

MEMORANDUM

DATE: January 23, 2026
(Updated May 29, 2026)

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

RE: **Proposed Residential Development**
27 Kimball Road – Amesbury, MA

MDM Transportation Consultants, Inc. (MDM) has prepared this traffic impact and access study (TIAS) for the proposed residential development to be located at 27 Kimball Road in Amesbury, Massachusetts. The location of the Site relative to adjacent roadways is shown in **Figure 1**. This TIAS provides a summary of the baseline traffic conditions at the Site and adjacent roadways/intersections, evaluates existing and projected trip generation, 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 traffic impact assessment are as follows:

- *Baseline Traffic Volumes.* Kimball Road carries approximately 2,170 vehicles per day (vpd) on weekdays. Peak hour traffic flow on Kimball Road ranges from approximately 165 to 195 vehicles per hour (vph), which represents approximately 8 to 9 percent of daily traffic flow. Consistent with commuter travel, the traffic flow on Kimball Road is skewed in the southbound direction during the weekday morning peak hour and is skewed northbound during the weekday evening peak hour.
- *Trip Generation.* Based on industry-standard trip rates and methodology published by the Institute of Transportation Engineers (ITE), the proposed development is estimated to generate approximately 40 trips during the weekday morning peak hour (10 entering and 30 exiting), 44 trips during the weekday evening peak hour (25 entering and 19 exiting), and 566 vehicle trips on a weekday.



Figure 1

Site Location

- *Safety Characteristics.* Based on extensive review of MassDOT crash data, the study intersections and Kimball Road segment experienced crash rates below the District 4 average, no HSIP locations were found, and no immediate safety countermeasures are necessary based on the crash history at the study area intersections. With selective clearing and grading as part of the installation of the Site driveway the available sight lines will satisfy the recommended sight line requirements from AASHTO. Field review indicates that at least one large caliper tree, which appears to be within the right-of-way, will need to be removed to achieve said sight distances approximately 60 feet west of the existing Site driveway location. New plantings (shrubs, bushes) and structures (walls, fences, etc.) shall be maintained at a height of 2 feet or less within the sight lines in vicinity of the Site Driveway intersection to Kimball Road to provide unobstructed sight lines. Snow windrows located within sight triangle areas that exceed 3.5-feet in height or that would otherwise inhibit sight lines shall be promptly removed.
- *Adequate Capacity.* The proposed development is not expected to materially impact study area intersections and will not result in any material changes in traffic operations in the study area between future No-Build and Build conditions. Therefore, no off-site mitigation measures are warranted based on operations. Likewise, the Site Driveway approach to Kimball Road will operate below capacity with minimal delay (LOS A) during the peak hours.

In summary, MDM finds that incremental traffic associated with the proposed development is not expected to materially impact operating conditions in the study area. Implementation of access/egress improvements, pedestrian and bicycle accommodations and a TDM program as outlined under the *Recommendations and Conclusions* section will establish a framework of minimizing Site traffic impacts by encouraging non-motorized travel modes and pedestrian accommodation that is compatible with other projects in the area.

PROJECT DESCRIPTION

The existing Site (27 Kimball Road) consists of a single-family home on a 9.40± acre lot with a along the south side of Kimball Road. Site access/egress is currently provided via a residential driveway along Kimball Road.

Under the proposed site programming, the Site will be redeveloped into an 86-unit residential development with surface parking. To provide access/egress for the proposed homes, the existing driveway along Kimball Road will be widened. A preliminary site plan prepared by Allen & Major is presented in **Figure 2**. On-site parking for the development will be comprised of 146± parking spaces.

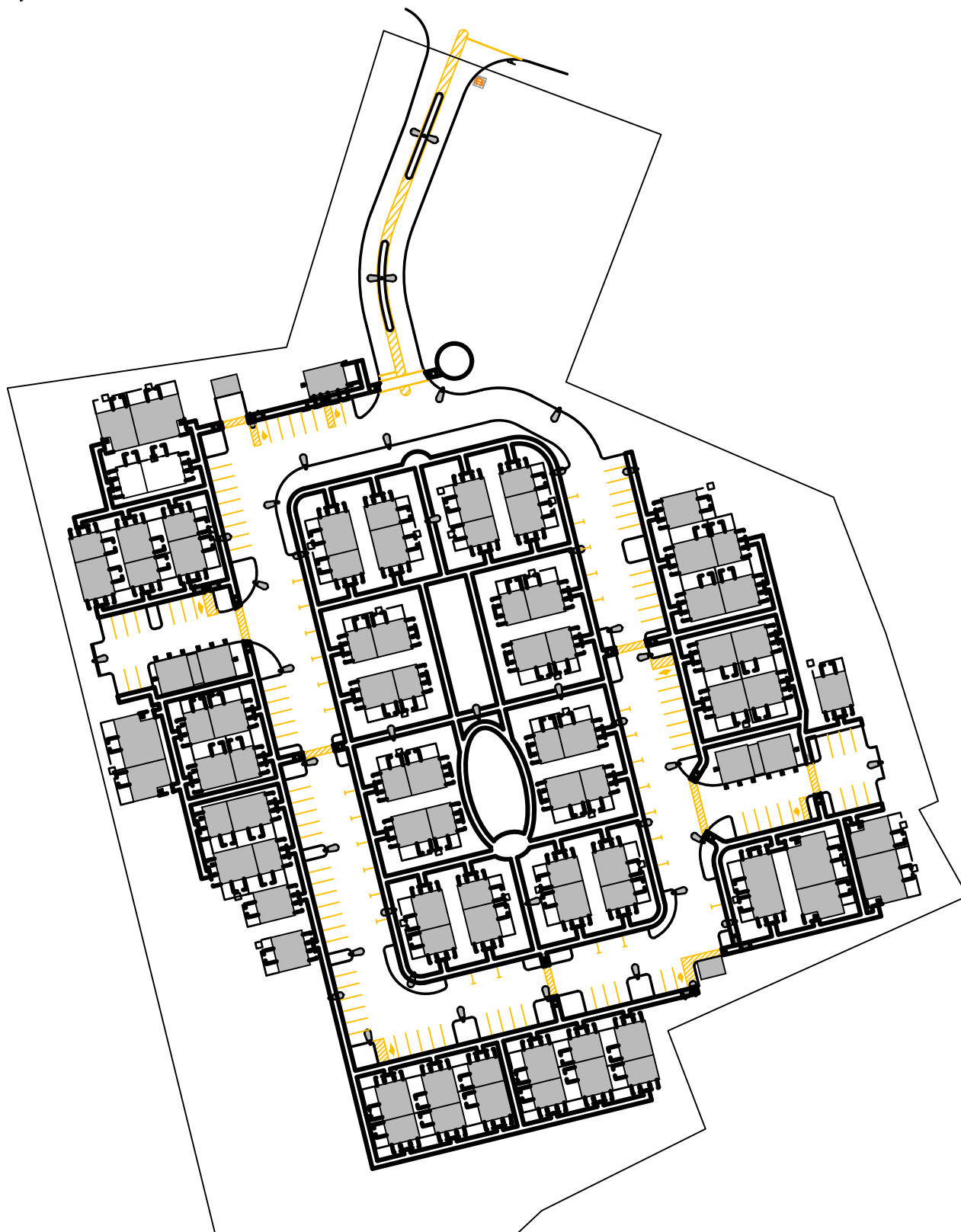


Figure 2

EXISTING TRAFFIC & SAFETY CHARACTERISTICS

An overview of existing roadway conditions, traffic volumes, and safety characteristics is provided below.

Haverhill Road

Haverhill Road is classified by MassDOT as a minor arterial roadway under MassDOT (State) jurisdiction. Within the immediate project area, Haverhill Road is a largely east-west roadway providing a connection between Main Street and Macy Street to the east and East Main Street to the West. Within the immediate project area, the roadway provides a single travel lane in each direction separated by a single yellow centerline to the south of the site and by a median north of the site. The posted (regulatory) speed limit on Haverhill Road is 40 mph in the study area. Land uses along Haverhill Road include industrial, recreational, commercial, and residential properties.

Kimball Road

Kimball Road is classified by the Massachusetts Department of Transportation (MassDOT) as a local roadway under local (City) jurisdiction. Kimball Road is a northwest-southeast roadway providing a connection between Haverhill Road to the southeast and Amesbury Road in New Hampshire to the northwest. Within the immediate project area, the roadway provides one travel lane in each direction separated by a double yellow centerline. The posted (regulatory) speed limit on Kimball Road is 25 mph in the study area. Land uses along Kimball Road include residential properties.

Baseline Traffic Data

Traffic-volume data used in this study was obtained by mechanical and manual methods in December 2025. Turning movement counts (TMCs) were conducted at the existing study intersections. Traffic data was collected during the weekday morning (7:00 to 9:00 AM) and weekday evening (4:00 to 6:00 PM) peak commuter periods. A review of MassDOT permanent count station data for the area indicated that December represents below average traffic conditions (11 percent). To represent average conditions, an 11 percent increase was applied to the traffic data. The weekday morning and weekday evening peak hour traffic volumes for the study intersections are shown in **Figure 3** and **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 that were obtained along Kimball Road near 22 Kimball Road in December 2025 are summarized in **Table 1** without adjustment.

TABLE 1
ROADWAY TRAFFIC-VOLUME SUMMARY

Time Period	Daily Volume (vpd) ¹	Percent Daily Traffic ²	Peak Hour Volume (vph) ³	Peak Flow Direction ⁴	Peak Hour Directional Volume (vph)
<i>Kimball Road Near 22 Kimball Road</i>					
Weekday Morning Peak Hour	2,170	8%	165	58% SB	115
Weekday Evening Peak Hour	2,170	9%	192	53% NB	122

¹Two-way daily traffic expressed in vehicles per day without adjustment.

²The percent of daily traffic that occurs during the peak hour.

³Two-way peak-hour volume expressed in vehicles per hour.

⁴NB = Northbound, SB = Southbound

As summarized in **Table 1**, Kimball Road carries approximately 2,170 vehicles per day (vpd) on weekdays. Peak hour traffic flow on Kimball Road ranges from approximately 165 to 195 vehicles per hour (vph), which represents approximately 8 to 9 percent of daily traffic flow. Consistent with commuter travel, the traffic flow on Kimball Road is skewed in the southbound direction during the weekday morning peak hour and is skewed northbound during the weekday evening peak hour.

Measured Travel Speeds

Vehicle speeds were obtained for Kimball Road in December 2025 using an automatic speed radar device. **Table 2** summarizes the average and 85th percentile speeds along Kimball Road in the immediate site vicinity. Speed data is provided in the **Attachments**.

TABLE 2
SPEED STUDY RESULTS

Travel Direction	Regulatory Speed Limit ¹	Travel Speed	
		Mean ²	85 th Percentile ³
<i>Kimball Road – Immediate Site Vicinity</i>			
Northbound	25	26	31
Southbound	25	27	32

¹Regulatory speed limit in mph

²Arithmetic mean in mph

³The 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 Kimball Road was observed to be 26 mph in the northbound direction and 27 mph in the southbound direction; the 85th percentile travel speed was observed to be 31 mph in the northbound direction and 32 mph in the southbound direction. Notwithstanding that the observed travel speeds are in line with the regulatory speed limit of 25 mph, the Proponent will work with the Town to implement traffic calming measures along Kimball Road if desirable as outlined under *Off-Site Improvements*.

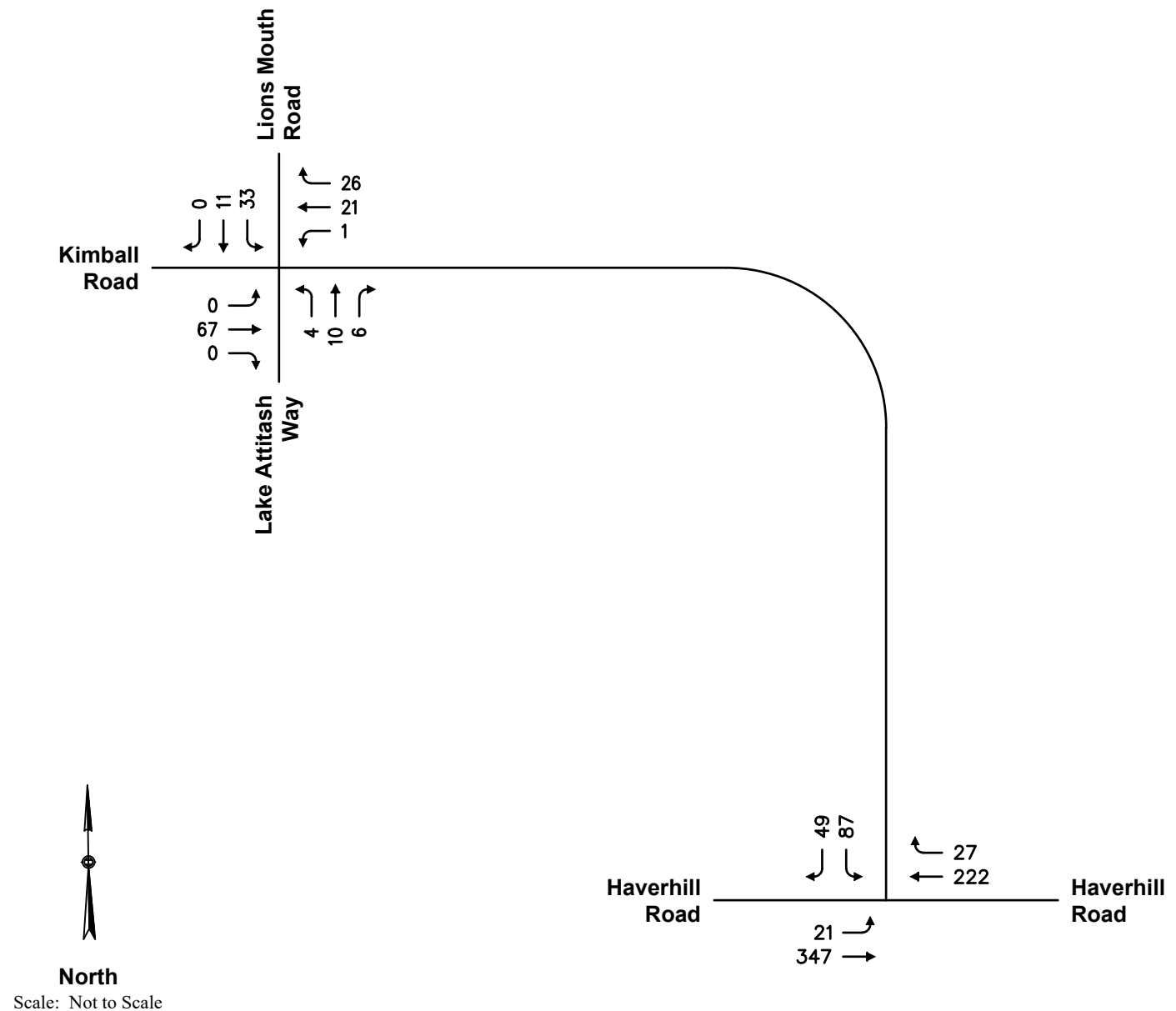
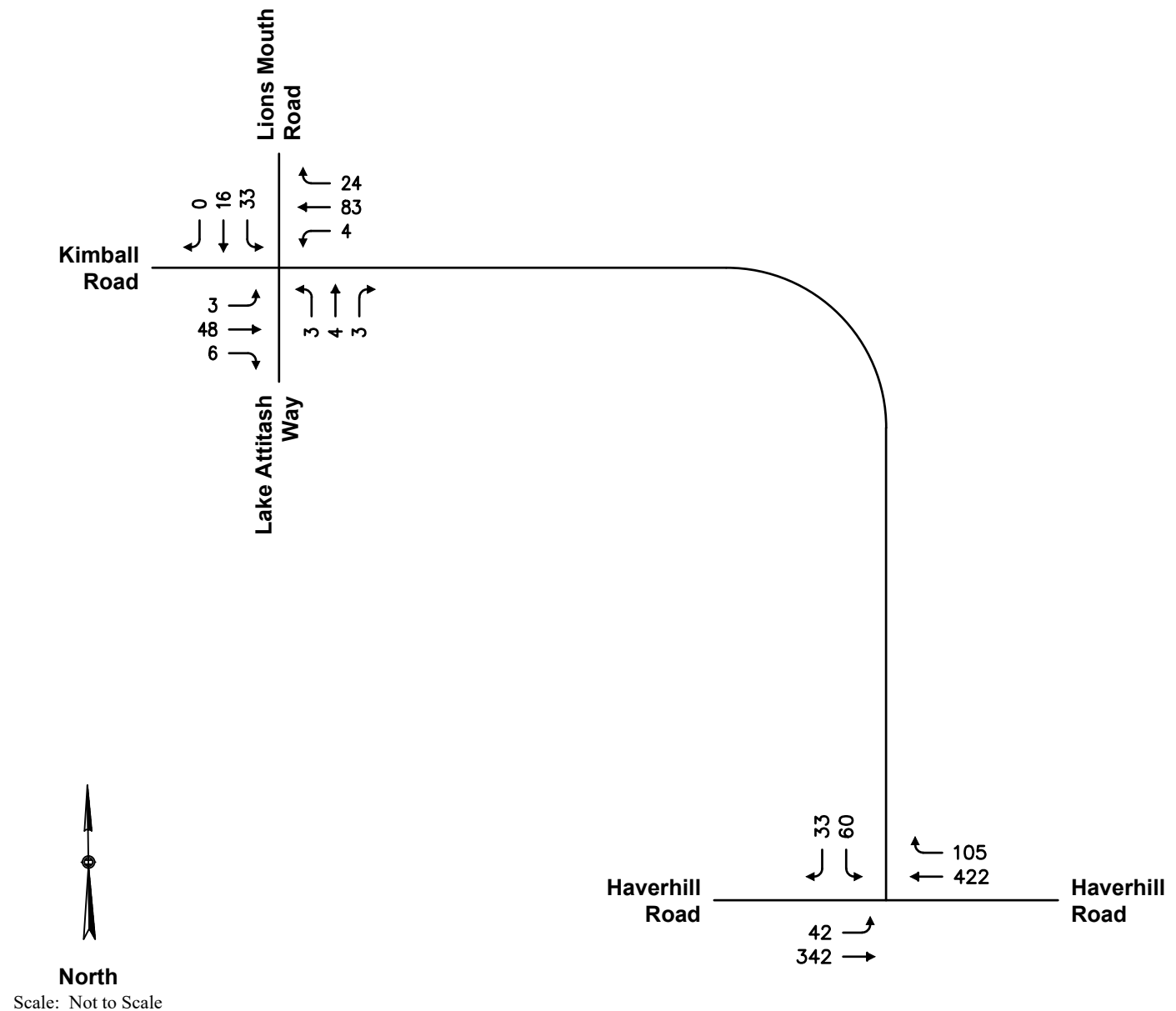


Figure 3



Public Transportation Facilities

The Merrimac Valley Transit Authority (MVRTA) provides fixed-route, fare-free bus services in the vicinity of the Site via Route 17 – Salisbury Beach via Amesbury. MVRTA Route 17 runs from the Washington Square Transit Station in Haverhill and travels along Route 110 (Haverhill Road within the vicinity of the Site) where it turns around at Salisbury Beach. A stop is currently provided at the Haverhill Road intersection with Kimball Road, a 5-minute walk from the Site. Bus Route 17 provides service to the Washington Square Transit Station, allowing a connection to the other MVRTA bus routes and is a 5-minute walk from Haverhill Station for access to the MBTA Haverhill Commuter Rail Line to North Station in Boston and Amtrak's Downeaster, providing service to Brunswick Station in Brunswick, Maine and North Station in Boston. Bus Route 17 allows connections to Bus Route 19, which connects to Newburyport Station for access to the MBTA Newburyport/Rockport Commuter Rail Line to North Station in Boston. The MVRTA Route 17 map and schedule are provided in the **Attachments**.

Crash History

In order to identify crash trends and safety characteristics at the study intersection and along Kimball Road, crash data were obtained from MassDOT for the City of Amesbury for the five-year period 2021 through 2025. Crash data for the study intersections is summarized in **Table 3** with detailed data provided in the **Attachments**.

MassDOT has also determined the official District 4 (which includes the City of Amesbury) crash rate is 0.57 for unsignalized intersections and the official statewide crash rate to be 2.50 for urban local roadways. These crash rates represent MassDOT's "average" crash experience and serve as a basis for comparing reported crash rates for the area. Where calculated crash rates notably exceed the averages, some form of safety countermeasures may be warranted. A review of Highway Safety Improvement Project (HSIP) locations in the site vicinity was also conducted.

TABLE 3
STUDY INTERSECTION CRASH SUMMARY¹
2021 THROUGH 2025

Data Category	Haverhill Road at Kimball Road	Kimball Road at Lions Mouth Road/ Lake Attitash Way
Intersection Type	Unsignalized	Unsignalized
Crash Rate	0.14	0.21
MassDOT Avg ³	0.57	0.57
<i>Year:</i>		
2021	1	0
2022	0	1
2023	2	0
2024	0	0
<u>2025</u>	<u>0</u>	<u>0</u>
Total	3	1
<i>Type:</i>		
Angle	0	0
Rear-End	0	0
Head-On	0	0
Sideswipe	1	0
Single Vehicle	1	1
Other/Unknown	1	0
<i>Severity:</i>		
P. Damage Only	2	1
Personal Injury	1	0
Fatality	0	0
Unknown	0	0
<i>Conditions:</i>		
Dry	3	0
Wet	0	0
Ice/Snow	0	1
Unknown	0	0
<i>Time:</i>		
7:00 to 9:00 AM	0	0
4:00 to 6:00 PM	2	1
Rest of Day	1	0

¹ Source: MassDOT Crash Database

²Crashes per million entering vehicles

³MassDOT District 4 Average Crash Rate: 0.57 (Unsignalized)

As summarized in **Table 3**:

- *Haverhill Road at Kimball Road.* Three (3) crashes were reported at or near the unsignalized intersection of Haverhill Road and Kimball Road intersection resulting in a crash rate of 0.14, which is below the District 4 average of 0.57. The reported crashes included an angle/sideswipe type collision, a single-vehicle type collision, and an unknown type collision. Two (2) of the collisions resulted in property damage only (66%) under dry roadway conditions (100%) and two (2) crashes occurred during the afternoon peak travel period (66%).
- *Kimball Road at Lions Mouth Road/Lake Attitash Way.* One (1) crash was reported at or near the unsignalized intersection of Kimball Road and Lions Mouth Road/Lake Attitash Way resulting in a crash rate of 0.21, which is below the District 4 average of 0.57. The crash was a single-vehicle type crash. It resulted in property damage only and was during icy conditions and the afternoon peak traffic period.

Kimball Road Segment – Haverhill Road to Lions Mouth Road. Nine (9) crashes were reported along the 1.2 miles section of Kimball Road between Haverhill Road and Lions Mouth Road resulting in a roadway segment crash rate of 1.71 which is below the MassDOT crash rate for an urban local roadway. All of the crashes (100%) all involved single vehicle collisions with a tree/utility pole. The majority (78%) of the crashes resulted in property damage collisions with no apparent injuries.

In summary, based on extensive review of MassDOT crash data, the study locations and Kimball Road segment experienced crash rates below the District 4 average, no HSIP locations were found; therefore, no immediate safety countermeasures are necessary based on the crash history at the study area intersections.

Sight Line Evaluation

An evaluation of sight lines was conducted to ensure that minimum recommended sight lines are available at the Site driveway intersection with Kimball Road. The evaluation documents sight lines under proposed conditions for vehicles as they relate to these roadways with comparison to recommended guidelines.

The American Association of State Highway and Transportation Officials' (AASHTO) standards¹ reference two types of sight distance which are relevant at the site driveway intersections with Kimball Road: stopping sight distance (SSD) and intersection sight distance (ISD). Sight lines for critical vehicle movements at the Site driveway intersection along Kimball Road were compared to minimum SSD and ISD recommendations for the regulatory and observed travel speeds in the area.

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 the design speed limit, to stop safely before reaching a stationary object in its path, in this case, a vehicle exiting onto Kimball Road. 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 when 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 Kimball Road approach to the Site driveways. **Table 4** presents a summary of the available SSD as they relate to Kimball Road and AASHTO's recommended SSD based on regulatory speeds.

TABLE 4
STOPPING SIGHT DISTANCE SUMMARY
APPROCHES TO SITE DRIVEWAY

Approach/ Travel Direction	Available SSD	AASHTO Recommended ¹	
		Regulatory Speed ²	85 th Percentile Travel Speed ³
<i>Northbound</i>	300± Feet	160 Feet	220 Feet
<i>Southbound</i>	400± Feet	145 Feet	205 Feet

¹Recommended 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.

²Regulatory speed limit: 25 mph

³85th Percentile travel speed: Kimball Road: 31 mph NB and 32 mph SB

As summarized in **Table 4** analysis results indicate that the available sight lines exceed AASHTO's recommended SSD criteria for both travel directions along Kimball Road based on the regulatory and 85th percentile travel speeds.

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". In this case, the Site driveway approach to Kimball Road is proposed to be under "STOP" control. The ISD in question relates to the ability to turn either right or left onto Kimball Road.

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 (10 feet from the effective travel way) for the northbound and southbound travel directions on Kimball Road. **Table 5** presents a summary of the available ISD for the departure from the Site driveway to Kimball Road and AASHTO's recommended ISD assuming continued maintenance within the sight line triangles.

TABLE 5
INTERSECTION SIGHT DISTANCE SUMMARY
DRIVWAY DEPARTURES TO KIMBALL ROAD

View Direction	Available ISD	AASHTO Minimum ¹	AASHTO Ideal ¹
		85 th Percentile Travel Speed ³	Regulatory Speed Limit ²
Looking North	400± Feet	205 Feet	240 Feet
Looking South	290± Feet	220 Feet	280 Feet

¹Recommended 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.

²Regulatory speed limit: 25 mph

³85th Percentile travel speed: Kimball Road: 31 mph NB and 32 mph SB

The results of the ISD analysis presented in **Table 5** and shown in **Figure 5**, indicate that with clearing and grading as part of the driveway construction, the available sight lines at the Kimball Road intersection with the proposed Site driveway will exceed the sight line requirements from AASHTO for the regulatory and 85th percentile travel speeds. Field review indicates that at least one large caliper tree, which appears to be within the right-of-way, will need to be removed to achieve said sight distances approximately 60 feet west of the existing Site driveway location. MDM recommends that any new plantings (shrubs, bushes) or physical landscape features to be located within the sight line triangles should also be maintained at a height of 2 feet or less above the adjacent roadway grade to ensure unobstructed lines of sight.



REV.	DESCRIPTION	BY	DATE
FIGURE 5 - INTERSECTION SIGHT DISTANCE			
SIGHT LINE TRIANGLES 27 KIMBALL ROAD AMESBURY, MASSACHUSETTS PREPARED FOR: MARCUS PARTNERS 201 WASHINGTON STREET SUITE 2100 BOSTON, MA 02108			
MDMTRANSPORTATION CONSULTANTS, INC. PLANNERS & ENGINEERS 28 Lord Road, Suite 280 Marlborough, MA 01752 Tel: (508) 303-0370			
Project No. 1465		File Name: 1465 Sight Distance (2026-05-28).dwg	
Date: May 28, 2026		Scale: As Noted	Sheet 1 of 1

PROJECTED FUTURE TRAFFIC CONDITIONS

Evaluation of the proposed development impacts requires the establishment of a future analysis condition. This section estimates future roadway and traffic conditions with and without the proposed development. For this evaluation, a 2025 Baseline and a seven-year planning horizon (year 2032) was selected consistent with industry standard guidelines.

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), includes existing traffic, new traffic due to general background traffic growth, and traffic related to specific developments by others that are 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 the Baseline traffic volume networks to develop Baseline conditions and superimposed on the No-Build traffic-flow networks to develop future Build conditions.

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

Background 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.

Nearby permanent count station data published by MassDOT indicates a 0.5 percent per year growth rate. For purposes of this evaluation, a 1.0 percent compounded annual growth rate was used (7.2 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**. Based on consultation with the City of Amesbury Planning Staff and review of Massachusetts Environmental Policy Act (MEPA) files, despite there being several large pending or approved projects, none are projected to significantly increase traffic volumes through the study area beyond normal background 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 7.2 percent (1.0 percent compounded annually over 7 years). The resulting 2032 No-Build traffic volumes are displayed in **Figure 6** and **Figure 7**.

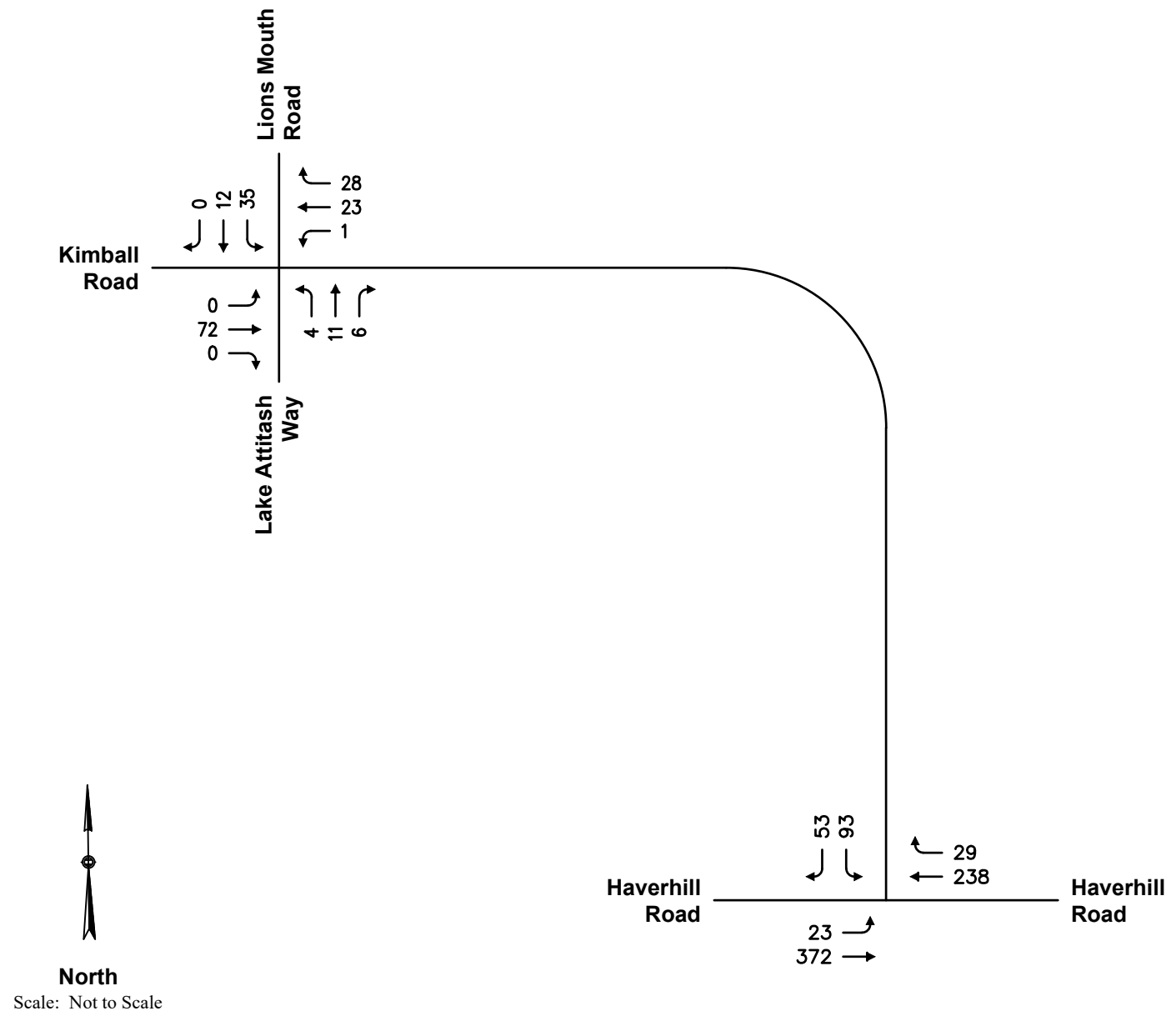


Figure 6

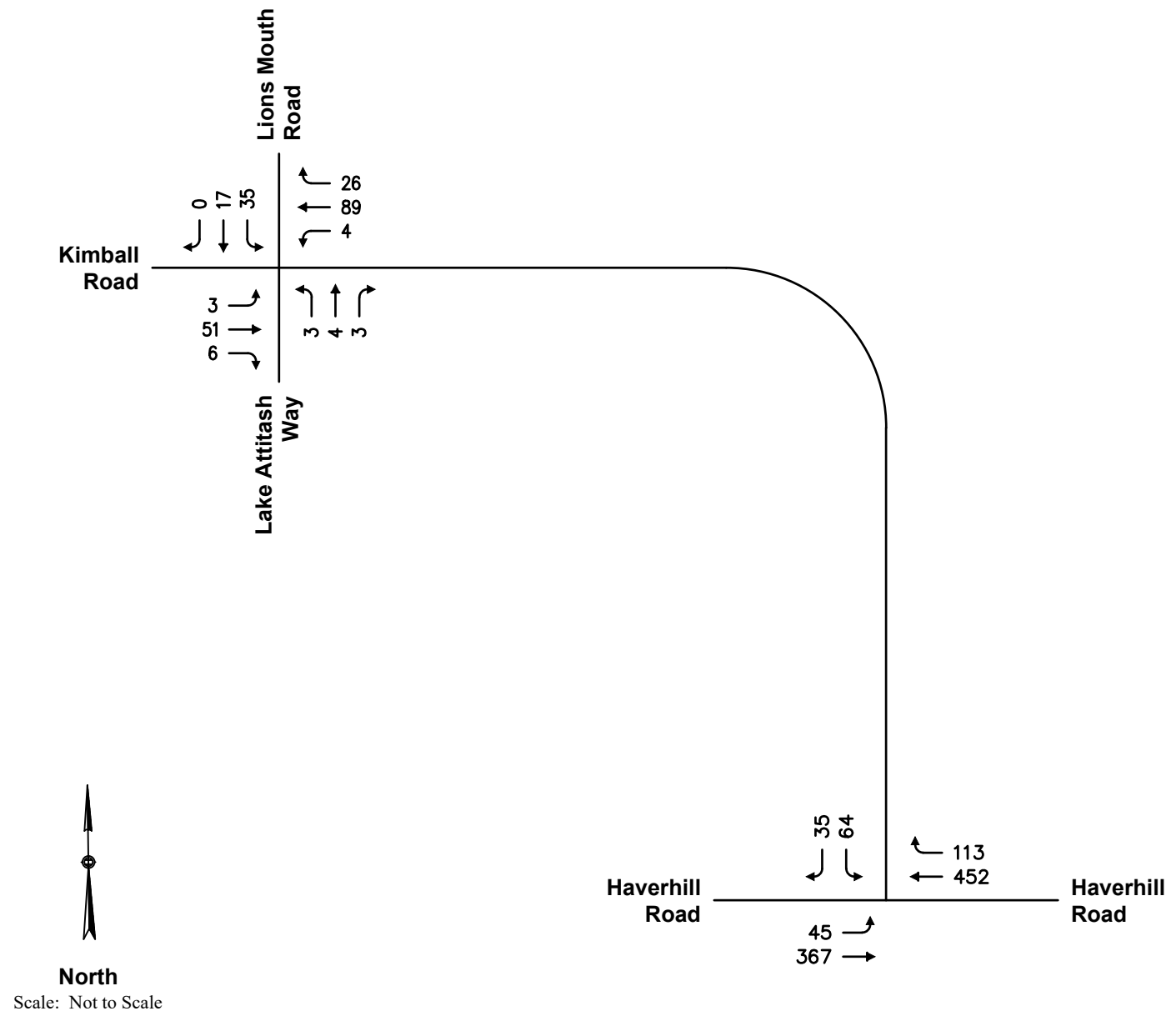


Figure 7

Trip Generation

The trip generation estimates for the proposed Site development are provided for the weekday morning and weekday evening, which correspond to the critical analysis periods for the proposed use and adjacent street traffic flow. New traffic generated by the project was estimated using trip rates published in ITE's *Trip Generation* for the Land Use Codes (LUC) based on trip rates for Single Family Attached Housing (LUC 215) applied to 86 units. **Table 6** presents the trip-generation estimates for the proposed development based on ITE methodology.

TABLE 6
TRIP-GENERATION SUMMARY

Peak Hour/Direction	Single Family Attached Housing (86 Units) ¹
<i>Weekday Morning Peak Hour:</i>	
Entering	10
<u>Exiting</u>	<u>30</u>
Total	40
<i>Weekday Evening Peak Hour:</i>	
Entering	25
<u>Exiting</u>	<u>19</u>
Total	44
<i>Weekday Daily (24-Hour):</i>	566

Source: ITE *Trip Generation*, 12th Edition; 2025.

¹ITE LUC 215 – Single Family Attached Housing – applied to 86 units (average rates).

As summarized in **Table 6**, based on industry-standard trip rates, the proposed development is estimated to generate approximately 40 trips during the weekday morning peak hour (10 entering and 30 exiting), 44 trips during the weekday evening peak hour (25 entering and 19 exiting), and 566 vehicle trips on a weekday.

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. Journey to Work data served as the primary basis for determining the trip distribution pattern for the proposed development. Trip distribution calculations are provided in the **Attachments**.

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

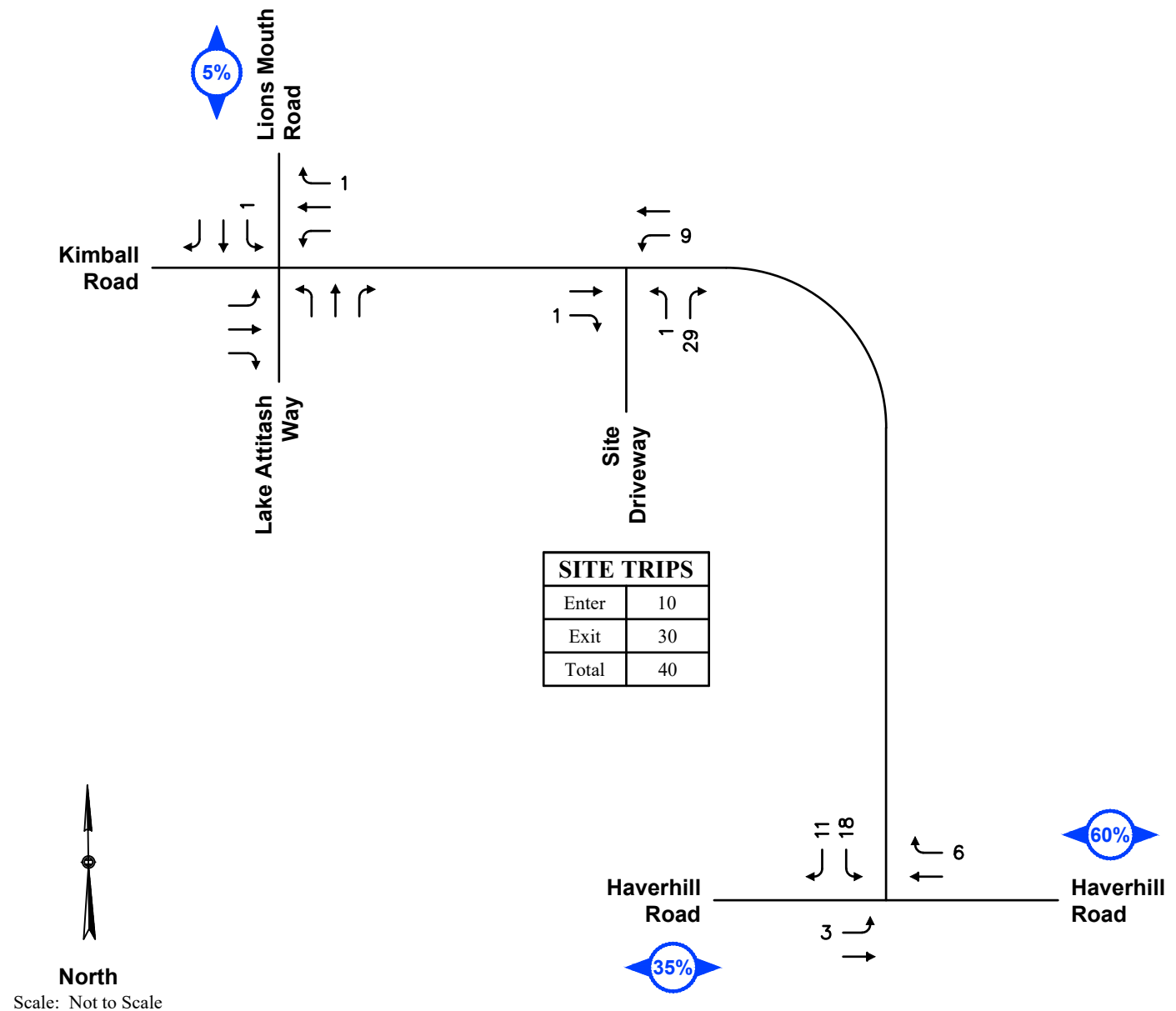


Figure 8

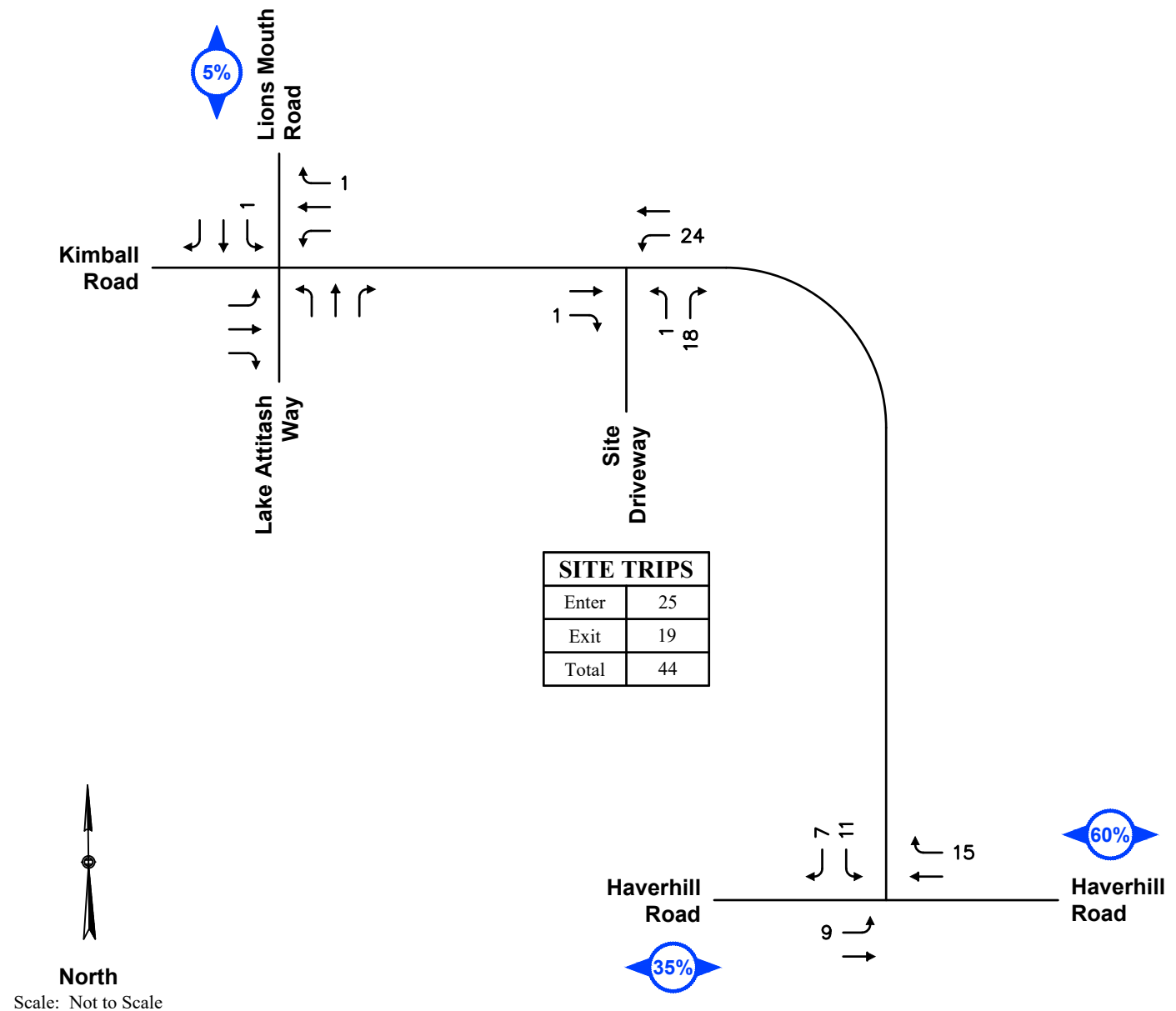


Figure 9

2032 Build Traffic Conditions

2032 Build condition traffic volumes are derived by adding incremental traffic increases for the proposed development of the Site to the 2032 No-Build conditions. **Figure 10** and **Figure 11** present the 2032 Build condition traffic-volume networks for the weekday morning and weekday evening peak hours.

OPERATIONS ANALYSIS

This section provides an overview of operational analysis methodology as well as an assessment of driveway operations under 2025 Baseline and projected 2032 No-Build and Build conditions.

Analysis Methodology

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 if required.

Capacity analysis of intersections is developed using the Synchro® computer software, which implements the methods of the Highway Capacity Manual 7th Edition (HCM7). 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). The specific control delays and associated LOS designations are presented in the **Attachments**.

Analysis Results

Level-of-Service (LOS) analyses were conducted for the Baseline, No-Build and Build conditions for the study intersection. The results of the intersection capacity analyses are summarized below in **Table 7** and **Table 8**. Detailed analysis results are presented in the **Attachments**.

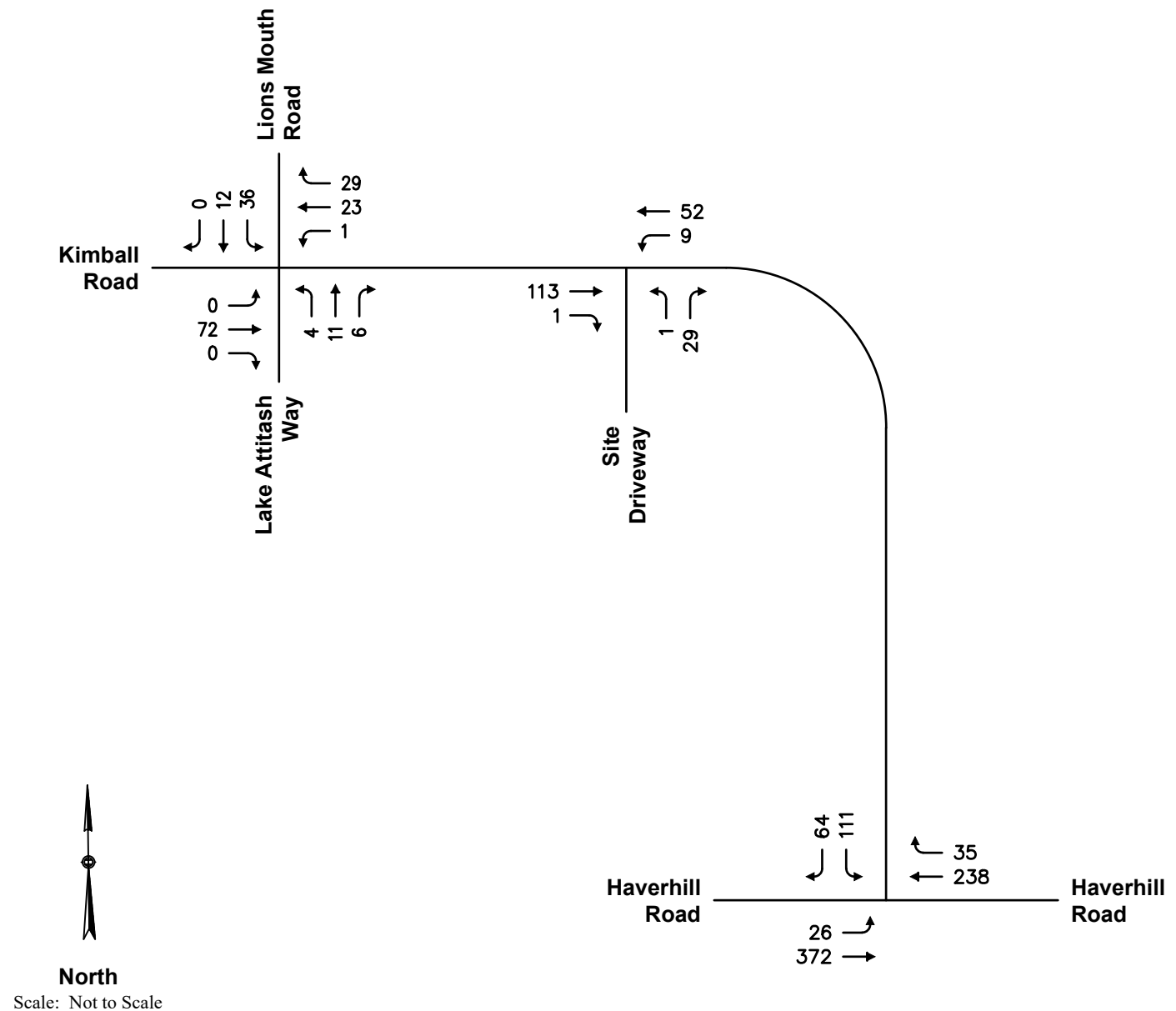


Figure 10

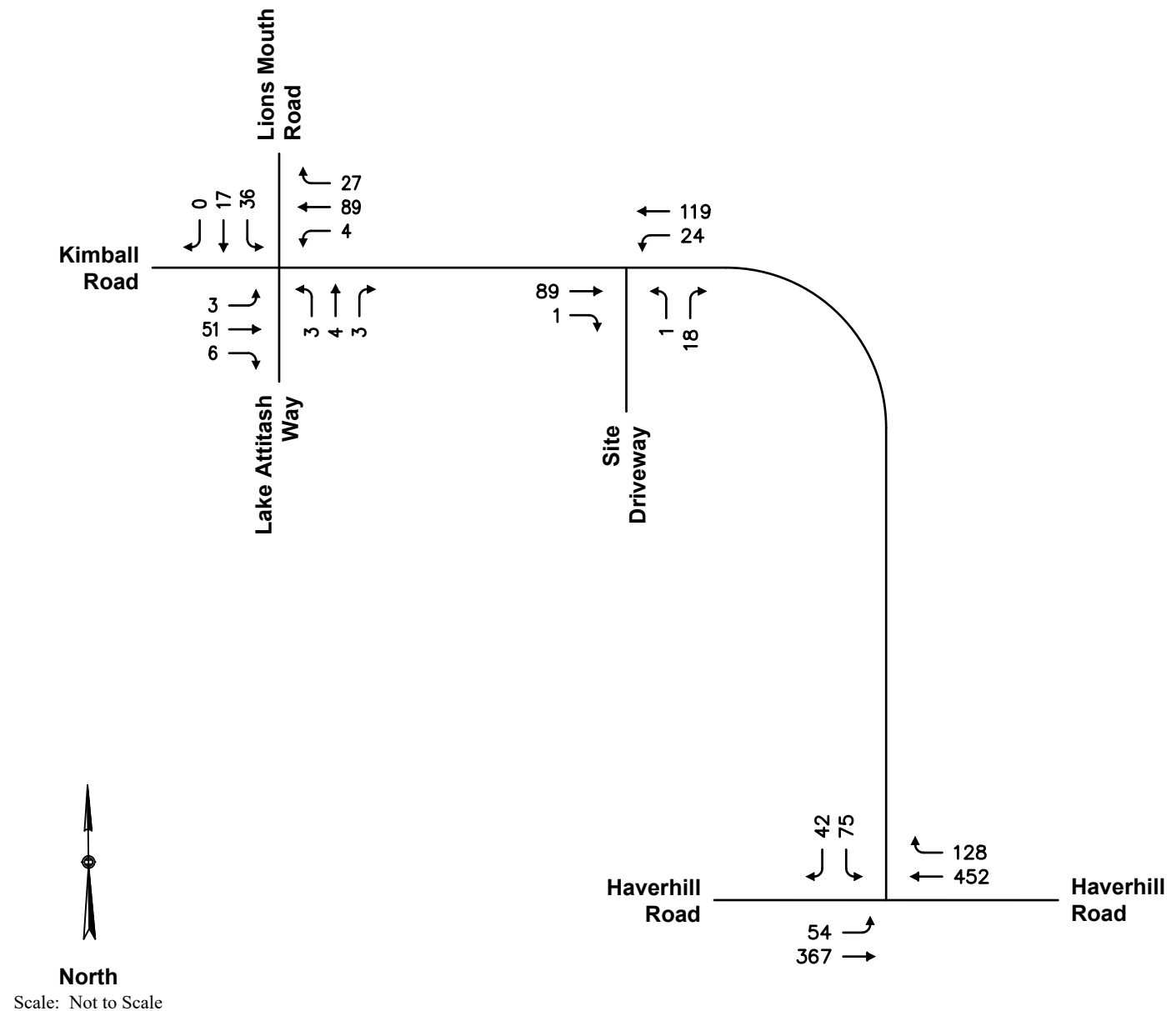


Figure 11

TABLE 7
INTERSECTION CAPACITY ANALYSIS RESULTS
WEEKDAY MORNING PEAK HOUR

Period	Approach	2025 Baseline			2032 No-Build			2033 Build		
		v/c ¹	Delay ²	LOS ³	v/c	Delay	LOS	v/c	Delay	LOS
<i>Haverhill Road at Kimball Road</i>	Eastbound	0.02	<5	A	0.02	<5	A	0.02	<5	A
	Westbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
	SB Exit	0.24	14	B	0.28	16	C	0.34	17	C
<i>Kimball Road at Lions Mouth Road/Lake Attitash Way</i>	Eastbound	0.10	8	A	0.10	8	A	0.10	8	A
	Westbound	0.06	7	A	0.07	7	A	0.07	7	A
	Northbound	0.03	7	A	0.03	7	A	0.03	7	A
	Southbound	0.07	8	A	0.07	8	A	0.08	8	A
<i>Kimball Road at Site Driveway</i>	Northbound	n/a	n/a	n/a	n/a	n/a	n/a	0.00	<5	A
	Southbound	n/a	n/a	n/a	n/a	n/a	n/a	0.01	<5	A
	EB Exit	n/a	n/a	n/a	n/a	n/a	n/a	0.04	9	A

¹Volume-to-capacity ratio

²Average control delay per vehicle (in seconds)

³Level of service

⁴n/a = not applicable

TABLE 8
INTERSECTION CAPACITY ANALYSIS RESULTS
WEEKDAY EVENING PEAK HOUR

Period	Approach	2025 Baseline			2032 No-Build			2033 Build		
		v/c ¹	Delay ²	LOS ³	v/c	Delay	LOS	v/c	Delay	LOS
<i>Haverhill Road at Kimball Road</i>	Eastbound	0.05	<5	A	0.05	<5	A	0.06	<5	A
	Westbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
	SB Exit	0.25	19	C	0.30	22	C	0.37	24	C
<i>Kimball Road at Lions Mouth Road/Lake Attitash Way</i>	Eastbound	0.08	8	A	0.08	8	A	0.08	8	A
	Westbound	0.14	8	A	0.15	8	A	0.16	8	A
	Northbound	0.01	7	A	0.01	7	A	0.01	7	A
	Southbound	0.07	8	A	0.08	8	A	0.08	8	A
<i>Kimball Road at Site Driveway</i>	Northbound	n/a	n/a	n/a	n/a	n/a	n/a	0.00	<5	A
	Southbound	n/a	n/a	n/a	n/a	n/a	n/a	0.02	<5	A
	EB Exit	n/a	n/a	n/a	n/a	n/a	n/a	0.02	9	A

¹Volume-to-capacity ratio

²Average control delay per vehicle (in seconds)

³Level of service

⁴n/a = not applicable

As summarized in **Table 7** and **Table 8**:

- *Haverhill Road at Kimball Road.* Under future Build conditions, the southbound Kimball Road approach to Haverhill Road will continue to operate below capacity at LOS C or better during the weekday morning and evening peak hours. Mainline traffic along Haverhill Road will continue to operate unimpeded with minimal delay (LOS A) during the peak hours.
- *Kimball Road at Lions Mouth Road/Lake Attitash Way.* Under future Build conditions, all the approaches to the intersection will continue to operate below capacity with minimal delay (LOS A) during the morning and evening peak hours.
- *Kimball Road at Site Driveway.* Under future Build conditions, the eastbound Site Driveway approach to Kimball Road will continue to operate below capacity with minimal delay (LOS A) during the weekday morning and evening peak hours. Likewise, mainline traffic along Kimball Road will continue to operate unimpeded during the peak hours.

In summary, the proposed development is not expected to materially impact study area intersections and will not result in any material changes in traffic operations in the study area between future No-Build and Build conditions. Therefore, no off-site mitigation measures are warranted based on operations.

RECOMMENDATIONS AND CONCLUSIONS

MDM finds the study area can accommodate modest traffic increases of the project. Relative traffic increases for the proposed project represent an inconsequential change in operations compared to No-Build conditions and are immaterial to traffic operations along Kimball Road. However, actions are identified to support the project to ensure that site access meets applicable safety criteria, to enhance neighborhood walking/bicycling and to reduce dependency on single-occupant auto use. These include (a) access-related improvements, (b) pedestrian and bicycle accommodations, (c) offsite intersection improvements, and (d) TDM actions as summarized below.

Access/Egress Improvements

- *Driveway Design.* The driveway alignment, widths and curb radii have been designed to achieve perpendicular alignment with appropriate width and curb radii between the proposed Site Driveway and Kimball Road to accommodate the Town's largest fire apparatus (ladder truck) and single unit delivery trucks. Signs and pavement markings that are compliant with the Manual on Uniform Traffic Control Devices (MUTCD) should be installed on the approach to Kimball Road including STOP signs (R1-1) and STOP line pavement markings. AutoTurn for a ladder truck and Single Unit delivery truck are included in the **Attachments**.
- *Sight Line Triangles.* With selective clearing and grading as part of the installation of the Site driveway the available sight lines will satisfy the recommended sight line requirements from AASHTO. Field review indicates that at least one large caliper tree, which appears to be within the right-of-way, will need to be removed to achieve said sight distances approximately 60 feet west of the existing Site driveway location. New plantings (shrubs, bushes) and structures (walls, fences, etc.) shall be maintained at a height of 2 feet or less within the sight lines in vicinity of the Site Driveway intersection to Kimball Road to provide unobstructed sight lines. Snow windrows located within sight triangle areas that exceed 3.5-feet in height or that would otherwise inhibit sight lines shall be promptly removed.

Pedestrian and Bicycle Accommodations

- *Pedestrian Connections.* The Site Plan incorporates sidewalks that connect the proposed building to the on-site surface parking areas. The on-site sidewalk system should be designed to not preclude a future connection to Kimball Road.
- *Bicycle Amenities.* The Proponent will provide bicycle accommodation within the property including covered/secure bike parking to encourage and facilitate this mode of transportation to/from the Site.

Off-Site Improvements

Haverhill Road at Kimball Road. Independent of the project, MDM recommends that the Town should consider safety improvements at the intersection of Haverhill Road at Kimball Road (**Figure 12**) to enhance both vehicle and pedestrian safety. As shown, an island is recommended around the existing utility pole to provide a separate left and right turn lane on the approach to Haverhill Road. The pedestrian sidewalk, ADA compliant ramps and a marked crosswalk should be provided to allow for a pedestrian refuge area, shorter crosswalk and relocate the crosswalk outside the utility pole.

Kimball Road – Traffic Calming. Notwithstanding that the observed travel speeds along Kimball Road in the site vicinity are in line with the regulatory speed limit of 25 mph, the Proponent will work with the Town to provide a contribution for implementation of traffic calming measures along Kimball Road if desirable. Such traffic calming measures may include driver radar speed feedback signs, speed humps, or other similar measures which may be appropriate.

Transportation Demand Management (TDM)

TDM programs include a series of measures that are designed to encourage the use of alternative modes of travel to single-occupant vehicles (SOVs) through influencing the choice of travel modes by residents. The benefits that are derived from an effective TDM program include less congestion on the roadway network; improved air quality; reduced parking demands and the need for construction of new parking spaces; and health benefits through walking and bicycling. A preliminary list of potential TDM program elements may include the following:

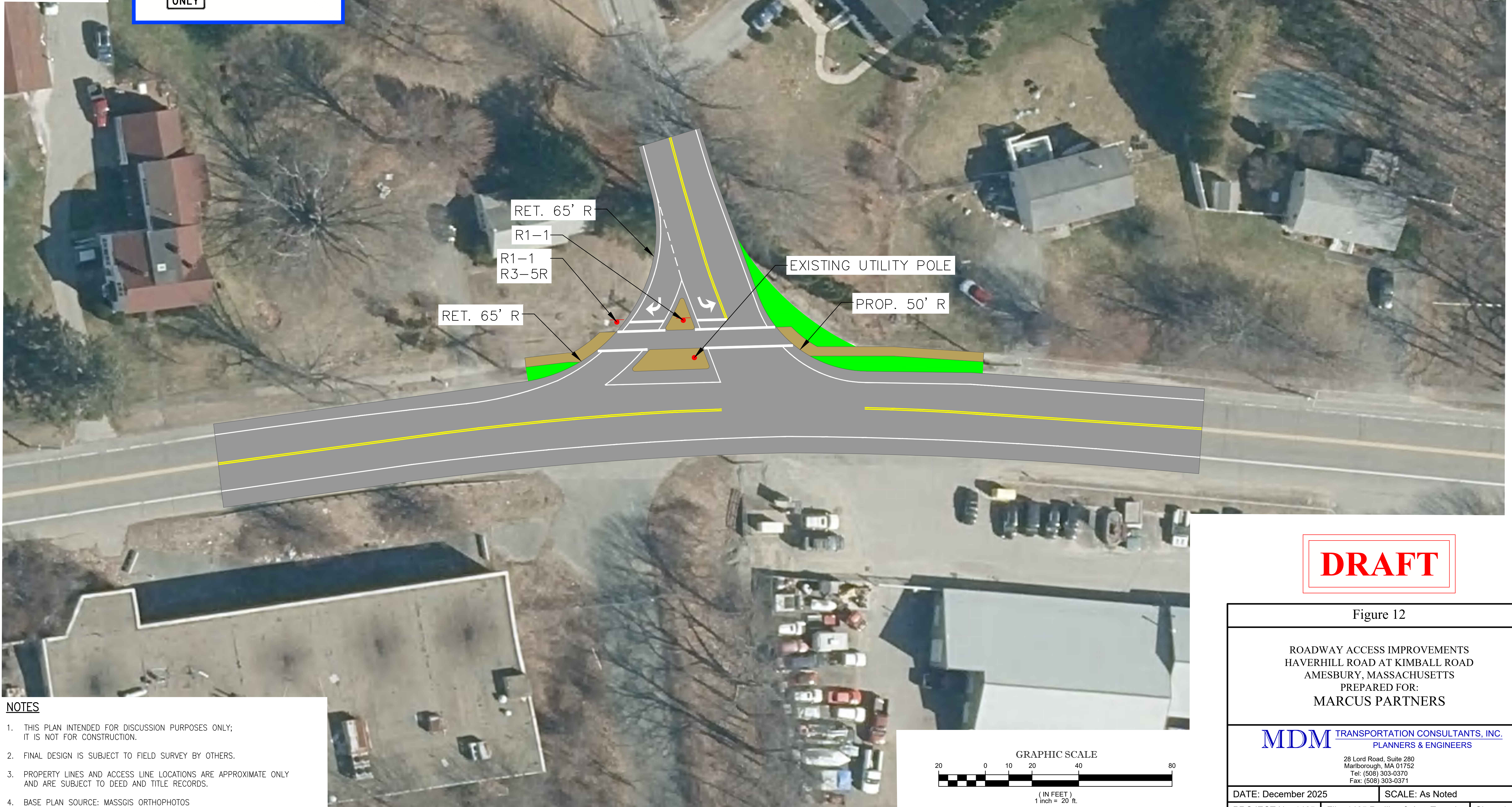
- *Public Transportation Information & Promotion*
- *Electric Vehicle Charging Stations*
- *Pedestrian Infrastructure*
- *Secure Covered Bike Parking*

Conclusions

In summary, MDM finds that incremental traffic associated with the proposed development is not expected to materially impact operating conditions in the study area. Implementation of access/egress improvements, pedestrian and bicycle accommodations and a TDM program as outlined under the *Recommendations and Conclusions* section will establish a framework of minimizing Site traffic impacts by encouraging non-motorized travel modes and pedestrian accommodation that is compatible with other projects in the area.



	TYPE	#
	R1-1	2
	R3-5R	1



NOTES

1. THIS PLAN INTENDED FOR DISCUSSION PURPOSES ONLY; IT IS NOT FOR CONSTRUCTION.
2. FINAL DESIGN IS SUBJECT TO FIELD SURVEY BY OTHERS.
3. PROPERTY LINES AND ACCESS LINE LOCATIONS ARE APPROXIMATE ONLY AND ARE SUBJECT TO DEED AND TITLE RECORDS.
4. BASE PLAN SOURCE: MASSGIS ORTHOPHOTOS

DRAFT

Figure 12

ROADWAY ACCESS IMPROVEMENTS
HAVERHILL ROAD AT KIMBALL ROAD
AMESBURY, MASSACHUSETTS
PREPARED FOR:
MARCUS PARTNERS

MDM TRANSPORTATION CONSULTANTS, INC.
PLANNERS & ENGINEERS

28 Lord Road, Suite 280
Marlborough, MA 01752
Tel: (508) 303-0370
Fax: (508) 303-0371

DATE: December 2025

SCALE: As Noted

PROJECT No. 1465

File: 1465 Redline & AutoTurn.dwg

Sheet 1 of 1

ATTACHMENTS

- ☐ Traffic Volume Data
- ☐ Seasonal/Yearly Growth Data
- ☐ Speed Data
- ☐ Public Transportation Information
- ☐ Crash Data
- ☐ Sight Distance Calculations
- ☐ Trip Generation Calculations
- ☐ Trip Distribution Calculations
- ☐ Capacity Analysis
- ☐ AutoTurn

□ Traffic Volume Data

MDM Transportation Consultants, Inc.

28 Lord Rd, Suite 280
Marlborough, MA, 01752

North: Kimball Road
E/W: Haverhill Road
Amesbury, MA

File Name : 1465 Haverhill Road at Kimball Road
Site Code : 1465
Start Date : 12/4/2025
Page No : 1

Groups Printed- Lights - Mediums - Articulated Trucks

	Kimball Road From North				Haverhill Road From East				Haverhill Road From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	11	24	0	35	4	32	0	36	54	2	0	56	127
07:15 AM	7	19	0	26	2	40	0	42	92	1	0	93	161
07:30 AM	4	27	0	31	7	43	0	50	76	3	0	79	160
07:45 AM	9	21	0	30	8	40	0	48	97	3	0	100	178
Total	31	91	0	122	21	155	0	176	319	9	0	328	626
08:00 AM	8	25	0	33	2	38	0	40	77	4	0	81	154
08:15 AM	11	14	0	25	3	55	0	58	65	7	0	72	155
08:30 AM	16	18	0	34	11	67	0	78	74	5	0	79	191
08:45 AM	9	18	0	27	8	68	0	76	57	6	0	63	166
Total	44	75	0	119	24	228	0	252	273	22	0	295	666
04:00 PM	7	13	0	20	28	86	0	114	73	8	0	81	215
04:15 PM	3	7	0	10	23	102	0	125	70	6	0	76	211
04:30 PM	8	14	0	22	20	91	0	111	69	8	0	77	210
04:45 PM	7	11	2	20	21	101	0	122	84	11	0	95	237
Total	25	45	2	72	92	380	0	472	296	33	0	329	873
05:00 PM	12	16	0	28	24	78	0	102	75	7	0	82	212
05:15 PM	3	13	0	16	30	110	0	140	80	12	0	92	248
05:30 PM	7	13	0	20	27	86	0	113	66	6	0	72	205
05:45 PM	2	8	0	10	15	70	0	85	41	3	0	44	139
Total	24	50	0	74	96	344	0	440	262	28	0	290	804
Grand Total	124	261	2	387	233	1107	0	1340	1150	92	0	1242	2969
Apprch %	32	67.4	0.5		17.4	82.6	0		92.6	7.4	0		
Total %	4.2	8.8	0.1	13	7.8	37.3	0	45.1	38.7	3.1	0	41.8	
Lights	118	260	2	380	229	1078	0	1307	1120	88	0	1208	2895
% Lights	95.2	99.6	100	98.2	98.3	97.4	0	97.5	97.4	95.7	0	97.3	97.5
Mediums	6	1	0	7	4	28	0	32	30	4	0	34	73
% Mediums	4.8	0.4	0	1.8	1.7	2.5	0	2.4	2.6	4.3	0	2.7	2.5
Articulated Trucks	0	0	0	0	0	1	0	1	0	0	0	0	1
% Articulated Trucks	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0

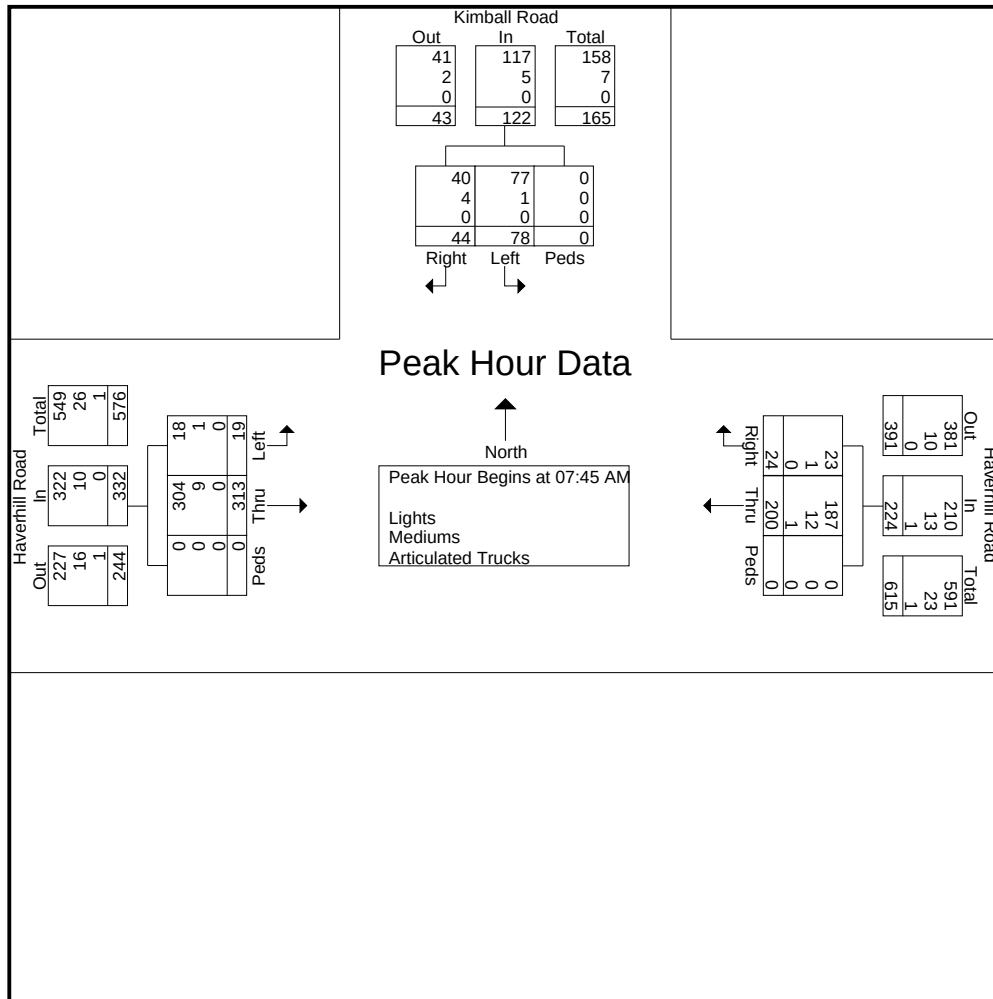
MDM Transportation Consultants, Inc.

28 Lord Rd, Suite 280
Marlborough, MA, 01752

North: Kimball Road
E/W: Haverhill Road
Amesbury, MA

File Name : 1465 Haverhill Road at Kimball Road
Site Code : 1465
Start Date : 12/4/2025
Page No : 2

	Kimball Road From North				Haverhill Road From East				Haverhill Road 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 07:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	9	21	0	30	8	40	0	48	97	3	0	100	178
08:00 AM	8	25	0	33	2	38	0	40	77	4	0	81	154
08:15 AM	11	14	0	25	3	55	0	58	65	7	0	72	155
08:30 AM	16	18	0	34	11	67	0	78	74	5	0	79	191
Total Volume	44	78	0	122	24	200	0	224	313	19	0	332	678
% App. Total	36.1	63.9	0		10.7	89.3	0		94.3	5.7	0		
PHF	.688	.780	.000	.897	.545	.746	.000	.718	.807	.679	.000	.830	.887
Lights	40	77	0	117	23	187	0	210	304	18	0	322	649
% Lights	90.9	98.7	0	95.9	95.8	93.5	0	93.8	97.1	94.7	0	97.0	95.7
Mediums	4	1	0	5	1	12	0	13	9	1	0	10	28
% Mediums	9.1	1.3	0	4.1	4.2	6.0	0	5.8	2.9	5.3	0	3.0	4.1
Articulated Trucks	0	0	0	0	0	1	0	1	0	0	0	0	1
% Articulated Trucks	0	0	0	0	0	0.5	0	0.4	0	0	0	0	0.1



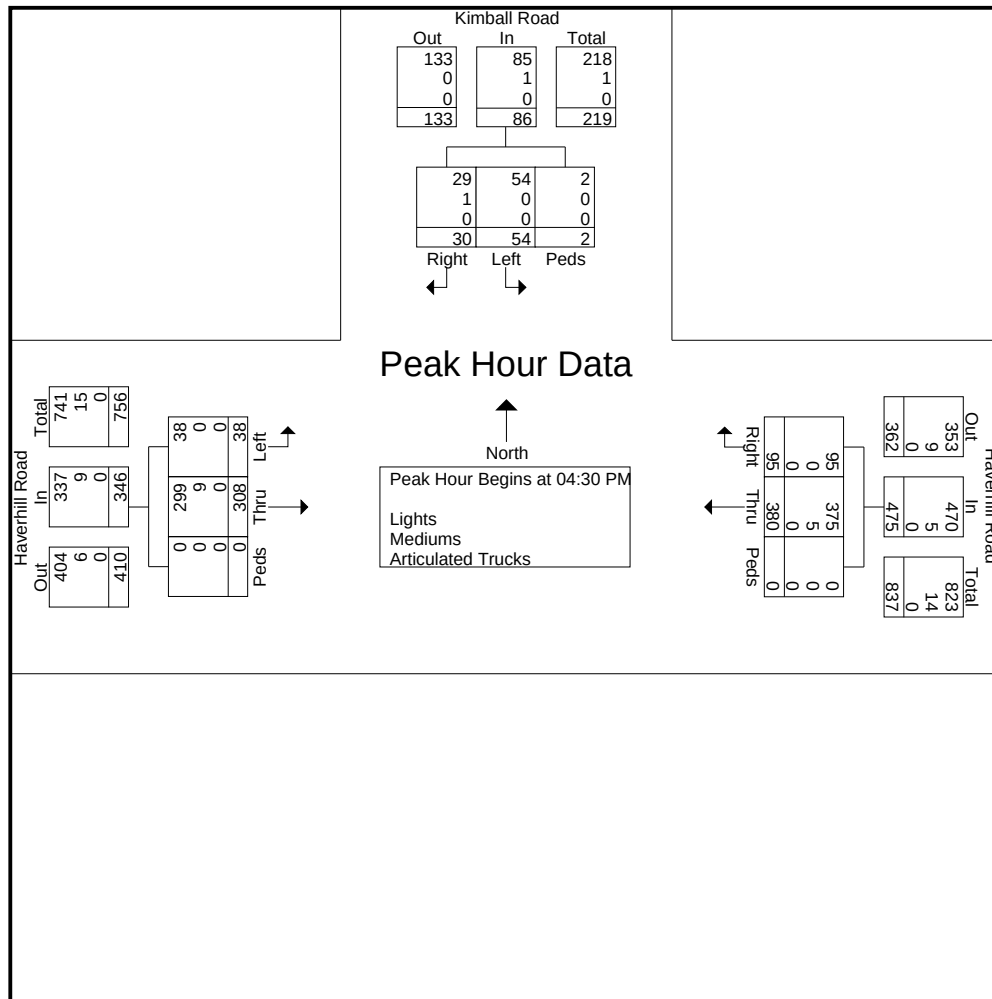
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Page No : 3

	Kimball Road From North				Haverhill Road From East				Haverhill Road 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 04:30 PM													
04:30 PM	8	14	0	22	20	91	0	111	69	8	0	77	210
04:45 PM	7	11	2	20	21	101	0	122	84	11	0	95	237
05:00 PM	12	16	0	28	24	78	0	102	75	7	0	82	212
05:15 PM	3	13	0	16	30	110	0	140	80	12	0	92	248
Total Volume	30	54	2	86	95	380	0	475	308	38	0	346	907
% App. Total	34.9	62.8	2.3		20	80	0		89	11	0		
PHF	.625	.844	.250	.768	.792	.864	.000	.848	.917	.792	.000	.911	.914
Lights	29	54	2	85	95	375	0	470	299	38	0	337	892
% Lights	96.7	100	100	98.8	100	98.7	0	98.9	97.1	100	0	97.4	98.3
Mediums	1	0	0	1	0	5	0	5	9	0	0	9	15
% Mediums	3.3	0	0	1.2	0	1.3	0	1.1	2.9	0	0	2.6	1.7
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



28 Lord Rd, Suite 280
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E/W: Kimball Road
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Site Code : 1465
Start Date : 12/4/2025
Page No : 1

Groups Printed- Lights - Mediums - Articulated Trucks

	Lions Mouth Road From North					Kimball Road From East					Lake Attitash Way From South					Kimball Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	1	5	0	6	2	2	0	0	4	1	2	1	0	4	0	17	0	0	17	31
07:15 AM	0	0	2	0	2	2	2	0	0	4	1	8	0	0	9	0	19	0	0	19	34
07:30 AM	0	3	3	0	6	3	4	0	0	7	1	1	1	0	3	0	13	1	0	14	30
07:45 AM	0	1	3	0	4	5	6	0	0	11	1	1	3	0	5	0	18	0	0	18	38
Total	0	5	13	0	18	12	14	0	0	26	4	12	5	0	21	0	67	1	0	68	133
08:00 AM	0	1	5	0	6	0	6	1	0	7	1	4	0	0	5	0	17	0	0	17	35
08:15 AM	0	3	9	0	12	13	1	0	0	14	1	4	1	0	6	0	17	0	0	17	49
08:30 AM	0	5	13	0	18	5	6	0	0	11	2	0	0	0	2	0	8	0	0	8	39
08:45 AM	0	0	1	0	1	6	7	0	0	13	1	1	0	0	2	1	18	0	0	19	35
Total	0	9	28	0	37	24	20	1	0	45	5	9	1	0	15	1	60	0	0	61	158
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

28 Lord Rd, Suite 280
Marlborough, MA, 01752

File Name : 1465 Kimball Road at Lions Mouth Road-Lake Attitash Way
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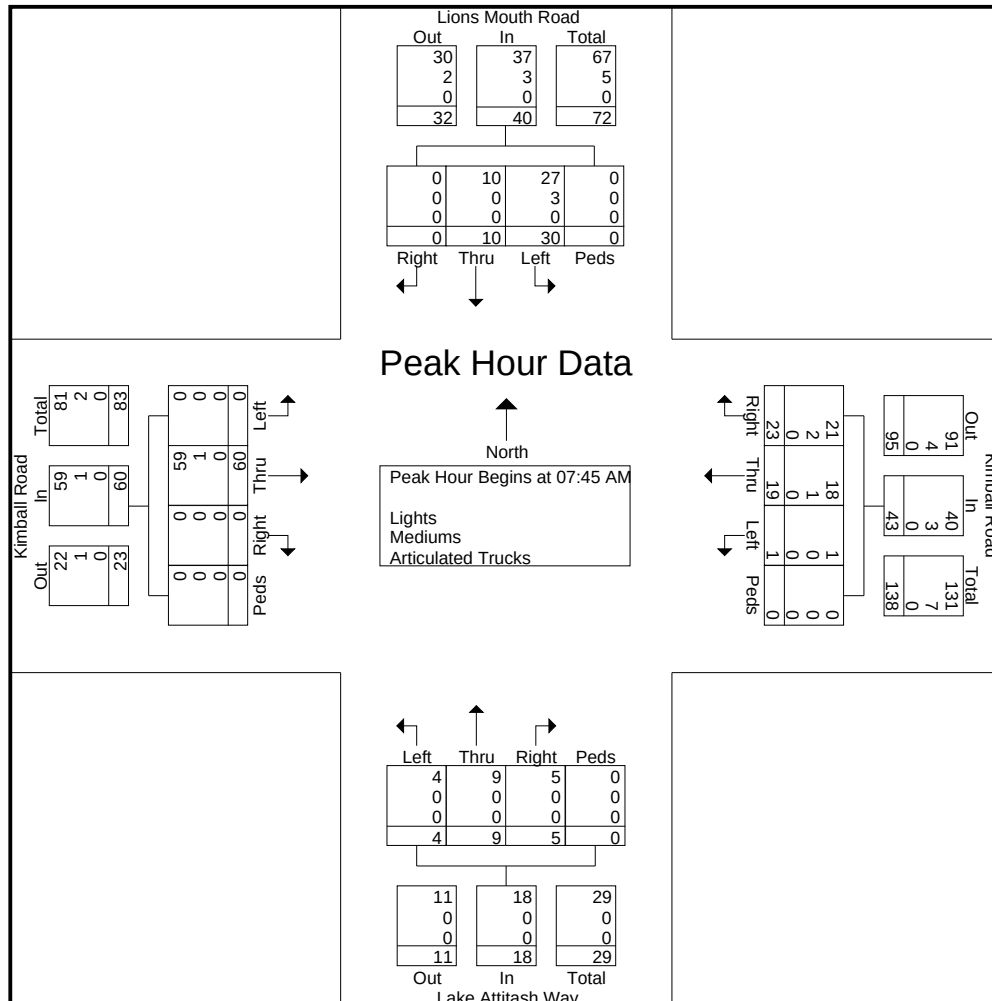
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	Lions Mouth Road From North					Kimball Road From East					Lake Attitash Way From South					Kimball Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 07:45 AM																					
07:45 AM	0	1	3	0	4	5	6	0	0	11	1	1	3	0	5	0	18	0	0	18	38
08:00 AM	0	1	5	0	6	0	6	1	0	7	1	4	0	0	5	0	17	0	0	17	35
08:15 AM	0	3	9	0	12	13	1	0	0	14	1	4	1	0	6	0	17	0	0	17	49
08:30 AM	0	5	13	0	18	5	6	0	0	11	2	0	0	0	2	0	8	0	0	8	39
Total Volume	0	10	30	0	40	23	19	1	0	43	5	9	4	0	18	0	60	0	0	60	161
% App. Total	0	25	75	0		53.5	44.2	2.3	0		27.8	50	22.2	0		0	100	0	0		
PHF	.000	.500	.577	.000	.556	.442	.792	.250	.000	.768	.625	.563	.333	.000	.750	.000	.833	.000	.000	.833	.821
Lights	0	10	27	0	37	21	18	1	0	40	5	9	4	0	18	0	59	0	0	59	154
% Lights	0	100	90.0	0	92.5	91.3	94.7	100	0	93.0	100	100	100	0	100	0	98.3	0	0	98.3	95.7
Mediums	0	0	3	0	3	2	1	0	0	3	0	0	0	0	0	0	1	0	0	1	7
% Mediums	0	0	10.0	0	7.5	8.7	5.3	0	0	7.0	0	0	0	0	0	0	1.7	0	0	1.7	4.3
Articulated Trucks	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0



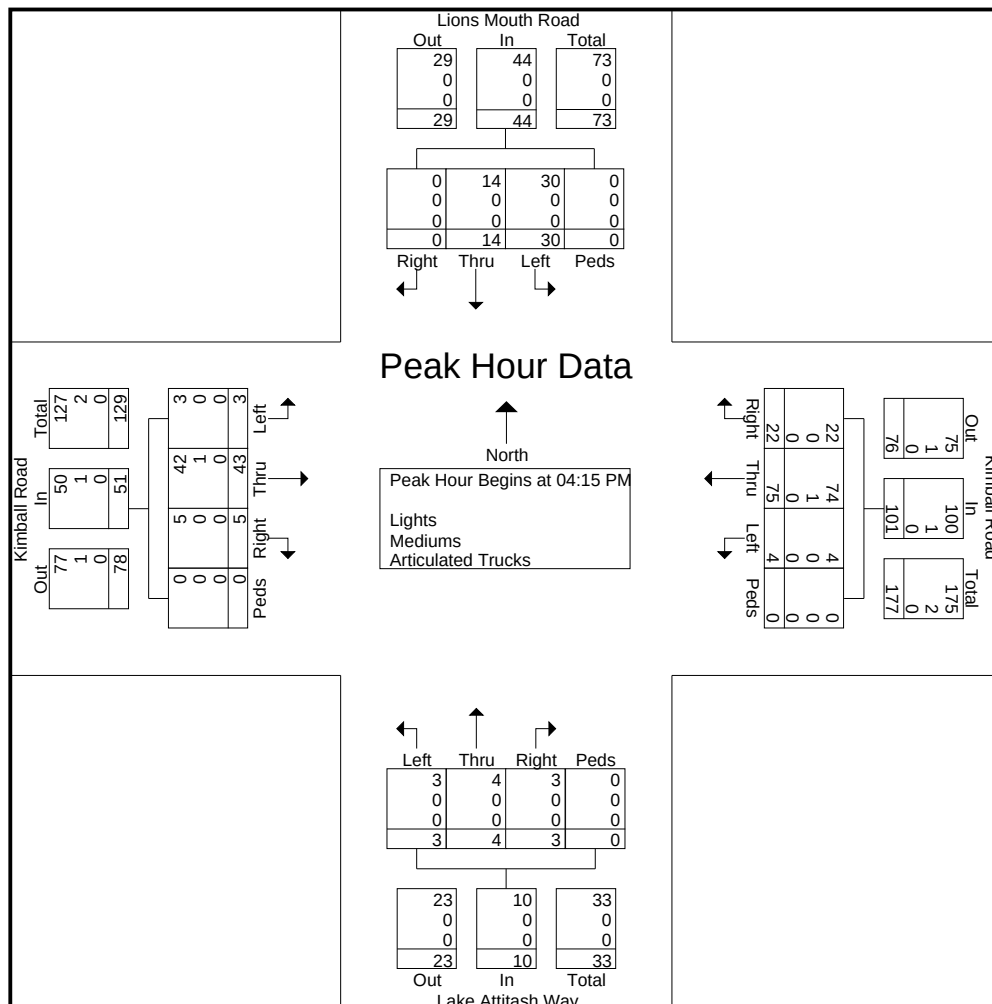
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	Lions Mouth Road From North					Kimball Road From East					Lake Attitash Way From South					Kimball Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	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 04:15 PM																					
04:15 PM	0	4	4	0	8	6	19	2	0	27	0	1	1	0	2	1	7	0	0	8	45
04:30 PM	0	5	12	0	17	8	17	2	0	27	1	1	0	0	2	0	14	0	0	14	60
04:45 PM	0	2	5	0	7	4	19	0	0	23	1	1	1	0	3	1	12	1	0	14	47
05:00 PM	0	3	9	0	12	4	20	0	0	24	1	1	1	0	3	3	10	2	0	15	54
Total Volume	0	14	30	0	44	22	75	4	0	101	3	4	3	0	10	5	43	3	0	51	206
% App. Total	0	31.8	68.2	0		21.8	74.3	4	0		30	40	30	0		9.8	84.3	5.9	0		
PHF	.000	.700	.625	.000	.647	.688	.938	.500	.000	.935	.750	1.0 0	.750	.000	.833	.417	.768	.375	.000	.850	.858
Lights	0	14	30	0	44	22	74	4	0	100	3	4	3	0	10	5	42	3	0	50	204
% Lights	0	100	100	0	100	100	98.7	100	0	99.0	100	100	100	0	100	100	97.7	100	0	98.0	99.0
Mediums	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% Mediums	0	0	0	0	0	0	1.3	0	0	1.0	0	0	0	0	0	0	2.3	0	0	2.0	1.0
Articulated Trucks	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0



28 Lord Road, Suite 280
Marlborough, MA 01752

Start Time	04-Dec-25 Thu	Southeastbound		Hour Totals		Northwestbound				Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		0	24			2	19				
12:15		0	29			0	24				
12:30		1	18			0	15				
12:45		0	23	1	94	0	11	2	69	3	163
01:00		0	15			1	15				
01:15		0	9			0	15				
01:30		0	14			0	21				
01:45		0	23	0	61	0	15	1	66	1	127
02:00		0	9			0	22				
02:15		0	17			0	14				
02:30		1	17			0	28				
02:45		0	24	1	67	1	31	1	95	2	162
03:00		0	28			0	22				
03:15		2	21			0	25				
03:30		1	17			3	26				
03:45		3	21	6	87	0	27	3	100	9	187
04:00		3	22			0	30				
04:15		0	8			1	32				
04:30		3	19			0	29				
04:45		3	21	9	70	1	31	2	122	11	192
05:00		5	26			0	33				
05:15		10	16			2	33				
05:30		17	15			1	31				
05:45		12	12	44	69	4	20	7	117	51	186
06:00		20	15			1	11				
06:15		23	7			1	30				
06:30		29	12			7	17				
06:45		21	7	93	41	7	25	16	83	109	124
07:00		32	6			6	8				
07:15		24	10			4	13				
07:30		30	5			8	10				
07:45		29	5	115	26	11	8	29	39	144	65
08:00		33	8			11	8				
08:15		24	7			11	13				
08:30		33	1			15	12				
08:45		25	5	115	21	13	9	50	42	165	63
09:00		18	3			13	11				
09:15		23	3			11	12				
09:30		19	2			18	8				
09:45		15	2	75	10	11	8	53	39	128	49
10:00		14	3			12	2				
10:15		11	2			12	3				
10:30		11	2			6	3				
10:45		17	2	53	9	13	1	43	9	96	18
11:00		9	1			16	1				
11:15		18	1			10	0				
11:30		13	1			14	3				
11:45		18	0	58	3	11	2	51	6	109	9
Total		570	558			258	787			828	1345
Percent		50.5%	49.5%			24.7%	75.3%			38.1%	61.9%
Combined Total		1128				1045				2173	

□ Seasonal/Yearly Growth Data

SECTION I - CONTINUOUS COUNTING STATION MONTHLY AVERAGE DAILY TRAFFIC

STATION 5010 - NEWBURY - RTE.I-95 - SOUTH OF SCOTLAND RD.													
YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
08	59,463	60,485	63,000	65,420	68,863	72,461	79,444	81,485	69,158	70,161	63,382	59,916	67,770
	-5%	1%	-4%	1%	1%	1%	1%	2%	5%	-1%	0%	3%	1%
09	56,254	60,998	60,741	65,981	69,723	72,870	80,271	83,498	72,755	69,281	63,516	61,523	68,118
	2%	-1%	4%	0%	3%	3%	4%	1%	1%	3%	-1%	2%	
10	57,311	60,412	62,874	66,194	71,671	75,291	83,447	84,636	73,300	69,965	65,132	60,888	69,260
	-5%	-4%	-1%	-3%	-5%	-1%	0%	-5%	-1%	0%	0%	4%	-2%
11	54,718	58,007	62,347	64,386	68,084	74,276	83,211	80,459	72,745	69,941	65,261	63,216	68,054
	7%	5%	0%	2%	5%	-1%	1%	6%	-1%	-2%	0%	-1%	2%
12	58,648	61,080	62,489	65,667	71,204	73,600	84,023	84,971	71,999	68,649	65,349	62,383	69,172
	0%	-7%	-3%	0%	0%	4%	-1%	1%	2%	5%	-1%	-18%	-1%
13	58,632	56,534	60,707	65,432	71,158	76,325	83,494	85,725	73,509	71,971	64,770	51,183	68,287
	11%	18%	12%	10%	10%	9%	11%	9%	9%	12%	14%	32%	13%
19	65,199	66,906	67,914	72,286	78,626	83,152	92,596	93,397	79,865	80,604	74,071	67,365	76,832
	-13%	-8%	-3%	-3%	-2%	-2%	-6%	0%	0%	-5%	-5%	1%	-4%
22	56,769	61,786	65,805	69,938	76,710	81,433	86,868	87,624	79,625	76,559	70,426	67,952	73,458
	14%	5%	4%	3%	3%	1%	1%	2%	0%	3%	1%	0%	3%
23	64,620	64,761	68,174	71,810	79,189	82,104	87,645	89,279	80,008	79,031	71,170	68,218	75,501
	1%	7%	1%	0%	1%	4%	3%	1%	3%	1%	1%	3%	2%
24	65,074	69,132	69,156	71,730	79,863	85,280	90,269	89,942	82,031	80,203	71,692	69,927	77,025
Seasonal Adjustment Factor (to average month)	1.20	1.15	1.11	1.05	0.97	0.92	0.84	0.83	0.95	0.97	1.06	1.13	
Growth													0.69%

STATION 5128 - NEWBURY - RTE.1 - SOUTH OF HANOVER ST.													
YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
09	7,734	7,890	8,469	8,675	9,200	9,352	9,300	9,935	9,390	9,100	8,160	8,019	8,769
	-9%	-21%	-2%	-1%	2%	4%	5%	-7%	-1%	-2%	3%	4%	-2%
11	7,049	6,245	8,315	8,569	9,368	9,680	9,794	9,263	9,262	8,926	8,421	8,320	8,601
	14%	27%	2%	5%	-1%	-19%	-6%	0%	3%	1%	0%	-1%	1%
12	8,030	7,928	8,495	8,964	9,304	7,820	9,220	9,260	9,578	8,997	8,442	8,203	8,687
	-2%	-9%	-7%	-2%	3%	27%	5%	7%	-2%	1%	-2%	-4%	1%
13	7,899	7,233	7,901	8,805	9,625	9,924	9,665	9,869	9,420	9,100	8,239	7,844	8,794
	0%	-2%	2%	-1%	1%	-2%	-3%	-5%	-4%	-4%	-2%	-1%	-2%
19	7,866	7,086	8,059	8,736	9,686	9,723	9,394	9,418	9,076	8,763	8,037	7,768	8,634
	-14%	-1%	-7%	-7%	-7%	-8%	-6%	-4%	-8%	-3%	-3%	-5%	-6%
22	6,784	7,002	7,486	8,114	8,979	8,964	8,792	9,010	8,385	8,469	7,767	7,404	8,096
Seasonal Adjustment Factor (to average month)	1.14	1.20	1.06	0.99	0.92	0.94	0.92	0.91	0.94	0.97	1.05	1.09	
Growth													-0.22%

STATION 5258 - WEST NEWBURY - RTE.I-95 - NORTH OF SCOTLAND RD.													
YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
08	56,156	55,549	58,000	60,205	63,921	67,516	74,637	76,747	65,170	64,871	58,424	54,893	63,007
	-3%	1%	3%	1%	1%	1%	1%	-1%	2%	0%	0%	2%	1%
09	54,522	56,074	60,000	60,916	64,808	68,356	75,236	76,000	66,789	65,870	58,560	56,041	63,598
	-4%	-2%	-4%	0%	2%	2%	4%	4%	2%	-2%	3%	0%	1%
10	52,451	54,781	57,350	60,787	66,228	69,857	78,218	79,290	68,013	64,657	60,104	55,878	63,968
	2%	-3%	0%	-2%	-5%	-1%	0%	-5%	-1%	-1%	0%	4%	-1%
11	53,628	53,106	57,332	59,404	62,699	69,034	78,077	75,436	67,289	64,076	60,090	58,319	63,208
	1%	6%	-1%	2%	5%	2%	-1%	5%	-2%	-1%	0%	-2%	1%
12	54,432	56,313	56,875	60,519	66,028	70,268	77,650	79,389	66,070	63,430	59,947	57,335	64,021
	5%	-9%	-2%	-1%	-1%	0%	1%	1%	3%	5%	0%	-4%	0%
13	57,356	51,519	55,611	60,141	65,643	70,600	78,055	80,033	67,988	66,341	59,842	55,071	64,017
	-2%	10%	5%	23%	32%	35%	0%	0%	2%	2%	7%	10%	
14	56,230	56,749	58,187	73,796	86,800	95,350	78,191	80,125	69,074	67,601	60,900	59,143	70,179
	-1%	-2%	0%	-16%	-21%	-24%	3%	1%	11%	1%	3%	4%	-5%
15	55,438	55,775	58,392	61,794	68,294	72,448	80,774	81,307	76,709	68,187	62,696	61,379	66,933
	13%	18%	11%	7%	6%	6%	1%	1%	-3%	6%	7%	11%	6%
22	62,554	65,764	64,634	66,418	72,212	76,625	81,948	82,156	74,214	72,586	67,337	68,054	71,209
	-2%	0%	2%	2%	2%	-1%	-1%	1%	0%	2%	4%	0%	1%
23	61,601	65,891	65,869	67,640	73,738	76,172	81,452	83,029	74,124	73,887	70,271	67,947	71,802
	7%	3%	1%	1%	0%	3%	3%	1%	2%	2%	-4%	-3%	1%
24	66,139	68,077	66,673	68,176	73,977	78,718	83,817	83,707	75,685	75,676	67,485	65,627	72,813
Seasonal Adjustment Factor (to average month)	1.17	1.15	1.12	1.05	0.97	0.91	0.85	0.84	0.95	0.98	1.07	1.12	
Growth													0.98%
Average Seasonal Adjustment Factor (to average month)	1.17	1.17	1.09	1.03	0.95	0.92	0.87	0.86	0.95	0.97	1.06	1.11	

ITALICS = ESTIMATED DATA
MADT

□ Speed Data

MDM Transportation Consultants, Inc.

SE/NW: Kimball Road
At 21 Kimball Rd Driveway
Amesbury, MA

28 Lord Road, Suite 280
Marlborough, MA 01752

Site Code: 1465
Station ID:

Southeastbound

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
12/04/25	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	29	29
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	29	29
03:00	0	1	0	3	2	0	0	0	0	0	0	0	0	0	6	32	34
04:00	0	0	0	5	3	1	0	0	0	0	0	0	0	0	9	34	37
05:00	0	0	7	24	12	1	0	0	0	0	0	0	0	0	44	32	34
06:00	0	1	8	48	32	4	0	0	0	0	0	0	0	0	93	33	34
07:00	3	3	13	60	35	1	0	0	0	0	0	0	0	0	115	32	34
08:00	1	2	12	58	39	3	0	0	0	0	0	0	0	0	115	33	34
09:00	1	2	15	35	19	3	0	0	0	0	0	0	0	0	75	32	34
10:00	0	0	5	33	12	3	0	0	0	0	0	0	0	0	53	32	35
11:00	0	0	8	32	15	3	0	0	0	0	0	0	0	0	58	33	35
12 PM	1	1	19	47	24	2	0	0	0	0	0	0	0	0	94	32	34
13:00	1	1	9	33	15	2	0	0	0	0	0	0	0	0	61	32	34
14:00	0	0	8	35	24	0	0	0	0	0	0	0	0	0	67	32	34
15:00	0	0	10	57	19	1	0	0	0	0	0	0	0	0	87	31	34
16:00	1	0	9	45	15	0	0	0	0	0	0	0	0	0	70	31	33
17:00	0	7	32	29	1	0	0	0	0	0	0	0	0	0	69	28	29
18:00	0	2	16	18	5	0	0	0	0	0	0	0	0	0	41	29	32
19:00	0	1	4	17	4	0	0	0	0	0	0	0	0	0	26	30	33
20:00	0	1	6	13	1	0	0	0	0	0	0	0	0	0	21	29	29
21:00	0	0	2	3	5	0	0	0	0	0	0	0	0	0	10	33	34
22:00	0	0	1	4	3	1	0	0	0	0	0	0	0	0	9	34	37
23:00	0	0	1	1	1	0	0	0	0	0	0	0	0	0	3	32	34
Total	8	22	185	602	286	25	0	0	0	0	0	0	0	0	1128		
Percent	0.7%	2.0%	16.4%	53.4%	25.4%	2.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	09:00	07:00	08:00	06:00									07:00		
Vol.	3	3	15	60	39	4									115		
PM Peak	12:00	17:00	17:00	15:00	12:00	12:00									12:00		
Vol.	1	7	32	57	24	2									94		
Total	8	22	185	602	286	25	0	0	0	0	0	0	0	0	1128		
Percent	0.7%	2.0%	16.4%	53.4%	25.4%	2.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 23 MPH
50th Percentile : 27 MPH
85th Percentile : 32 MPH
95th Percentile : 34 MPH

Stats
10 MPH Pace Speed : 26-35 MPH
Number in Pace : 888
Percent in Pace : 78.7%
Number of Vehicles > 25 MPH : 913
Percent of Vehicles > 25 MPH : 80.9%
Mean Speed(Average) : 28 MPH

MDM Transportation Consultants, Inc.

SE/NW: Kimball Road
At 21 Kimball Rd Driveway
Amesbury, MA

28 Lord Road, Suite 280
Marlborough, MA 01752

Site Code: 1465
Station ID:

Northwestbound

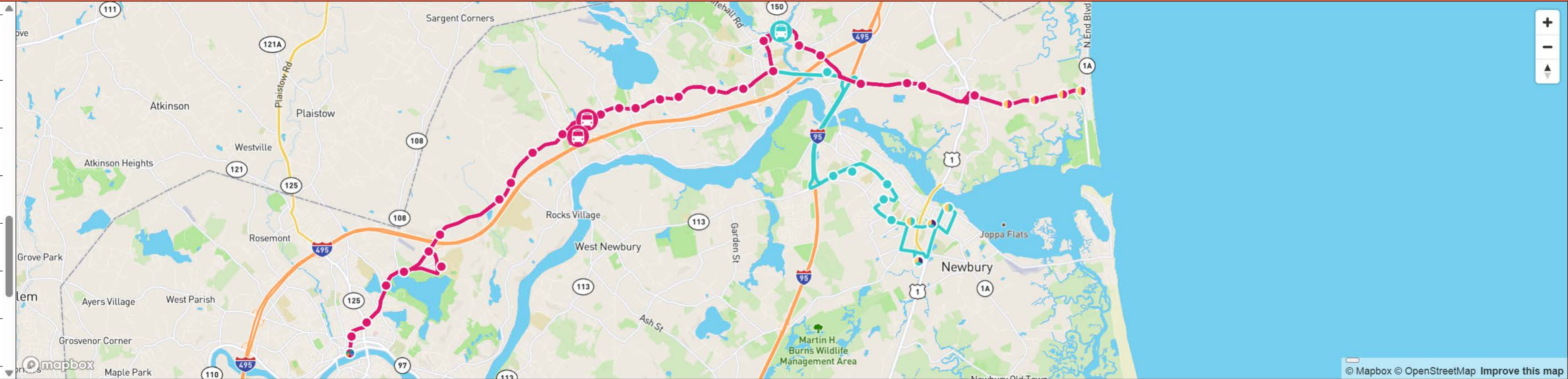
Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
12/04/25	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	29	29
01:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	29	29
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	29	29
03:00	0	0	1	2	0	0	0	0	0	0	0	0	0	0	3	28	29
04:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	24	24
05:00	0	0	3	3	1	0	0	0	0	0	0	0	0	0	7	29	33
06:00	0	2	3	6	5	0	0	0	0	0	0	0	0	0	16	32	34
07:00	1	1	4	14	9	0	0	0	0	0	0	0	0	0	29	32	34
08:00	0	4	6	26	14	0	0	0	0	0	0	0	0	0	50	32	34
09:00	0	3	8	28	13	1	0	0	0	0	0	0	0	0	53	32	34
10:00	0	0	5	25	12	1	0	0	0	0	0	0	0	0	43	32	34
11:00	0	5	5	27	13	1	0	0	0	0	0	0	0	0	51	32	34
12 PM	0	1	10	31	25	2	0	0	0	0	0	0	0	0	69	33	34
13:00	0	1	10	32	21	2	0	0	0	0	0	0	0	0	66	33	34
14:00	0	8	15	45	26	1	0	0	0	0	0	0	0	0	95	32	34
15:00	1	1	12	60	25	1	0	0	0	0	0	0	0	0	100	32	34
16:00	1	1	21	81	17	1	0	0	0	0	0	0	0	0	122	29	33
17:00	1	6	66	41	2	1	0	0	0	0	0	0	0	0	117	28	29
18:00	3	12	43	23	2	0	0	0	0	0	0	0	0	0	83	27	29
19:00	1	4	15	15	3	1	0	0	0	0	0	0	0	0	39	29	33
20:00	1	2	16	20	3	0	0	0	0	0	0	0	0	0	42	29	31
21:00	0	0	11	23	5	0	0	0	0	0	0	0	0	0	39	29	33
22:00	0	0	4	5	0	0	0	0	0	0	0	0	0	0	9	28	29
23:00	0	1	1	4	0	0	0	0	0	0	0	0	0	0	6	28	29
Total	9	52	261	515	196	12	0	0	0	0	0	0	0	0	1045		
Percent	0.9%	5.0%	25.0%	49.3%	18.8%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	11:00	09:00	09:00	08:00	09:00									09:00		
Vol.	1	5	8	28	14	1									53		
PM Peak	18:00	18:00	17:00	16:00	14:00	12:00									16:00		
Vol.	3	12	66	81	26	2									122		
Total	9	52	261	515	196	12	0	0	0	0	0	0	0	0	1045		
Percent	0.9%	5.0%	25.0%	49.3%	18.8%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 21 MPH
50th Percentile : 26 MPH
85th Percentile : 31 MPH
95th Percentile : 33 MPH

Stats
10 MPH Pace Speed : 21-30 MPH
Number in Pace : 776
Percent in Pace : 74.3%
Number of Vehicles > 25 MPH : 723
Percent of Vehicles > 25 MPH : 69.2%
Mean Speed(Average) : 27 MPH

□ Public Transportation Information

- [see schedule](#)
- ☐ **14: LAWRENCE-HAVERHILL VIA AMAZON/WARD HILL**
- [see schedule](#)
- ☐ **15: WESTGATE PLAZA VIA HILLDALE**
- [see schedule](#)
- ☐ **16: WESTGATE PLAZA VIA WASHINGTON STREET**
- [see schedule](#)
- ☒ **17: SALISBURY BEACH VIA AMESBURY**
- [see schedule](#)
- ☐ **18: RIVERSIDE/GROVELAND**
- [see schedule](#)
- ☒ **19: AMESBURY/COSTELLO**
- [see schedule](#)
- ☐ **20: SALISBURY BEACH**
- [see schedule](#)



ROUTE 17 OUTBOUND

SALISBURY BEACH VIA AMESBURY

WEEKDAYS

1	2	3	4	5	6	7	
Bus starts at Washington Square	Bus leaves from NECC	Bus leaves from Merrivillage Apartments	Bus leaves from Route 110 & Main Street	Bus leaves from Nicholas Costello Transportation Center	Bus leaves from Elm & Lafayette Street	Bus ends at Salisbury Beach	Bus continues on as Route
5:00	-	-	5:30	5:40	5:45	5:55	20 Inbound
6:00	6:10	6:20	6:30	6:40	6:45	6:55	20 Inbound
7:00	7:10	7:20	7:30	7:40	7:45	7:55	20 Inbound
8:00	8:10	8:20	8:30	8:40	8:45	8:55	20 Inbound
9:00	9:10	9:20	9:30	9:40	9:45	9:55	20 Inbound
10:00	10:10	10:20	10:30	10:40	10:45	10:55	20 Inbound
11:00	11:10	11:20	11:30	11:40	11:45	11:55	20 Inbound
12:00	12:10	12:20	12:30	12:40	12:45	12:55	20 Inbound
1:00	1:10	1:20	1:30	1:40	1:45	1:55	20 Inbound
2:00	2:10	2:20	2:30	2:40	2:45	2:55	20 Inbound
3:00	3:10	3:20	3:30	3:40	3:45	3:55	20 Inbound
4:00	4:10	4:20	4:30	4:40	4:45	4:55	20 Inbound
5:00	5:10	5:20	5:30	5:40	5:45	5:55	20 Inbound
6:00	6:10	6:20	6:30	6:40	6:45	6:55	20 Inbound
7:00	7:10	7:20	7:30	7:40	-	-	-

SATURDAYS

7:00	7:10	7:20	7:30	7:40	7:45	7:55	20 Inbound
8:00	8:10	8:20	8:30	8:40	8:45	8:55	20 Inbound
9:00	9:10	9:20	9:30	9:40	9:45	9:55	20 Inbound
10:00	10:10	10:20	10:30	10:40	10:45	10:55	20 Inbound
11:00	11:10	11:20	11:30	11:40	11:45	11:55	20 Inbound
12:00	12:10	12:20	12:30	12:40	12:45	12:55	20 Inbound
1:00	1:10	1:20	1:30	1:40	1:45	1:55	20 Inbound
2:00	2:10	2:20	2:30	2:40	2:45	2:55	20 Inbound
3:00	3:10	3:20	3:30	3:40	3:45	3:55	20 Inbound
4:00	4:10	4:20	4:30	4:40	4:45	4:55	20 Inbound
5:00	5:10	5:20	5:30	5:40	5:45	5:55	20 Inbound
6:00	6:10	6:20	6:30	6:40	6:45	6:55	-

SUNDAYS

9:00	-	9:15	9:23	9:30	9:35	9:45	17
10:00	-	10:15	10:23	10:30	10:35	10:45	17
11:00	-	11:15	11:23	11:30	11:35	11:45	17
12:00	-	12:15	12:23	12:30	12:35	12:45	17
1:00	-	1:15	1:23	1:30	1:35	1:45	17
2:00	-	2:15	2:23	2:30	2:35	2:45	17
3:00	-	3:15	3:23	3:30	3:35	3:45	17
4:00	-	4:15	4:23	4:30	4:35	4:45	17
5:00	-	5:15	5:23	5:30	5:35	5:45	-

Updated 01/29/25

ROUTE 17 INBOUND

HAVERHILL VIA AMESBURY

WEEKDAYS

7	8	9	10	11	12	13	14	
Bus starts at Salisbury Beach	Bus leaves from Salisbury Center	Bus leaves from Elm & Lafayette Street	Bus leaves from Nicholas Costello Transportation Center	Bus leaves from Route 110 & Main Street	Bus leaves from Merrivillage Apartments	Bus leaves from NECC	Bus ends at Washington Square	Bus continues on as Route
5:00	5:05	5:15	5:20	5:25	-	-	5:50	17
5:50	5:55	6:05	6:10	6:15	6:25	6:35	6:45	17
6:50	6:55	7:05	7:10	7:15	7:25	7:35	7:45	17
7:50	7:55	8:05	8:10	8:15	8:25	8:35	8:45	17
8:50	8:55	9:05	9:10	9:15	9:25	9:35	9:45	17
9:50	9:55	10:05	10:10	10:15	10:25	10:35	10:45	17
10:50	10:55	11:05	11:10	11:15	11:25	11:35	11:45	17
11:50	11:55	12:05	12:10	12:15	12:25	12:35	12:45	17
12:50	12:55	1:05	1:10	1:15	1:25	1:35	1:45	17
1:50	1:55	2:05	2:10	2:15	2:25	2:35	2:45	17
2:50	2:55	3:05	3:10	3:15	3:25	3:35	3:45	17
3:50	3:55	4:05	4:10	4:15	4:25	4:35	4:45	17
4:50	4:55	5:05	5:10	5:15	5:25	5:35	5:45	17
5:50	5:55	6:05	6:10	6:15	6:25	6:35	6:45	17
6:50	6:55	7:05	7:10	7:15	7:25	7:35	7:45	-
7:50	7:55	8:05	8:10	8:15	8:25	8:35	8:45	-

SATURDAYS

7:50	7:55	8:05	8:10	8:15	8:25	8:35	8:45	17
8:50	8:55	9:05	9:10	9:15	9:25	9:35	9:45	17
9:50	9:55	10:05	10:10	10:15	10:25	10:35	10:45	17
10:50	10:55	11:05	11:10	11:15	11:25	11:35	11:45	17
11:50	11:55	12:05	12:10	12:15	12:25	12:35	12:45	17
12:50	12:55	1:05	1:10	1:15	1:25	1:35	1:45	17
1:50	1:55	2:05	2:10	2:15	2:25	2:35	2:45	17
2:50	2:55	3:05	3:10	3:15	3:25	3:35	3:45	17
3:50	3:55	4:05	4:10	4:15	4:25	4:35	4:45	17
4:50	4:55	5:05	5:10	5:15	5:25	5:35	5:45	17
5:50	5:55	6:05	6:10	6:15	6:25	6:35	6:45	-
6:50	6:55	7:05	7:10	7:15	7:25	7:35	7:45	-

SUNDAYS

9:00	-	9:10	9:15	9:22	9:30	-	9:45	17
10:00	-	10:10	10:15	10:22	10:30	-	10:45	17
11:00	-	11:10	11:15	11:22	11:30	-	11:45	17
12:00	-	12:10	12:15	12:22	12:30	-	12:45	17
1:00	-	1:10	1:15	1:22	1:30	-	1:45	17
2:00	-	2:10	2:15	2:22	2:30	-	2:45	17
3:00	-	3:10	3:15	3:22	3:30	-	3:45	17
4:00	-	4:10	4:15	4:22	4:30	-	4:45	17
5:00	-	5:10	5:15	5:22	5:30	-	5:45	-

Updated 01/29/25

□ Crash Data

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Amesbury, MA COUNT DATE : May-26

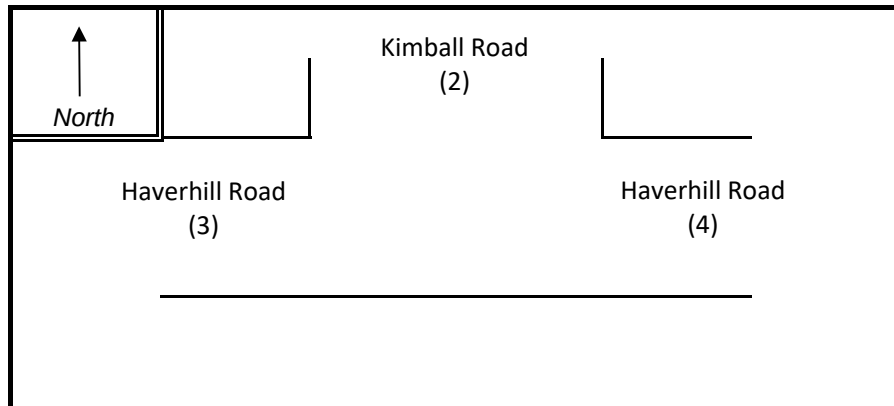
DISTRICT : 4 UNSIGNALIZED : ☒ SIGNALIZED : ☐

~ INTERSECTION DATA ~

MAJOR STREET : Haverhill Road

MINOR STREET(S) : Kimball Road

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) :	0	93	384	527		1,004

"K" FACTOR : INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES : # OF YEARS : AVERAGE # OF CRASHES PER YEAR (A) :

CRASH RATE CALCULATION :

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

Comments : MassDOT District 4 Avg: Signalized = 0.73; Unsignalized = 0.57

Project Title & Date : 1465 - Amesbury

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Amesbury, MA COUNT DATE : May-26

DISTRICT : 4 UNSIGNALIZED : ☒ SIGNALIZED : ☐

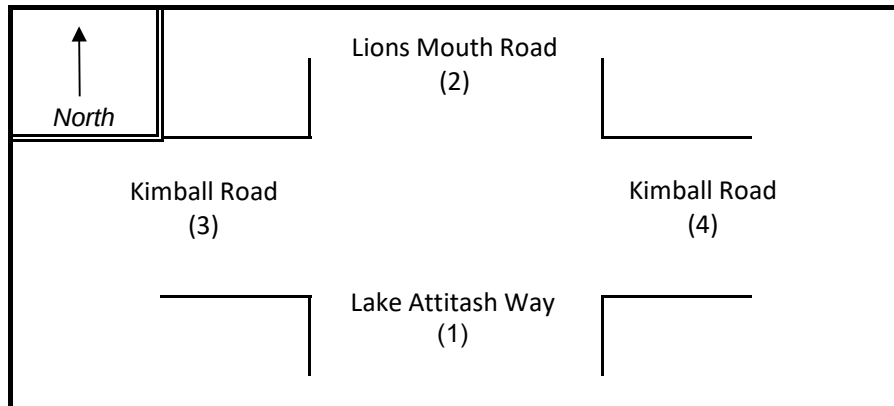
~ INTERSECTION DATA ~

MAJOR STREET : Kimball Road

MINOR STREET(S) : Lions Mouth Road

Lake Attitash Way

**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) :	10	49	57	111		227

"K" FACTOR : 0.088 INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : 2,580

TOTAL # OF CRASHES : 1 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : 0.20

CRASH RATE CALCULATION :

0.21

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

Comments : MassDOT District 4 Avg: Signalized = 0.73; Unsignalized = 0.57

Project Title & Date : 1465 - Amesbury

SEGMENT CRASH RATE WORKSHEET

CITY/TOWN : Amesbury, MA COUNT DATE : May-26

DISTRICT : 4

~ SEGMENT DATA ~

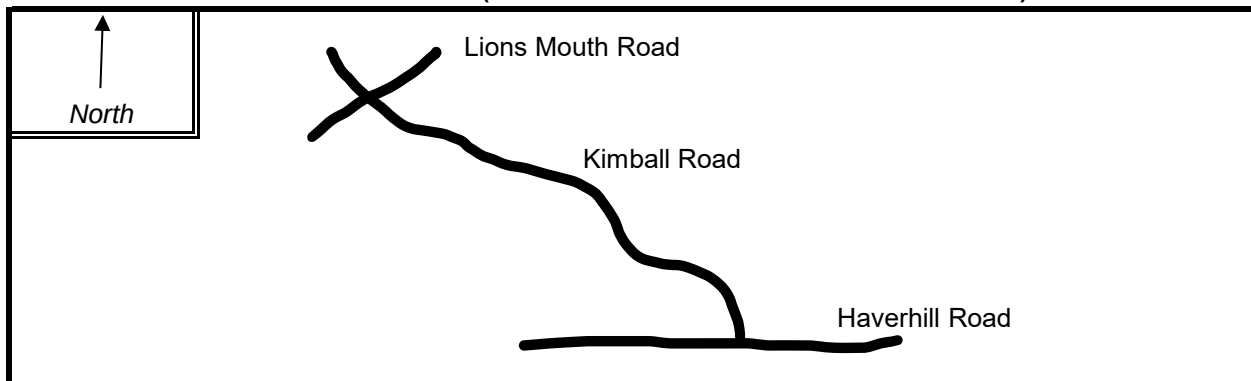
ROADWAY NAME: Kimball Road

START POINT: Haverhill Road

END POINT: Lions Mouth Road

FUNCTIONAL CLASSIFICATION OF ROADWAY: Urban Local

ROADWAY DIAGRAM (LABEL ROADWAY AND CROSS STREETS)



AVERAGE DAILY TRAFFIC

SEGMENT LENGTH IN MILES (L): **1.2**

AVERAGE DAILY TRAFFIC VOLUME (V): **2,408**

TOTAL # OF CRASHES:

9

OF
YEARS :

5

AVERAGE # OF
CRASHES PER YEAR (A) :

1.80

CRASH RATE
CALCULATION :

1.71

RATE =

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

Comments : MassDOT Urban Local Avg: 2.50

Project Title & Date: 1465 - Amesbury

Crash Date	Crash Severity	Crash Time	Number of Vehicles	Light Conditions	Manner of Collision	Road Surface Condition	Total Fatalities	Total Non-Fatal Injuries	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Most Harmful Event (All Vehicles)	X	Y	Roadway
Haverhill Road at Kimball Road																
4/23/2021	Property damage only (none injured)	10:53 AM		2 Daylight	Sideswipe, opposite direction	Dry	0		V1: Turning left / V2: Travelling straight ahead 0	V1:{Passenger car} / V2:{Passenger car}	V1: E / V2: W	Clear/Other	V1:{Collision with motor vehicle in traffic} / V2:{Collision with motor vehicle in traffic}	244278.9327	954901.0952	HAVERHILL RD
1/11/2023	Property damage only (none injured)	4:51 PM		2 Dark - lighted roadway	Single vehicle crash	Dry	0		V1: Travelling straight ahead / V2: Travelling straight ahead 0	V1:{Passenger car} / V2:{Passenger car}	V1: E / V2: E	Clear	V1:{Collision with animal - deer} / V2:{Collision with animal - other}	244278.9327	954901.0952	HAVERHILL RD Rte
5/7/2023	Non-fatal injury	4:17 PM		2 Daylight	Unknown	Dry	0		V1: Travelling straight ahead / V2: Entering traffic lane 1	V1:{Motorcycle} / V2:{Passenger car}	V1: W / V2: S	Clear	V1:{Other non-collision} / V2:{Other non-collision}	244289.5343	954909.4578	KIMBALL RD Rte
Kimball Road at Lions Mouth Road & Lake Attitash Way																
12/11/2022	Property damage only (none injured)	5:21 PM		2 Dark - lighted roadway	Single vehicle crash	Ice	0		V1: Travelling straight ahead / V2: Turning right 0	V1:{Passenger car} / V2:{Passenger car}	V1: S / V2: N	Snow/Clear	V1:{Collision with tree} / V2:{Other non-collision}	242936.5468	956103.7499	KIMBALL RD / LAKE ATTITASH WAY
Kimball Road Roadway Segment																
4/11/2021	Unknown	2:44 AM		1 Dark - lighted roadway	Single vehicle crash	Dry	0		0 V1: Travelling straight ahead	V1:{Passenger car}	V1: N	Clear	V1:{Collision with tree}	243760.7342	955598.1873	KIMBALL RD / ASHLEY DR
6/6/2021	Property damage only (none injured)	1:25 AM		1 Dark - lighted roadway	Single vehicle crash	Wet	0		0 V1: Travelling straight ahead	V1:{Passenger car}	V1: E	Rain	V1:{Collision with tree}	243795.7829	955421.9649	KIMBALL RD
8/25/2021	Property damage only (none injured)	4:22 PM		2 Daylight	Sideswipe, opposite direction	Dry	0		V1: Travelling straight ahead / V2: Travelling straight ahead 0	V1:{Passenger car} / V2:{Passenger car}	V1: S / V2: N	Clear	V1:{Collision with motor vehicle in traffic} / V2:{Collision with motor vehicle in traffic}	243760.7342	955598.1873	KIMBALL ROAD
3/12/2022	Property damage only (none injured)	8:20 PM		1 Dark - lighted roadway	Single vehicle crash	Ice	0		0 V1: Leaving traffic lane	V1:{Passenger car}	V1: N	Snow	V1:{Collision with tree}	243817.1688	955405.3818	KIMBALL RD
3/25/2022	Property damage only (none injured)	1:29 PM		1 Daylight	Single vehicle crash	Dry	0		0 V1: Travelling straight ahead	V1:{Passenger car}	V1: N	Clear	V1:{Collision with utility pole}	244160.3945	955283.2511	KIMBALL RD
7/31/2022	Non-fatal injury	5:25 PM		1 Daylight	Single vehicle crash	Dry	0		3 V1: Travelling straight ahead	V1:{Passenger car}	V1: S	Clear	V1:{Collision with tree}	243897.1487	955379.6496	KIMBALL RD
1/21/2023	Non-fatal injury	1:46 PM		1 Daylight	Single vehicle crash	Dry	0		1 V1: Travelling straight ahead	V1:{Passenger car}	V1: E	Clear	V1:{Collision with tree}	243878.7458	955384.6419	KIMBALL RD Rte
3/1/2023	Property damage only (none injured)	6:27 AM		1 Daylight	Single vehicle crash	Ice	0		0 V1: Travelling straight ahead	V1:{Passenger car}	V1: S	Clear	V1:{Overturn/rollover}	243771.6867	955529.6698	KIMBALL RD Rte
11/25/2025	Property damage only (none injured)	10:26 PM		1 Dusk	Single vehicle crash	Wet	0		0 V1: Travelling straight ahead	V1:{Passenger car}	V1: N	Rain	V1:{Collision with utility pole}	243752.9625	955625.0749	KIMBALL RD Rte

1. Select Fields

2. Query Type

3. Define Query

4. Visualize Results

Basic Search

Spatial Search

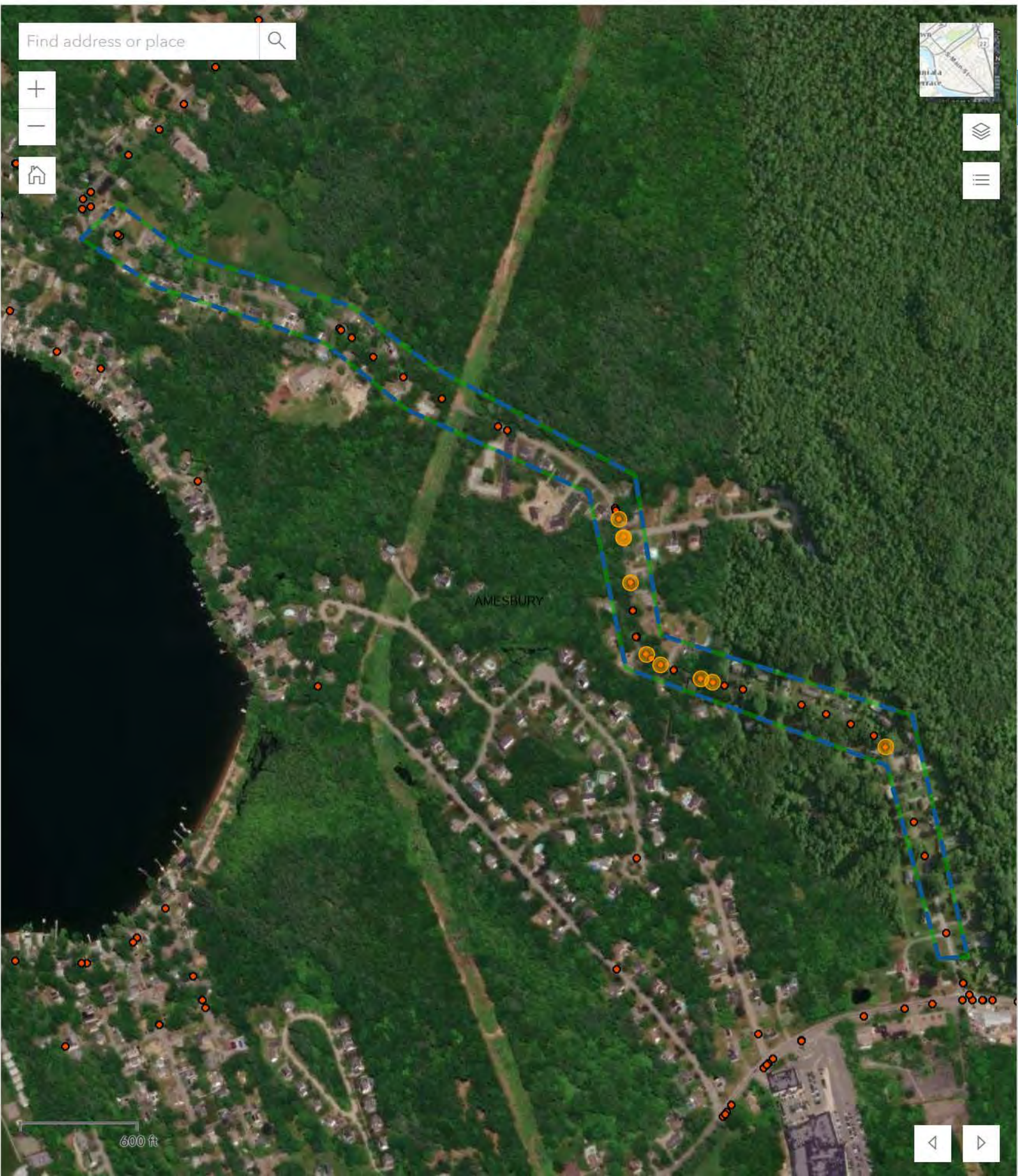
Advanced Search

Reset All Filters

Data Level: **Crash**

Visualize Results

Reset Spatial Filters



crash date from

01/01/2021

crash date to

12/31/2025

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

□ Sight Distance Calculations

Stopping Sight Distance - Posted

Kimball Road

		SPEED (MPH)	BRAKE REACTION DISTANCE (FT)	BRAKING DISTANCE (FT)	CALCULATED STOPPING SIGHT DISTANCE (FT)
Direction 1	EB	25	91.875	53.0	144.9
Direction 2	WB	25	91.875	66.6	158.5

INPUTS

Direction 1

Direction 2

Travel Direction
Speed
Grade
t
a

EB
25
0.045
2.5
11.2

WB
25
-0.035
2.5
11.2

Stopping Sight Distance (SSD) - Source: AASHTO

SSD = Reaction Distance + Brake Distance

Reaction Distance = $1.47 \times t \times V$

Brake Distance = $V^2 / (30 \times ((a/32.2) + G))$

Where:

t = reaction time (sec)

V = travel speed (mph)

G = roadway grade

a = deceleration rate (ft/sec²)

Stopping Sight Distance - 85th Percentile

Kimball Road

		SPEED (MPH)	BRAKE REACTION DISTANCE (FT)	BRAKING DISTANCE (FT)	CALCULATED STOPPING SIGHT DISTANCE (FT)
Direction 1	EB	32	117.6	86.9	204.5
Direction 2	WB	31	113.925	102.4	216.3

INPUTS

Direction 1

Direction 2

Travel Direction

EB

WB

Speed

32

31

Grade

0.045

-0.035

t

2.5

2.5

a

11.2

11.2

Stopping Sight Distance (SSD) - Source: AASHTO

SSD = Reaction Distance + Brake Distance

Reaction Distance = $1.47 \times t \times V$

Brake Distance = $V^2 / (30 \times ((a/32.2) + G))$

Where:

t = reaction time (sec)

V = travel speed (mph)

G = roadway grade

a = deceleration rate (ft/sec²)

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

Kimball Road

	Speed Limit	Ideal ISD	SAY
Looking East (left-turn from a stop)	ISD = 1.47* 25 * 7.5 =	275.625	280 feet
Looking West (right-turn from a stop)	ISD = 1.47* 25 * 6.5 =	238.875	240 feet

□ Trip Generation Calculations

Institute of Transportation Engineers (ITE) 12th Edition Land Use Code (LUC) 215 - Single-Family Attached Housing
--

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 86

AVERAGE WEEKDAY DAILY

$T = 6.57^* (X)$
 $T = 6.57^* \quad 86$
 $T = 565.02$
 $T = 566$ vehicle trips
with 50% (283 vpd) entering and 50% (283 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 0.47^* (X)$
 $T = 0.47^* \quad 86$
 $T = 40.42$
 $T = 40$ vehicle trips
with 25% (10 vph) entering and 75% (30 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 0.51^* (X)$
 $T = 0.51^* \quad 86$
 $T = 43.86$
 $T = 44$ vehicle trips
with 57% (25 vph) entering and 43% (19 vph) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

$T = 0.47^* (X)$
 $T = 0.47^* \quad 86$
 $T = 40.42$
 $T = 40$ vehicle trips
with 48% (19 vph) entering and 52% (21 vph) exiting.

□ Trip Distribution Calculations

				To/From Routes						To/From Routes							
Workplace		Residence		Population	Haverhill Road (To/From East)		Haverhill Road (To/From West)		Lions Mouth Road (To/From North)		Lake Attitash Way (To/From South)		Kimball Road (To/From West)				
Amesbury	MA	Amesbury	MA	1,063	65%	691		0	35%	372		0		0		0	100%
Newburyport	MA	Amesbury	MA	908	100%	908		0		0		0		0		0	100%
Boston	MA	Amesbury	MA	823	50%	412	50%	412		0		0		0		0	100%
Haverhill	MA	Amesbury	MA	318		0	100%	318		0		0		0		0	100%
Salisbury	MA	Amesbury	MA	244	100%	244		0		0		0		0		0	100%
Danvers	MA	Amesbury	MA	235	100%	235		0		0		0		0		0	100%
Andover	MA	Amesbury	MA	232		0	100%	232		0		0		0		0	100%
Beverly	MA	Amesbury	MA	225	90%	203	10%	23		0		0		0		0	100%
Portsmouth	NH	Amesbury	MA	214	100%	214		0		0		0		0		0	100%
Cambridge	MA	Amesbury	MA	183	90%	165	10%	18		0		0		0		0	100%
Peabody	MA	Amesbury	MA	179	90%	161	10%	18		0		0		0		0	100%
Lawrence	MA	Amesbury	MA	159		0	100%	159		0		0		0		0	100%
Seabrook	NH	Amesbury	MA	147	100%	147		0		0		0		0		0	100%
North Andover	MA	Amesbury	MA	128		0	100%	128		0		0		0		0	100%
Burlington	MA	Amesbury	MA	122	10%	12	90%	110		0		0		0		0	100%
Ipswich	MA	Amesbury	MA	114	100%	114		0		0		0		0		0	100%
Salem	MA	Amesbury	MA	114	90%	103	10%	11		0		0		0		0	100%
Woburn	MA	Amesbury	MA	110	10%	11	90%	99		0		0		0		0	100%
Newbury	MA	Amesbury	MA	107	100%	107		0		0		0		0		0	100%
Methuen	MA	Amesbury	MA	102		0	100%	102		0		0		0		0	100%
Wakefield	MA	Amesbury	MA	85	75%	64	25%	21		0		0		0		0	100%
Lynn	MA	Amesbury	MA	84	90%	76	10%	8		0		0		0		0	100%
Tewksbury	MA	Amesbury	MA	83		0	100%	83		0		0		0		0	100%
Salem	NH	Amesbury	MA	82		0	100%	82		0		0		0		0	100%
Gloucester	MA	Amesbury	MA	79	100%	79		0		0		0		0		0	100%
Hampton	NH	Amesbury	MA	79	100%	79		0		0		0		0		0	100%
Exeter	NH	Amesbury	MA	78	75%	59		0	25%	20		0		0		0	100%
Rowley	MA	Amesbury	MA	72	100%	72		0		0		0		0		0	100%
Waltham	MA	Amesbury	MA	66		0	100%	66		0		0		0		0	100%
Wilmington	MA	Amesbury	MA	63		0	100%	63		0		0		0		0	100%
Billerica	MA	Amesbury	MA	61		0	100%	61		0		0		0		0	100%
Georgetown	MA	Amesbury	MA	59	75%	44	25%	15		0		0		0		0	100%
Lowell	MA	Amesbury	MA	56		0	100%	56		0		0		0		0	100%
Somerville	MA	Amesbury	MA	56		0	100%	56		0		0		0		0	100%
Merrimac	MA	Amesbury	MA	55		0	100%	55		0		0		0		0	100%
West Newbury	MA	Amesbury	MA	55	10%	6	90%	50		0		0		0		0	100%
Plaistow	NH	Amesbury	MA	53		0	75%	40		0		0	25%	13		0	100%
Newton	MA	Amesbury	MA	48	10%	5	90%	43		0		0		0		0	100%
Bedford	MA	Amesbury	MA	43		0	100%	43		0		0		0		0	100%
North Reading	MA	Amesbury	MA	43	75%	32	25%	11		0		0		0		0	100%
Topsfield	MA	Amesbury	MA	43	90%	39	10%	4		0		0		0		0	100%
Groveland	MA	Amesbury	MA	41		0	100%	41		0		0		0		0	100%
Worcester	MA	Amesbury	MA	41		0	100%	41		0		0		0		0	100%
Lynnfield	MA	Amesbury	MA	37	100%	37		0		0		0		0		0	100%
Manchester	NH	Amesbury	MA	37	20%	7	60%	22		0		0	20%	7		0	100%
Newington	NH	Amesbury	MA	36	100%	36		0		0		0		0		0	100%
Middleton	MA	Amesbury	MA	35	90%	32	10%	4		0		0		0		0	100%
Malden	MA	Amesbury	MA	33	75%	25	25%	8		0		0		0		0	100%
Stratham	NH	Amesbury	MA	33	100%	33		0		0		0		0		0	100%
Lexington	MA	Amesbury	MA	32	25%	8	75%	24		0		0		0		0	100%
Total				7,395	4460		2527		392		0		20		0		0
					60.3%		34.2%		5.3%		0.0%		0.3%		0.0%		0.0%
				SAY	60%		35%		5%		0%		0%		0%		100%

□ Capacity Analysis

7: Lake Attitash Way/Lions Mouth Way & Kimball Road Weekday Morning Peak Hour Volumes**Intersection**

Intersection Delay, s/veh 7.5

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	67	0	1	21	26	4	10	6	33	11	0
Future Vol, veh/h	0	67	0	1	21	26	4	10	6	33	11	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	0	2	0	0	5	9	0	0	0	10	0	0
Mvmt Flow	0	82	0	1	26	32	5	12	7	40	13	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7.6	7.1	7.2	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	0%	2%	75%
Vol Thru, %	50%	100%	44%	25%
Vol Right, %	30%	0%	54%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	67	48	44
LT Vol	4	0	1	33
Through Vol	10	67	21	11
RT Vol	6	0	26	0
Lane Flow Rate	24	82	59	54
Geometry Grp	1	1	1	1
Degree of Util (X)	0.027	0.093	0.061	0.067
Departure Headway (Hd)	4.045	4.115	3.778	4.483
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	875	864	938	793
Service Time	2.118	2.17	1.843	2.543
HCM Lane V/C Ratio	0.027	0.095	0.063	0.068
HCM Control Delay, s/veh	7.2	7.6	7.1	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.2	0.2

HCM 7th TWSC
3: Haverhill Road & Kimball Road

2025 Baseline Conditions
Weekday Morning Peak Hour Volumes

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	21	347	222	27	87	49
Future Vol, veh/h	21	347	222	27	87	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	5	3	7	4	1	9
Mvmt Flow	24	390	249	30	98	55
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	280	0	-	0	702	265
Stage 1	-	-	-	-	265	-
Stage 2	-	-	-	-	437	-
Critical Hdwy	4.15	-	-	-	6.41	6.29
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.245	-	-	-	3.509	3.381
Pot Cap-1 Maneuver	1266	-	-	-	406	757
Stage 1	-	-	-	-	782	-
Stage 2	-	-	-	-	653	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1266	-	-	-	396	757
Mov Cap-2 Maneuver	-	-	-	-	396	-
Stage 1	-	-	-	-	763	-
Stage 2	-	-	-	-	653	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0.45	0		14.54		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	103	-	-	-	396	757
HCM Lane V/C Ratio	0.019	-	-	-	0.247	0.073
HCM Ctrl Dly (s/v)	7.9	0	-	-	17	10.1
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1	0.2

7: Lake Attitash Way/Lions Mouth Road & Kimball Road Weekday Evening Peak Hour Volumes

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	48	6	4	83	24	3	4	3	33	16	0
Future Vol, veh/h	3	48	6	4	83	24	3	4	3	33	16	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	2	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	3	56	7	5	97	28	3	5	3	38	19	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7.5	7.7	7.3	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	30%	5%	4%	67%
Vol Thru, %	40%	84%	75%	33%
Vol Right, %	30%	11%	22%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	57	111	49
LT Vol	3	3	4	33
Through Vol	4	48	83	16
RT Vol	3	6	24	0
Lane Flow Rate	12	66	129	57
Geometry Grp	1	1	1	1
Degree of Util (X)	0.013	0.075	0.142	0.069
Departure Headway (Hd)	4.163	4.065	3.947	4.381
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	845	872	901	807
Service Time	2.262	2.131	2.002	2.465
HCM Lane V/C Ratio	0.014	0.076	0.143	0.071
HCM Control Delay, s/veh	7.3	7.5	7.7	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.2	0.5	0.2

HCM 7th TWSC
3: Haverhill Road & Kimball Road

2025 Baseline Conditions
Weekday Evening Peak Hour Volumes

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	42	342	422	105	60	33
Future Vol, veh/h	42	342	422	105	60	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	3	1	0	0	3
Mvmt Flow	46	376	464	115	66	36
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	579	0	-	0	990	521
Stage 1	-	-	-	-	521	-
Stage 2	-	-	-	-	468	-
Critical Hdwy	4.1	-	-	-	6.4	6.23
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.327
Pot Cap-1 Maneuver	1005	-	-	-	276	553
Stage 1	-	-	-	-	600	-
Stage 2	-	-	-	-	634	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1005	-	-	-	260	553
Mov Cap-2 Maneuver	-	-	-	-	260	-
Stage 1	-	-	-	-	565	-
Stage 2	-	-	-	-	634	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0.96	0		19.41		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	197	-	-	-	260	553
HCM Lane V/C Ratio	0.046	-	-	-	0.254	0.066
HCM Ctrl Dly (s/v)	8.8	0	-	-	23.5	12
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1	0.2

7: Lake Attitash Way/Lions Mouth Way & Kimball Road Weekday Morning Peak Hour Volumes

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	72	0	1	23	28	4	11	6	35	12	0
Future Vol, veh/h	0	72	0	1	23	28	4	11	6	35	12	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	0	2	0	0	5	9	0	0	0	10	0	0
Mvmt Flow	0	88	0	1	28	34	5	13	7	43	15	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7.7	7.1	7.3	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	0%	2%	74%
Vol Thru, %	52%	100%	44%	26%
Vol Right, %	29%	0%	54%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	21	72	52	47
LT Vol	4	0	1	35
Through Vol	11	72	23	12
RT Vol	6	0	28	0
Lane Flow Rate	26	88	63	57
Geometry Grp	1	1	1	1
Degree of Util (X)	0.029	0.101	0.067	0.072
Departure Headway (Hd)	4.072	4.127	3.792	4.5
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	867	860	932	789
Service Time	2.156	2.189	1.865	2.571
HCM Lane V/C Ratio	0.03	0.102	0.068	0.072
HCM Control Delay, s/veh	7.3	7.7	7.1	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.2	0.2

HCM 7th TWSC
3: Haverhill Road & Kimball Road

2032 No-Build Conditions
Weekday Morning Peak Hour Volumes

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	23	372	238	29	93	53
Future Vol, veh/h	23	372	238	29	93	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	5	3	7	4	1	9
Mvmt Flow	26	418	267	33	104	60
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	300	0	-	0	753	284
Stage 1	-	-	-	-	284	-
Stage 2	-	-	-	-	470	-
Critical Hdwy	4.15	-	-	-	6.41	6.29
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.245	-	-	-	3.509	3.381
Pot Cap-1 Maneuver	1244	-	-	-	379	739
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	631	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1244	-	-	-	368	739
Mov Cap-2 Maneuver	-	-	-	-	368	-
Stage 1	-	-	-	-	746	-
Stage 2	-	-	-	-	631	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0.46	0		15.58		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	105	-	-	-	368	739
HCM Lane V/C Ratio	0.021	-	-	-	0.284	0.081
HCM Ctrl Dly (s/v)	8	0	-	-	18.6	10.3
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1	0.3

7: Lake Attitash Way/Lions Mouth Road & Kimball Road Weekday Evening Peak Hour Volumes

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	51	6	4	89	26	3	4	3	35	17	0
Future Vol, veh/h	3	51	6	4	89	26	3	4	3	35	17	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	2	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	3	59	7	5	103	30	3	5	3	41	20	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7.5	7.7	7.4	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	30%	5%	3%	67%
Vol Thru, %	40%	85%	75%	33%
Vol Right, %	30%	10%	22%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	60	119	52
LT Vol	3	3	4	35
Through Vol	4	51	89	17
RT Vol	3	6	26	0
Lane Flow Rate	12	70	138	60
Geometry Grp	1	1	1	1
Degree of Util (X)	0.014	0.079	0.152	0.074
Departure Headway (Hd)	4.294	4.081	3.954	4.402
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	839	868	898	802
Service Time	2.294	2.154	2.016	2.493
HCM Lane V/C Ratio	0.014	0.081	0.154	0.075
HCM Control Delay, s/veh	7.4	7.5	7.7	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.3	0.5	0.2

HCM 7th TWSC
3: Haverhill Road & Kimball Road

2032 No-Build Conditions
Weekday Evening Peak Hour Volumes

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	45	367	452	113	64	35
Future Vol, veh/h	45	367	452	113	64	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	3	1	0	0	3
Mvmt Flow	49	403	497	124	70	38
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	621	0	-	0	1061	559
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	502	-
Critical Hdwy	4.1	-	-	-	6.4	6.23
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.327
Pot Cap-1 Maneuver	970	-	-	-	250	527
Stage 1	-	-	-	-	577	-
Stage 2	-	-	-	-	612	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	970	-	-	-	234	527
Mov Cap-2 Maneuver	-	-	-	-	234	-
Stage 1	-	-	-	-	539	-
Stage 2	-	-	-	-	612	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0.97	0		21.77		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	197	-	-	-	234	527
HCM Lane V/C Ratio	0.051	-	-	-	0.301	0.073
HCM Ctrl Dly (s/v)	8.9	0	-	-	26.9	12.4
HCM Lane LOS	A	A	-	-	D	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.2	0.2

7: Lake Attitash Way/Lions Mouth Way & Kimball Road Weekday Morning Peak Hour Volumes

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	72	0	1	23	29	4	11	6	36	12	0
Future Vol, veh/h	0	72	0	1	23	29	4	11	6	36	12	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	0	2	0	0	5	9	0	0	0	10	0	0
Mvmt Flow	0	88	0	1	28	35	5	13	7	44	15	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7.7	7.1	7.3	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	0%	2%	75%
Vol Thru, %	52%	100%	43%	25%
Vol Right, %	29%	0%	55%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	21	72	53	48
LT Vol	4	0	1	36
Through Vol	11	72	23	12
RT Vol	6	0	29	0
Lane Flow Rate	26	88	65	59
Geometry Grp	1	1	1	1
Degree of Util (X)	0.029	0.101	0.068	0.073
Departure Headway (Hd)	4.074	4.13	3.789	4.503
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	866	860	933	788
Service Time	2.159	2.192	1.862	2.574
HCM Lane V/C Ratio	0.03	0.102	0.07	0.075
HCM Control Delay, s/veh	7.3	7.7	7.1	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.2	0.2

HCM 7th TWSC
3: Haverhill Road & Kimball Road

2033 Build Conditions
Weekday Morning Peak Hour Volumes

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	26	372	238	35	111	64
Future Vol, veh/h	26	372	238	35	111	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	5	3	7	4	1	9
Mvmt Flow	29	418	267	39	125	72
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	307	0	-	0	763	287
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	476	-
Critical Hdwy	4.15	-	-	-	6.41	6.29
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.245	-	-	-	3.509	3.381
Pot Cap-1 Maneuver	1237	-	-	-	374	736
Stage 1	-	-	-	-	764	-
Stage 2	-	-	-	-	627	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1237	-	-	-	362	736
Mov Cap-2 Maneuver	-	-	-	-	362	-
Stage 1	-	-	-	-	741	-
Stage 2	-	-	-	-	627	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0.52	0		16.55		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	118	-	-	-	362	736
HCM Lane V/C Ratio	0.024	-	-	-	0.344	0.098
HCM Ctrl Dly (s/v)	8	0	-	-	20.1	10.4
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.5	0.3

HCM 7th TWSC
10: Site Driveway & Kimball Road

2033 Build Conditions
Weekday Morning Peak Hour Volumes

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	113	1	9	52	2	29
Future Vol, veh/h	113	1	9	52	2	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	123	1	10	57	2	32
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	124	0	199	123
Stage 1	-	-	-	-	123	-
Stage 2	-	-	-	-	76	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1463	-	789	927
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	947	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1463	-	784	927
Mov Cap-2 Maneuver	-	-	-	-	784	-
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	940	-
Approach	EB	WB		NB		
HCM Ctrl Dly, s/v	0	1.1		9.08		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	917	-	-	266	-	
HCM Lane V/C Ratio	0.037	-	-	0.007	-	
HCM Ctrl Dly (s/v)	9.1	-	-	7.5	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

7: Lake Attitash Way/Lions Mouth Road & Kimball Road Weekday Evening Peak Hour Volumes

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	51	6	4	89	27	3	4	3	36	17	0
Future Vol, veh/h	3	51	6	4	89	27	3	4	3	36	17	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	2	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	3	59	7	5	103	31	3	5	3	42	20	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7.5	7.7	7.4	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	30%	5%	3%	68%
Vol Thru, %	40%	85%	74%	32%
Vol Right, %	30%	10%	23%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	60	120	53
LT Vol	3	3	4	36
Through Vol	4	51	89	17
RT Vol	3	6	27	0
Lane Flow Rate	12	70	140	62
Geometry Grp	1	1	1	1
Degree of Util (X)	0.014	0.079	0.153	0.075
Departure Headway (Hd)	4.297	4.084	3.952	4.405
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	838	867	899	802
Service Time	2.297	2.157	2.014	2.496
HCM Lane V/C Ratio	0.014	0.081	0.156	0.077
HCM Control Delay, s/veh	7.4	7.5	7.7	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.3	0.5	0.2

HCM 7th TWSC
3: Haverhill Road & Kimball Road

2033 Build Conditions
Weekday Evening Peak Hour Volumes

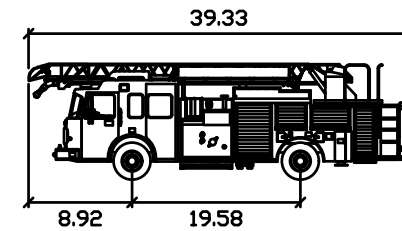
Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	54	367	452	128	75	42
Future Vol, veh/h	54	367	452	128	75	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	3	1	0	0	3
Mvmt Flow	59	403	497	141	82	46
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	637	0	-	0	1089	567
Stage 1	-	-	-	-	567	-
Stage 2	-	-	-	-	522	-
Critical Hdwy	4.1	-	-	-	6.4	6.23
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.327
Pot Cap-1 Maneuver	956	-	-	-	241	521
Stage 1	-	-	-	-	572	-
Stage 2	-	-	-	-	599	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	956	-	-	-	221	521
Mov Cap-2 Maneuver	-	-	-	-	221	-
Stage 1	-	-	-	-	526	-
Stage 2	-	-	-	-	599	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	1.16	0		24.14		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	231	-	-	-	221	521
HCM Lane V/C Ratio	0.062	-	-	-	0.372	0.089
HCM Ctrl Dly (s/v)	9	0	-	-	30.6	12.6
HCM Lane LOS	A	A	-	-	D	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.6	0.3

HCM 7th TWSC
10: Site Driveway & Kimball Road

2033 Build Conditions
Weekday Evening Peak Hour Volumes

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	89	1	24	119	1	18
Future Vol, veh/h	89	1	24	119	1	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	1	26	129	1	20
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	98	0	279	97
Stage 1	-	-	-	-	97	-
Stage 2	-	-	-	-	182	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1495	-	711	959
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	850	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1495	-	698	959
Mov Cap-2 Maneuver	-	-	-	-	698	-
Stage 1	-	-	-	-	909	-
Stage 2	-	-	-	-	850	-
Approach	EB	WB		NB		
HCM Ctrl Dly, s/v	0	1.25		8.91		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	940	-	-	302	-	
HCM Lane V/C Ratio	0.022	-	-	0.017	-	
HCM Ctrl Dly (s/v)	8.9	-	-	7.5	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	

□ AutoTurn



Amesbury Ladder 4 - 2023 E-One Typhoon 100' RMA
feet
Width : 8.17
Track : 8.17
Lock to Lock Time : 6.0
Steering Angle : 40.6

GRAPHIC SCALE



(IN FEET)
1 inch = 40 ft.

DRAFT

AutoTurn (Left Entering & Right Exiting + Site)

SITE ACCESS IMPROVEMENTS
27 KIMBALL ROAD
AMESBURY, MASSACHUSETTS
PREPARED FOR:
MARCUS PARTNERS

MDM TRANSPORTATION CONSULTANTS, INC.
PLANNERS & ENGINEERS

28 Lord Road, Suite 280
Marlborough, MA 01752
Tel: (508) 303-0370
Fax: (508) 303-0371

DATE: 5/29/2026

SCALE: As Noted

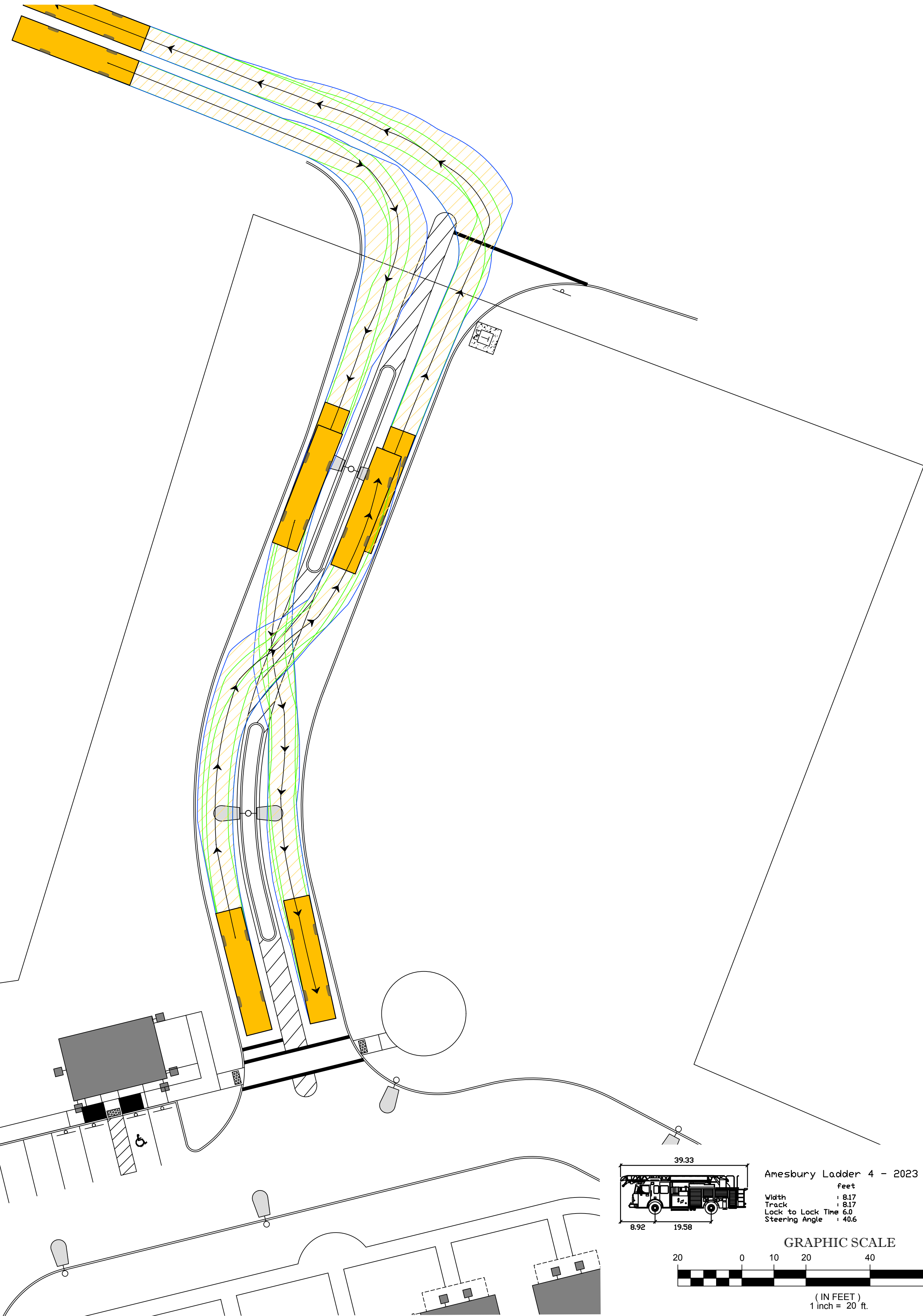
PROJECT No. 1465

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Sheet 1 of 3

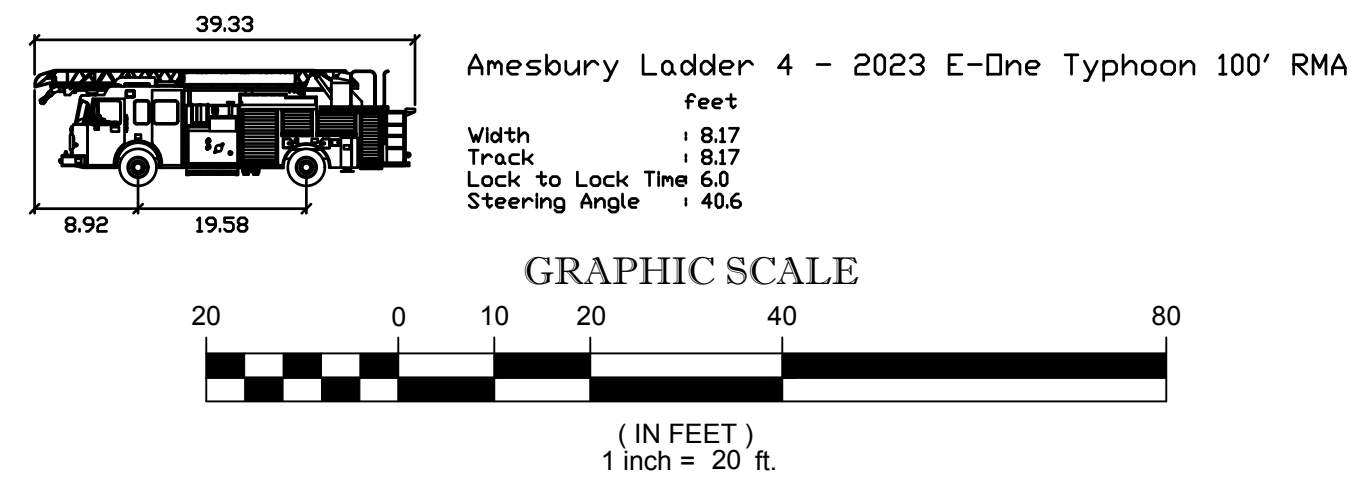
NOTES

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IT IS NOT FOR CONSTRUCTION.
2. FINAL DESIGN IS SUBJECT TO FIELD SURVEY BY OTHERS.
3. PROPERTY LINES AND ACCESS LINE LOCATIONS ARE APPROXIMATE ONLY
AND ARE SUBJECT TO DEED AND TITLE RECORDS.
4. BASE PLAN SOURCE: MARCUS PARTNERS



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DRAFT

AutoTurn (Right Entering & Left Exiting + Crossover)

SITE ACCESS IMPROVEMENTS
27 KIMBALL ROAD
AMESBURY, MASSACHUSETTS
PREPARED FOR:
MARCUS PARTNERS

MDM TRANSPORTATION CONSULTANTS, INC.
PLANNERS & ENGINEERS

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Marlborough, MA 01752
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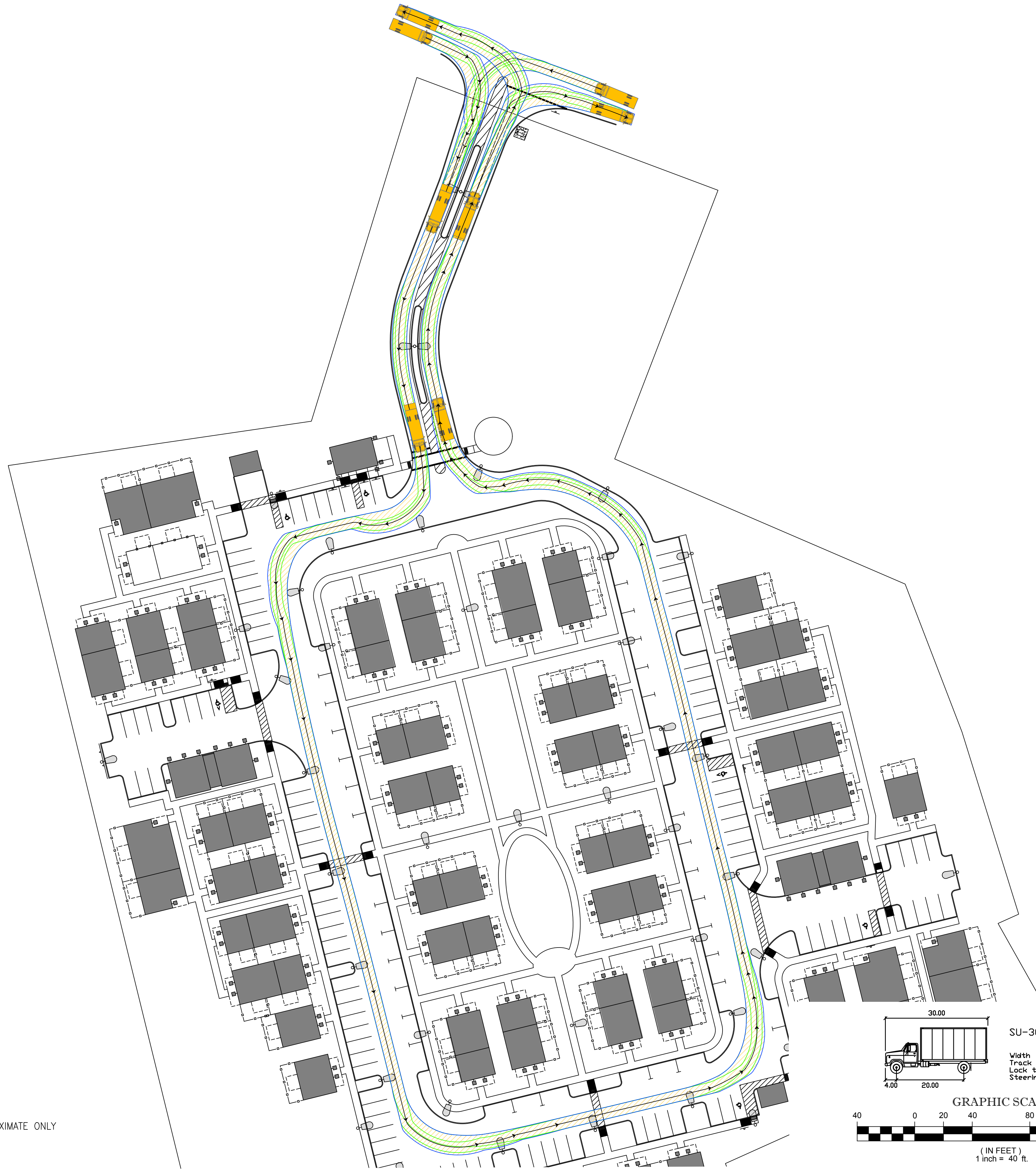
DATE: 5/29/2026

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PROJECT No. 1465

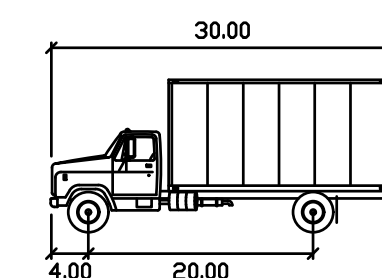
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Sheet 2 of 3



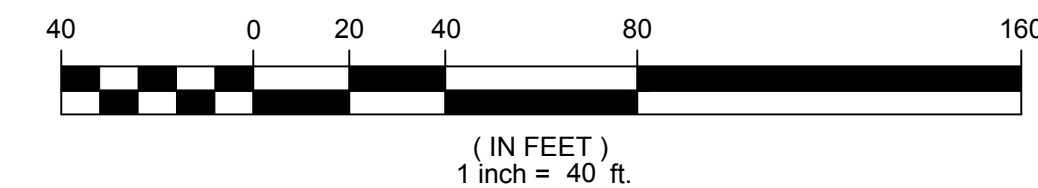
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4. BASE PLAN SOURCE: MARCUS PARTNERS



SU-30
Width 8.00
Track 8.00
Lock to Lock Time 6.0
Steering Angle 31.8

GRAPHIC SCALE



DRAFT

AutoTurn SU-30

SITE ACCESS IMPROVEMENTS
27 KIMBALL ROAD
AMESBURY, MASSACHUSETTS
PREPARED FOR:
MARCUS PARTNERS

MDM TRANSPORTATION CONSULTANTS, INC.
PLANNERS & ENGINEERS

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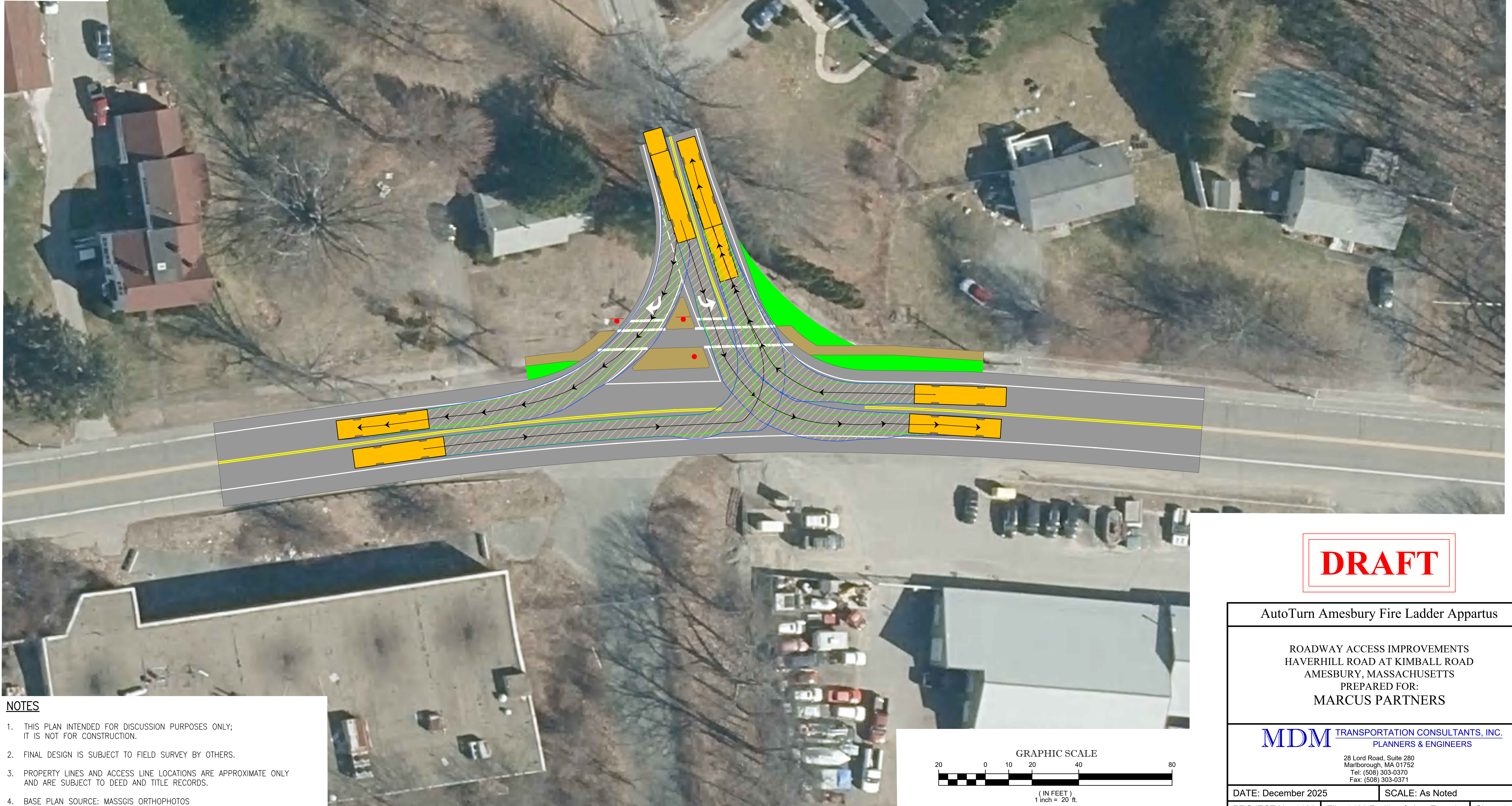
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PROJECT No. 1465

File: 1465 Site Plan (2026-6-1).dwg

Sheet 3 of 3



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4. BASE PLAN SOURCE: MASSGIS ORTHOPHOTOS

DRAFT

AutoTurn Amesbury Fire Ladder Appartus

ROADWAY ACCESS IMPROVEMENTS
HAVERHILL ROAD AT KIMBALL ROAD
AMESBURY, MASSACHUSETTS
PREPARED FOR:
MARCUS PARTNERS

MDM TRANSPORTATION CONSULTANTS, INC.
PLANNERS & ENGINEERS

28 Lord Road, Suite 280
Marlborough, MA 01752
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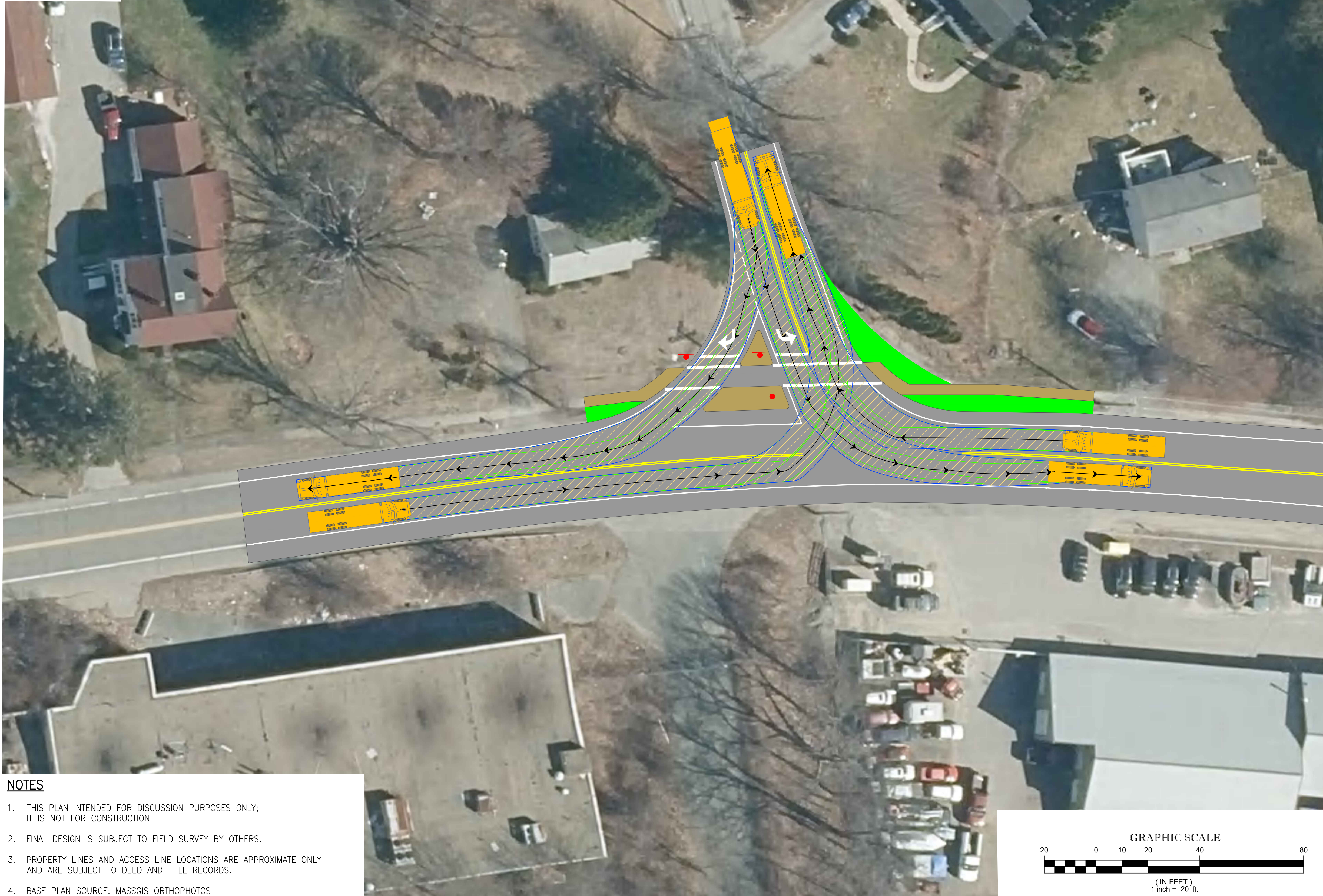
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SCALE: As Noted

PROJECT No. 1465

File: 1465 Redline & AutoTurn.dwg

Sheet 1 of 1



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4. BASE PLAN SOURCE: MASSGIS ORTHOPHOTOS

DRAFT

AutoTurn SU-40

ROADWAY ACCESS IMPROVEMENTS
HAVERHILL ROAD AT KIMBALL ROAD
AMESBURY, MASSACHUSETTS
PREPARED FOR:
MARCUS PARTNERS

MDM TRANSPORTATION CONSULTANTS, INC.
PLANNERS & ENGINEERS

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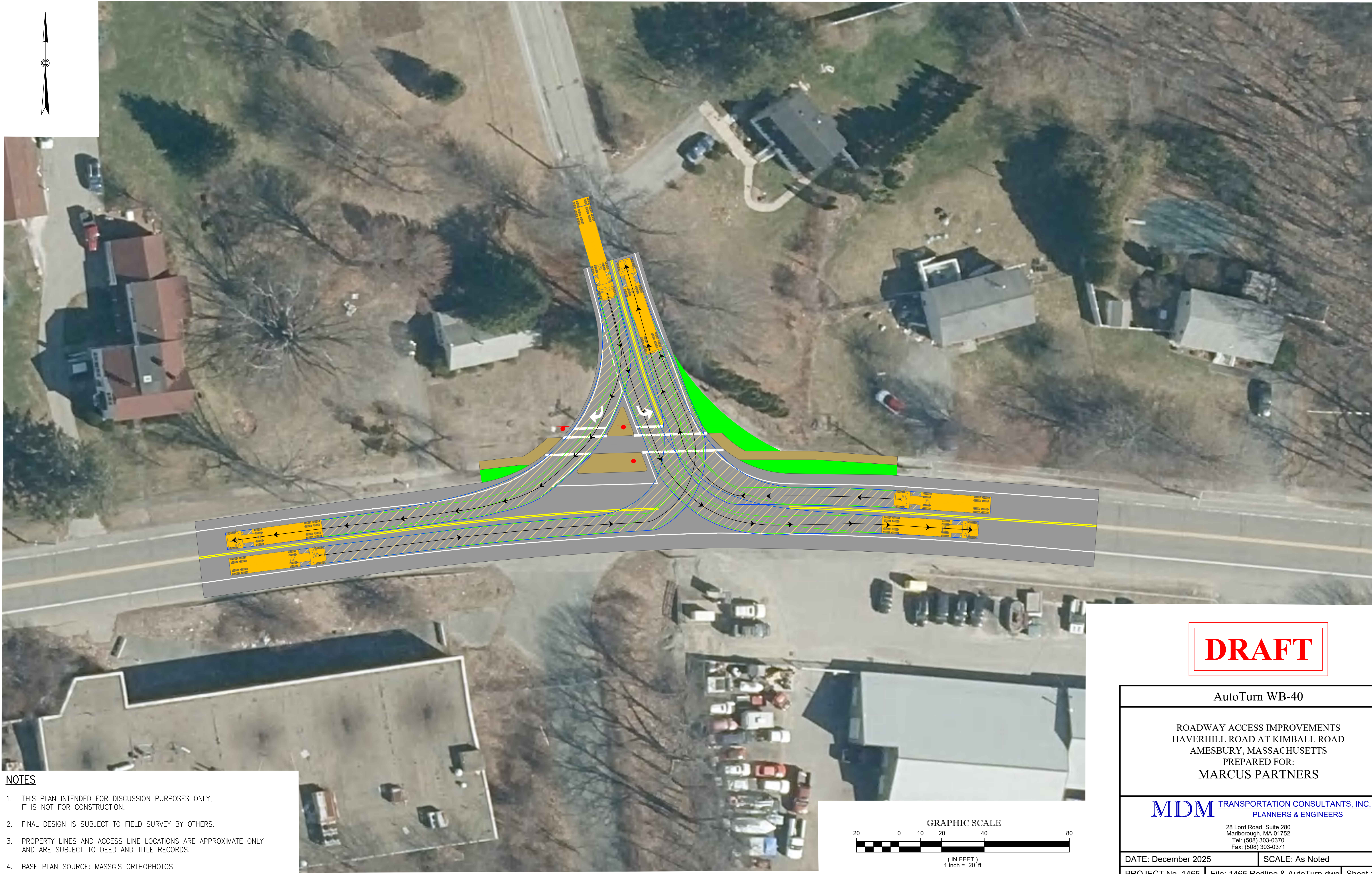
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Sheet 1 of 1



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DRAFT

AutoTurn WB-40		
ROADWAY ACCESS IMPROVEMENTS HAVERHILL ROAD AT KIMBALL ROAD AMESBURY, MASSACHUSETTS PREPARED FOR: MARCUS PARTNERS		
MDM TRANSPORTATION CONSULTANTS, INC. PLANNERS & ENGINEERS 28 Lord Road, Suite 280 Marlborough, MA 01752 Tel: (508) 303-0370 Fax: (508) 303-0371		
DATE: December 2025	SCALE: As Noted	
PROJECT No. 1465	File: 1465 Redline & AutoTurn.dwg	Sheet 1 of 1