

# **Transportation Impact Assessment**

Proposed Car Wash  
1650 Washington Street  
Holliston, Massachusetts

*Prepared for:*

1650 Washington, LLC  
Framingham, Massachusetts

August 2023

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## **EXECUTIVE SUMMARY**

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### **DESCRIPTION OF PROJECT**

Vanasse & Associates, Inc. (VAI) has prepared this Transportation Impact Assessment (TIA) to identify traffic impacts associated with a proposed car wash to be located at 1650 Washington Street in Holliston, Massachusetts (the “Project”). The purpose of this TIA is to review existing and future traffic conditions in the vicinity of the site, determine the traffic impact of the proposed Project at key intersections expected to experience increased traffic levels from the Project, and review the need for improvements to mitigate the Project’s traffic impact.

### **PROPOSED PROJECT**

The site is bounded by Washington Street (Route 16) to the north, Chestnut Street to the east, and commercial properties to the south and west. Currently, the site contains one residential building and has three curb cuts, two onto Route 16 and one onto Chestnut Street. The Project entails razing the existing residential building and constructing a car wash. The site will consist of a 3,300 square feet (sf) automatic tunnel and two self-service bays with 20 parking spaces. Site access will be provided via one curb cut onto Route 16.

### **EXISTING CONDITIONS**

An inventory was conducted to collect traffic volumes, operating characteristics, speed limits, and sight distances, as well as land use information. Traffic volumes were collected in November 2022 and April 2023 at the intersections expected to receive the traffic impact from the Project. These are listed below:

- Route 16 at the Post Office driveway
- Route 16 at Pope Road, Chestnut Street, and a private driveway

## **FUTURE CONDITIONS**

Traffic volumes within the study area were projected to 2030, which reflects a seven-year planning horizon consistent with State traffic study guidelines. These conditions incorporate traffic growth due to general background traffic increases as well as development projects currently being proposed/permitted or under construction and expected to generate traffic in the future. This condition is referred to as the No-Build condition.

## **PROJECT-GENERATED TRAFFIC**

The Project is expected to generate 802 vehicle trips on an average weekday (two-way, 24-hour volume), with 58 vehicle trips (30 entering and 28 exiting) expected during the weekday evening peak hour. On Saturday, the Project is expected to generate 988 vehicle trips, with 131 vehicles trips (66 entering and 65 exiting) expected during the Saturday midday peak hour.

Project-related traffic-volume increases external to the study area relative to 2030 No-Build conditions are anticipated to range from 29 to 66 vehicles or 2.1 to 5.9 percent during the peak periods.

## **TRAFFIC OPERATIONS ANALYSIS**

In future conditions, operations are generally preserved with minor increases in delays and vehicle queue lengths on the various approaches.

## **RECOMMENDATIONS**

Access to the Project site will be provided via a new driveway onto Route 16. As the site currently has three curb cuts; two onto Route 16 and one onto Chestnut Street, the Project will decrease the number of curb cuts onto Route 16 by one and eliminate the one onto Chestnut Street. The following recommendations are offered with respect to the design and operation of the Project site driveway:

- The driveway should be placed under STOP-sign (*Manual on Uniform Traffic Control Devices* (MUTCD)<sup>1</sup> R1-1) control, with a painted STOP-bar included.
- All signs and other pavement markings to be installed within the Project site shall conform to the applicable standards of the current MUTCD.
- Signs and landscaping adjacent to the Project site driveway should be designed and maintained so as not to restrict lines of sight.
- Snow windrows within sight triangle areas of the Project site driveway should be promptly removed where such accumulations would impede sightlines.

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<sup>1</sup>*Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.

## **CONCLUSIONS**

As documented in this study, Project-related traffic increases result in minor delay increases at area intersections; however, there is no change in vehicle queuing so it is unlikely that Project-related traffic increases will be noticeable. Further, Project-related traffic increases will not result in significant increases on overall traffic volumes or traffic delays within the study area. The site driveway will provide efficient access to and from the development. In general, Project-related traffic can be adequately accommodated within the existing infrastructure with minimal impact on the traffic operations within the study area.

## **INTRODUCTION**

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Vanasse & Associates, Inc. (VAI) has prepared this Transportation Impact Assessment (TIA) in order to identify the traffic impacts associated with the proposed car wash to be located at 1650 Washington Street in Holliston, Massachusetts. This report identifies and analyzes existing and future traffic conditions both with and without the Project and reviews access requirements, potential off-site improvements, and safety considerations.

### **STUDY METHODOLOGY**

This study was prepared in accordance with the State guidelines for TIAs and was conducted in three distinct stages.

The first stage involved an assessment of existing conditions in the study area and included an inventory of roadway geometry, observations of traffic flow, and collection of peak-period traffic counts.

In the second stage of the study, future traffic conditions were projected and analyzed. Specific travel demand forecasts for the Project were assessed along with future traffic demands due to expected traffic growth independent of the Project. A seven-year time horizon was selected for these analyses consistent with State guidelines for the preparation of TIAs. The traffic analysis conducted in stage two identifies projected future roadway capacity, traffic safety, and site access issues.

The third stage of the study presents and evaluates measures to address traffic and safety issues, if any are necessary, based on the results from stage two of the study.



## **EXISTING CONDITIONS**

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An inventory of existing conditions within the study area was conducted in November 2022 and April 2023. The field investigation consisted of an inventory of existing traffic volumes; and operating characteristics; as well as posted speed limits, sight distance, and land use information within the study area. The study area for the Project contains the major roadway which provides access to the Project, as well as the intersections which are expected to accommodate the majority of Project-related traffic. The study area is listed below and graphically depicted on Figure 1.

- Washington Street (Route 16) at the Post Office driveway
- Route 16 at Pope Road, Chestnut Street and the private driveway

The following describes the study area roadway which provides access/egress to the Project.

### **GEOMETRY**

#### **Roadway**

##### **Route 16**

Route 16 is classified as a principal arterial roadway under Massachusetts Department of Transportation (MassDOT) jurisdiction. Route 16 runs in a general east-to-west alignment throughout the study area. Route 16 provides one general-purpose travel lane in each direction separated by a double-yellow centerline. The land uses along Route 16 throughout the study area generally consist of commercial and residential uses.

#### **Intersections**

Figure 2 summarizes existing lane use, travel lane widths, and sidewalk and crosswalk locations at the study area intersections.

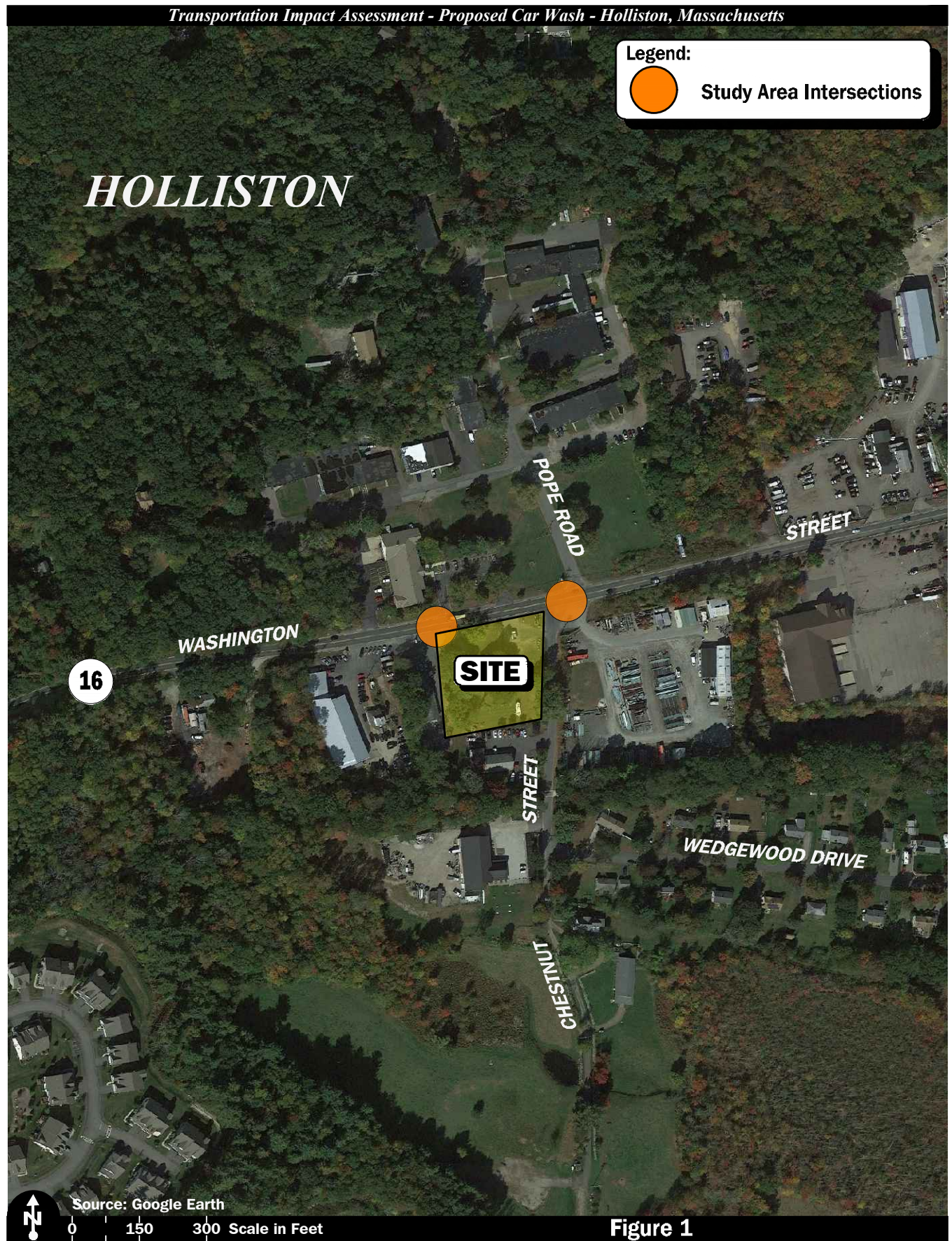


Figure 1

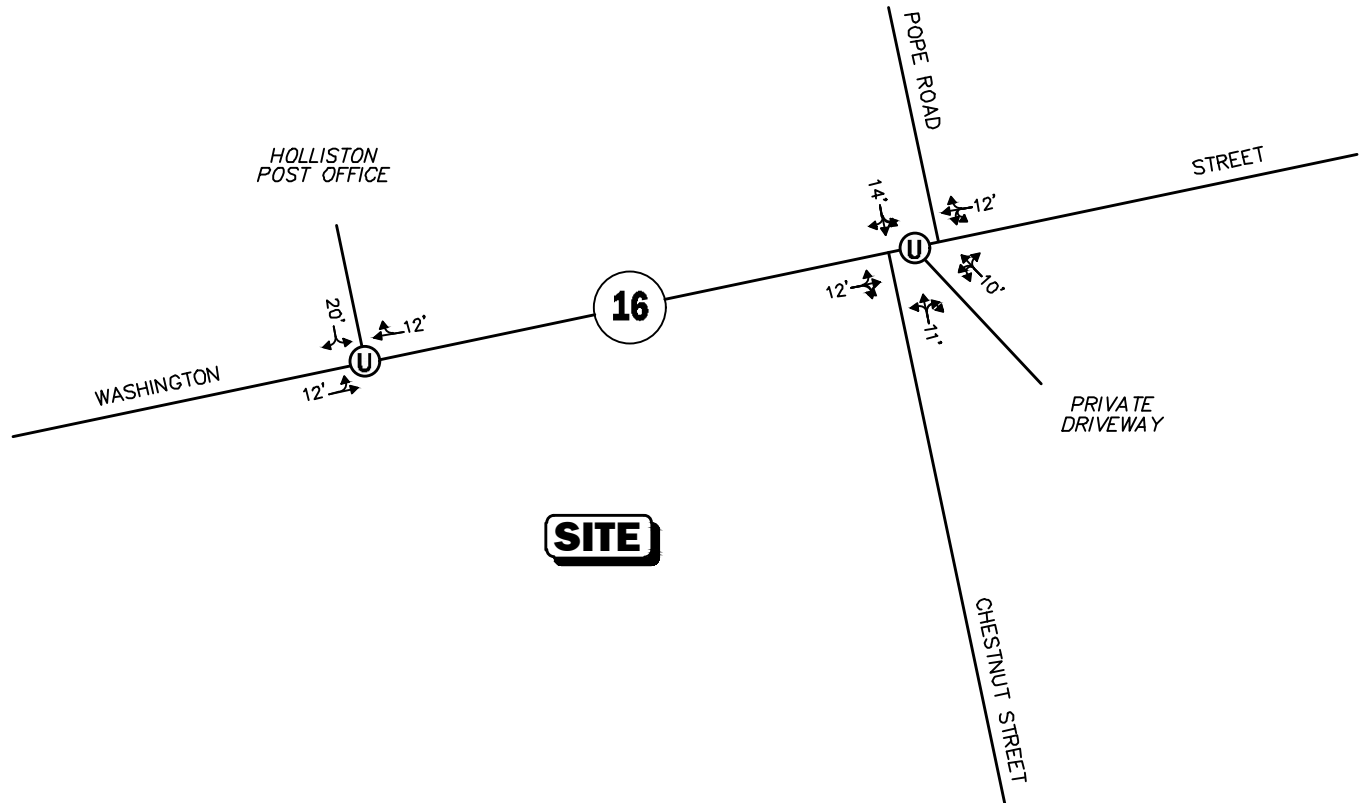
Site Location Map  
Study Area Map



**Legend:**

Ⓢ Unsignalized Intersection

xx' ↕ Lane Use and Travel Lane Width



Not To Scale



**Figure 2**

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



## **EXISTING TRAFFIC VOLUMES**

In order to establish base traffic-volume demands and flow patterns within the study area, manual turning movement counts (TMCs) were completed in November 2022 and April 2023. Automatic Traffic Recorder (ATR) counts were conducted over a Thursday through Saturday (72-hour) period in April 2023 while the TMCs were conducted during the weekday evening (4:00 to 6:00 PM) and Saturday midday (11:00 AM to 2:00 PM) peak periods. Bicycles and pedestrians were also counted.

### **Traffic-Volume Adjustments**

In order to develop 2023 Existing traffic-volume conditions, MassDOT weekday seasonal factors for Urban Groups 3 (other principal arterials) were reviewed.<sup>2</sup> Based on a review of this data, it was determined that traffic volumes for the month of April are 6 percent *above* average-month conditions and traffic volumes for the month of November are 3 percent *above* average-month conditions. As such, the traffic volumes were not adjusted in order to be representative of average-month conditions.

MassDOT no longer requires pandemic-related adjustment of traffic counts performed after March 2022 except in locations where the predominant land use consists of offices or similar uses.<sup>3</sup> Given that the predominant land use within the study area is residential, no further adjustment (beyond the seasonal adjustment) is necessary.

As can be seen in Table 1, Route 16 is observed to carry approximately 13,210 vehicles per day (vpd) during an average weekday and 11,524 vpd during an average Saturday with 1,267 vehicles per hour (vph) during the weekday evening peak hour and 2,054 vph during the Saturday midday peak hour. During the weekday evening peak hour, 54 percent of the traffic is traveling westbound, and during the Saturday midday peak hour, 51 percent of the traffic is traveling westbound. The existing weekday evening and Saturday midday peak-hour traffic volumes for the study area intersections are graphically depicted on Figure 3.

**Table 1**  
**2023 EXISTING ROADWAY TRAFFIC-VOLUME SUMMARY**

Location	Weekday	Weekday Evening Peak Hour			Saturday	Saturday Midday Peak Hour		
	Daily Volume (vpd) <sup>a</sup>	Volume (vph) <sup>b</sup>	Percent of Daily Traffic <sup>c</sup>	Predominant Flow	Daily Volume (vpd) <sup>a</sup>	Volume (vph)	Percent of Daily Traffic	Predominant Flow
Route 16, west of Chestnut Street	13,210	1,267	9.6	54.3% WB	11,524	1,054	9.1	51.3% WB

<sup>a</sup>Two-way daily traffic expressed in vehicles per day.

<sup>b</sup>Two-way peak-hour volume expressed in vehicles per hour.

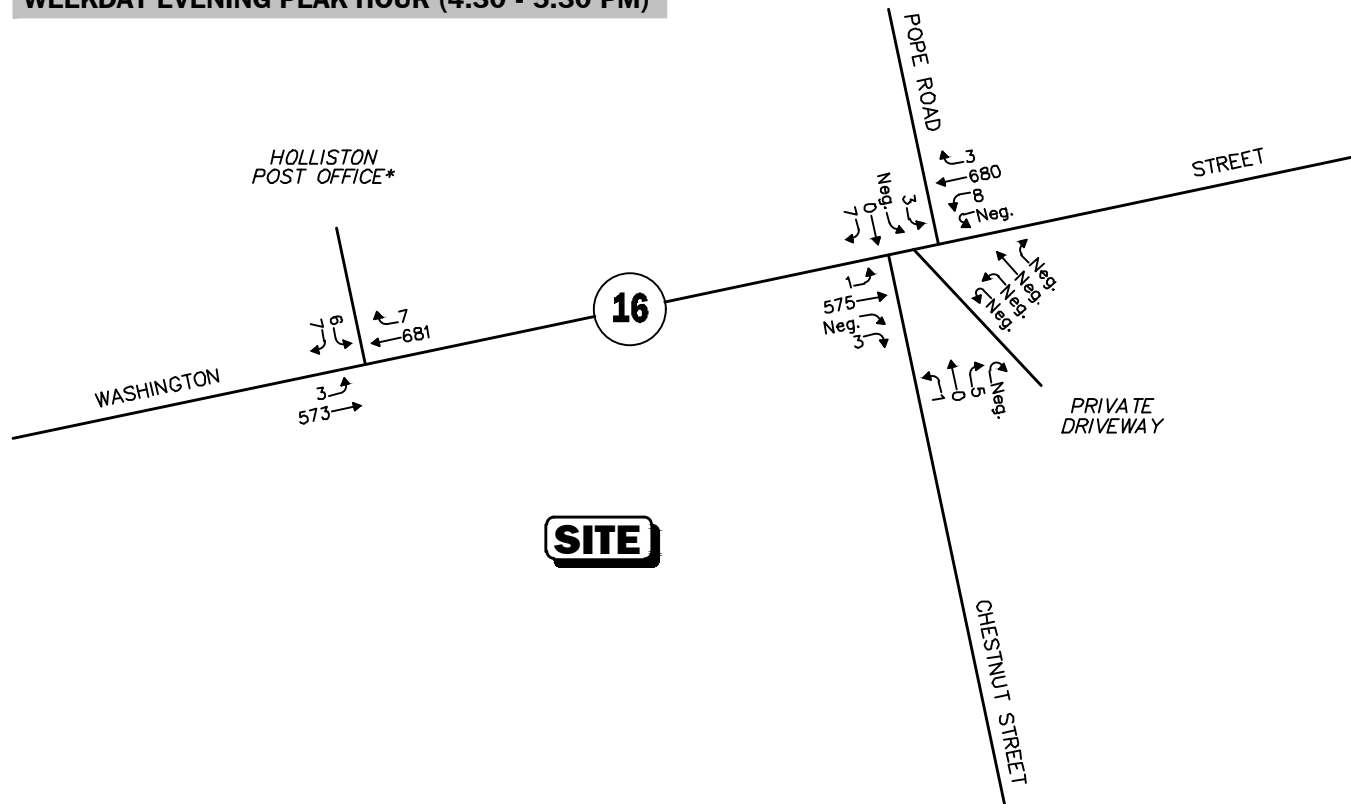
<sup>c</sup>The percent of daily traffic that occurs during the peak hour.

WB = westbound.

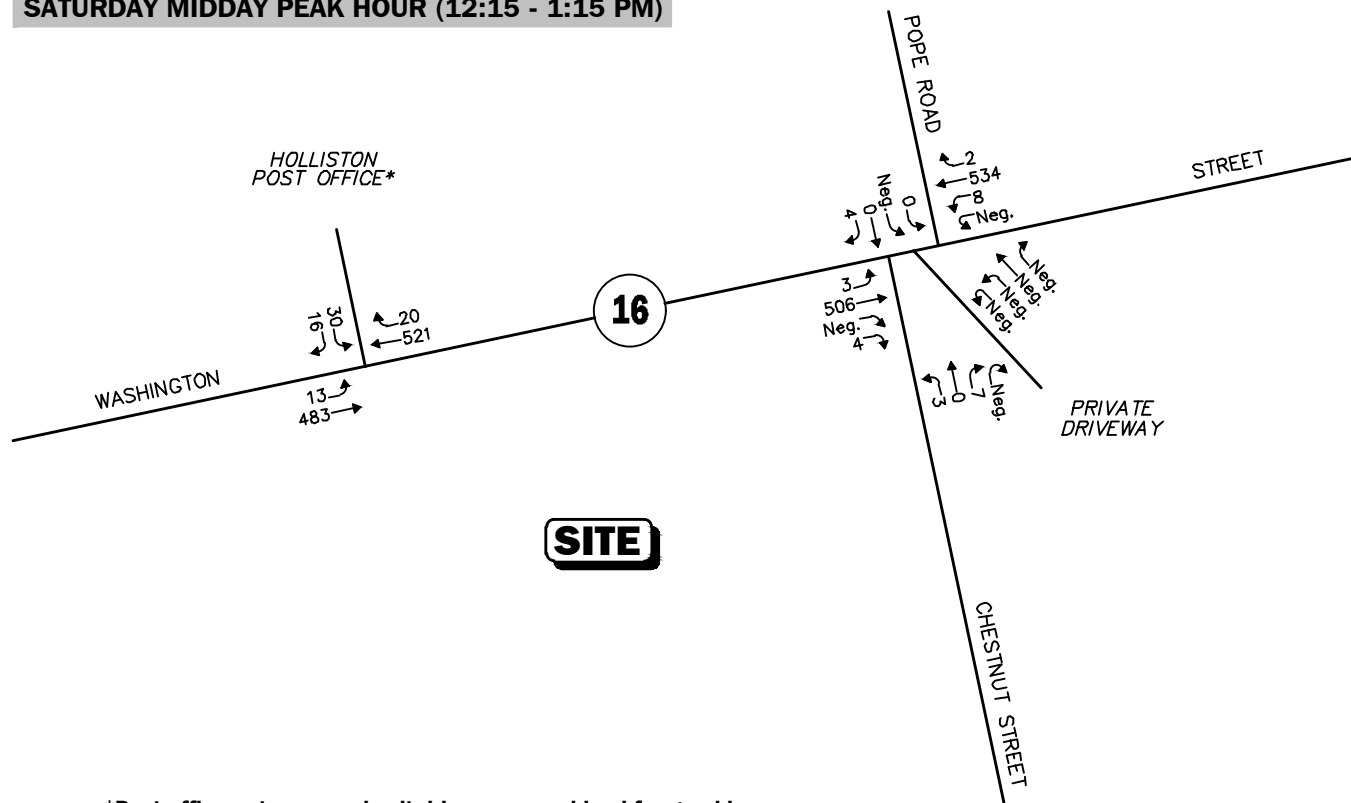
<sup>2</sup>MassDOT statewide Traffic Data Collection; 2019 Weekday Seasonal Factors, Groups U3.

<sup>3</sup>25% *Design Submission Guidelines*; MassDOT Highway Division, Traffic and Safety Engineering; Revised May 31, 2022.

WEEKDAY EVENING PEAK HOUR (4:30 - 5:30 PM)



SATURDAY MIDDAY PEAK HOUR (12:15 - 1:15 PM)



\*Post office entrance and exit driveways combined for graphics purposes.  
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.



Not To Scale

Figure 3

## **PEDESTRIAN AND BICYCLE FACILITIES**

An extensive inventory of pedestrian and bicycle facilities within the study area was undertaken in April 2023. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study area roadways and at the study area intersections, as well as the location of bicycle facilities.

## **PUBLIC TRANSPORTATION**

Public transportation services are provided within the study area by the MetroWest Regional Transit Authority (MWRTA). The MWRTA provides fixed-route bus service to the Massachusetts Bay Transportation Authority (MBTA) Framingham Commuter Rail Station and the MWRTA Blandin Hub in Framingham on the No. 6 route by way of the Mission Spring bus stop, which is located at 100 Summer Street, approximately 0.7 miles (a 14-minute walk) to the east of the Project site. The MWRTA also uses the Flag Down System which allows buses to stop anywhere along their routes to pick up passengers, where it is safe to do so. Passengers can hail MWRTA buses by waving.

Table 2 summarizes the characteristics of these services. The public transportation schedules and fare information are provided in the Appendix.

**Table 2**  
**PUBLIC TRANSPORTATION SERVICES**

Bus Route Number	Service	Stop Closest to Site	Distance from Site	Weekday	
				Hours of Operation	Headway (minutes)
6	Holliston/Milford Line	Mission Crossings	~0.7 miles east	6:43 AM – 7:44 PM	~70

## **MOTOR VEHICLE CRASH DATA**

Motor vehicle crash information for the study area intersections was provided by the MassDOT Safety Management/Traffic Operations Unit for the most recent five-year period available (2016 through 2020) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized in Table 3 by intersection, type, weather condition, lighting condition, pavement condition, and severity.

As can be seen in Table 3, the intersection of Route 16 at Pope Road, Chestnut Street, and the private driveway experienced 4 accidents over the five-year review period, averaging 0.8 accidents per year. The majority of the accidents were rear-end collisions, occurred on dry pavement, during the daylight, in clear weather, and caused property damage only. The intersection of Route 16 at the Post Office driveway experienced no accidents over the five-year review period. The crash rates for the intersections were observed to be lower than the MassDOT District 3 crash rates for unsignalized intersections.

**Table 3**  
**MOTOR VEHICLE CRASH DATA SUMMARY<sup>a</sup>**

	Route 16/ Post Office Driveway	Route 16/ Pope Road/ Chestnut Street/Private Driveway
<i>Year:</i>		
2016	0	3
2017	0	0
2018	0	0
2019	0	1
<u>2020</u>	<u>0</u>	<u>0</u>
Total	0	4
Average <sup>a</sup>	0.0	0.8
Crash Rate <sup>b</sup>	0.00	0.15
Significant <sup>c</sup>	No	No
<i>Type:</i>		
Angle	0	1
Rear-End	0	3
Head-On	0	0
Sideswipe	0	0
Fixed Object	0	0
Pedestrian/Bicycle	0	0
<u>Unknown/Other</u>	<u>0</u>	<u>0</u>
Total	0	4
<i>Conditions:</i>		
Clear	0	2
Cloudy	0	1
Rain	0	1
Fog/Smog/Smoke	0	0
<u>Snow/Ice</u>	<u>0</u>	<u>0</u>
Total	0	4
<i>Lighting:</i>		
Daylight	0	4
Dawn/Dusk	0	0
Dark (Road Lit)	0	0
<u>Dark (Road Unlit)</u>	<u>0</u>	<u>0</u>
Total	0	4
<i>Pavement Conditions :</i>		
Dry	0	3
Wet	0	1
Snow/Ice	0	0
<u>Unknown/Other</u>	<u>0</u>	<u>0</u>
Total	0	4
<i>Severity:</i>		
Property Damage Only	0	3
Personal Injury	0	1
Fatality	0	0
<u>Unknown</u>	<u>0</u>	<u>0</u>
Total	0	4

<sup>a</sup>Average number of crashes over a five-year period.

<sup>b</sup>Crash rate per million entering vehicles (mev).

<sup>c</sup>Significant if crash rate > 0.61 for unsignalized intersections (MassDOT District 3 rates).

Source: MassDOT Crash Data, 2016 through 2020.

## **VEHICLE SPEEDS**

Existing vehicle speeds along Route 16, west of Chestnut Street, were recorded to determine the average and 85<sup>th</sup> percentile vehicle speeds. The speed limit on Route 16 is posted at 45 miles per hour (mph). The results of the speed measurements are shown in Table 4.

**Table 4**  
**OBSERVED VEHICLE SPEEDS (In Miles Per Hour)**

Location/Direction	Average Speed	85 <sup>th</sup> Percentile Speed <sup>a</sup>
<i>Route 16, west of Chestnut Street:</i>		
Eastbound	38	42
Westbound	33	38

<sup>a</sup>The 85<sup>th</sup> percentile speed is the speed at which 85 percent of the traffic is traveling at or below. It is commonly used for setting speed limits on roadways.

As can be seen from Table 4, the average speed recorded eastbound on Route 16 was 38 mph and the 85<sup>th</sup> percentile speed recorded was 42 mph. The average speed recorded westbound was 33 mph and the 85<sup>th</sup> percentile speed was 38 mph.



## **FUTURE CONDITIONS**

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

### **FUTURE TRAFFIC GROWTH**

Traffic growth on area roadways is a function of the expected land development impacting the study area. Several methods are used to estimate this growth. A procedure frequently employed estimates an annual percentage increase in traffic growth and applies that percentage to all existing 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.

In addition, we identified the location and type of planned development affecting the study area, estimated the traffic to be generated by that development, and assigned it to the area roadway network. This produces a more realistic estimate of growth for local traffic. However, the drawback of this procedure is that the potential growth in population and development external to the study area would not be accounted for in the traffic projections.

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

#### **General Background Growth**

Traffic-volume data compiled by MassDOT from permanent count stations and historic traffic counts in the area were reviewed in order to determine general background traffic growth trends. Based on a review of this data and other area traffic studies, it was determined that the traffic volumes are increasing in the area by approximately 0.68 percent per year on average. Therefore, a 1.0 percent per year compounded annual background traffic growth rate was used to account for future traffic growth including presently unforeseen development within the study area.

### **Specific Development by Others**

The Town of Holliston was contacted in order to determine if there are any planned or approved development projects that are expected to influence future traffic volumes within the study area. Based on these discussions, no developments were identified at this time that are expected to result in an increase in traffic within the study area beyond the general background traffic growth rate.

### **Planned Roadway Improvements**

The Town of Holliston and MassDOT were contacted in order to determine if there are any planned roadway improvement projects expected to be completed within the study area in the seven-year planning horizon. Based on these discussions, no roadway improvement projects are planned within the study area beyond general maintenance.

### **No-Build Traffic Volumes**

The 2030 No-Build peak-hour traffic-volume networks were developed by applying the 1.0 percent per year compounded annual background traffic growth rate to the 2023 Existing peak-hour traffic volumes. The resulting 2030 No-Build weekday morning and evening peak-hour traffic-volume networks are shown on Figure 4.

## **PROJECT-GENERATED TRAFFIC**

The Project entails razing the existing residential building and constructing a car wash, which will collectively have a 3,300 square feet (sf) automatic car wash tunnel and two self-service bays. In order to develop the traffic characteristics of the proposed Project, trip-generation statistics published by the Institute of Transportation Engineers (ITE)<sup>4</sup> for Land Use Code (LUC) 947 *Self-Service Car Wash*, and LUC 948, *Automated Car Wash* were used.

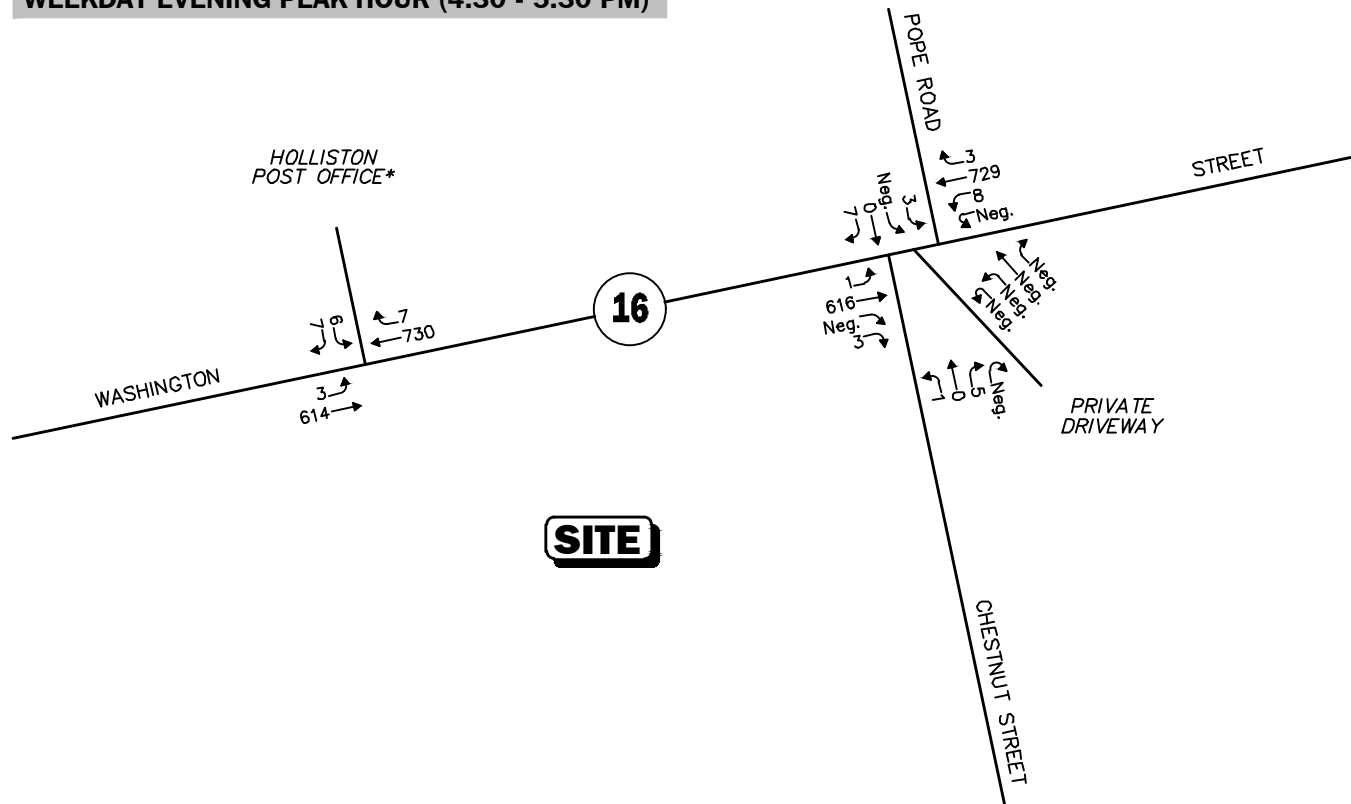
### **Trip Generation for 1650 Washington Street Using ATR Data**

LUC 948 does not have trip rates for the weekday daily and Saturday daily time period. These trip rates for the proposed car wash were found by comparing the ratio of self-service square footage and automated square footage of the car wash. It was assumed that the ratio of square footage would be similar to the ratio of trips for each Land Use Code.

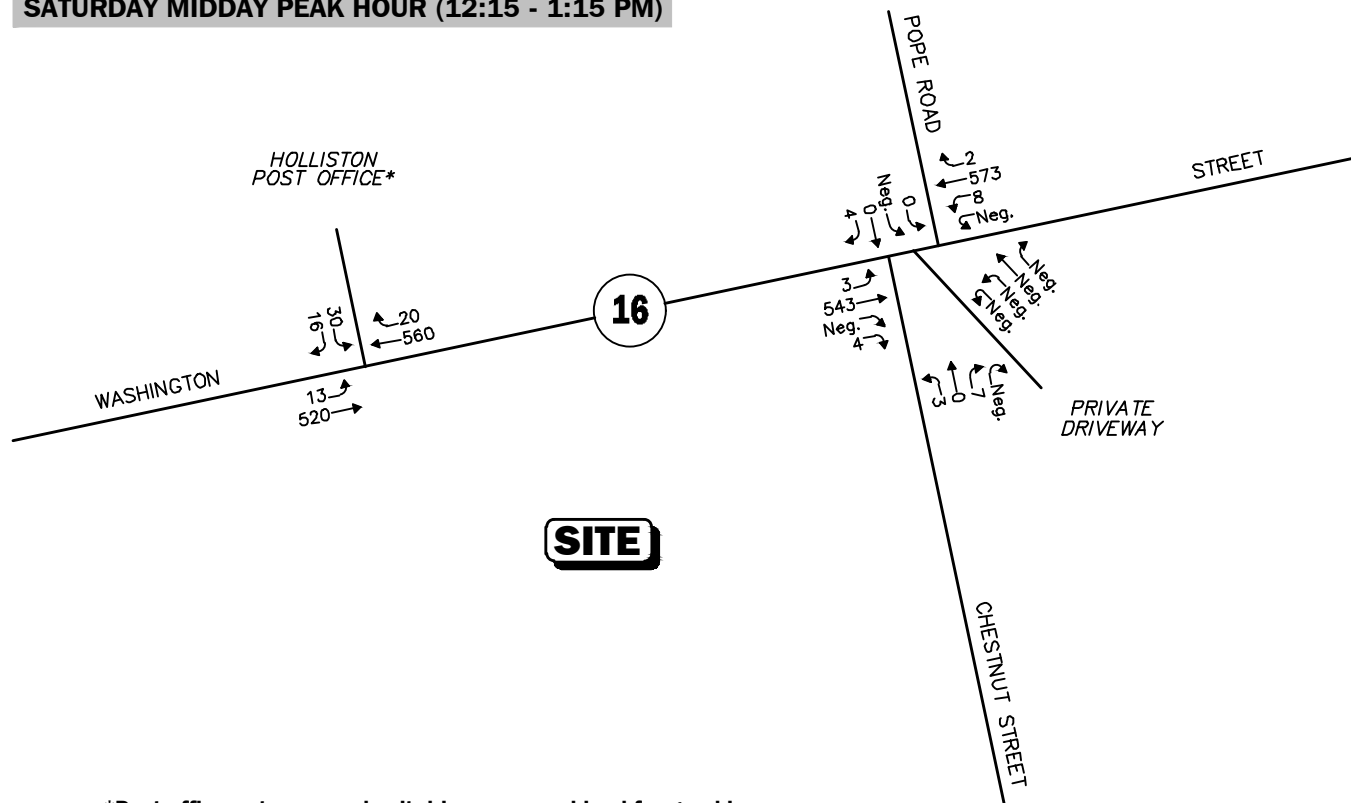
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<sup>4</sup>*Trip Generation*, 11<sup>th</sup> Edition; Institute of Transportation Engineers; Washington, DC; 2021.

WEEKDAY EVENING PEAK HOUR (4:30 - 5:30 PM)



SATURDAY MIDDAY PEAK HOUR (12:15 - 1:15 PM)



\*Post office entrance and exit driveways combined for graphics purposes.  
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.



Not To Scale

Figure 4



2030 No-Build  
Peak-Hour Traffic Volumes

**Table 5**  
**PROPOSED SITE TRIP-GENERATION SUMMARY**

Time Period/ Directional Distribution	Self-Service Car Wash <sup>a</sup> (A) Vehicle Trips	Automated Car Wash <sup>b</sup> (B) Vehicle Trips	Total Vehicle Trips (A+B=C) Vehicle Trips
Weekday Daily	216	586	802
<i>Weekday Evening Peak Hour:</i>			
Entering	6	24	30
<u>Exiting</u>	<u>5</u>	<u>23</u>	<u>28</u>
Total	11	47	58
Saturday Daily	266	722	988
<i>Saturday Midday Peak Hour:</i>			
Entering	16	50	66
<u>Exiting</u>	<u>15</u>	<u>50</u>	<u>65</u>
Total	31	100	131

<sup>a</sup>Based on ITE LUC 947, *Self-Service Car Wash*; two wash stalls.

<sup>b</sup>Based on ITE LUC 948, *Automated Car Wash*; 3,300 sf.

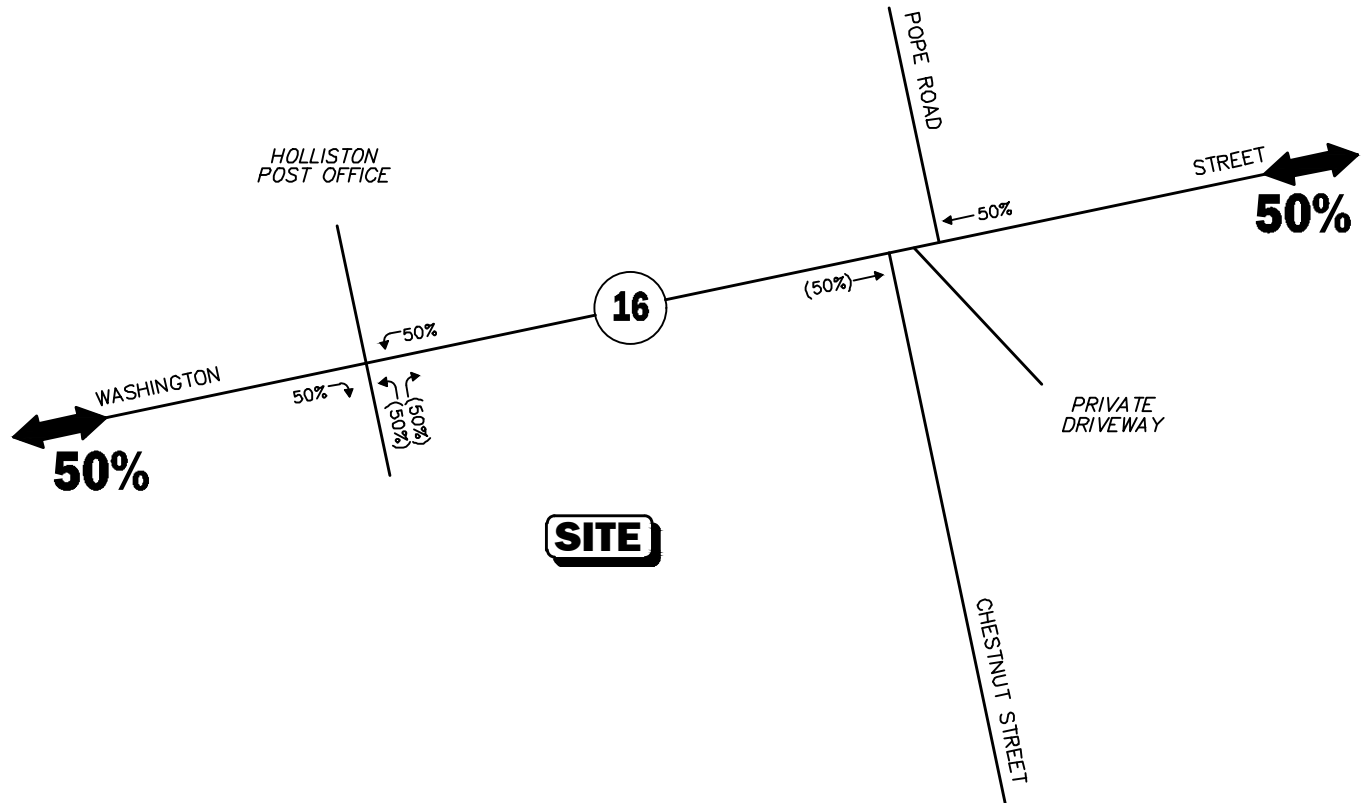
As can be seen in Table 5, the Project is expected to generate 802 vehicle trips (approximately 401 vehicles entering and exiting) on an average weekday (two-way, 24-hour volume), with 58 vehicle trips (30 entering and 28 exiting) expected during the weekday evening peak hour. On Saturday, the Project is expected to generate 988 vehicle trips (approximately 494 vehicles entering and exiting), with 131 vehicles trips (66 entering and 65 exiting) expected during the Saturday midday peak hour.

### **TRIP DISTRIBUTION AND ASSIGNMENT**

The directional distribution of the site-generated trips to and from the Project was determined based on a review of existing travel patterns at the study area intersections. The trip distribution for the Project is summarized in Table 6 and graphically depicted on Figure 5. The weekday morning and evening peak-hour traffic volumes expected to be generated by the Project were assigned on the study area roadway network as shown on Figure 6.

**Legend:**

XX      Entering Trips  
(XX)    Exiting Trips



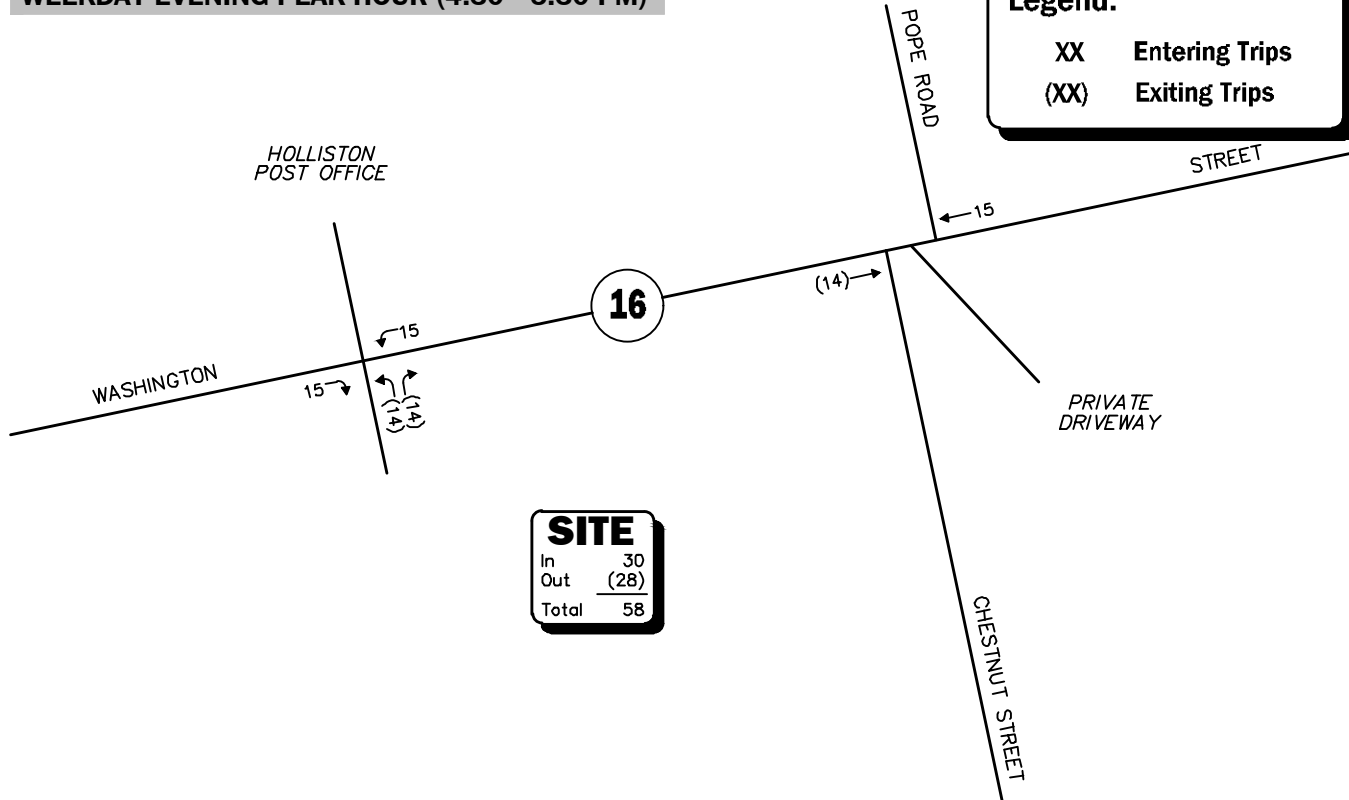
Not To Scale

**Figure 5**

**Trip Distribution**



WEEKDAY EVENING PEAK HOUR (4:30 - 5:30 PM)



SATURDAY MIDDAY PEAK HOUR (12:15 - 1:15 PM)

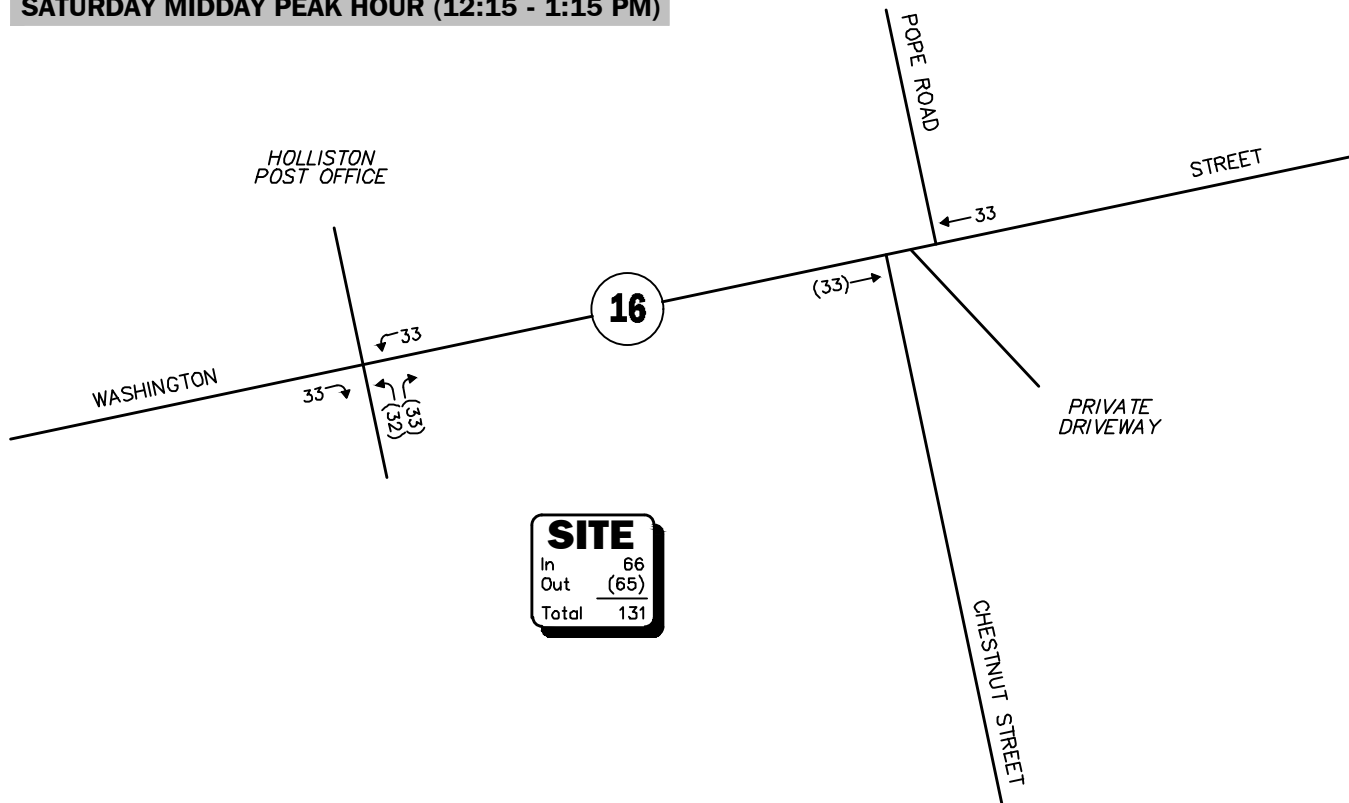


Figure 6

Site-Generated  
Peak-Hour Traffic Volumes

**Table 6**  
**TRIP-DISTRIBUTION SUMMARY**

Roadway	Direction (To/From)	Percent (To/From)
Route 16	East	50
Route 16	West	50
TOTAL		100

### **FUTURE TRAFFIC VOLUMES – BUILD CONDITION**

The 2030 Build condition networks consist of the 2030 No-Build traffic volumes with the anticipated Project-generated traffic added to them. The 2030 Build weekday morning and evening peak-hour traffic-volume networks are graphically depicted on Figure 7.

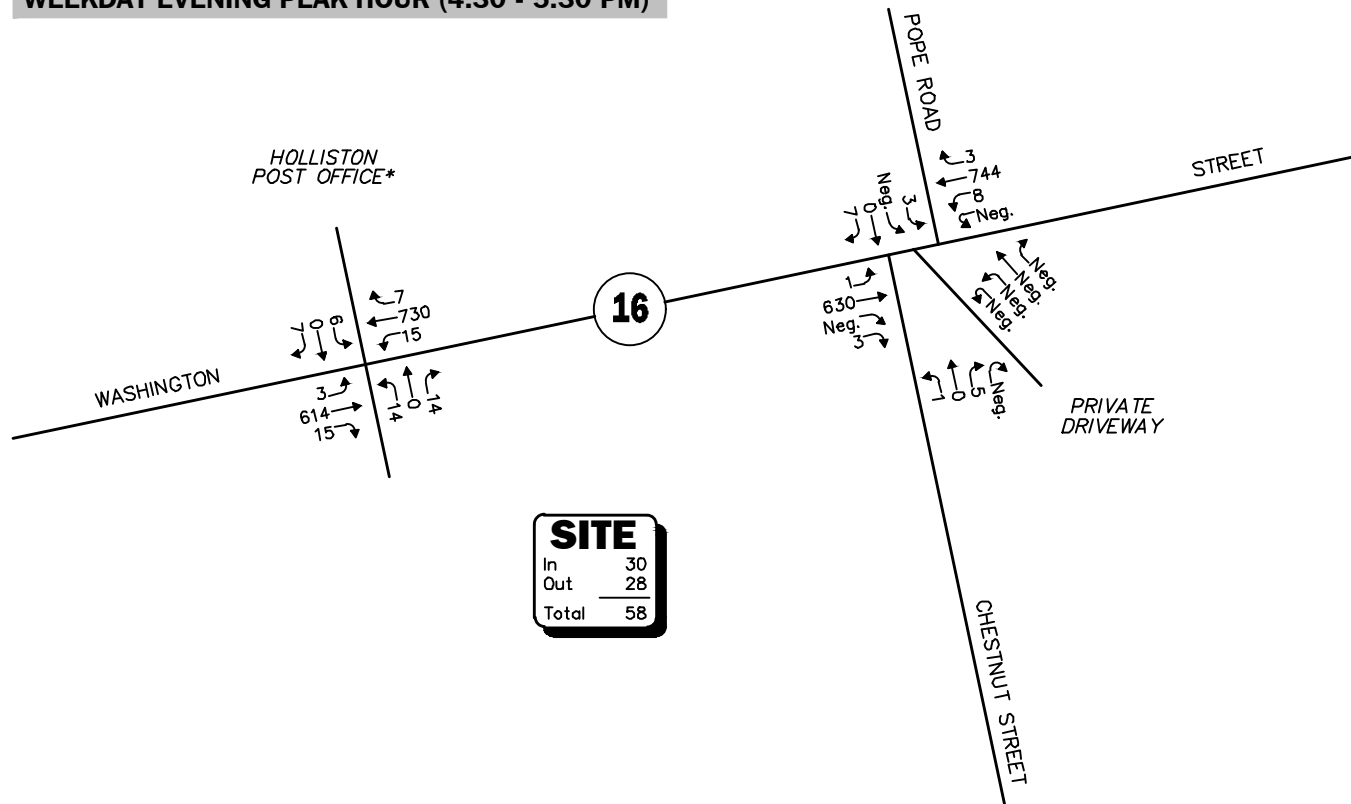
A summary of peak-hour projected traffic-volume increases external to the study area that is the subject of this assessment is shown in Table 7. These volumes are based on the expected increases from the Project.

As shown in Table 7, Project-related traffic-volume increases external to the study area relative to 2030 No-Build conditions are anticipated to range from 29 to 66 vehicles or 2.1 to 5.9 percent during the peak periods.

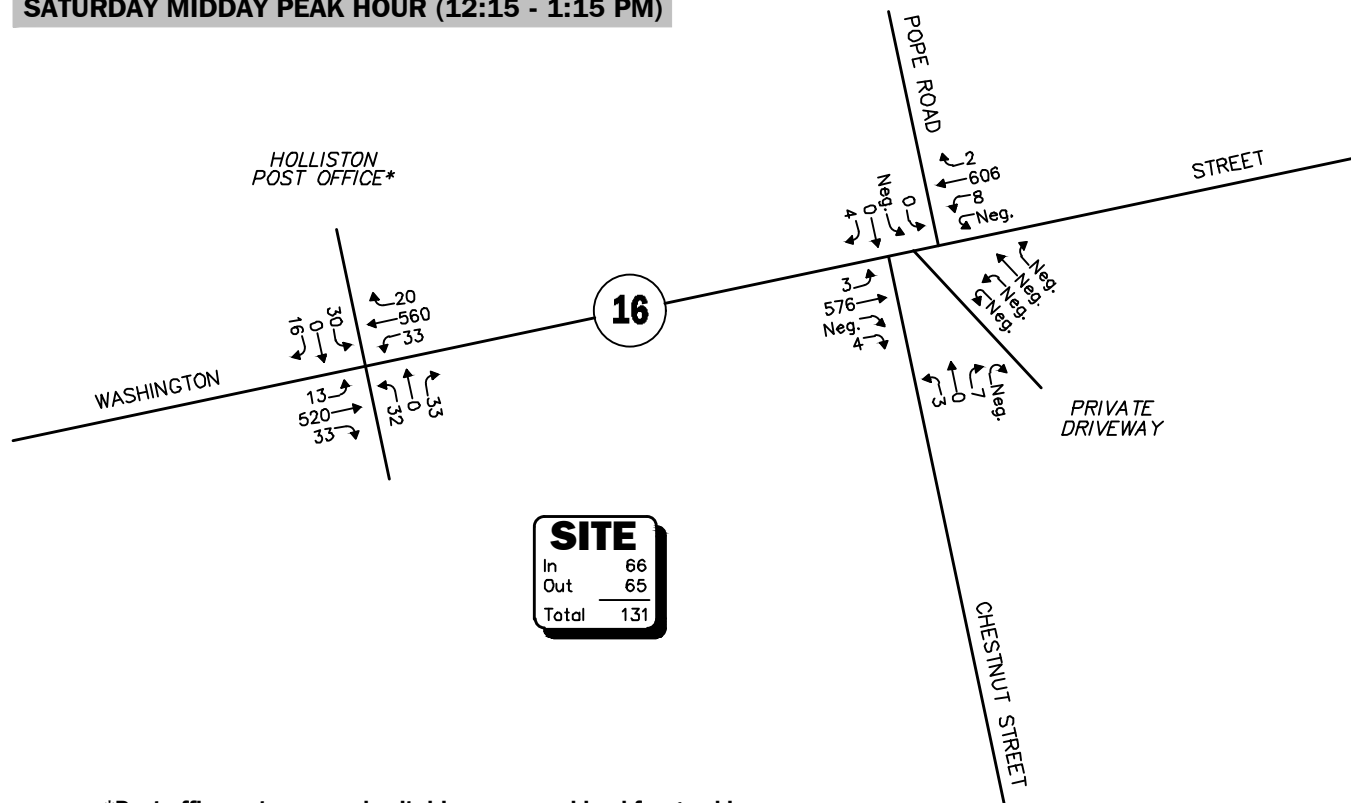
**Table 7**  
**PEAK-HOUR TRAFFIC-VOLUME INCREASES**

Location/Peak Hour	2030 No-Build	2030 Build	Traffic-Volume Increase Over No-Build	Percent Increase Over No-Build
<i>Route 16, east of Pope Road:</i>				
Weekday Evening	1,354	1,383	29	2.1
Saturday Midday	1,109	1,174	65	5.9
<i>Route 16, west of the Post Office Driveway:</i>				
Weekday Evening	1,364	1,393	29	2.1
Saturday Midday	1,133	1,199	66	5.8

WEEKDAY EVENING PEAK HOUR (4:30 - 5:30 PM)



SATURDAY MIDDAY PEAK HOUR (12:15 - 1:15 PM)



\*Post office entrance and exit driveways combined for graphics purposes.  
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.



Not To Scale

Figure 7



## SIGHT DISTANCE EVALUATION

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Sight distance measurements were performed at the site driveway intersection with Route 16 in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)<sup>5</sup> recommendations. Both stopping sight distance (SSD) and intersection sight distance (ISD) measurements were performed. In brief, SSD is the distance recommended to be provided by a vehicle traveling at the design speed of a roadway, on wet pavement, to stop prior to striking an object in its travel path. ISD is the sight distance recommended to be provided by a driver entering or crossing an intersecting roadway to perceive an on-coming vehicle and safely complete a turning or crossing maneuver with on-coming traffic. ***In accordance with AASHTO standards, if the measured ISD is at least equal to the recommended SSD value for the appropriate design speed, the intersection can operate in a safe manner.*** Table 8 presents the measured SSD and ISD at the subject intersection.

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<sup>5</sup>*A Policy on Geometric Design of Highway and Streets*, 7<sup>th</sup> Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2018.

**Table 8**  
**SIGHT DISTANCE MEASUREMENTS<sup>a</sup>**

Intersection/Sight Distance Measurement	Recommended Distances (Feet)	Field Measured Distances (Feet)
	Posted Speed Limit 45 mph	
<b><i>Route 16 at the Project Site Driveway</i></b>		
<i>Stopping Sight Distance:</i>		
Route 16 approaching from the east	360	600+
Route 16 approaching from the west	360	600+
<i>Intersection Sight Distance:</i>		
Left turn from Project site driveway (looking east)	500	600+
Left turn from Project site driveway (looking west)	500	600+

<sup>a</sup>Recommended values obtained from *A Policy on Geometric Design of Highways and Streets*, 7<sup>th</sup> Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018.

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

As can be seen in Table 8, the sight distance at the intersection of the site driveway with Route 16 was found to exceed the recommended values for both SSD and ISD based on the posted speed of 45 mph, which exceeds the observed 85<sup>th</sup> percentile speed.

## **TRAFFIC OPERATIONS ANALYSIS**

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

### **METHODOLOGY**

#### **Levels of Service**

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

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

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

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<sup>6</sup>The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual 6<sup>th</sup> Edition*; Transportation Research Board; Washington, DC; 2016.

## Unsignalized Intersections

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

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

The levels of service of unsignalized intersections are determined by application of a procedure described in the *Highway Capacity Manual 6<sup>th</sup> Edition*. Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the *Highway Capacity Manual 6<sup>th</sup> Edition*. Table 9 summarizes the relationship between level of service and average control delay for two-way STOP-controlled and all-way STOP-controlled intersections.

**Table 9**  
**LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS<sup>a</sup>**

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

<sup>a</sup>Source: *Highway Capacity Manual 6<sup>th</sup> Edition*; Transportation Research Board; Washington, DC; 2016; page 20-6.

## **ANALYSIS RESULTS**

Level-of-service analyses were conducted for 2023 Existing, 2030 No-Build, and 2030 Build conditions for the study area intersections. The results of the intersection capacity analysis within the study area are described below, with a tabular summary provided in Table 10.

### **Unsignalized Intersection**

#### **Route 16 at the Post Office Driveway and the Project Site Driveway**

Under 2023 Existing and 2030 No-Build conditions, the critical movement at this intersection operates at LOS D and LOS B during the weekday evening and Saturday midday peak hours. The only change in level of service under 2030 Building conditions due to the addition of the Project volumes is at the southbound left-turn movement which during the weekday evening and Saturday midday peak hours degrades from D to E. The queue length is unchanged under 2030 Build conditions compared to 2030 No-Build conditions. The Project site driveway critical movement is LOS D during the weekday evening and Saturday midday peak hours with a vehicle queue of up to 2 vehicles.

#### **Route 16 at Chestnut Street and Pope Road and the Private Driveway**

Under 2023 Existing conditions, the critical movements at this intersection operate at LOS C during the weekday evening peak hour and operate at LOS B and C during the Saturday midday peak hours. Under 2030 No-Build conditions, the critical movements at this intersection operate at LOS C and D during the weekday evening peak hour and operate at LOS B and C during the Saturday midday peak hours. No changes to the critical movement level of service occur as a result of the addition of Project volumes under 2030 Build conditions. Critical movement delay increases by 1 second or less and the queue length is unchanged under 2030 Build conditions compared to 2030 No-Build conditions.

**Table 10**  
**UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY**

Unsignalized Intersection/ Critical Movement/Peak Hour	2023 Existing				2030 No-Build				2030 Build			
	Demand <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	Demand	Delay	LOS	Queue	Demand	Delay	LOS	Queue
<b>Route 16 at the Post Office Driveway and the Project Site Driveway</b>												
<i>Weekday Evening:</i>												
Post Office Driveway SB LT	6	30.3	D	1	6	31.8	D	1	--	--	--	--
Post Office Driveway SB RT	7	14.0	B	1	7	14.4	B	1	--	--	--	--
Project site Driveway NB LT/TH/RT	--	--	--	--	--	--	--	--	28	33.6	D	1
Post Office Driveway SB LT	--	--	--	--	--	--	--	--	6	46.6	E	1
Post Office Driveway SB TH/RT	--	--	--	--	--	--	--	--	7	14.4	B	1
<i>Saturday Midday:</i>												
Post Office Driveway SB LT	30	27.4	D	1	30	26.6	D	1	--	--	--	--
Post Office Driveway SB RT	16	12.4	B	1	16	12.6	B	1	--	--	--	--
Project site Driveway NB LT/TH/RT	--	--	--	--	--	--	--	--	65	32.1	D	2
Post Office Driveway SB LT	--	--	--	--	--	--	--	--	30	46.8	E	1
Post Office Driveway SB TH/RT	--	--	--	--	--	--	--	--	16	12.6	B	1
<b>Route 16 at Chestnut Street, Pope Road, and the Private Driveway</b>												
<i>Weekday Evening:</i>												
Chestnut Street NB LT/TH/RT	6	16.9	C	1	6	17.7	C	1	6	18.2	C	1
Pope Road SB LT/TH/RT	10	24.1	C	1	10	25.2	D	1	10	26.0	D	1
<i>Saturday Midday:</i>												
Chestnut Street NB LT/TH/RT	10	17.2	C	1	10	17.7	C	1	10	18.8	C	1
Pope Road SB LT/TH/RT	4	12.2	B	0	4	12.4	B	0	4	12.8	B	0

<sup>a</sup>Demand in vehicles per hour.

<sup>b</sup>Delay in seconds per vehicle.

<sup>c</sup>Level of service.

<sup>d</sup>95th percentile queue length (veh).

NB = northbound; SB = southbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

## RECOMMENDATIONS AND CONCLUSIONS

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VAI has prepared this TIA in order to evaluate potential traffic impacts associated with the proposed car wash to be located at 1650 Washington Street in Holliston, Massachusetts. This study was prepared in accordance with MassDOT Guidelines for *Transportation Impact Assessments (TIAs)*; and was conducted pursuant to the standards of the traffic engineering and transportation planning professions for the preparation of such reports. Based on the results of this study, the following can be concluded:

- The study area intersection crash rates were observed to be lower than the MassDOT District 3 crash rates for unsignalized and signalized intersections.
- The Project is expected to generate 802 vehicle trips on an average weekday (two-way, 24-hour volume), with 58 vehicle trips (30 entering and 28 exiting) expected during the weekday evening peak hour. On Saturday, the Project is expected to generate 988 vehicle trips, with 131 vehicle trips (66 entering and 65 exiting) expected during the Saturday midday peak hour.
- The analysis has indicated that the Project will generally result in minimal impact on motorist delays and vehicle queue lengths at the study intersection.

## **RECOMMENDATIONS**

The following improvements have been recommended as a part of this evaluation:

### **Project Access**

Access to the Project site will be provided via a new driveway onto Route 16. As the site currently has three curb cuts; two onto Route 16 and one onto Chestnut Street, the Project will decrease the number of curb cuts onto Route 16 by one and eliminate the curb cut onto Chestnut Street. The following recommendations are offered with respect to the design and operation of the Project site driveway:

- The driveway should be placed under STOP-sign (MUTCD R1-1) control, with a painted STOP-bar included.
- All signs and other pavement markings to be installed within the Project site shall conform to the applicable standards of the current MUTCD.
- Signs and landscaping adjacent to the Project site driveway should be designed and maintained so as not to restrict lines of sight.
- Snow windrows within sight triangle areas of the Project site driveway should be promptly removed where such accumulations would impede sightlines.

## **CONCLUSIONS**

As documented in this study, Project-related traffic increases result in minor delay increases at area intersections; however, there is no change in vehicle queuing so it is unlikely that Project-related traffic increases will be noticeable. Further, Project-related traffic increases will not result in significant increases on overall traffic volumes or traffic delays within the study area. The site driveway will provide efficient access to and from the development. In general, Project-related traffic can be adequately accommodated within the existing infrastructure with minimal impact on the traffic operations within the study area.



## APPENDIX

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TRAFFIC COUNT DATA  
SEASONAL ADJUSTMENT DATA  
PUBLIC TRANSPORTATION SCHEDULES  
MASSDOT CRASH RATE WORKSHEETS  
VEHICLE SPEED DATA  
GROWTH RATE DATA  
TRIP GENERATION DATA  
CAPACITY ANALYSIS



## TRAFFIC COUNT DATA

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Accurate Counts  
978-664-2565

Location : Washington Street  
Location : West of Chestnut Street  
City/State: Holliston, MA

95480001

4/24/2023	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Week Average	
Time	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 AM	*	*	*	*	*	*	17	18	30	26	32	44	*	*	26	29
1:00	*	*	*	*	*	*	10	9	13	12	24	16	*	*	16	12
2:00	*	*	*	*	*	*	3	10	7	4	17	13	*	*	9	9
3:00	*	*	*	*	*	*	2	13	6	9	8	10	*	*	5	11
4:00	*	*	*	*	*	*	21	30	20	38	17	20	*	*	19	29
5:00	*	*	*	*	*	*	93	215	88	215	27	52	*	*	69	161
6:00	*	*	*	*	*	*	220	566	216	510	117	131	*	*	184	402
7:00	*	*	*	*	*	*	408	630	392	582	196	184	*	*	332	465
8:00	*	*	*	*	*	*	462	591	400	505	314	276	*	*	392	457
9:00	*	*	*	*	*	*	336	424	356	357	363	407	*	*	352	396
10:00	*	*	*	*	*	*	379	361	364	353	463	460	*	*	402	391
11:00	*	*	*	*	*	*	393	381	441	398	503	469	*	*	446	416
12:00 PM	*	*	*	*	*	*	453	388	478	422	490	468	*	*	474	426
1:00	*	*	*	*	*	*	428	373	446	436	483	498	*	*	452	436
2:00	*	*	*	*	*	*	443	414	462	439	461	411	*	*	455	421
3:00	*	*	*	*	*	*	544	447	640	478	421	441	*	*	535	455
4:00	*	*	*	*	*	*	638	546	635	535	420	404	*	*	564	495
5:00	*	*	*	*	*	*	634	530	636	478	386	353	*	*	552	454
6:00	*	*	*	*	*	*	497	350	553	405	326	307	*	*	459	354
7:00	*	*	*	*	*	*	296	282	339	329	238	237	*	*	291	283
8:00	*	*	*	*	*	*	228	209	220	228	198	222	*	*	215	220
9:00	*	*	*	*	*	*	148	129	151	159	143	135	*	*	147	141
10:00	*	*	*	*	*	*	103	60	111	108	143	123	*	*	119	97
11:00	*	*	*	*	*	*	44	41	71	82	25	28	*	*	47	50
Total	0	0	0	0	0	0	6800	7017	7075	7108	5815	5709	0	0	6562	6610
Day	0		0		0		13817		14183		11524		0		13172	
AM Peak							8:00	7:00	11:00	7:00	11:00	11:00			11:00	7:00
Volume							462	630	441	582	503	469			446	465
PM Peak							4:00	4:00	3:00	4:00	12:00 PM	1:00			4:00	4:00
Volume							638	546	640	535	490	498			564	495
Comb Total	0		0		0		13817		14183		11524		0		13172	
ADT	ADT: 13,210		AADT: 13,210													

**Post Office**

<b>18-Nov</b>					<b>22-Nov</b>				
<b>Time</b>	<b>Right Out</b>	<b>Left Out</b>	<b>Right In</b>	<b>Left In</b>	<b>Time</b>	<b>Right Out</b>	<b>Left Out</b>	<b>Right In</b>	<b>Left In</b>
<b>11:00</b>	6	4	6	5	<b>4:00</b>	3	0	1	3
<b>11:15</b>	8	2	7	2	<b>4:15</b>	4	1	2	2
<b>11:30</b>	4	5	5	5	<b>4:30</b>	0	2	2	0
<b>11:45</b>	6	8	6	6	<b>4:45</b>	2	1	3	2
<b>12:00</b>	2	6	3	5	<b>5:00</b>	3	2	0	1
<b>12:15</b>	2	10	7	5	<b>5:15</b>	2	0	2	0
<b>12:30</b>	3	5	4	2	<b>5:30</b>	1	1	1	1
<b>12:45</b>	9	14	9	5	<b>5:45</b>	0	0	0	0

# Post Office

18-Nov					22-Nov				
Time	Right Out	Left Out	Right In	Left In	Time	Right Out	Left Out	Right In	Left In
11:00	0	0	0	0	4:00	0	0	0	0
11:15	0	0	0	0	4:15	1	0	0	0
11:30	0	0	0	0	4:30	0	0	0	0
11:45	0	0	0	0	4:45	0	1	0	0
12:00	0	0	0	0	5:00	0	0	0	0
12:15	1	0	0	1	5:15	0	0	0	0
12:30	0	0	0	0	5:30	2	1	0	0
12:45	1	1	0	0	5:45	2	0	0	0

# Accurate Counts

978-664-2565

N/S Street : Pope Rd / Chestnut St

E/W Street : Washington Street

City/State : Holliston, MA

Weather : Cloudy

File Name : 95480001

Site Code : 95480001

Start Date : 4/27/2023

Page No : 1

## Groups Printed- Cars - Trucks

	Pope Rd From North				Washington St From East				Driveway From Southeast				Chestnut St From South				Washington St From West				
Start Time	Left	Bear Left	Thru	Right	Hard Left	Left	Thru	Right	Hard Left	Bear Left	Bear Right	Hard Right	Left	Thru	Right	Hard Right	Left	Thru	Bear Right	Right	Int. Total
04:00 PM	0	0	0	4	0	1	160	1	0	1	0	0	2	0	2	0	3	146	0	1	321
04:15 PM	1	0	0	1	0	2	157	1	0	0	0	0	0	0	1	0	0	132	0	1	296
04:30 PM	0	0	0	2	0	1	172	1	0	0	0	0	0	0	1	0	1	139	0	0	317
04:45 PM	2	0	0	3	0	3	166	1	0	0	0	0	0	0	0	0	0	142	0	1	318
Total	3	0	0	10	0	7	655	4	0	1	0	0	2	0	4	0	4	559	0	3	1252
05:00 PM	1	0	0	1	0	3	152	1	0	0	0	0	1	0	1	0	0	155	0	1	316
05:15 PM	0	0	0	1	0	1	190	0	0	0	0	0	0	0	3	0	0	139	0	1	335
05:30 PM	0	0	0	1	0	1	165	0	0	0	0	0	0	0	1	0	0	132	0	0	300
05:45 PM	0	0	0	0	0	1	144	0	0	0	0	0	2	0	1	0	1	100	0	2	251
Total	1	0	0	3	0	6	651	1	0	0	0	0	3	0	6	0	1	526	0	4	1202
Grand Total	4	0	0	13	0	13	1306	5	0	1	0	0	5	0	10	0	5	1085	0	7	2454
Apprch %	23.5	0	0	76.5	0	1	98.6	0.4	0	100	0	0	33.3	0	66.7	0	0.5	98.9	0	0.6	
Total %	0.2	0	0	0.5	0	0.5	53.2	0.2	0	0	0	0	0.2	0	0.4	0	0.2	44.2	0	0.3	
Cars	3	0	0	13	0	13	1295	4	0	1	0	0	5	0	10	0	5	1077	0	7	2433
% Cars	75	0	0	100	0	100	99.2	80	0	100	0	0	100	0	100	0	100	99.3	0	100	99.1
Trucks	1	0	0	0	0	0	11	1	0	0	0	0	0	0	0	0	0	8	0	0	21
% Trucks	25	0	0	0	0	0	0.8	20	0	0	0	0	0	0	0	0	0	0.7	0	0	0.9

	Pope Rd From North					Washington St From East					Driveway From Southeast					Chestnut St From South					Washington St From West					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:30 PM																										
04:30 PM	0	0	0	2	2	0	1	172	1	174	0	0	0	0	0	0	0	1	0	1	1	139	0	0	140	317
04:45 PM	2	0	0	3	5	0	3	166	1	170	0	0	0	0	0	0	0	0	0	0	0	142	0	1	143	318
05:00 PM	1	0	0	1	2	0	3	152	1	156	0	0	0	0	0	1	0	1	0	2	0	155	0	1	156	316
05:15 PM	0	0	0	1	1	0	1	190	0	191	0	0	0	0	0	0	0	3	0	3	0	139	0	1	140	335
Total Volume	3	0	0	7	10	0	8	680	3	691	0	0	0	0	0	1	0	5	0	6	1	575	0	3	579	1286
% App. Total	30	0	0	70		0	1.2	98.4	0.4		0	0	0	0		16.7	0	83.3	0		0.2	99.3	0	0.5		
PHF	.375	.000	.000	.583	.500	.000	.667	.895	.750	.904	.000	.000	.000	.000	.000	.250	.000	.417	.000	.500	.250	.927	.000	.750	.928	.960
Cars	2	0	0	7	9	0	8	675	2	685	0	0	0	0	0	1	0	5	0	6	1	573	0	3	577	1277
% Cars	66.7	0	0	100	90.0	0	100	99.3	66.7	99.1	0	0	0	0	0	100	0	100	0	100	100	99.7	0	100	99.7	99.3
Trucks	1	0	0	0	1	0	0	5	1	6	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	9
% Trucks	33.3	0	0	0	10.0	0	0	0.7	33.3	0.9	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0.3	0.7

# Accurate Counts

978-664-2565

N/S Street : Pope Rd / Chestnut St

E/W Street : Washington Street

City/State : Holliston, MA

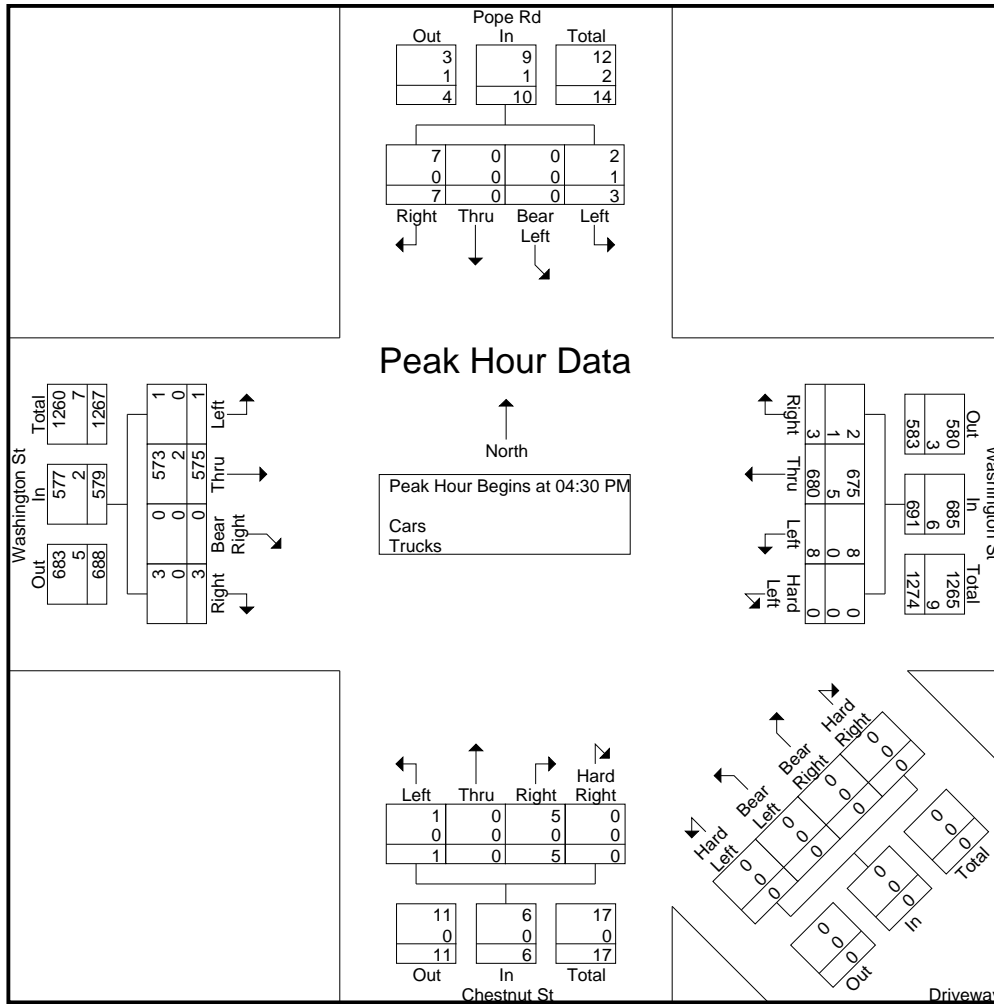
Weather : Cloudy

File Name : 95480001

Site Code : 95480001

Start Date : 4/27/2023

Page No : 2



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

Peak Hour for Each Approach Begins at:

	04:00 PM					04:30 PM					04:00 PM					05:00 PM					04:30 PM				
+0 mins.	0	0	0	4	4	0	1	172	1	174	0	1	0	0	1	1	0	1	0	2	1	139	0	0	140
+15 mins.	1	0	0	1	2	0	3	166	1	170	0	0	0	0	0	0	0	3	0	3	0	142	0	1	143
+30 mins.	0	0	0	2	2	0	3	152	1	156	0	0	0	0	0	0	0	1	0	1	0	155	0	1	156
+45 mins.	2	0	0	3	5	0	1	190	0	191	0	0	0	0	0	2	0	1	0	3	0	139	0	1	140
Total Volume	3	0	0	10	13	0	8	680	3	691	0	1	0	0	1	3	0	6	0	9	1	575	0	3	579
% App. Total	23.1	0	0	76.9		0	1.2	98.4	0.4		0	100	0	0		33.3	0	66.7	0		0.2	99.3	0	0.5	
PHF	.375	.000	.000	.625	.650	.000	.667	.895	.750	.904	.000	.250	.000	.000	.250	.375	.000	.500	.000	.750	.250	.927	.000	.750	.928
Cars	2	0	0	10	12	0	8	67	2	685	0	1	0	0	1	3	0	6	0	9	1	57	0	3	577
% Cars	66.7	0	0	100	92.3	0	100	99.3	66.7	99.1	0	100	0	0	100	10	0	10	0	100	10	99.7	0	10	99.7
Trucks	1	0	0	0	1	0	0	5	1	6	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
% Trucks	33.3	0	0	0	7.7	0	0	0.7	33.3	0.9	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0.3

978-664-2565

N/S Street : Pope Rd / Chestnut St

E/W Street : Washington Street

City/State : Holliston, MA

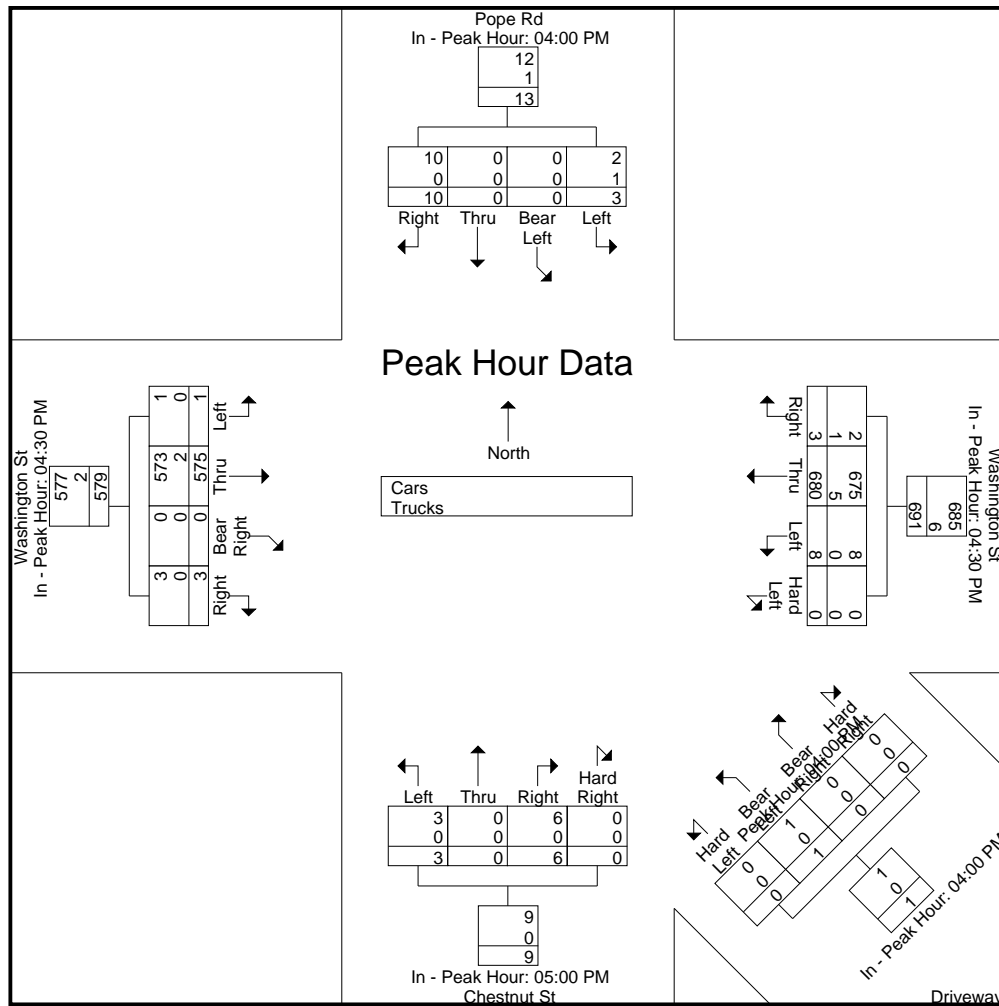
Weather : Cloudy

File Name : 95480001

Site Code : 95480001

Start Date : 4/27/2023

Page No : 3





# Accurate Counts

978-664-2565

N/S Street : Pope Rd / Chestnut St

E/W Street : Washington Street

City/State : Holliston, MA

Weather : Cloudy

File Name : 95480001

Site Code : 95480001

Start Date : 4/27/2023

Page No : 4

## Groups Printed- Cars

	Pope Rd From North				Washington St From East				Driveway From Southeast				Chestnut St From South				Washington St From West				Int. Total
Start Time	Left	Bear Left	Thru	Right	Hard Left	Left	Thru	Right	Hard Left	Bear Left	Bear Right	Hard Right	Left	Thru	Right	Hard Right	Left	Thru	Bear Right	Right	
04:00 PM	0	0	0	4	0	1	157	1	0	1	0	0	2	0	2	0	3	145	0	1	317
04:15 PM	1	0	0	1	0	2	154	1	0	0	0	0	0	0	1	0	0	131	0	1	292
04:30 PM	0	0	0	2	0	1	171	0	0	0	0	0	0	0	1	0	1	138	0	0	314
04:45 PM	1	0	0	3	0	3	163	1	0	0	0	0	0	0	0	0	0	142	0	1	314
Total	2	0	0	10	0	7	645	3	0	1	0	0	2	0	4	0	4	556	0	3	1237
05:00 PM	1	0	0	1	0	3	151	1	0	0	0	0	1	0	1	0	0	154	0	1	314
05:15 PM	0	0	0	1	0	1	190	0	0	0	0	0	0	0	3	0	0	139	0	1	335
05:30 PM	0	0	0	1	0	1	165	0	0	0	0	0	0	0	1	0	0	130	0	0	298
05:45 PM	0	0	0	0	0	1	144	0	0	0	0	0	2	0	1	0	1	98	0	2	249
Total	1	0	0	3	0	6	650	1	0	0	0	0	3	0	6	0	1	521	0	4	1196
Grand Total	3	0	0	13	0	13	1295	4	0	1	0	0	5	0	10	0	5	1077	0	7	2433
Apprch %	18.8	0	0	81.2	0	1	98.7	0.3	0	100	0	0	33.3	0	66.7	0	0.5	98.9	0	0.6	
Total %	0.1	0	0	0.5	0	0.5	53.2	0.2	0	0	0	0	0.2	0	0.4	0	0.2	44.3	0	0.3	

	Pope Rd From North					Washington St From East					Driveway From Southeast					Chestnut St From South					Washington St From West					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:30 PM																										
04:30 PM	0	0	0	2	2	0	1	171	0	172	0	0	0	0	0	0	0	1	0	1	1	138	0	0	139	314
04:45 PM	1	0	0	3	4	0	3	163	1	167	0	0	0	0	0	0	0	0	0	0	0	142	0	1	143	314
05:00 PM	1	0	0	1	2	0	3	151	1	155	0	0	0	0	0	1	0	1	0	2	0	154	0	1	155	314
05:15 PM	0	0	0	1	1	0	1	190	0	191	0	0	0	0	0	0	0	3	0	3	0	139	0	1	140	335
Total Volume	2	0	0	7	9	0	8	675	2	685	0	0	0	0	0	1	0	5	0	6	1	573	0	3	577	1277
% App. Total	22.2	0	0	77.8		0	1.2	98.5	0.3		0	0	0	0		16.7	0	83.3	0		0.2	99.3	0	0.5		
PHF	.500	.000	.000	.583	.563	.000	.667	.888	.500	.897	.000	.000	.000	.000	.000	.250	.000	.417	.000	.500	.250	.930	.000	.750	.931	.953

# Accurate Counts

978-664-2565

N/S Street : Pope Rd / Chestnut St

E/W Street : Washington Street

City/State : Holliston, MA

Weather : Cloudy

File Name : 95480001

Site Code : 95480001

Start Date : 4/27/2023

Page No : 7

## Groups Printed- Trucks

	Pope Rd From North					Washington St From East					Driveway From Southeast					Chestnut St From South					Washington St From West					
Start Time	Left	Bear Left	Thru	Right		Hard Left	Left	Thru	Right		Hard Left	Bear Left	Bear Right	Hard Right		Left	Thru	Right	Hard Right		Left	Thru	Bear Right	Right		Int. Total
04:00 PM	0	0	0	0		0	0	3	0		0	0	0	0		0	0	0	0		0	1	0	0		4
04:15 PM	0	0	0	0		0	0	3	0		0	0	0	0		0	0	0	0		0	1	0	0		4
04:30 PM	0	0	0	0		0	0	1	1		0	0	0	0		0	0	0	0		0	1	0	0		3
04:45 PM	1	0	0	0		0	0	3	0		0	0	0	0		0	0	0	0		0	0	0	0		4
Total	1	0	0	0		0	0	10	1		0	0	0	0		0	0	0	0		0	3	0	0		15
05:00 PM	0	0	0	0		0	0	1	0		0	0	0	0		0	0	0	0		0	1	0	0		2
05:15 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0
05:30 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	2	0	0		2
05:45 PM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	2	0	0		2
Total	0	0	0	0		0	0	1	0		0	0	0	0		0	0	0	0		0	5	0	0		6
Grand Total	1	0	0	0		0	0	11	1		0	0	0	0		0	0	0	0		0	8	0	0		21
Apprch %	100	0	0	0		0	0	91.7	8.3		0	0	0	0		0	0	0	0		0	100	0	0		
Total %	4.8	0	0	0		0	0	52.4	4.8		0	0	0	0		0	0	0	0		0	38.1	0	0		

	Pope Rd From North					Washington St From East					Driveway From Southeast					Chestnut St From South					Washington St From West						
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																											
Peak Hour for Entire Intersection Begins at 04:00 PM																											
04:00 PM	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	4
04:15 PM	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	4
04:30 PM	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3	
04:45 PM	1	0	0	0	1	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Total Volume	1	0	0	0	1	0	0	10	1	11	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	15	
% App. Total	100	0	0	0		0	0	90.9	9.1		0	0	0	0		0	0	0	0		0	100	0	0			
PHF	.250	.000	.000	.000	.250	.000	.000	.833	.250	.917	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.750	.000	.000	.750	.938	

# Accurate Counts

978-664-2565

N/S Street : Pope Rd / Chestnut St

E/W Street : Washington Street

City/State : Holliston, MA

Weather : Cloudy

File Name : 954800S1

Site Code : 95480001

Start Date : 4/29/2023

Page No : 1

## Groups Printed- Cars - Trucks

	Pope Rd From North				Washington St From East				Driveway From Southeast				Chestnut St From South				Washington St From West				Int. Total
Start Time	Left	Bear Left	Thru	Right	Hard Left	Left	Thru	Right	Hard Left	Bear Left	Bear Right	Hard Right	Left	Thru	Right	Hard Right	Left	Thru	Bear Right	Right	
11:00 AM	0	0	0	0	0	1	136	0	0	0	0	0	2	0	0	0	2	118	0	0	259
11:15 AM	3	0	0	1	0	1	127	0	0	0	0	0	0	0	0	0	1	135	0	1	269
11:30 AM	1	0	0	0	0	1	124	2	0	0	0	0	1	0	0	0	0	108	0	0	237
11:45 AM	1	0	0	1	0	2	139	1	0	0	0	0	0	0	0	0	0	116	0	1	261
Total	5	0	0	2	0	5	526	3	0	0	0	0	3	0	0	0	3	477	0	2	1026
12:00 PM	0	0	0	2	0	0	107	0	0	0	0	0	1	0	1	0	1	110	0	1	223
12:15 PM	0	0	0	1	0	3	129	0	0	0	0	0	1	0	1	0	0	119	0	1	255
12:30 PM	0	0	0	1	0	0	130	1	0	0	0	0	0	0	2	0	0	145	0	1	280
12:45 PM	0	0	0	2	0	3	148	0	0	0	0	0	1	0	2	0	1	107	0	1	265
Total	0	0	0	6	0	6	514	1	0	0	0	0	3	0	6	0	2	481	0	4	1023
01:00 PM	0	0	0	0	0	2	127	1	0	0	0	0	1	0	2	0	2	135	0	1	271
01:15 PM	1	0	0	1	0	3	119	0	0	0	0	0	2	0	3	0	1	121	0	2	253
01:30 PM	0	0	0	0	0	2	130	0	0	0	0	0	2	0	6	0	0	124	0	2	266
01:45 PM	0	0	0	0	0	0	118	0	0	0	0	0	0	0	1	0	0	118	0	0	237
Total	1	0	0	1	0	7	494	1	0	0	0	0	5	0	12	0	3	498	0	5	1027
Grand Total	6	0	0	9	0	18	1534	5	0	0	0	0	11	0	18	0	8	1456	0	11	3076
Apprch %	40	0	0	60	0	1.2	98.5	0.3	0	0	0	0	37.9	0	62.1	0	0.5	98.7	0	0.7	
Total %	0.2	0	0	0.3	0	0.6	49.9	0.2	0	0	0	0	0.4	0	0.6	0	0.3	47.3	0	0.4	
Cars	6	0	0	9	0	18	1530	5	0	0	0	0	11	0	18	0	8	1451	0	11	3067
% Cars	100	0	0	100	0	100	99.7	100	0	0	0	0	100	0	100	0	100	99.7	0	100	99.7
Trucks	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	5	0	0	9
% Trucks	0	0	0	0	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0.3

	Pope Rd From North					Washington St From East					Driveway From Southeast					Chestnut St From South					Washington St From West					Int. Total
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 12:15 PM																										
12:15 PM	0	0	0	1	1	0	3	129	0	132	0	0	0	0	0	1	0	1	0	2	0	119	0	1	120	255
12:30 PM	0	0	0	1	1	0	0	130	1	131	0	0	0	0	0	0	0	2	0	2	0	145	0	1	146	280
12:45 PM	0	0	0	2	2	0	3	148	0	151	0	0	0	0	0	1	0	2	0	3	1	107	0	1	109	265
01:00 PM	0	0	0	0	0	0	2	127	1	130	0	0	0	0	0	1	0	2	0	3	2	135	0	1	138	271
Total Volume	0	0	0	4	4	0	8	534	2	544	0	0	0	0	0	3	0	7	0	10	3	506	0	4	513	1071
% App. Total	0	0	0	100		0	1.5	98.2	0.4		0	0	0	0		30	0	70	0		0.6	98.6	0	0.8		
PHF	.000	.000	.000	.500	.500	.000	.667	.902	.500	.901	.000	.000	.000	.000	.000	.750	.000	.875	.000	.833	.375	.872	.000	1.0	.878	.956
Cars	0	0	0	4	4	0	8	533	2	543	0	0	0	0	0	3	0	7	0	10	3	504	0	4	511	1068
% Cars	0	0	0	100	100	0	100	99.8	100	99.8	0	0	0	0	0	100	0	100	0	100	100	99.6	0	100	99.6	99.7
Trucks	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	3
% Trucks	0	0	0	0	0	0	0	0.2	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0.4	0.3

# Accurate Counts

978-664-2565

N/S Street : Pope Rd / Chestnut St

E/W Street : Washington Street

City/State : Holliston, MA

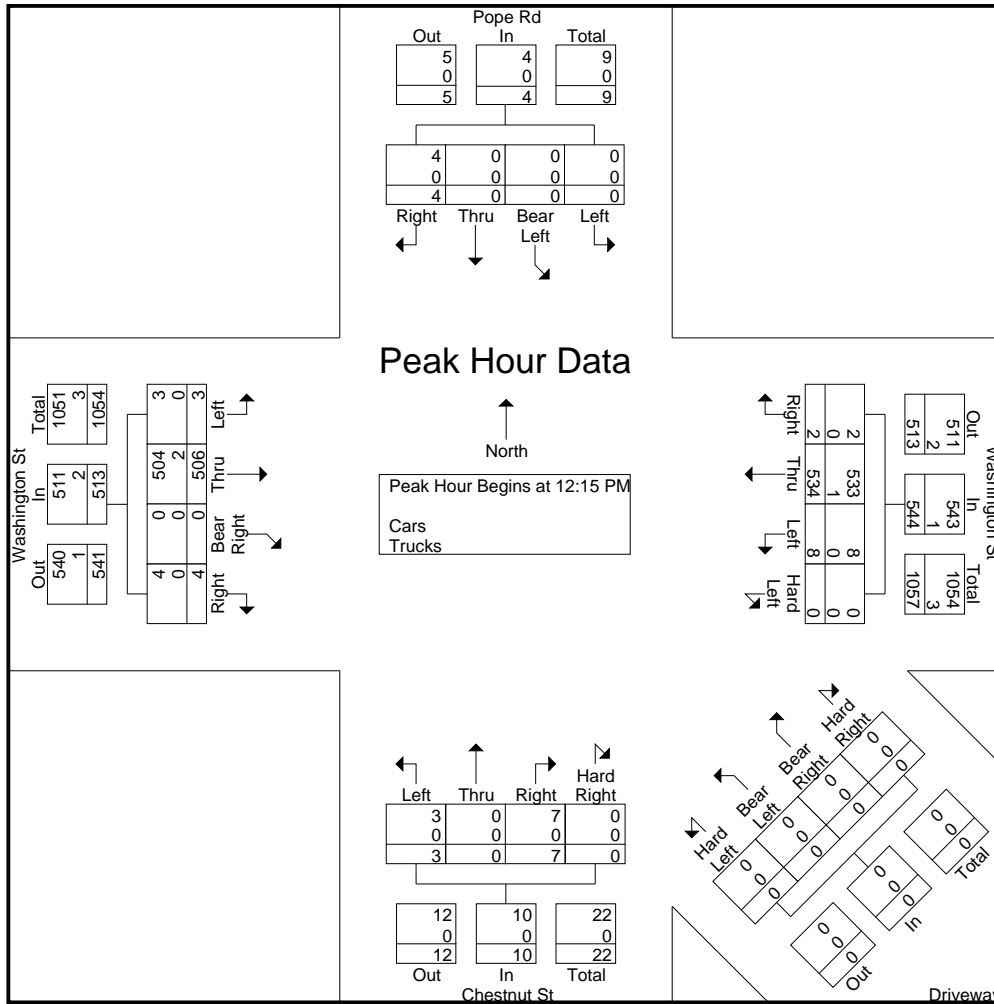
Weather : Cloudy

File Name : 954800S1

Site Code : 95480001

Start Date : 4/29/2023

Page No : 2



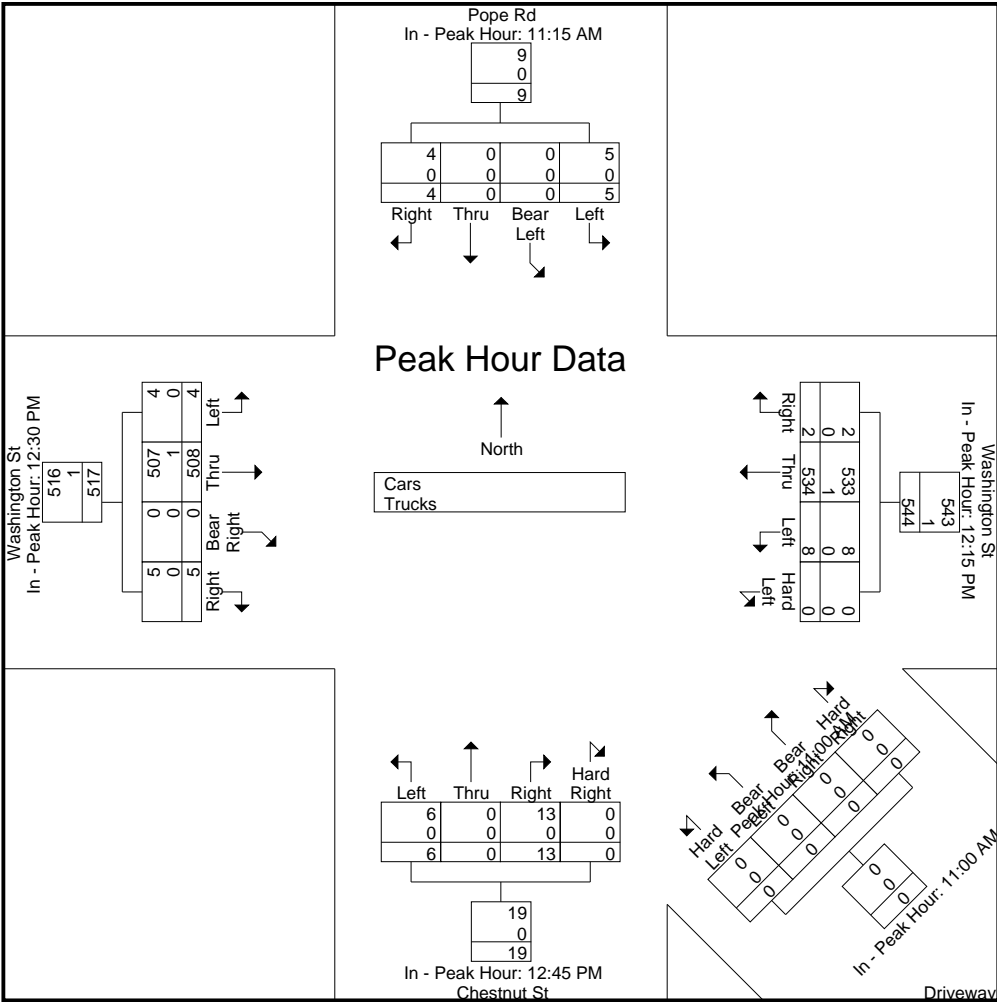
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	11:15 AM					12:15 PM					11:00 AM					12:45 PM					12:30 PM				
+0 mins.	3	0	0	1	4	0	3	129	0	132	0	0	0	0	0	1	0	2	0	3	0	145	0	1	146
+15 mins.	1	0	0	0	1	0	0	130	1	131	0	0	0	0	0	1	0	2	0	3	1	107	0	1	109
+30 mins.	1	0	0	1	2	0	3	148	0	151	0	0	0	0	0	2	0	3	0	5	2	135	0	1	138
+45 mins.	0	0	0	2	2	0	2	127	1	130	0	0	0	0	0	2	0	6	0	8	1	121	0	2	124
Total Volume	5	0	0	4	9	0	8	534	2	544	0	0	0	0	0	6	0	13	0	19	4	508	0	5	517
% App. Total	55.6	0	0	44.4		0	1.5	98.2	0.4		0	0	0	0		31.6	0	68.4	0		0.8	98.3	0	1	
PHF	.417	.000	.000	.500	.563	.000	.667	.902	.500	.901	.000	.000	.000	.000	.000	.750	.000	.542	.000	.594	.500	.876	.000	.625	.885
Cars	5	0	0	4	9	0	8	53	2	543	0	0	0	0	0	6	0	13	0	19	4	50	0	5	516
% Cars	10	0	0	10	100	0	10	99.	10	99.8	0	0	0	0	0	10	0	10	0	100	10	99.	0	10	99.8
Trucks	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
% Trucks	0	0	0	0	0	0	0	0.2	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0.2

N/S Street : Pope Rd / Chestnut St  
E/W Street : Washington Street  
City/State : Holliston, MA  
Weather : Cloudy

File Name : 954800S1  
Site Code : 95480001  
Start Date : 4/29/2023  
Page No : 3



# Accurate Counts

978-664-2565

N/S Street : Pope Rd / Chestnut St

E/W Street : Washington Street

City/State : Holliston, MA

Weather : Cloudy

File Name : 954800S1

Site Code : 95480001

Start Date : 4/29/2023

Page No : 4

## Groups Printed- Cars

	Pope Rd From North				Washington St From East				Driveway From Southeast				Chestnut St From South				Washington St From West				Int. Total
Start Time	Left	Bear Left	Thru	Right	Hard Left	Left	Thru	Right	Hard Left	Bear Left	Bear Right	Hard Right	Left	Thru	Right	Hard Right	Left	Thru	Bear Right	Right	
11:00 AM	0	0	0	0	0	1	136	0	0	0	0	0	2	0	0	0	2	118	0	0	259
11:15 AM	3	0	0	1	0	1	126	0	0	0	0	0	0	0	0	0	1	135	0	1	268
11:30 AM	1	0	0	0	0	1	123	2	0	0	0	0	1	0	0	0	0	107	0	0	235
11:45 AM	1	0	0	1	0	2	139	1	0	0	0	0	0	0	0	0	0	115	0	1	260
Total	5	0	0	2	0	5	524	3	0	0	0	0	3	0	0	0	3	475	0	2	1022
12:00 PM	0	0	0	2	0	0	106	0	0	0	0	0	1	0	1	0	1	110	0	1	222
12:15 PM	0	0	0	1	0	3	128	0	0	0	0	0	1	0	1	0	0	118	0	1	253
12:30 PM	0	0	0	1	0	0	130	1	0	0	0	0	0	0	2	0	0	145	0	1	280
12:45 PM	0	0	0	2	0	3	148	0	0	0	0	0	1	0	2	0	1	107	0	1	265
Total	0	0	0	6	0	6	512	1	0	0	0	0	3	0	6	0	2	480	0	4	1020
01:00 PM	0	0	0	0	0	2	127	1	0	0	0	0	1	0	2	0	2	134	0	1	270
01:15 PM	1	0	0	1	0	3	119	0	0	0	0	0	2	0	3	0	1	121	0	2	253
01:30 PM	0	0	0	0	0	2	130	0	0	0	0	0	2	0	6	0	0	123	0	2	265
01:45 PM	0	0	0	0	0	0	118	0	0	0	0	0	0	0	1	0	0	118	0	0	237
Total	1	0	0	1	0	7	494	1	0	0	0	0	5	0	12	0	3	496	0	5	1025
Grand Total	6	0	0	9	0	18	1530	5	0	0	0	0	11	0	18	0	8	1451	0	11	3067
Apprch %	40	0	0	60	0	1.2	98.5	0.3	0	0	0	0	37.9	0	62.1	0	0.5	98.7	0	0.7	
Total %	0.2	0	0	0.3	0	0.6	49.9	0.2	0	0	0	0	0.4	0	0.6	0	0.3	47.3	0	0.4	

	Pope Rd From North					Washington St From East					Driveway From Southeast					Chestnut St From South					Washington St From West					Int. Total
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 12:15 PM																										
12:15 PM	0	0	0	1	1	0	<b>3</b>	128	0	131	0	0	0	0	0	<b>1</b>	0	1	0	2	0	118	0	<b>1</b>	119	253
12:30 PM	0	0	0	1	1	0	0	130	<b>1</b>	131	0	0	0	0	0	0	0	<b>2</b>	0	2	0	<b>145</b>	0	1	<b>146</b>	<b>280</b>
12:45 PM	0	0	0	<b>2</b>	<b>2</b>	0	3	<b>148</b>	0	<b>151</b>	0	0	0	0	0	1	0	2	0	<b>3</b>	1	107	0	1	109	265
01:00 PM	0	0	0	0	0	0	2	127	1	130	0	0	0	0	0	1	0	2	0	3	<b>2</b>	134	0	1	137	270
Total Volume	0	0	0	4	4	0	8	533	2	543	0	0	0	0	0	3	0	7	0	10	3	504	0	4	511	1068
% App. Total	0	0	0	100		0	1.5	98.2	0.4		0	0	0	0		30	0	70	0		0.6	98.6	0	0.8		
PHF	.000	.000	.000	.500	.500	.000	.667	.900	.500	.899	.000	.000	.000	.000	.000	.750	.000	.875	.000	.833	.375	.869	.000	1.0 0	.875	.954

# Accurate Counts

978-664-2565

N/S Street : Pope Rd / Chestnut St

E/W Street : Washington Street

City/State : Holliston, MA

Weather : Cloudy

File Name : 954800S1

Site Code : 95480001

Start Date : 4/29/2023

Page No : 7

## Groups Printed- Trucks

	Pope Rd From North				Washington St From East				Driveway From Southeast				Chestnut St From South				Washington St From West				Int. Total
Start Time	Left	Bear Left	Thru	Right	Hard Left	Left	Thru	Right	Hard Left	Bear Left	Bear Right	Hard Right	Left	Thru	Right	Hard Right	Left	Thru	Bear Right	Right	
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	4
12:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	3
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
Grand Total	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	5	0	0	9
Apprch %	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	0	44.4	0	0	0	0	0	0	0	0	0	0	55.6	0	0	

	Pope Rd From North					Washington St From East					Driveway From Southeast					Chestnut St From South					Washington St From West					Int. Total
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 11:30 AM																										
11:30 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2
11:45 AM	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	1
12:00 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2
Total Volume	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	6
% App. Total	0	0	0	0		0	0	100	0		0	0	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.750	.000	.750	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.750	.000	.000	.750	.750

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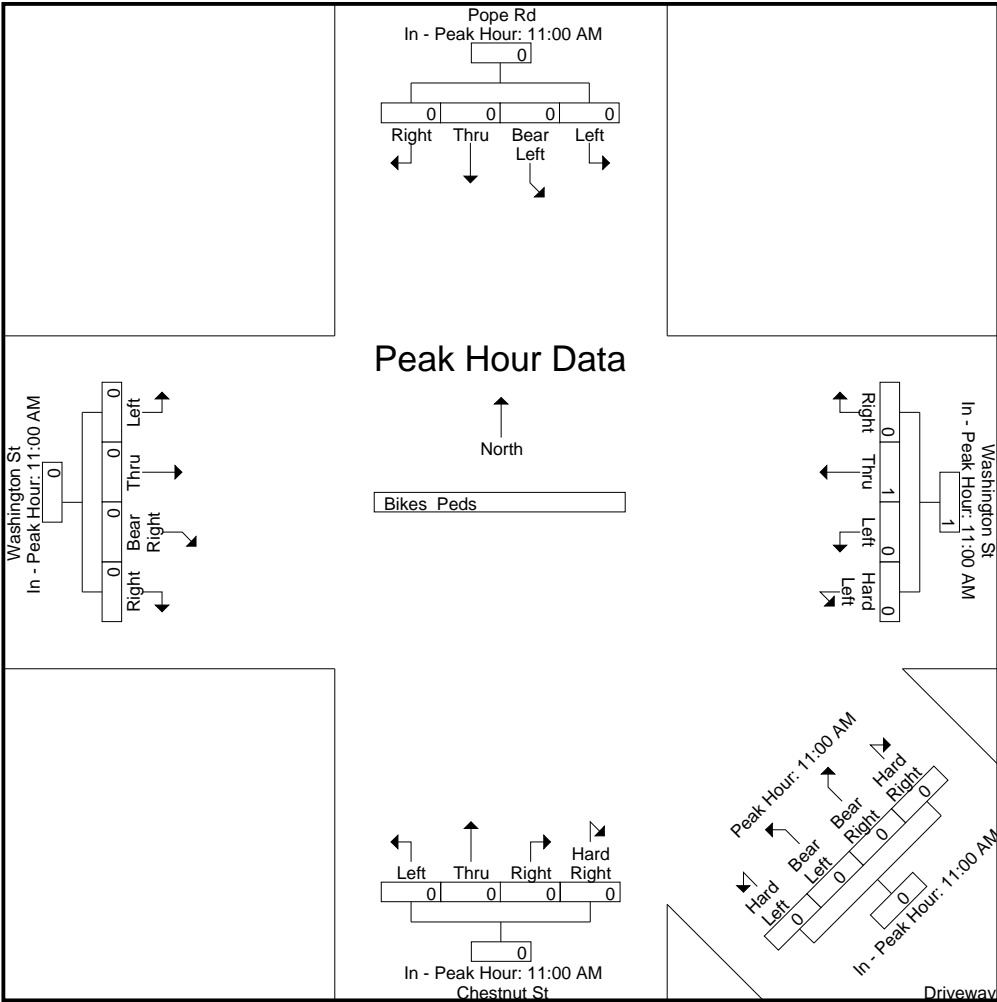
	Pope Rd From North					Washington St From East					Driveway From Southeast					Chestnut St From South					Washington St From West							
Start Time	Left	Bear Left	Thru	Right	Peds	Hard Left	Left	Thru	Right	Peds	Hard Left	Bear Left	Bear Right	Hard Right	Peds	Left	Thru	Right	Hard Right	Peds	Left	Thru	Bear Right	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
11:00 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
11:15 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
11:30 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
11:45 AM	0	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	1	1
Total	0	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	1	1
12:00 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
12:15 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
12:30 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
12:45 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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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
Grand Total	0	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	1	1
Apprch %	0	0	0	0		0	0	100	0		0	0	0	0		0	0	0	0		0	0	0	0				
Total %	0	0	0	0		0	0	100	0		0	0	0	0		0	0	0	0		0	0	0	0		0	100	

[illegible]



N/S Street : Pope Rd / Chestnut St  
E/W Street : Washington Street  
City/State : Holliston, MA  
Weather : Cloudy

File Name : 954800S1  
Site Code : 95480001  
Start Date : 4/29/2023  
Page No : 12



## SEASONAL ADJUSTMENT DATA

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Massachusetts Highway Department  
Statewide Traffic Data Collection  
2019 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
<b>R1</b>	1.22	1.14	1.12	1.06	1.00	0.96	0.87	0.85	0.96	0.99	1.04	1.12	0.85
<b>R2</b>	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
<b>R3</b>	1.15	1.06	1.07	1.00	0.89	0.88	0.89	0.89	0.95	0.92	1.02	1.01	0.97
<b>R4-R7</b>	1.09	1.09	1.11	1.02	0.96	0.92	0.89	0.89	0.99	0.98	1.09	1.13	0.98
<b>U1-Boston</b>	1.03	1.01	0.98	0.94	0.94	0.92	0.95	0.93	0.94	0.94	0.97	1.04	0.96
<b>U1-Essex</b>	1.09	1.06	1.03	0.99	0.94	0.90	0.88	0.86	0.93	0.94	0.99	1.06	0.93
<b>U1-Southeast</b>	1.06	1.05	1.01	0.97	0.95	0.93	0.93	0.90	0.94	0.94	0.98	1.04	0.98
<b>U1-West</b>	1.19	1.14	1.09	0.95	0.92	0.89	0.89	0.86	0.91	0.95	0.97	1.07	0.84
<b>U1-Worcester</b>	1.02	1.04	0.97	0.94	0.93	0.91	0.95	0.91	0.93	0.92	0.95	1.10	0.88
<b>U2</b>	1.01	1.00	0.94	0.93	0.91	0.89	0.93	0.90	0.90	0.91	0.94	1.02	0.99
<b>U3</b>	1.06	1.03	0.98	0.94	0.93	0.91	0.95	0.91	0.92	0.93	0.97	1.00	0.98
<b>U4-U7</b>	1.01	1.00	0.95	0.92	0.88	0.86	0.92	0.91	0.92	0.94	0.99	1.04	0.99
<b>Rec - East</b>	1.04	1.16	1.12	0.98	0.92	0.88	0.77	0.81	0.94	1.02	1.08	1.12	0.99
<b>Rec - West</b>	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.98

Round off:

0-999 = 10

>1000 = 100

U = Urban

R = Rural

1 - Interstate

2 - Freeway and Expressway

3 - Other Principal Arterial

4 - Minor Arterial

5 - Major Collector

6 - Minor Collector

7 - Local Road and Street

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

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

## PUBLIC TRANSPORTATION SCHEDULES



6

ROUTE 6 (Monday-Friday Service)

6

# ROUTE 6: Holliston/Milford Line



MetroWest Regional Transportation Authority

## Fare Information

	Cash //	Charlie Card
Adult:	\$1.50 //	\$1.25
Senior (65 years of age or older*):	\$0.75 //	\$0.70
Individuals with Disabilities:	\$0.75 //	\$0.70
Student with valid student ID:	\$1.00 //	N/A
Children under 6 (with adult):	Free	
Active Duty men & women in uniform:	Free	

\*To receive the senior discount, a photo ID with birth date listed must be presented. MBTA Access Card, Medicare Card, or MWRTA TAP Pass are accepted as proof of eligibility.

Children under 12 years old may not ride unaccompanied.

Charlie Cards are available free of charge at the MWRTA Blandin Hub or on the bus. Value can be added to existing cards onboard or at an MBTA kiosk.

## Transfers / Connections

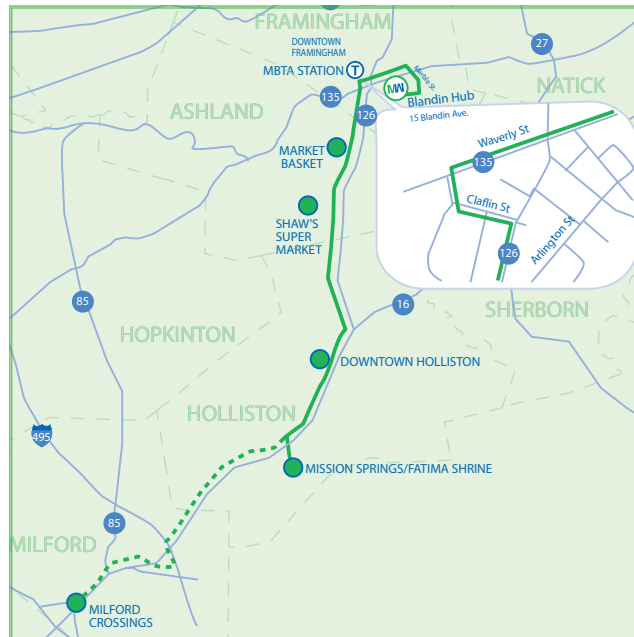
Transfer slips are available on all MWRTA buses and are good for one transfer going in the same direction within the MWRTA bus system only. Transfers are not compatible with the MBTA system. One transfer per paid fare is issued upon request, and must be presented to the next driver within 90 minutes.

Riders can connect to the MBTA Commuter Rails in Downtown Framingham, West Natick, Natick Center, Ashland, and Southborough, as well as the MBTA Green Line at Woodland.

For MBTA schedule and service information, please call (617) 222-3200.

**There is no service provided on the following holidays:**

New Year's Day, Patriot's Day, Memorial Day,  
Independence Day, Thanksgiving Day, Christmas Day.



## MWRTA Customer Service:

Ph: (508) 935-2222

Central Hub: 15 Blandin Ave.

Framingham, MA 01702

[www.mwrtar.com](http://www.mwrtar.com)



Follow us: @MWRTA



Download the MWRTA  
CATCH App on Apple  
& Google Play stores!



Scan QR code with  
your phone to go  
to the MWRTA  
website.

## AM

## PM

OUTBOUND	Blandin Hub (15 Blandin Ave.)	5:50	7:14	8:30	9:40	10:52	12:04	1:10	2:00	3:30	4:48	6:08	7:12
	Framingham MBTA	5:56	7:18	8:34	9:43	10:55	12:08	1:14	2:04	3:34	4:53	6:12	7:17
	Winthrop / Hollis Sts.	5:58	7:20	8:36	9:45	10:57	12:10	1:16	2:06	3:36	4:55	6:14	7:19
	Market Basket	~	7:23	8:40	9:49	11:01	12:14	1:20	2:10	3:42	5:00	6:18	7:24
	Shaw's	~	7:26	8:44	9:53	11:05	12:17	1:24	2:15	3:47	5:05	6:22	7:28
	Washington St. at Cong. Church	6:08	7:33	8:50	9:59	11:11	12:24	1:30	2:22	3:53	5:12	6:28	7:34
	Milford Crossings	~	7:43	9:00	10:10	11:22	12:34	1:40	2:34	4:05	5:25	6:40	7:44
	Spruce St.	6:25	~	~	~	~	~	~	~	~	~	~	~
INBOUND	Milford Crossings	6:35	7:55	9:05	10:15	11:27	12:36	1:42	2:50	4:08	5:30	6:44	7:47
	Holliston Public Library	6:43	8:07	9:17	10:27	11:39	12:48	1:54	3:02	4:20	5:42	6:49	7:57
	Shaw's	~	8:13	9:23	10:33	11:45	12:54	2:00	3:08	4:28	5:50	6:54	8:03
	Market Basket	~	8:17	9:27	10:37	11:49	12:58	2:04	3:13	4:33	5:55	6:58	8:07
	Winthrop / Hollis Sts.	6:54	8:19	9:29	10:39	11:51	1:00	2:06	3:16	4:36	5:58	7:00	8:10
	Framingham MBTA	6:58	8:23	9:32	10:42	11:54	1:03	2:09	3:20	4:39	6:01	7:04	8:13
	Blandin Hub (15 Blandin Ave.)	7:04	8:28	9:35	10:46	11:58	1:07	2:15	3:25	4:43	6:05	7:07	8:18

### Scheduled Times

Scheduled times are only approximate; please wait for the MWRTA ten minutes in advance of scheduled times to assure not missing the bus. For up to the minute bus information call MWRTA at (508) 935 -2222 or visit [www.mwrt.com](http://www.mwrt.com) for GPS tracking.

The MWRTA uses the Flag Down System which allows buses to stop anywhere along their routes to pick up passengers, where it is safe to do so. Passengers can hail MWRTA buses by waving.

### Transfers

Route 6 passengers can make the following transfers:

Route 14 at Milford Crossings (Stop & Shop)

Route 4S & 5 at the Framingham MBTA station

Routes 4N, 4S, 5, 10, and 11 at the Blandin Hub.

Passengers may request a pick up at Mission Springs by calling (508) 935-2222.

\*Stop may NOT be serviced due to snow/ice.

## MASSDOT CRASH RATE WORKSHEETS

---



## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Holliston COUNT DATE : Nov-22

DISTRICT : 3 UNSIGNALIZED : ☒ SIGNALIZED : ☐

### ~ INTERSECTION DATA ~

MAJOR STREET : Route 16

MINOR STREET(S) : Post Office Driveway

**INTERSECTION  
DIAGRAM**  
(Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM) :	576	688		13		1,277

" K " FACTOR :

**0.090**

INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

**14,189**

TOTAL # OF CRASHES :

**0**

# OF YEARS :

**5**

AVERAGE # OF CRASHES PER YEAR ( A ) :

**0.00**

**CRASH RATE CALCULATION :**

**0.00**

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

Comments : Below Statewide and District Crash Rates

Project Title & Date : Proposed Car Wash



## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Holliston COUNT DATE : Apr-23

DISTRICT : 3 UNSIGNALIZED : ☒ SIGNALIZED : ☐

### ~ INTERSECTION DATA ~

MAJOR STREET : Route 16

MINOR STREET(S) : Pope Road

Chestnut Street

Private Driveway

**INTERSECTION  
DIAGRAM**  
(Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM) :	579	699	6	10		1,294

" K " FACTOR :

**0.090**

INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

**14,378**

TOTAL # OF CRASHES :

**4**

# OF YEARS :

**5**

AVERAGE # OF CRASHES PER YEAR ( A ) :

**0.80**

**CRASH RATE CALCULATION :**

**0.15**

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

Comments : Below Statewide and District Crash Rates

Project Title & Date: Proposed Car Wash

## VEHICLE SPEED DATA

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**Accurate Counts**  
978-664-2565

Location : Washington Street  
Location : West of Chestnut Street  
City/State: Holliston, MA  
Direction: EB

95480001

4/29/2023	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	Total
12:00 AM	0	0	0	0	4	23	13	3	1	0	0	0	0	44
1:00	0	0	0	0	3	7	4	1	1	0	0	0	0	16
2:00	0	0	0	0	1	6	2	2	2	0	0	0	0	13
3:00	0	0	0	0	1	2	4	2	1	0	0	0	0	10
4:00	0	0	1	0	2	10	4	2	0	1	0	0	0	20
5:00	0	0	0	0	7	16	18	9	2	0	0	0	0	52
6:00	0	0	0	3	15	55	38	15	3	2	0	0	0	131
7:00	1	0	2	2	31	65	56	22	2	1	0	1	1	184
8:00	0	2	3	4	36	129	82	18	1	0	0	0	1	276
9:00	5	7	7	15	63	164	127	16	3	0	0	0	0	407
10:00	0	2	3	14	110	208	107	15	1	0	0	0	0	460
11:00	1	0	6	20	111	200	115	14	2	0	0	0	0	469
12:00 PM	11	6	6	17	87	210	107	21	1	2	0	0	0	468
1:00	1	2	12	15	111	236	103	13	3	1	1	0	0	498
2:00	0	2	1	15	50	199	113	30	1	0	0	0	0	411
3:00	0	0	1	10	75	225	103	25	1	0	0	0	1	441
4:00	3	2	4	14	60	187	99	27	6	2	0	0	0	404
5:00	0	1	0	4	62	175	93	16	2	0	0	0	0	353
6:00	0	0	0	10	49	151	83	11	2	0	1	0	0	307
7:00	0	0	1	0	42	111	75	8	0	0	0	0	0	237
8:00	0	0	0	16	80	90	24	11	1	0	0	0	0	222
9:00	0	0	0	4	41	63	21	6	0	0	0	0	0	135
10:00	0	0	1	5	39	55	18	4	0	1	0	0	0	123
11:00	0	0	0	0	7	17	4	0	0	0	0	0	0	28
Total	22	24	48	168	1087	2604	1413	291	36	10	2	1	3	5709

Percentile	15th	50th	85th	95th
Speed	34	38	42	45
Mean Speed (Average)	37.9			
10 MPH Pace Speed	35-44			
Number in Pace	4010			
Percent in Pace	70.2%			
Number > 35 MPH	4360			
Percent > 35 MPH	76.4%			

Grand Total	93	138	308	811	3916	8687	4799	888	112	32	17	18	15	19834
Percentile				15th	50th	85th	95th							
Speed				33	38	42	45							
Mean Speed (Average)				37.6										
10 MPH Pace Speed				35-44										
Number in Pace				13468										
Percent in Pace				67.9%										
Number > 35 MPH				14568										
Percent > 35 MPH				73.4%										

**Accurate Counts**  
978-664-2565

Location : Washington Street  
Location : West of Chestnut Street  
City/State: Holliston, MA  
Direction: WB

95480001

4/29/2023	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	Total
12:00 AM	0	0	1	6	18	6	1	0	0	0	0	0	0	32
1:00	0	0	2	11	7	3	1	0	0	0	0	0	0	24
2:00	0	0	1	3	10	2	1	0	0	0	0	0	0	17
3:00	0	0	0	2	3	2	1	0	0	0	0	0	0	8
4:00	0	0	0	6	7	2	1	0	1	0	0	0	0	17
5:00	0	1	0	4	12	9	1	0	0	0	0	0	0	27
6:00	0	0	4	7	38	47	18	3	0	0	0	0	0	117
7:00	1	2	2	27	61	74	26	2	0	1	0	0	0	196
8:00	4	1	6	18	137	122	24	2	0	0	0	0	0	314
9:00	0	9	13	43	143	131	21	3	0	0	0	0	0	363
10:00	5	9	11	61	192	155	30	0	0	0	0	0	0	463
11:00	3	6	13	81	236	146	17	1	0	0	0	0	0	503
12:00 PM	0	19	15	68	231	129	24	4	0	0	0	0	0	490
1:00	0	1	8	60	183	198	27	6	0	0	0	0	0	483
2:00	0	5	12	53	220	146	23	2	0	0	0	0	0	461
3:00	0	2	3	40	173	158	41	3	1	0	0	0	0	421
4:00	2	6	5	45	143	177	38	4	0	0	0	0	0	420
5:00	4	1	4	31	164	154	26	2	0	0	0	0	0	386
6:00	0	0	4	21	141	138	20	2	0	0	0	0	0	326
7:00	1	2	1	42	114	66	10	2	0	0	0	0	0	238
8:00	0	0	5	57	88	40	7	1	0	0	0	0	0	198
9:00	0	2	3	49	56	27	4	1	1	0	0	0	0	143
10:00	0	1	5	46	60	29	2	0	0	0	0	0	0	143
11:00	0	0	0	9	11	3	2	0	0	0	0	0	0	25
Total	20	67	118	790	2448	1964	366	38	3	1	0	0	0	5815

Percentile	15th	50th	85th	95th
Speed	30	34	38	41
Mean Speed (Average)	33.8			
10 MPH Pace Speed	30-39			
Number in Pace	4389			
Percent in Pace	75.5%			
Number > 35 MPH	2372			
Percent > 35 MPH	40.8%			

Grand Total	97	263	647	3057	8199	6093	1210	116	6	1	0	0	1	19690
Percentile				15th	50th	85th	95th							
Speed				29	34	38	41							
Mean Speed (Average)				33.4										
10 MPH Pace Speed				30-39										
Number in Pace				14231										
Percent in Pace				72.3%										
Number > 35 MPH				7427										
Percent > 35 MPH				37.7%										

**Accurate Counts**  
978-664-2565

Location : Washington Street  
Location : West of Chestnut Street  
City/State: Holliston, MA  
Direction: Combined

95480001

4/29/2023	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	Total
12:00 AM	0	0	1	6	22	29	14	3	1	0	0	0	0	76
1:00	0	0	2	11	10	10	5	1	1	0	0	0	0	40
2:00	0	0	1	3	11	8	3	2	2	0	0	0	0	30
3:00	0	0	0	2	4	4	5	2	1	0	0	0	0	18
4:00	0	0	1	6	9	12	5	2	1	1	0	0	0	37
5:00	0	1	0	4	19	25	19	9	2	0	0	0	0	79
6:00	0	0	4	10	53	102	56	18	3	2	0	0	0	248
7:00	2	2	4	29	92	139	82	24	2	2	0	1	1	380
8:00	4	3	9	22	173	251	106	20	1	0	0	0	1	590
9:00	5	16	20	58	206	295	148	19	3	0	0	0	0	770
10:00	5	11	14	75	302	363	137	15	1	0	0	0	0	923
11:00	4	6	19	101	347	346	132	15	2	0	0	0	0	972
12:00 PM	11	25	21	85	318	339	131	25	1	2	0	0	0	958
1:00	1	3	20	75	294	434	130	19	3	1	1	0	0	981
2:00	0	7	13	68	270	345	136	32	1	0	0	0	0	872
3:00	0	2	4	50	248	383	144	28	2	0	0	0	1	862
4:00	5	8	9	59	203	364	137	31	6	2	0	0	0	824
5:00	4	2	4	35	226	329	119	18	2	0	0	0	0	739
6:00	0	0	4	31	190	289	103	13	2	0	1	0	0	633
7:00	1	2	2	42	156	177	85	10	0	0	0	0	0	475
8:00	0	0	5	73	168	130	31	12	1	0	0	0	0	420
9:00	0	2	3	53	97	90	25	7	1	0	0	0	0	278
10:00	0	1	6	51	99	84	20	4	0	1	0	0	0	266
11:00	0	0	0	9	18	20	6	0	0	0	0	0	0	53
Total	42	91	166	958	3535	4568	1779	329	39	11	2	1	3	11524

Percentile	15th	50th	85th	95th
Speed	31	36	41	44
Mean Speed (Average)	35.9			
10 MPH Pace Speed	30-39			
Number in Pace	8031			
Percent in Pace	69.7%			
Number > 35 MPH	6732			
Percent > 35 MPH	58.4%			

Grand Total	190	401	955	3868	12115	14780	6009	1004	118	33	17	18	16	39524
Percentile				15th	50th	85th	95th							
Speed				30	36	41	43							
Mean Speed (Average)				35.5										
10 MPH Pace Speed				30-39										
Number in Pace				26677										
Percent in Pace				67.5%										
Number > 35 MPH				21993										
Percent > 35 MPH				55.6%										

## GROWTH RATE DATA

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General Background Traffic Growth - Daily Traffic Volumes

CITY/TOWN	ROUTE/STREET	LOCATION	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Annual Growth
Holliston	Washington Street	East of Summer Street	19,300	19,368	19,659	20,893	21,023	22,179	19,653	19,908	20,127	20,409	20,491	0.47%
Holliston	Prentice Street	At Hopkinton Town Line	6,355	3,900	3,078	4,031	3,987	4,111	4,206	4,382	4,456	4,469	5,189	0.90%
														0.68%

## TRIP GENERATION DATA

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***Institute of Transportation Engineers (ITE)***  
***Trip Generation , 11th Edition***  
**Land Use Code (LUC) 947 - Self-Service Car Wash**

Average Vehicle Trips Ends vs: 1 Wash Stall  
Independent Variable (X): 2.000

**AVERAGE WEEKDAY DAILY**

$T = 108 * (X)$   
 $T = 108 * 2.000$   
 $T = 216.00$   
 $T = 216$  vehicle trips  
with 50% ( 108 vpd) entering and 50% ( 108 vpd) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$T = 5.54 * (X)$   
 $T = 5.54 * 2.000$   
 $T = 11.08$   
 $T = 11$  vehicle trips  
with 72% ( 6 vph) entering and 28% ( 5 vph) exiting.

**SATURDAY DAILY**

$T = 132.8 * (X)$   
 $T = 132.8 * 2.000$   
 $T = 265.60$   
 $T = 266$  vehicle trips  
with 50% ( 133 vpd) entering and 50% ( 133 vpd) exiting.

**SATURDAY MIDDAY PEAK HOUR OF GENERATOR**

$T = 15.25 * (X)$   
 $T = 15.25 * 2.000$   
 $T = 30.50$   
 $T = 31$  vehicle trips  
with 39% ( 16 vph) entering and 61% ( 15 vph) exiting.

***Institute of Transportation Engineers (ITE)***  
***Trip Generation , 11th Edition***  
**Land Use Code (LUC) 948 - Automated Car Wash**

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area  
Independent Variable (X): 3.300

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 14.20 * (X)$$

$$T = 14.20 * 3.300$$

$$T = 46.86$$

$$T = 47 \text{ vehicle trips}$$

with 39% ( 24 vph) entering and 61% ( 23 vph) exiting.

**SATURDAY MIDDAY PEAK HOUR OF GENERATOR**

$$T = 30.4 * (X)$$

$$T = 30.4 * 3.300$$

$$T = 100.32$$

$$T = 100 \text{ vehicle trips}$$

with 39% ( 50 vph) entering and 61% ( 50 vph) exiting.

## CAPACITY ANALYSIS

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2023 Existing Weekday Evening Peak Hour  
2023 Existing Saturday Midday Peak Hour  
2030 No-Build Weekday Evening Peak Hour  
2030 No-Build Saturday Midday Peak Hour  
2030 Build Weekday Evening Peak Hour  
2030 Build Saturday Midday Peak Hour







2023 Existing Weekday Evening Peak Hour

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2023 Existing Weekday Evening Peak Hour  
1: Route 16 & Post Office Driveway

07/24/2023

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	573	681	7	6	7
Future Vol, veh/h	3	573	681	7	6	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	70	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	90	90	67	67
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	651	757	8	9	10
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	765	0	-	0	1418	761
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	657	-
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	857	-	-	-	152	409
Stage 1	-	-	-	-	465	-
Stage 2	-	-	-	-	519	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	857	-	-	-	151	409
Mov Cap-2 Maneuver	-	-	-	-	151	-
Stage 1	-	-	-	-	463	-
Stage 2	-	-	-	-	519	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		21.5		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	857	-	-	-	151	409
HCM Lane V/C Ratio	0.004	-	-	-	0.059	0.026
HCM Control Delay (s)	9.2	0	-	-	30.3	14
HCM Lane LOS	A	A	-	-	D	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0.1

2023 Existing Weekday Evening Peak Hour  
2: Chestnut Street/Pope Road & Route 16

07/24/2023

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	575	3	8	680	3	1	0	5	3	0	7
Future Vol, veh/h	1	575	3	8	680	3	1	0	5	3	0	7
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	90	90	90	50	50	50	50	50	50
Heavy Vehicles, %	0	1	0	0	1	33	0	0	0	33	0	0
Mvmt Flow	1	618	3	9	756	3	2	0	10	6	0	14
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	759	0	0	621	0	0	1405	1399	620	1403	1399	758
Stage 1	-	-	-	-	-	-	622	622	-	776	776	-
Stage 2	-	-	-	-	-	-	783	777	-	627	623	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.43	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.43	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.43	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.797	4	3.3
Pot Cap-1 Maneuver	862	-	-	969	-	-	118	142	492	100	142	410
Stage 1	-	-	-	-	-	-	478	482	-	347	410	-
Stage 2	-	-	-	-	-	-	390	410	-	423	481	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	862	-	-	969	-	-	112	139	492	97	139	410
Mov Cap-2 Maneuver	-	-	-	-	-	-	112	139	-	97	139	-
Stage 1	-	-	-	-	-	-	477	481	-	346	403	-
Stage 2	-	-	-	-	-	-	371	403	-	414	480	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			16.9			24.1		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	314	862	-	-	969	-	-	208				
HCM Lane V/C Ratio	0.038	0.001	-	-	0.009	-	-	0.096				
HCM Control Delay (s)	16.9	9.2	0	-	8.8	0	-	24.1				
HCM Lane LOS	C	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.3				





2023 Existing Saturday Midday Peak Hour

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2023 Existing Saturday Midday Peak Hour  
1: Route 16 & Post Office Driveway

07/24/2023

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	483	521	20	30	16
Future Vol, veh/h	13	483	521	20	30	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	70	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	90	90	60	60
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	15	549	579	22	50	27
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	601	0	-	0	1169	590
Stage 1	-	-	-	-	590	-
Stage 2	-	-	-	-	579	-
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	986	-	-	-	215	511
Stage 1	-	-	-	-	558	-
Stage 2	-	-	-	-	564	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	986	-	-	-	210	511
Mov Cap-2 Maneuver	-	-	-	-	210	-
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	564	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		22.2		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	986	-	-	-	210	511
HCM Lane V/C Ratio	0.015	-	-	-	0.238	0.052
HCM Control Delay (s)	8.7	0	-	-	27.4	12.4
HCM Lane LOS	A	A	-	-	D	B
HCM 95th %tile Q(veh)	0	-	-	-	0.9	0.2



2023 Existing Saturday Midday Peak Hour  
2: Chestnut Street/Pope Road & Route 16

07/24/2023

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	506	4	8	534	2	3	0	7	0	0	4
Future Vol, veh/h	3	506	4	8	534	2	3	0	7	0	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	90	90	90	83	83	83	50	50	50
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	3	575	5	9	593	2	4	0	8	0	0	8
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	595	0	0	580	0	0	1200	1197	578	1200	1198	594
Stage 1	-	-	-	-	-	-	584	584	-	612	612	-
Stage 2	-	-	-	-	-	-	616	613	-	588	586	-
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	991	-	-	1004	-	-	163	187	519	163	187	509
Stage 1	-	-	-	-	-	-	501	501	-	484	487	-
Stage 2	-	-	-	-	-	-	481	486	-	499	500	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	991	-	-	1004	-	-	158	184	519	158	184	509
Mov Cap-2 Maneuver	-	-	-	-	-	-	158	184	-	158	184	-
Stage 1	-	-	-	-	-	-	499	499	-	482	481	-
Stage 2	-	-	-	-	-	-	467	480	-	489	498	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.1			17.2			12.2		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	308	991	-	-	1004	-	-	509				
HCM Lane V/C Ratio	0.039	0.003	-	-	0.009	-	-	0.016				
HCM Control Delay (s)	17.2	8.6	0	-	8.6	0	-	12.2				
HCM Lane LOS	C	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0				

2030 No-Build Weekday Evening Peak Hour







2030 No-Build Weekday Evening Peak Hour  
1: Route 16 & Post Office Driveway

07/24/2023

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	614	730	7	6	7
Future Vol, veh/h	3	614	730	7	6	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	70	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	667	793	8	7	8

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	801	0	0 1470 797
Stage 1	-	-	- - 797 -
Stage 2	-	-	- - 673 -
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	831	-	- - 142 390
Stage 1	-	-	- - 447 -
Stage 2	-	-	- - 511 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	831	-	- - 141 390
Mov Cap-2 Maneuver	-	-	- - 141 -
Stage 1	-	-	- - 444 -
Stage 2	-	-	- - 511 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	22.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	831	-	-	-	141	390
HCM Lane V/C Ratio	0.004	-	-	-	0.046	0.02
HCM Control Delay (s)	9.3	0	-	-	31.8	14.4
HCM Lane LOS	A	A	-	-	D	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.1

2030 No-Build Weekday Evening Peak Hour  
2: Chestnut Street/Pope Road & Route 16

07/24/2023

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	616	3	8	729	3	1	0	5	3	0	7
Future Vol, veh/h	1	616	3	8	729	3	1	0	5	3	0	7
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	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	0	1	33	0	0	0	33	0	0
Mvmt Flow	1	662	3	9	792	3	1	0	5	3	0	8
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	795	0	0	665	0	0	1482	1479	664	1480	1479	794
Stage 1	-	-	-	-	-	-	666	666	-	812	812	-
Stage 2	-	-	-	-	-	-	816	813	-	668	667	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.43	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.43	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.43	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.797	4	3.3
Pot Cap-1 Maneuver	835	-	-	934	-	-	104	127	464	88	127	391
Stage 1	-	-	-	-	-	-	452	460	-	331	395	-
Stage 2	-	-	-	-	-	-	374	395	-	401	460	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	835	-	-	934	-	-	100	125	464	86	125	391
Mov Cap-2 Maneuver	-	-	-	-	-	-	100	125	-	86	125	-
Stage 1	-	-	-	-	-	-	451	459	-	330	388	-
Stage 2	-	-	-	-	-	-	360	388	-	396	459	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			17.7			25.2		
HCM LOS							C			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	289	835	-	-	934	-	-	189				
HCM Lane V/C Ratio	0.023	0.001	-	-	0.009	-	-	0.058				
HCM Control Delay (s)	17.7	9.3	0	-	8.9	0	-	25.2				
HCM Lane LOS	C	A	A	-	A	A	-	D				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2				

2030 No-Build Saturday Midday Peak Hour







2030 No-Build Saturday Midday Peak Hour  
1: Route 16 & Post Office Driveway

07/24/2023

Intersection

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	520	560	20	30	16
Future Vol, veh/h	13	520	560	20	30	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	70	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	14	565	609	22	33	17

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	631	0	0 1213 620
Stage 1	-	-	- 620 -
Stage 2	-	-	- 593 -
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	961	-	- 203 492
Stage 1	-	-	- 540 -
Stage 2	-	-	- 556 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	961	-	- 199 492
Mov Cap-2 Maneuver	-	-	- 199 -
Stage 1	-	-	- 529 -
Stage 2	-	-	- 556 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	21.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	961	-	-	-	199	492
HCM Lane V/C Ratio	0.015	-	-	-	0.164	0.035
HCM Control Delay (s)	8.8	0	-	-	26.6	12.6
HCM Lane LOS	A	A	-	-	D	B
HCM 95th %tile Q(veh)	0	-	-	-	0.6	0.1

2030 No-Build Saturday Midday Peak Hour  
2: Chestnut Street/Pope Road & Route 16

07/24/2023

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	543	4	8	573	2	3	0	7	0	0	4
Future Vol, veh/h	3	543	4	8	573	2	3	0	7	0	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	3	590	4	9	623	2	3	0	8	0	0	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	625	0	0	594	0	0	1242	1241	592	1244	1242	624
Stage 1	-	-	-	-	-	-	598	598	-	642	642	-
Stage 2	-	-	-	-	-	-	644	643	-	602	600	-
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	966	-	-	992	-	-	153	176	510	152	176	489
Stage 1	-	-	-	-	-	-	492	494	-	466	472	-
Stage 2	-	-	-	-	-	-	465	472	-	490	493	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	966	-	-	992	-	-	149	173	510	148	173	489
Mov Cap-2 Maneuver	-	-	-	-	-	-	149	173	-	148	173	-
Stage 1	-	-	-	-	-	-	490	492	-	464	465	-
Stage 2	-	-	-	-	-	-	454	465	-	480	491	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			17.7			12.4		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	295	966	-	-	992	-	-	489				
HCM Lane V/C Ratio	0.037	0.003	-	-	0.009	-	-	0.009				
HCM Control Delay (s)	17.7	8.7	0	-	8.7	0	-	12.4				
HCM Lane LOS	C	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0				

2030 Build Weekday Evening Peak Hour

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2030 Build Weekday Evening Peak Hour  
1: Project Site Driveway/Post Office Driveway & Route 16

07/24/2023

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Vol, veh/h	3	614	15	15	730	7	14	0	14	6	0	7
Future Vol, veh/h	3	614	15	15	730	7	14	0	14	6	0	7
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	-	-	-	-	-	-	-	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	3	667	16	16	793	8	15	0	15	7	0	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	801	0	0	683	0	0	1514	1514	675	1518	1518	797
Stage 1	-	-	-	-	-	-	681	681	-	829	829	-
Stage 2	-	-	-	-	-	-	833	833	-	689	689	-
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	831	-	-	919	-	-	99	121	457	99	120	390
Stage 1	-	-	-	-	-	-	444	453	-	368	388	-
Stage 2	-	-	-	-	-	-	366	386	-	439	450	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	831	-	-	919	-	-	94	117	457	93	116	390
Mov Cap-2 Maneuver	-	-	-	-	-	-	94	117	-	93	116	-
Stage 1	-	-	-	-	-	-	441	450	-	366	376	-
Stage 2	-	-	-	-	-	-	348	374	-	422	447	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	33.6	29.3
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	156	831	-	-	919	-	-	93	390
HCM Lane V/C Ratio	0.195	0.004	-	-	0.018	-	-	0.07	0.02
HCM Control Delay (s)	33.6	9.3	0	-	9	0	-	46.6	14.4
HCM Lane LOS	D	A	A	-	A	A	-	E	B
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	0.2	0.1

2030 Build Weekday Evening Peak Hour  
2: Chestnut Street/Pope Road & Route 16

07/24/2023

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	630	3	8	744	3	1	0	5	3	0	7
Future Vol, veh/h	1	630	3	8	744	3	1	0	5	3	0	7
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	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	0	1	33	0	0	0	33	0	0
Mvmt Flow	1	677	3	9	809	3	1	0	5	3	0	8
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	812	0	0	680	0	0	1514	1511	679	1512	1511	811
Stage 1	-	-	-	-	-	-	681	681	-	829	829	-
Stage 2	-	-	-	-	-	-	833	830	-	683	682	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.43	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.43	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.43	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.797	4	3.3
Pot Cap-1 Maneuver	823	-	-	922	-	-	99	121	455	84	121	383
Stage 1	-	-	-	-	-	-	444	453	-	324	388	-
Stage 2	-	-	-	-	-	-	366	388	-	393	453	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	823	-	-	922	-	-	96	119	455	82	119	383
Mov Cap-2 Maneuver	-	-	-	-	-	-	96	119	-	82	119	-
Stage 1	-	-	-	-	-	-	443	452	-	323	381	-
Stage 2	-	-	-	-	-	-	352	381	-	388	452	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			18.2			26		
HCM LOS							C			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	280	823	-	-	922	-	-	182				
HCM Lane V/C Ratio	0.023	0.001	-	-	0.009	-	-	0.06				
HCM Control Delay (s)	18.2	9.4	0	-	8.9	0	-	26				
HCM Lane LOS	C	A	A	-	A	A	-	D				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2				

2030 Build Saturday Midday Peak Hour

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2030 Build Saturday Midday Peak Hour  
1: Project Site Driveway/Post Office Driveway & Route 16

07/24/2023

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Vol, veh/h	13	520	33	33	560	20	32	0	33	30	0	16
Future Vol, veh/h	13	520	33	33	560	20	32	0	33	30	0	16
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	-	-	-	-	-	-	-	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	14	565	36	36	609	22	35	0	36	33	0	17
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	631	0	0	601	0	0	1312	1314	583	1321	1321	620
Stage 1	-	-	-	-	-	-	611	611	-	692	692	-
Stage 2	-	-	-	-	-	-	701	703	-	629	629	-
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	961	-	-	986	-	-	137	160	516	135	158	492
Stage 1	-	-	-	-	-	-	484	487	-	437	448	-
Stage 2	-	-	-	-	-	-	433	443	-	474	478	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	961	-	-	986	-	-	124	148	516	118	146	492
Mov Cap-2 Maneuver	-	-	-	-	-	-	124	148	-	118	146	-
Stage 1	-	-	-	-	-	-	473	476	-	427	423	-
Stage 2	-	-	-	-	-	-	394	418	-	431	467	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.5			32.1			34.9		
HCM LOS							D			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2			
Capacity (veh/h)	202	961	-	-	986	-	-	118	492			
HCM Lane V/C Ratio	0.35	0.015	-	-	0.036	-	-	0.276	0.035			
HCM Control Delay (s)	32.1	8.8	0	-	8.8	0	-	46.8	12.6			
HCM Lane LOS	D	A	A	-	A	A	-	E	B			
HCM 95th %tile Q(veh)	1.5	0	-	-	0.1	-	-	1	0.1			

2030 Build Saturday Midday Peak Hour  
2: Chestnut Street/Pope Road & Route 16

07/24/2023

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	576	4	8	606	2	3	0	7	0	0	4
Future Vol, veh/h	3	576	4	8	606	2	3	0	7	0	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	3	626	4	9	659	2	3	0	8	0	0	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	661	0	0	630	0	0	1314	1313	628	1316	1314	660
Stage 1	-	-	-	-	-	-	634	634	-	678	678	-
Stage 2	-	-	-	-	-	-	680	679	-	638	636	-
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	937	-	-	962	-	-	136	160	487	136	160	467
Stage 1	-	-	-	-	-	-	471	476	-	445	455	-
Stage 2	-	-	-	-	-	-	444	454	-	468	475	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	937	-	-	962	-	-	133	157	487	132	157	467
Mov Cap-2 Maneuver	-	-	-	-	-	-	133	157	-	132	157	-
Stage 1	-	-	-	-	-	-	469	474	-	443	448	-
Stage 2	-	-	-	-	-	-	433	447	-	458	473	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			18.8			12.8		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	271	937	-	-	962	-	-	467				
HCM Lane V/C Ratio	0.04	0.003	-	-	0.009	-	-	0.009				
HCM Control Delay (s)	18.8	8.9	0	-	8.8	0	-	12.8				
HCM Lane LOS	C	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0				