

MEMORANDUM

TO: Glavey Family Trust
PO Box 381
Littleton, MA 01460

DATE: September 3, 2019

FROM: Samuel W. Gregorio, PE, PTOE, RSP₁
Senior Design Engineer

PROJECT NO.: T0921

RE: Healy Corner, #195 Tahattawan Road - Littleton, MA
Traffic Impact Assessment

INTRODUCTION

TEC, Inc. (TEC) has been retained by the Glavey Family Trust (the “Applicant”) to prepare a Traffic Impact Assessment (TIA) associated with the proposed Healy Corner development (the “Project”) to be located at #195 Tahattawan Road in Littleton, Massachusetts. The existing site currently contains a two-story single-family dwelling. The Project consists of retaining the existing dwelling and constructing 16 additional single-family homes. Fourteen (14) of the dwellings will be accessed a new cul-de-sac roadway opposite Tahattawan Road along Harwood Avenue. The additional three (3) dwellings, including the existing dwelling, will be access directly from Harwood Avenue.

TEC has evaluated the traffic operations for the site driveways and study area intersections under existing and future conditions. The future year planning horizon examines traffic operations under existing conditions (2019), as well as a 7-year design horizon (2026) for traffic volume projections, which includes an evaluation of the no-build conditions (without the proposed project) and build conditions (with site traffic added). These conditions are compared to determine what, if any, additional off-site mitigation is necessary to provide reasonable traffic operations in the area after the project is complete.

EXISTING CONDITIONS

The study area was selected to contain the major roadways and intersection providing local access to the project site. The project is classified on the low-end of a ‘moderate project’ per the Town’s Subdivision Regulations (Section 249-32); therefore, the study area has been restricted to the intersection of Harwood Avenue / Tahattawan Road. The study area intersections are shown graphically in Figure 1.

Geometry

A comprehensive field inventory of existing traffic conditions at the study area intersections was conducted by TEC staff in August 2019 to obtain information related to intersection geometry and lane usage. The field investigation consisted of an inventory of existing roadway geometrics,

operating characteristics, and safety characteristics. A description of the existing roadway and intersection inventory is provided below.

Roadways

Harwood Avenue

Harwood Avenue is an east-west collector roadway under the jurisdiction of the Town of Littleton that extends from King Street in the west to Newtown Road in the east. Harwood Avenue provides one lane in each direction with directional flow separated by a double-yellow centerline for the entire 2.7-mile-long roadway. Harwood Avenue does not provide parking along either side of the roadway. The speed limit varies from 25 miles per hour (mph) to 35 mph. Land use on Harwood Avenue is primarily residential along the entire corridor. Sidewalks and bicycle accommodations are not available along the roadway.

Tahattawan Road

Tahattawan Road is a north-south local roadway under the jurisdiction of the Town of Littleton that extends from Harwood Avenue in the south to Foster Street in the north. Tahattawan Road consists of one lane in each direction with directional flow separated by a single-yellow centerline for the 1-mile-long roadway. Tahattawan Road does not provide parking along either side of the roadway. The speed limit is posted at 30 mph. Land use on Tahattawan Road is primarily residential along the entire corridor. Sidewalks and bicycle accommodations are not available along the roadway.

Intersections

Harwood Avenue / Tahattawan Road

Tahattawan Road intersects Harwood Avenue to form a skewed three-legged unsignalized intersection. The Harwood Avenue eastbound and westbound approaches are free-flowing while the Tahattawan Road southbound approach is under stop-control. Each approach consists of a single general-purpose travel lane with directional flow separated by a marked centerline. Sidewalks, crosswalks and traditional bicycle accommodations are not provided at the intersection. The skewed nature of the intersection results in a large area of pavement on the westerly side of the intersection which is typically utilized for right-turning vehicles along Tahattawan Road southbound. In addition, the intersection skew results in a stop-sign along the Tahattawan Road approach that is set-back from the intersection conflict points and results in drivers travelling southbound to look far-over their shoulders to view oncoming eastbound traffic.

Public Transportation

The proposed Healy Corner Project site is located in close proximity to an existing public transportation service, which helps to promote transit usage and reduce the impacts of the development on the adjacent corridors, especially for local trips.



1" = 400

Healy Corner Development
Traffic Impact Assessment (TIA)

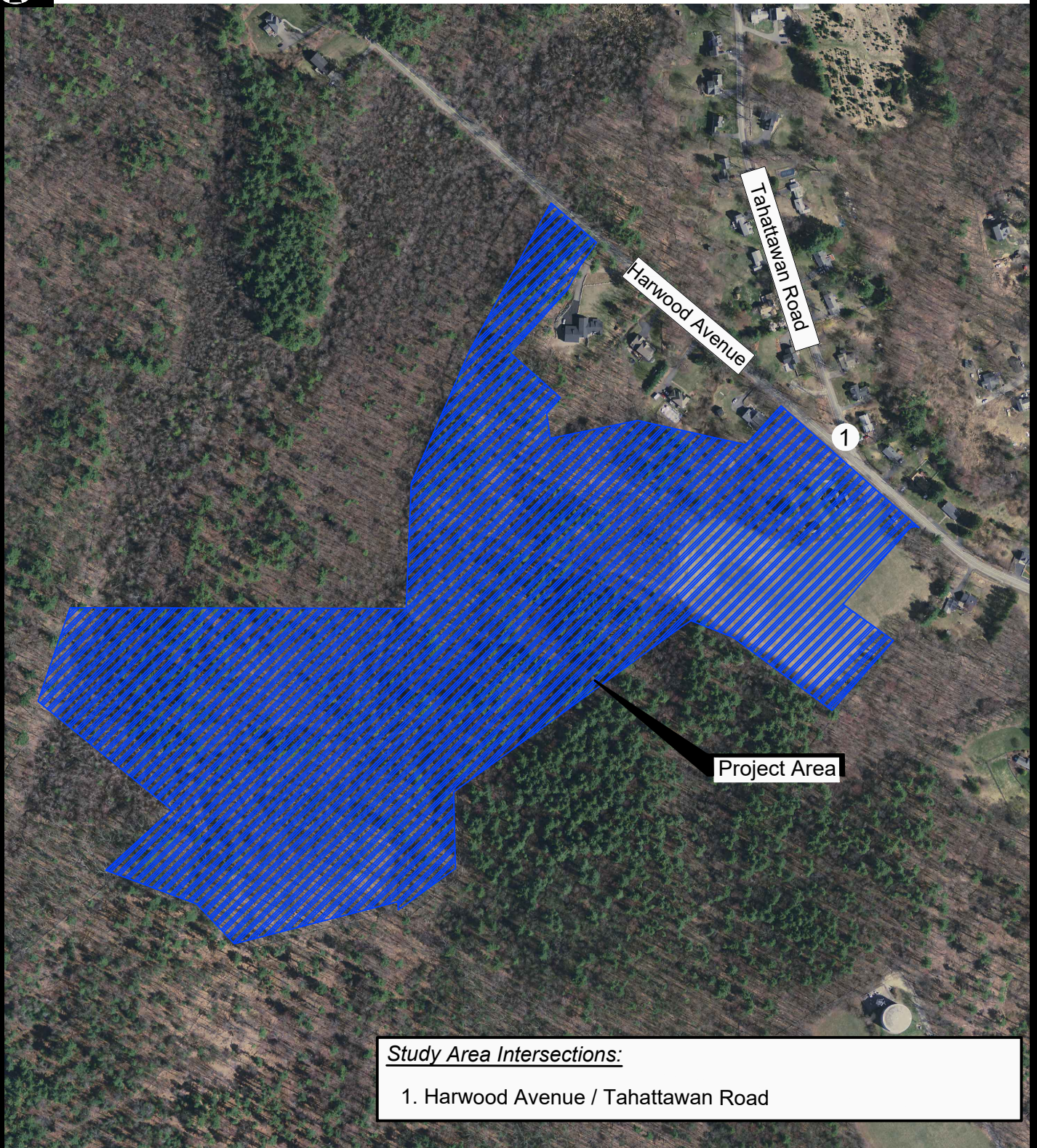


Figure 1

**Project Location Map &
Study Area Intersections**

Massachusetts Bay Transportation Authority Commuter Rail Services

The Massachusetts Bay Transportation Authority (MBTA) operates one (1) commuter rail service in the vicinity of the project. The Fitchburg / North Station Commuter Rail Line provides direct service to North Station via the Littleton / Rte. 495 MBTA Commuter Rail Station, 2.0 miles west of the project site. Commuter rail route and schedule data are included in Attachment A and a summary of the route is provided below:

Fitchburg Commuter Rail Line - The MBTA commuter rail provides connections from North Station in Boston to stations at Porter, Belmont, Waverley, Waltham, Brandies/Roberts, Kendal Green, Hastings, Silver Hill, Lincoln, Concord, West Concord, South Acton, Littleton/ Interstate 495 (I-495), Ayer, Shirley, North Leominster, Fitchburg, Wachusett. The Littleton/I-495 MBTA Commuter Rail Station is approximately 2.0 miles west of the project site. Inbound service runs between 4:50 AM (departing Wachusett) and 12:05 AM (arriving at North Station), and outbound service runs between 6:35 AM (departing North Station) and 1:44 AM (arriving at Wachusett) with headways of approximately 30 minutes to 90 minutes on weekdays. On Saturdays and Sundays, inbound service runs between 6:30 AM (departing Wachusett) and 11:16 PM (arriving at North Station) and outbound service runs between 8:35 AM (departing North Station) and 1:06 AM (arriving at Wachusett), with headways of approximately 2 hours to 3 hours.

Existing Traffic Volumes

Turning Movement Counts

In order to establish existing traffic-volume conditions at the study area intersections, manual Turning Movement Counts (TMCs) were conducted at the study area intersections during the weekday morning (7:00 AM – 9:00 AM) and weekday evening (4:00 PM – 6:00 PM) peak periods on Tuesday, August 20, 2019. A detailed summary of the turning movement counts, partitioned into 15-minute intervals, is provided within Attachment B.

Automatic Traffic Recorder Counts

Automatic Traffic Recorder (ATR) counts were conducted concurrently with the TMCs from Tuesday, August 20, 2019 to Wednesday, August 21, 2019 to gather daily traffic-volume, vehicle classification, and speed data for the study area roadways during a continuous 48-hour time period. The ATR provided volume, speed, and classification data for Harwood Avenue, west of Tahattawan Road. A summary of the weekday ATR traffic data is presented in Table 1. A detailed summary of the ATR counts, partitioned into 15-minute intervals, are provided in Attachment C.

Table 1 – Existing Weekday Traffic Volume Summary

Location	Weekday Traffic Volume ^(a)	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
		Traffic Volume ^(b)	K Factor ^(c)	Directional Distribution ^(d)	Traffic Volume	K Factor	Directional Distribution
Harwood Avenue, west of Tahattawan Road	1,443	127	8.8	66.9% EB	149	10.3	71.1% WB

^a Daily traffic expressed in vehicles per day, ^b Hourly traffic expressed in vehicles per hour

^c Percent of daily traffic volumes which occurs during the peak hour, ^d Percent of peak-hour volume in the predominant direction of travel

Harwood Avenue, in the vicinity of Tahattawan Road, carries approximately 1,450 vehicles per day (vpd) on an average weekday. Directional distribution along the roadway is weighted along the eastbound direction in the weekday morning peak hour and the westbound direction in the weekday evening peak hour. This indicates heavy travel to/from Route 2 utilizing Harwood Avenue for commuter traffic. Speed data indicates that the average speed and 85th percentile speed along Harwood Avenue eastbound are 37 and 41 mph, respectively. The average speed and 85th percentile speed along Harwood Avenue westbound are 37 and 42 mph, respectively. This indicates that traffic along the corridor is generally travel well above the posted speed limit.

Seasonal Adjustment

In accordance with Massachusetts Department of Transportation (MassDOT) standards, traffic volumes are typically adjusted to average-month conditions. To evaluate the potential for seasonal fluctuation of traffic volumes on roadways near the study area intersection, TEC reviewed historic traffic volume counts collected by MassDOT at permanent counts stations along Interstate 495 in Littleton^{1,2}. These published values indicated that weekday and Saturday traffic volumes in August are 8.8 percent higher than average-month conditions. Therefore, the August 2019 traffic volumes were left unadjusted to reflect a conservative analysis scenario. The compiled seasonal adjustment data is provided in Attachment D. The 2019 Existing Conditions traffic volumes are presented in Figure 2.

Safety Analysis

Sight Distance

TEC visited the site in August 2019 and measured the available sight distances at the proposed cul-de-sac roadway. The available sight lines were compared to minimum requirements established by the American Association of State Highway and Transportation Officials (AASHTO).

Sight distance represents the length of roadway that is visible to a driver traveling within the roadway. Two types of sight distance are typically evaluated for driveways and intersections: stopping sight distance (SSD) and intersection sight distance (ISD). SSD is the minimum distance required for a driver traveling along a roadway to perceive an object in the roadway and stop safely in advance of the object when traveling on a wet pavement surface. SSD is measured from an eye height of 3.5 feet to an object height of 2 feet above the ground, which is equivalent to a driver viewing the taillight of a vehicle ahead. SSD is measured along the centerline of the travel lane approaching the driveway or intersection.

¹ MassDOT Permanent Count Station 4427 – Littleton – Route I-495 – South of ramp Route 119 to Route 496 SB

² MassDOT Permanent Count Station 4091 – Littleton – Route I-495 – North of ramp Route 2 WB to RT 495 NB

ISD represents the length of the roadway visible to a driver waiting to exit a driveway or minor street. Minimum ISD requirements are based on the distance required for a driver to exit a minor street onto a major street without requiring an approaching vehicle to reduce its speed from the design speed to less than 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet and is measured from a distance 15 feet beyond the edge of the travel-way of the major roadway to represent a driver waiting to exit a driveway or minor roadway.

SSD is typically considered the critical sight distance, as it represents the minimum distance required for safe stopping, while ISD represents an acceptable speed reduction for approaching vehicles. The ISA, however, must be at least equal to the minimum required SSD in order to prevent a driver from entering the roadway when an approaching vehicle is too close to safely stop. The guidance provided by AASHTO states:

“If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road.”

Tables 2 and 3 provide a summary of the available sight distances at the site access roadway along Harwood Avenue.

Table 2 – Existing Stopping Sight Distance Measurements

Approach / Direction	Operating Speed	AASHTO Recommended Minimum	Measured Stopping Sight Distance
Harwood Avenue at Tahattawan Road: Harwood Avenue eastbound	41 MPH	300 FT ^a	> 400 FT
Harwood Avenue westbound	42 MPH	315 FT ^b	> 400 FT

^a Based on 3% grade approaching intersection

^b Based on 2% grade approaching intersection

Table 3 – Existing Intersection Sight Distance Measurements

Approach / Direction	Operating Speed	AASHTO Recommended Minimum	Measured Intersection Sight Distance
Harwood Avenue at Tahattawan Road: Looking East	42 MPH	315 FT	>400 FT
Looking West	41 MPH	300 FT	330 FT ^c
Harwood Avenue at Cul-de-Sac: Looking East	42 MPH	315 FT	170 FT
Looking West	41 MPH	300 FT	170 FT

^c Based on skewed positioning of through vehicle movement to cul-de-sac and assumes general maintenance of grass

As shown in Table 2, the SSD approaching the intersection along Harwood Avenue exceeds AASHTO’s minimum recommendations for safe operations. The ISD egressing both Tahattawan

Road and the proposed cul-de-sac driveway have restricted sight lines based on existing conditions. Egressing Tahattawan Road from the north, the ISD looking to the west is restricted by existing tall grass which could be mowed for general maintenance. Once existing non-tree vegetation is kept to trimmed levels, the ISD looking west would extend approximately 330-feet.

Along the proposed cul-de-sac, the ISD is limited in both directions by existing trees which line Harwood Avenue to both the east and the west. The site plan does not call out specific tree removal beyond the general extents of the proposed cul-de-sac layout which therefore restricts ISD to approximately 170 feet both to the east and the west. This condition can be mitigated to meet AASHTO minimum recommendations with the removal of additional trees in the public right-of-way adjacent to the property and additional trees within the site layout adjacent to the Harwood Avenue layout. The Applicant will commit to removing the additional trees on-site and in the public right-of-way within the ISD sight triangles, egressing the cul-de-sac, to meet AASHTO minimum recommendations as noted in Table 3.

Crash History Analysis

Crash data for the study area intersection was compiled and analyzed for the most recent consecutive seven-year period (2012-2018) on file from MassDOT and the Massachusetts Registry of Motor Vehicles (RMV). The motor vehicle crash data was reviewed to determine if any collision trends exist within the study area. After evaluation of the Harwood Avenue / Tahattawan Road intersection, it was determined that there were zero (0) 'reported' crashes at the intersection within the seven-year study period indicating no safety concern.

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2026, which reflects a 7-year planning horizon in accordance with MassDOT standards for a TIA. The traffic conditions for the year 2026, under No-Build conditions, were developed to document the operating conditions independent of the proposed project, including all existing traffic, new traffic resulting from background growth, and traffic from specific developments in the vicinity of the site. Anticipated site-generated traffic volumes for the proposed school were superimposed upon the No-Build traffic networks to reflect the Build conditions with the proposed project.

Background Traffic Growth

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

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

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

General Background Growth

Traffic-volume data compiled by MassDOT from permanent count stations and historic traffic counts in Littleton^{3,4} and Acton⁵ along local roadways within the vicinity of the project were reviewed in order to determine traffic growth trends. Based on the MassDOT traffic volume data, traffic volumes in the area have been increasing at a rate of 1.67 percent per year since 2010. Therefore, to provide a conservative analysis scenario, a 1.7 percent per year compounded annual background traffic growth rate was used to account for potential future traffic growth external to the study area and presently unforeseen development. Count station data have been included in Attachment E.

Specific Development by Others

TEC coordinated with the Town of Littleton Planning Department to identify nearby private / public development projects in the vicinity of the study area that are either in the planning process or were recently approved but not yet occupied. Based on these discussions the Town of Littleton identified no projects that are in the vicinity of the study area.

No-Build Traffic Volumes

The 2026 No-Build weekday morning, weekday dismissal, and weekday evening peak-hour traffic-volume networks were developed by applying the 1.7 percent per year compounded annual background traffic growth rate to the 2019 Existing Conditions peak-hour traffic volumes over the 7-year design horizon. The resulting 2026 No-Build weekday morning and weekday evening peak-hour traffic-volume networks are illustrated in Figure 2.

Site Generated Traffic

The existing site currently contains a two-story single-family dwelling. The Project consists of retaining the existing dwelling and constructing 16 additional single-family homes. Fourteen (14) of the dwellings will be accessed a new cul-de-sac roadway opposite Tahattawan Road along Harwood Avenue. The additional three (3) dwellings, including the existing dwelling, will be access directly from Harwood Avenue.

TEC estimated the site-generated traffic based on industry standard trip rates published in the Institute of Transportation Engineers (ITE) publication *Trip Generation, 10th Edition* for Land Use Code (LUC) 210 – Single Family Units. As shown in Table 4, the proposed Healy Corner Project is anticipated to generate approximately 193 new vehicle trips during the average weekday, with 15 new vehicle trips (4 entering and 11 exiting) during the weekday morning peak hour, 19 new vehicle trips (12 entering and 7 exiting) during the weekday evening peak hour. For the purposes of this TIA, the full total existing and proposed traffic was assessed as part of the capacity and queue analysis.

³ MassDOT Permanent Count Station 4427 – Littleton – Route I-495 South of Rt. 119 to Rt. 495 SB

⁴ MassDOT Permanent Count Station 237172 – Littleton – Littleton

⁵ MassDOT Permanent Count Station 4002 – Acton – Great Road – Littleton Town Line

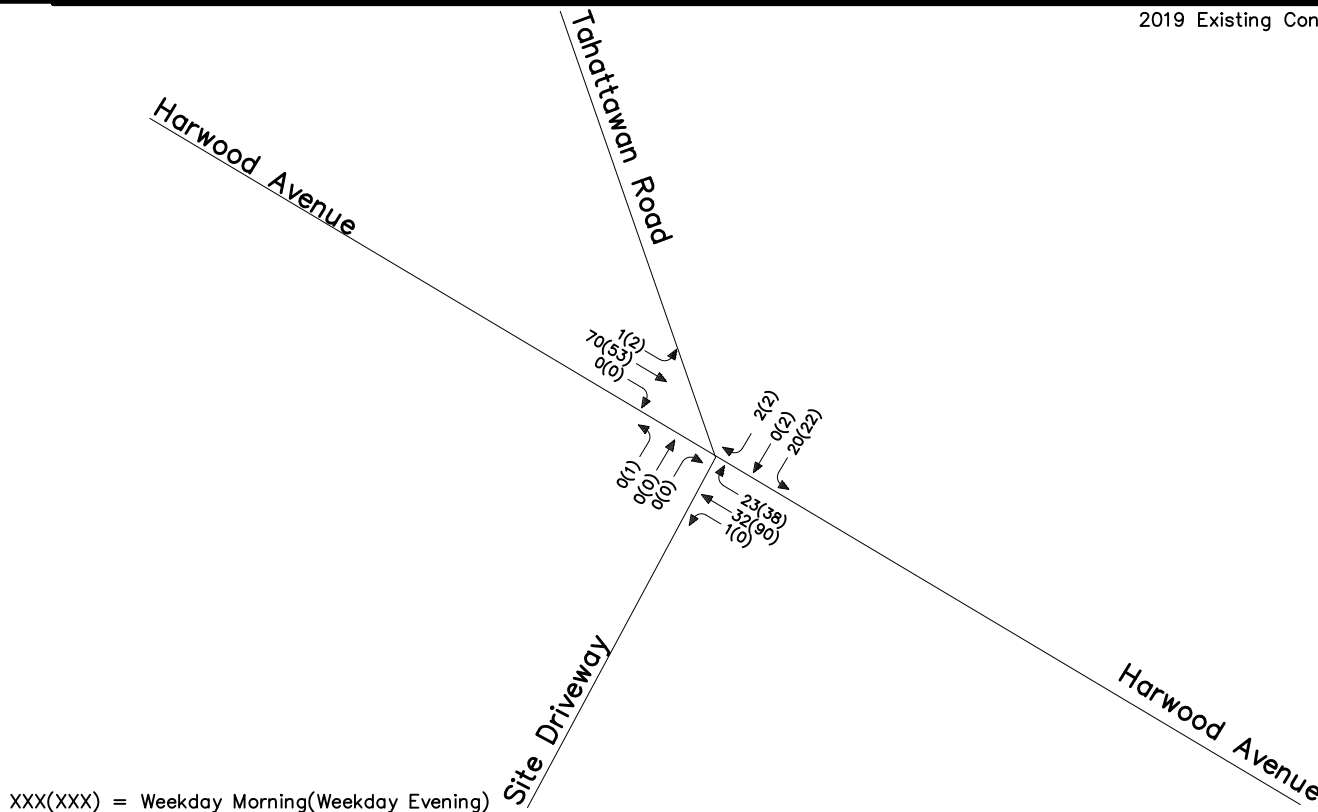


Not to Scale

Healy Corner Development

Traffic Impact Assessment (TIA)

2019 Existing Conditions



2026 No Build

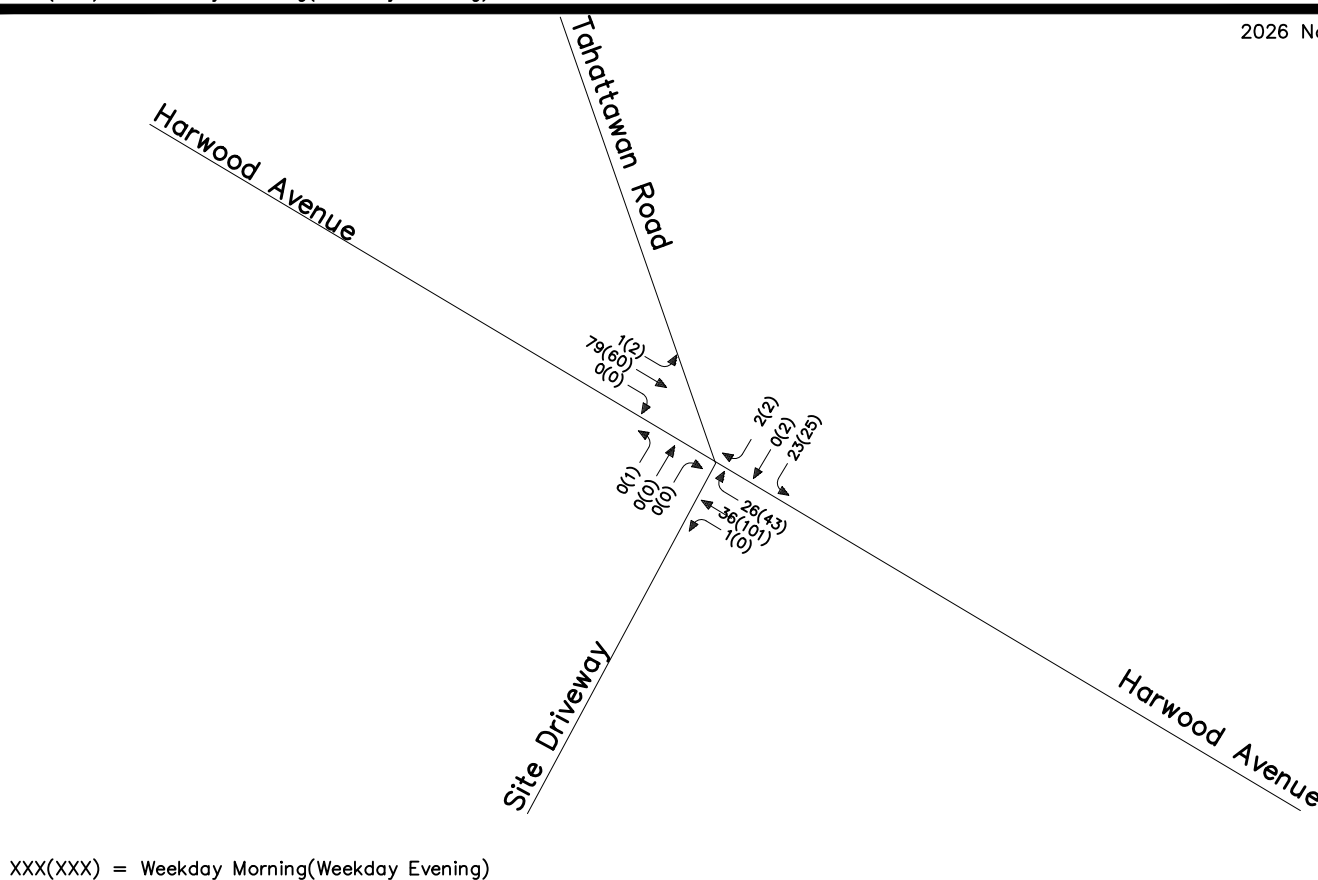


Figure 2

2019 Existing Conditions and 2026 No Build
Weekday Morning, Weekday Evening
Peak Hour Traffic Volumes



Trip generation worksheets are provided in Attachment F.

Table 4 - Trip Generation Summary

Time Period / Direction	Existing Trips	Proposed Trips	Total Trips
<i>Weekday Daily</i>	15	193	204
<i>Weekday Morning Peak Hour</i>			
Enter	0	4	4
Exit	<u>1</u>	<u>11</u>	<u>12</u>
Total	1	15	16
<i>Weekday Evening Peak Hour</i>			
Enter	7	12	13
Exit	<u>6</u>	<u>7</u>	<u>7</u>
Total	13	19	20

Trip Distribution

The distribution of the Healy Corner development site-generated traffic volumes was based on a gravity model using 2018 U.S. Census Bureau estimated Journey-to-Work data for the surrounding communities as described in the target worker population. This includes communities such as Littleton, Acton, Cambridge, Boston, Burlington, Westford, Concord, Billerica, Waltham, Bedford, Wilmington, and Framingham. The resulting primary trip distributions are shown in Table 5. The Net Site-Generated Trip Assignment traffic-volume network is graphically depicted in Figure 3 for the weekday morning and weekday evening peak hours. Trip distribution gravity model information is provided in Attachment G.

Table 5 – Trip Distribution Summary

Direction	All Time Periods
Harwood Avenue to/from East	48%
Harwood Avenue to/from West	11%
<u>Tahattawan Road to/from North</u>	<u>41%</u>
Total	100%

Note that three (3) of the dwellings on-site; including the existing dwelling, will be accessed from driveways to the east of the Harwood Avenue / Tahattawan Road / Cul-de-Sac intersection. Therefore, the trip assessment in/out of the cul-de-sac will represent only thirteen (13) of the dwellings.

2026 Build Traffic Volumes

The 2026 Build Condition traffic-volume networks consist of the 2026 No-Build traffic-volumes with the addition of the site-generated traffic for the proposed Healy Corner development. The resulting 2026 Build weekday morning and weekday evening peak-hour traffic-volume networks are presented in Figure 3.

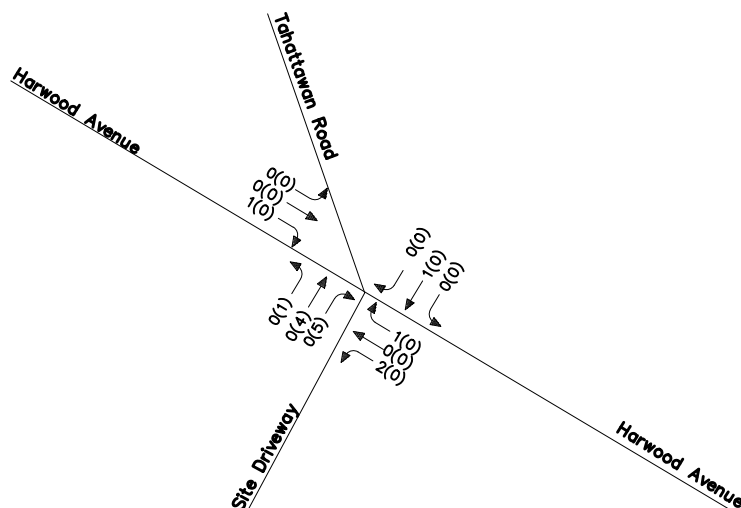


Not to Scale

Healy Corner Development

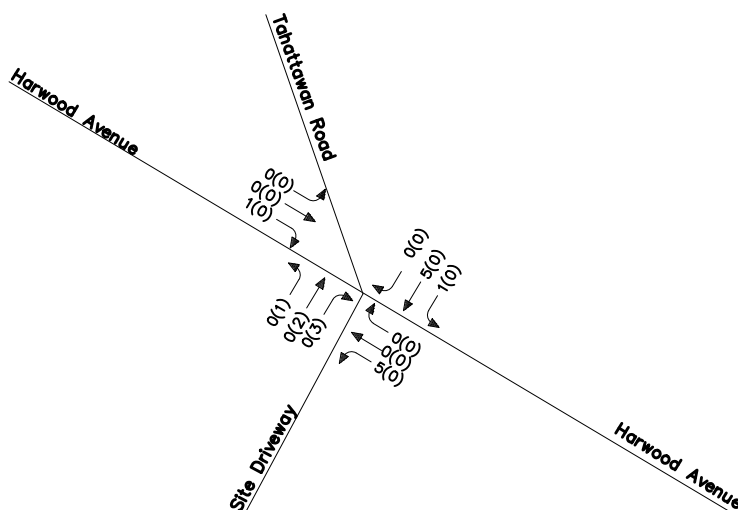
Traffic Impact Assessment (TIA)

AM Site Generated



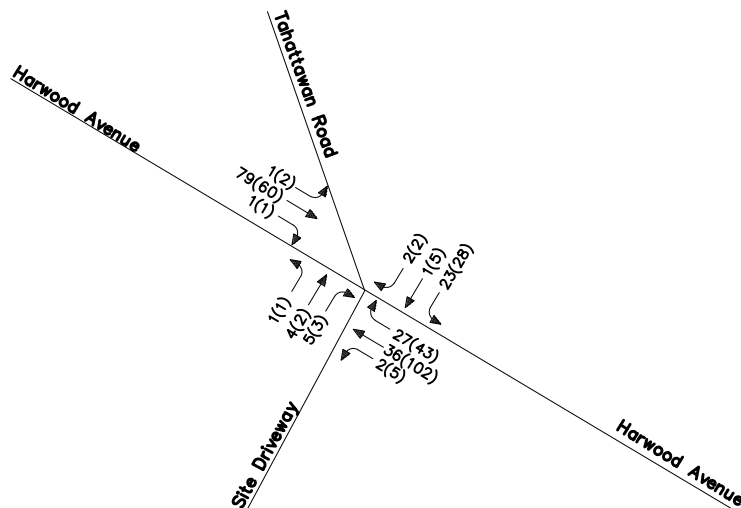
XXX(XXX) = Enter(Exit)

PM Site Generated



XXX(XXX) = Enter(Exit)

2026 Build



XXX(XXX) = Weekday Morning(Weekday Evening)

Figure 3

Site Generated and 2026 Build
Conditions Peak Hour Traffic Volumes



CAPACITY AND QUEUE ANALYSIS

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

Methodology

Levels of Service

A primary result of capacity analyses is the assignment of level-of-service to traffic facilities under various traffic-flow conditions.⁶ The concept of level-of-service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best operating conditions and LOS F representing the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

Queue Length Analysis

Vehicle queue analyses are a direct measurement of an intersection's ability to process vehicles under various traffic control and volume scenarios and lane use arrangements. The vehicle queue analysis was performed using the Synchro 9.0™ intersection capacity analysis software which is also based upon the methodology and procedures presented in the *HCM 2010*. Synchro reports the 95th percentile queues for unsignalized intersections and both the 50th (average) and 95th percentile vehicle queues for signalized intersections, which are based on the number of vehicles that experience a delay of six (6) seconds or more at an intersection and is a function of the traffic signal timing; vehicle arrival patterns during the analysis period; and the saturation flow rate. The 50th percentile or average vehicle queue is the average number of vehicles that are projected to be delayed by six seconds or more at the intersection under study during the analysis period. The 95th percentile vehicle queue is the vehicle queue length that will be exceeded only five (5) percent of the time; or approximately three (3) minutes out of 60 minutes during the peak one hour of the day. During the remaining 57 minutes, the vehicle queue length will be less than the 95th percentile queue length.

⁶ The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual 2010*; Transportation Research Board; Washington, DC; 2010

Parameters for Traffic Impact Analysis

The levels of service of two-way stop-controlled intersections are determined by application of a procedure described in the *HCM 2010*. Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and stop signs. Control delay includes the effects of initial deceleration delay approaching a stop sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the *HCM 2010*. Table 6 summarizes the relationship between level of service and average control delay.

Table 6 – Level-of-Service Criteria for Unsignalized Intersections ^(a)

Level of Service ($v/c \leq 1.0$)	Level of Service ($v/c > 1.0$)	Average Control Delay (s/veh)	Description
A	F	≤ 10.0	LOS A represents a condition with little or no control delay to minor street traffic.
B	F	10.1 to 15.0	LOS B represents a condition with short control delays to minor street traffic.
C	F	15.1 to 25.0	LOS C represents a condition with average control delays to minor street traffic.
D	F	25.1 to 35.0	LOS D represents a condition with long control delays to minor street traffic.
E	F	35.1 to 50.0	LOS E represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
F	F	> 50.0	LOS F represents a condition where minor street demand volume exceeds capacity of an approach lane, with excessive control delays resulting.

^a Source: *Highway Capacity Manual 2010*; Transportation Research Board; Washington D.C.; 2010; page 17-2

Intersection Capacity and Queue Analysis Results

Level-of-service and queue analyses were conducted for 2019 Existing Conditions, 2026 No-Build Conditions, and 2026 Build Conditions, for the intersections within the study area. The results of the intersection capacity and queue analysis are summarized in Table 7. The detailed intersection capacity and queue analysis worksheets are provided in Attachment H.

Harwood Avenue / Tahattawan Road / Cul-de-Sac

All movements at the intersection of Harwood Avenue / Tahattawan Road / Cul-de-Sac are anticipated to operate at acceptable levels-of-service (LOS B or better) following the construction of the project. The project is not anticipated to generate more than 10 individual trips along any one approach during the peak hours (1 new vehicle per approach on average every 6 minutes). At this trip generation rate, the project impacts will generally be negligible and unnoticeable to the general public.

Table 7 – Intersection Capacity and Queue Analysis Summary

Intersection / Lane Group	2019 Existing				2026 No-Build				2026 Build			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Harwood Avenue / Tahattawan Road												
<i>Weekday Morning Peak Period</i>												
Harwood Avenue EB	0.01	7.3	A	<25	0.01	7.3	A	<25	0.01	7.3	A	<25
Harwood Avenue WB	-	-	-	-	-	-	-	-	0.01	7.4	A	<25
Cul-de-Sac NB	-	-	-	-	-	-	-	-	0.01	9.3	A	<25
Tahattawan Road SB	0.03	9.3	A	<25	0.04	9.5	A	<25	0.04	9.7	A	<25
<i>Weekday Evening Peak Period</i>												
Harwood Avenue EB	0.01	7.5	A	<25	0.01	7.5	A	<25	0.01	7.5	A	<25
Harwood Avenue WB	-	-	-	-	-	-	-	-	0.01	7.4	A	<25
Cul-de-Sac NB	-	-	-	-	-	-	-	-	0.01	9.7	A	<25
Tahattawan Road SB	0.05	9.8	A	<25	0.06	10.0	B	<25	0.08	10.6	B	<25

^a Volume-to-capacity ratio.

^b Delay expressed in seconds per vehicle (average)

^c Level of service.

^d 95th Percentile Queue only for unsignalized intersections

CONCLUSIONS AND RECOMMENDATIONS

TEC has examined the potential traffic impacts associated with the proposed Healy Corner development, located at #195 Tahattawan Road in Littleton, Massachusetts on the study area roadways and intersections. The following is a summary of the results and conclusions of this effort:

- The existing site currently contains a two-story single-family dwelling. The Project consists of retaining the existing dwelling and constructing 16 additional single-family homes.
- Fourteen (14) of the dwellings will be accessed a new cul-de-sac roadway opposite Tahattawan Road along Harwood Avenue. The additional three (3) dwellings, including the existing dwelling, will be access directly from Harwood Avenue.
- The stopping sight distance (SSD) approaching the intersection along Harwood Avenue exceeds AASHTO's minimum recommendations for safe operations.
- Egressing Tahattawan Road from the north, the intersection sight distance (ISD) looking to the west is restricted by existing tall grass which could be mowed for general maintenance. Once existing non-tree vegetation is kept to trimmed levels, the ISD looking west would extend approximately 330-feet.
- Along the proposed cul-de-sac, the ISD is limited in both directions by existing trees which line Harwood Avenue to both the east and the west. The Applicant will commit to removing the additional trees on-site and in the public right-of-way within the ISD sight triangles, egressing the cul-de-sac, to meet AASHTO minimum recommendations as noted in Table 2.
- The proposed Healy Corner Project is anticipated to generate approximately 193 new vehicle trips during the average weekday, with 15 new vehicle trips (4 entering and 11 exiting) during the weekday morning peak hour, 19 new vehicle trips (12 entering and 7 exiting) during the weekday evening peak hour.
- All movements at the intersection of Harwood Avenue / Tahattawan Road / Cul-de-Sac are anticipated to operate at acceptable levels-of-service (LOS B or better) following the construction of the project. The project is not anticipated to generate more than 10 individual trips along any one approach during the peak hours (1 new vehicle per approach on average every 6 minutes). At this trip generation rate, the project impacts will generally be negligible and unnoticeable to the general public.

In conclusion, with minor traffic signal trimming modifications and the optional reestablishment of traffic signal operations at the intersection of Harwood Avenue / Tahattawan Road the anticipated traffic generated by the proposed Healy Corner development can be safely and efficiently accommodated within the study area corridors and intersections.

Attachment A

Public Transportation Data

FITCHBURG LINE

Effective May 20, 2019

Monday to Friday

Inbound to Boston

ZONE	STATION	TRAIN #	AM										PM										Saturday & Sunday																
			400	402	404	406	408	492	410	412	414	416	418	420	422	494	424	426	428	430	432		1400	1402	1404	1406	1408	1410	1412	1414	1416	1418	1420	1422	1424	1426	1428	1430	1432
8	Wachusett	6	4:50	5:45	6:20	6:40	7:10	-	8:10	9:37	10:50	12:05	1:30	2:50	4:05	-	5:43	7:03	8:25	9:30	10:35		6:30	8:45	10:50	1:15	3:40	6:10	9:45										
8	Fitchburg	6	4:58	5:53	6:28	6:48	7:18	-	8:18	9:45	10:58	12:13	1:38	2:58	4:13	-	5:51	7:11	8:33	9:38	10:43		6:38	8:53	10:58	1:23	3:48	6:18	9:53										
8	North Leominster	6	5:05	6:00	6:35	6:55	7:25	-	8:25	9:52	11:05	12:20	1:45	3:05	4:20	-	5:58	7:18	8:40	9:45	10:50		6:45	9:00	11:05	1:30	3:55	6:25	10:00										
8	Shirley	5	5:13	6:08	6:43	7:03	7:33	-	8:33	10:00	11:13	12:28	1:53	3:13	4:28	-	6:06	7:26	8:48	9:53	10:58		6:53	9:08	11:13	1:38	4:03	6:33	10:08										
8	Ayer	5	5:18	6:13	6:48	7:08	7:38	-	8:38	10:05	11:18	12:33	1:58	3:18	4:33	-	6:11	7:31	8:53	9:58	11:03		6:58	9:13	11:18	1:43	4:08	6:38	10:13										
7	Littleton/Rte 495	6	5:26	6:21	6:56	7:16	7:46	7:55	8:46	10:13	11:26	12:41	2:06	3:26	4:41	5:15	6:19	7:39	9:01	10:06	11:11		7:06	9:21	11:26	2:01	4:26	6:56	10:31										
6	South Acton	6	5:33	6:28	7:03	7:23	7:53	8:02	8:53	10:19	11:32	12:47	2:12	3:32	4:47	5:21	6:25	7:45	9:07	10:12	11:17		7:12	9:27	11:32	2:06	4:31	7:01	10:26										
5	West Concord	6	5:37	6:32	-	7:28	-	8:06	8:57	10:23	11:36	12:51	2:16	3:36	4:53	5:25	6:29	7:49	9:11	10:16	11:21		7:17	9:32	11:37	2:11	4:36	7:06	10:31										
5	Concord	6	5:42	6:37	-	7:33	-	8:11	9:02	10:27	11:40	12:55	2:20	3:40	4:57	5:29	6:33	7:53	9:15	10:20	11:25		7:21	9:36	11:41	2:16	4:41	7:11	10:36										
4	Lincoln	6	5:49	6:44	-	7:40	-	8:18	9:09	10:33	11:46	1:01	2:26	3:46	5:03	5:35	6:39	7:59	9:21	10:26	11:31		7:26	9:41	11:46	2:21	4:46	7:16	10:41										
3	Silver Hill	6	-	6:47	-	-	-	-	8:21	-	10:37	11:50	-	-	-	-	-	-	-	-	-		7:31	9:46	11:51	2:26	4:51	7:21	10:46										
3	Hastings	6	5:54	6:50	-	-	-	8:24	-	10:37	11:50	-	-	-	-	-	-	-	-	-	-		7:35	9:50	11:55	2:31	4:56	7:26	10:51										
3	Kendal Green		5:57	6:53	-	7:47	-	8:27	9:15	10:39	11:52	1:07	2:32	3:52	5:09	5:41	6:45	8:05	9:27	10:32	11:37		7:39	9:54	11:59	2:36	5:01	7:31	11:06										
2	Brandeis/Roberts	6	6:01	6:57	-	7:51	-	8:31	9:18	10:42	11:55	1:10	2:35	3:55	5:13	5:44	6:48	8:08	9:30	10:35	11:40		7:43	9:58	12:03	2:41	5:06	7:36	11:11										
2	Waltham	6	6:05	7:01	-	7:55	8:13	8:35	9:22	10:46	11:59	1:13	2:41	3:59	5:17	5:48	6:52	8:12	9:34	10:39	11:44		7:46	10:01	12:06	2:46	5:11	7:41	11:16										
1	Waverley	6	6:10	7:06	-	8:00	-	8:40	9:27	10:51	12:04	-	-	-	5:22	5:53	-	-	9:39	-	-		7:48	10:03	12:08	2:51	5:16	7:46	11:21										
1	Belmont	6	6:13	7:09	-	8:03	-	8:43	9:30	10:53	12:06	1:20	2:47	4:07	5:24	5:55	6:58	8:18	9:41	10:45	11:50		7:51	10:06	12:11	2:56	5:21	7:51	11:26										
1A	Porter Square	6	6:18	7:14	7:31	8:08	8:22	8:48	9:35	10:58	12:11	1:25	2:52	4:12	5:29	6:00	7:03	8:23	9:46	10:50	11:55		8:01	10:16	12:21	2:57	5:22	7:52	11:27										
1A	North Station	6	6:29	7:25	7:42	8:19	8:33	8:59	9:46	11:08	12:21	1:35	3:02	4:22	5:40	6:10	7:13	8:33	9:56	11:00	12:05																		

Trains in purple box indicate peak period trains.

Monday to Friday

Outbound from Boston

ZONE	STATION	TRAIN #	AM										PM										Saturday & Sunday														
			401	491	403	405	407	409	411	413	415	493	417	419	421	423	425	427	429	431	433		1401	1403	1405	1407	1409	1411	1413								
																							1401	1403	1405	1407	1409	1411	1413								
1A	North Station	6	6:35	6:45	7:43	8:45	10:00	11:15	12:45	1:55	3:30	3:59	4:30	5:05	5:35	5:55	6:25	7:15	8:45	10:40	12:10		8:35	10:45	1:10	3:30	5:45	7:55	11:30								
1A	Porter Square	6	6:45	6:55	7:53	8:55	10:10	11:25	12:55	2:05	3:40	4:09	4:41	5:15	5:46	6:05	6:35	7:25	8:55	10:50	12:20		8:45	10:55	1:20	3:40	5:55	8:05	11:40								
1	Belmont	-	-	7:00	7:58	9:00	10:15	11:30	1:00	2:10	3:45	4:14	-	5:20	-	6:10	6:40	7:30	9:00	10:55	12:25		8:49	10:59	1:24	3:44	5:59	8:09	11:44								
1	Waverley	1	-	7:02	8:00	9:02	10:17	-	-	2:12	3:48	4:17	-	5:23	-	6:13	6:43	7:32	9:02	10:57	12:27		8:52	11:02	1:27	3:47	6:02	8:12	11:47								
2	Waltham	6	-	7:07	8:05	9:07	10:22	11:36	1:06	2:17	3:53	4:22	-	5:28	5:56	6:18	6:48	7:37	9:07	11:02	12:32		8:57	11:07	1:32	3:52	6:07	8:17	11:52								
2	Brandeis/Roberts	6	-	7:10	8:09	9:10	10:25	11:39	1:09	2:20	3:57	4:26	-	5:32	-	6:22	6:52	7:40	9:10	11:05	12:35		9:00	11:10	1:35	3:55	6:10	8:20	11:55								
3	Kendal Green	-	-	7:14	8:13	9:14	10:29	11:43	1:13	2:24	4:01	4:30	-	5:36	-	6:26	6:56	7:44	9:14	11:09	12:39		9:04	11:14	1:39	3:59	6:14	8:24	11:59								
3	Hastings	-	-	-	-	-	-	-	-	-	-	4:33	-	5:39	-	6:29	6:59	7:47	-	-	-		9:08	11:18	1:43	4:04	6:19	8:29	12:04								
3	Silver Hill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6:31	7:01	7:49	-	-	-		9:09	11:19	1:44	4:10	6:25	8:35	12:10								
4	Lincoln	-	-	7:19	8:18	9:19	10:34	11:48	1:18	2:29	4:07	4:38	-	5:45	6:06	6:36	7:06	7:53	9:19	11:14	12:44		9:15	11:25	1:50	4:10	6:25	8:35	12:10								
5	Concord	-	-	7:24	8:23	9:24	10:39	11:53	1:23	2:34	4:12	4:43	-	5:50	6:11	6:41	7:11	7:58	9:24	11:19	12:49		9:18	11:28	1:53	4:13	6:28	8:38	12:13								
5	West Concord	6	-	7:28	8:28	9:28	10:43	11:57	1:27	2:38	4:17	4:48	-	5:55	6:16	6:46	7:16	8:02	9:28	11:23	12:53		9:24	11:34	1:59	4:19	6:34	8:44	12:19								
6	South Acton	6	7:09	7:33	8:33	9:33	10:48	12:02	1:32	2:43	4:21	4:52	5:08	6:00	6:21	6:50	7:20	8:07	9:33	11:28	12:58		9:31	11:41	2:06	4:26	6:41	8:51	12:26								
7	Littleton/Rte 495	6	7:16	7:40	8:41	9:40	10:55	12:09	1:39	2:50	4:28	5:00	5:15	6:07	6:28	6:57	7:27	8:14	9:40	11:35	1:05		9:38	11:48	2:13	4:33	6:48	8:58	12:33								
8	Ayer	-	7:24	-	8:49	9:48	11:03	12:17	1:47	2:58	4:36	-	5:23	6:15	6:36	7:05	7:35	8:22	9:48	11:43	1:13		9:43	11:53	2:18	4:38	6:53	9:03	12:38								
8	Shirley	-	7:29	-	8:54	9:53	11:08	12:23	1:53	3:03	4:42	-	5:28	6:21	6:42	7:11	7:41	8:27	9:53	11:48	1:18		9:51	12:01	2:26	4:46	7:01	9:11	12:46								
8	North Leominster	6	7:38	-	9:04	10:02	11:17	12:32	2:02	3:12	4:51	-	5:37	6:30	6:51	7:20	7:50	8:36	10:02	11:57	1:27		10:01	12:11	2:36	4:58	7:11	9:21	12:56								
8	Fitchburg	6	7:48	-	9:11	10:09	11:24	12:41	1:09	2:09	3:21	4:58	-	5:44	6:37	7:00	7:27																				

Attachment B

Turning Movement Counts (TMCs)

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Class:

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

Page

PDI File #: 197131 A

Location: N: Tahattawan Road S: Driveway NE: Driveway

Location: E: Harwood Avenue W: Harwood Avenue

City, State: Littleton, MA

Client: TEC/L. Oltman

Site Code: TBA

Count Date: Tuesday, August 20, 2019

Start Time: 7:00 AM

End Time: 9:00 AM

Class:

Cars

	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue									
	from North										from Northeast										from East										from South										from West									
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Right	Bear Right	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total																				
7:00 AM	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	11	0	0	0	11	18																		
7:15 AM	0	0	5	0	0	5	0	0	0	0	0	0	0	3	9	0	0	12	0	0	0	0	0	0	0	0	15	0	0	0	15	32																		
7:30 AM	0	0	4	0	0	4	0	0	0	0	0	16	0	3	13	0	0	16	0	0	0	0	0	0	0	0	14	0	0	0	14	34																		
7:45 AM	1	0	5	0	0	6	0	0	0	0	0	0	0	5	9	0	0	14	0	0	0	0	0	0	0	0	15	0	0	0	15	35																		
Total	1	0	17	0	0	18	0	0	0	0	0	0	0	11	35	0	0	46	0	0	0	0	0	0	0	0	55	0	0	0	55	119																		
8:00 AM	0	0	5	0	0	5	0	0	0	0	0	0	0	3	8	0	0	11	0	0	0	0	0	0	0	0	14	0	0	0	14	30																		
8:15 AM	0	0	5	0	0	5	0	0	0	0	0	0	0	5	8	1	0	14	0	0	0	0	0	0	0	0	18	0	1	0	19	38																		
8:30 AM	0	0	4	0	0	4	0	0	0	0	0	17	0	10	7	0	0	17	0	0	0	0	0	0	0	0	18	0	0	0	18	39																		
8:45 AM	0	1	7	0	0	8	0	0	0	0	0	9	0	3	6	0	0	9	0	0	0	1	0	1	0	8	0	1	0	9	27																			
Total	0	1	21	0	0	22	0	0	0	0	0	0	0	21	29	1	0	51	0	0	0	1	0	1	0	58	0	2	0	60	134																			
Grand Total	1	1	38	0	0	40	0	0	0	0	0	0	0	32	64	1	0	97	0	0	0	1	0	1	0	113	0	2	0	115	253																			
Approach %	2.5	2.5	95.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	33.0	66.0	1.0	0.0		0.0	0.0	0.0	100.0	0.0	0.0	0.0	98.3	0.0	1.7	0.0		0.0																			
Total %	0.4	0.4	15.0	0.0	0.0	15.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.6	25.3	0.4	0.0	38.3	0.0	0.0	0.0	0.4	0.0	0.4	0.0	44.7	0.0	0.8	0.0	45.5																				
Exiting Leg Total	34										151										2										66										253									

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue									
	from North										from Northeast										from East										from South										from West									
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total																			
7:45 AM	1	0	5	0	0	6	0	0	0	0	0	0	0	0	5	9	0	0	14	0	0	0	0	0	0	0	0	15	0	0	0	15	35																	
8:00 AM	0	0	5	0	0	5	0	0	0	0	0	0	0	0	3	8	0	0	11	0	0	0	0	0	0	0	0	14	0	0	0	14	30																	
8:15 AM	0	0	5	0	0	5	0	0	0	0	0	0	0	0	5	8	1	0	14	0	0	0	0	0	0	0	0	18	0	1	0	19	38																	
8:30 AM	0	0	4	0	0	4	0	0	0	0	0	0	0	0	10	7	0	0	17	0	0	0	0	0	0	0	0	18	0	0	0	18	39																	
Total Volume	1	0	19	0	0	20	0	0	0	0	0	0	0	0	23	32	1	0	56	0	0	0	0	0	0	0	0	65	0	1	0	66	142																	
% Approach Total	5.0	0.0	95.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	41.1	57.1	1.8	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	98.5	0.0	1.5	0.0		0.910																		
PHF	0.250	0.000	0.950	0.000	0.000	0.833	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.575	0.889	0.250	0.000	0.824	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.903	0.000	0.250	0.000	0.868																			
Entering Leg	1	0	19	0	0	20	0	0	0	0	0	0	0	0	23	32	1	0	56	0	0	0	0	0	0	0	0	65	0	1	0	66	142																	
Exiting Leg						24													84													33	142																	
Total	44										140										99										284																			

Location: N: Tahattawan Road S: Driveway NE: Driveway
Location: E: Harwood Avenue W: Harwood Avenue
City, State: Littleton, MA
Client: TEC/L. Oltman

Count Date: Tuesday, August 20, 2019

Class:

Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)

Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue									
from North										from Northeast										from East										from South										from West									
Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total																				
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																				
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																				
0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0																				
1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3																				
Total																																																	
8:00 AM																																																	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																				
8:15 AM																																																	
0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1																				
8:30 AM																																																	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1																				
8:45 AM																																																	
0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																				
Total																																																	
Grand Total																																																	
1	0	3	0	0	4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5																				
Approach %																																																	
25.0	0.0	75.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0																					
Total %																																																	
10.0	0.0	30.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	50.0																				
Exiting Leg Total																																																	
0																																																	
Buses																																																	
0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1																				
% Buses																																																	
0.0	0.0	33.3	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0																				
Exiting Leg Total																																																	
0																																																	
Single-Unit Trucks																																																	
1	0	1	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	7																			
% Single-Unit																																																	
100.0	0.0	33.3	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80.0	0.0	0.0	0.0	80.0	70.0																			
Exiting Leg Total																																																	
0																																																	
Articulated Trucks																																																	
0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2																			
% Articulated																																																	
0.0	0.0	33.3	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	20.0	20.0																			
Exiting Leg Total																																																	
0																																																	

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

	Tahattawan Road				Driveway				Harwood Avenue				Driveway				Harwood Avenue					
	from North				from Northeast				from East				from South				from West					
	Right	Thru	Left	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total
7:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7:30 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Total Volume	1	0	2	0	0	3	0	0	0	0	0	0	1	0	0	0	0	4	0	0	0	4
% Approach Total	33.3	0.0	66.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
PHF	0.250	0.000	0.500	0.000	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.333	0.000	0.000	0.000	0.000	0.333
Buses	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses %	0.0	0.0	50.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Single-Unit Trucks	1	0	1	0	0	2	0	0	0	0	0	1	0	0	0	0	3	0	0	0	0	3
Single-Unit %	100.0	0.0	50.0	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	75.0	0.0	0.0	0.0	75.0	75.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	25.0	
Buses	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Single-Unit Trucks	1	0	1	0	0	2	0	0	0	0	0	1	0	0	1	0	3	0	0	0	0	3
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	

Location:	N: Tahattawan Road S: Driveway NE: Driveway
Location:	E: Harwood Avenue W: Harwood Avenue
City, State:	Littleton, MA
Client:	TEC/L. Oltman
Site Code:	TBA
Count Date:	Tuesday, August 20, 2019
Start Time:	7:00 AM
End Time:	9:00 AM



Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)

[illegible]

PDI File #: 197131 A

Location: N: Tahattawan Road S: Driveway NE: Driveway

Location: E: Harwood Avenue W: Harwood Avenue

City, State: Littleton, MA

Client: TEC/L. Oltman

Site Code: TBA

Count Date: Tuesday, August 20, 2019

Start Time: 7:00 AM

End Time: 9:00 AM

Class:



PRECISION
DATA
INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue									
	from North					from Northeast					from East					from South					from West																													
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total													
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0													
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0													
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0													
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0													
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0													
8:15 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0													
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0													
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0													
Total	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1													
Grand Total	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1													
Approach %	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0														
Exiting Leg Total						0						1						0						0						0						0						0								

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue													
	from North					from Northeast					from East					from South					from West																																	
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total																	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
8:15 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
Total Volume	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1																
% Approach Total	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.250																
PHF	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250																	
Entering Leg	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1																	
Exiting Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1																	
Total						1						0						1						0						0						0						0						0						2

PDI File #: 197131 A

Location: N: Tahattawan Road S: Driveway NE: Driveway

Location: E: Harwood Avenue W: Harwood Avenue

City, State: Littleton, MA

Client: TEC/L. Oltman

Site Code: TBA

Count Date: Tuesday, August 20, 2019

Start Time: 7:00 AM

End Time: 9:00 AM

Class:



PRECISION
DATA
INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Single-Unit Trucks

	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue									
	from North					from Northeast					from East					from South					from West																													
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total																			
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
7:30 AM	0	0	1	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2																	
7:45 AM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	3																	
Total	1	0	1	0	0	2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	5																		
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1																		
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1																		
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	2	0	0	0	2	2																		
Grand Total	1	0	1	0	0	2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	7																		
Approach %	50.0	0.0	50.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0																		
Total %	14.3	0.0	14.3	0.0	0.0	28.6	0.0	0.0	0.0	0.0	0.0	14.3	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57.1	0.0	0.0	0.0	0.0	57.1																		
Exiting Leg Total						0						0						5						0						0						2														

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:30 AM	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue									
	from North					from Northeast					from East					from South					from West																													
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total														
7:30 AM	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2														
7:45 AM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3														
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0														
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1														
Total Volume	1	0	1	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	0	0	3	6														
% Approach Total	50.0	0.0	50.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.500														
PHF	0.250	0.000	0.250	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.500															
Entering Leg	1	0	1	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	0	0	3	6														
Exiting Leg						0						4						0						0						0						2														
Total						2						5						0						0						5						6														

PDI File #: 197131 A

Location: N: Tahattawan Road S: Driveway NE: Driveway

Location: E: Harwood Avenue W: Harwood Avenue

City, State: Littleton, MA

Client: TEC/L. Oltman

Site Code: TBA

Count Date: Tuesday, August 20, 2019

Start Time: 7:00 AM

End Time: 9:00 AM

Class:



PRECISION
DATA
INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Tahattawan Road						Driveway						Harwood Avenue						Driveway						Harwood Avenue									
	from North						from Northeast						from East						from South						from West									
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total			
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1			
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1			
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:45 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1			
Total	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1			
Grand Total	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2			
Approach %	0.0	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0				
Total %	0.0	0.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0				
Exiting Leg Total							0							2							0							0						

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:00 AM	Tahattawan Road						Driveway						Harwood Avenue						Driveway						Harwood Avenue					
	from North						from Northeast						from East						from South						from West					
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Thru	Left	U-Turn	Total	Hard Right	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250	
Entering Leg	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	
Exiting Leg						0						1												0				0	1	
Total						0						1												1				1	2	



**PRECISION
DATA
INDUSTRIES, LLC**

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datareq@pdillc.com

Pedestrians

8:00 AM	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue									
	from North										from Northeast										from East										from South										from West									
	Right	Thru	Left	Hard Left	U-Turn	CW-EB	CW-WB	Total	Hard Right	Thru Right	Left	U-Turn	CW-SB	CW-NB	Total	Hard Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Hard Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total																					
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																					
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																					
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2																					
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0																					
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	1	2	0	0	0	0	0	0	4																					
%Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																					
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.500																					
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	1	2	0	0	0	0	0	0	4																					
Exiting Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4																					
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	4	4	0	0	0	0	0	0	8																					

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:



PRECISION
DATA
INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

PDI File #: 197131 AA

Location: N: Tahattawan Road S: Driveway NE: Driveway

Location: E: Harwood Avenue W: Harwood Avenue

City, State: Littleton, MA

Client: TEC/L. Oltman

Site Code: TBA

Count Date: Tuesday, August 20, 2019

Start Time: 4:00 PM

End Time: 6:00 PM

Class:

Cars and Heavy Vehicles (Combined)

	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue									
	from North										from Northeast										from East										from South										from West									
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total																				
4:00 PM	0	0	4	0	0	4	0	0	0	0	0	0	0	8	16	0	0	24	0	0	0	0	0	0	0	0	12	0	0	0	12	40																		
4:15 PM	0	0	4	0	0	4	0	0	0	0	0	0	0	2	25	0	0	27	0	0	0	0	0	0	0	0	16	0	0	0	16	47																		
4:30 PM	1	1	7	0	0	9	0	0	0	0	0	0	0	7	19	0	0	26	0	0	0	0	0	0	0	10	0	0	0	10	45																			
4:45 PM	1	1	1	0	0	3	0	0	0	0	0	0	0	12	24	0	0	36	0	0	0	0	1	0	1	0	12	0	0	0	12	52																		
Total	2	2	16	0	0	20	0	0	0	0	0	0	0	29	84	0	0	113	0	0	0	0	1	0	1	0	50	0	0	0	50	184																		
5:00 PM	0	0	10	0	0	10	0	0	0	0	0	0	0	9	22	0	0	31	0	0	0	0	0	0	0	0	11	0	1	0	12	53																		
5:15 PM	0	0	4	0	0	4	0	0	0	0	0	0	0	10	25	0	0	35	0	0	0	0	0	0	0	20	0	1	0	21	60																			
5:30 PM	1	0	4	0	0	5	0	0	0	0	0	0	0	8	25	0	0	33	0	0	0	0	0	0	0	7	0	0	0	7	45																			
5:45 PM	1	0	8	0	0	9	0	0	0	0	0	0	0	4	20	0	0	24	0	0	0	0	0	0	0	3	0	0	0	3	36																			
Total	2	0	26	0	0	28	0	0	0	0	0	0	0	31	92	0	0	123	0	0	0	0	0	0	0	41	0	2	0	43	194																			
Grand Total	4	2	42	0	0	48	0	0	0	0	0	0	0	60	176	0	0	236	0	0	0	1	0	1	0	91	0	2	0	93	378																			
Approach %	8.3	4.2	87.5	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	25.4	74.6	0.0	0.0		0.0	0.0	0.0	100.0	0.0		0.0	97.8	0.0	2.2	0.0																					
Total %	1.1	0.5	11.1	0.0	0.0	12.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.9	46.6	0.0	0.0	62.4	0.0	0.0	0.0	0.3	0.0	0.3	0.0	24.1	0.0	0.5	0.0	24.6																				
Exiting Leg Total							62							0							133							2							181							378								
Cars	4	2	42	0	0	48	0	0	0	0	0	0	0	60	172	0	0	232	0	0	0	1	0	1	0	88	0	2	0	90	371																			
% Cars	100.0	100.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	97.7	0.0	0.0	98.3	0.0	0.0	0.0	100.0	0.0	0.0	0.0	96.7	0.0	100.0	0.0	96.8	98.1																			
Exiting Leg Total							62							0							130							2							177							371								
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	3	0	0	0	3	7																			
% Heavy Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	3.2	1.9																			
Exiting Leg Total							0							3							3							0							4							7								

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue									
	from North										from Northeast										from East										from South										from West									
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total																			
4:30 PM	1	1	7	0	0	9	0	0	0	0	0	26	0	0	0	7	19	0	0	26	0	0	0	0	0	0	0	10	0	0	0	10	45																	
4:45 PM	1	1	1	0	0	3	0	0	0	0	0	36	0	0	0	12	24	0	0	36	0	0	0	1	0	1	0	12	0	0	0	12	52																	
5:00 PM	0	0	10	0	0	10	0	0	0	0	0	31	0	0	0	0	22	0	0	31	0	0	0	0	0	0	11	0	1	0	12	53																		
5:15 PM	0	0	4	0	0	4	0	0	0	0	0	35	0	0	0	10	25	0	0	35	0	0	0	0	0	0	20	0	1	0	21	60																		
Total Volume	2	2	22	0	0	26	0	0	0	0	0	128	0	0	0	38	90	0	0	128	0	0	0	1	0	1	0	53	0	2	0	55	210																	
% Approach Total	7.7	7.7	84.6	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	29.7	70.3	0.0	0.0		0.0	0.0	0.0	100.0	0.0		0.0	96.4	0.0	3.6	0.0		0.875																		
PHF	0.500	0.500	0.550	0.000	0.000	0.650	0.000	0.000	0.000	0.000	0.000	0.889	0.000	0.000	0.000	0.792	0.900	0.000	0.000	0.889	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.663	0.000	0.500	0.000	0.655																		
Cars	2	2	22	0	0	26	0	0	0	0	0	126	0	0	0	38	88	0	0	126	0	0	0	1	0	1	0	52	0	2	0	54	207																	
Cars %	100.0	100.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	98.4	0.0	0.0	0.0	100.0	97.8	0.0	0.0	98.4	0.0	0.0	0.0	100.0	0.0	0.0	98.1	0.0	100.0	0.0	0.0	98.2	98.6																	
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	0	1	3																		
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	2.2	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	1.8	1.4																		
Cars Enter Leg	2	2	22	0	0	26	0	0	0	0	0	126	0	0	0	38	88	0	0	126	0	0	0	1	0	1	0	52	0	2	0	54	207																	
Heavy Enter Leg	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	0	1	3																		
Total Entering Leg	2	2	22	0	0	26	0	0	0	0	0	128	0	0	0	38	90	0	0	128	0	0	0	1	0	1	0	53	0	2	0	55	210																	
Cars Exiting Leg							40							74							2							91																						
Heavy Exiting Leg							0							1							0							2																						
Total Exiting Leg							40							75							2							93																						



PRECISION
DATA
INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

PDI File #: 197131 AA

Location: N: Tahattawan Road S: Driveway NE: Driveway

Location: E: Harwood Avenue W: Harwood Avenue

City, State: Littleton, MA

Client: TEC/L. Oltman

Site Code: TBA

Count Date: Tuesday, August 20, 2019

Start Time: 4:00 PM

End Time: 6:00 PM

Class:

Cars

	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue										
	from North										from Northeast										from East										from South										from West										
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total																				
4:00 PM	0	0	4	0	0	4	0	0	0	0	0	0	0	0	8	16	0	0	24	0	0	0	0	0	0	0	0	11	0	0	0	11	39																		
4:15 PM	0	0	4	0	0	4	0	0	0	0	0	0	0	0	2	24	0	0	26	0	0	0	0	0	0	0	0	15	0	0	0	15	45																		
4:30 PM	1	1	7	0	0	9	0	0	0	0	0	0	0	0	7	19	0	0	26	0	0	0	7	0	0	0	0	10	0	0	0	10	45																		
4:45 PM	1	1	1	0	0	3	0	0	0	0	0	0	0	0	12	24	0	0	36	0	0	0	0	0	1	0	1	0	12	0	0	12	52																		
Total	2	2	16	0	0	20	0	0	0	0	0	0	0	0	29	83	0	0	112	0	0	0	0	1	0	1	0	48	0	0	0	48	181																		
5:00 PM	0	0	10	0	0	10	0	0	0	0	0	0	0	0	9	21	0	0	30	0	0	0	0	0	0	0	0	11	0	1	0	12	52																		
5:15 PM	0	0	4	0	0	4	0	0	0	0	0	0	0	0	10	24	0	0	34	0	0	0	0	0	0	0	0	19	0	1	0	20	58																		
5:30 PM	1	0	4	0	0	5	0	0	0	0	0	0	0	0	8	25	0	0	33	0	0	0	0	0	0	0	0	7	0	0	0	7	45																		
5:45 PM	1	0	8	0	0	9	0	0	0	0	0	0	0	0	4	19	0	0	23	0	0	0	0	0	0	0	0	3	0	0	0	3	35																		
Total	2	0	26	0	0	28	0	0	0	0	0	0	0	0	31	89	0	0	120	0	0	0	0	0	0	0	0	40	0	2	0	42	190																		
Grand Total	4	2	42	0	0	48	0	0	0	0	0	0	0	0	60	172	0	0	232	0	0	0	1	0	1	0	1	0	88	0	2	0	90	371																	
Approach %	8.3	4.2	87.5	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	25.9	74.1	0.0	0.0			0.0	0.0	0.0	100.0	0.0		0.0	97.8	0.0	2.2	0.0		0.0	23.7	0.0	0.5	0.0	24.3														
Total %	1.1	0.5	11.3	0.0	0.0	12.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.2	46.4	0.0	0.0	62.5	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.3	0.0	23.7	0.0	0.5	0.0	0.0	24.3																		
Exiting Leg Total	62										0										130										2										177										371

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:30 PM	Tahattawan Road						Driveway						Harwood Avenue						Driveway						Harwood Avenue								
	from North						from Northeast						from East						from South						from West								
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total		
4:30 PM	1	1	7	0	0	9	0	0	0	0	0	0	0	0	7	19	0	0	26	0	0	0	0	0	0	0	0	10	0	0	0	10	
4:45 PM	1	1	1	0	0	3	0	0	0	0	0	0	0	0	12	24	0	0	36	0	0	0	1	0	1	0	0	12	0	0	0	12	
5:00 PM	0	0	10	0	0	10	0	0	0	0	0	0	0	0	9	21	0	0	30	0	0	0	0	0	0	0	0	11	0	1	0	12	
5:15 PM	0	0	4	0	0	4	0	0	0	0	0	0	0	0	10	24	0	0	34	0	0	0	0	0	0	0	0	19	0	1	0	20	
Total Volume	2	2	22	0	0	26	0	0	0	0	0	0	0	0	38	88	0	0	126	0	0	0	1	0	1	0	1	52	0	2	0	54	
% Approach Total	7.7	7.7	84.6	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	30.2	69.8	0.0	0.0			0.0	0.0	0.0	100.0	0.0		0.0	96.3	0.0	3.7	0.0			
PHF	0.500	0.500	0.550	0.000	0.000	0.650	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.792	0.917	0.000	0.000	0.875	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.684	0.000	0.500	0.000	0.675	0.892
Entering Leg	2	2	22	0	0	26	0	0	0	0	0	0	0	0	38	88	0	0	126	0	0	0	1	0	1	0	1	52	0	2	0	54	207
Exiting Leg	40						74						2						91						207								
Total	66						200						3						145						414								



PRECISION
DATA
INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

PDI File #: 197131 AA

Location: N: Tahattawan Road S: Driveway NE: Driveway

Location: E: Harwood Avenue W: Harwood Avenue

City, State: Littleton, MA

Client: TEC/L. Oltman

Site Code: TBA

Count Date: Tuesday, August 20, 2019

Start Time: 4:00 PM

End Time: 6:00 PM

Class:

Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)

	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue									
	from North					from Northeast					from East					from South					from West																													
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total																						
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1																						
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1																						
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
4:45 PM	0	0	0	0	0	0	0	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	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3																						
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1																						
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1																						
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1																						
Total	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4																						
Grand Total	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3																						
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0	0.0	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	0.0	57.1	0.0	0.0	57.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.9																						
Exiting Leg Total	0					0						3	0						0						4																									
Buses	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																						
Exiting Leg Total	0					0						0						0						0																										
Single-Unit Trucks	0	0	0	0	0		0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	3																						
% Single-Unit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0																						
Exiting Leg Total	0					0						3	0						0						4																									
Articulated Trucks	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																						
Exiting Leg Total	0					0						0						0						0	0																									

Location:	N: Tahattawan Road S: Driveway NE: Driveway
Location:	E: Harwood Avenue W: Harwood Avenue
City, State:	Littleton, MA
Client:	TEC/L. Oltman
Site Code:	TBA
Count Date:	Tuesday, August 20, 2019
Start Time:	4:00 PM
End Time:	6:00 PM



Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)

	Tahattawan Road					Driveway					Harwood Avenue					Driveway					Harwood Avenue				
	from North					from Northeast					from East					from South					from West				
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total	
Buses	0					0	0					0	0					0						0	
Single-Unit Trucks	0					0	0					1						0						3	
Articulated Trucks	0					0	0					0						0						0	
Total Exiting Leg	0					0	0					1						0						3	

PDI File #: 197131 AA

Location: N: Tahattawan Road S: Driveway NE: Driveway

Location: E: Harwood Avenue W: Harwood Avenue

City, State: Littleton, MA

Client: TEC/L. Oltman

Site Code: TBA

Count Date: Tuesday, August 20, 2019

Start Time: 4:00 PM

End Time: 6:00 PM

Class:



PRECISION
DATA
INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Buses

	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue									
	from North										from Northeast										from East										from South										from West									
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total																			
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0																		
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0																		
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
Exiting Leg Total						0						0						0						0						0																				

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Tahattawan Road										Harwood Avenue										Driveway										Harwood Avenue																
	from North					from Northeast					from East					from South					from West																										
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total										
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0									
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0									
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0									
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0									
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0									
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0									
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000										
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
Exiting Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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					

Single-Unit Trucks

Class

[illegible]

PDI File #: 197131 AA

Location: N: Tahattawan Road S: Driveway NE: Driveway

Location: E: Harwood Avenue W: Harwood Avenue

City, State: Littleton, MA

Client: TEC/L. Oltman

Site Code: TBA

Count Date: Tuesday, August 20, 2019

Start Time: 4:00 PM

End Time: 6:00 PM

Class:



PRECISION
DATA
INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Articulated Trucks

	Tahattawan Road						Driveway						Harwood Avenue						Driveway						Harwood Avenue					
	from North						from Northeast						from East						from South						from West					
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Thru	Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:45 PM	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total	0						0						0						0						0					

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue									
	from North										from Northeast										from East										from South										from West									
	Right	Thru	Left	Hard Left	U-Turn	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Total	Hard Right	Right	Thru	Left	U-Turn	Total	Right	Bear Right	Thru	Left	U-Turn	Total	Right	Thru	Bear Left	Left	U-Turn	Total																				
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																				
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																				
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																				
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																				
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																				
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																				
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000																				
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																				
Exiting Leg	0	0	0	0	0	0	0	0	0	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																			

PDI File #: 197131 AA
Location: N: Tahattawan Road S: Driveway NE: Driveway
Location: E: Harwood Avenue W: Harwood Avenue
City, State: Littleton, MA
Client: TEC/L. Oltman
Site Code: TBA
Count Date: Tuesday, August 20, 2019
Start Time: 4:00 PM
End Time: 6:00 PM
Class:



Pedestrians

	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue									
	from North										from Northeast										from East										from South										from West									
	Right	Thru	Left	Hard Left	U-Turn	CW-EB	CW-WB	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	CW-SB	CW-WB	CW-NB	Total	Hard Right	Bear Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-NB	CW-SB	Total																	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0																
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0																
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																
Approach %	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0																
Exiting Leg Total	0										2										0										0																			

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Tahattawan Road										Driveway										Harwood Avenue										Driveway										Harwood Avenue									
	from North										from Northeast										from East										from South										from West									
	Right	Thru	Left	Hard Left	U-Turn	CW-EB	CW-WB	Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	CW-EB	CW-WB	Total	Hard Right	Bear Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-NE	CW-SB	Total	Right	Thru	Bear Left	Left	U-Turn	CW-NE	CW-SB	Total										
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0										2										0										0										0									

Attachment C

Automatic Traffic Recorder (ATRs) Counts

Harwood Avenue (at #275)
west of Tahattawan Road
City, State: Littleton, MA
Client: TEC/ L.Oltman



197131 A Volume
Site Code: TBA
Date Start: 08/20/19
Date End: 08/21/19

Start	WB				EB				Combin ed		08/20/19			
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue	
12:00	0		8		0		8		0		16			
12:15	1		9		0		10		1		19			
12:30	0		14		1		10		1		24			
12:45	0	1	13	44	0	1	12	40	0	2	25	84		
01:00	0		15		0		7		0		22			
01:15	0		6		0		6		0		12			
01:30	1		6		0		7		1		13			
01:45	0	1	7	34	0	0	8	28	0	1	15	62		
02:00	0		13		0		2		0		15			
02:15	0		10		0		8		0		18			
02:30	0		11		0		7		0		18			
02:45	0	0	18	52	1	1	10	27	1	1	28	79		
03:00	0		15		0		9		0		24			
03:15	0		23		1		10		1		33			
03:30	2		22		0		11		2		33			
03:45	0	2	16	76	0	1	7	37	0	3	23	113		
04:00	1		17		0		13		1		30			
04:15	1		24		1		15		2		39			
04:30	1		21		0		11		1		32			
04:45	0	3	26	88	0	1	11	50	0	4	37	138		
05:00	3		22		0		12		3		34			
05:15	4		27		5		21		9		48			
05:30	2		25		8		8		10		33			
05:45	1	10	21	95	9	22	3	44	10	32	24	139		
06:00	4		23		5		11		9		34			
06:15	4		21		6		20		10		41			
06:30	12		10		13		20		25		30			
06:45	14	34	17	71	9	33	8	59	23	67	25	130		
07:00	5		10		11		8		16		18			
07:15	11		10		15		10		26		20			
07:30	14		10		14		3		28		13			
07:45	12	42	10	40	17	57	5	26	29	99	15	66		
08:00	8		12		13		3		21		15			
08:15	9		7		20		5		29		12			
08:30	7		7		20		4		27		11			
08:45	8	32	2	28	11	64	5	17	19	96	7	45		
09:00	12		3		14		2		26		5			
09:15	10		3		10		4		20		7			
09:30	9		5		10		0		19		5			
09:45	17	48	4	15	14	48	4	10	31	96	8	25		
10:00	7		1		17		1		24		2			
10:15	8		1		6		2		14		3			
10:30	10		2		7		2		17		4			
10:45	7	32	4	8	11	41	1	6	18	73	5	14		
11:00	3		1		6		0		9		1			
11:15	15		0		8		0		23		0			
11:30	9		1		15		0		24		1			
11:45	6	33	0	2	10	39	0	0	16	72	0	2		
Total	238		553		308		344		546		897			
Percent	43.6%		61.6%		56.4%		38.4%							
Day Total			791				652				1443			
Peak	09:00	-	04:45	-	07:45	-	06:00	-	07:30	-	04:45	-	-	
Vol.	48	-	100	-	70	-	59	-	107	-	152	-	-	
P.H.F.	0.706		0.926		0.875		0.702		0.922		0.792			

Harwood Avenue (at #275)
west of Tahattawan Road
City, State: Littleton, MA
Client: TEC/ L.Oltman



197131 A Volume
Site Code: TBA
Date Start: 08/20/19
Date End: 08/21/19

Start	WB				EB				Combin ed		08/21/19			
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed	
12:00	1		14		3		4		4		18			
12:15	1		11		0		10		1		21			
12:30	0		15		1		12		1		27			
12:45	1	3	13	53	0	4	8	34	1	7	21	87		
01:00	0		14		0		10		0		24			
01:15	0		11		1		7		1		18			
01:30	0		14		1		7		1		21			
01:45	0	0	9	48	0	2	12	36	0	2	21	84		
02:00	0		12		0		10		0		22			
02:15	0		7		0		9		0		16			
02:30	0		12		0		8		0		20			
02:45	0	0	13	44	0	0	9	36	0	0	22	80		
03:00	0		11		0		9		0		20			
03:15	1		13		1		7		2		20			
03:30	1		13		1		9		2		22			
03:45	0	2	23	60	0	2	12	37	0	4	35	97		
04:00	1		19		0		9		1		28			
04:15	0		17		1		13		1		30			
04:30	2		12		1		16		3		28			
04:45	0	3	23	71	0	2	5	43	0	5	28	114		
05:00	1		34		1		9		2		43			
05:15	6		25		2		16		8		41			
05:30	2		21		9		7		11		28			
05:45	1	10	26	106	6	18	11	43	7	28	37	149		
06:00	4		25		5		8		9		33			
06:15	7		26		1		11		8		37			
06:30	4		17		13		13		17		30			
06:45	13	28	13	81	12	31	12	44	25	59	25	125		
07:00	4		17		15		9		19		26			
07:15	7		4		12		3		19		7			
07:30	6		11		17		9		23		20			
07:45	13	30	9	41	16	60	4	25	29	90	13	66		
08:00	7		13		22		6		29		19			
08:15	10		4		23		9		33		13			
08:30	12		3		24		4		36		7			
08:45	5	34	2	22	20	89	1	20	25	123	3	42		
09:00	9		3		8		1		17		4			
09:15	5		4		11		7		16		11			
09:30	9		2		13		2		22		4			
09:45	5	28	6	15	9	41	1	11	14	69	7	26		
10:00	6		4		13		4		19		8			
10:15	5		3		12		5		17		8			
10:30	6		2		8		1		14		3			
10:45	5	22	1	10	6	39	1	11	11	61	2	21		
11:00	6		2		10		0		16		2			
11:15	8		3		6		1		14		4			
11:30	10		3		12		1		22		4			
11:45	16	40	1	9	8	36	2	4	24	76	3	13		
Total	200		560		324		344		524		904			
Percent	38.2%		61.9%		61.8%		38.1%							
Day Total			760				668				1428			
Peak	07:45	-	05:00	-	08:00	-	03:45	-	07:45	-	05:00	-	-	
Vol.	42	-	106	-	89	-	50	-	127	-	149	-	-	
P.H.F.	0.808		0.779		0.927		0.781		0.882		0.866			

Harwood Avenue (at #275)
west of Tahattawan Road
City, State: Littleton, MA
Client: TEC/ L.Oltman



PRECISION
D A T A
INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

197131 A Class
Site Code: TBA
Date Start: 20-Aug-19
Date End: 21-Aug-19

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
08/20/19	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	2	0	0	0	1	0	0	0	0	0	0	0	3
05:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
06:00	0	25	5	0	4	0	0	0	0	0	0	0	0	34
07:00	2	28	7	0	3	1	1	0	0	0	0	0	0	42
08:00	1	17	13	0	1	0	0	0	0	0	0	0	0	32
09:00	1	33	7	0	6	1	0	0	0	0	0	0	0	48
10:00	1	21	7	0	3	0	0	0	0	0	0	0	0	32
11:00	0	26	3	0	4	0	0	0	0	0	0	0	0	33
12 PM	1	27	7	1	8	0	0	0	0	0	0	0	0	44
13:00	1	25	2	0	4	2	0	0	0	0	0	0	0	34
14:00	2	35	8	0	7	0	0	0	0	0	0	0	0	52
15:00	2	43	17	0	13	0	0	1	0	0	0	0	0	76
16:00	3	56	23	0	5	0	0	1	0	0	0	0	0	88
17:00	6	63	17	0	8	1	0	0	0	0	0	0	0	95
18:00	5	48	15	0	2	0	0	1	0	0	0	0	0	71
19:00	0	31	7	0	2	0	0	0	0	0	0	0	0	40
20:00	0	20	7	0	1	0	0	0	0	0	0	0	0	28
21:00	0	10	5	0	0	0	0	0	0	0	0	0	0	15
22:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
23:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
Total	25	529	155	1	71	6	1	3	0	0	0	0	0	791
Percent	3.2%	66.9%	19.6%	0.1%	9.0%	0.8%	0.1%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.	07:00	09:00	08:00		09:00	04:00	07:00							09:00
PM Peak Vol.	17:00	17:00	16:00	12:00	15:00	13:00		15:00						17:00
	6	63	23	1	13	2		1						95

Harwood Avenue (at #275)
west of Tahattawan Road
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197131 A Class
Site Code: TBA
Date Start: 20-Aug-19
Date End: 21-Aug-19

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
08/21/19	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
05:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
06:00	2	20	3	0	3	0	0	0	0	0	0	0	0	28
07:00	1	19	6	0	2	2	0	0	0	0	0	0	0	30
08:00	3	19	10	0	2	0	0	0	0	0	0	0	0	34
09:00	0	15	10	0	2	1	0	0	0	0	0	0	0	28
10:00	0	9	5	0	8	0	0	0	0	0	0	0	0	22
11:00	2	23	8	0	6	0	0	1	0	0	0	0	0	40
12 PM	0	33	9	1	8	2	0	0	0	0	0	0	0	53
13:00	0	31	10	1	6	0	0	0	0	0	0	0	0	48
14:00	0	27	12	0	5	0	0	0	0	0	0	0	0	44
15:00	0	25	17	1	15	1	0	1	0	0	0	0	0	60
16:00	0	48	16	0	7	0	0	0	0	0	0	0	0	71
17:00	2	78	20	0	6	0	0	0	0	0	0	0	0	106
18:00	1	65	10	0	5	0	0	0	0	0	0	0	0	81
19:00	0	27	9	0	4	0	0	1	0	0	0	0	0	41
20:00	0	15	5	0	2	0	0	0	0	0	0	0	0	22
21:00	0	10	4	0	1	0	0	0	0	0	0	0	0	15
22:00	0	6	4	0	0	0	0	0	0	0	0	0	0	10
23:00	0	7	2	0	0	0	0	0	0	0	0	0	0	9
Total	11	493	162	3	82	6	0	3	0	0	0	0	0	760
Percent	1.4%	64.9%	21.3%	0.4%	10.8%	0.8%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	08:00		10:00	07:00		11:00						11:00
Vol.	3	23	10		8	2		1						40
PM Peak	17:00	17:00	17:00	12:00	15:00	12:00		15:00						17:00
Vol.	2	78	20	1	15	2		1						106

Harwood Avenue (at #275)
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Date Start: 20-Aug-19
Date End: 21-Aug-19

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
08/20/19														
9	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
05:00	1	11	4	0	6	0	0	0	0	0	0	0	0	22
06:00	0	26	4	0	3	0	0	0	0	0	0	0	0	33
07:00	2	38	12	0	2	1	0	2	0	0	0	0	0	57
08:00	2	46	10	0	6	0	0	0	0	0	0	0	0	64
09:00	0	36	7	1	4	0	0	0	0	0	0	0	0	48
10:00	0	23	12	2	3	0	1	0	0	0	0	0	0	41
11:00	0	30	8	0	1	0	0	0	0	0	0	0	0	39
12 PM	0	27	6	1	6	0	0	0	0	0	0	0	0	40
13:00	0	13	10	0	3	1	0	1	0	0	0	0	0	28
14:00	1	15	9	0	2	0	0	0	0	0	0	0	0	27
15:00	0	25	8	0	4	0	0	0	0	0	0	0	0	37
16:00	2	29	14	0	5	0	0	0	0	0	0	0	0	50
17:00	0	34	7	0	3	0	0	0	0	0	0	0	0	44
18:00	0	55	3	0	1	0	0	0	0	0	0	0	0	59
19:00	0	24	2	0	0	0	0	0	0	0	0	0	0	26
20:00	0	13	2	0	2	0	0	0	0	0	0	0	0	17
21:00	1	8	1	0	0	0	0	0	0	0	0	0	0	10
22:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	9	462	120	4	51	2	1	3	0	0	0	0	0	652
Percent	1.4%	70.9%	18.4%	0.6%	7.8%	0.3%	0.2%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	07:00	10:00	05:00	07:00	10:00	07:00						08:00
Vol.	2	46	12	2	6	1	1	2						64
PM Peak	16:00	18:00	16:00	12:00	12:00	13:00		13:00						18:00
Vol.	2	55	14	1	6	1		1						59

Harwood Avenue (at #275)
west of Tahattawan Road
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Client: TEC/ L.Oltman



PRECISION
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197131 A Class
Site Code: TBA
Date Start: 20-Aug-19
Date End: 21-Aug-19

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
08/21/19	0	3	1	0	0	0	0	0	0	0	0	0	0	4
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
05:00	0	9	7	0	2	0	0	0	0	0	0	0	0	18
06:00	0	18	10	0	3	0	0	0	0	0	0	0	0	31
07:00	0	37	17	0	4	2	0	0	0	0	0	0	0	60
08:00	1	66	14	1	5	2	0	0	0	0	0	0	0	89
09:00	0	32	5	1	1	0	0	2	0	0	0	0	0	41
10:00	1	23	6	1	8	0	0	0	0	0	0	0	0	39
11:00	0	23	10	0	3	0	0	0	0	0	0	0	0	36
12 PM	0	24	6	0	2	0	0	2	0	0	0	0	0	34
13:00	0	26	6	0	3	0	0	1	0	0	0	0	0	36
14:00	1	20	10	1	3	1	0	0	0	0	0	0	0	36
15:00	0	21	13	0	3	0	0	0	0	0	0	0	0	37
16:00	0	29	10	0	4	0	0	0	0	0	0	0	0	43
17:00	0	34	5	0	3	0	0	1	0	0	0	0	0	43
18:00	0	33	9	0	2	0	0	0	0	0	0	0	0	44
19:00	0	20	4	0	1	0	0	0	0	0	0	0	0	25
20:00	0	18	2	0	0	0	0	0	0	0	0	0	0	20
21:00	0	9	1	0	0	0	0	1	0	0	0	0	0	11
22:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
23:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
Total	3	463	139	4	47	5	0	7	0	0	0	0	0	668
Percent	0.4%	69.3%	20.8%	0.6%	7.0%	0.7%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	07:00	08:00	10:00	07:00		09:00						08:00
Vol.	1	66	17	1	8	2		2						89
PM Peak	14:00	17:00	15:00	14:00	16:00	14:00		12:00						18:00
Vol.	1	34	13	1	4	1		2						44

Harwood Avenue (at #275)
west of Tahattawan Road
City, State: Littleton, MA
Client: TEC/ L.Oltman



PRECISION
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INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdilc.com

197131 A Speed
Site Code: TBA
Date Start: 20-Aug-19
Date End: 21-Aug-19

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th Perce	Avera (Mean
08/20/																
19	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
01:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	38	37
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	33	32
04:00	0	0	0	0	1	1	0	1	0	0	0	0	0	3	46	39
05:00	0	0	2	0	4	3	1	0	0	0	0	0	0	10	38	32
06:00	0	1	2	2	6	17	4	2	0	0	0	0	0	34	40	35
07:00	0	3	5	11	15	7	1	0	0	0	0	0	0	42	35	29
08:00	0	2	1	3	14	9	3	0	0	0	0	0	0	32	38	33
09:00	0	1	2	6	17	14	7	1	0	0	0	0	0	48	39	34
10:00	0	1	0	6	12	10	3	0	0	0	0	0	0	32	38	33
11:00	0	0	0	0	8	14	6	4	1	0	0	0	0	33	44	38
12 PM	0	0	0	3	8	21	9	3	0	0	0	0	0	44	41	37
13:00	0	0	2	3	6	18	4	1	0	0	0	0	0	34	38	35
14:00	0	0	1	2	9	29	11	0	0	0	0	0	0	52	40	37
15:00	0	0	1	0	8	42	21	3	1	0	0	0	0	76	42	38
16:00	0	0	2	1	13	44	25	3	0	0	0	0	0	88	41	38
17:00	0	2	2	4	22	34	27	4	0	0	0	0	0	95	42	37
18:00	0	1	2	3	11	26	26	2	0	0	0	0	0	71	42	37
19:00	0	1	0	1	8	23	6	0	1	0	0	0	0	40	39	36
20:00	0	0	2	0	7	10	6	2	0	1	0	0	0	28	43	37
21:00	0	0	0	0	4	6	4	1	0	0	0	0	0	15	42	38
22:00	0	0	0	0	1	1	4	1	1	0	0	0	0	8	47	42
23:00	0	0	0	0	0	1	1	0	0	0	0	0	0	2	42	40
Total	0	12	24	45	177	331	169	28	4	1	0	0	0	791		
%	0.0%	1.5%	3.0%	5.7%	22.4%	41.8%	21.4%	3.5%	0.5%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	09:00	06:00	09:00	11:00	11:00						09:00		
Vol.	3	5	11	17	17	7	4	1						48		
PM Peak	17:00	13:00	17:00	17:00	16:00	17:00	17:00	15:00	20:00					17:00		
Vol.	2	2	4	22	44	27	4	1	1					95		

Stats

15th Percentile :	30 MPH
50th Percentile :	36 MPH
85th Percentile :	41 MPH
95th Percentile :	43 MPH

Mean Speed(Average) :	36 MPH
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	508
Percent in Pace :	64.2%
Number of Vehicles > 35 MPH :	467
Percent of Vehicles > 35 MPH :	59.0%

Harwood Avenue (at #275)
west of Tahattawan Road
City, State: Littleton, MA
Client: TEC/ L.Oltman



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197131 A Speed
Site Code: TBA
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Date End: 21-Aug-19

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th Perce	Avera (Mean)
08/21/																
19	0	0	0	1	0	0	1	1	0	0	0	0	0	3	46	39
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	2	0	0	0	0	0	0	0	0	0	2	28	27
04:00	0	0	0	0	1	0	0	2	0	0	0	0	0	3	47	42
05:00	0	0	0	1	1	4	4	0	0	0	0	0	0	10	42	38
06:00	0	0	2	1	2	11	10	0	2	0	0	0	0	28	42	38
07:00	0	0	2	0	8	12	4	4	0	0	0	0	0	30	43	37
08:00	0	2	1	1	6	16	8	0	0	0	0	0	0	34	40	35
09:00	0	0	0	2	11	8	4	3	0	0	0	0	0	28	42	36
10:00	0	0	0	1	9	6	4	2	0	0	0	0	0	22	42	36
11:00	0	0	0	1	5	19	13	2	0	0	0	0	0	40	42	38
12 PM	0	0	1	2	14	24	10	2	0	0	0	0	0	53	41	36
13:00	0	0	0	4	7	27	7	3	0	0	0	0	0	48	40	37
14:00	0	0	2	0	9	19	11	3	0	0	0	0	0	44	42	37
15:00	0	0	0	0	11	30	15	3	1	0	0	0	0	60	42	38
16:00	0	0	0	1	15	37	15	3	0	0	0	0	0	71	41	37
17:00	0	1	1	0	24	50	23	7	0	0	0	0	0	106	42	37
18:00	0	1	0	0	8	41	25	5	1	0	0	0	0	81	42	39
19:00	0	0	0	0	10	17	10	4	0	0	0	0	0	41	42	38
20:00	0	0	1	1	6	9	5	0	0	0	0	0	0	22	40	36
21:00	0	0	0	2	7	3	2	1	0	0	0	0	0	15	40	35
22:00	0	0	0	1	2	3	2	1	1	0	0	0	0	10	46	39
23:00	0	0	0	0	3	3	2	1	0	0	0	0	0	9	43	38
Total	0	4	10	21	159	339	175	47	5	0	0	0	0	760		
%	0.0%	0.5%	1.3%	2.8%	20.9%	44.6%	23.0%	6.2%	0.7%	0.0%	0.0%	0.0%	0.0%			
AM Peak		08:00	06:00	03:00	09:00	11:00	11:00	07:00	06:00					11:00		
Vol.		2	2	2	11	19	13	4	2					40		
PM Peak		17:00	14:00	13:00	17:00	17:00	18:00	17:00	15:00					17:00		
Vol.		1	2	4	24	50	25	7	1					106		

Stats

15th Percentile :	31 MPH
50th Percentile :	36 MPH
85th Percentile :	42 MPH
95th Percentile :	45 MPH

Mean Speed(Average) :	37 MPH
10 MPH Pace Speed :	35-44 MPH
Number in Pace :	514
Percent in Pace :	67.6%
Number of Vehicles > 35 MPH :	498
Percent of Vehicles > 35 MPH :	65.6%

Harwood Avenue (at #275)
west of Tahattawan Road
City, State: Littleton, MA
Client: TEC/ L.Oltman



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197131 A Speed
Site Code: TBA
Date Start: 20-Aug-19
Date End: 21-Aug-19

EB

Start Time	14	15	20	25	30	35	40	45	50	55	60	65	70	Total	85th Perce	Avera (Mean
	14	19	24	29	34	39	44	49	54	59	64	69	9999			
08/20/19	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
03:00	0	0	0	0	0	0	1	0	0	0	0	0	0	1	43	42
04:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	28	27
05:00	0	0	0	1	10	6	5	0	0	0	0	0	0	22	40	35
06:00	0	0	0	2	10	18	3	0	0	0	0	0	0	33	38	35
07:00	0	0	0	4	17	20	13	3	0	0	0	0	0	57	41	36
08:00	0	0	1	1	20	31	10	0	1	0	0	0	0	64	39	36
09:00	0	0	0	2	18	21	7	0	0	0	0	0	0	48	38	35
10:00	0	0	0	2	13	20	4	2	0	0	0	0	0	41	38	36
11:00	0	0	0	2	7	24	5	1	0	0	0	0	0	39	39	36
12 PM	0	0	0	1	9	13	13	2	2	0	0	0	0	40	43	38
13:00	0	0	1	1	4	18	4	0	0	0	0	0	0	28	38	36
14:00	0	0	1	2	10	10	4	0	0	0	0	0	0	27	38	35
15:00	0	0	0	2	9	14	10	2	0	0	0	0	0	37	42	37
16:00	0	0	0	0	16	16	14	3	1	0	0	0	0	50	42	38
17:00	0	0	0	2	13	22	6	1	0	0	0	0	0	44	39	36
18:00	0	0	0	0	20	32	7	0	0	0	0	0	0	59	38	36
19:00	0	0	0	4	4	12	4	1	1	0	0	0	0	26	41	36
20:00	0	0	1	3	6	4	1	2	0	0	0	0	0	17	41	34
21:00	0	0	0	0	2	2	4	2	0	0	0	0	0	10	45	40
22:00	0	0	0	1	2	2	1	0	0	0	0	0	0	6	39	35
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	0	0	4	31	192	285	116	19	5	0	0	0	0	652		
%	0.0%	0.0%	0.6%	4.8%	29.4%	43.7%	17.8%	2.9%	0.8%	0.0%	0.0%	0.0%	0.0%			
AM Peak			08:00	07:00	08:00	08:00	07:00	07:00	08:00					08:00		
Vol.			1	4	20	31	13	3	1					64		
PM Peak			13:00	19:00	18:00	18:00	16:00	16:00	12:00					18:00		
Vol.			1	4	20	32	14	3	2					59		

Stats
15th Percentile : 30 MPH
50th Percentile : 35 MPH
85th Percentile : 40 MPH
95th Percentile : 43 MPH

Mean Speed(Average) : 36 MPH
10 MPH Pace Speed : 30-39 MPH
Number in Pace : 477
Percent in Pace : 73.2%
Number of Vehicles > 35 MPH : 368
Percent of Vehicles > 35 MPH : 56.4%

Harwood Avenue (at #275)
west of Tahattawan Road
City, State: Littleton, MA
Client: TEC/ L.Oltman



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197131 A Speed
Site Code: TBA
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Date End: 21-Aug-19

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th Perce	Avera (Mean
08/21/																
19	0	0	0	2	0	1	1	0	0	0	0	0	0	4	41	33
01:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	33	32
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	1	0	0	1	0	0	0	0	0	2	47	40
04:00	0	0	0	0	0	1	0	1	0	0	0	0	0	2	47	42
05:00	0	0	0	0	4	9	3	2	0	0	0	0	0	18	42	38
06:00	0	0	0	1	7	13	8	2	0	0	0	0	0	31	42	37
07:00	0	1	1	1	12	32	11	2	0	0	0	0	0	60	40	36
08:00	0	0	1	2	22	42	19	3	0	0	0	0	0	89	41	37
09:00	0	1	0	3	5	21	9	2	0	0	0	0	0	41	41	37
10:00	0	0	0	2	6	21	8	2	0	0	0	0	0	39	41	37
11:00	0	0	0	2	9	16	7	2	0	0	0	0	0	36	41	37
12 PM	0	0	0	3	7	18	5	1	0	0	0	0	0	34	39	36
13:00	0	1	0	1	6	15	12	1	0	0	0	0	0	36	42	37
14:00	1	0	1	0	4	20	10	0	0	0	0	0	0	36	41	37
15:00	0	0	0	2	6	14	12	2	1	0	0	0	0	37	42	38
16:00	0	0	0	0	10	23	9	1	0	0	0	0	0	43	40	37
17:00	0	1	0	2	11	16	11	2	0	0	0	0	0	43	41	37
18:00	0	0	0	0	6	23	13	1	0	1	0	0	0	44	42	38
19:00	0	0	1	1	5	11	7	0	0	0	0	0	0	25	41	36
20:00	0	0	0	3	5	7	4	1	0	0	0	0	0	20	41	36
21:00	0	0	1	3	4	3	0	0	0	0	0	0	0	11	36	31
22:00	0	0	0	0	1	9	1	0	0	0	0	0	0	11	38	37
23:00	0	0	0	1	1	2	0	0	0	0	0	0	0	4	37	33
Total	1	4	5	29	134	317	150	26	1	1	0	0	0	668		
%	0.1%	0.6%	0.7%	4.3%	20.1%	47.5%	22.5%	3.9%	0.1%	0.1%	0.0%	0.0%	0.0%			
AM Peak		07:00	07:00	09:00	08:00	08:00	08:00	08:00						08:00		
Vol.		1	1	3	22	42	19	3						89		
PM Peak	14:00	13:00	14:00	12:00	17:00	16:00	18:00	15:00	15:00	18:00				18:00		
Vol.	1	1	1	3	11	23	13	2	1	1				44		

Stats
15th Percentile : 31 MPH
50th Percentile : 36 MPH
85th Percentile : 41 MPH
95th Percentile : 43 MPH

Mean Speed(Average) : 37 MPH
10 MPH Pace Speed : 35-44 MPH
Number in Pace : 467
Percent in Pace : 69.9%
Number of Vehicles > 35 MPH : 432
Percent of Vehicles > 35 MPH : 64.6%

Attachment D

Seasonal Adjustment Data

Seasonal Adjustment

Project: Healy Corner - Littleton, MA
Date: 8/15/2019
Analyst: TEC, Inc. / BB
Source: MassDOT Permanent Count Station 4427

STATION 4427 - LITTLETON - INTERSTATE 495 - SOUTH OF RAMP - RT 119 TO RT 495 SB
STATION 4091 - LITTLETON - INTERSTATE 495 NORTH OF RAMP - RT 2 WB TO RT 495 NB

YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	Seasonal Adjustment
16	107,552	106,144	108,603	116,007	124,525	124,146	126,666	119,357	118,425	114,021	116,545		116,545	-8.7%
16	102,251	104,951	107,990	116,135	123,826	122,974	125,354	117,926	116,719	112,283			115,041	-9.0%
Average Adj. =														-8.8%

Assume -8.8% Seasonal Adjustment.

Attachment E

General Background Growth

Attachment F

Site Trip Generation

Trip Generation Assessment

Project: Healy Corner
 Date: August 15, 2019
 Analyst: TEC, Inc. / Bob Brisson
 Source: Institute of Transportation Engineers - Trip Generation - 10th Ed.

Proposed Development

17 Units Single Family (ITE LUC 210)

Units:		17 Units													
	Total Trips			Total	% Distribution		# New Trips		Total New Pass-by Trips	Total New Primary Trips	# Passby Trips		# Primary Trips		
	Avg. Rates	Fitted Curve	Trips		IN	OUT	IN	OUT			IN	OUT			
Weekday Daily	NA	204	204	50%	50%	102	102	0	204	0	0	102	102		
Weekday AM PH	NA	16	16	26%	74%	4	12	0	16	0	0	4	12		
Weekday PM PH	NA	20	20	64%	36%	13	7	0	20	0	0	13	7		
Saturday Daily	NA	186	186	50%	50%	93	93	0	186	0	0	93	93		
Sat Midday PH	NA	32	32	54%	46%	17	15	0	32	0	0	17	15		

Net Increase	Total Trips			Total New Trips		Total New Pass-by Trips	Total New Primary Trips	Total Pass-by Trips		Total Primary Trips	
				In	Out			In	Out	In	Out
Weekday Daily	204			102	102	0	204	0	0	102	102
Weekday AM Peak Hour	16			4	12	0	16	0	0	4	12
Weekday PM Peak Hour	20			13	7	0	20	0	0	13	7
Saturday Daily	186			93	93	0	186	0	0	93	93
Sat Middy Peak Hour	32			17	15	0	32	0	0	17	15

Attachment G

Site Trip Distribution

Trip Distribution Gravity Model

Project: T0921 - Healy Corner Development - Littleton, MA

Date: August 19, 2019

Analyst: TEC, Inc. / BB

Source: United States Census Bureau, 5-Year ACS, 2009-2013

					Major Route Entering				Major Route Entering				Major Route Exiting				Major Route Exiting			
Workplace State-County-MCD Name	Residence State-County-MCD Name	Count	% of Total Amesbury Workers	% of Distributed Workforce	Harwood Ave. from east	Harwood Ave. from west	Tahattawan Road from north	Check	Harwood Ave. from east	Harwood Ave. from west	Tahattawan Road from north	Check	Harwood Ave. to east	Harwood Ave. to west	Tahattawan Road to north	Check	Harwood Ave. to east	Harwood Ave. to west	Tahattawan Road to north	Check
Littlton town Middlesex Co. MA	Littlton town Middlesex Co. MA	900	19.50%	21.61%	15%	15%	70%	100%	3%	3%	15%	22%	15%	15%	70%	100%	3%	3%	15%	22%
Acton town Middlesex Co. MA	Littlton town Middlesex Co. MA	369	7.99%	8.86%	100%			100%	9%	0%	0%	9%	100%			100%	9%	0%	0%	9%
Cambridge city Middlesex Co. MA	Littlton town Middlesex Co. MA	316	6.85%	7.59%	100%			100%	8%	0%	0%	8%	100%			100%	8%	0%	0%	8%
Boston city Suffolk Co. MA	Littlton town Middlesex Co. MA	299	6.48%	7.18%	100%			100%	7%	0%	0%	7%	100%			100%	7%	0%	0%	7%
Burlington town Middlesex Co. MA	Littlton town Middlesex Co. MA	211	4.57%	5.07%	100%			100%	5%	0%	0%	5%	100%			100%	5%	0%	0%	5%
Westford town Middlesex Co. MA	Littlton town Middlesex Co. MA	174	3.77%	4.18%			100%	100%	0%	0%	4%	4%			100%	100%	0%	0%	4%	4%
Concord town Middlesex Co. MA	Littlton town Middlesex Co. MA	168	3.64%	4.03%	100%			100%	4%	0%	0%	4%	100%			100%	4%	0%	0%	4%
Billerica town Middlesex Co. MA	Littlton town Middlesex Co. MA	158	3.42%	3.79%			100%	100%	0%	0%	4%	4%			100%	100%	0%	0%	4%	4%
Waltham city Middlesex Co. MA	Littlton town Middlesex Co. MA	148	3.21%	3.55%	100%			100%	4%	0%	0%	4%	100%			100%	4%	0%	0%	4%
Bedford town Middlesex Co. MA	Littlton town Middlesex Co. MA	147	3.18%	3.53%			100%	100%	0%	0%	4%	4%			100%	100%	0%	0%	4%	4%
Wilmington town Middlesex Co. MA	Littlton town Middlesex Co. MA	111	2.40%	2.67%			100%	100%	0%	0%	3%	3%			100%	100%	0%	0%	3%	3%
Framingham town Middlesex Co. MA	Littlton town Middlesex Co. MA	106	2.30%	2.55%	30%	40%	30%	100%	1%	1%	1%	3%	30%	40%	30%	100%	1%	1%	1%	3%
Lowell city Middlesex Co. MA	Littlton town Middlesex Co. MA	106	2.30%	2.55%			100%	100%	0%	0%	3%	3%			100%	100%	0%	0%	3%	3%
Marlborough city Middlesex Co. MA	Littlton town Middlesex Co. MA	103	2.23%	2.47%	30%	40%	30%	100%	1%	1%	1%	2%	30%	40%	30%	100%	1%	1%	1%	2%
Andover town Essex Co. MA	Littlton town Middlesex Co. MA	83	1.80%	1.99%			100%	100%	0%	0%	2%	2%			100%	100%	0%	0%	2%	2%
Harvard town Worcester Co. MA	Littlton town Middlesex Co. MA	80	1.73%	1.92%	50%	50%		100%	1%	1%	0%	2%	50%	50%		100%	1%	1%	0%	2%
Worcester city Worcester Co. MA	Littlton town Middlesex Co. MA	64	1.39%	1.54%	30%	40%	30%	100%	0%	1%	0%	2%	30%	40%	30%	100%	0%	1%	0%	2%
Ayer town Middlesex Co. MA	Littlton town Middlesex Co. MA	63	1.36%	1.51%		100%		100%	0%	2%	0%	2%		100%		100%	0%	2%	0%	2%
Hopkinton town Middlesex Co. MA	Littlton town Middlesex Co. MA	57	1.23%	1.37%	30%	40%	30%	100%	0%	1%	0%	1%	30%	40%	30%	100%	0%	1%	0%	1%
Groton town Middlesex Co. MA	Littlton town Middlesex Co. MA	47	1.02%	1.13%			100%	100%	0%	0%	1%	1%			100%	100%	0%	0%	1%	1%
Chelmsford town Middlesex Co. MA	Littlton town Middlesex Co. MA	46	1.00%	1.10%			100%	100%	0%	0%	1%	1%			100%	100%	0%	0%	1%	1%
Newton city Middlesex Co. MA	Littlton town Middlesex Co. MA	44	0.95%	1.06%	100%			100%	1%	0%	0%	1%	100%			100%	1%	0%	0%	1%
Hudson town Middlesex Co. MA	Littlton town Middlesex Co. MA	40	0.87%	0.96%		70%	30%	100%	0%	1%	0%	1%		70%	30%	100%	0%	1%	0%	1%
Maynard town Middlesex Co. MA	Littlton town Middlesex Co. MA	40	0.87%	0.96%	100%			100%	1%	0%	0%	1%	100%			100%	1%	0%	0%	1%
Lexington town Middlesex Co. MA	Littlton town Middlesex Co. MA	39	0.84%	0.94%	100%			100%	1%	0%	0%	1%	100%			100%	1%	0%	0%	1%
Shirley town Middlesex Co. MA	Littlton town Middlesex Co. MA	39	0.84%	0.94%		100%		100%	0%	1%	0%	1%		100%		100%	0%	1%	0%	1%
Medford city Middlesex Co. MA	Littlton town Middlesex Co. MA	38	0.82%	0.91%	50%		50%	100%	0%	0%	0%	1%	50%		50%	100%	0%	0%	0%	1%
Boxborough town Middlesex Co. MA	Littlton town Middlesex Co. MA	37	0.80%	0.89%	75%	25%		100%	1%	0%	0%	1%	75%	25%		100%	1%	0%	0%	1%
Holliston town Middlesex Co. MA	Littlton town Middlesex Co. MA	35	0.76%	0.84%	40%	30%	30%	100%	0%	0%	0%	1%	40%	30%	30%	100%	0%	0%	0%	1%
Tewksbury town Middlesex Co. MA	Littlton town Middlesex Co. MA	34	0.74%	0.82%			100%	100%	0%	0%	1%	1%			100%	100%	0%	0%	1%	1%
Shrewsbury town Worcester Co. MA	Littlton town Middlesex Co. MA	33	0.71%	0.79%	30%	40%	30%	100%	0%	0%	0%	1%	30%	40%	30%	100%	0%	0%	0%	1%
Somerville city Middlesex Co. MA	Littlton town Middlesex Co. MA	29	0.63%	0.70%	100%			100%	1%	0%	0%	1%	100%			100%	1%	0%	0%	1%
TOTAL		4616	90.21%	100.00%					48.2%	11.3%	40.5%	100.0%					48.2%	11.3%	40.5%	100.0%
				Say				48%	11%	41%	100%	Say				48%	11%	41%	100%	

Attachment H

Capacity and Queue Analysis

Lanes, Volumes, Timings
1: Harwood Avenue & Tahattawan Road

2019 Existing Conditions
Weekday Morning

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1	70	33	23	20	2
Future Volume (vph)	1	70	33	23	20	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	1000		1000	
Travel Time (s)		22.7	22.7		22.7	
Peak Hour Factor	0.93	0.93	0.82	0.82	0.79	0.79
Heavy Vehicles (%)	0%	7%	0%	0%	5%	50%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	70	33	23	20	2
Future Vol, veh/h	1	70	33	23	20	2
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	93	93	82	82	79	79
Heavy Vehicles, %	0	7	0	0	5	50
Mvmt Flow	1	75	40	28	25	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	68	0	0 131 54
Stage 1	-	-	- 54 -
Stage 2	-	-	- 77 -
Critical Hdwy	4.1	-	- 6.45 6.7
Critical Hdwy Stg 1	-	-	- 5.45 -
Critical Hdwy Stg 2	-	-	- 5.45 -
Follow-up Hdwy	2.2	-	- 3.545 3.75
Pot Cap-1 Maneuver	1546	-	- 856 893
Stage 1	-	-	- 961 -
Stage 2	-	-	- 938 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1546	-	- 855 893
Mov Cap-2 Maneuver	-	-	- 855 -
Stage 1	-	-	- 960 -
Stage 2	-	-	- 938 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1546	-	-	-	858
HCM Lane V/C Ratio	0.001	-	-	-	0.032
HCM Control Delay (s)	7.3	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Lanes, Volumes, Timings
1: Harwood Avenue & Tahattawan Road

2019 Existing Conditions
Weekday Evening

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	53	90	38	24	2
Future Volume (vph)	2	53	90	38	24	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	1000		1000	
Travel Time (s)		22.7	22.7		22.7	
Peak Hour Factor	0.66	0.66	0.89	0.89	0.65	0.65
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	53	90	38	24	2
Future Vol, veh/h	2	53	90	38	24	2
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	66	66	89	89	65	65
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	3	80	101	43	37	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	144	0	0 209 123
Stage 1	-	-	- 123 -
Stage 2	-	-	- 86 -
Critical Hdwy	4.1	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.2	-	- 3.5 3.3
Pot Cap-1 Maneuver	1451	-	- 784 933
Stage 1	-	-	- 907 -
Stage 2	-	-	- 942 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1451	-	- 782 933
Mov Cap-2 Maneuver	-	-	- 782 -
Stage 1	-	-	- 905 -
Stage 2	-	-	- 942 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1451	-	-	-	792
HCM Lane V/C Ratio	0.002	-	-	-	0.051
HCM Control Delay (s)	7.5	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Lanes, Volumes, Timings
1: Harwood Avenue & Tahattawan Road

2026 No-Build Conditions
Weekday Morning

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1	79	37	26	23	2
Future Volume (vph)	1	79	37	26	23	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	1000		1000	
Travel Time (s)		22.7	22.7		22.7	
Peak Hour Factor	0.93	0.93	0.82	0.82	0.79	0.79
Heavy Vehicles (%)	0%	7%	0%	0%	5%	50%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	79	37	26	23	2
Future Vol, veh/h	1	79	37	26	23	2
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	93	93	82	82	79	79
Heavy Vehicles, %	0	7	0	0	5	50
Mvmt Flow	1	85	45	32	29	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	77	0	0 148 61
Stage 1	-	-	- 61 -
Stage 2	-	-	- 87 -
Critical Hdwy	4.1	-	- 6.45 6.7
Critical Hdwy Stg 1	-	-	- 5.45 -
Critical Hdwy Stg 2	-	-	- 5.45 -
Follow-up Hdwy	2.2	-	- 3.545 3.75
Pot Cap-1 Maneuver	1535	-	- 837 884
Stage 1	-	-	- 954 -
Stage 2	-	-	- 929 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1535	-	- 836 884
Mov Cap-2 Maneuver	-	-	- 836 -
Stage 1	-	-	- 953 -
Stage 2	-	-	- 929 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1535	-	-	-	840
HCM Lane V/C Ratio	0.001	-	-	-	0.038
HCM Control Delay (s)	7.3	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Lanes, Volumes, Timings
1: Harwood Avenue & Tahattawan Road

2026 No-Build Conditions
Weekday Evening

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	2	60	101	43	27	2
Future Volume (vph)	2	60	101	43	27	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	1000		1000	
Travel Time (s)		22.7	22.7		22.7	
Peak Hour Factor	0.66	0.66	0.89	0.89	0.65	0.65
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	60	101	43	27	2
Future Vol, veh/h	2	60	101	43	27	2
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	66	66	89	89	65	65
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	3	91	113	48	42	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	161	0	0 234 137
Stage 1	-	-	- 137 -
Stage 2	-	-	- 97 -
Critical Hdwy	4.1	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.2	-	- 3.5 3.3
Pot Cap-1 Maneuver	1430	-	- 759 917
Stage 1	-	-	- 895 -
Stage 2	-	-	- 932 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1430	-	- 757 917
Mov Cap-2 Maneuver	-	-	- 757 -
Stage 1	-	-	- 893 -
Stage 2	-	-	- 932 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1430	-	-	-	766
HCM Lane V/C Ratio	0.002	-	-	-	0.058
HCM Control Delay (s)	7.5	0	-	-	10
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Lanes, Volumes, Timings
1: Cul-de-sac/Tahattawan Road & Harwood Avenue

2026 Build Conditions
Weekday Morning

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	79	1	2	36	27	1	4	5	23	1	2
Future Volume (vph)	1	79	1	2	36	27	1	4	5	23	1	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			1000			1000			1000	
Travel Time (s)		22.7			22.7			22.7			22.7	
Peak Hour Factor	0.93	0.93	0.93	0.82	0.82	0.82	0.92	0.92	0.92	0.79	0.79	0.79
Heavy Vehicles (%)	0%	7%	0%	0%	0%	0%	0%	0%	0%	5%	0%	50%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

HCM 2010 TWSC
1: Cul-de-sac/Tahattawan Road & Harwood Avenue

2026 Build Conditions
Weekday Morning

Intersection

Int Delay, s/veh 2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	79	1	2	36	27	1	4	5	23	1	2
Future Vol, veh/h	1	79	1	2	36	27	1	4	5	23	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	82	82	82	92	92	92	79	79	79
Heavy Vehicles, %	0	7	0	0	0	0	0	0	0	5	0	50
Mvmt Flow	1	85	1	2	44	33	1	4	5	29	1	3

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	77	0	0	86	0	0	155	169	86	157	153	61
Stage 1	-	-	-	-	-	-	88	88	-	65	65	-
Stage 2	-	-	-	-	-	-	67	81	-	92	88	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.15	6.5	6.7
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.15	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.15	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.545	4	3.75
Pot Cap-1 Maneuver	1535	-	-	1523	-	-	816	728	978	802	742	884
Stage 1	-	-	-	-	-	-	925	826	-	938	845	-
Stage 2	-	-	-	-	-	-	948	832	-	908	826	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1535	-	-	1523	-	-	811	727	978	792	741	884
Mov Cap-2 Maneuver	-	-	-	-	-	-	811	727	-	792	741	-
Stage 1	-	-	-	-	-	-	924	825	-	937	844	-
Stage 2	-	-	-	-	-	-	943	831	-	897	825	-

Approach	EB		WB		NB		SB
HCM Control Delay, s	0.1		0.2		9.3		9.7
HCM LOS					A		A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	844	1535	-	-	1523	-	-	796
HCM Lane V/C Ratio	0.013	0.001	-	-	0.002	-	-	0.041
HCM Control Delay (s)	9.3	7.3	0	-	7.4	0	-	9.7
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Lanes, Volumes, Timings
1: Cul-de-sac/Tahattawan Road & Harwood Avenue

2026 Build Conditions
Weekday Evening

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	60	1	5	102	43	1	2	3	28	5	2
Future Volume (vph)	2	60	1	5	102	43	1	2	3	28	5	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1000			1000			1000			1000	
Travel Time (s)		22.7			22.7			22.7			22.7	
Peak Hour Factor	0.66	0.66	0.66	0.89	0.89	0.89	0.92	0.92	0.92	0.65	0.65	0.65
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

HCM 2010 TWSC
1: Cul-de-sac/Tahattawan Road & Harwood Avenue

2026 Build Conditions
Weekday Evening

Intersection

Int Delay, s/veh 2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	60	1	5	102	43	1	2	3	28	5	2
Future Vol, veh/h	2	60	1	5	102	43	1	2	3	28	5	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	89	89	89	92	92	92	65	65	65
Heavy Vehicles, %	0	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	3	91	2	6	115	48	1	2	3	43	8	3

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	163	0	0	93	0	0	255	273	92	252	250	139
Stage 1	-	-	-	-	-	-	98	98	-	151	151	-
Stage 2	-	-	-	-	-	-	157	175	-	101	99	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1428	-	-	1514	-	-	702	637	971	706	656	915
Stage 1	-	-	-	-	-	-	913	818	-	856	776	-
Stage 2	-	-	-	-	-	-	850	758	-	910	817	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1428	-	-	1514	-	-	690	633	971	698	652	915
Mov Cap-2 Maneuver	-	-	-	-	-	-	690	633	-	698	652	-
Stage 1	-	-	-	-	-	-	911	816	-	854	773	-
Stage 2	-	-	-	-	-	-	835	755	-	903	815	-

Approach	EB		WB		NB		SB
HCM Control Delay, s	0.2		0.2		9.7		10.6
HCM LOS					A		B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	779	1428	-	-	1514	-	-	700
HCM Lane V/C Ratio	0.008	0.002	-	-	0.004	-	-	0.077
HCM Control Delay (s)	9.7	7.5	0	-	7.4	0	-	10.6
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2