Leicester Central

Leicester, Massachusetts

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Table of Contents

List of Tables

List of Figures

Executive Summary

Vanasse Hangen Brustlin, Inc. [VHB] has evaluated the traffic impacts associated with the development of a manufacturing facility to be located adjacent to Huntoon Memorial Highway (Route 56) in Leicester, Massachusetts. Under existing conditions, the location is a wooded area consisting of 3 parcels of approximately 50 acres. Access to the Site will be provided via two unsignalized driveway off Huntoon Memorial Highway (Route 56).

Based on VHB's knowledge of the area and the development of typical traffic impact and access evaluations, the following intersections were included in this assessment:

- Huntoon Memorial Highway (Route 56) at Stafford Street – signalized
- Huntoon Memorial Highway (Route 56) at Clark Street - unsignalized

Manual turning movement counts (TMCs) to collect peak hour data were conducted at each of the study-area intersections on October 6, 2021 from 7:00AM to 9:00AM and 4:00PM to 6:00PM. Concurrent with the TMCs, 48-hour automatic traffic recorder (ATR) counts were conducted on Huntoon Memorial Highway south of Clark Street.

The proposed Project is expected to generate approximately 185 new vehicle trips (145 entering/40 exiting) during the weekday morning peak hour and 200 new vehicle trips (60 entering/140 exiting) during the weekday evening peak hour.

Capacity analyses were conducted for each of the study area intersections under 2021 Existing conditions, 2028 No-Build conditions (without the proposed development), and 2028 Build conditions (with the proposed development). The capacity analysis results indicated that the Project will not significantly impact operating conditions and that the overall level of service will remain the same at all study area intersections between 2028 No-Build and 2028 Build conditions.

Overall, the results of this study show that the additional traffic generated by the proposed Project can be accommodated by the existing roadway network surrounding the Site.

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1

Introduction

VHB, on behalf of JMC/TBG Leicester, LLC (the "Proponent"), has conducted this Transportation Impact Assessment (TIA) for the proposed Leicester Central development at 90 and 92 Huntoon Memorial Highway (the "Site"). The development is expected to consist of a manufacturing facility, including associated parking facilities and driveway connections to Huntoon Memorial Highway (Route 56). The Project Site is shown in Figure 1.

This traffic study has been prepared in conformance with the Massachusetts Department of Transportation's (MassDOT) Transportation Impact Assessment (TIA) Guidelines [1].

1.1 Project Description

The Project Site, which includes the development of a wooded area that is bordered by Huntoon Memorial Highway, Grindstone Brook and additional undeveloped land in Leicester, Massachusetts. The current development proposal for the Site involves the construction of a 260,000 square foot manufacturing facility. The Site design currently accommodates parking for 279 passenger vehicles over multiple lots.

With the proposed Project, access to the Site will be provided via two unsignalized driveways off of Huntoon Memorial Highway (Route 56).

[1] *Transportation Impact Assessment (TIA) Guidelines*, Massachusetts Department of Transportation, March 13, 2014.

1.2 Study Methodology

This traffic assessment has been conducted in three main stages. The first stage involved an assessment of existing traffic conditions within the Project area including an inventory of existing roadway geometry; observations of traffic flow, including daily and peak period traffic counts; and a review of vehicular crash data.

The second stage of the study established the framework for evaluating the transportation impacts of the proposed project. Specific travel demand forecasts for the Project were assessed along with future traffic demands on the study area roadways due to projected background traffic growth and other proposed area development that will occur, independent of the proposed development. The year 2028, a seven-year time horizon from the traffic data collection, was selected as the design year for analysis for the preparation of this TIA in accordance with MassDOT guidelines.

The third and final stage involved conducting traffic analyses to identify both existing and projected future roadway capacities and demands. This analysis was used as the basis for determining potential Project impacts and potential mitigation measures.

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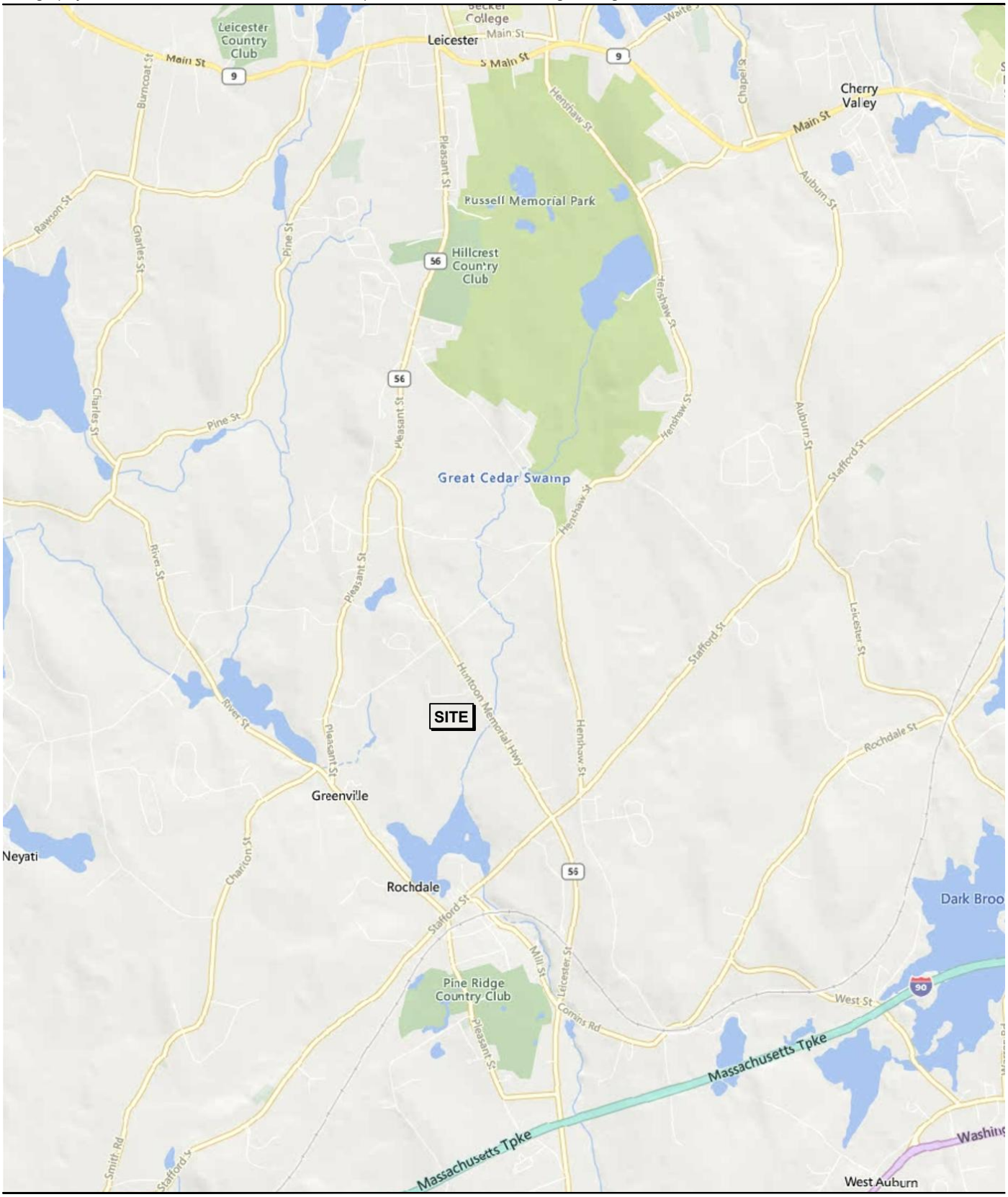

Figure 1

Site Location Map

Huntoon Memorial Highway
Leicester, Massachusetts

2

Existing Conditions

Evaluation of the transportation impacts associated with the proposed development requires a thorough understanding of the existing transportation system in the Project study area. The existing conditions evaluation consisted of an inventory of the traffic control, roadway, driveway, and intersection geometry in the study area; the collection of peak period traffic volumes; an overview of existing public transit options; and a review of recent vehicular crash history. Each of these elements is described in detail below.

2.1 Study Area

Based on an understanding of the current traffic operations in the region, a study area comprised of the following intersections and their approach roadways were selected for the review and are highlighted in Figure 2:

- Huntoon Memorial Highway (Route 56) at Stafford Street – signalized
- Huntoon Memorial Highway (Route 56) at Clark Street - unsignalized

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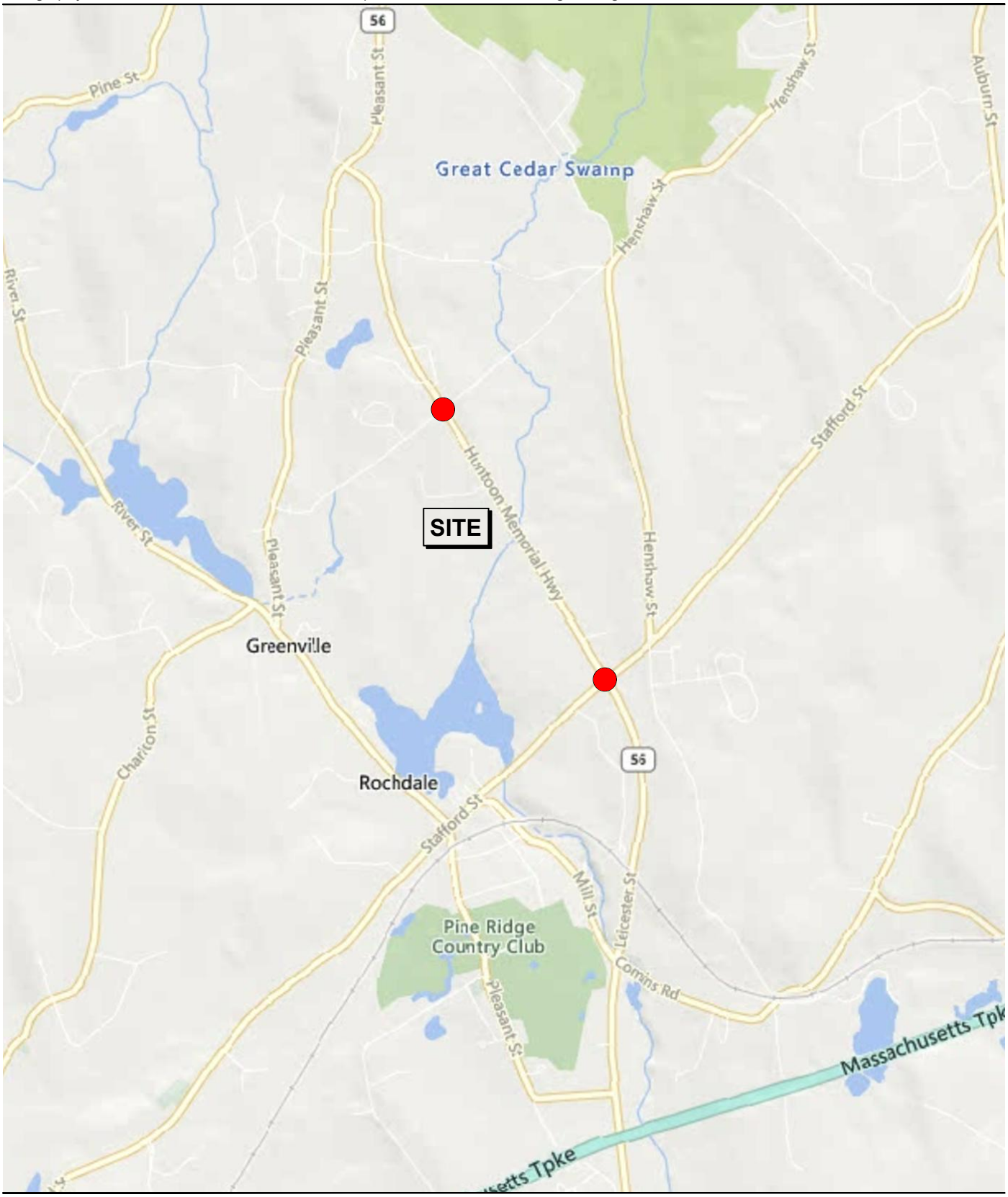


Legend

Study Area Intersection

0 1000' 2000'

Figure 2

Study Area Intersections

Huntoon Memorial Highway
Leicester, Massachusetts

2.1.1 Roadway Geometry

Descriptions of the study area roadways and intersections are provided below, including descriptions of the existing lane configurations, traffic control at the study area intersections, the roadway jurisdiction in this area, and existing pedestrian and bicycle infrastructure.

2.1.1.1 Roadways

Huntoon Memorial Highway (Route 56)

Huntoon Memorial Highway (Route 56) is an urban minor arterial roadway under the jurisdiction of the Town of Leicester. Huntoon Memorial Highway (Route 56) travels in a north-south orientation through Leicester from the Oxford town line to Pleasant Street (Route 56) with one lane in each direction. Route 56, which serves as the primary north-south corridor through the Town of Leicester, continues north into Paxton under multiple names. In the vicinity of the site, wide shoulders ranging from 6 to 10 feet are provided on Huntoon Memorial Highway (Route 56). There are no sidewalks present within the study area. Land use along this roadway is a mix of industrial and commercial use along with undeveloped wooded areas. Huntoon Memorial Highway (Route 56) has a posted speed limit of 50 mph, with a reduced speed zone of 40 mph in the vicinity of Stafford Street.

2.1.1.2 Intersections

Huntoon Memorial Highway (Route 56) at Stafford Street

Huntoon Memorial Highway (Route 56) is intersected by Stafford Street from the east and west to form a four-legged signalized intersection. The Huntoon Memorial Highway northbound and southbound approaches consist of an exclusive left-turn lane with a general-purpose lane, while the approaches from Stafford Street in both directions consist of a single-general purpose lane. Right turns on red are prohibited at all approaches to the intersection. Sidewalks exist on each approach for approximately 20 feet leading up to the intersection and there are crosswalks provided across all four legs. The posted speed limit on Huntoon Memorial Highway (Route 56) approaching the intersection is 40 mph. The posted speed limit on Stafford Street approaching the intersection is 30 mph.

Huntoon Memorial Highway (Route 56) at Clark Street

Huntoon Memorial Highway (Route 56) is intersected by Clark Street from the east and west to form a four-legged unsignalized intersection. All approaches to the intersection consist of a single-general purpose lane in each direction. The eastbound and westbound Clark Street approaches operate under STOP-sign control. Sidewalks do not exist on any approaches to this intersection and no crosswalks are provided. The posted speed limit on Huntoon Memorial Highway (Route 56) approaching the intersection is 50 mph. There are no posted speed limits on Clark Street approaching the intersection.

Existing Lane Configuration and traffic control are illustrated in Figure 3.

2.2 Traffic Volumes

To identify current traffic flow characteristics along the primary roadways serving the Project study area, peak-hour turning movement counts (TMCs) and daily traffic volumes were collected within the study area. Traffic volumes for the analysis conducted were collected for VHB on October 6, 2021 from 7:00AM to 9:00AM and 4:00PM to 6:00PM. The counting effort also included heavy vehicles, bicycles, and busses.

The network weekday morning peak hour was found to be 7:15 AM to 8:15 AM. The network weekday evening peak hour was found to be 4:30 PM to 5:30PM.

2.2.1 Vehicle Volumes

To identify current traffic flow characteristics along the primary roadways serving the Project study area, VHB conducted traffic counts adjacent to the Project Site in October 2021 while local schools were in session. VHB's traffic data collection involved measuring daily traffic volumes on Huntoon Memorial Highway (Route 56) in Leicester from Clark Street to Stafford Street. The daily volume was collected by VHB using an automated traffic recorder (ATR) on Tuesday, October 5, 2021 through Wednesday, October 6, 2021.

The traffic volumes along Huntoon Memorial Highway (Route 56) are summarized in Table 1. All traffic count data is included in Appendix.

As shown in Table 1, Huntoon Memorial Highway (Route 56) south of Clark Street carries approximately 7,650 vehicles on a typical weekday with the peak hours accounting for 7.5-percent (morning peak hour) and 8.5-percent (evening peak hour) of the weekday daily traffic flow. The predominant flow of traffic along Huntoon Memorial Highway (Route 56) is in the southbound direction during the weekday morning peak hour and heavier in the northbound direction during the weekday evening peak hour.

2.2.1.1 Seasonal Adjustment

The traffic data collected for the study area were obtained during the month of October 2021. Per the 2019 MassDOT Weekday Seasonal and Axle Correction Factors, traffic volumes in October are higher than average: U4-U7= 0.94. To present a conservative analysis, the traffic volumes were not adjusted. The resulting 2021 existing conditions weekday morning and weekday evening peak hour vehicular traffic volumes are shown in Figure 4. The seasonal adjustment factors are included in Appendix.

Table 1 Observed Traffic Volumes

Source: Based on automatic traffic recorder (ATR) counts conducted in June 2021 and adjusted to account for COVID-19 conditions

	Daily [a]	Weekday Morning Peak Hour				Weekday Evening Peak Hour			
Location	Weekday	Volume [b]	K Factor [c]	Dir. Dist. [d]		Volume [b]	K Factor [c]	Dir. Dist. [d]	
Huntoon Memorial Hwy, south of Clark St	7,650	570	7.5%	62%	SB	650	8.5%	62%	NB

Note: Peak hours do not necessarily coincide with the peak hours of turning movement counts.

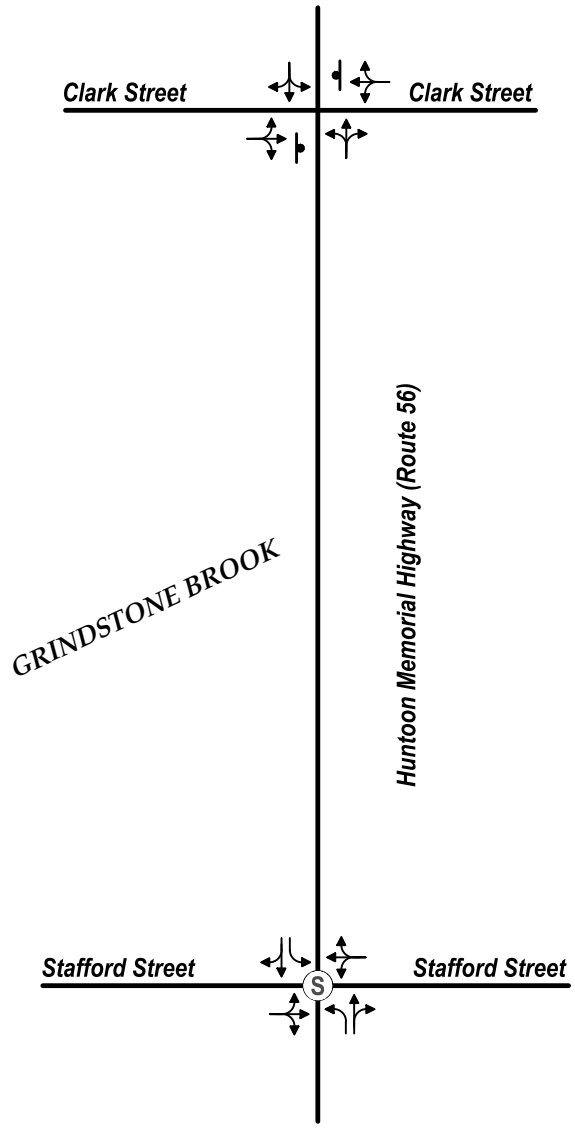
a Average Daily Traffic volume, expressed in vehicles per day

b Peak period traffic volume, expressed in vehicles per hour

c Represents the percent daily traffic which occurs during the peak hour

d Directional distribution of peak hour traffic

Lane Configuration



Legend

Stop Controlled

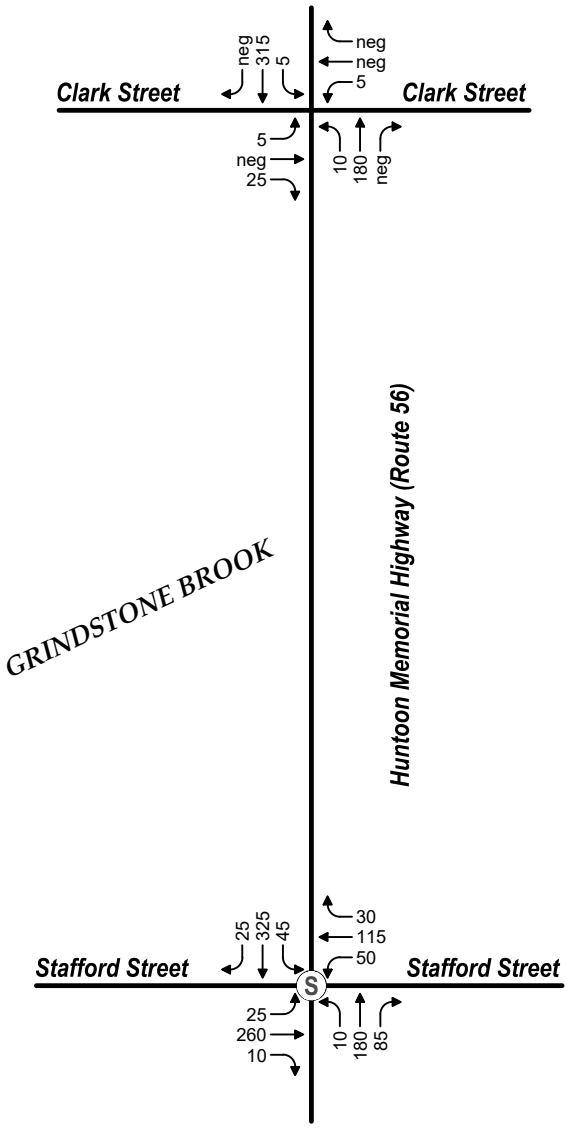
Signalized Intersection

Figure 3

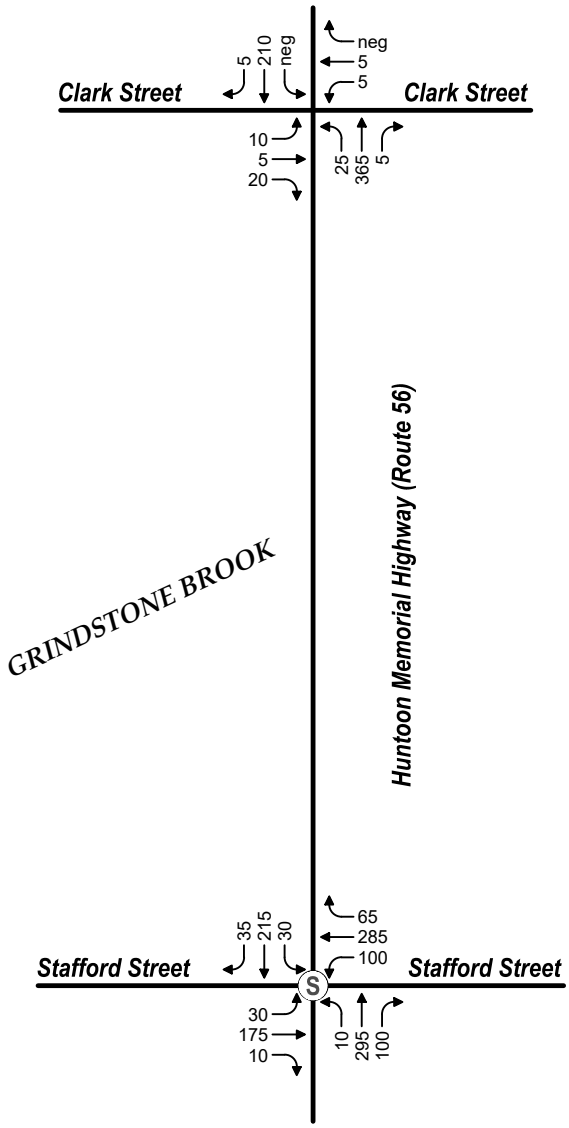
Study Area Existing Lane Geometry and Traffic Control

Huntoon Memorial Highway
Leicester, Massachusetts

Weekday Morning Peak Hour
(7:15AM to 8:15AM)



Weekday Evening Peak Hour
(4:30AM to 5:30AM)



Legend
neg <5 Vehicles
Ⓢ Signalized Intersection

Figure 4

2021 Existing Conditions
Weekday Peak Hour Vehicle Volumes

Huntoon Memorial Highway
Leicester, Massachusetts

2.2.2 Multimodal Transportation

2.2.2.1 Bicycle and Pedestrian Accommodations

Sidewalks are provided on each corner of the intersection of Huntoon Memorial Highway (Route 56) at Stafford Street. Crosswalks are provided at the intersection of Huntoon Memorial Highway (Route 56) at Stafford Street all study area intersections across every approach and are equipped with pedestrian push buttons and signal heads. Crosswalk ramps and tactical warning strips are provided for all crosswalk approaches. There are no designated pedestrian accommodations at any other intersections in the study area or along any roads in the study area including at the proposed site location.

2.2.2.2 Public Transportation

Worcester Regional Transit Authority

The Worcester Regional Transit Authority (WRTA) provides bus service at the intersection of Pleasant Street (Route 56) and South Main Street (Route 9) approximately 3 mi. north of the proposed site location. Specifically, Route 33 and Route 19 that provide service between Leicester and Worcester.

The WRTA schedules are included in the Appendix.

2.2.3 Vehicular Crash History

A detailed crash analysis was conducted to identify potential vehicle accident trends and/or roadway deficiencies in the traffic study area. The most current vehicle accident data for the traffic study area intersections were obtained from MassDOT for the years 2014 through 2018. The MassDOT database is comprised of crash data from the Massachusetts Registry of Motor Vehicles (RMV) Division primarily for use in traffic studies and safety evaluations. Data files are provided for an entire city or town for an entire year, though it is possible that some crash records may be omitted either due to individual crashes not being reported, or the city crash records not being provided in a compatible format for RMV use. A summary of the study intersections vehicle crash history based on the available data is presented in Table 2 and the detailed crash data is provided in the Appendix.

Crash rates are calculated based on the number of crashes at an intersection and the volume of traffic traveling through that intersection on a daily basis. Rates that exceed MassDOT's average for crashes at intersections in the MassDOT district in which the town or city is located could indicate safety or geometric issues for a particular intersection. For this Project's study area, the calculated crash rates for intersections located in Leicester were compared to MassDOT's District 3 average, as Leicester is located in District 3. In District 3, the average crash rate is 0.89 for signalized intersections and 0.61 for unsignalized intersections. These rates imply that, on average, 0.89 crashes occurred per million vehicles entering signalized intersections and 0.61 crashes occurred per million vehicles entering unsignalized intersections throughout District 3. It should be noted that the location for some crashes cannot be precisely determined from the database.

Table 2 Vehicular Crash Data (2014 – 2018)

	Huntoon Memorial Highway at Stafford Street	Huntoon Memorial Highway at Clark Street
Signalized	Yes	No
MassDOT District Average Crash Rate	0.89	0.61
Calculated Crash Rate	0.66	0.22
Exceeds Average	No	No
Year		
2014	4	0
2015	4	0
2016	6	1
2017	1	1
2018	4	1
Total	19	3
Collision Type		
Angle	9	1
Head-on	1	0
Rear-end	4	0
Sideswipe, opposite direction	2	0
Sideswipe, same direction	1	0
Single Vehicle Crash	2	2
Severity		
Fatal Injury	0	0
Non-Fatal Injury	5	0
Property Damage Only	14	3
Not Reported/Unknown	0	0
Time of day		
Weekday, 7:00 AM - 9:00 AM	0	1
Weekday, 4:00 – 6:00 PM	4	0
Weekday, other time	12	2
Weekend	3	0
Lighting Conditions		
Dawn/Dusk	3	0
Daylight	11	3
Dark – Lighted Roadway	4	0
Dark – roadway not lighted	1	0
Pavement Conditions		
Dry	9	2
Wet	7	0
Snow/Ice/Slush	3	1
Non-Motorist (Bike, Pedestrian)	0	0

Source: Crash data was obtained from MassDOT Crash Portal (2014-2018).

As shown in Table 2, the majority of crashes throughout the study area were angle crashes occurring on dry pavement resulting in property damage only. Based on the MassDOT records, there were no fatal crashes during the five-year period studied and no collisions involving pedestrians.

2.2.3.1 Highway Safety Improvement Program

In addition to calculating the crash rate, study area intersections should also be reviewed in MassDOT's Highway Safety Improvement Program (HSIP) database. The HSIP database identifies crash clusters. An HSIP-eligible cluster is one in which the total number of equivalent property damage only[2] (EPDO) crashes in the area is within the top 5-percent of all clusters in that region. An HSIP-eligible location is eligible for FHWA and MassDOT funds to address the identified safety issues at these locations.

As part of this effort, VHB reviewed this database and found that the study area intersections are not HSIP-eligible.

2 Equivalent property damage only (EPDO) is a method of combining the number of crashes with the severity of the crashes based on a weighted scale. Crashes involving property damage only are reported at a minimal level of importance, while collisions involving personal injury (or fatalities) are weighted more heavily.

3

Future Conditions

Traffic volumes in the study area were projected to a seven-year traffic-planning horizon, the year 2028. Independent of the Project, volumes on the roadway network under the future 2028 No-Build conditions were assumed to include existing traffic and new traffic resulting from background traffic growth. Under the 2028 Build condition, Project generated traffic volumes were added to the 2028 No-Build volumes to reflect the Build conditions within the Project study area.

3.1 No-Build Conditions

The 2028 No-Build conditions analyze the future transportation conditions within the study area absent of the proposed Project. This condition considers future growth and infrastructure improvements within the area.

Traffic growth on area roadways is a function of the expected land development, economic activity, and changes in demographics. Several methods can be used to estimate this growth. A procedure frequently employed is to estimate an annual percentage increase and apply that increase to study area traffic volumes. An alternative procedure is to identify estimated traffic generated by planned new major developments that would be expected to impact the Project study area roadways. For the purpose of this assessment, and to provide a conservative analysis, both methods were considered.

3.1.1 Historic Traffic Growth

Historic traffic data in the vicinity of the Project Site as well as the South Coast Rail traffic study were reviewed to determine an appropriate growth rate. Based on data obtained from

MassDOT Transportation Data Management System, a growth rate of 1-percent per year was determined to be appropriate for this Study.

3.1.2 Site-Specific Growth

In addition to accounting for background growth, the traffic associated with other planned and/or approved developments within the seven-year horizon is accounted for in this analysis. Based on research by VHB, there are several planned development projects within the vicinity of the study area that were taken into consideration.

3.1.2.1 30 Huntoon Memorial Highway: Wireless Facility

This development is proposed as an unmanned facility and will not regularly act as a daily or peak hour trip generator.

3.1.2.2 88 Huntoon Memorial Highway: Nonretail Marijuana Cultivator

This development is proposed to repurpose an existing building and will employ 50-60 full time employees this will increase daily trips in the study area and may have an impact on peak times. However, given that the project is non-retail, and the expected operating hours are 7am to 11pm it is likely that the traffic generated will be at times that do not coincide with existing peak hours.

For the purpose of this assessment an ITE trip generation was prepared for a manufacturing facility with 60 employees and was added to the background growth to determine future no build conditions. This sight-specific growth includes: 145 daily trips, 20 AM peak hour trips, and 20 PM peak hour trips.

3.1.2.3 101 Huntoon Memorial Highway: Manufacturing Addition

An 8,100sf addition is proposed at this location however no increase in the number of employees is expected and thus should not result in a noticeable increase in the number of trips generated by the facility.

3.1.2.4 112 Huntoon Memorial Highway: Parking Expansion

The proposed parking area expansion is for the purpose of storing commercial vehicles and equipment and will not regularly increase daily or peak hour trip generation by this site.

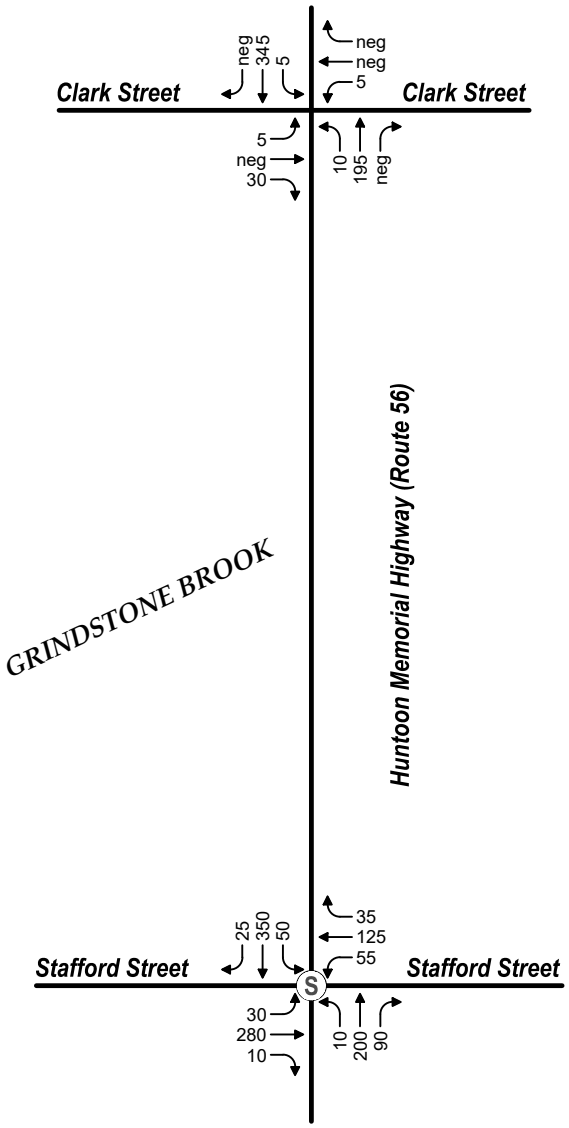
3.1.3 Roadway and Public Transportation Improvements

In assessing future traffic conditions for the Project, proposed roadway and public transportation improvements within the study area were considered. Based on research by VHB and discussions with the Town of Leicester, no significant projects which may affect travel patterns in the future were identified.

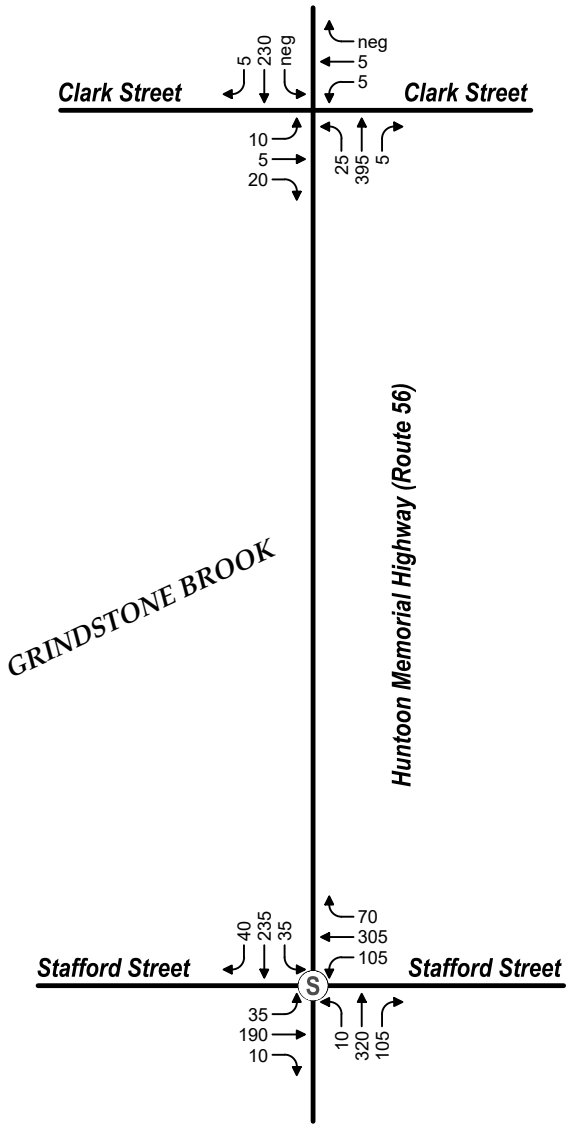
3.1.4 No-Build Traffic Volumes

The 2028 No-Build traffic volumes were developed using a growth rate of 1-percent per year and adding in the anticipated trips to be generated by the planned and/or approved development projects described above. The resulting 2028 No-Build weekday morning and weekday evening peak hour vehicle traffic volume networks are shown in Figure 5.

Weekday Morning Peak Hour
(7:15AM to 8:15AM)



Weekday Evening Peak Hour
(4:30AM to 5:30AM)



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neg <5 Vehicles
Ⓢ Signalized Intersection

Figure 5

2028 No-Build Conditions
Weekday Peak Hour Vehicle Volumes

Huntoon Memorial Highway
Leicester, Massachusetts

3.2 Build Conditions

The 2028 Build conditions analyze the future transportation conditions within the study area with the proposed Project in place. This condition considers the site-generated traffic volumes and distributes these volumes over the study area roadways. These conditions are described further below.

3.2.1 Trip Generation

The rate at which any development generates traffic is dependent upon the size, location, and concentration of surrounding developments. To estimate the number of vehicle trips to be generated by the proposed Project, national data from the ITE *Trip Generation Manual*[3] was utilized. The ITE Trip Generation Manual categorizes these land uses and provides weekday daily, weekday morning peak hour, and weekday evening peak hour vehicle trip generation estimates. As mentioned previously, the Project currently involves the development of a wooded area to construct a 260,000-sf building and associated parking areas. However, as there is no tenant currently programmed for the development a variety of building uses were reviewed. Specifically, three trip generation estimates for the proposed use were considered for this site: Land Use Code (LUC) 140 (Manufacturing), LUC 150 (Warehousing), and LUC 156 (High-Cube Parcel Hub Warehouse). Each of the land uses considered had different impacts at different times of day for the characteristics specific to the proposed site. Of the uses considered, LUC 140 (Manufacturing) results in the most significant number of development-related trips during peak hours and thus is used in the analysis to allow for a more conservative assessment. Furthermore, to allow for flexibility during the planning process, a 300,000 sf building was used for analysis purposes. Table 3 summarizes the projected trip generation for the development. The ITE trip generation worksheets are included in the Appendix.

3 Trip Generation Manual (10th edition), Institute of Transportation Engineers (Washington DC), 2017.

Table 3 Projected Trip Generation

	Total Trips [a]		
	LUC 140 (Manufacturing)	**LUC 150 (Warehousing)**	**LUC 156 (High-Cube Parcel Hub Warehouse)**
Weekday Daily			
Enter	590	260	1160
Exit	590	260	1160
Total	1180	520	2320
Weekday Morning			
Enter	145	45	100
Exit	40	15	95
Total	185	60	195
Weekday Evening			
Enter	60	15	115
Exit	140	50	55
Total	200	65	170

a Based on ITE Land Use Codes for 300,000-sf.

As shown above, the Project is expected to generate a total of 1180 vehicle trips on a daily basis (590 entering/590 exiting). The Project is expected to generate approximately 185 new vehicle trips (145 entering/40 exiting) during the weekday morning peak hour and 200 new vehicle trips (60 entering/140 exiting) during the weekday evening peak hour.

It should be noted that the make-up of the projected trips is dependent on the final occupant and operation. The trips for a typical manufacturing use would be expected to consist primarily of employee (i.e. passenger) vehicles with regular deliveries, consistent with a typical commercial development. If the facility is geared more towards a warehouse use, the total number of trips would decrease while the percent of trucks and/or vans making up those trips would increase when compared to a manufacturing use. That being said, in either instance, most truck trips would be expected to occur outside of the peak hours being analyzed.

3.2.2 Trip Distribution

The directional distribution of Project traffic traveling to and from the Site is based on the currently observed distribution patterns of the existing roadway network. The results are summarized in Table 4. Figure 6 illustrates the regional trip distribution and detailed trip distribution calculations are provided in the Appendix.

Table 4 Project Trip Distribution

Roadway	Direction (from/to)	Percent of Trips
Clark Street	East	1%
Clark Street	West	4%
Stafford Street	East	8%
Stafford Street	West	5%
Huntoon Memorial Highway	North	43%
Huntoon Memorial Highway	South	39%
Total		100%

Source: US Census data (2012-2016).

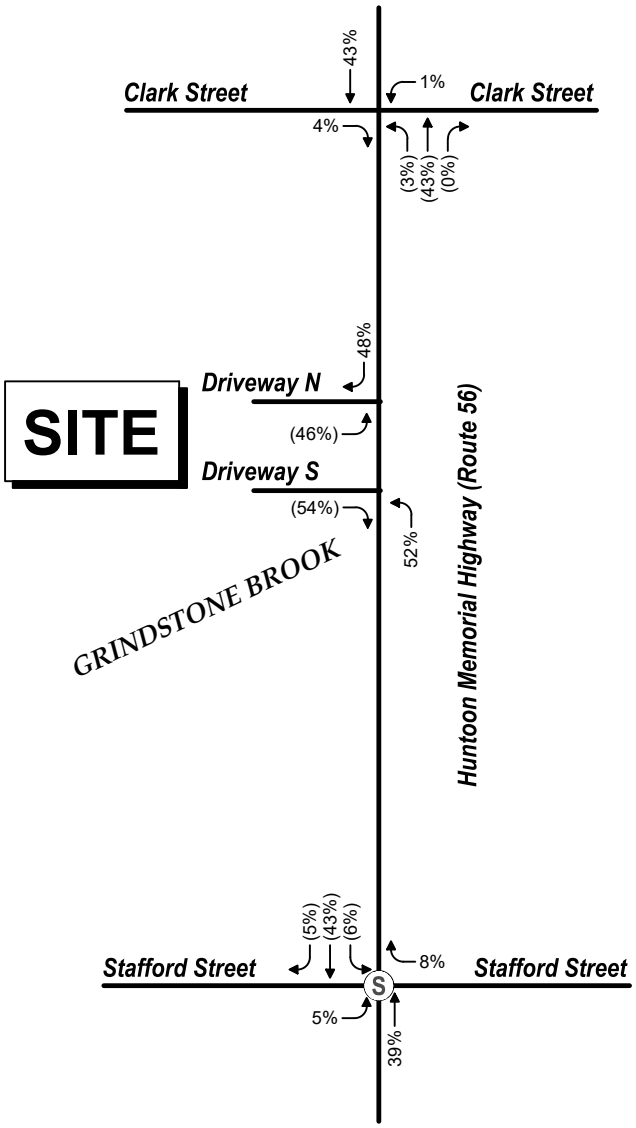
As shown in Table 4, it is expected that the majority of Site traffic (52%) will arrive to the site from the south, with 39% from Huntoon Memorial Highway (Route 56) and 13% from Stafford Street. The projected Site-generated traffic volumes, as shown in Table 3, were distributed on the study area roadways using the trip distribution shown in Table 4. The Site-generated traffic volumes are provided in the Appendix to this document.

As noted in the previous section, the distribution is often a function of the facilities operation. Employee (passenger vehicle) trips would be expected to arrive at the facility based on the existing traffic patterns. A warehouse use that has a higher truck percentage would typically see its distribution skewed towards higher level roadways, in this case to/from the south and Route 20. That being said, given the significantly lower number of trips generated by a warehouse use, these distribution changes would not shift the number of new trips enough to significantly affect the analysis presented in the following sections.

3.2.3 Build Traffic Volumes

The future 2028 Build conditions vehicle traffic volumes were developed by adding the Site-generated traffic volumes as shown in Table 3 to the 2028 No-Build conditions peak hour vehicle traffic volumes. Figure 7 shows the resulting 2028 Build conditions vehicle traffic volume networks for the weekday morning and weekday evening peak hours.

Generated Trip Distribution



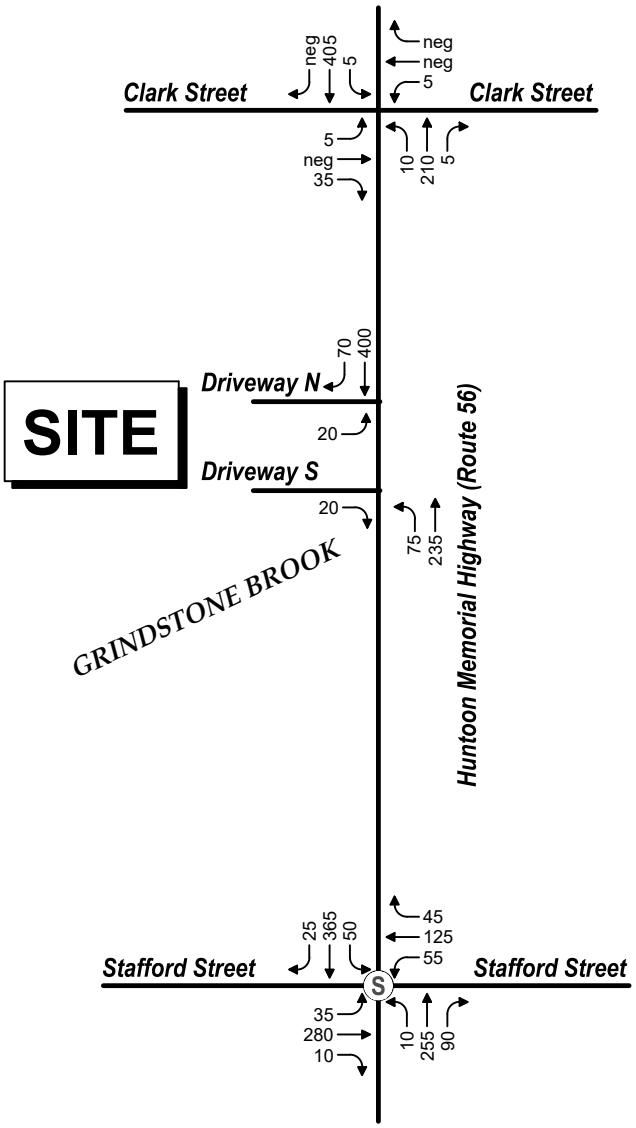
Legend
neg <5 Vehicles
Ⓢ Signalized Intersection

Figure 6

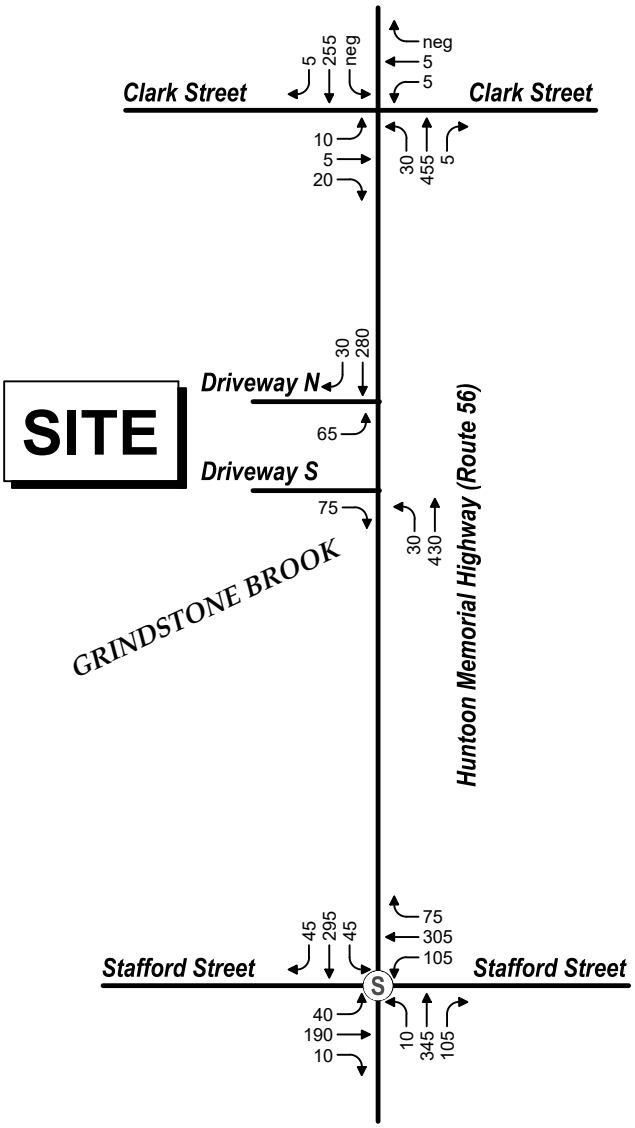
Distribution
Trip Generation

Huntoon Memorial Highway
Leicester, Massachusetts

Weekday Morning Peak Hour
(7:15AM to 8:15AM)



Weekday Evening Peak Hour
(4:15AM to 5:15AM)



Legend
neg **<5 Vehicles**
Ⓢ **Signalized Intersection**

Figure 6

2028 Build Conditions
Weekday Peak Hour Vehicle Volumes

Huntoon Memorial Highway
Leicester, Massachusetts

3.2.4 Project Site Access and Circulation

Access to the Site will be provided via two unsignalized driveways on Huntoon Memorial Highway (Route 56). Sight distances at the proposed driveway locations were reviewed and were found to have available sight distance greater than 665-ft which is the sight distance required to make a left turn on to a major street with traffic traveling at 60 MPH[4].

3.2.5 Project Parking

The current proposal for the site involves the development of a 260,000-sf building for manufacturing and includes 279 total parking spaces across four lots including:

- 61 spaces to the south west side of the proposed building with access to the back driveway and the southern driveway;
- 84 spaces to the south of the proposed building with access to the southern driveway; and
- 131 spaces to the north east of the proposed building between the proposed building and Huntoon Memorial Highway (Route 56) with access to the southern driveway.

It should also be noted that the site, as laid out, currently has space for 59 tractor trailer spaces and 42 loading docks on the north west side of the proposed building to accommodate potential tenants. Access to these spaces would be via the northern site driveway.

[4] MassDOT Project Development & Design Guide: Exhibit 3-11

4

Traffic Operations Analysis

The purpose of this analysis is to measure existing traffic volumes and to project future traffic volumes that quantify traffic flow within the study area. To assess quality flow, roadway capacity analyses were conducted with respect to Existing and projected 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. Roadway operating conditions are classified by calculated levels of service.

4.1 Level-of-Service Criteria

The evaluation criteria used to analyze area intersections in this traffic study are based on the percentile delay method for signalized intersections and the Highway Capacity Manual (HCM), 6th Edition[5] for unsignalized intersections. The term 'Level of Service' (LOS) is used to denote the different operating conditions that occur on a given roadway segment under various traffic volume loads. It is a qualitative measure that considers a number of factors including roadway geometry, speed, travel delay and freedom to maneuver. LOS provides an index to the operational qualities of a roadway segment or an intersection. LOS designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions.

In addition to LOS, two other measures of effectiveness (MOEs) are typically used to quantify the traffic operations at intersections; volume-to-capacity ratio (v/c) and delay (expressed in

5 *Highway Capacity Manual, 6th Edition*, Transportation Research Board, Washington, D.C., 2016.

seconds per vehicle). For example, an existing v/c ratio of 0.90 for an intersection indicates that the intersection is operating at 90-percent of its available capacity. A delay of 15 seconds for a particular vehicular movement or approach indicates that vehicles on the movement or approach will experience an average additional travel time of 15 seconds. For a given LOS letter designation there may be a wide range of values for both v/c ratios and delay. Comparison of intersection capacity results therefore requires that, in addition to the LOS, the other MOEs should also be considered.

The LOS designations, which are based on delay, are reported differently for signalized and unsignalized intersections. For signalized intersections, the analysis considers the operation of all traffic entering the intersection and the LOS designation is for overall conditions at the intersection. For unsignalized intersections, however, the analysis assumes that traffic on the mainline is not affected by traffic on the side streets. Thus, the LOS designation is for the critical movement exiting the side street, which is generally the left turn out of the side street or Site driveway. Table 6 shows the LOS criteria for both signalized intersections and unsignalized intersections.

It should be noted that the analytical methodologies typically used for the analysis of unsignalized intersections use conservative analysis parameters, such as long critical gaps. Actual field observations indicate that drivers on minor streets generally accept shorter gaps in traffic than those used in the analysis procedures and therefore experience less delay than reported by the analysis software. The analysis methodologies also do not fully take into account the beneficial grouping effects caused by nearby signalized intersections. The net effect of these analysis procedures is the over-estimation of calculated delays at unsignalized intersections in the study area. Cautious judgment should therefore be exercised when interpreting the capacity analysis results at unsignalized intersections.

Table 5 Level of Service Criteria

Level of Service	Delay – Signalized Intersection	Delay – Unsignalized Intersection
A	0 to 10 seconds	0 to 10 seconds
B	10 to 20 seconds	10 to 15 seconds
C	20 to 35 seconds	15 to 25 seconds
D	35 to 55 seconds	25 to 35 seconds
E	55 to 80 seconds	35 to 50 seconds
F	Greater than 80 seconds	Greater than 50 seconds

Source: Highway Capacity Manual 6TH Edition.

4.2 Signalized Intersection Capacity Analysis

Capacity analyses conducted by VHB for the signalized intersections are summarized in Table 7. The capacity analyses were conducted for the 2021 Existing, 2028 No-Build, and 2028 Build conditions and the detailed results are included in the Appendix.

As shown in Table 7, the signalized study area intersections are expected to operate at an acceptable LOS (LOS D or better) under all future conditions, with or without the Project. No drops in intersection LOS are expected between 2028 No-Build and 2028 Build conditions.

Table 6 Signalized Intersection Capacity Analysis

Location / Movement	2021 Existing Conditions					2028 No-Build Conditions					2028 Build Conditions				
	v/c [a]	Del [b]	LOS [c]	50 Q [d]	95 Q [e]	v/c [a]	Del [b]	LOS [c]	50 Q [d]	95 Q [e]	v/c [a]	Del [b]	LOS [c]	50 Q [d]	95 Q [e]
Huntoon Memorial Highway (Route 56) at Stafford Street															
Weekday Morning															
NB L	0.05	17.4	B	4	16	0.08	18.3	B	3	15	0.09	18.8	B	3	15
NB T/R	0.46	22.5	C	120	202	0.66	27.7	C	110	#199	0.79	34.5	C	137	#269
SB L	0.14	18.5	B	18	46	0.23	20.2	C	16	44	0.30	22.6	C	17	47
SB T/R	0.57	24.9	C	169	273	0.81	34.7	C	150	#290	0.85	38.7	D	159	#306
EB L/T/R	0.82	42.0	D	185	240	0.88	44.6	D	133	#268	0.90	46.7	D	136	#276
WB L/T/R	0.87	53.7	D	130	175	0.88	51.7	D	89	#206	0.90	53.5	D	94	#216
Overall	**0.53**	**34.0**	**C**			**0.57**	**37.8**	**D**			**0.59**	**41.3**	**D**		
Weekday Evening															
NB L	0.05	24.0	C	5	17	0.06	24.6	C	5	18	0.07	24.2	C	5	18
NB T/R	0.84	46.5	D	228	326	0.96	63.5	E	258	#447	0.97	64.5	E	274	#471
SB L	0.25	29.8	C	14	38	0.45	42.9	D	18	#59	0.60	55.7	E	24	#82
SB T/R	0.51	30.8	C	127	191	0.60	33.4	C	146	231	0.71	36.5	D	187	289
EB L/T/R	0.48	23.2	C	124	176	0.44	22.0	C	108	177	0.48	23.2	C	114	187
WB L/T/R	0.96	56.6	E	296	#513	0.93	48.7	D	280	#482	0.98	61.8	E	292	#502
Overall	**0.73**	**42.5**	**D**			**0.76**	**45.5**	**D**			**0.78**	**50.8**	**D**		

a Volume to capacity ratio.
b Average total delay, in seconds per vehicle.
c Level-of-service.
d 50th percentile queue, in feet.
e 95th percentile queue, in feet.
~ Volume exceeds capacity, queue is theoretically infinite.
# 95th percentile volume exceeds capacity, queue may be longer.
m Volume for 95th percentile queue is metered by upstream signal.

4.3 Unsignalized Intersection Capacity Analysis

The unsignalized capacity analysis results for the study area intersections are summarized in Table 8. The capacity analyses were conducted for the 2021 Existing, 2028 No-Build, and 2021 Build conditions and the detailed results are included in the Appendix.

As shown in Table 8, the addition of Project related trips is expected to have only minor impacts on the roadway network surrounding the Site. The westbound movements at Clark Street will see a slight reduction in LOS during the morning peak periods, the reduction in LOS from a B to a C for this approach results from a slight increase in delay of 1.4 seconds.

Table 7 Unsignalized Intersection Capacity Analysis

Location / Movement	2021 Existing Conditions					2028 No-Build Conditions					2028 Build Conditions				
	v/c [a]	Del [b]	LOS [c]	50 Q [d]	95 Q [e]	v/c [a]	Del [b]	LOS [c]	50 Q [d]	95 Q [e]	v/c [a]	Del [b]	LOS [c]	50 Q [d]	95 Q [e]
Huntoon Memorial Highway (Route 56) at Clark Street															
Weekday Morning															
EB L/T/R	0.06	11.7	B		4	0.07	11.8	B		4	0.09	12.5	B		6
WB L/T/R	0.02	13.9	B		2	0.02	14.3	B		2	0.02	15.7	C		2
Weekday Evening															
EB L/T/R	0.10	13.1	B		6	0.08	12.9	B		6	0.09	14.0	B		6
WB L/T/R	0.10	16.8	C		6	0.04	16.1	C		2	0.04	18.0	C		2
Huntoon Memorial Highway (Route 56) at Driveway North															
Weekday Morning															
EB L/T/R											0.06	14.8	B		4
Weekday Evening															
EB L/T/R											0.20	17.4	C		14
Huntoon Memorial Highway (Route 56) at Driveway South															
Weekday Morning															
EB L/T/R											0.04	11.0	B		2
Weekday Evening															
EB L/T/R											0.11	10.5	B		8

a	Volume to capacity ratio.	e	95th percentile queue, in feet.
b	Average total delay, in seconds per vehicle.	~	Volume exceeds capacity, queue is theoretically infinite.
c	Level-of-service.	#	95th percentile volume exceeds capacity, queue may be longer.
d	50th percentile queue, in feet.	m	Volume for 95th percentile queue is metered by upstream signal.

5

Conclusion

VHB has conducted a detailed traffic evaluation to assess the potential impacts associated with the proposed Project. The proposed Project involves the development of up to a 300,000 sf manufacturing facility that will be supported by up to 279 standard parking spaces. An additional 59 spaces are currently provided on the site plan for tractor trailers with space for 42 loading docks, depending on the final tenant.

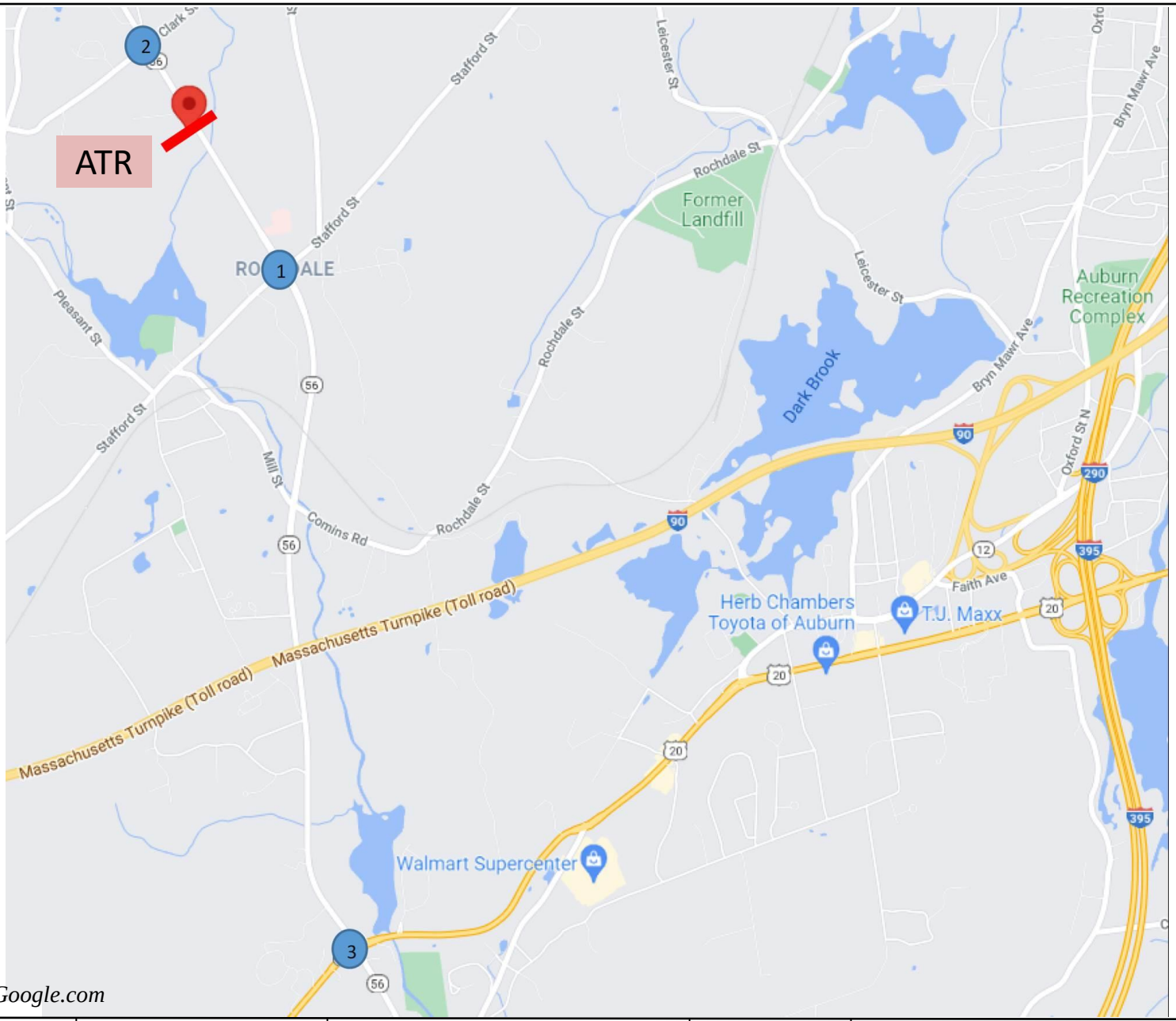
Based on standard ITE data, the Project is expected to generate up to approximately 1,180 daily vehicle trips, and 185 and 200 vehicle trips during the critical weekday morning and evening peak hours. The capacity analyses conducted as part of this evaluation indicated that the Project will not significantly impact operating conditions and that the overall level of service will remain the same at all study area intersections between 2028 No-Build and 2028 Build conditions.

Overall, the results of this study show that the additional new traffic generated by the proposed Project can be accommodated on the surrounding roadway network.

Appendix

Traffic Counts

- ATR's
- TMC's



Map Credit: Google.com

BOSTON TRAFFIC DATA	BTD ID: 792_C9_VHB	Leicester, MA	# of TMC's: 03	Client: Vanasse Hangen Brustlin, Inc.
		Collected on October 5 to 6, 2021	# of ATR's: 01	Contact: Erin L. Thompson, PE, IMSA III

Client:	Erin L. Thompson, PE, IMSA III
Project #:	792_C9_VHB
BTD #:	Location 1
Location:	Leicester, MA
Street 1:	Huntoon Memorial Hwy (Rte 56)
Street 2:	Stafford Street
Count Date:	10/6/2021
Day of Week:	Wednesday
Weather:	Clouds & Sun, 60°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Stafford Street Eastbound				Stafford Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	29	5	0	11	73	3	0	3	55	8	0	21	23	6
7:15 AM	0	5	40	18	0	18	86	5	0	5	58	4	0	13	18	5
7:30 AM	0	1	44	30	0	12	78	5	0	3	83	5	0	13	41	8
7:45 AM	0	3	53	18	0	5	78	7	0	8	64	0	0	14	30	10
8:00 AM	0	0	43	18	0	11	81	7	0	9	53	3	0	11	24	5
8:15 AM	0	9	36	11	0	7	58	9	0	9	70	0	0	13	22	7
8:30 AM	0	1	41	17	0	4	51	2	0	5	51	3	0	11	23	5
8:45 AM	0	6	43	17	0	9	53	5	0	3	32	3	0	11	26	5

	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Stafford Street Eastbound				Stafford Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	5	87	19	0	7	61	10	0	4	36	1	0	15	61	13
4:15 PM	0	8	92	17	0	5	52	4	0	1	34	2	0	16	60	17
4:30 PM	0	1	86	21	0	9	55	6	0	5	42	3	0	13	81	20
4:45 PM	0	2	63	25	0	5	53	8	0	6	59	2	0	28	58	17
5:00 PM	0	2	78	21	0	12	51	9	0	10	32	0	0	30	83	17
5:15 PM	0	6	66	32	0	6	58	11	0	7	40	3	0	31	61	12
5:30 PM	0	5	82	23	0	6	49	6	0	2	33	2	0	24	76	14
5:45 PM	0	4	76	18	0	4	39	6	0	6	34	2	0	10	42	10

AM PEAK HOUR 7:15 AM to 8:15 AM	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Stafford Street Eastbound				Stafford Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**9**	**180**	**84**	**0**	**46**	**323**	**24**	**0**	**25**	**258**	**12**	**0**	**51**	**113**	**28**
PHF	**0.91**				**0.90**				**0.81**				**0.77**			
HV %	**0.0%**	**22.2%**	**8.9%**	**4.8%**	**0.0%**	**4.3%**	**5.6%**	**0.0%**	**0.0%**	**0.0%**	**1.2%**	**33.3%**	**0.0%**	**3.9%**	**2.7%**	**0.0%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Stafford Street Eastbound				Stafford Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**11**	**293**	**99**	**0**	**32**	**217**	**34**	**0**	**28**	**173**	**8**	**0**	**102**	**283**	**66**
PHF	**0.93**				**0.94**				**0.78**				**0.87**			
HV %	**0.0%**	**0.0%**	**2.0%**	**1.0%**	**0.0%**	**3.1%**	**2.8%**	**2.9%**	**0.0%**	**0.0%**	**0.0%**	**25.0%**	**0.0%**	**1.0%**	**1.1%**	**3.0%**

Client:	Erin L. Thompson, PE, IMSA III
Project #:	792_C9_VHB
BTD #:	Location 1
Location:	Leicester, MA
Street 1:	Huntoon Memorial Hwy (Rte 56)
Street 2:	Stafford Street
Count Date:	10/6/2021
Day of Week:	Wednesday
Weather:	Clouds & Sun, 60°F

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HEAVY VEHICLES

	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Stafford Street Eastbound				Stafford Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	1	0	0	7	0	0	0	1	3	0	1	0	1
7:15 AM	0	1	4	0	0	0	3	0	0	0	1	1	0	1	0	0
7:30 AM	0	0	3	0	0	1	5	0	0	0	0	2	0	1	1	0
7:45 AM	0	1	4	1	0	0	9	0	0	0	1	0	0	0	2	0
8:00 AM	0	0	5	3	0	1	1	0	0	0	1	1	0	0	0	0
8:15 AM	0	0	5	0	0	0	4	0	0	0	2	0	0	0	0	3
8:30 AM	0	0	5	1	0	1	4	0	0	0	0	2	0	1	2	1
8:45 AM	0	0	6	1	0	1	4	1	0	1	2	1	0	1	1	0

	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Stafford Street Eastbound				Stafford Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	1	0
4:15 PM	0	3	2	1	0	1	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	3	0	0	1	2	1	0	0	0	0	0	0	0	2
4:45 PM	0	0	1	0	0	0	1	0	0	0	0	2	0	1	0	0
5:00 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0
5:15 PM	0	0	0	1	0	0	2	0	0	0	0	0	0	0	2	0
5:30 PM	0	0	2	0	0	0	0	0	0	0	0	1	0	1	0	0
5:45 PM	0	0	3	1	0	0	0	1	0	0	0	0	0	0	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Stafford Street Eastbound				Stafford Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**21**	**5**	**0**	**3**	**13**	**1**	**0**	**1**	**5**	**4**	**0**	**2**	**3**	**4**
PHF	**0.81**				**0.71**				**0.63**				**0.56**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Stafford Street Eastbound				Stafford Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**3**	**9**	**1**	**0**	**2**	**4**	**1**	**0**	**0**	**0**	**2**	**0**	**1**	**1**	**2**
PHF	**0.54**				**0.44**				**0.25**				**0.50**			

Client:	Erin L. Thompson, PE, IMSA III
Project #:	792_C9_VHB
BTD #:	Location 1
Location:	Leicester, MA
Street 1:	Huntoon Memorial Hwy (Rte 56)
Street 2:	Stafford Street
Count Date:	10/6/2021
Day of Week:	Wednesday
Weather:	Clouds & Sun, 60°F

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PEDESTRIANS & BICYCLES

	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Stafford Street Eastbound				Stafford Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Stafford Street Eastbound				Stafford Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
4:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:15 AM to 8:15 AM	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Stafford Street Eastbound				Stafford Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:30 PM to 5:30 PM	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Stafford Street Eastbound				Stafford Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Erin L. Thompson, PE, IMSA III
Project #:	792_C9_VHB
BTD #:	Location 2
Location:	Leicester, MA
Street 1:	Huntoon Memorial Hwy (Rte 56)
Street 2:	Clark Street
Count Date:	10/6/2021
Day of Week:	Wednesday
Weather:	Clouds & Sun, 60°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Clark Street Eastbound				Clark Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	28	0	0	0	91	0	0	1	2	4	0	0	0	1
7:15 AM	0	0	43	0	0	1	91	0	0	1	1	7	0	2	0	0
7:30 AM	0	4	43	1	0	1	80	1	0	1	0	6	0	1	1	0
7:45 AM	0	3	51	0	0	1	83	1	0	2	0	7	0	2	0	0
8:00 AM	0	3	43	1	0	0	62	0	0	2	0	4	0	2	0	0
8:15 AM	0	0	41	0	0	2	61	2	0	0	0	6	0	4	0	0
8:30 AM	0	2	38	0	0	1	49	0	0	1	1	5	0	2	1	1
8:45 AM	0	3	47	0	0	0	57	0	0	0	1	6	0	1	0	0

	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Clark Street Eastbound				Clark Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	4	90	2	0	0	57	2	0	0	0	5	0	2	1	0
4:15 PM	0	4	98	3	0	0	45	1	0	3	0	6	0	2	0	1
4:30 PM	0	5	111	0	0	0	46	2	0	1	1	8	0	3	3	1
4:45 PM	0	4	77	2	0	0	52	1	0	2	0	2	0	1	0	0
5:00 PM	0	4	93	2	0	0	49	2	0	3	4	5	0	1	0	0
5:15 PM	0	10	80	3	0	0	55	0	0	2	0	5	0	0	0	0
5:30 PM	0	11	79	2	0	0	55	0	0	1	1	5	0	1	2	0
5:45 PM	0	6	88	1	0	0	36	0	0	1	1	1	0	1	1	1

AM PEAK HOUR 7:00 AM to 8:00 AM	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Clark Street Eastbound				Clark Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**8**	**165**	**1**	**0**	**3**	**345**	**2**	**0**	**5**	**3**	**24**	**0**	**5**	**1**	**1**
PHF	**0.81**				**0.95**				**0.89**				**0.88**			
HV %	**0.0%**	**12.5%**	**7.3%**	**0.0%**	**0.0%**	**33.3%**	**5.5%**	**0.0%**	**0.0%**	**0.0%**	**33.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:00 PM to 5:00 PM	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Clark Street Eastbound				Clark Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**17**	**376**	**7**	**0**	**0**	**200**	**6**	**0**	**6**	**1**	**21**	**0**	**8**	**4**	**2**
PHF	**0.86**				**0.87**				**0.70**				**0.50**			
HV %	**0.0%**	**0.0%**	**2.1%**	**0.0%**	**0.0%**	**0.0%**	**3.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**4.8%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Erin L. Thompson, PE, IMSA III
Project #:	792_C9_VHB
BTD #:	Location 2
Location:	Leicester, MA
Street 1:	Huntoon Memorial Hwy (Rte 56)
Street 2:	Clark Street
Count Date:	10/6/2021
Day of Week:	Wednesday
Weather:	Clouds & Sun, 60°F

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HEAVY VEHICLES

	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Clark Street Eastbound				Clark Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	1	0	0	0	6	0	0	0	1	0	0	0	0	0
7:15 AM	0	0	4	0	0	0	5	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	3	0	0	1	6	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	4	0	0	0	1	0	0	1	0	0	0	0	0	0
8:15 AM	0	0	4	0	0	1	4	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	4	0	0	0	5	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	8	0	0	0	5	0	0	0	0	0	0	0	0	0

	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Clark Street Eastbound				Clark Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	3	0	0	0	1	0	0	0	0	1	0	0	0	0
4:15 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Clark Street Eastbound				Clark Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**20**	**0**	**0**	**1**	**15**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.63**				**0.80**				**0.25**				**0.00**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Clark Street Eastbound				Clark Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**8**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
PHF	**0.67**				**0.75**				**0.25**				**0.00**			

Client:	Erin L. Thompson, PE, IMSA III
Project #:	792_C9_VHB
BTD #:	Location 2
Location:	Leicester, MA
Street 1:	Huntoon Memorial Hwy (Rte 56)
Street 2:	Clark Street
Count Date:	10/6/2021
Day of Week:	Wednesday
Weather:	Clouds & Sun, 60°F

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PEDESTRIANS & BICYCLES

	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Clark Street Eastbound				Clark Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Clark Street Eastbound				Clark Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

AM PEAK HOUR[1] 7:00 AM to 8:00 AM	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Clark Street Eastbound				Clark Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1

PM PEAK HOUR[1] 4:00 PM to 5:00 PM	Huntoon Memorial Hwy (Rte 56) Northbound				Huntoon Memorial Hwy (Rte 56) Southbound				Clark Street Eastbound				Clark Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Client:	Erin L. Thompson, PE, IMSA III
Project #:	792_C9_VHB
BTD #:	Location 3
Location:	Oxford, MA
Street 1:	Leicester Street (Rte 56)
Street 2:	Southbridge Road (U.S. 20)
Count Date:	10/6/2021
Day of Week:	Wednesday
Weather:	Clouds & Sun, 60°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Leicester Street (Rte 56) Northbound				Leicester Street (Rte 56) Southbound				Southbridge Road (U.S. 20) Eastbound				Southbridge Road (U.S. 20) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	19	29	11	0	43	53	29	0	13	244	18	0	12	128	6
7:15 AM	0	29	50	11	0	37	49	28	0	10	284	28	0	9	129	12
7:30 AM	0	18	43	17	0	34	69	11	0	20	300	23	0	5	117	13
7:45 AM	0	29	40	6	0	36	42	13	0	22	252	23	0	6	141	26
8:00 AM	0	19	35	7	0	27	41	9	0	15	277	28	0	7	119	20
8:15 AM	0	13	30	7	0	28	50	6	0	16	195	24	0	7	114	13
8:30 AM	0	22	45	7	0	25	41	13	0	13	189	17	0	6	134	18
8:45 AM	0	17	37	13	0	23	47	8	0	12	200	28	0	6	111	25

	Leicester Street (Rte 56) Northbound				Leicester Street (Rte 56) Southbound				Southbridge Road (U.S. 20) Eastbound				Southbridge Road (U.S. 20) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	19	52	6	0	18	55	9	0	20	167	27	0	13	322	40
4:15 PM	0	37	53	6	0	16	52	15	0	18	171	24	0	9	315	45
4:30 PM	0	27	52	9	0	18	59	17	0	14	215	19	0	7	333	31
4:45 PM	0	27	53	5	0	11	69	10	0	14	155	24	0	10	283	32
5:00 PM	0	34	45	4	0	30	67	22	0	14	191	29	0	9	326	29
5:15 PM	0	29	63	6	0	17	66	20	0	15	153	23	0	6	325	43
5:30 PM	0	22	64	4	0	19	51	18	0	16	152	39	0	9	268	28
5:45 PM	0	29	55	7	0	14	33	13	0	14	134	27	0	5	262	40

AM PEAK HOUR 7:00 AM to 8:00 AM	Leicester Street (Rte 56) Northbound				Leicester Street (Rte 56) Southbound				Southbridge Road (U.S. 20) Eastbound				Southbridge Road (U.S. 20) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**95**	**162**	**45**	**0**	**150**	**213**	**81**	**0**	**65**	**1080**	**92**	**0**	**32**	**515**	**57**
PHF		**0.84**				**0.89**				**0.90**				**0.87**		
HV %	**0.0%**	**5.3%**	**7.4%**	**4.4%**	**0.0%**	**12.7%**	**5.2%**	**22.2%**	**0.0%**	**9.2%**	**4.9%**	**7.6%**	**0.0%**	**12.5%**	**8.2%**	**12.3%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Leicester Street (Rte 56) Northbound				Leicester Street (Rte 56) Southbound				Southbridge Road (U.S. 20) Eastbound				Southbridge Road (U.S. 20) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**117**	**213**	**24**	**0**	**76**	**261**	**69**	**0**	**57**	**714**	**95**	**0**	**32**	**1267**	**135**
PHF		**0.90**				**0.85**				**0.87**				**0.96**		
HV %	**0.0%**	**1.7%**	**1.4%**	**4.2%**	**0.0%**	**9.2%**	**1.1%**	**1.4%**	**0.0%**	**8.8%**	**2.9%**	**5.3%**	**0.0%**	**3.1%**	**2.5%**	**5.9%**

Client:	Erin L. Thompson, PE, IMSA III
Project #:	792_C9_VHB
BTD #:	Location 3
Location:	Oxford, MA
Street 1:	Leicester Street (Rte 56)
Street 2:	Southbridge Road (U.S. 20)
Count Date:	10/6/2021
Day of Week:	Wednesday
Weather:	Clouds & Sun, 60°F

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HEAVY VEHICLES

	Leicester Street (Rte 56) Northbound				Leicester Street (Rte 56) Southbound				Southbridge Road (U.S. 20) Eastbound				Southbridge Road (U.S. 20) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	2	0	0	5	5	6	0	2	13	1	0	2	9	1
7:15 AM	0	2	4	1	0	3	3	9	0	0	14	3	0	0	8	2
7:30 AM	0	0	2	1	0	5	2	3	0	1	11	1	0	2	14	2
7:45 AM	0	2	4	0	0	6	1	0	0	3	15	2	0	0	11	2
8:00 AM	0	1	7	0	0	7	4	0	0	4	13	5	0	1	17	2
8:15 AM	0	1	1	2	0	3	6	1	0	2	12	5	0	0	15	2
8:30 AM	0	1	4	1	0	5	4	4	0	2	10	2	0	0	8	2
8:45 AM	0	2	5	1	0	4	5	2	0	4	10	3	0	0	8	7

	Leicester Street (Rte 56) Northbound				Leicester Street (Rte 56) Southbound				Southbridge Road (U.S. 20) Eastbound				Southbridge Road (U.S. 20) Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	1	0	1	0	1	3	0	0	3	5	2	0	0	8	2
4:15 PM	0	0	3	1	0	1	1	2	0	0	10	2	0	0	14	5
4:30 PM	0	0	0	0	0	2	0	0	0	1	11	2	0	0	7	1
4:45 PM	0	1	0	0	0	2	2	0	0	3	2	2	0	0	11	2
5:00 PM	0	1	1	1	0	2	0	1	0	0	4	0	0	1	4	2
5:15 PM	0	0	2	0	0	1	1	0	0	1	4	1	0	0	10	3
5:30 PM	0	2	0	0	0	1	0	0	0	1	1	0	0	0	6	2
5:45 PM	0	0	2	0	0	0	0	0	0	1	3	2	0	0	7	3

AM PEAK HOUR 8:00 AM to 9:00 AM	Leicester Street (Rte 56) Northbound				Leicester Street (Rte 56) Southbound				Southbridge Road (U.S. 20) Eastbound				Southbridge Road (U.S. 20) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**5**	**17**	**4**	**0**	**19**	**19**	**7**	**0**	**12**	**45**	**15**	**0**	**1**	**48**	**13**
PHF	**0.81**				**0.87**				**0.82**				**0.78**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Leicester Street (Rte 56) Northbound				Leicester Street (Rte 56) Southbound				Southbridge Road (U.S. 20) Eastbound				Southbridge Road (U.S. 20) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**2**	**3**	**2**	**0**	**6**	**6**	**2**	**0**	**7**	**28**	**8**	**0**	**0**	**40**	**10**
PHF	**0.44**				**0.88**				**0.77**				**0.66**			

Client:	Erin L. Thompson, PE, IMSA III
Project #:	792_C9_VHB
BTD #:	Location 3
Location:	Oxford, MA
Street 1:	Leicester Street (Rte 56)
Street 2:	Southbridge Road (U.S. 20)
Count Date:	10/6/2021
Day of Week:	Wednesday
Weather:	Clouds & Sun, 60°F

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PEDESTRIANS & BICYCLES

	Leicester Street (Rte 56) Northbound				Leicester Street (Rte 56) Southbound				Southbridge Road (U.S. 20) Eastbound				Southbridge Road (U.S. 20) Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Leicester Street (Rte 56) Northbound				Leicester Street (Rte 56) Southbound				Southbridge Road (U.S. 20) Eastbound				Southbridge Road (U.S. 20) Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR[1] 7:00 AM to 8:00 AM	Leicester Street (Rte 56) Northbound				Leicester Street (Rte 56) Southbound				Southbridge Road (U.S. 20) Eastbound				Southbridge Road (U.S. 20) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR[1] 4:30 PM to 5:30 PM	Leicester Street (Rte 56) Northbound				Leicester Street (Rte 56) Southbound				Southbridge Road (U.S. 20) Eastbound				Southbridge Road (U.S. 20) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] *NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.*

Volume Report

Job 792_C9_VHB_ATR
Area Leicester, MA
Location Huntoon Memorial Hwy, between Clark St & Stafford St (approx. #90 Huntoon)

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Tuesday, October 5, 2021

Time	Total		NB		SB		Time	Total		NB		SB	
0000	9		5		4		1200	120		64		56	
0015	9		5		4		1215	106		40		66	
0030	7		5		2		1230	115		65		50	
0045	12	37	6	21	6	16	1245	114	455	65	234	49	221
0100	3		3		0		1300	104		42		62	
0115	2		2		0		1315	142		86		56	
0130	3		2		1		1330	108		52		56	
0145	5	13	1	8	4	5	1345	121	475	55	235	66	240
0200	2		0		2		1400	119		54		65	
0215	1		0		1		1415	115		76		39	
0230	1		0		1		1430	125		80		45	
0245	4	8	2	2	2	6	1445	143	502	85	295	58	207
0300	4		1		3		1500	164		91		73	
0315	12		3		9		1515	132		80		52	
0330	9		2		7		1530	150		96		54	
0345	3	28	1	7	2	21	1545	142	588	98	365	44	223
0400	9		2		7		1600	157		96		61	
0415	6		1		5		1615	156		92		64	
0430	23		5		18		1630	163		108		55	
0445	20	58	3	11	17	47	1645	163	639	109	405	54	234
0500	29		3		26		1700	164		109		55	
0515	46		4		42		1715	158		112		46	
0530	67		11		56		1730	156		117		39	
0545	56	198	14	32	42	166	1745	103	581	64	402	39	179
0600	75		22		53		1800	101		62		39	
0615	101		33		68		1815	98		65		33	
0630	103		33		70		1830	74		42		32	
0645	123	402	33	121	90	281	1845	73	346	47	216	26	130
0700	105		25		80		1900	73		38		35	
0715	130		36		94		1915	58		36		22	
0730	121		52		69		1930	62		38		24	
0745	141	497	62	175	79	322	1945	60	253	33	145	27	108
0800	109		43		66		2000	50		30		20	
0815	117		51		66		2015	42		31		11	
0830	113		46		67		2030	32		20		12	
0845	110	449	48	188	62	261	2045	27	151	13	94	14	57
0900	89		35		54		2100	31		15		16	
0915	96		36		60		2115	30		17		13	
0930	91		44		47		2130	24		18		6	
0945	94	370	45	160	49	210	2145	23	108	14	64	9	44
1000	85		34		51		2200	25		15		10	
1015	108		46		62		2215	19		15		4	
1030	102		46		56		2230	20		11		9	
1045	87	382	54	180	33	202	2245	18	82	13	54	5	28
1100	93		42		51		2300	8		8		0	
1115	101		51		50		2315	18		12		6	
1130	117		52		65		2330	5		3		2	
1145	96	407	57	202	39	205	2345	8	39	7	30	1	9
							Total	**7068**		**3646**		**3422**	

Volume Report

Job 792_C9_VHB_ATR
Area Leicester, MA
Location Huntoon Memorial Hwy, between Clark St & Stafford St (approx. #90 Huntoon)

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Wednesday, October 6, 2021

Time	Total		NB		SB	
0000	7		7		0	
0015	7		3		4	
0030	8		7		1	
0045	3	25	2	19	1	6
0100	4		3		1	
0115	3		2		1	
0130	5		3		2	
0145	4	16	4	12	0	4
0200	3		1		2	
0215	3		1		2	
0230	2		1		1	
0245	3	11	2	5	1	6
0300	5		1		4	
0315	7		1		6	
0330	3		1		2	
0345	7	22	0	3	7	19
0400	13		4		9	
0415	19		3		16	
0430	25		2		23	
0445	22	79	5	14	17	65
0500	31		8		23	
0515	52		5		47	
0530	64		13		51	
0545	62	209	18	44	44	165
0600	84		20		64	
0615	107		45		62	
0630	92		23		69	
0645	117	400	37	125	80	275
0700	127		33		94	
0715	145		45		100	
0730	138		52		86	
0745	158	568	62	192	96	376
0800	125		57		68	
0815	115		44		71	
0830	101		44		57	
0845	116	457	52	197	64	260
0900	98		40		58	
0915	121		51		70	
0930	92		46		46	
0945	102	413	46	183	56	230
1000	99		52		47	
1015	107		51		56	
1030	90		41		49	
1045	97	393	45	189	52	204
1100	101		49		52	
1115	112		62		50	
1130	107		59		48	
1145	104	424	53	223	51	201

Time	Total		NB		SB	
1200	115		59		56	
1215	97		47		50	
1230	118		67		51	
1245	112	442	64	237	48	205
1300	112		66		46	
1315	137		77		60	
1330	121		66		55	
1345	116	486	58	267	58	219
1400	144		57		87	
1415	138		62		76	
1430	136		73		63	
1445	160	578	101	293	59	285
1500	151		86		65	
1515	168		104		64	
1530	149		85		64	
1545	153	621	88	363	65	258
1600	173		104		69	
1615	162		103		59	
1630	173		114		59	
1645	146	654	91	412	55	242
1700	164		99		65	
1715	158		94		64	
1730	164		97		67	
1745	125	611	87	377	38	234
1800	120		75		45	
1815	115		64		51	
1830	116		76		40	
1845	108	459	60	275	48	184
1900	93		55		38	
1915	75		50		25	
1930	68		43		25	
1945	53	289	39	187	14	102
2000	62		44		18	
2015	58		42		16	
2030	39		32		7	
2045	54	213	26	144	28	69
2100	41		29		12	
2115	36		24		12	
2130	32		21		11	
2145	20	129	8	82	12	47
2200	33		20		13	
2215	28		23		5	
2230	20		12		8	
2245	22	103	10	65	12	38
2300	12		10		2	
2315	12		10		2	
2330	13		11		2	
2345	5	42	4	35	1	7
Total	**7644**		**3943**		**3701**	

Classification Report

Job # 792_C9_VHB_ATR
Area Leicester, MA
Location Huntoon Memorial Hwy (Rte 56), between Clark St & Stafford St (approx. #90 Huntoon)
Direction Northbound
Tuesday, October 5, 2021

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	21	0	16	4	0	0	0	0	0	1	0	0	0	0
0100	8	0	6	2	0	0	0	0	0	0	0	0	0	0
0200	2	0	2	0	0	0	0	0	0	0	0	0	0	0
0300	7	0	5	1	0	0	0	0	0	1	0	0	0	0
0400	11	0	7	3	0	0	1	0	0	0	0	0	0	0
0500	32	0	24	7	0	0	1	0	0	0	0	0	0	0
0600	121	0	90	25	0	1	3	0	0	2	0	0	0	0
0700	175	1	141	19	2	3	5	1	0	3	0	0	0	0
0800	188	0	140	29	2	5	2	1	0	9	0	0	0	0
0900	160	2	111	31	3	6	5	0	0	2	0	0	0	0
1000	180	2	137	23	0	4	5	0	0	9	0	0	0	0
1100	202	0	164	24	3	1	2	0	0	8	0	0	0	0
1200	234	2	189	22	2	6	1	3	0	7	1	0	0	1
1300	235	1	184	39	2	1	3	1	1	2	1	0	0	0
1400	295	1	246	35	3	1	4	1	0	4	0	0	0	0
1500	365	1	296	62	1	2	0	1	0	2	0	0	0	0
1600	405	0	338	60	0	2	2	0	0	3	0	0	0	0
1700	402	0	345	54	1	0	0	0	0	2	0	0	0	0
1800	216	1	191	24	0	0	0	0	0	0	0	0	0	0
1900	145	0	129	15	0	0	1	0	0	0	0	0	0	0
2000	94	0	88	5	0	0	0	0	0	1	0	0	0	0
2100	64	0	59	4	0	1	0	0	0	0	0	0	0	0
2200	54	0	53	1	0	0	0	0	0	0	0	0	0	0
2300	30	0	29	1	0	0	0	0	0	0	0	0	0	0
Total	**3646**	**11**	**2990**	**490**	**19**	**33**	**35**	**8**	**1**	**56**	**2**	**0**	**0**	**1**
	100.00%	**0.30%**	**82.01%**	**13.44%**	**0.52%**	**0.91%**	**0.96%**	**0.22%**	**0.03%**	**1.54%**	**0.05%**	**0.00%**	**0.00%**	**0.03%**

Classification Report

Job # 792_C9_VHB_ATR
Area Leicester, MA
Location Huntoon Memorial Hwy (Rte 56), between Clark St & Stafford St (approx. #90 Huntoon)
Direction Northbound
Wednesday, October 6, 2021

BOSTON TRAFFIC DATA
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Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	19	0	15	3	0	0	1	0	0	0	0	0	0	0
0100	12	0	12	0	0	0	0	0	0	0	0	0	0	0
0200	5	0	3	2	0	0	0	0	0	0	0	0	0	0
0300	3	0	1	2	0	0	0	0	0	0	0	0	0	0
0400	14	0	9	0	0	0	2	0	0	3	0	0	0	0
0500	44	0	30	10	0	0	1	0	0	3	0	0	0	0
0600	125	0	101	14	2	1	5	0	0	2	0	0	0	0
0700	192	0	164	20	3	0	3	0	0	2	0	0	0	0
0800	197	1	145	34	2	1	3	2	0	9	0	0	0	0
0900	183	2	147	24	1	3	2	0	0	3	1	0	0	0
1000	189	0	145	25	3	4	2	2	1	7	0	0	0	0
1100	223	1	182	28	0	2	3	0	0	6	1	0	0	0
1200	237	5	190	22	2	3	3	5	0	6	1	0	0	0
1300	267	5	215	35	2	1	2	3	1	3	0	0	0	0
1400	293	3	248	33	3	1	3	2	0	0	0	0	0	0
1500	363	2	308	45	3	1	3	0	0	1	0	0	0	0
1600	412	2	357	48	1	0	2	0	0	2	0	0	0	0
1700	377	6	331	37	0	2	0	0	0	1	0	0	0	0
1800	275	4	254	17	0	0	0	0	0	0	0	0	0	0
1900	187	0	161	24	2	0	0	0	0	0	0	0	0	0
2000	144	1	134	7	0	0	0	0	0	2	0	0	0	0
2100	82	1	73	8	0	0	0	0	0	0	0	0	0	0
2200	65	0	60	5	0	0	0	0	0	0	0	0	0	0
2300	35	0	30	4	0	0	0	0	0	1	0	0	0	0
Total	**3943**	**33**	**3315**	**447**	**24**	**19**	**35**	**14**	**2**	**51**	**3**	**0**	**0**	**0**
	100.00%	**0.84%**	**84.07%**	**11.34%**	**0.61%**	**0.48%**	**0.89%**	**0.36%**	**0.05%**	**1.29%**	**0.08%**	**0.00%**	**0.00%**	**0.00%**

Classification Report

Job # 792_C9_VHB_ATR
Area Leicester, MA
Location Huntoon Memorial Hwy (Rte 56), between Clark St & Stafford St (approx. #90 Huntoon)
Direction Southbound
Tuesday, October 5, 2021

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
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Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	16	0	14	2	0	0	0	0	0	0	0	0	0	0
0100	5	0	5	0	0	0	0	0	0	0	0	0	0	0
0200	6	1	4	1	0	0	0	0	0	0	0	0	0	0
0300	21	0	15	6	0	0	0	0	0	0	0	0	0	0
0400	47	0	30	15	0	0	0	0	0	2	0	0	0	0
0500	166	0	119	39	1	5	2	0	0	0	0	0	0	0
0600	281	0	218	53	2	2	1	0	0	4	1	0	0	0
0700	322	1	247	60	1	0	2	0	0	8	2	0	0	1
0800	261	2	203	44	1	3	3	0	1	3	1	0	0	0
0900	210	0	147	37	4	3	4	2	1	10	2	0	0	0
1000	202	1	149	31	7	6	3	0	0	3	2	0	0	0
1100	205	1	151	33	2	2	2	1	0	11	2	0	0	0
1200	221	1	168	34	2	1	4	0	1	8	2	0	0	0
1300	240	0	182	34	5	1	5	2	0	8	2	0	0	1
1400	207	1	176	23	1	0	2	0	1	3	0	0	0	0
1500	223	0	186	27	3	4	1	0	0	1	0	0	0	1
1600	234	0	196	34	1	2	1	0	0	0	0	0	0	0
1700	179	0	146	29	1	0	1	0	0	1	1	0	0	0
1800	130	0	110	16	2	0	0	0	0	2	0	0	0	0
1900	108	0	95	11	1	0	0	0	0	0	1	0	0	0
2000	57	0	49	8	0	0	0	0	0	0	0	0	0	0
2100	44	0	40	4	0	0	0	0	0	0	0	0	0	0
2200	28	0	25	3	0	0	0	0	0	0	0	0	0	0
2300	9	0	9	0	0	0	0	0	0	0	0	0	0	0
Total	**3422**	**8**	**2684**	**544**	**34**	**29**	**31**	**5**	**4**	**64**	**16**	**0**	**0**	**3**
	100.00%	**0.23%**	**78.43%**	**15.90%**	**0.99%**	**0.85%**	**0.91%**	**0.15%**	**0.12%**	**1.87%**	**0.47%**	**0.00%**	**0.00%**	**0.09%**

Classification Report

Job # 792_C9_VHB_ATR
Area Leicester, MA
Location Huntoon Memorial Hwy (Rte 56), between Clark St & Stafford St (approx. #90 Huntoon)
Direction Southbound
Wednesday, October 6, 2021

BOSTON TRAFFIC DATA
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Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	6	0	5	0	1	0	0	0	0	0	0	0	0	0
0100	4	0	4	0	0	0	0	0	0	0	0	0	0	0
0200	6	0	4	2	0	0	0	0	0	0	0	0	0	0
0300	19	0	16	3	0	0	0	0	0	0	0	0	0	0
0400	65	0	42	20	0	2	0	0	0	1	0	0	0	0
0500	165	0	121	40	0	1	1	0	0	2	0	0	0	0
0600	275	0	207	54	2	1	4	0	0	5	2	0	0	0
0700	376	0	289	72	1	1	3	0	0	10	0	0	0	0
0800	260	1	202	46	1	1	2	1	1	3	2	0	0	0
0900	230	1	184	23	1	3	3	1	2	7	4	0	0	1
1000	204	2	157	30	2	2	2	1	0	6	2	0	0	0
1100	201	1	160	23	0	1	5	1	1	6	3	0	0	0
1200	205	3	160	30	1	2	1	0	1	4	3	0	0	0
1300	219	2	165	32	3	6	4	0	0	4	3	0	0	0
1400	285	6	236	31	3	1	5	0	1	0	1	0	0	1
1500	258	3	215	31	2	1	2	0	0	3	0	0	0	1
1600	242	1	210	27	1	1	1	0	0	1	0	0	0	0
1700	234	5	211	18	0	0	0	0	0	0	0	0	0	0
1800	184	1	159	23	1	0	0	0	0	0	0	0	0	0
1900	102	2	83	15	0	0	0	0	0	2	0	0	0	0
2000	69	0	63	5	0	1	0	0	0	0	0	0	0	0
2100	47	0	39	7	0	0	0	0	0	1	0	0	0	0
2200	38	0	35	2	0	0	0	0	0	1	0	0	0	0
2300	7	0	6	1	0	0	0	0	0	0	0	0	0	0
Total	**3701**	**28**	**2973**	**535**	**19**	**24**	**33**	**4**	**6**	**56**	**20**	**0**	**0**	**3**
	100.00%	**0.76%**	**80.33%**	**14.46%**	**0.51%**	**0.65%**	**0.89%**	**0.11%**	**0.16%**	**1.51%**	**0.54%**	**0.00%**	**0.00%**	**0.08%**

Seasonal Adjustment

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
R1	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
R2	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
R3	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
R4-R7	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
U1-Boston	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
U1-Essex	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
U1-Southeast	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
U1-West	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
U1-Worcester	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
U2	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
U3	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
U4-U7	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
Rec - East	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
Rec - West	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.

12/13/2021

Collisions

- Crash Data
- Crash Rates

Huntoon Memorial Highway at Clark Street

Crash Number	City Town Name	Crash Date	Crash Time	Max Injury Severity Reported	Light Conditions	Manner of Collision	Road Surface Condition	Weather Conditions
4212741	LEICESTER	06/16/2016	11:19 AM	No injury	Daylight	Single vehicle crash	Dry	Clear
4447806	LEICESTER	10/26/2017	3:07 PM	No injury	Daylight	Angle	Dry	Clear/ Unknown
4527883	LEICESTER	04/16/2018	8:35 AM	No injury	Daylight	Single vehicle crash	Slush	Cloudy/ Rain

Data Level: CRASH
Query Type: Spatial

Criteria: If you conducted an Advanced Query your SQL statement will be listed here

Huntoon Memorial Highway at Stafford Street

Crash Number	City Town Name	Crash Date	Crash Time	Max Injury Severity Reported	Light Conditions	Manner of Collision	Road Surface Condition	Weather Conditions
3726237	LEICESTER	01/25/2014	9:11 AM	Non-fatal injury - Non-incapacitating	Daylight	Angle	Dry	Clear
3886348	LEICESTER	07/21/2014	8:02 PM	No injury	Dusk	Single vehicle crash	Dry	Clear/ Unknown
3970752	LEICESTER	11/06/2014	11:41 AM	Non-fatal injury - Possible	Daylight	Angle	Wet	Cloudy/ Rain
3979272	LEICESTER	11/22/2014	1:39 PM	No injury	Daylight	Single vehicle crash	Dry	Clear
4006488	LEICESTER	02/10/2015	5:01 PM	No injury	Daylight	Rear-end	Snow	Clear
4014645	LEICESTER	02/16/2015	9:34 AM	No injury	Daylight	Rear-end	Ice	Clear
4033606	LEICESTER	04/17/2015	1:00 AM	No injury	Dark - lighted roadway	Sideswipe, opposite direction	Dry	Clear
4113151	LEICESTER	11/13/2015	9:25 AM	No injury	Daylight	Sideswipe, same direction	Dry	Clear
4158872	LEICESTER	02/25/2016	5:49 PM	No injury	Dark - lighted roadway	Angle	Wet	Rain
4158873	LEICESTER	02/25/2016	9:21 PM	No injury	Dark - lighted roadway	Angle	Wet	Rain
4212745	LEICESTER	06/24/2016	10:51 AM	No injury	Daylight	Angle	Dry	Clear
4230811	LEICESTER	07/28/2016	12:20 PM	Non-fatal injury - Non-incapacitating	Daylight	Angle	Dry	Cloudy
4296402	LEICESTER	12/05/2016	6:02 AM	No injury	Dawn	Sideswipe, opposite direction	Ice	Snow/ Other
4304728	LEICESTER	12/24/2016	11:00 AM	No injury	Daylight	Rear-end	Wet	Cloudy/ Rain
4347946	LEICESTER	03/31/2017	1:33 PM	No injury	Daylight	Angle	Wet	Cloudy
4489835	LEICESTER	01/11/2018	7:11 PM	Non-fatal injury - Possible	Dark - roadway not lighted	Head-on	Wet	Fog, smog, smoke
4502000	LEICESTER	02/13/2018	5:40 PM	No injury	Dusk	Rear-end	Dry	Clear
4582634	LEICESTER	08/10/2018	12:22 PM	No injury	Daylight	Angle	Dry	Clear
4625009	LEICESTER	11/09/2018	5:09 PM	Non-fatal injury - Non-incapacitating	Dark - lighted roadway	Angle	Wet	Rain

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

MassHighway

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Leicester COUNT DATE : Jun-21

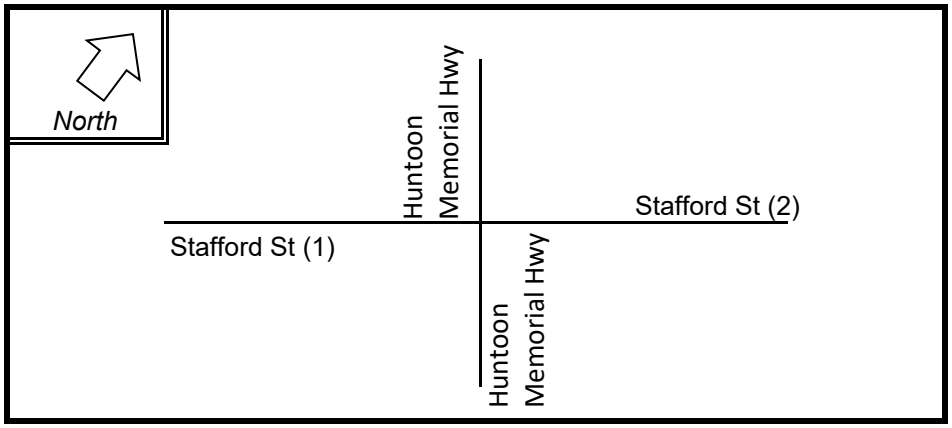
DISTRICT : 3 UNSIGNALIZED : SIGNALIZED : x

~ INTERSECTION DATA ~

MAJOR STREET : Huntoon Memorial Hwy

MINOR STREET(S) : Stafford St

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 (PM) :	209	451	403	283		1,346

" K " FACTOR : **0.085** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **15,835**

Co

TOTAL # OF CRASHES : 19 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **3.80**

CRASH RATE CALCULATION : **0.66** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date: 15392.00 Leicester Traffic Study

MassHighway

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Leicester COUNT DATE : Jun-21

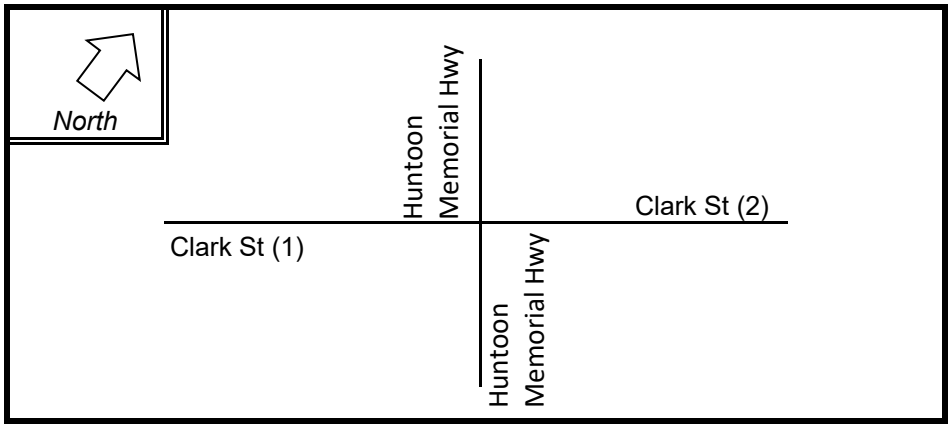
DISTRICT : 3 UNSIGNALIZED : x SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Huntoon Memorial Hwy

MINOR STREET(S) : Clark St

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 (PM) :	33	9	391	207		**640**

" K " FACTOR : **0.085** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **7,529**

Co

TOTAL # OF CRASHES : 3 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.60**

CRASH RATE CALCULATION : **0.22** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date: 15392.00 Leicester Traffic Study

WRTA Bus Schedules/Maps

- **Route 19**
- **Route 33**

OUTBOUND

WEEKDAYS

See the map for matching timepoint locations

1	1C	2	3	4A	4
BUS STARTS Union Station Hub	BUS Leaves City Hall Franklin St.	BUS Leaves Clark University	BUS Leaves Webster Square Plaza	BUS Leaves Goddard & Apricot	BUS ENDS Goddard & Coppage Dr.
530a	533a	543a	549a	556a	BR
*600a	603a	613a	619a	.....	626a
*630a	633a	643a	649a	.....	656a
700a	703a	713a	719a	.....	726a
730a	733a	743a	749a		756a
800a	803a	813a	819a	826a	BR
830a	833a	843a	849a	856a	BR
845a	848a	859a	904a		911a
900a	903a	913a	919a	926a	BR
930a	933a	943a	949a	956a	BR
945a	948a	959a	1004a		1011a
1000a	1003a	1013a	1019a	1026a	BR
1030a	1033a	1043a	1049a	1056a	BR
1045a	1048a	1059a	1104a		1111a
1100a	1103a	1113a	1119a	1126a	BR
1130a	1133a	1143a	1149a	1156a	BR
1145a	1148a	1159a	**1204p**		**1211p**
1200p	**1203p**	**1213p**	**1219p**	**1226p**	**BR**
1230p	**1233p**	**1243p**	**1249p**	**1256p**	**BR**
1245p	**1248p**	**1259p**	**104p**		**111p**
100p	**103p**	**113p**	**119p**	**126p**	**BR**
130p	**133p**	**143p**	**149p**	**156p**	**BR**
145p	**148p**	**159p**	**204p**		**211p**
230p	**233p**	**245p**	**251p**		**256p**
300p	**303p**	**315p**	**321p**	.....	**331p**
330p	**333p**	**345p**	**351p**	**401p**	**BR**
345p	**348p**	**359p**	**404p**		**411p**
400p	**403p**	**415p**	**421p**	**431p**	**BR**
445p	**448p**	**455p**	**501p**	**516p**	**BR**
515p	**518p**	**528p**	**533p**	**546p**	**BR**
540p	**543p**	**555p**	**601p**	**611p**	**BR**
610p	**613p**	**625p**	**631p**	**641p**	**BR**
655p	**658p**	**708p**	**714p**	**721p**	**BR**
725p	**728p**	**738p**	**744p**		**751P**
750p	**753p**	**803p**	**809p**	**816p**	**BR**
820p	**823p**	**832p**	**838p**		**846p**
920p	**923p**	**932p**	**938p**	.....	**946p**
1020p	**1023p**	**1032p**	**1038p**		**1046p**

– PLEASE NOTE –

Outbound trips beginning at 8:30 pm service to/from Webster Square Plaza

BR - Weekday outbound trips to Goddard and Coppage are served on these trips by request to the driver

****These trips service South High.***

SATURDAYS

See the map for matching timepoint locations

1	1C	2	3	5	6	7
BUS STARTS Union Station Hub	BUS Leaves City Hall Franklin St.	BUS Leaves Clark University	BUS Leaves Webster Square Plaza	BUS Leaves Leicester Wal-Mart	BUS Leaves Spencer Center	BUS ENDS Spencer DPW
**650a	653a	700a	706a	716a	.....	.....
710a	713a	720a	727a	737a	747a	751a
800a	803a	813a	820a	835a	847a	851a
900a	903a	913a	920a	935a	947a	951a
1000a	1003a	1013a	1020a	1035a	1047a	1051a
1100a	1103a	1113a	1120a	1135a	1147a	1151a
1200p	**1203p**	**1213p**	**1220p**	**1235p**	**1247p**	**1251p**
100p	**103p**	**113p**	**120p**	**135p**	**147p**	**151p**
200p	**203p**	**213p**	**220p**	**235p**	**247p**	**251p**
300p	**303p**	**313p**	**320p**	**335p**	**347p**	**351p**
400p	**403p**	**413p**	**420p**	**435p**	**447p**	**451p**
500p	**503p**	**513p**	**520p**	**535p**	**547p**	**551p**
600p	**603p**	**613p**	**620p**	**635p**	**647p**	**651p**
655p	**658p**	**708p**	**715p**	**725p**	**737p**	**741p**
***755p	**758p**	**805p**	**811p**	.....	.....	.....*
***855p	**858p**	**905p**	**911p**	.....	.....	.....
***945p	**948p**	**955p**	**1001p**	.....	.....	.....

– PLEASE NOTE –

****** These trips end at Webster Square Plaza***

******* This trip starts / ends at Walmart***

SUNDAYS

1	1C	2	3	5
BUS STARTS Union Station Hub	BUS Leaves City Hall Franklin St.	BUS Leaves Clark University	BUS Leaves Webster Square Plaza	BUS ENDS Leicester Wal-Mart
1030a	1033a	1040a	1046a	1056a
1130a	1133a	1140a	1146a	1156a
1230p	**1233p**	**1240p**	**1246p**	**1256p**
130p	**133p**	**140p**	**146p**	**156p**
230p	**233p**	**240p**	**246p**	**256p**
330p	**333p**	**340p**	**346p**	**356p**
430p	**433p**	**440p**	**446p**	**456p**
530p	**533p**	**540p**	**546p**	**556p**

INBOUND

WEEKDAYS

See the map for matching timepoint locations

4	4A	3	2	1A	1
BUS STARTS Goddard & Coppage Dr.	BUS Leaves Goddard & Apricot	BUS Leaves Webster Square Plaza	BUS Leaves Clark University	BUS Leaves City Hall Main St.	BUS ENDS Union Station Hub
500a	.....	510a	515a	525a	530a
530a	.....	540a	545a	555a	600a
.....	600a	605a	615a	625a	630a
630a	.....	640a	645a	655a	700a
700a	.....	710a	715a	725a	730a
730a	.....	740a	745a	755a	800a
800a		805a	815a	825a	830a
.....	830a	835a	845a	855a	900a
.....	900a	905a	915a	925a	930a
915a		923a	929a	941a	945a
.....	930a	935a	945a	955a	1000a
.....	1000a	1005a	1015a	1025a	1030a
1015a		1023a	1029a	1041a	1045a
.....	1030a	1035a	1045a	1055a	1100a
.....	1100a	1105a	1115a	1125a	1130a
1115p	1123p	1123p	1129p	1141p	1145p
.....	1130a	1135a	1145a	1155a	**1200p**
.....	**1200p**	**1205p**	**1215p**	**1225p**	**1230p**
1215p		**1223p**	**1229p**	**1241p**	**1245p**
1230p	.....	**1240p**	**1245p**	**1255p**	**100p**
.....	**100p**	**105p**	**115p**	**125p**	**130p**
115p		**123p**	**129p**	**141p**	**145p**
.....	**130p**	**135p**	**145p**	**155p**	**200p**
.....	**200p**	**205p**	**215p**	**225p**	**230p**
215p		**223p**	**229p**	**241p**	**245p**
305p	.....	**315p**	**326p**	**340p**	**345p**
315p		**323p**	**329p**	**341p**	**345p**
335p	.....	**345p**	**351p**	**410p**	**415p**
.....	**405p**	**410p**	**421p**	**435p**	**440p**
415p		**423p**	**429p**	**441p**	**445p**
.....	**435p**	**440p**	**451p**	**505p**	**510p**
.....	**520p**	**525p**	**531p**	**550p**	**555p**
.....	**550p**	**555p**	**601p**	**620p**	**625p**
.....	**615p**	**620p**	**631p**	**645p**	**650p**
645p	.....	**655p**	**701p**	**715p**	**720p**
.....	**725p**	**730p**	**740p**	**750p**	**755p**
755p	.....	**805p**	**810p**	**820p**	**825p**
.....	**820p**	**825p**	**835p**	**845p**	**850p**
850p		**858p**	**905p**	**915p**	**920p**
950p		**958p**	**1005p**	**1015p**	**1020p**
1050p		**1058p**	**1105p**	**1115p**	**1120p**

– PLEASE NOTE –

On Weekdays most inbound RT 19 buses continue as Route 23 outbound.

SATURDAYS

See the map for matching timepoint locations

7	6	5	3	2	1A	1
BUS STARTS Spencer DPW	BUS Leaves Spencer Center	BUS Leaves Leicester Wal-Mart	BUS Leaves Webster Sq. Plaza	BUS Leaves Clark University	BUS Leaves City Hall Main St.	BUS ENDS Union Station Hub
.....	.....	.....	***640a	645a	650a	655a
.....	.....	**720a	735a	742a	750a	755a
755a	758a	808a	827a	837a	845a	850a
855a	858a	908a	927a	937a	945a	950a
955a	958a	1008a	1027a	1037a	1045a	1050a
1055a	1058a	1108a	1127a	1137a	1145a	1150a
1155a	1158a	**1208p**	**1227p**	**1237p**	**1245p**	**1250p**
1255p	**1258p**	**108p**	**127p**	**137p**	**145p**	**150p**
155p	**158p**	**208p**	**227p**	**237p**	**245p**	**250p**
255p	**258p**	**308p**	**327p**	**337p**	**345p**	**350p**
355p	**358p**	**408p**	**427p**	**437p**	**445p**	**450p**
455p	**458p**	**508p**	**527p**	**537p**	**545p**	**550p**
555p	**558p**	**608p**	**627p**	**637p**	**645p**	**650p**
655p	**658p**	**708p**	**727p**	**737p**	**745p**	**750p**
745p	**748p**	**758p**	**817p**	**827p**	**835p**	**840p**
.....	.....	.....	**815p	**820p**	**830p**	**835p**
.....	.....	.....	**915p	**920p**	**930p**	**935p**
			**1005p	**1010p**	**1020p**	**1025p**

– PLEASE NOTE –

****** This trip starts at Webster Sq Plaza***

******* This trip starts / ends at Walmart***

SUNDAYS

5	3	2	1A	1
BUS STARTS Leicester Wal-Mart	BUS Leaves Webster Square Plaza	BUS Leaves Clark University	BUS Leaves City Hall Main St.	BUS ENDS Union Station Hub
1100a	1113a	1118a	1125a	1130a
1200p	**1213p**	**1218p**	**1225p**	**1230p**
100p	**113p**	**118p**	**125p**	**130p**
200p	**213p**	**218p**	**225p**	**230p**
300p	**313p**	**318p**	**325p**	**330p**
400p	**413p**	**418p**	**425p**	**430p**
500p	**513p**	**518p**	**525p**	**530p**
600p	**613p**	**618p**	**625p**	**630p**

– PLEASE NOTE –

On Saturdays, most inbound Route 19 buses continue as Route 30 outbound.

On Sundays, all inbound Route 19 buses continue as Route 23 outbound.

Route 19

UNION STATION HUB – WEBSTER SQUARE – CLARK UNIVERSITY via MAIN ST.

Effective Date: August 28, 2021

Worcester Regional Transit Authority

Serving:

Federal Building / U.S. Courthouse
YMCA Central Branch
Clark University
Webster Square
Webster Square Plaza
Gates Lane School
Sullivan Middle School
Becker College (Leicester campus) - Sat & Sun Only
Leicester Housing Authority - Sat & Sun Only
Leicester Wal-Mart - Sat & Sun Only
Spencer - Saturday Only

Translation

English: If this information is needed in another language, please visit www.therta.com and use the Google Translate feature.

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Spanish: Si necesita esta información en otro idioma, por favor visite www.therta.com y utilice Google Translate.

French: Si vous désirez ces renseignements dans une autre langue, prière de vous server de Google Translate qui se trouve à l'adresse suivante: www.therta.com.

Polish: Jeśli ta informacja jest potrzebna w innym języku, proszę odwiedzić www.therta.com i korzystać z Google Translate funkcji.

Vietnamese: Nếu thông tin này là cần thiết trong một ngôn ngữ khác, vui lòng truy cập www.therta.com và sử dụng các tính năng của Google Translate.

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Swahili: Kama unahitaji habari hii katika nyingine lugha, unaweza kubonyeza mahali panaandikwa "Google Translate" hapa juu.

Note: French, Spanish, Polish and Portuguese translations were created by human translation from the English version. Vietnamese, Chinese and Swahili translations were created from the English version using Google Translate. There are likely grammatical errors in these translations, however time constraints required use of Google Translate for bus schedule printing within necessary timeframe (June 2017)

For Transit Information Call
508•791•9782 *or visit*
www.therta.com

Welcome aboard the WRTA!

This route timetable shows the times of departure at major stops along the route and contains route maps and other important information. Additional information be can obtained by calling the WRTA Information Line at **(508) 791-WRTA (9782)**, or visit our website at www.TheRTA.com.

WRTA FARE INFORMATION
Effective July 1, 2017

Full Cash Fare (Adults age 14 and up)	$1.75
Senior/Disabled Cash Fare	$0.85
Children 5-13 years of age accompanied by an adult	$0.85
Children 9 years of age not accompanied by an adult**	$1.75
Children under 5 accompanied by an adult	FREE
One Day 8 Ride Pass (Adults age 14 & up)	$4.50
Senior/Disabled*/Child One Day 8 Ride Pass	$2.25
31 Day Pass	$57.00
Senior/Disabled*31 Day Pass	$28.50

***Valid ID Required for Senior/Disabled Fare**

Please have exact fare ready when boarding the bus. The farebox does not accept pennies or half dollars.

***The Charlie Card** is available to either purchase a monthly pass or add stored value (cash). The stored value gives you discounted fare with the WRTA. They can be used on the WRTA, MBTA and other participating RTA's in Massachusetts. You can obtain a Charlie Card at the Customer Service Center located at 60 Foster Street, Worcester, MA*

Route schedules and the purchase of passes are available at the Customer Service Center at 60 Foster Street, Worcester.

ACCESSIBILITY: All WRTA buses are wheelchair accessible and feature bicycle racks for two bicycles. For TTY service call Massachusetts Relay TTY (800) 439-2370. For information, accommodations and or to provide feedback call 508-791-9782 option 2.

PROPER IDENTIFICATION: One of the following valid identification cards must be shown to the driver each time you board:

SENIOR . . . . . WRTA Senior I.D. card

DISABLED . . . Statewide Access Pass / WRTA ADA Photo I.D. MCB ID and PCA-ride free

MEDICARE . . . . . Medicare card with Photo I.D.

HOLIDAY SERVICE: Saturday* Service is provided on Martin Luther King, Jr. Day, Presidents' Day, Patriots' Day, Columbus Day, and the day after Thanksgiving.

Weekday Service is provided on Veterans' Day.

Routes 29, 33, 42 and community shuttles operate on a weekday schedule on these holidays. Routes 19 and 30 operate on a modified Saturday schedule on these holidays.

NO SERVICE ON: New Years Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; Christmas Day

Please…NO Smoking, Eating, Drinking or Music

**The Federal Transit Administration permits transit systems to set a minimum age limit for children riding without a parent or guardian. The WRTA has set this age limit at Nine (9) years old. In order to ensure compliance with this age limit, operators may question a child seeking to board a bus who appears, in the operator's opinion, to be Eight (8) years old or younger. If an operator is not satisfied with a child's answer, the operator may call for assistance from a WRTA supervisor and/or public safety personnel. This policy applies to Paratransit Service as well.

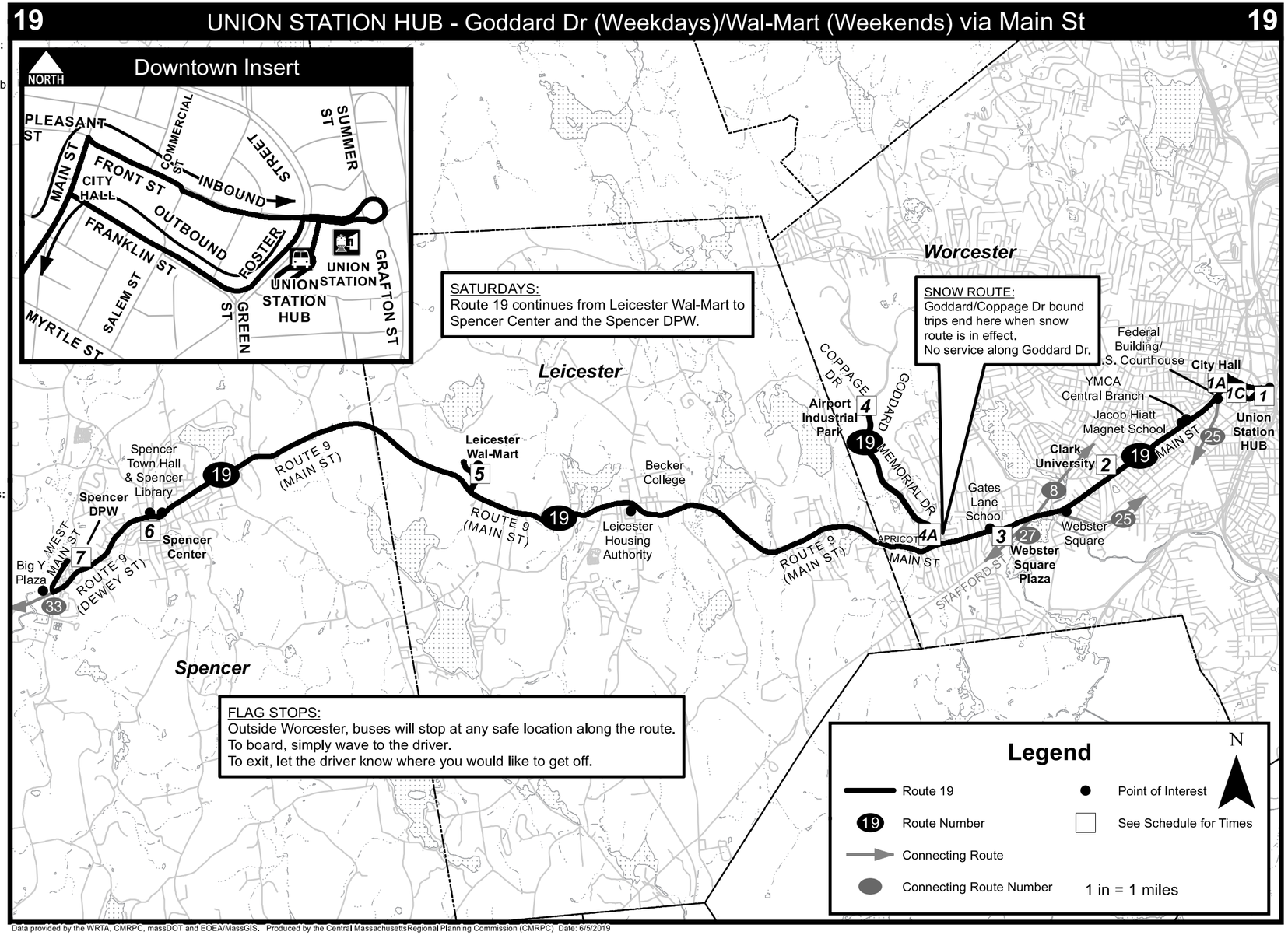
Most Routes Serve:
~ WRTA Customer Service Center/Hub
~ Union Station

Route 19 Serving:
~ City Hall
~ Federal Building/ U.S. Courthouse
~ YMCA Central Branch
~ Jacob Hiatt Magnet School
~ Clark University
~ Webster Square
~ Webster Square Plaza
~ Gates Lane School

Rt. 19 Weeknd Only
~ Becker College (Leicester campus)
~ Leicester Center
~ Leicester Wal-Mart
~ Spencer Center
~ Spencer DPW Garage

Connecting Routes:
Route 8
Route 23
Route 25
Route 27
Route 33

19 UNION STATION HUB - Goddard Dr (Weekdays)/Wal-Mart (Weekends) via Main St 19



Data provided by the WRTA, CMRPC, massDOT and EOEA/MassGIS. Produced by the Central Massachusetts Regional Planning Commission (CMRPC) Date: 6/5/2019

Thank you for riding the WRTA

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31 Day Pass	$57.00
Senior/Disabled*31 Day Pass	$28.50

***Valid ID Required for Senior/Disabled Fare**

Please have exact fare ready when boarding the bus. The farebox does not accept pennies or half dollars.

***The Charlie Card** is available to either purchase a monthly pass or add stored value (cash). The stored value gives you discounted fare with the WRTA. They can be used on the WRTA, MBTA and other participating RTA's in Massachusetts. You can obtain a Charlie Card at the Customer Service Center located at 60 Foster Street, Worcester, MA*

Route schedules and the purchase of passes are available at the Customer Service Center at 60 Foster Street, Worcester.

ACCESSIBILITY: All WRTA buses are wheelchair accessible and feature bicycle racks for two bicycles. For TTY service call Massachusetts Relay TTY (800) 439-2370. For information, accommodations and or to provide feedback call 508-791-9782 option 2.

PROPER IDENTIFICATION: One of the following valid identification cards must be shown to the driver each time you board:

SENIOR . . . . . WRTA Senior I.D. card

DISABLED . . . Statewide Access Pass / WRTA ADA Photo I.D. MCB ID and PCA-ride free

MEDICARE . . . . . Medicare card with Photo I.D.

HOLIDAY SERVICE: Saturday* Service is provided on Martin Luther King, Jr. Day, Presidents' Day, Patriots' Day, Columbus Day, and the day after Thanksgiving.

Weekday Service is provided on Veterans' Day.

Routes 29, 33, 42 and community shuttles operate on a weekday schedule on these holidays. Routes 19 and 30 operate on a modified Saturday schedule on these holidays.

NO SERVICE ON: New Years Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; Christmas Day

Please…NO Smoking, Eating, Drinking or Music

**The Federal Transit Administration permits transit systems to set a minimum age limit for children riding without a parent or guardian. The WRTA has set this age limit at Nine (9) years old. In order to ensure compliance with this age limit, operators may question a child seeking to board a bus who appears, in the operator's opinion, to be Eight (8) years old or younger. If an operator is not satisfied with a child's answer, the operator may call for assistance from a WRTA supervisor and/or public safety personnel. This policy applies to Paratransit Service as well.

OUTBOUND WEEKDAYS

See the map for matching timepoint locations

1	1C	2	3	4	5	6	7	8	9	10
BUS STARTS Union Station Hub	**BUS Leaves** City Hall Franklin St	**BUS Leaves** Clark University	**BUS Leaves** Webster Square Plaza	**BUS Leaves** Leicester Center	**BUS Leaves** Leicester Wal-Mart	**BUS ENDS** Spencer Center	**BUS Leaves** Spencer DPW Garage	**BUS Leaves** East Brookfield Courthouse	**BUS Leaves** East Brookfield	**BUS ENDS** Brookfield Center
450a	453a	458a	505a	511a	516a	521a	.....	.....	528a	*535a
600a	603a	613a	620a	629a	632a	642a	*646a	.....		.....
635a	638a	648a	655a	704a	707a	717a	.....	.....	724a	*731a
740a	743a	753a	800a	809a	812a	822a	.....	*826a		.....
920a	923a	933a	940a	949a	952a	1002a	.....	*1006a		.....
1100a	1104a	1114a	1121a	1130a	1133a	1144a	.....	*1156a		.....
1210p	**1214p**	**1224p**	**1231p**	**1240p**	**1243p**	**1254p**	**.....**	***106p**		**.....**
110p	**114p**	**124p**	**131p**	**140p**	**143p**	**154p**	**.....**	***206p**		**.....**
210p	**214p**	**224p**	**231p**	**240p**	**243p**	**254p**	**.....**	***306p**		**.....**
310p	**314p**	**324p**	**331p**	**340p**	**343p**	**354p**	**.....**	***406p**		**.....**
410p	**414p**	**424p**	**431p**	**440p**	**443p**	**454p**	**.....**	***506p**		**.....**
510p	**513p**	**523p**	**530p**	**539p**	**542p**	**552p**	**.....**	**.....**	**559p**	***606p**
610p	**613p**	**623p**	**630p**	**639p**	**642p**	**652p**	**.....**	**.....**	**659p**	***706p**
710p	**713p**	**723p**	**730p**	**739p**	**742p**	**749p**	***753p**	.....	.....	.....

**** Trips end here***

INBOUND WEEKDAYS

See the map for matching timepoint locations

10	9	8	7	6	5	4	3	2	1A	1
BUS STARTS Brookfield Center	**BUS Leaves** East Brookfield	**BUS Leaves** East Brookfield Courthouse	**BUS Leaves** Spencer DPW Garage	**BUS Leaves** Spencer Center	**BUS Leaves** Leicester Wal-Mart	**BUS Leaves** Leicester Center	**BUS Leaves** Webster Square Plaza	**BUS Leaves** Clark Univ.	**BUS Leaves** City Hall (Main St.)	**BUS ENDS** Union Station Hub
539a	546a	.....	.....	553a	600a	603a	613a	620a	630a	635a
.....	.....	.....	650a	654a	701a	705a	715a	725a	735a	740a
735a	744a	.....	.....	751a	758a	801a	813a	820a	830a	835a
.....	.....	830a	.....	834a	841a	845a	855a	905a	915a	920a
.....	.....	1010a	.....	1014a	1021a	1025a	1035a	1045a	1055a	1100a
.....	.....	**1200p**	**.....**	**1205p**	**1215p**	**1220p**	**1235p**	**1243p**	**1255p**	**100p**
.....	**.....**	**110p**	**.....**	**115p**	**125p**	**130p**	**145p**	**153p**	**205p**	**210p**
.....	**.....**	**210p**	**.....**	**215p**	**225p**	**230p**	**245p**	**253p**	**305p**	**310p**
.....	**.....**	**310p**	**.....**	**315p**	**325p**	**330p**	**345p**	**353p**	**405p**	**410p**
.....	**.....**	**410p**	**.....**	**415p**	**425p**	**430p**	**445p**	**453p**	**505p**	**510p**
.....	**.....**	**510p**	**.....**	**515p**	**525p**	**530p**	**545p**	**553p**	**605p**	**610p**
610p	**619p**	**.....**	**.....**	**626p**	**633p**	**636p**	**648p**	**655p**	**705p**	**710p**
710p	**719p**	**.....**	**.....**	**726p**	**733p**	**736p**	**748p**	**755p**	**805p**	**810p**
.....	**.....**	**.....**	**757p**	**801p**	**808p**	**811p**	**823p**	**830p**	**840p**	**845p**

SATURDAY SERVICE: TO SPENCER USE ROUTE 19

Route 33

UNION STATION HUB-LEICESTER – SPENCER – EAST BROOKFIELD – BROOKFIELD via MAIN ST. & ROUTE 9

Effective Date: January 25, 2020

Worcester Regional Transit Authority

Serving:
Union Station
Federal Building / U.S. Courthouse
YMCA Central Branch
Clark University
Webster Square
Webster Square Plaza
Becker College (Leicester campus)
Leicester Housing Authority
Leicester Wal-Mart
Western Worcester District Court

Translation

English: If this information is needed in another language, please visit www.therta.com and use the Google Translate feature.

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Polish: Jeśli ta informacja jest potrzebna w innym języku, proszę odwiedzić www.therta.com i korzystać z Google Translate funkcji.

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Chinese (Traditional): 如果此信息需要以另一種語言，請訪問www.therta.com並使用谷歌翻譯功能。

Swahili: Kama unahitaji habari hii katika nyingine lugha, unaweza kubonyeza mahali panaandikwa "Google Translate" hapa juu.

Note: French, Spanish, Polish and Portuguese translations were created by human translation from the English version. Vietnamese, Chinese and Swahili translations were created from the English version using Google Translate. There are likely grammatical errors in these translations, however time constraints required use of Google Translate for bus schedule printing within necessary timeframe (June 2017)

For Transit Information Call
***508·791·9782** or visit*
www.therta.com

33 UNION STATION HUB - Leicester - Spencer - East Brookfield - Brookfield via Main St & Route 9 33

Most Routes Serve:

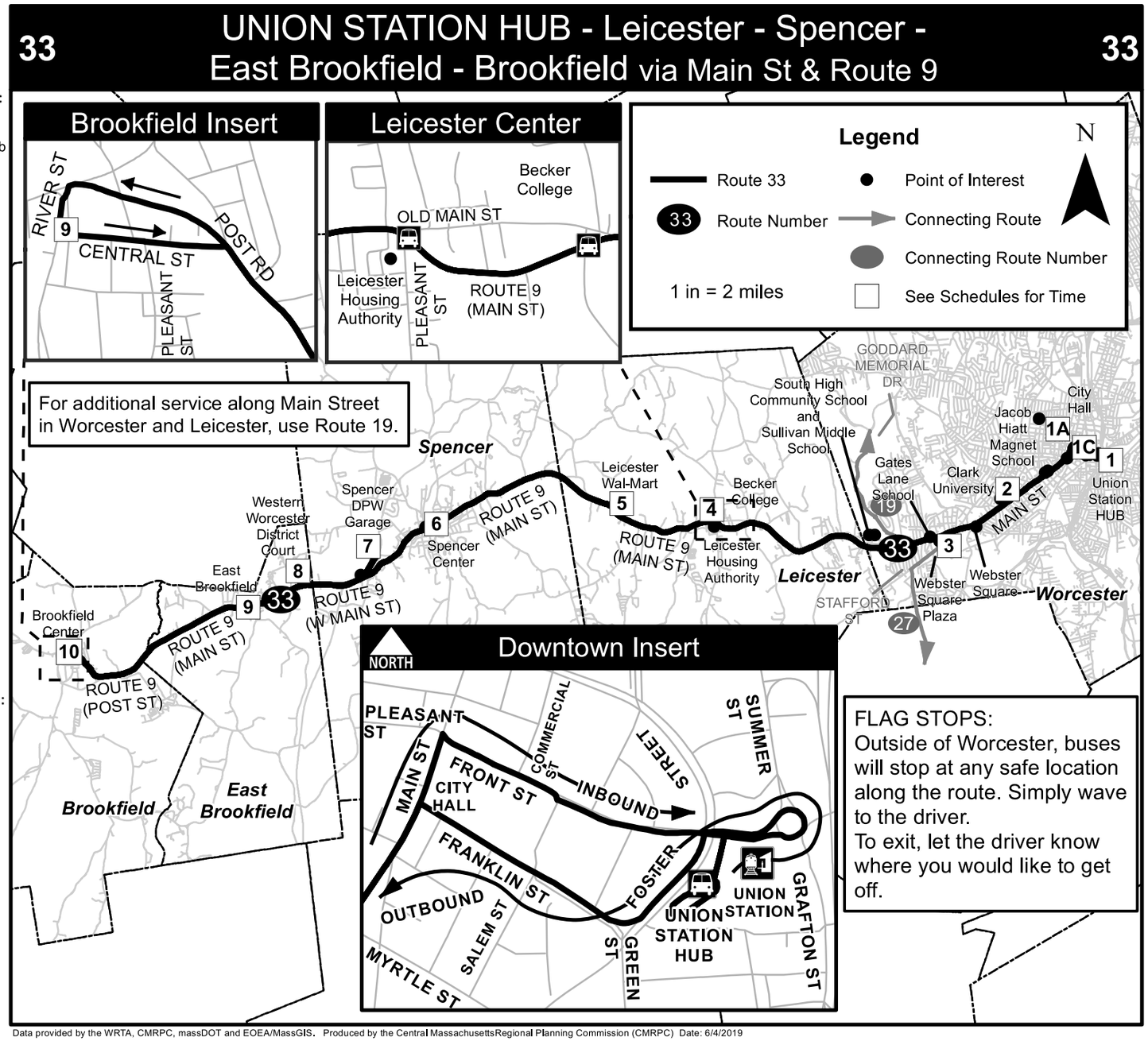
~ WRTA Customer Service Center/Hub
~ Union Station

Route 33 Serving:

~ Worcester City Hall
~ Federal Building/ U.S. Courthouse
~ YMCA Central Branch
~ Jacob Hiatt Magnet School
~ Clark University
~ Webster Square
~ Webster Square Plaza
~ Gates Lane School
~ Leicester Center
~ Leicester Wal-Mart
~ Spencer Center
~ Western Worcester District Court
~ East Brookfield Elementary School
~ Lake Lashaway
~ East Brookfield Center
~ Brookfield Center

Connecting Routes:

Route 8
Route 19
Route 25
Route 27



Data provided by the WRTA, CMRPC, massDOT and EOEA/MassGIS. Produced by the Central MassachusettsRegional Planning Commission (CMRPC) Date: 6/4/2019

Thank you for riding the

Trip generation and distribution

- **ITE Trip Generation**
- **Growth and Generated Volumes**
- **Distribution Calculations**

Manufacturing
(140)

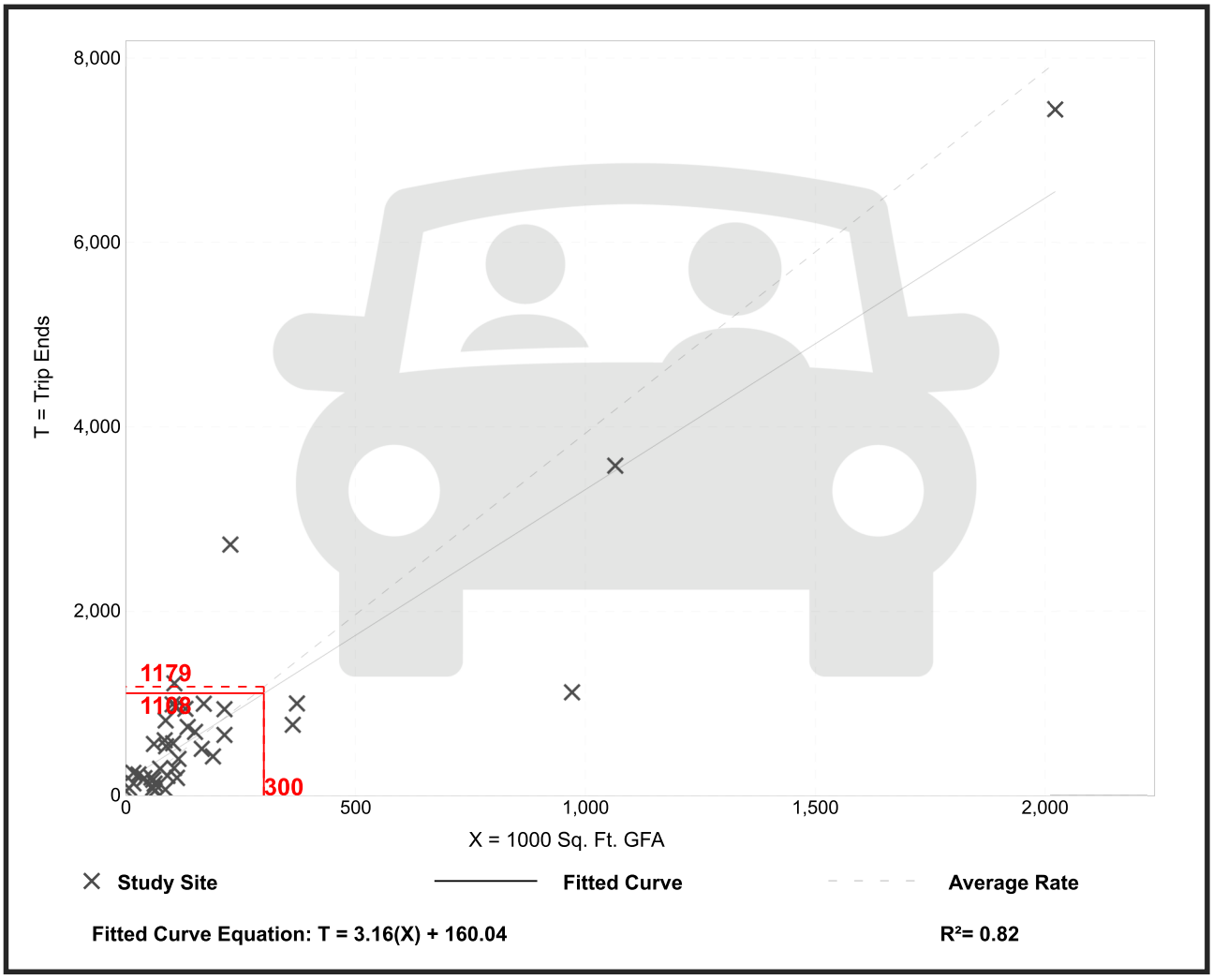
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 39
Avg. 1000 Sq. Ft. GFA: 209
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.93	0.83 - 49.50	2.62

Data Plot and Equation



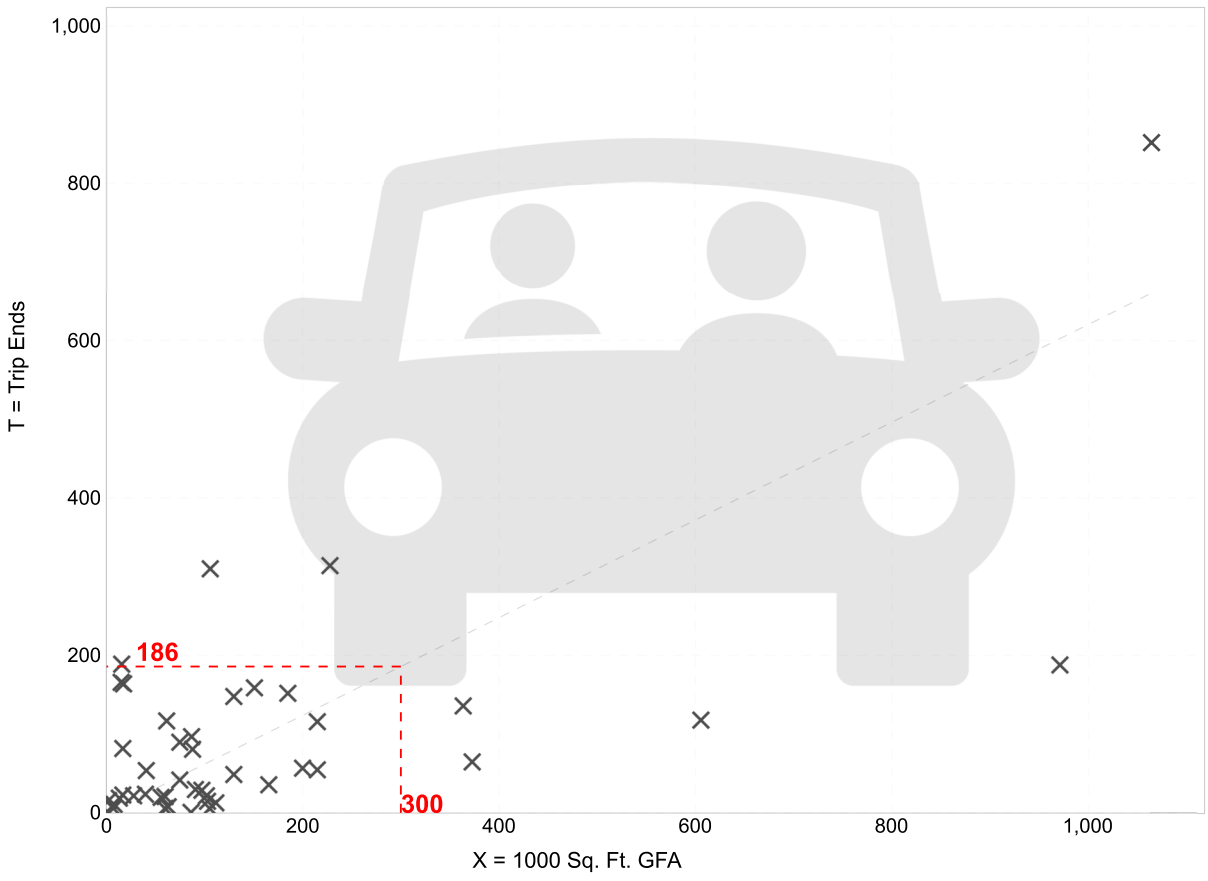
Manufacturing
(140)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 45
Avg. 1000 Sq. Ft. GFA: 149
Directional Distribution: 77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.62	0.01 - 11.93	1.03

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= **

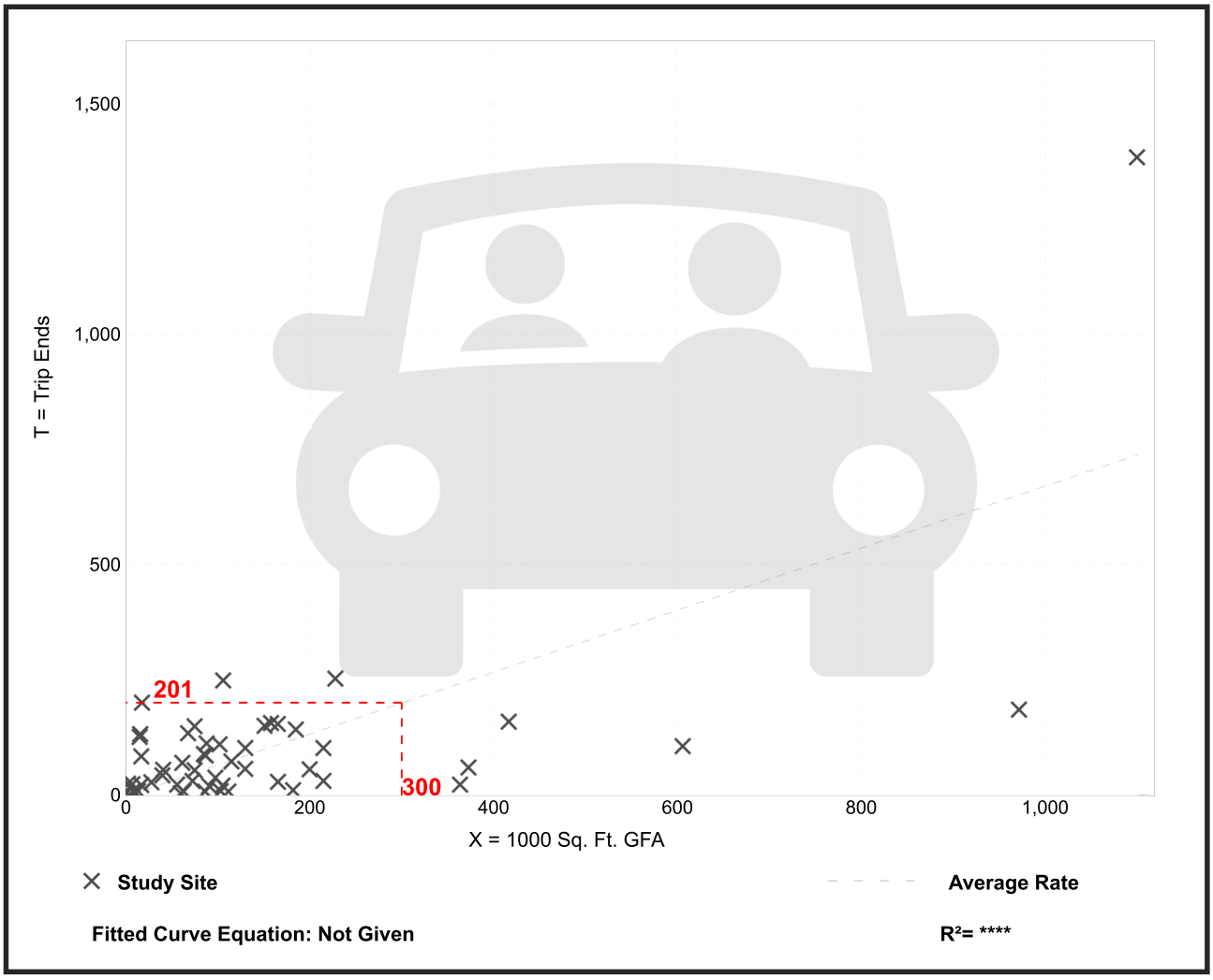
Manufacturing
(140)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 52
Avg. 1000 Sq. Ft. GFA: 152
Directional Distribution: 31% entering, 69% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.67	0.07 - 11.37	0.94

Data Plot and Equation



TRAFFIC GROWTH CALCULATIONS

Project Name: Leicester Central
Project No: 15392.00

Location: Leicester, MA
Date: 11/10/2021

Calc. By: JDD
Chkd. By:

Rate of Growth = 0.01
Years of Growth = 7

No seasonal Adjustment Applied - October is above average (U4-U7 =0.94)

No COVID-19 adjustment based on I-290 & I395 Interchange count stations: R11552, R11553, R11517, R11518

				xx = balanced		growth rate not applied to driveways		BACKGROUND DEVELOPMENTS				xx = balanced				xx = balanced	
		2021 EXISTING VOLUMES - UNBALANCED		2021 EXISTING VOLUMES - BALANCED		7-YEAR GROWTH		88 Huntoon		TOTAL BACKGROUND DEVELOPMENTS		2028 NO BUILD VOLUMES		SITE-GENERATED VOLUMES 140		2028 BUILD VOLUMES 140	
INTERSECTION	MOVEMENT	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1. Huntoon Memorial Highway at Stafford Street																	
Stafford St.	EB L	25	28	25	30	27	32	1	1	1	1	30	35	7	3	35	40
	EB T	258	173	260	175	279	188					280	190			280	190
	EB R	12	8	10	10	11	11					10	10			10	10
Stafford St.	WB L	51	102	50	100	54	107					55	105			55	105
	WB T	113	283	115	285	123	306					125	305			125	305
	WB R	28	66	30	65	32	70	1	1	1	1	35	70	12	5	45	75
Huntoon Memorial Highway	NB L	9	11	10	10	11	11					10	10			10	10
	NB T	180	293	180	295	193	316	6	4	6	4	200	320	57	23	255	345
	NB R	84	99	85	100	91	107					90	105			90	105
Huntoon Memorial Highway	SB L	46	32	45	30	48	32	1	1	1	1	50	35	2	8	50	45
	SB T	323	217	325	215	348	231	2	4	2	4	350	235	17	60	365	295
	SB R	24	34	25	35	27	38		1		1	25	40	2	7	25	45
2. Huntoon Memorial Highway at Clark Street																	
Clark St.	EB L	6	8	5	10	5	11					5	10			5	10
	EB T	1	5	1	5	1	5					1.072135352	5			1	5
	EB R	24	20	25	20	27	21	1		1		30	20	6	2	35	20
Clark St.	WB L	7	5	5	5	5	5					5	5	1	1	5	5
	WB T	1	3	1	5	1	5					1.072135352	5			1	5
	WB R		1		1		1						1.072135352				1
Huntoon Memorial Highway	NB L	10	23	10	25	11	27					10	25	1	4	10	30
	NB T	180	366	180	365	193	391	2	4	2	4	195	395	17	60	210	455
	NB R	2	7	2	5	2	5					2.144270704	5	1	1	5	5
Huntoon Memorial Highway	SB L	3		5		5						5				5	
	SB T	316	209	315	210	338	225	6	4	6	4	345	230	62	26	405	255
	SB R	2	5	2	5	2	5					2.144270704	5			2	5

TRIP DISTRIBUTION CALCULATIONS

Project Name: Leicester Central
Project No: 15392.00

Location: Leicester, MA
Date: 11/10/2021

Calc. By: JDD
Chkd. By:

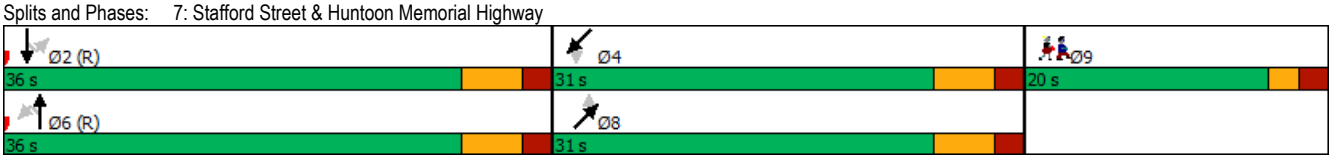
INTERSECTION	MOVEMENT	NEW TRIPS		AM PEAK HOUR TRIPS 140			PM PEAK HOUR TRIPS 140		
		ENTER	EXIT	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
1. Huntoon Memorial Highway at Stafford Street									
Stafford Street	EB L	5%		7		7	3		3
	EB T								
	EB R								
Stafford Street	WB L								
	WB T								
	WB R	8%		12		12	5		5
Huntoon Memorial Highway	NB L								
	NB T	39%		57		57	23		23
	NB R								
Huntoon Memorial Highway	SB L		6%		2	2		8	8
	SB T		43%		17	17		60	60
	SB R		5%		2	2		7	7
2. Huntoon Memorial Highway at Clark Street									
Clark Street	EB L								
	EB T								
	EB R	4%		6		6	2		2
Clark Street	WB L	1%		1		1	1		1
	WB T								
	WB R								
Huntoon Memorial Highway	NB L		3%		1	1		4	4
	NB T		43%		17	17		60	60
	NB R		0.4%		1	1		1	1
Huntoon Memorial Highway	SB L								
	SB T	43%		62		62	26		26
	SB R								

Capacity Analyses

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR	Ø9
Lane Configurations													
Traffic Volume (vph)	10	180	85	45	325	25	25	260	10	50	115	30	
Future Volume (vph)	10	180	85	45	325	25	25	260	10	50	115	30	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	250		0	300		0	0		0	0		0	
Storage Lanes	1		0	1		0	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Right Turn on Red			No			No			No			No	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		1281			4526			2170			863		
Travel Time (s)		29.1			102.9			49.3			19.6		
Peak Hour Factor	0.91	0.91	0.91	0.90	0.90	0.90	0.81	0.81	0.81	0.77	0.77	0.77	
Heavy Vehicles (%)	22%	9%	5%	4%	6%	0%	0%	1%	33%	4%	3%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	11	291	0	50	389	0	0	364	0	0	253	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		6			2			8			4		9
Permitted Phases	6			2			8			4			
Detector Phase	6	6		2	2		8	8		4	4		
Switch Phase													
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0		4.0
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0		20.0
Total Split (s)	36.0	36.0		36.0	36.0		31.0	31.0		31.0	31.0		20.0
Total Split (%)	41.4%	41.4%		41.4%	41.4%		35.6%	35.6%		35.6%	35.6%		23%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		2.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0		
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0		
Lead/Lag													
Lead-Lag Optimize?													
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None		Ped
v/c Ratio	0.05	0.46		0.14	0.57			0.82			0.87		
Control Delay	20.0	24.2		20.8	26.6			46.1			59.3		
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0		
Total Delay	20.0	24.2		20.8	26.6			46.1			59.3		
Queue Length 50th (ft)	4	120		18	169			185			130		
Queue Length 95th (ft)	16	202		46	273			240			175		
Internal Link Dist (ft)		1201			4446			2090			783		
Turn Bay Length (ft)	250			300									
Base Capacity (vph)	231	642		353	680			510			335		
Starvation Cap Reductn	0	0		0	0			0			0		
Spillback Cap Reductn	0	0		0	0			0			0		
Storage Cap Reductn	0	0		0	0			0			0		
Reduced v/c Ratio	0.05	0.45		0.14	0.57			0.71			0.76		

Intersection Summary	
Area Type:	Other
Cycle Length: 87	
Actuated Cycle Length: 87	
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: Stafford Street & Huntoon Memorial Highway



Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	180	85	45	325	25	25	260	10	50	115	30
Future Volume (vph)	10	180	85	45	325	25	25	260	10	50	115	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.95		1.00	0.99			1.00			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1480	1679		1736	1780			1847			1787	
Flt Permitted	0.39	1.00		0.50	1.00			0.95			0.64	
Satd. Flow (perm)	607	1679		922	1780			1766			1162	
Peak-hour factor, PHF	0.91	0.91	0.91	0.90	0.90	0.90	0.81	0.81	0.81	0.77	0.77	0.77
Adj. Flow (vph)	11	198	93	50	361	28	31	321	12	65	149	39
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	11	291	0	50	389	0	0	364	0	0	253	0
Heavy Vehicles (%)	22%	9%	5%	4%	6%	0%	0%	1%	33%	4%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	33.1	33.1		33.1	33.1			21.9			21.9	
Effective Green, g (s)	33.1	33.1		33.1	33.1			21.9			21.9	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.25			0.25	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	230	638		350	677			444			292	
v/s Ratio Prot		0.17			c0.22							
v/s Ratio Perm	0.02			0.05				0.21			c0.22	
v/c Ratio	0.05	0.46		0.14	0.57			0.82			0.87	
Uniform Delay, d1	17.0	20.2		17.7	21.4			30.7			31.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.4	2.3		0.9	3.5			11.3			22.6	
Delay (s)	17.4	22.5		18.5	24.9			42.0			53.7	
Level of Service	B	C		B	C			D			D	
Approach Delay (s)		22.4			24.2			42.0			53.7	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	87.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	180	2	5	315	2	5	1	25	5	1	1
Future Volume (vph)	10	180	2	5	315	2	5	1	25	5	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		4526			2076			1218			2255	
Travel Time (s)		102.9			47.2			27.7			51.3	
Peak Hour Factor	0.89	0.89	0.89	0.87	0.87	0.87	0.86	0.86	0.86	1.00	1.00	1.00
Heavy Vehicles (%)	0%	8%	0%	33%	4%	0%	6%	1%	24%	7%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	215	0	0	370	0	0	36	0	0	7	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	180	2	5	315	2	5	1	25	5	1	1
Future Vol, veh/h	10	180	2	5	315	2	5	1	25	5	1	1
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	89	89	89	87	87	87	86	86	86	100	100	100
Heavy Vehicles, %	0	8	0	33	4	0	6	1	24	7	1	0
Mvmt Flow	11	202	2	6	362	2	6	1	29	5	1	1

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	364	0	0	204	0	0	601	601	363	615	601	203
Stage 1	-	-	-	-	-	-	375	375	-	225	225	-
Stage 2	-	-	-	-	-	-	226	226	-	390	376	-
Critical Hdwy	4.1	-	-	4.43	-	-	7.16	6.51	6.44	7.17	6.51	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.51	-	6.17	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.51	-	6.17	5.51	-
Follow-up Hdwy	2.2	-	-	2.497	-	-	3.554	4.009	3.516	3.563	4.009	3.3
Pot Cap-1 Maneuver	1206	-	-	1203	-	-	406	415	635	396	415	843
Stage 1	-	-	-	-	-	-	638	619	-	766	719	-
Stage 2	-	-	-	-	-	-	768	719	-	624	618	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1206	-	-	1203	-	-	400	408	635	373	408	843
Mov Cap-2 Maneuver	-	-	-	-	-	-	400	408	-	373	408	-
Stage 1	-	-	-	-	-	-	632	615	-	758	712	-
Stage 2	-	-	-	-	-	-	758	712	-	591	614	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	0.4	0.1	11.7	13.9
HCM LOS			B	B

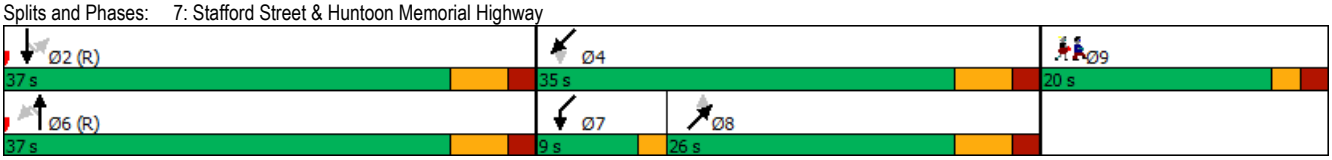
Minor Lane/Major Mvmt	NELn1	NBL	NBT	NBR	SBL	SBT	SBR	SWLn1
Capacity (veh/h)	571	1206	-	-	1203	-	-	411
HCM Lane V/C Ratio	0.063	0.009	-	-	0.005	-	-	0.017
HCM Control Delay (s)	11.7	8	0	-	8	0	-	13.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR	Ø9
Lane Configurations													
Traffic Volume (vph)	10	295	100	30	215	35	30	175	10	100	285	65	
Future Volume (vph)	10	295	100	30	215	35	30	175	10	100	285	65	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	250		0	300		0	0		0	0		0	
Storage Lanes	1		0	1		0	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Right Turn on Red			No			No			No			No	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		1281			4526			2170			863		
Travel Time (s)		29.1			102.9			49.3			19.6		
Peak Hour Factor	0.93	0.93	0.93	0.94	0.94	0.94	0.78	0.78	0.78	0.87	0.87	0.87	
Heavy Vehicles (%)	18%	5%	4%	3%	3%	3%	0%	2%	50%	2%	1%	0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	11	425	0	32	266	0	0	275	0	0	518	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA		
Protected Phases		6			2			8		7	4		9
Permitted Phases	6			2			8			4			
Detector Phase	6	6		2	2		8	8		7	4		
Switch Phase													
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0		4.0
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		8.0	12.0		20.0
Total Split (s)	37.0	37.0		37.0	37.0		26.0	26.0		9.0	35.0		20.0
Total Split (%)	40.2%	40.2%		40.2%	40.2%		28.3%	28.3%		9.8%	38.0%		22%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		2.0	4.0		2.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0		2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0		
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0		
Lead/Lag							Lag	Lag		Lead			
Lead-Lag Optimize?													
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None		Ped
v/c Ratio	0.05	0.84		0.25	0.51			0.48			0.96		
Control Delay	21.8	46.2		28.7	30.1			27.4			61.7		
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0		
Total Delay	21.8	46.2		28.7	30.1			27.4			61.7		
Queue Length 50th (ft)	5	228		14	127			124			296		
Queue Length 95th (ft)	17	326		38	191			176			#513		
Internal Link Dist (ft)		1201			4446			2090			783		
Turn Bay Length (ft)	250			300									
Base Capacity (vph)	258	587		149	608			576			541		
Starvation Cap Reductn	0	0		0	0			0			0		
Spillback Cap Reductn	0	0		0	0			0			0		
Storage Cap Reductn	0	0		0	0			0			0		
Reduced v/c Ratio	0.04	0.72		0.21	0.44			0.48			0.96		

Intersection Summary

Area Type: Other
Cycle Length: 92
Actuated Cycle Length: 92
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Stafford Street & Huntoon Memorial Highway



Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	295	100	30	215	35	30	175	10	100	285	65
Future Volume (vph)	10	295	100	30	215	35	30	175	10	100	285	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.96		1.00	0.98			0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1530	1745		1752	1806			1803			1823	
Flt Permitted	0.48	1.00		0.24	1.00			0.87			0.81	
Satd. Flow (perm)	766	1745		442	1806			1586			1492	
Peak-hour factor, PHF	0.93	0.93	0.93	0.94	0.94	0.94	0.78	0.78	0.78	0.87	0.87	0.87
Adj. Flow (vph)	11	317	108	32	229	37	38	224	13	115	328	75
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	11	425	0	32	266	0	0	275	0	0	518	0
Heavy Vehicles (%)	18%	5%	4%	3%	3%	3%	0%	2%	50%	2%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		6			2			8		7	4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	26.6	26.6		26.6	26.6			33.4			33.4	
Effective Green, g (s)	26.6	26.6		26.6	26.6			33.4			33.4	
Actuated g/C Ratio	0.29	0.29		0.29	0.29			0.36			0.36	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	221	504		127	522			575			541	
v/s Ratio Prot		c0.24			0.15							
v/s Ratio Perm	0.01			0.07				0.17			c0.35	
v/c Ratio	0.05	0.84		0.25	0.51			0.48			0.96	
Uniform Delay, d1	23.6	30.7		25.1	27.3			22.6			28.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.4	15.7		4.7	3.5			0.6			28.0	
Delay (s)	24.0	46.5		29.8	30.8			23.2			56.6	
Level of Service	C	D		C	C			C			E	
Approach Delay (s)		45.9			30.7			23.2			56.6	
Approach LOS		D			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	25	365	5	1	210	5	10	5	20	5	5	1
Future Volume (vph)	25	365	5	1	210	5	10	5	20	5	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		4526			2076			1218			2255	
Travel Time (s)		102.9			47.2			27.7			51.3	
Peak Hour Factor	0.84	0.84	0.84	0.94	0.94	0.94	0.69	0.69	0.69	0.32	0.32	0.32
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	471	0	0	229	0	0	50	0	0	35	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1.9

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	365	5	1	210	5	10	5	20	5	5	1
Future Vol, veh/h	25	365	5	1	210	5	10	5	20	5	5	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	94	94	94	69	69	69	32	32	32
Heavy Vehicles, %	0	1	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	30	435	6	1	223	5	14	7	29	16	16	3

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	228	0	0	441	0	0	736	729	226	744	728	438
Stage 1	-	-	-	-	-	-	228	228	-	498	498	-
Stage 2	-	-	-	-	-	-	508	501	-	246	230	-
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	1352	-	-	1130	-	-	337	352	818	333	353	623
Stage 1	-	-	-	-	-	-	779	719	-	558	548	-
Stage 2	-	-	-	-	-	-	551	546	-	762	718	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1352	-	-	1130	-	-	316	341	818	309	342	623
Mov Cap-2 Maneuver	-	-	-	-	-	-	316	341	-	309	342	-
Stage 1	-	-	-	-	-	-	756	718	-	542	532	-
Stage 2	-	-	-	-	-	-	517	530	-	727	717	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	0.5	0	13.1	16.8
HCM LOS			B	C

Minor Lane/Major Mvmt	NELn1	NBL	NBT	NBR	SBL	SBT	SBR	SWLn1
Capacity (veh/h)	495	1352	-	-	1130	-	-	339
HCM Lane V/C Ratio	0.102	0.022	-	-	0.001	-	-	0.101
HCM Control Delay (s)	13.1	7.7	0	-	8.2	0	-	16.8
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	0.3

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	200	90	50	350	25	30	280	10	55	125	35
Future Volume (vph)	10	200	90	50	350	25	30	280	10	55	125	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	300		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1281			4526			2170			863	
Travel Time (s)		29.1			102.9			49.3			19.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	9%	5%	4%	6%	0%	0%	1%	33%	4%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	315	0	54	407	0	0	348	0	0	234	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	6	6		2	2		8	8		4	4	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Total Split (s)	24.0	24.0		24.0	24.0		21.0	21.0		21.0	21.0	
Total Split (%)	36.9%	36.9%		36.9%	36.9%		32.3%	32.3%		32.3%	32.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
v/c Ratio	0.08	0.66		0.23	0.81			0.88			0.88	
Control Delay	19.4	29.1		21.5	37.2			50.4			59.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	19.4	29.1		21.5	37.2			50.4			59.1	
Queue Length 50th (ft)	3	110		16	150			133			89	
Queue Length 95th (ft)	15	#199		44	#290			#268			#206	
Internal Link Dist (ft)		1201			4446			2090			783	
Turn Bay Length (ft)	250			300								
Base Capacity (vph)	135	474		231	503			405			273	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.08	0.66		0.23	0.81			0.86			0.86	

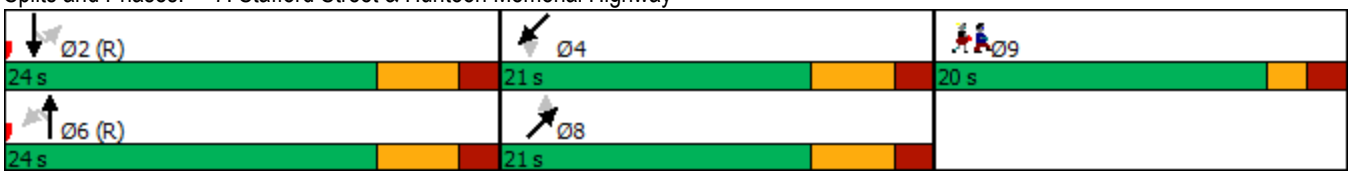
Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 65	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	31%
Yellow Time (s)	2.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Ped
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Stafford Street & Huntoon Memorial Highway



Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	200	90	50	350	25	30	280	10	55	125	35
Future Volume (vph)	10	200	90	50	350	25	30	280	10	55	125	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.95		1.00	0.99			1.00			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1480	1681		1736	1781			1848			1785	
Flt Permitted	0.31	1.00		0.45	1.00			0.95			0.65	
Satd. Flow (perm)	477	1681		820	1781			1755			1184	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	217	98	54	380	27	33	304	11	60	136	38
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	11	315	0	54	407	0	0	348	0	0	234	0
Heavy Vehicles (%)	22%	9%	5%	4%	6%	0%	0%	1%	33%	4%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	18.4	18.4		18.4	18.4			14.6			14.6	
Effective Green, g (s)	18.4	18.4		18.4	18.4			14.6			14.6	
Actuated g/C Ratio	0.28	0.28		0.28	0.28			0.22			0.22	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	135	475		232	504			394			265	
v/s Ratio Prot		0.19			c0.23							
v/s Ratio Perm	0.02			0.07				c0.20			0.20	
v/c Ratio	0.08	0.66		0.23	0.81			0.88			0.88	
Uniform Delay, d1	17.1	20.6		17.9	21.7			24.4			24.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.2	7.1		2.3	13.0			20.2			27.3	
Delay (s)	18.3	27.7		20.2	34.7			44.6			51.7	
Level of Service	B	C		C	C			D			D	
Approach Delay (s)		27.4			33.0			44.6			51.7	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	37.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	195	2	5	345	2	5	1	30	5	1	1
Future Volume (vph)	10	195	2	5	345	2	5	1	30	5	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		4526			2076			1218			2255	
Travel Time (s)		102.9			47.2			27.7			51.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	8%	0%	33%	4%	0%	6%	1%	24%	7%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	225	0	0	382	0	0	39	0	0	7	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1.1

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	195	2	5	345	2	5	1	30	5	1	1
Future Vol, veh/h	10	195	2	5	345	2	5	1	30	5	1	1
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	8	0	33	4	0	6	1	24	7	1	0
Mvmt Flow	11	212	2	5	375	2	5	1	33	5	1	1

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	377	0	0	214	0	0	622	622	376	638	622	213
Stage 1	-	-	-	-	-	-	386	386	-	235	235	-
Stage 2	-	-	-	-	-	-	236	236	-	403	387	-
Critical Hdwy	4.1	-	-	4.43	-	-	7.16	6.51	6.44	7.17	6.51	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.51	-	6.17	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.51	-	6.17	5.51	-
Follow-up Hdwy	2.2	-	-	2.497	-	-	3.554	4.009	3.516	3.563	4.009	3.3
Pot Cap-1 Maneuver	1193	-	-	1192	-	-	393	404	624	382	404	832
Stage 1	-	-	-	-	-	-	629	612	-	757	712	-
Stage 2	-	-	-	-	-	-	758	712	-	614	611	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1193	-	-	1192	-	-	387	398	624	357	398	832
Mov Cap-2 Maneuver	-	-	-	-	-	-	387	398	-	357	398	-
Stage 1	-	-	-	-	-	-	623	609	-	749	705	-
Stage 2	-	-	-	-	-	-	748	705	-	578	608	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	0.4	0.1	11.8	14.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NELn1	NBL	NBT	NBR	SBL	SBT	SBR	SWLn1
Capacity (veh/h)	567	1193	-	-	1192	-	-	395
HCM Lane V/C Ratio	0.069	0.009	-	-	0.005	-	-	0.019
HCM Control Delay (s)	11.8	8	0	-	8	0	-	14.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	320	105	35	235	40	35	190	10	105	305	70
Future Volume (vph)	10	320	105	35	235	40	35	190	10	105	305	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	300		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1281			4526			2170			863	
Travel Time (s)		29.1			102.9			49.3			19.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	18%	5%	4%	3%	3%	3%	0%	2%	50%	2%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	462	0	38	298	0	0	256	0	0	522	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		6			2			8		7	4	
Permitted Phases	6			2			8			4		
Detector Phase	6	6		2	2		8	8		7	4	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		8.0	12.0	
Total Split (s)	31.0	31.0		31.0	31.0		31.0	31.0		8.0	39.0	
Total Split (%)	34.4%	34.4%		34.4%	34.4%		34.4%	34.4%		8.9%	43.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		2.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
v/c Ratio	0.06	0.96		0.44	0.60			0.44			0.93	
Control Delay	25.1	65.5		45.7	34.1			24.5			52.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	25.1	65.5		45.7	34.1			24.5			52.8	
Queue Length 50th (ft)	5	258		18	146			108			280	
Queue Length 95th (ft)	18	#447		#59	231			177			#482	
Internal Link Dist (ft)		1201			4446			2090			783	
Turn Bay Length (ft)	250			300								
Base Capacity (vph)	186	485		86	501			581			563	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.06	0.95		0.44	0.59			0.44			0.93	

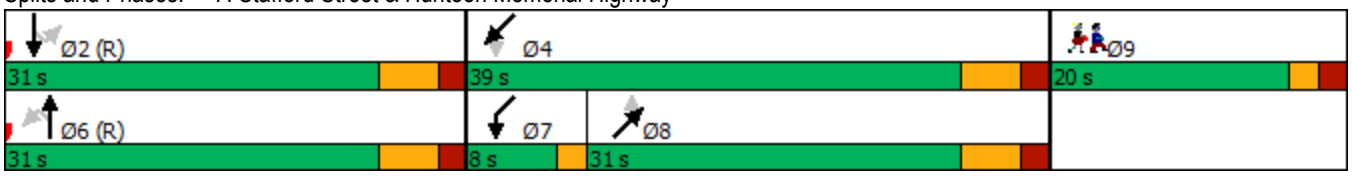
Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	22%
Yellow Time (s)	2.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Ped
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Stafford Street & Huntoon Memorial Highway



Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	320	105	35	235	40	35	190	10	105	305	70
Future Volume (vph)	10	320	105	35	235	40	35	190	10	105	305	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.96		1.00	0.98			0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1530	1747		1752	1805			1807			1823	
Flt Permitted	0.42	1.00		0.17	1.00			0.87			0.83	
Satd. Flow (perm)	672	1747		310	1805			1581			1531	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	348	114	38	255	43	38	207	11	114	332	76
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	11	462	0	38	298	0	0	256	0	0	522	0
Heavy Vehicles (%)	18%	5%	4%	3%	3%	3%	0%	2%	50%	2%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		6			2			8		7	4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	24.9	24.9		24.9	24.9			33.1			33.1	
Effective Green, g (s)	24.9	24.9		24.9	24.9			33.1			33.1	
Actuated g/C Ratio	0.28	0.28		0.28	0.28			0.37			0.37	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	185	483		85	499			581			563	
v/s Ratio Prot		c0.26			0.17							
v/s Ratio Perm	0.02			0.12				0.16			c0.34	
v/c Ratio	0.06	0.96		0.45	0.60			0.44			0.93	
Uniform Delay, d1	23.9	32.0		26.9	28.2			21.5			27.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.6	31.4		16.1	5.2			0.5			21.5	
Delay (s)	24.6	63.5		42.9	33.4			22.0			48.7	
Level of Service	C	E		D	C			C			D	
Approach Delay (s)		62.6			34.5			22.0			48.7	
Approach LOS		E			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	45.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	25	395	5	1	230	5	10	5	20	5	5	1
Future Volume (vph)	25	395	5	1	230	5	10	5	20	5	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		4526			2076			1218			2255	
Travel Time (s)		102.9			47.2			27.7			51.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	461	0	0	256	0	0	38	0	0	11	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1.2

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	395	5	1	230	5	10	5	20	5	5	1
Future Vol, veh/h	25	395	5	1	230	5	10	5	20	5	5	1
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	3	0	0	0	0	0	0	0
Mvmt Flow	27	429	5	1	250	5	11	5	22	5	5	1

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	255	0	0	434	0	0	744	743	253	754	743	432
Stage 1	-	-	-	-	-	-	255	255	-	486	486	-
Stage 2	-	-	-	-	-	-	489	488	-	268	257	-
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	1322	-	-	1136	-	-	333	346	791	328	346	628
Stage 1	-	-	-	-	-	-	754	700	-	566	554	-
Stage 2	-	-	-	-	-	-	564	553	-	742	699	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1322	-	-	1136	-	-	321	336	791	308	336	628
Mov Cap-2 Maneuver	-	-	-	-	-	-	321	336	-	308	336	-
Stage 1	-	-	-	-	-	-	734	699	-	551	539	-
Stage 2	-	-	-	-	-	-	542	538	-	715	698	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	0.5	0	12.9	16.1
HCM LOS			B	C

Minor Lane/Major Mvmt	NELn1	NBL	NBT	NBR	SBL	SBT	SBR	SWLn1
Capacity (veh/h)	491	1322	-	-	1136	-	-	336
HCM Lane V/C Ratio	0.077	0.021	-	-	0.001	-	-	0.036
HCM Control Delay (s)	12.9	7.8	0	-	8.2	0	-	16.1
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	0.1

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	255	90	50	365	25	35	280	10	55	125	45
Future Volume (vph)	10	255	90	50	365	25	35	280	10	55	125	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	300		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1281			4526			2170			863	
Travel Time (s)		29.1			102.9			49.3			19.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	22%	9%	5%	4%	6%	0%	0%	1%	33%	4%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	375	0	54	424	0	0	353	0	0	245	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	6	6		2	2		8	8		4	4	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Total Split (s)	24.0	24.0		24.0	24.0		21.0	21.0		21.0	21.0	
Total Split (%)	36.9%	36.9%		36.9%	36.9%		32.3%	32.3%		32.3%	32.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
v/c Ratio	0.09	0.79		0.30	0.85			0.90			0.90	
Control Delay	19.9	36.6		24.1	41.1			53.6			61.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	19.9	36.6		24.1	41.1			53.6			61.8	
Queue Length 50th (ft)	3	137		17	159			136			94	
Queue Length 95th (ft)	15	#269		47	#306			#276			#216	
Internal Link Dist (ft)		1201			4446			2090			783	
Turn Bay Length (ft)	250			300								
Base Capacity (vph)	120	474		180	499			398			277	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.09	0.79		0.30	0.85			0.89			0.88	

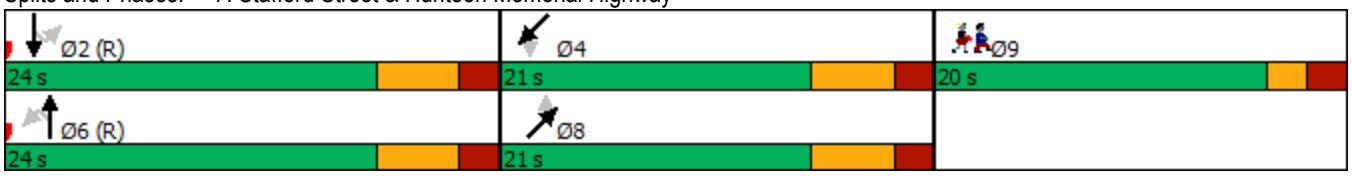
Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 65	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	31%
Yellow Time (s)	2.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Ped
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Stafford Street & Huntoon Memorial Highway



Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	255	90	50	365	25	35	280	10	55	125	45
Future Volume (vph)	10	255	90	50	365	25	35	280	10	55	125	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.96		1.00	0.99			1.00			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1480	1691		1736	1782			1847			1779	
Flt Permitted	0.28	1.00		0.35	1.00			0.93			0.67	
Satd. Flow (perm)	431	1691		643	1782			1727			1202	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	277	98	54	397	27	38	304	11	60	136	49
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	11	375	0	54	424	0	0	353	0	0	245	0
Heavy Vehicles (%)	22%	9%	5%	4%	6%	0%	0%	1%	33%	4%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	18.2	18.2		18.2	18.2			14.8			14.8	
Effective Green, g (s)	18.2	18.2		18.2	18.2			14.8			14.8	
Actuated g/C Ratio	0.28	0.28		0.28	0.28			0.23			0.23	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	120	473		180	498			393			273	
v/s Ratio Prot		0.22			c0.24							
v/s Ratio Perm	0.03			0.08				c0.20			0.20	
v/c Ratio	0.09	0.79		0.30	0.85			0.90			0.90	
Uniform Delay, d1	17.3	21.7		18.4	22.1			24.4			24.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.5	12.8		4.2	16.6			22.4			29.1	
Delay (s)	18.8	34.5		22.6	38.7			46.7			53.5	
Level of Service	B	C		C	D			D			D	
Approach Delay (s)		34.0			36.9			46.7			53.5	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	41.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	20	75	235	400	0
Future Volume (vph)	0	20	75	235	400	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30			30	30	
Link Distance (ft)	422			2109	347	
Travel Time (s)	9.6			47.9	7.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	22	0	0	337	435	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	75	235	400	0
Future Vol, veh/h	0	20	75	235	400	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	22	82	255	435	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	854	435	435	0	-	0
Stage 1	435	-	-	-	-	-
Stage 2	419	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	329	621	1125	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	301	621	1125	-	-	-
Mov Cap-2 Maneuver	301	-	-	-	-	-
Stage 1	597	-	-	-	-	-
Stage 2	664	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1125	-	621	-	-
HCM Lane V/C Ratio	0.072	-	0.035	-	-
HCM Control Delay (s)	8.4	0	11	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	20	0	0	235	400	70
Future Volume (vph)	20	0	0	235	400	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30			30	30	
Link Distance (ft)	458			347	2070	
Travel Time (s)	10.4			7.9	47.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	22	0	0	255	511	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	0	0	235	400	70
Future Vol, veh/h	20	0	0	235	400	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	0	0	255	435	76

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	728	473	511	0	-	0
Stage 1	473	-	-	-	-	-
Stage 2	255	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	390	591	1054	-	-	-
Stage 1	627	-	-	-	-	-
Stage 2	788	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	390	591	1054	-	-	-
Mov Cap-2 Maneuver	390	-	-	-	-	-
Stage 1	627	-	-	-	-	-
Stage 2	788	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1054	-	390	-	-
HCM Lane V/C Ratio	-	-	0.056	-	-
HCM Control Delay (s)	0	-	14.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	210	5	5	405	2	5	1	35	5	1	1
Future Volume (vph)	10	210	5	5	405	2	5	1	35	5	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		4526			2076			1218			2255	
Travel Time (s)		102.9			47.2			27.7			51.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	8%	0%	33%	4%	0%	6%	1%	24%	7%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	244	0	0	447	0	0	44	0	0	7	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1.1

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	210	5	5	405	2	5	1	35	5	1	1
Future Vol, veh/h	10	210	5	5	405	2	5	1	35	5	1	1
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	8	0	33	4	0	6	1	24	7	1	0
Mvmt Flow	11	228	5	5	440	2	5	1	38	5	1	1

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	442	0	0	233	0	0	705	706	441	724	705	231
Stage 1	-	-	-	-	-	-	451	451	-	253	253	-
Stage 2	-	-	-	-	-	-	254	255	-	471	452	-
Critical Hdwy	4.1	-	-	4.43	-	-	7.16	6.51	6.44	7.17	6.51	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.51	-	6.17	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.51	-	6.17	5.51	-
Follow-up Hdwy	2.2	-	-	2.497	-	-	3.554	4.009	3.516	3.563	4.009	3.3
Pot Cap-1 Maneuver	1129	-	-	1172	-	-	346	362	573	335	362	813
Stage 1	-	-	-	-	-	-	580	573	-	740	700	-
Stage 2	-	-	-	-	-	-	742	698	-	564	572	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1129	-	-	1172	-	-	340	356	573	308	356	813
Mov Cap-2 Maneuver	-	-	-	-	-	-	340	356	-	308	356	-
Stage 1	-	-	-	-	-	-	574	570	-	732	692	-
Stage 2	-	-	-	-	-	-	732	690	-	522	569	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	0.4	0.1	12.5	15.7
HCM LOS			B	C

Minor Lane/Major Mvmt	NELn1	NBL	NBT	NBR	SBL	SBT	SBR	SWLn1
Capacity (veh/h)	522	1129	-	-	1172	-	-	345
HCM Lane V/C Ratio	0.085	0.01	-	-	0.005	-	-	0.022
HCM Control Delay (s)	12.5	8.2	0	-	8.1	0	-	15.7
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	345	105	45	295	45	40	190	10	105	305	75
Future Volume (vph)	10	345	105	45	295	45	40	190	10	105	305	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	300		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1281			4526			2170			863	
Travel Time (s)		29.1			102.9			49.3			19.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	18%	5%	4%	3%	3%	3%	0%	2%	50%	2%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	489	0	49	370	0	0	261	0	0	528	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		6			2			8		7	4	
Permitted Phases	6			2			8			4		
Detector Phase	6	6		2	2		8	8		7	4	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		12.0	12.0		8.0	12.0	
Total Split (s)	32.0	32.0		32.0	32.0		30.0	30.0		8.0	38.0	
Total Split (%)	35.6%	35.6%		35.6%	35.6%		33.3%	33.3%		8.9%	42.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		2.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
v/c Ratio	0.07	0.97		0.60	0.71			0.48			0.98	
Control Delay	25.0	66.4		60.8	37.3			26.3			64.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	25.0	66.4		60.8	37.3			26.3			64.7	
Queue Length 50th (ft)	5	274		24	187			114			292	
Queue Length 95th (ft)	18	#471		#82	289			187			#502	
Internal Link Dist (ft)		1201			4446			2090			783	
Turn Bay Length (ft)	250			300								
Base Capacity (vph)	149	505		82	522			540			539	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.07	0.97		0.60	0.71			0.48			0.98	

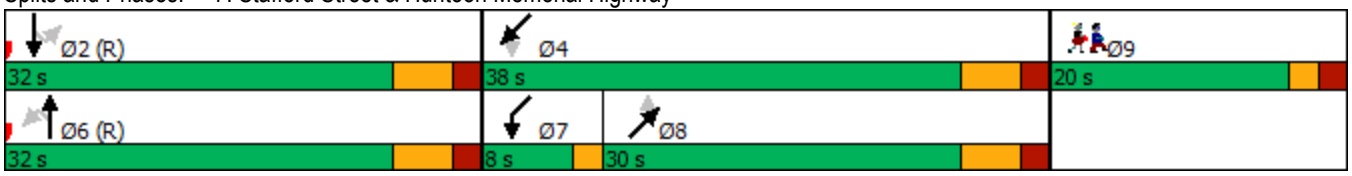
Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	22%
Yellow Time (s)	2.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Ped
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Stafford Street & Huntoon Memorial Highway



Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	10	345	105	45	295	45	40	190	10	105	305	75
Future Volume (vph)	10	345	105	45	295	45	40	190	10	105	305	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.97		1.00	0.98			0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1530	1750		1752	1808			1807			1821	
Flt Permitted	0.32	1.00		0.15	1.00			0.84			0.82	
Satd. Flow (perm)	517	1750		284	1808			1522			1516	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	375	114	49	321	49	43	207	11	114	332	82
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	11	489	0	49	370	0	0	261	0	0	528	0
Heavy Vehicles (%)	18%	5%	4%	3%	3%	3%	0%	2%	50%	2%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		6			2			8		7	4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	26.0	26.0		26.0	26.0			32.0			32.0	
Effective Green, g (s)	26.0	26.0		26.0	26.0			32.0			32.0	
Actuated g/C Ratio	0.29	0.29		0.29	0.29			0.36			0.36	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	149	505		82	522			541			539	
v/s Ratio Prot		c0.28			0.20							
v/s Ratio Perm	0.02			0.17				0.17			c0.35	
v/c Ratio	0.07	0.97		0.60	0.71			0.48			0.98	
Uniform Delay, d1	23.3	31.6		27.5	28.6			22.6			28.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.0	32.9		28.2	7.9			0.7			33.1	
Delay (s)	24.2	64.5		55.7	36.5			23.2			61.8	
Level of Service	C	E		E	D			C			E	
Approach Delay (s)		63.6			38.8			23.2			61.8	
Approach LOS		E			D			C			E	

Intersection Summary			
HCM 2000 Control Delay	50.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	75	30	430	280	0
Future Volume (vph)	0	75	30	430	280	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30			30	30	
Link Distance (ft)	461			1948	291	
Travel Time (s)	10.5			44.3	6.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	82	0	0	500	304	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	75	30	430	280	0
Future Vol, veh/h	0	75	30	430	280	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	82	33	467	304	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	837	304	304	0	-	0
Stage 1	304	-	-	-	-	-
Stage 2	533	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	337	736	1257	-	-	-
Stage 1	748	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	325	736	1257	-	-	-
Mov Cap-2 Maneuver	325	-	-	-	-	-
Stage 1	722	-	-	-	-	-
Stage 2	588	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1257	-	736	-	-
HCM Lane V/C Ratio	0.026	-	0.111	-	-
HCM Control Delay (s)	7.9	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	65	0	0	430	280	30
Future Volume (vph)	65	0	0	430	280	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30			30	30	
Link Distance (ft)	468			291	2286	
Travel Time (s)	10.6			6.6	52.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	71	0	0	467	337	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	65	0	0	430	280	30
Future Vol, veh/h	65	0	0	430	280	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	0	0	467	304	33

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	788	321	337	0	-	0
Stage 1	321	-	-	-	-	-
Stage 2	467	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	360	720	1222	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	631	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	360	720	1222	-	-	-
Mov Cap-2 Maneuver	360	-	-	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	631	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1222	-	360	-	-
HCM Lane V/C Ratio	-	-	0.196	-	-
HCM Control Delay (s)	0	-	17.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	30	455	5	1	255	5	10	5	20	5	5	1
Future Volume (vph)	30	455	5	1	255	5	10	5	20	5	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		4526			2076			1218			2255	
Travel Time (s)		102.9			47.2			27.7			51.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	533	0	0	283	0	0	38	0	0	11	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1.2

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	455	5	1	255	5	10	5	20	5	5	1
Future Vol, veh/h	30	455	5	1	255	5	10	5	20	5	5	1
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	3	0	0	0	0	0	0	0
Mvmt Flow	33	495	5	1	277	5	11	5	22	5	5	1

Major/Minor	Major1			Major2			Minor2			Minor1		
Conflicting Flow All	282	0	0	500	0	0	849	848	280	859	848	498
Stage 1	-	-	-	-	-	-	282	282	-	564	564	-
Stage 2	-	-	-	-	-	-	567	566	-	295	284	-
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	1292	-	-	1075	-	-	283	301	764	279	301	576
Stage 1	-	-	-	-	-	-	729	681	-	514	512	-
Stage 2	-	-	-	-	-	-	512	511	-	718	680	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1292	-	-	1075	-	-	271	290	764	260	290	576
Mov Cap-2 Maneuver	-	-	-	-	-	-	271	290	-	260	290	-
Stage 1	-	-	-	-	-	-	703	680	-	496	494	-
Stage 2	-	-	-	-	-	-	488	493	-	691	679	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	0.5	0	14	18
HCM LOS			B	C

Minor Lane/Major Mvmt	NELn1	NBL	NBT	NBR	SBL	SBT	SBR	SWLn1
Capacity (veh/h)	436	1292	-	-	1075	-	-	288
HCM Lane V/C Ratio	0.087	0.025	-	-	0.001	-	-	0.042
HCM Control Delay (s)	14	7.9	0	-	8.4	0	-	18
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	0.1