AM	203	25	0	228
10:00 AM	274	21	0	295
11:00 AM	261	21	0	282
12:00 PM	187	19	0	206
1:00 PM	151	15	0	166
2:00 PM	129	14	0	143
3:00 PM	113	9	54	176
4:00 PM	176	17	50	243
5:00 PM	225	27	51	303
6:00 PM	236	3	52	291
7:00 PM	231	0	46	277
8:00 PM	146	0	29	175
9:00 PM	129	0	26	155
10:00 PM	0	0	0	0
11:00 PM	0	0	0	0
			Max	**303**

Unadjusted Saturday Hourly Parking Demand

85th% Demand	YMCA 303	Daycare 0	Fields 54	Total
12:00 AM	0	0	0	0
1:00 AM	0	0	0	0
2:00 AM	0	0	0	0
3:00 AM	0	0	0	0
4:00 AM	0	0	0	0
5:00 AM	0	0	0	0
6:00 AM	46	0	0	46
7:00 AM	46	0	21	67
8:00 AM	125	0	53	178
9:00 AM	246	0	46	292
10:00 AM	303	0	50	353
11:00 AM	264	0	51	315
12:00 PM	191	0	54	245
1:00 PM	155	0	49	204
2:00 PM	149	0	39	188
3:00 PM	149	0	5	154
4:00 PM	164	0	3	167
5:00 PM	167	0	2	169
6:00 PM	122	0	0	122
7:00 PM	61	0	0	61
8:00 PM	0	0	0	0
9:00 PM	0	0	0	0
10:00 PM	0	0	0	0
11:00 PM	0	0	0	0
			Max	**353**

YMCA, Daycare, Fields Weekday Hourly Parking Demand

85th% Demand	YMCA 274	Daycare 27	Fields 54	Total
12:00 AM	0	0	0	0
1:00 AM	0	0	0	0
2:00 AM	0	0	0	0
3:00 AM	0	0	0	0
4:00 AM	0	0	0	0
5:00 AM	0	0	0	0
6:00 AM	43	0	0	43
7:00 AM	85	13	0	98
8:00 AM	101	21	0	122
9:00 AM	173	22	0	195
10:00 AM	233	18	0	251
11:00 AM	222	18	0	240
12:00 PM	159	17	0	176
1:00 PM	129	13	0	142
2:00 PM	110	12	0	122
3:00 PM	97	8	46	151
4:00 PM	150	15	43	208
5:00 PM	192	23	44	259
6:00 PM	201	3	45	249
7:00 PM	197	0	40	237
8:00 PM	125	0	25	150
9:00 PM	110	0	23	133
10:00 PM	0	0	0	0
11:00 PM	0	0	0	0
Adjustment Factor =	0.85		**Max**	**259**

YMCA, Daycare, Fields Weekday Hourly Parking Demand

85th% Demand	YMCA 303	Daycare 0	Fields 54	Total
12:00 AM	0	0	0	0
1:00 AM	0	0	0	0
2:00 AM	0	0	0	0
3:00 AM	0	0	0	0
4:00 AM	0	0	0	0
5:00 AM	0	0	0	0
6:00 AM	40	0	0	40
7:00 AM	40	0	18	58
8:00 AM	107	0	46	153
9:00 AM	210	0	40	250
10:00 AM	258	0	43	301
11:00 AM	225	0	44	269
12:00 PM	163	0	46	209
1:00 PM	132	0	42	174
2:00 PM	127	0	34	161
3:00 PM	127	0	5	132
4:00 PM	140	0	3	143
5:00 PM	142	0	2	144
6:00 PM	104	0	0	104
7:00 PM	52	0	0	52
8:00 PM	0	0	0	0
9:00 PM	0	0	0	0
10:00 PM	0	0	0	0
11:00 PM	0	0	0	0
Adjustment Factor =	0.85		**Max**	**301**