Transportation Impact Assessment

The Pines Residences
41 North Main Street (Route 27)
Sherborn, Massachusetts

Prepared for:

Barsky Estate Realty Trust
Natick, Massachusetts

October 2020

Prepared by:

Vanasse & Associates inc
Transportation Engineers & Planners

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Dear Reviewer:

This letter shall certify that this *Transportation Impact Assessment* has been prepared under my direct supervision and responsible charge. I am a Registered Professional Engineer (P.E.) in the Commonwealth of Massachusetts (Massachusetts P.E. No. 38871, Civil) and hold Certification as a Professional Traffic Operations Engineer (PTOE) from the Transportation Professional Certification Board, Inc. (TPCB), an independent affiliate of the Institute of Transportation Engineers (ITE) (PTOE Certificate No. 993). I am also a Fellow of the Institute of Transportation Engineers (FITE).

Sincerely,

VANASSE & ASSOCIATES, INC.

Jeffrey S. Dirk

Jeffrey S. Dirk, P.E., PTOE, FITE
Managing Partner

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EXECUTIVE SUMMARY

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a multifamily residential development to be known as The Pines Residences and located at 41 North Main Street (Route 27) in Sherborn, Massachusetts (hereafter referred to as the Project). This assessment was prepared in consultation with the Town of Sherborn and the Massachusetts Department of Transportation (MassDOT), and was performed in accordance with MassDOT's *Transportation Impact Assessment (TIA) Guidelines* and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports.

Based on this assessment, we have concluded the following with respect to the Project:

1. Using trip-generation statistics published by the Institute of Transportation Engineers (ITE),[1] the Project is expected to generate approximately 326 vehicle trips on an average weekday (two-way, 24-hour volume), with 21 vehicle trips expected during the weekday morning peak-hour and 27 vehicle trips expected during the weekday evening peak-hour;

2. The Project will not have a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions), with majority of the movements at the study intersections shown to continue to operate at a level-of-service (LOS) D or better under all analysis conditions, where an LOS of "D" or better is defined as "acceptable" traffic operations;

3. Independent of the Project, all movements exiting the Powderhouse Lane at the Route 27/Powderhouse Lane intersection are currently operating at or over capacity (LOS "E" or "F", respectively) during the weekday morning and evening peak-hours. Project-related impacts at this intersection are generally defined as an increase in motorist delays that resulted in an increase in vehicle queuing along Powderhouse Lane of up to four (4) vehicles;

4. No apparent safety deficiencies were noted with respect to the motor vehicle crash history at the study area intersections, with all of the intersections found to have motor vehicle crash rates below the MassDOT average crash rates for similar intersections; and

[1] *Trip Generation*, 10th Edition; Institute of Transportation Engineers; Washington, DC; 2017.

5. Lines of sight to and from Powderhouse Lane (the access to the Project site) at its intersection with Route 27 were found to exceed the recommended minimum distance for safe operation based on the appropriate approach speed.

In consideration of the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with implementation of the recommendations that follow.

RECOMMENDATIONS

A detailed transportation improvement program has been developed that is designed to provide safe and efficient access to the Project site and address any deficiencies identified at off-site locations evaluated in conjunction with this study. The following improvements have been recommended as a part of this evaluation and, where applicable, will be completed in conjunction with the Project subject to receipt of all necessary rights, permits, and approvals.

Project Access

Access to the Project site will be provided by way of a new driveway that will intersect the west end of Powderhouse Lane approximately 290-feet west of Route 27. Secondary access for emergency vehicles will be provided by way of a gated access drive to Hunting Lane in the northern portion of the Project site. The following recommendations are offered with respect to the design and operation of the Project site access and internal circulation, many of which are reflected on the Site Plans:

- The Project site driveway and internal circulating roadways should be 24-feet in width and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle.

- The emergency vehicle access should be a minimum of 20-feet in width and constructed of bituminous asphaltic concrete or other stabilized surface material that can support travel by the largest anticipated responding emergency vehicle under all weather conditions, and gated or otherwise secured in a manner to restrict use by general traffic.

- Where perpendicular parking is proposed, the drive aisle behind the parking should be a minimum of 23-feet in order to facilitate parking maneuvers.

- A STOP-sign control should be provided on the Powderhouse Lane approach to Route 27 in order to reinforce the assignment of the vehicular right-of-way at the intersection.

- All signs and pavement markings to be installed within the Project site should conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).[2]

- Americans with Disabilities Act (ADA) compliant wheelchair ramps should be provided at all pedestrian crossings.

- Signs and landscaping to be installed as a part of the Project within intersection sight triangle areas should be designed and maintained so as not to restrict lines of sight.

[2] *Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.

- Snow windrows within sight triangle areas should be promptly removed where such accumulations would impede sight lines.

- A school bus waiting area should be provided at an appropriate location defined in consultation with Sherborn Public Schools.

- Consideration should be given to providing accommodations for electric vehicle charging for residents of the Project.

Off-Site

Route 27 at Route16

Independent of the Project, left-turn movements from the Route 16 approach to the signalized intersection of Route 16 at Route 27 were shown to be operating over capacity (i.e., LOS F) during the weekday evening peak hour under 2020 Existing conditions. In an effort to improve traffic operations at the intersection, it is recommended that an optimal traffic signal timing plan be implemented at this intersection in order to improve traffic operations and reduce vehicle queueing. With implementation of an optimal traffic signal timing plan, overall intersection operations will be improved from LOS E to LOS D during the weekday evening peak-hour, with operating conditions for the Route 16 left-turn movement shown to improve from LOS F to LOS E with reduced vehicle queuing.

Transportation Demand Management

Public transportation services are not currently provided within the Town of Sherborn. To the north of the Project site, the Massachusetts Bay Transportation Authority (MBTA) provides Commuter Rail service to South Station in Boston on the Framingham/Worcester Line from Natick and West Natick Stations, which are within an approximate 7 to 9 minute driving distance of the Project site. In an effort to reduce the overall number of automobile trips in the area, the following Transportation Demand Management (TDM) measures will be implemented as a part of the Project:

- A transportation coordinator, who may also have other operations/management responsibilities, will be assigned for the Project to coordinate the TDM program;

- A "welcome packet" will be provided to residents detailing available public transportation services, bicycle and walking alternatives, and commuter options available;

- Work-at-home workspaces will be provided support telecommuting by residents of the Project;

- An internal mail room will be provided within the building; and

- Secure bicycle parking will be provided within the Project site consisting of: i) exterior bicycle parking conveniently located proximate to building entrances; and ii) weather protected bicycle parking located in secure areas.

With implementation of the aforementioned recommendations, safe and efficient access will be provided to the Project site and the Project can be accommodated within the confines of the existing and improved transportation system.

INTRODUCTION

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a multifamily residential development to be known as The Pines Residences and located at 41 North Main Street (Route 27) in Sherborn, Massachusetts (hereafter referred to as the Project). This study evaluates the following specific areas as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; and identifies and analyzes existing traffic conditions and future traffic conditions, both with and without the Project, along Route 27 and at the following specific intersections: Route 27 at Hunting Lane, Route 27 at Eliot Street (Route 16) and Route 27 at Powderhouse Lane.

PROJECT DESCRIPTION

The Project will entail the construction of a 60-unit multifamily residential community be located at 41 North Main Street (Route 27) in Sherborn, Massachusetts. The Project site encompasses approximately 6.24± acres of land that is bounded by Hunting Lane to the north; commercial properties and areas of open and wooded space to the south; Route 27 and commercial properties to the east; and a railroad right-of-way to the west. Figure 1 depicts the Project site location in relation to the existing roadway network. The Project site is currently occupied by a barn and a maintenance building with supporting appurtenances that will be removed to accommodate the Project. The existing residential building that fronts along Route 27 and the single-family home located at 43 North Main Street will be retained as a part of the Project.

Access to the Project site will be provided by way of a new driveway that will intersect the west end of Powderhouse Lane approximately 290-feet west of Route 27. Secondary access for emergency vehicles will be provided by way of a gated access drive to Hunting Lane in the northern portion of the Project site.

Figure 1

Site Location Map

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On-site parking will be provided for approximately 118 vehicles, including eight (8) accessible parking spaces, or a parking ratio of 1.97 spaces per unit. This parking ratio (1.97 parking spaces per unit) is within the range of values documented by the Institute of Transportation Engineers (ITE) for similar multifamily residential communities.[3]

STUDY METHODOLOGY

This study was prepared in consultation with the Town of Sherborn and Massachusetts Department of Transportation (MassDOT); was performed in accordance with MassDOT's *Transportation Impact Assessment (TIA) Guidelines* and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports; and was conducted in three distinct stages.

The first stage involved an assessment of existing conditions in the study area and included an inventory of roadway geometrics; pedestrian and bicycle facilities; on-street parking; public transportation services; observations of traffic flow; and collection of pedestrian, bicycle and vehicle counts.

In the second stage of the study, future traffic conditions were projected and analyzed. Specific travel demand forecasts for the Project were assessed along with future traffic demands due to expected traffic growth independent of the Project. A seven-year time horizon was selected for analyses consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. The traffic analysis conducted in stage two identifies existing or projected future roadway capacity, traffic safety, and site access issues.

The third stage of the study presents and evaluates measures to address traffic and safety issues, if any, identified in stage two of the study.

[3] *Parking Generation Manual*, 5th Edition; Institute of Transportation Engineers; Washington, D.C.; 2019. The average observed parking demand ratio for a multifamily (mid-rise) residential community was reported to be 1.31 parking spaces per dwelling unit and the 85th percentile peak parking demand was identified to be 1.47 spaces per dwelling unit.

EXISTING CONDITIONS

A comprehensive field inventory of existing conditions within the study area was conducted in May 2020. The field investigation consisted of an inventory of existing roadway geometrics; pedestrian and bicycle facilities; traffic volumes; and operating characteristics; as well as posted speed limits and land use information within the study area. The study area that was assessed for the Project consisted of Powderhouse Lane and North Main Street (Route 27), and the following specific intersections: Route 27 at Hunting Lane; Route 27 at Eliot Street (Route 16); and Route 27 at Powderhouse Lane.

The following describes the study area roadways and intersections.

Roadways

North Main Street (Route 27)

- Route 27 is a two-lane urban principle arterial roadway under Town jurisdiction
- Traverses the Town in a general north-south direction providing access to the Town of Natick to the north and the Town of Medfield to the south
- Provides two 10 to 14-foot wide travel lanes that are separated by a double-yellow centerline with 1 to 2-foot wide marked shoulders
- Illumination is provided intermittently by way of street lights mounted on wood poles
- The posted speed limit varies from 30 to 35 miles per hour (mph), with a 20 mph school zone posted approaching Route 16 for the Pine Hill Elementary School that is applicable Monday through Friday from 7:30-8:30 AM and 2:30-3:30 PM
- A 5-foot wide sidewalk is provided along the west side of the roadway
- Land use consists of the residential and commercial properties and areas of open and wooded space

Powderhouse Lane

- Powderhouse Lane is a local access roadway under Town jurisdiction
- Traverses study area in a general east-west direction terminating at a driveway (to the Project site) approximately 290 feet west of Route 27

- Provides a 20 to 24-foot wide traveled-way that accommodates two-way travel with no pavement markings
- Illumination is provided by way of street lights mounted on wood poles
- Sidewalks and a posted speed limit are not provided along the Powderhouse Lane
- Perpendicular parking is provided along the south side of the roadway
- Land use within the study area consists of the Project site, commercial properties and areas of open and wooded space

Intersections

Table 1 and Figure 2 summarize existing lane use, traffic control, and pedestrian and bicycle accommodations at the study area intersections as observed in May 2020.

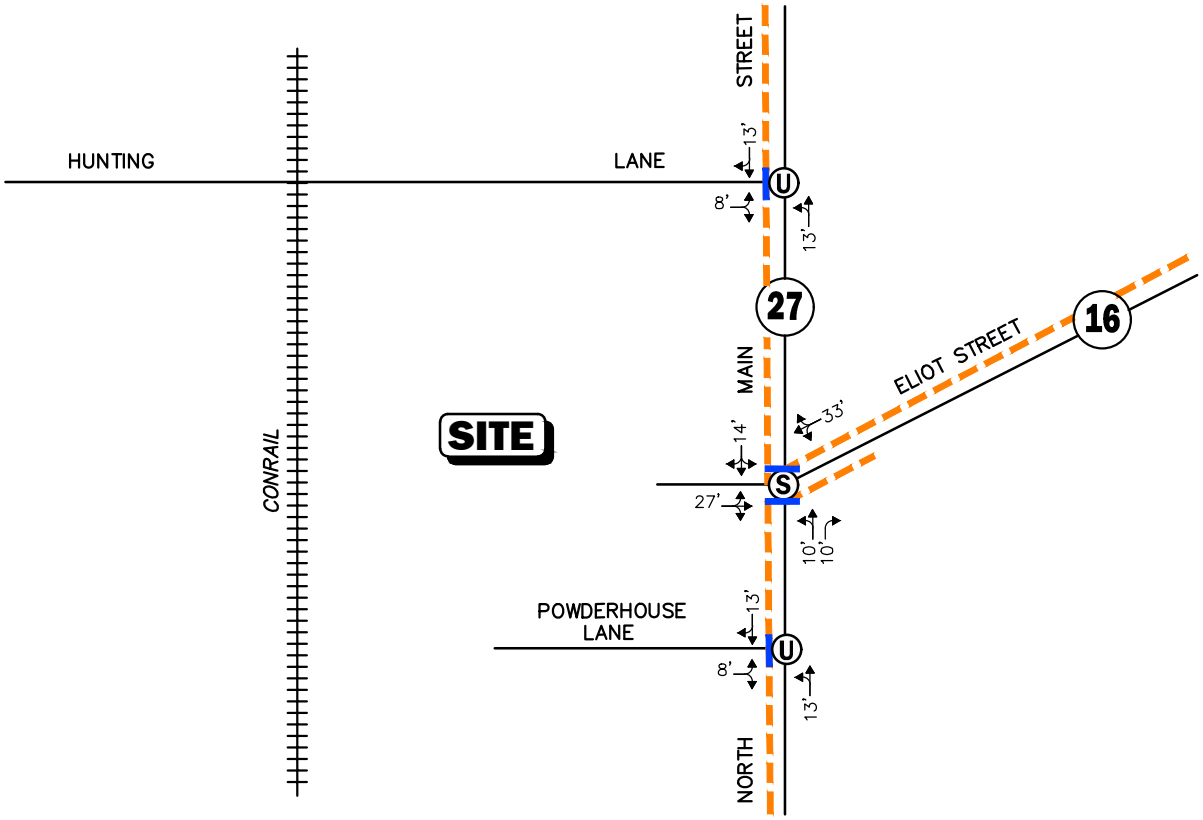
Table 1
STUDY AREA INTERSECTION DESCRIPTION

Intersection	Traffic Control Type[a]	No. of Travel Lanes Provided	Shoulder Provided? (Yes/No/Width)	Pedestrian Accommodations? (Yes/No/Description)	Bicycle Accommodations? (Yes/No/Description)
Rte. 27/ Hunting Ln.	S	1 general-purpose travel lane on all approaches	Yes– 2 feet on Rte. 27 and 1 to 2 feet on Hunting Ln.	Yes – A sidewalk is provided along west side of Rte. 27; crosswalk provided for crossing Hunting Ln.	Yes - Shared traveled-way on Rte. 27[b]
Rte. 27/ Rte.16	TS	1 right-turn lane, and 1 through/left-turn travel lane on Rte. 27 northbound; 1 general-purpose travel lane on Rte. 27 southbound; 1 wide (flared) travel lane on Rte. 16 that functions as 2 lanes	Yes – 1 to 2 feet on Rte. 27 and 1 to 4 feet on Rte. 16	Yes – Sidewalks are provided along west side of Rte. 27, along the north side of Rte. 16 and along the south side of Rte. 16 to Pine Hill Ln.; crosswalks provided across the Rte. 27 north and south legs; pedestrian traffic signal equipment and phasing (exclusive) provided	Yes - Shared traveled-way
Rte. 27/ Powderhouse Ln.	S[c]	1 general-purpose travel lane on all approaches	Yes – 1 to 2 feet on Rte. 27	Yes - Sidewalk is provided along west side of Rte. 27; crosswalk provided across Powderhouse Lane	Yes - Shared traveled-way on Rte. 27

[a]TS = traffic signal control; S = STOP-sign control; Y = YIELD-sign control.
[b]Combined shoulder and travel lane width equal to or exceed 14 feet.
[c]A stop sign is not currently provided on Powderhouse Lane.

Legend:

- Ⓢ Signalized Intersection
- Ⓤ Unsignalized Intersection
- Sidewalk
- Crosswalk
- XX' Lane Use and Travel Lane Width



* Illegal movement.

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Figure 2

Existing Lane Use Travel Lane Width and Pedestrian Facilities

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TRAFFIC VOLUMES

In order to determine existing traffic-volume demands and flow patterns within the study area, automatic traffic recorder (ATR) counts and manual turning movement and vehicle classification counts (TMCs) were obtained for the study area from counts that were performed December 2016 due to the impact on traffic volumes and trip patterns resulting from the COVID-19 pandemic. The 2016 traffic count data included a 48-hour ATR that was conducted on Route 27 north of Eliot Street on December 6th and 7th (Tuesday through Wednesday, inclusive) and TMC's that were performed during the weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak periods on December 7, 2016 (Wednesday) at the Route 27/Route 16 and Route 27/ Powderhouse Road intersections. This data was supplemented by an ATR that was performed as a part of this assessment on April 15th and 16th (Wednesday through Thursday, inclusive) on Route 27 at the same location that the December 2016 ATR count was performed in order to develop an adjustment factor to account for the impact to traffic volumes resulting from the pandemic.

Traffic-Volume Adjustments

In order to evaluate the potential for seasonal fluctuation of traffic volumes within the study area, traffic volume data from MassDOT Continuous Count Station No. AET09 located on Massachusetts Turnpike (Interstate 90) in Framingham were reviewed.[4] Based on a review of this data, it was determined that traffic volumes for the month of April are approximately 3.0 percent above average-month conditions and traffic volumes for the month of December are approximately 8.0 percent below average-month conditions. As such, the December traffic volumes were adjusted upward by 8.0 percent in order to represent average-month conditions and the April traffic volumes were not were not adjusted downward in order to provide a conservative (above-average) analysis condition.

In order to account for the impact on traffic volumes and trip patterns resulting from the "safer-at-home" order and the phased "Reopening Massachusetts" plan that was issued by the Governor on May 18, 2020, in response to the COVID-19 pandemic, the traffic volume data that was collected as a part of the ATR count on Route 27 in 2020 were compared to the December 2016 traffic volumes that were collected at the same location. The April and December traffic volumes were both adjusted to average-month conditions and the 2016 traffic volumes were expanded to 2020 by applying a background traffic growth rate of 1.5 percent per year (discussion follows) in order to allow for a comparison of the data. Based on this pre and post COVID-19 traffic count data comparison, the traffic volume data that was collected as a part of this assessment were adjusted upward by 60 percent in order to account for the reduced traffic volumes resulting from the phased "Reopening Massachusetts" plan and the absence of school related traffic. In addition, the 2016 TMCs were adjusted to 2020 traffic volume conditions by applying the 1.5 percent per year compounded annual background traffic growth rate to the seasonally adjusted traffic volumes.

The 2020 Existing traffic volumes are summarized in Table 2, with the weekday morning and evening peak-hour traffic volumes graphically depicted on Figure 3. Note that the peak-hour traffic volumes presented in Table 2 were obtained from Figure 3.

[4]MassDOT Traffic Volumes for the Commonwealth of Massachusetts; 2020.

Table 2
2020 EXISTING TRAFFIC VOLUMES

Location/Peak Hour	AWT[a]	VPH[b]	K Factor[c]	Directional Distribution[d]
North Main Street (Route 27), north of Eliot Street (Route 16)	17,375	--	--	--
Weekday Morning (7:30 – 8:30 AM)	--	1,446	8.3	65.9% NB
Weekday Evening (4:45 – 5:45 PM)	--	1,311	7.5	60.6% SB

[a]Average weekday traffic in vehicles per day.
[b]Vehicles per hour.
[c]Percent of daily traffic occurring during the peak hour.
[d]Percent traveling in peak direction.
NB = northbound, SB= southbound

As can be seen in Table 2, Route in the vicinity of the Project site was found to accommodate approximately 17,375 vehicles on an average weekday (two-way, 24-hour volume), with approximately 1,446 vehicles per hour (vph) during the weekday morning peak-hour and 1,311 vph during the weekday evening peak-hour.

PEDESTRIAN AND BICYCLE FACILITIES

A comprehensive field inventory of pedestrian and bicycle facilities within the study area was undertaken in May 2020. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study roadways and at the study area intersections. As detailed on Figure 2, sidewalks are provided along the west side of Route 27, along the north side of Route 16 and along the south side of Route 16 between Route 27 and Pine Lane (access to the Pine Hill Elementary School). Marked crosswalks are provided for crossing Hunting Lane at Route 27 and the Route 27 north and south leg of the Route 27/Route 16 intersection which include pedestrian traffic signal equipment and phasing.

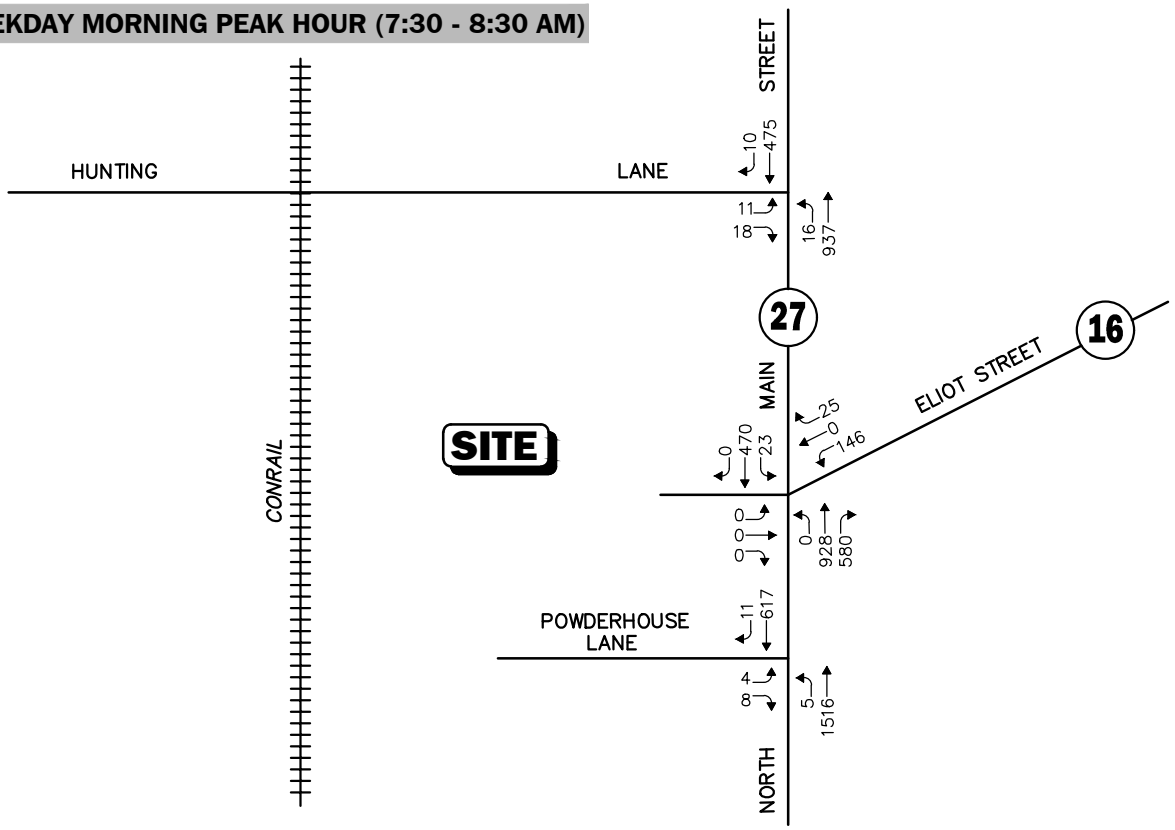
Formal bicycle facilities are not provided within the study area; however, Route 27 and Route 16 provide sufficient width (combined travel lane and shoulder) to support bicycle travel in a shared traveled-way configuration (i.e., motor vehicles and bicyclists sharing the roadway).[5]

PUBLIC TRANSPORTATION

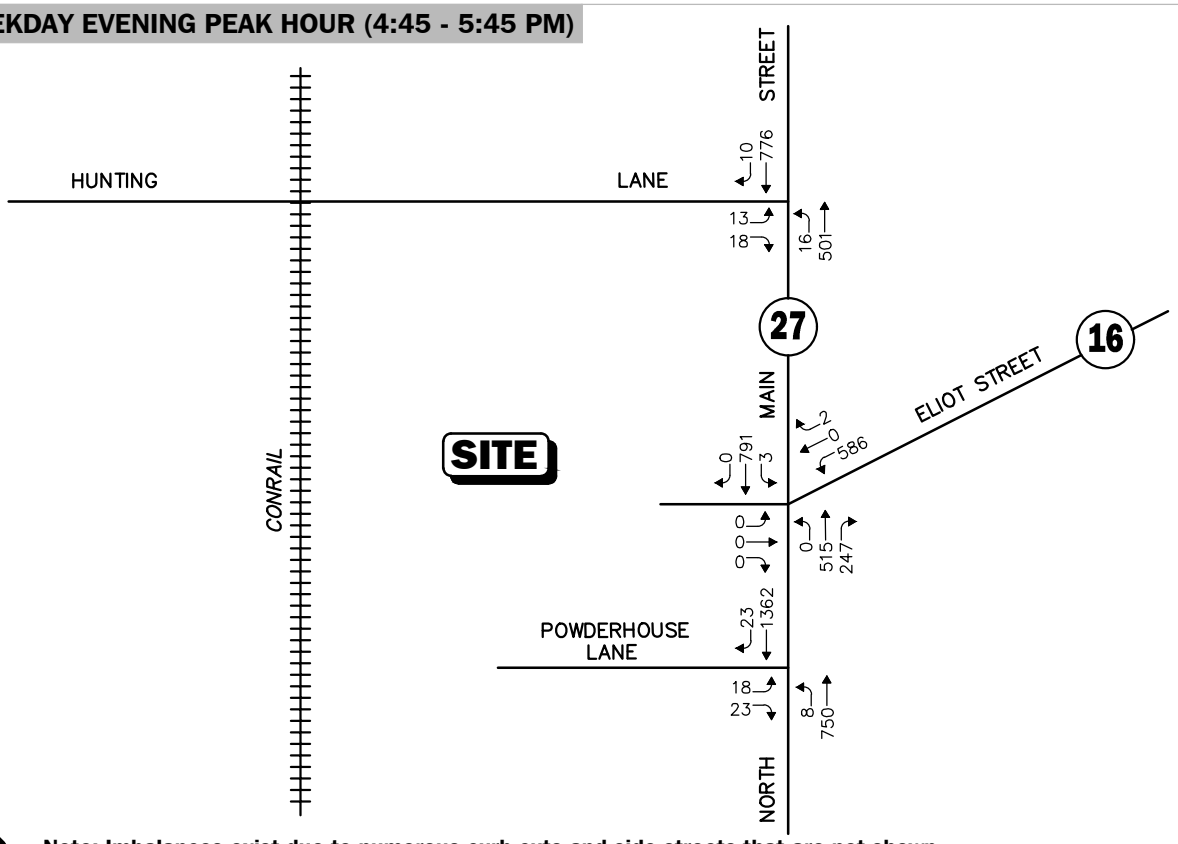
Public transportation services are not currently provided within the Town of Sherborn. To the north of the Project site, the Massachusetts Bay Transportation Authority (MBTA) provides Commuter Rail service to South Station in Boston on the Framingham/Worcester Line from Natick and West Natick Stations, which are within an approximate 7 to 9 minute driving distance of the Project site.

[5]A minimum combined travel lane and paved shoulder width of 14-feet is required to support bicycle travel in a shared traveled-way condition.

WEEKDAY MORNING PEAK HOUR (7:30 - 8:30 AM)



WEEKDAY EVENING PEAK HOUR (4:45 - 5:45 PM)



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

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Figure 3

2020 Existing
Peak Hour Traffic Volumes

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SPOT SPEED MEASUREMENTS

Vehicle travel speed measurements were performed on Route 27 within the study area in conjunction with the ATR counts. Table 3 summarizes the vehicle travel speed measurements.

Table 3
VEHICLE TRAVEL SPEED MEASUREMENTS

	Route 27	
	Northbound	Southbound
Mean Travel Speed (mph)	32	30
85th Percentile Speed (mph)	37	34
Posted Speed Limit (mph)	30	30

mph = miles per hour.

As can be seen in Table 3, the mean vehicle travel speed along Route 27 in the vicinity of the Project site was found to be 32 mph in the northbound direction and 30 mph southbound. The measured 85th percentile vehicle travel speed, or the speed at which 85 percent of the observed vehicles traveled at or below, was found to be 37 mph in the northbound direction and 34 mph southbound, which is 4 and 7 mph above the posted speed limit (30 mph) along this section of Route 27. The 85th percentile speed is used as the direction of engineering design and in the evaluation of sight distances and is often used in establishing posted speed limits.

MOTOR VEHICLE CRASH DATA

Motor vehicle crash information for the study area intersections was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2013 through 2017, inclusive) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized by intersection, type, severity, roadway and weather conditions, and day of occurrence, and presented in Table 4.

As can be seen in Table 4, the study area intersections were found to have averaged approximately five (5) or fewer reported motor vehicle crashes over the five-year review period, the majority of which occurred on a weekday, under clear weather conditions during daylight, and involved rear-end type collisions that resulted in property damage only. All of the study intersections were found to have a motor vehicle crash rate below the MassDOT statewide and District average crash rates for a signalized or unsignalized intersection, as appropriate, for the MassDOT Highway Division District in which the intersections are located (District 3).

A review of the MassDOT statewide High Crash Location List indicated that none of the study intersections are included on MassDOT's Highway Safety Improvement Program (HSIP) listing as a high crash location. In addition, no fatal motor vehicle crashes were reported to have occurred at the study area intersections over the five-year review period.

The detailed MassDOT Crash Rate Worksheets are provided in the Appendix.

Table 4
MOTOR VEHICLE CRASH DATA SUMMARY[a]

	Route 27/ Hunting Lane	Route 27/ Route 16	Route 27/ Powderhouse Lane
Traffic Control Type:[b]	U	TS	U
Year:			
2013	2	5	1
2014	4	5	2
2015	5	4	2
2016	1	4	4
2017	2	5	5
Total	14	23	14
Average	2.80	4.60	2.80
Rate[c]	0.43	0.48	0.29
MassDOT Crash Rate:[d]	0.57/0.61	0.78/0.89	0.57/0.61
Significant?[e]	No	No	No
Type:			
Angle	1	3	2
Rear-End	11	13	10
Sideswipe	1	1	1
Single Vehicle Crash	1	5	1
Unknown/Other	0	1	0
Total	14	23	14
Conditions:			
Clear	11	14	9
Cloudy	1	1	1
Rain	2	6	4
Snow/Ice	0	2	0
Total	14	23	14
Lighting:			
Daylight	11	17	9
Dawn/Dusk	1	0	0
Dark (Road Lit)	1	6	5
Dark (Road Unlit)	1	0	0
Total	14	23	14
Day of Week:			
Monday through Friday	14	18	11
Saturday	0	5	3
Sunday	0	0	0
Total	14	23	14
Severity:			
Property Damage Only	11	16	12
Non-fatal Injury	3	7	2
Total	14	23	14

[a]Source: MassDOT Safety Management/Traffic Operations Unit records, 2013 through 2017.
[b]Traffic Control Type: U = unsignalized; TS = traffic signal.
[c]Crash rate per million vehicles entering the intersection.
[d]Statewide/District crash rate.
[e]The intersection crash rate is significant if it is found to exceed the MassDOT crash rate for the MassDOT Highway Division District in which the Project is located (District 3).

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2027, which reflects a seven-year planning horizon consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. Independent of the Project, traffic volumes on the roadway network in the year 2027 under No-Build conditions include all existing traffic and new traffic resulting from background traffic growth. Anticipated Project-generated traffic volumes superimposed upon the 2027 No-Build traffic volumes reflect 2027 Build traffic volume conditions with the Project.

FUTURE TRAFFIC GROWTH

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

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

To provide a conservative analysis framework, both procedures were used, the salient components of which are described below.

Specific Development by Others

The Town of Sherborn Office of Planning and Development was consulted in order to determine if there were any projects planned within the study area that would have an impact on future traffic volumes at the study intersections. Based on this consultation, the following projects were identified for inclusion in this assessment:

Proposed Residential Community, 31 Hunting Lane, Sherborn, Massachusetts. This proposed project consists of the construction of a 28-unit residential community to be located at 31 Hunting Lane.

Proposed Residential Development, 59 North Main Street, Sherborn, Massachusetts. This project consists of the construction of 12 single-family homes to be located at 59 North Main Street.

Villages, 84 Coolidge Street, Sherborn, Massachusetts. This project consists of the construction of an 88-unit residential development to be located at 84 Coolidge Street. Traffic volumes associated with this project within the study area are expected to be relatively minor and would be reflected in the general background traffic growth rate (discussion follows).

Traffic volumes associated with the aforementioned specific development projects by others that are expected to result in an increase in traffic within the study area that would exceed the general background traffic growth rate were obtained from the traffic study prepared in support of the project or were developed using trip-generation information available from the ITE[6] for the appropriate land use, and were assigned onto the study area roadway network based on existing traffic patterns where no other information was available. No other developments were identified at this time that are expected to result in an increase in traffic within the study area beyond the general background traffic growth rate.

General Background Traffic Growth

Traffic-volume data compiled by MassDOT from permanent count stations located in Sherborn were reviewed in order to determine general traffic growth trends in the area. This data indicates that traffic volumes have fluctuated over the past several years, with the average growth rate found to be approximately 1.5 percent per year. As such, a compounded annual background traffic growth rate of 1.5 percent per year was used in order to account for future traffic growth and presently unforeseen development within the study area.

Roadway Improvement Projects

The Town of Sherborn and MassDOT were contacted in order to determine if there were any planned future roadway improvement projects expected to be complete by 2027 within the study area. Based on these discussions, no roadway improvement projects aside from routine maintenance activities were identified to be planned within the study area at this time.

Sherborn Circulation Plan

In 2018, the Town of Sherborn advanced a general plan for circulation improvements that emphasizes improvements to the transportation infrastructure that will enhance safety and facilitate mobility for all roadway users. The plan identified several concerns by residents including commuter traffic congestion in the town center; the lack of safe walking and biking routes; and poor access to public transportation. In addition, the Town adopted a Complete Streets Policy in 2016 which identified the following goals within the study area:

- Improve roadways and intersections for safe and efficient movement of vehicles. This section provides an option for redesigning Route 27/Route 16 intersection.

- Design roadways and intersections for safe sharing of the traveled-way by vehicles and bicycles.

- Encourage and support walking as a safe and pleasant mode of travel around the town center and throughout Town.

The Project has been designed to be consistent with these goals and will not to preclude the future changes along Route 27 contemplated by the Town as a part of the aforementioned planning studies.

[6]Ibid 1.

No-Build Traffic Volumes

The 2027 No-Build condition peak-hour traffic-volumes were developed by applying the 1.0 percent per year compounded annual background traffic growth rate to the 2020 Existing peak-hour traffic volumes and then adding the peak-hour traffic volumes associated with the identified specific development projects by others. The resulting 2027 No-Build weekday morning and evening peak-hour traffic volumes are shown on Figure 4.

PROJECT-GENERATED TRAFFIC

Design year (2027 Build) traffic volumes for the study area roadways were determined by estimating Project-generated traffic volumes and assigning those volumes on the study roadways. The following sections describe the methodology used to develop the anticipated traffic characteristics of the Project.

As proposed, the Project will entail the construction of a 60-unit multifamily residential community. In order to develop the traffic characteristics of the Project, trip-generation statistics published by the ITE[7] for a similar land use as that proposed were used. ITE Land Use Code (LUC) 221, *Multifamily Housing (Mid-Rise),* was used to develop the traffic characteristics of the Project, the results of which are summarized in Table 5.

Table 5
TRIP GENERATION SUMMARY

Time Period	Vehicle Trips[a]		
	Entering	Exiting	Total
Average Weekday:	163	163	326
Weekday Morning Peak-Hour:	5	16	21
Weekday Evening Peak-Hour:	16	11	27

[b]Based on ITE LUC 221, *Multifamily Housing (Mid-Rise).*

Project-Generated Traffic Volume Summary

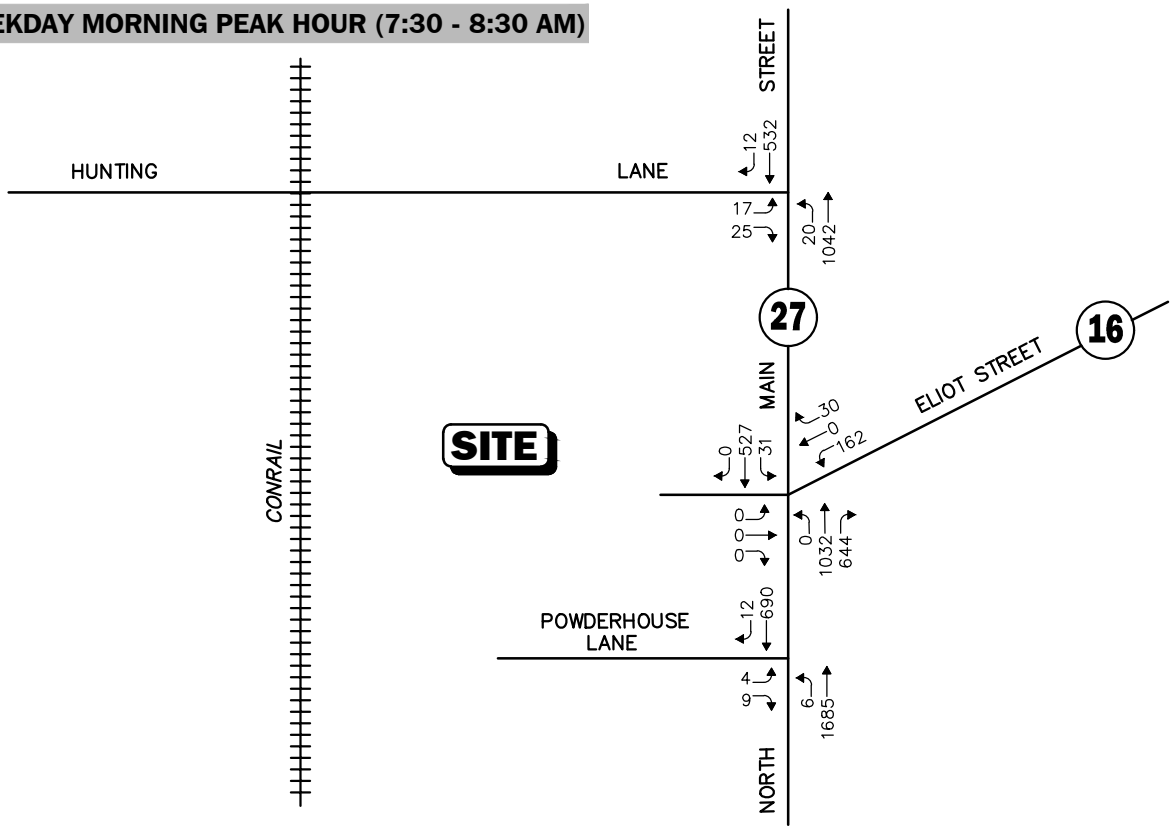
As can be seen in Table 5, the Project is expected to generate approximately 326 vehicle trips on an average weekday (two-way, 24-hour volume, or 163 vehicles entering and 163 exiting), with 21 vehicle trips (5 vehicles entering and 16 exiting) expected during the weekday morning peak-hour and 27 vehicle trips (16 vehicles entering and 11 exiting) expected during the weekday evening peak-hour.

TRIP DISTRIBUTION AND ASSIGNMENT

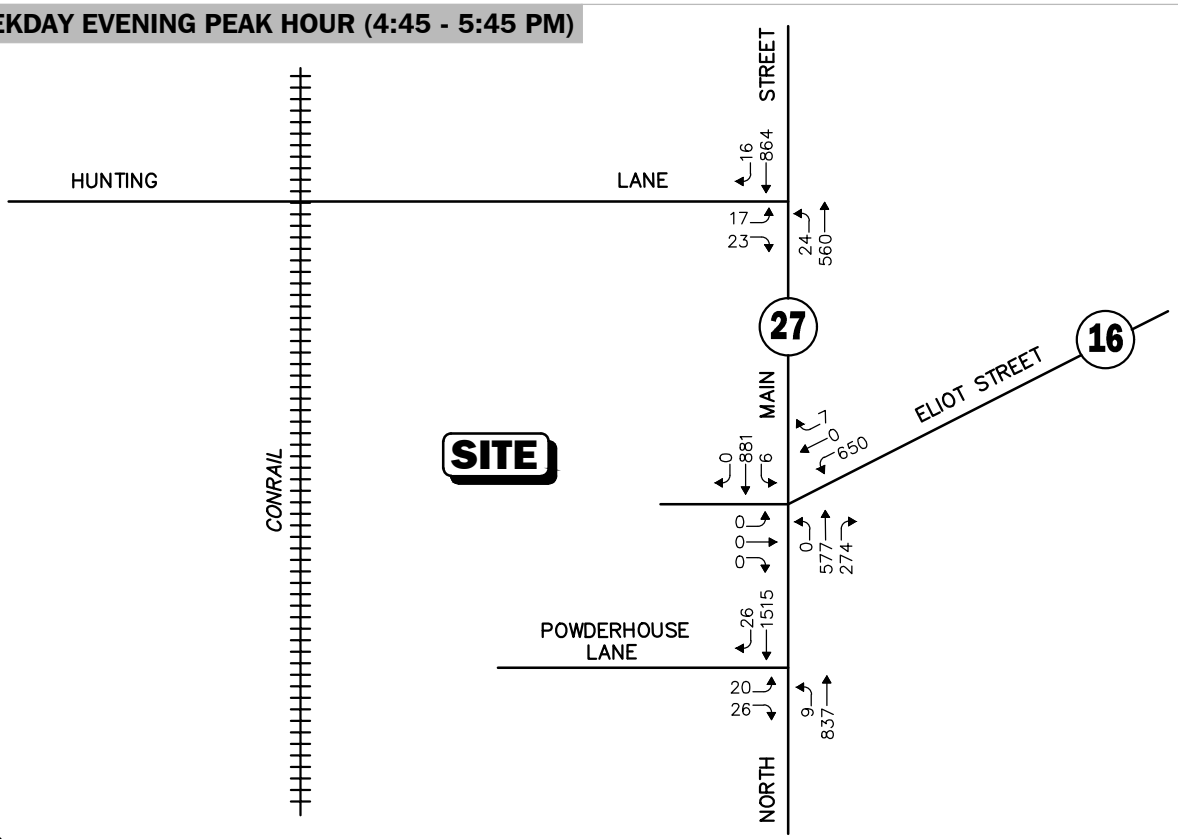
The directional distribution of generated trips to and from the Project site was determined based on a review of Journey-to-Work data obtained from the U.S. Census for persons residing in the Town of Sherborn and then refined based on existing traffic patterns within the study area. This methodology is consistent with the residential nature of the Project. The general trip distribution for the Project is graphically depicted on Figure 5. The additional traffic expected to be generated by the Project was assigned on the study area roadway network as shown on Figure 6 for the weekday morning and evening peak hours, respectively.

[7]Ibid 1.

WEEKDAY MORNING PEAK HOUR (7:30 - 8:30 AM)



WEEKDAY EVENING PEAK HOUR (4:45 - 5:45 PM)



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 4

2027 No-Build
Peak Hour Traffic Volumes

Vanasse & Associates inc

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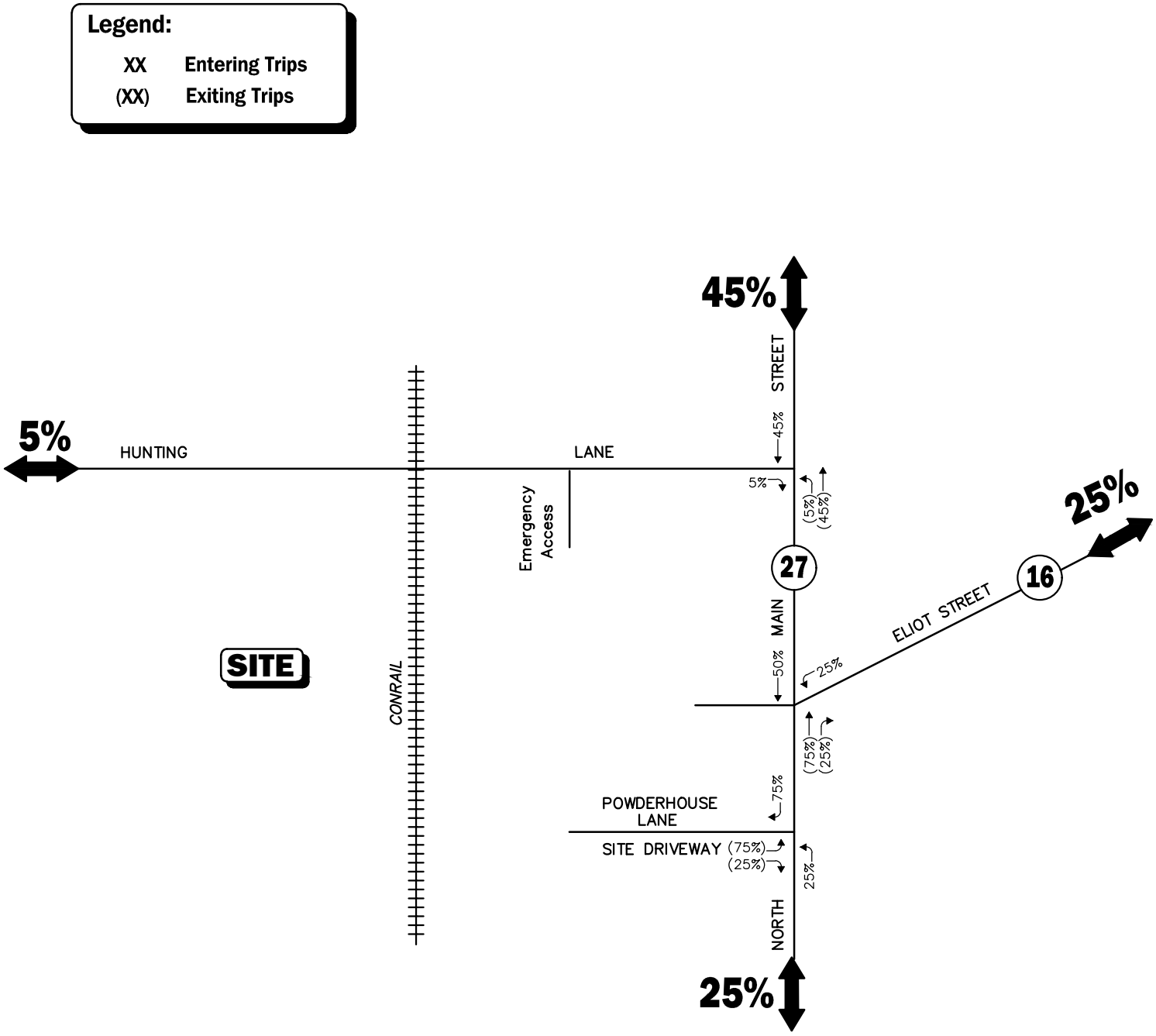

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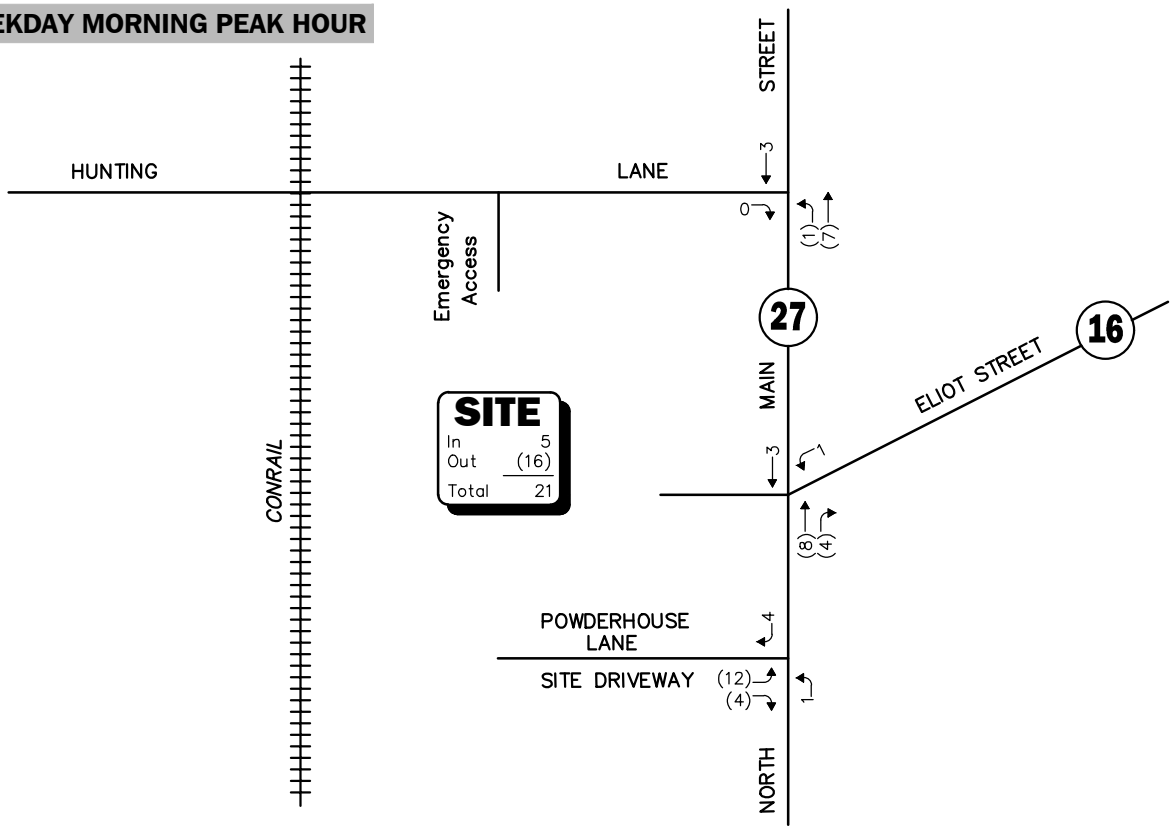
Figure 5

Trip Distribution Map

Vanasse & Associates inc

WEEKDAY MORNING PEAK HOUR



WEEKDAY EVENING PEAK HOUR

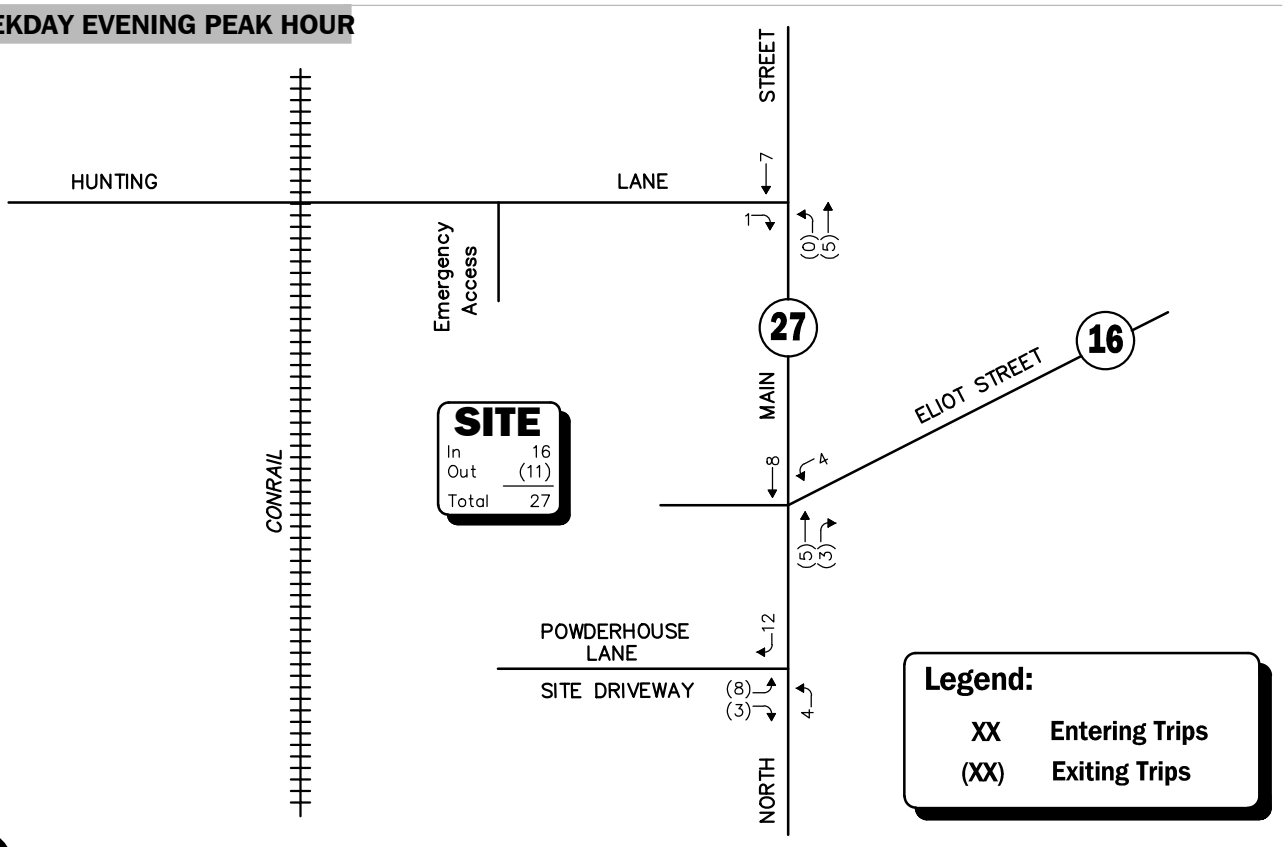


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Figure 6

Project-Generated Peak Hour Traffic Volumes

Vanasse & Associates inc

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FUTURE TRAFFIC VOLUMES - BUILD CONDITION

The 2027 Build condition traffic volumes consist of the 2027 No-Build traffic volumes with the additional traffic expected to be generated by the Project added to them. The 2027 Build weekday morning and evening peak-hour traffic-volumes are graphically depicted on Figure 7.

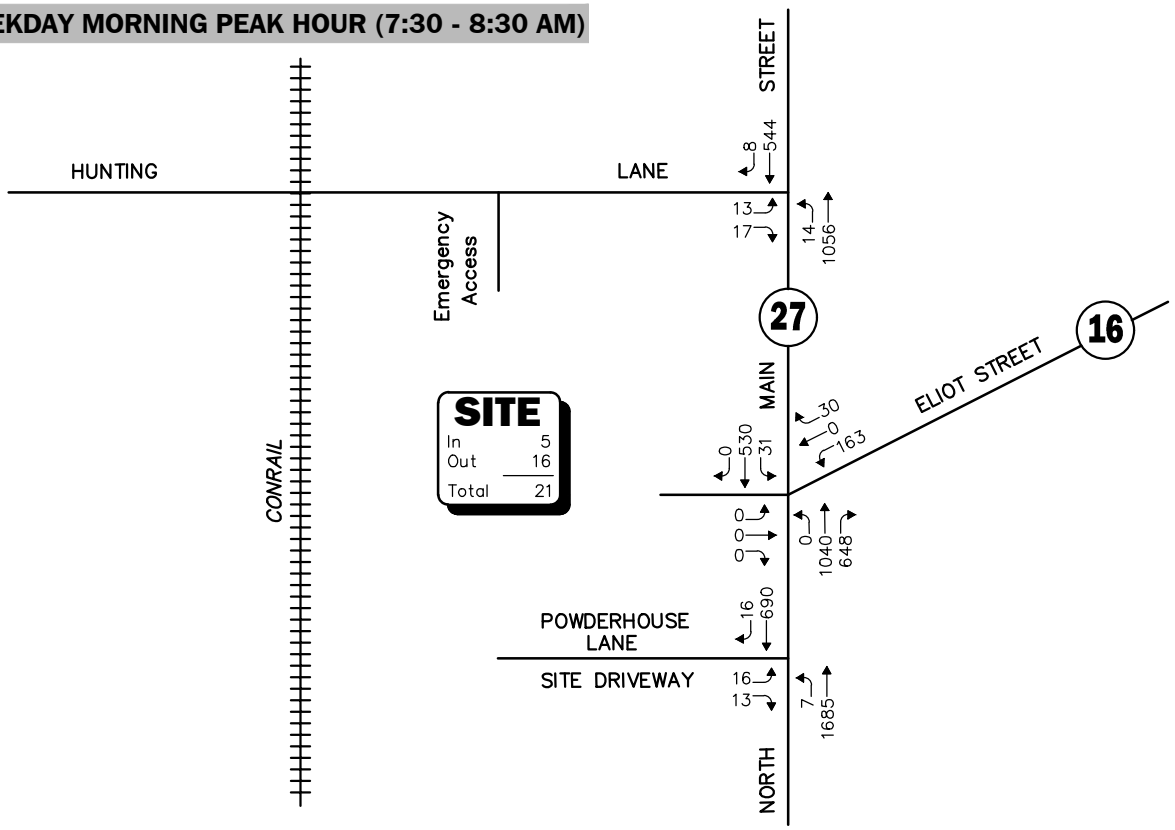
A summary of peak-hour projected traffic-volume changes outside of the study area that is the subject of this assessment is shown in Table 6. These changes are a result of the construction of the Project.

Table 6
PEAK-HOUR TRAFFIC-VOLUME INCREASES

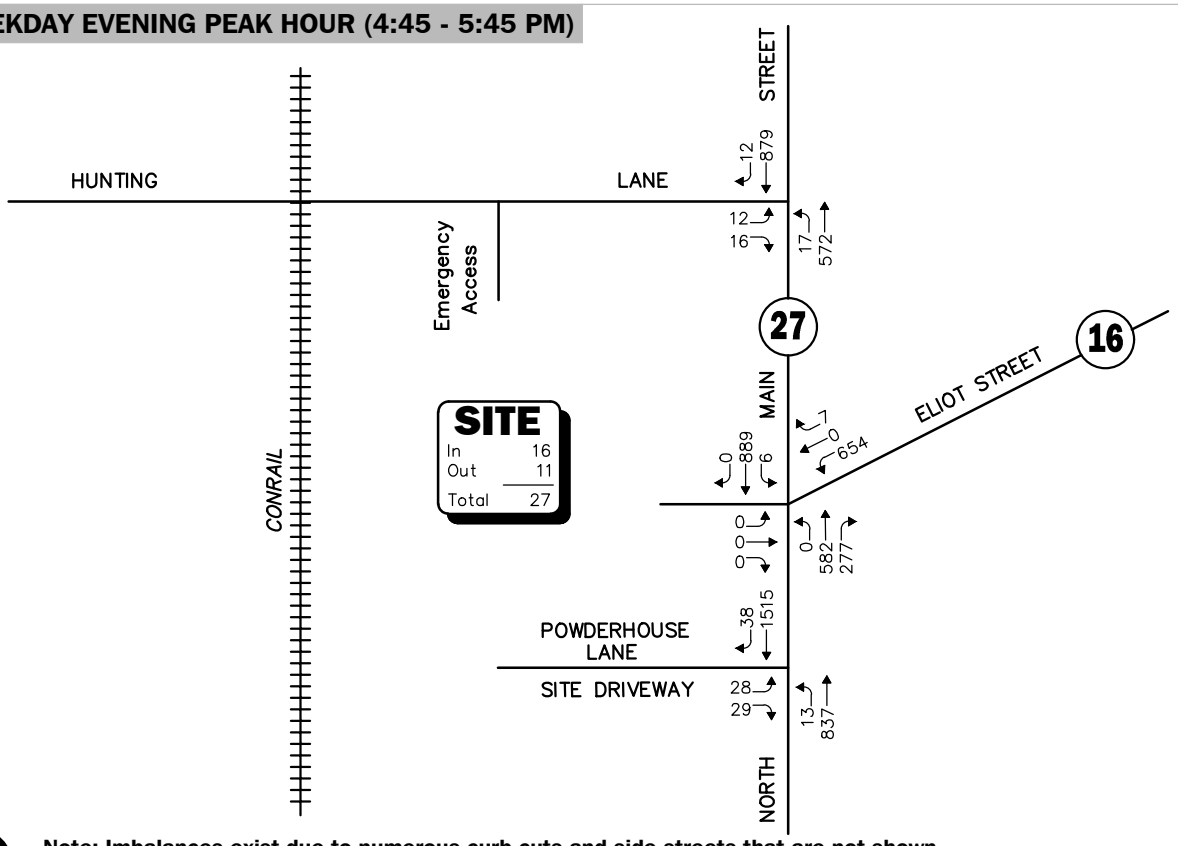
Location/Peak Hour	2020 Existing	2027 No-Build	2027 Build	Traffic Volume Increase Over No-Build	Percent Increase Over No-Build
Route 27, north of Hunting Lane:					
Weekday Morning	1,433	1,604	1,614	10	0.6
Weekday Evening	1,300	1,457	1,469	12	0.8
Route 27, south of Powderhouse Lane:					
Weekday Morning	2,146	2,390	2,395	5	0.2
Weekday Evening	2,143	2,387	2,394	7	0.3
Route 16, east of Route 27:					
Weekday Morning	774	867	872	5	0.6
Weekday Evening	838	937	944	7	0.7
Hunting Lane, west of Route 27:					
Weekday Morning	55	74	75	1	1.3
Weekday Evening	57	80	81	1	1.2

As shown in Table 6, Project-related traffic-volume increases outside of the study area relative to 2027 No-Build conditions are anticipated to range from 0.2 to 1.3 percent during the peak periods, with vehicle increases shown to range from 1 to 12 vehicles. ***When distributed over the peak-hour, the predicted traffic volume increases would not result in a significant impact (increase) on motorist delays or vehicle queuing outside of the immediate study area that is the subject of this assessment.***

WEEKDAY MORNING PEAK HOUR (7:30 - 8:30 AM)



WEEKDAY EVENING PEAK HOUR (4:45 - 5:45 PM)



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 7

2027 Build
Peak Hour Traffic Volumes

Vanasse & Associates inc

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TRAFFIC OPERATIONS ANALYSIS

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

METHODOLOGY

Levels of Service

A primary result of capacity analyses is the assignment of level of service to traffic facilities under various traffic-flow conditions.[8] The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

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

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

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

Unsignalized Intersections

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

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

The levels of service of unsignalized intersections are determined by application of a procedure described in the 2010 *Highway Capacity Manual.*[9] Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the 2010 *Highway Capacity Manual*. Table 7 summarizes the relationship between level of service and average control delay for two-way stop controlled and all-way stop controlled intersections.

Table 7
LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS[a]

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

[a]Source: *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010; page 19-2.

[9]*Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010.

Signalized Intersections

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

- *LOS A* describes operations with very low control delay; most vehicles do not stop at all.
- *LOS B* describes operations with relatively low control delay. However, more vehicles stop than LOS A.
- *LOS C* describes operations with higher control delays. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
- *LOS D* describes operations with control delay in the range where the influence of congestion becomes more noticeable. Many vehicles stop, and individual cycle failures are noticeable.
- *LOS E* describes operations with high control delay values. Individual cycle failures is frequent occurrences.
- *LOS F* describes operations with high control delay values that often occur with over-saturation. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Levels of service for signalized intersections are calculated using the operational analysis methodology of the 2000 Highway Capacity Manual and implemented as a part of the Synchro® 10 software as recommended by MassDOT. This method assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on delay. Level-of-service designations are based on the criterion of control or signal delay per vehicle. Control or signal delay is a measure of driver discomfort, frustration, and fuel consumption, and includes initial deceleration delay approaching the traffic signal, queue move-up time, stopped delay and final acceleration delay. Table 8 summarizes the relationship between level of service and control delay. The tabulated control delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to entire intersections.

Table 8
LEVEL-OF-SERVICE CRITERIA
FOR SIGNALIZED INTERSECTIONS[a]

Level of Service	Control (Signal) Delay Per Vehicle (Seconds)
A	≤10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	>80.0

[a]Source: *Highway Capacity Manual*, Transportation Research Board; Washington, DC; 2000; page 16-2.

Vehicle Queue Analysis

Vehicle queue analyses are a direct measurement of an intersection's ability to process vehicles under various traffic control and volume scenarios and lane use arrangements. The vehicle queue analysis was performed using the Synchro® intersection capacity analysis software which is based upon the methodology and procedures presented in the 2010 *Highway Capacity Manual*. The Synchro® vehicle queue analysis methodology is a simulation based model which reports the number of vehicles that experience a delay of six seconds or more at an intersection. For signalized intersections, Synchro® reports both the average (50th percentile) the 95th percentile vehicle queue. For unsignalized intersections, Synchro® reports the 95th percentile vehicle queue. Vehicle queue lengths are a function of the capacity of the movement under study and the volume of traffic being processed by the intersection during the analysis period. The 95th percentile vehicle queue is the vehicle queue length that will be exceeded only 5 percent of the time, or approximately three minutes out of sixty minutes during the peak one hour of the day (during the remaining fifty-seven minutes, the vehicle queue length will be less than the 95th percentile queue length).

ANALYSIS RESULTS

Level-of-service and vehicle queue analyses were conducted for 2020 Existing, 2027 No-Build and 2027 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized on Table 9 and Table 10, with the detailed analysis results presented in the Appendix.

The following is a summary of the level-of-service and vehicle queue analyses for the intersections within the study area. For context, we note that an LOS of "D" or better is generally defined as "acceptable" operating conditions.

Unsignalized Intersections

Project-related impacts at the unsignalized study area intersections are shown on Table 9 and are defined as follows:

Route 27/Hunting Lane – All movements at this unsignalized intersection are predicted to operate at LOS D or better during the peak hours with the addition of Project-related traffic (no change over No-Build conditions). Project-related impacts at the intersection were defined as an increase in average control delay of up to 4.1 seconds with no increase in vehicle queuing. All movements along Route 27 are predicted to operate at LOS A with negligible vehicle queuing expected.

Route 27 at Powderhouse Lane – The addition of Project-related traffic to this unsignalized intersection was not shown to result in a change in LOS over No-Build conditions; however, independent of the Project, all movements from Powderhouse Road were shown to be operating at or over capacity (i.e., LOS "E" or "F", respectively). Project-related impacts at this intersection are generally defined as an increase in motorist delays that resulted in an increase in vehicle queuing along Powderhouse Lane of up to four (4) vehicles. All movements along Route 27 are predicted to operate at LOS A with negligible vehicle queuing expected.

Signalized Intersection

Project-related impacts at the signalized study area intersections are shown on Table 10 and are defined as follows:

Route 27 at Route 16 – No-change in LOS is expected to occur for any movement over No-Build conditions. Independent of the Project, it was noted that left-turn movements from the Route 16 approach are currently operating over capacity (i.e., LOS F) during the weekday evening peak hour. Vehicle queues at the intersection were shown to increase by 2-3 vehicles with the addition of Project-related traffic.

Table 9
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Unsignalized Intersection/ Peak Hour/Movement	2020 Existing				2027 No-Build				2027 Build			
	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
North Main Street (Route 27)/Hunting Lane:												
Weekday Morning Peak-Hour:												
Hunting Lane EB LT/RT	29	23.3	C	1	42	33.3	D	1	42	34.0	D	1
Route 27 NB LT/TH	953	0.1	A	0	1,062	0.2	A	0	1,070	0.2	A	0
Route 27 SB RT/TH	485	0.0	A	0	545	0.0	A	0	548	0.0	A	0
Weekday Evening Peak-Hour:												
Hunting Lane EB LT/RT	31	24.2	C	1	40	32.2	D	1	41	32.7	D	1
Route 27 NB LT/TH	517	0.3	A	0	584	0.4	A	0	589	0.4	A	0
Route 27 SB RT/TH	786	0.0	A	0	880	0.0	A	0	887	0.0	A	0
North Main Street (Route 27)/Powderhouse Lane:												
Weekday Morning Peak-Hour:												
Powderhouse Lane EB LT/RT	12	46.6	E	1	13	>50.0	F	1	29	>50.0	F	5
Route 27 NB LT/TH	1,521	0.0	A	0	1,691	0.0	A	0	1,692	0.0	A	0
Route 27 SB RT/TH	626	0.0	A	0	702	0.0	A	0	706	0.0	A	0
Weekday Evening Peak-Hour:												
Powderhouse Lane EB LT/RT	41	>50.0	F	4	46	>50.0	F	6	57	>50.0	F	8
Route 27 NB LT/TH	758	0.1	A	0	846	0.1	A	0	850	0.2	A	0
Route 27 SB RT/TH	1,385	0.0	A	0	1,541	0.0	A	0	1,553	0.0	A	0

[a]Demand in vehicles per hour.
[b]Average control delay per vehicle (in seconds).
[c]Level-of-Service.
[d]Queue length in vehicles.
NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

Table 10
SIGNALIZED INTERSECTION LEVEL-OF-SERVICE SUMMARY

Signalized Intersection/Peak Hour	2020 Existing				2027 No-Build				2027 Build			
	V/C[a]	Delay[b]	LOS[c]	Queue[d] Avg/95th	V/C	Delay	LOS	Queue Avg/95th	V/C	Delay	LOS	Queue Avg/95th
Route 27/Eliot Street (Route 16):												
Weekday Morning:												
Rte. 16 WB LT	0.58	26.1	C	98/139	0.62	27.1	C	111/110	0.62	27.1	C	111/110
Rte. 16 WB RT	0.04	21.1	C	1/12	0.06	20.9	C	2/12	0.06	20.9	C	2/12
Rte. 27 NB TH	0.82	14.3	B	288/970[f]	0.92	23.6	C	409/753[f]	0.93	24.5	C	419/761[f]
Rte. 27 NB RT	0.35	0.8	A	0/27	0.39	0.8	A	0/0	0.39	0.8	A	0/0
Rte. 27 SB LT/TH	0.56	7.9	A	150/580[f]	0.92	21.0	C	237/489[f]	0.89	24.3	C	228/480[f]
Overall	--	**10.8**	**B**	--	--	**17.6**	**B**	--	--	**18.7**	**B**	--
Weekday Evening:												
Rte. 16 WB LT	1.15	>80.0	F	356[e]/587	1.41	>80.0	F	463[e]/664[f]	1.42	>80.0	F	468[e]/669[f]
Rte. 16 WB RT	0.00	16.4	B	0/5	0.01	19.7	B	2/12	0.01	19.7	B	2/11
Rte. 27 NB TH	0.55	9.7	A	140/213	0.57	9.7	A	166/250	0.58	9.7	A	168/254
Rte. 27 NB RT	0.15	0.6	A	0/0	0.17	0.6	A	0/0	0.17	0.5	A	0/0
Rte. 27 SB LT/TH	0.80	16.2	B	264/414	0.84	16.8	B	329/561[f]	0.84	17.8	B	334/624[f]
Overall	--	**38.4**	**D**	--	--	**69.3**	**E**	--	--	**70.3**	**E**	--

[a]Volume-to-capacity ratio.
[b]Control (signal) delay per vehicle in seconds.
[c]Level-of-Service.
[d]Queue length in feet.
[e]Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
[f]95th percentile volume exceeds capacity, queue may be loner. Queue shown is maximum after two cycles.
NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

SIGHT DISTANCE EVALUATION

Sight distance measurements were performed at the intersection of Powderhouse Lane at Route 27 in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)[10] requirements. Powderhouse Lane will serve as the primary access to the Project site. Both stopping sight distance (SSD) and intersection sight distance (ISD) measurements were performed. In brief, SSD is the distance required by a vehicle traveling at the design speed of a roadway, on wet pavement, to stop prior to striking an object in its travel path. ISD or corner sight distance (CSD) is the sight distance required by a driver entering or crossing an intersecting roadway to perceive an on-coming vehicle and safely complete a turning or crossing maneuver with on-coming traffic. In accordance with AASHTO standards, if the measured ISD is at least equal to the required SSD value for the appropriate design speed, the intersection can operate in a safe manner. Table 11 presents the measured SSD and ISD at the subject intersection.

Table 11
SIGHT DISTANCE MEASUREMENTS[a]

Intersection/Sight Distance Measurement	Feet		
	Required Minimum (SSD)	Desirable (ISD)[b]	Measured
Route 27 at the Powderhouse Lane			
Stopping Sight Distance:			
Route 27 approaching from the north	305	--	500+
Route 27 approaching from the south	305	--	500+
Intersection Sight Distance:			
Looking to the north from the Powderhouse Lane	305	385	500+
Looking to the south from the Powderhouse Lane	305	445	365

[a]Recommended minimum values obtained from *A Policy on Geometric Design of Highways and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018; and based on an approach speed of 40 mph on Route 27.

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

[10]*A Policy on Geometric Design of Highway and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2018.

As can be seen in Table 11, the available lines of sight to and from Powderhouse Lane at its intersection with Route 27 exceed the recommended minimum sight distance to function in a safe manner (SSD) based on a 40 mph approach speed along Route 27, which is 3 to 6 mph above the measured 85th percentile vehicle travel speed (34/37 mph) and 10 mph above the posed speed limit (30 mph).

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

VAI has conducted a TIA in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a 60-unit multifamily residential community to be known as The Pines Residences and located 41 North Main Street (Route 27) in Sherborn, Massachusetts. The following specific areas have been evaluated as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; under existing and future conditions, both with and without the Project. Based on this assessment, we have concluded the following with respect to the Project:

1. Using trip-generation statistics published by the ITE,[11] the Project is expected to generate approximately 326 vehicle trips on an average weekday (two-way, 24-hour volume), with 21 vehicle trips expected during the weekday morning peak-hour and 27 vehicle trips expected during the weekday evening peak-hour;

2. The Project will not have a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions), with majority of the movements at the study intersections shown to continue to operate at LOS D or better under all analysis conditions, where an LOS of "D" or better is defined as "acceptable" traffic operations;

3. Independent of the Project, all movements exiting the Powderhouse Lane at the Route 27/Powderhouse Lane intersection are currently operating at or over capacity (LOS "E" or "F", respectively) during the weekday morning and evening peak-hours. Project-related impacts at this intersection are generally defined as an increase in motorist delays that resulted in an increase in vehicle queuing along Powderhouse Lane of up to four (4) vehicles;

4. No apparent safety deficiencies were noted with respect to the motor vehicle crash history at the study area intersections, with all of the intersections found to have motor vehicle crash rates below the MassDOT average crash rates for similar intersections; and

[11] Ibid 1.

5. Lines of sight to and from Powderhouse Lane (the access to the Project site) at its intersection with Route 27 were found to exceed the recommended minimum distance for safe operation based on the appropriate approach speed.

In consideration of the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with implementation of the recommendations that follow.

RECOMMENDATIONS

A detailed transportation improvement program has been developed that is designed to provide safe and efficient access to the Project site and address any deficiencies identified at off-site locations evaluated in conjunction with this study. The following improvements have been recommended as a part of this evaluation and, where applicable, will be completed in conjunction with the Project subject to receipt of all necessary rights, permits, and approvals.

Project Access

Access to the Project site will be provided by way of a new driveway that will intersect the west end of Powderhouse Lane approximately 290-feet west of Route 27. Secondary access for emergency vehicles will be provided by way of a gated access drive to Hunting Lane in the northern portion of the Project site. The following recommendations are offered with respect to the design and operation of the Project site access and internal circulation, many of which are reflected on the Site Plans:

- The Project site driveway and internal circulating roadways should be 24-feet in width and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle.

- The emergency vehicle access should be a minimum of 20-feet in width and constructed of bituminous asphaltic concrete or other stabilized surface material that can support travel by the largest anticipated responding emergency vehicle under all weather conditions, and gated or otherwise secured in a manner to restrict use by general traffic.

- Where perpendicular parking is proposed, the drive aisle behind the parking should be a minimum of 23-feet in order to facilitate parking maneuvers.

- A STOP-sign control should be provided on the Powderhouse Lane approach to Route 27 in order to reinforce the assignment of the vehicular right-of-way at the intersection.

- All signs and pavement markings to be installed within the Project site should conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).[12]

- Americans with Disabilities Act (ADA) compliant wheelchair ramps should be provided at all pedestrian crossings.

- Signs and landscaping to be installed as a part of the Project within intersection sight triangle areas should be designed and maintained so as not to restrict lines of sight.

[12]Ibid 2.

- Snow windrows within sight triangle areas should be promptly removed where such accumulations would impede sight lines.

- A school bus waiting area should be provided at an appropriate location defined in consultation with Sherborn Public Schools.

- Consideration should be given to providing accommodations for electric vehicle charging for residents of the Project.

Off-Site

Route 27 at Route16

Independent of the Project, left-turn movements from the Route 16 approach to the signalized intersection of Route 16 at Route 27 were shown to be operating over capacity (i.e., LOS F) during the weekday evening peak hour under 2020 Existing conditions. In an effort to improve traffic operations at the intersection, it is recommended that an optimal traffic signal timing plan be implemented at this intersection in order to improve traffic operations and reduce vehicle queueing. With implementation of an optimal traffic signal timing plan, overall intersection operations will be improved from LOS E to LOS D during the weekday evening peak-hour, with operating conditions for the Route 16 left-turn movement shown to improve from LOS F to LOS E with reduced vehicle queuing.

Transportation Demand Management

Public transportation services are not currently provided within the Town of Sherborn. To the north of the Project site, the Massachusetts Bay Transportation Authority (MBTA) provides Commuter Rail service to South Station in Boston on the Framingham/Worcester Line from Natick and West Natick Stations, which are within an approximate 7 to 9 minute driving distance of the Project site. In an effort to reduce the overall number of automobile trips in the area, the following Transportation Demand Management (TDM) measures will be implemented as a part of the Project:

- A transportation coordinator, who may also have other operations/management responsibilities, will be assigned for the Project to coordinate the TDM program;

- A "welcome packet" will be provided to residents detailing available public transportation services, bicycle and walking alternatives, and commuter options available;

- Work-at-home workspaces will be provided support telecommuting by residents of the Project;

- An internal mail room will be provided within the building; and

- Secure bicycle parking will be provided within the Project site consisting of: i) exterior bicycle parking conveniently located proximate to building entrances; and ii) weather protected bicycle parking located in secure areas.

With implementation of the aforementioned recommendations, safe and efficient access will be provided to the Project site and the Project can be accommodated within the confines of the existing and improved transportation system.

APPENDIX

PROJECT SITE PLAN
AUTOMATIC TRAFFIC RECORDER COUNT DATA
MANUAL TURNING MOVEMENT COUNT DATA
SEASONAL ADJUSTMENT DATA
VEHICLE TRAVEL SPEED DATA
MOTOR VEHICLE CRASH DATA
CRASH RATE WORKSHEETS
GENERAL BACKGROUND TRAFFIC GROWTH
BACKGROUND DEVELOPMENT NETWORKS
TRIP-GENERATION CALCULATIONS
TRIP-DISTRIBUTION CALCULATIONS
CAPACITY ANALYSIS WORKSHEETS

PROJECT SITE PLAN

ZONING SUMMARY TABLE
RESIDENTIAL A (RA) DISTRICT

ITEM	REQUIRED	PROPOSED MAP 11 LOT 41A
MINIMUM LOT AREA	1 ACRE	6.24 ACRE
MINUMUM FRONTAGE	150 FEET	347±FT (MAIN ST) 491±FT (HUNTING LN)
MINIMUM LOT WIDTH	150 FEET [1]	276 FEET
MINIMUM LOT DEPTH	N/A	N/A
MINIMUM FRONT SETBACK	60 FEET	301.0 FT (MAIN ST) 65.0 FT (HUNTING LN)
MINIMUM SIDE SETBACK	30 FEET	59.0 FEET
MINIMUM REAR SETBACK	30 FEET	N/A
MAXIMUM HEIGHT (STORIES)	2.5	2 (LOWSIDE) 3 (HIGHSIDE)*
MAXIMUM HEIGHT (FEET)	35	>35*
MAXIMUM LOT COVERAGE	N/A	N/A

ZONING SUMMARY TABLE NOTES:

1. MINIMUM LOT WIDTH SHALL BE MEASURED AT FRONT SETBACK LINE AND AT BUILDING LINE. AT NO POINT BETWEEN THE REQUIRED FRONTAGE AND THE BUILDING LINE SHALL LOT WIDTH BE REDUCED TO LESS THAN 50 FEET, WITHOUT EXCEPTION FROM THE PLANNING BOARD.

* RELIEF REQUIRED

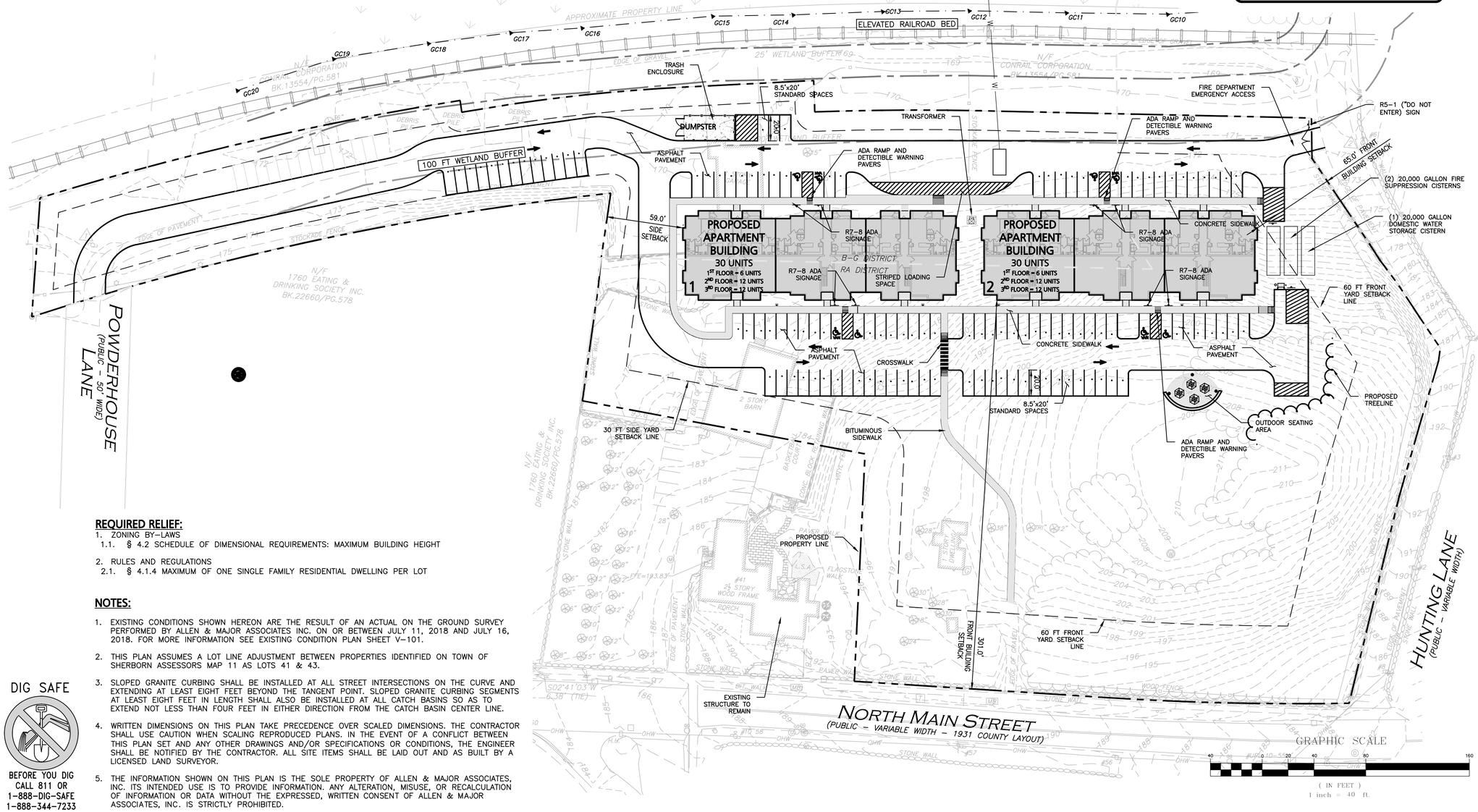
OFF-STREET PARKING SUMMARY TABLE

USE	CALCULATION	MIN. REQUIRED	PROPOSED
MULTI-FAMILY 60 UNITS	1.75 SPACES PER UNIT 60 UNITS * 1.75 = 105	105	118
	TOTAL	105	118

NOTES:
1. STANDARD PARKING SPACES SHALL BE 8.5' X 20'
2. PARALLEL PARKING SPACES SHALL BE 8.5' X 22'.
3. ADA SPACES REQUIRED:
   (101 – 150) TOTAL PARKING SPACES PROVIDED REQUIRES 5 ADA SPACES, 1 BEING VAN ACCESSIBLE
4. 8 ADA SPACE PROVIDED, 4 BEING VAN SPACES

LEGEND

- PROP. PROPERTY LINE
- SIGN
- BOLLARD
- BUILDING
- BUILDING ARCHITECTURE
- BUILDING INTERIOR WALLS
- CURB
- RETAINING WALL
- PARKING STRIPING
- ROADWAY STRIPING
- SIDEWALK
- ADA ACCESSIBLE RAMP
- ADA DET. WARNING SURFACE
- SETBACK LINE
- BASELINE
- SAW-CUT LINE
- PARKING COUNT
- TREE LINE
- TRANSFORMER



REQUIRED RELIEF:

1. ZONING BY-LAWS
   1.1. § 4.2 SCHEDULE OF DIMENSIONAL REQUIREMENTS: MAXIMUM BUILDING HEIGHT
2. RULES AND REGULATIONS
   2.1. § 4.1.4 MAXIMUM OF ONE SINGLE FAMILY RESIDENTIAL DWELLING PER LOT

NOTES:

1. EXISTING CONDITIONS SHOWN HEREON ARE THE RESULT OF AN ACTUAL ON THE GROUND SURVEY PERFORMED BY ALLEN & MAJOR ASSOCIATES INC. ON OR BETWEEN JULY 11, 2018 AND JULY 16, 2018. FOR MORE INFORMATION SEE EXISTING CONDITION PLAN SHEET V-101.
2. THIS PLAN ASSUMES A LOT LINE ADJUSTMENT BETWEEN PROPERTIES IDENTIFIED ON TOWN OF SHERBORN ASSESSORS MAP 11 AS LOTS 41 & 43.
3. SLOPED GRANITE CURBING SHALL BE INSTALLED AT ALL STREET INTERSECTIONS ON THE CURVE AND EXTENDING AT LEAST EIGHT FEET BEYOND THE TANGENT POINT. SLOPED GRANITE CURBING SEGMENTS AT LEAST EIGHT FEET IN LENGTH SHALL ALSO BE INSTALLED AT ALL CATCH BASINS SO AS TO EXTEND NOT LESS THAN FOUR FEET IN EITHER DIRECTION FROM THE CATCH BASIN CENTER LINE.
4. WRITTEN DIMENSIONS ON THIS PLAN TAKE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN THE EVENT OF A CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWINGS AND/OR SPECIFICATIONS OR CONDITIONS, THE ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR. ALL SITE ITEMS SHALL BE LAID OUT AND AS BUILT BY A LICENSED LAND SURVEYOR.
5. THE INFORMATION SHOWN ON THIS PLAN IS THE SOLE PROPERTY OF ALLEN & MAJOR ASSOCIATES, INC. ITS INTENDED USE IS TO PROVIDE INFORMATION. ANY ALTERATION, MISUSE, OR RECALCULATION OF INFORMATION OR DATA WITHOUT THE EXPRESSED, WRITTEN CONSENT OF ALLEN & MAJOR ASSOCIATES, INC. IS STRICTLY PROHIBITED.

DIG SAFE

BEFORE YOU DIG CALL 811 OR 1-888-DIG-SAFE 1-888-344-7233

R:\PROJECTS\2513-01A\CIVIL\DRAWINGS\CURRENT\C-2513-01A_LAYOUT & MATERIALS.DWG

SCHEMATIC DESIGN ISSUED FOR REVIEW MAY 21, 2019

PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION
2	05-21-2020	MISCELLANEOUS REVISIONS
1	01-21-2020	MISCELLANEOUS REVISIONS

APPLICANT\OWNER:
BARSKY ESTATE REALTY TRUST
23 HUNTING LANE
SHERBORN, MA 01770

PROJECT:
THE PINES RESIDENCES
41 NORTH MAIN STREET
SHERBORN, MA

PROJECT NO.	2513-01A	DATE:	11-14-19
SCALE:	1" = 30'	DWG. NAME:	C2513-01A
DESIGNED BY:	ARM	CHECKED BY:	MAM

PREPARED BY:

ALLEN & MAJOR ASSOCIATES, INC.
civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
www.allenmajor.com
100 COMMERCE WAY
WOBURN MA 01801
TEL: (781) 935-6889
FAX: (781) 935-2896
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE:
CONCEPTUAL PLAN 2
60 UNIT APARTMENTS

SHEET No.
C-101

AUTOMATIC TRAFFIC RECORDER COUNT DATA

Eliot Street (Route 16)
east of North Main Street (Route 16/27)
City, State: Sherborn, MA
Client: Green International/ J. Sobel

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

165403 B Volume
Site Code: TBA

Start	EB				WB				Combined				12/6/2016 Tue
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		
12:00	0		47		9		51		9		98		
12:15	3		54		19		33		22		87		
12:30	4		54		9		47		13		101		
12:45	3	10	44	199	6	43	42	173	9	53	86	372	
01:00	1		48		3		32		4		80		
01:15	1		44		5		36		6		80		
01:30	1		41		1		66		2		107		
01:45	1	4	59	192	6	15	32	166	7	19	91	358	
02:00	2		42		1		50		3		92		
02:15	0		37		1		58		1		95		
02:30	1		49		2		41		3		90		
02:45	0	3	37	165	2	6	57	206	2	9	94	371	
03:00	0		50		2		70		2		120		
03:15	1		61		1		88		2		149		
03:30	0		44		2		75		2		119		
03:45	0	1	64	219	1	6	83	316	1	7	147	535	
04:00	2		63		1		80		3		143		
04:15	0		45		0		97		0		142		
04:30	2		58		1		133		3		191		
04:45	3	7	53	219	1	3	126	436	4	10	179	655	
05:00	6		49		1		102		7		151		
05:15	7		53		1		128		8		181		
05:30	15		30		0		138		15		168		
05:45	18	46	40	172	2	4	134	502	20	50	174	674	
06:00	25		43		3		123		28		166		
06:15	36		47		4		135		40		182		
06:30	61		49		7		119		68		168		
06:45	80	202	45	184	7	21	136	513	87	223	181	697	
07:00	151		46		5		106		156		152		
07:15	197		33		16		148		213		181		
07:30	184		30		18		128		202		158		
07:45	141	673	33	142	21	60	119	501	162	733	152	643	
08:00	145		11		31		52		176		63		
08:15	129		15		27		80		156		95		
08:30	115		40		35		52		150		92		
08:45	144	533	15	81	43	136	51	235	187	669	66	316	
09:00	120		18		39		49		159		67		
09:15	133		17		43		33		176		50		
09:30	94		18		32		39		126		57		
09:45	102	449	9	62	42	156	43	164	144	605	52	226	
10:00	122		17		31		29		153		46		
10:15	119		11		20		36		139		47		
10:30	81		8		29		31		110		39		
10:45	66	388	3	39	37	117	36	132	103	505	39	171	
11:00	97		6		21		18		118		24		
11:15	69		6		35		14		104		20		
11:30	66		5		35		13		101		18		
11:45	63	295	3	20	32	123	11	56	95	418	14	76	
Total	2611		1694		690		3400		3301		5094		
Percent	79.1%		33.3%		20.9%		66.7%						
Day Total		4305				4090				8395			
Peak	07:00	-	03:15	-	08:30	-	05:30	-	07:15	-	04:30	-	-	-
Vol.	673	-	232	-	160	-	530	-	753	-	702	-	-	-
P.H.F.	0.854		0.906		0.930		0.960		0.884		0.919			

Eliot Street (Route 16)
east of North Main Street (Route 16/27)
City, State: Sherborn, MA
Client: Green International/ J. Sobel

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

165403 B Volume
Site Code: TBA

Start	EB				WB				Combined				12/7/2016
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	4		66		15		40		19		106		
12:15	2		59		10		34		12		93		
12:30	1		54		5		43		6		97		
12:45	2	9	65	244	8	38	52	169	10	47	117	413	
01:00	0		52		7		50		7		102		
01:15	0		68		7		54		7		122		
01:30	3		49		2		49		5		98		
01:45	2	5	43	212	4	20	52	205	6	25	95	417	
02:00	1		36		0		46		1		82		
02:15	0		29		1		56		1		85		
02:30	0		38		1		69		1		107		
02:45	1	2	47	150	1	3	52	223	2	5	99	373	
03:00	0		47		2		58		2		105		
03:15	0		48		1		52		1		100		
03:30	1		55		0		81		1		136		
03:45	0	1	47	197	1	4	92	283	1	5	139	480	
04:00	2		54		2		92		4		146		
04:15	2		51		1		94		3		145		
04:30	1		40		2		119		3		159		
04:45	3	8	35	180	0	5	111	416	3	13	146	596	
05:00	7		42		0		129		7		171		
05:15	8		30		0		120		8		150		
05:30	18		55		1		127		19		182		
05:45	14	47	46	173	0	1	130	506	14	48	176	679	
06:00	22		50		4		125		26		175		
06:15	49		58		4		144		53		202		
06:30	63		55		8		132		71		187		
06:45	97	231	48	211	6	22	121	522	103	253	169	733	
07:00	141		42		10		132		151		174		
07:15	208		41		17		134		225		175		
07:30	181		32		15		106		196		138		
07:45	150	680	22	137	22	64	83	455	172	744	105	592	
08:00	153		26		31		70		184		96		
08:15	104		23		48		53		152		76		
08:30	132		21		27		68		159		89		
08:45	135	524	18	88	31	137	59	250	166	661	77	338	
09:00	118		14		37		48		155		62		
09:15	92		14		49		45		141		59		
09:30	115		13		46		36		161		49		
09:45	117	442	7	48	29	161	49	178	146	603	56	226	
10:00	129		7		34		55		163		62		
10:15	143		9		23		32		166		41		
10:30	103		17		30		32		133		49		
10:45	82	457	10	43	27	114	23	142	109	571	33	185	
11:00	85		3		33		15		118		18		
11:15	65		5		23		19		88		24		
11:30	71		6		43		12		114		18		
11:45	56	277	4	18	30	129	11	57	86	406	15	75	
Total	2683		1701		698		3406		3381		5107		
Percent	79.4%		33.3%		20.6%		66.7%						
Day Total		4384				4104				8488			
Peak	07:15	-	12:00	-	08:45	-	05:45	-	07:15	-	05:45	-	-	-
Vol.	692	-	244	-	163	-	531	-	777	-	740	-	-	-
P.H.F.	0.832		0.924		0.832		0.922		0.863		0.916			

Accurate Counts
978-664-2565

Location : South Main Street
Location : North of Eliot Street
City/State: Sherborn, MA

8587VOL1

Start Time	4/15/2020 Wed	SB Morning	SB Afternoon	Hour Totals Morning	Hour Totals Afternoon	NB Morning	NB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		6	71			3	63				
12:15		4	75			3	81				
12:30		3	90			3	68				
12:45		4	80	17	316	1	85	10	297	27	613
01:00		3	76			1	67				
01:15		3	70			1	59				
01:30		0	78			3	68				
01:45		0	106	6	330	0	59	5	253	11	583
02:00		0	75			3	72				
02:15		1	74			3	77				
02:30		0	106			2	75				
02:45		3	96	4	351	2	50	10	274	14	625
03:00		0	103			0	72				
03:15		1	105			3	84				
03:30		1	109			4	86				
03:45		1	97	3	414	4	52	11	294	14	708
04:00		0	98			1	64				
04:15		0	76			3	61				
04:30		4	105			7	77				
04:45		2	92	6	371	5	77	16	279	22	650
05:00		6	85			11	70				
05:15		7	93			18	63				
05:30		12	59			41	54				
05:45		12	56	37	293	33	51	103	238	140	531
06:00		24	49			40	52				
06:15		37	55			34	61				
06:30		49	34			79	48				
06:45		36	35	146	173	64	32	217	193	363	366
07:00		40	35			56	33				
07:15		39	34			73	28				
07:30		43	27			84	24				
07:45		47	17	169	113	66	21	279	106	448	219
08:00		45	25			77	19				
08:15		51	21			67	18				
08:30		37	17			63	17				
08:45		47	15	180	78	62	13	269	67	449	145
09:00		43	9			53	9				
09:15		49	10			63	10				
09:30		48	8			43	6				
09:45		55	6	195	33	59	9	218	34	413	67
10:00		47	8			55	8				
10:15		53	5			57	10				
10:30		55	7			58	11				
10:45		60	10	215	30	68	4	238	33	453	63
11:00		64	3			50	8				
11:15		60	7			75	5				
11:30		61	5			76	4				
11:45		82	5	267	20	68	4	269	21	536	41
Total		1245	2522			1645	2089			2890	4611
Percent		33.1%	66.9%			44.1%	55.9%			38.5%	61.5%

Location : South Main Street
Location : North of Eliot Street
City/State: Sherborn, MA

8587VOL1

Start Time	4/16/2020 Thu	SB Morning	SB Afternoon	Hour Totals Morning	Hour Totals Afternoon	NB Morning	NB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		5	73			4	75				
12:15		2	72			2	56				
12:30		5	75			4	73				
12:45		4	70	16	290	1	54	11	258	27	548
01:00		3	66			2	65				
01:15		1	69			0	86				
01:30		0	85			1	73				
01:45		0	70	4	290	0	74	3	298	7	588
02:00		1	90			0	50				
02:15		0	85			2	63				
02:30		0	81			1	62				
02:45		2	91	3	347	2	64	5	239	8	586
03:00		0	118			0	73				
03:15		1	91			0	84				
03:30		0	115			1	68				
03:45		1	78	2	402	3	77	4	302	6	704
04:00		0	104			3	69				
04:15		0	77			1	65				
04:30		3	68			6	70				
04:45		0	89	3	338	5	62	15	266	18	604
05:00		6	104			7	67				
05:15		6	81			16	67				
05:30		12	73			28	56				
05:45		10	76	34	334	36	60	87	250	121	584
06:00		17	53			41	52				
06:15		39	59			47	39				
06:30		50	58			65	47				
06:45		41	30	147	200	77	45	230	183	377	383
07:00		38	34			47	29				
07:15		49	24			57	34				
07:30		54	34			65	24				
07:45		50	31	191	123	68	26	237	113	428	236
08:00		35	19			61	12				
08:15		59	20			81	25				
08:30		49	8			61	19				
08:45		51	8	194	55	61	15	264	71	458	126
09:00		45	10			51	6				
09:15		51	7			58	11				
09:30		55	14			53	9				
09:45		55	6	206	37	59	9	221	35	427	72
10:00		56	8			48	2				
10:15		57	6			55	10				
10:30		58	5			57	11				
10:45		66	12	237	31	56	4	216	27	453	58
11:00		60	2			60	9				
11:15		59	9			84	4				
11:30		64	9			54	5				
11:45		64	6	247	26	53	3	251	21	498	47
Total		1284	2473			1544	2063			2828	4536
Percent		34.2%	65.8%			42.8%	57.2%			38.4%	61.6%
Grand Total		2529	4995			3189	4152			5718	9147
Percent		33.6%	66.4%			43.4%	56.6%			38.5%	61.5%
ADT		ADT 7,432		AADT 7,432							

Accurate Counts
978-664-2565

Location : South Main Street
Location : North of Eliot Street
City/State: Sherborn, MA

8587VOL1

Start	4/13/2020		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB
12:00 AM	*	*	*	*	17	10	16	11	*	*	*	*	*	*	16	10
01:00	*	*	*	*	6	5	4	3	*	*	*	*	*	*	5	4
02:00	*	*	*	*	4	10	3	5	*	*	*	*	*	*	4	8
03:00	*	*	*	*	3	11	2	4	*	*	*	*	*	*	2	8
04:00	*	*	*	*	6	16	3	15	*	*	*	*	*	*	4	16
05:00	*	*	*	*	37	103	34	87	*	*	*	*	*	*	36	95
06:00	*	*	*	*	146	217	147	230	*	*	*	*	*	*	146	224
07:00	*	*	*	*	169	**279**	191	237	*	*	*	*	*	*	180	258
08:00	*	*	*	*	180	269	194	**264**	*	*	*	*	*	*	187	**266**
09:00	*	*	*	*	195	218	206	221	*	*	*	*	*	*	200	220
10:00	*	*	*	*	215	238	237	216	*	*	*	*	*	*	226	227
11:00	*	*	*	*	**267**	269	**247**	251	*	*	*	*	*	*	**257**	260
12:00 PM	*	*	*	*	316	**297**	290	258	*	*	*	*	*	*	303	278
01:00	*	*	*	*	330	253	290	298	*	*	*	*	*	*	310	276
02:00	*	*	*	*	351	274	347	239	*	*	*	*	*	*	349	256
03:00	*	*	*	*	**414**	294	**402**	**302**	*	*	*	*	*	*	**408**	**298**
04:00	*	*	*	*	371	279	338	266	*	*	*	*	*	*	354	272
05:00	*	*	*	*	293	238	334	250	*	*	*	*	*	*	314	244
06:00	*	*	*	*	173	193	200	183	*	*	*	*	*	*	186	188
07:00	*	*	*	*	113	106	123	113	*	*	*	*	*	*	118	110
08:00	*	*	*	*	78	67	55	71	*	*	*	*	*	*	66	69
09:00	*	*	*	*	33	34	37	35	*	*	*	*	*	*	35	34
10:00	*	*	*	*	30	33	31	27	*	*	*	*	*	*	30	30
11:00	*	*	*	*	20	21	26	21	*	*	*	*	*	*	23	21
Lane	0	0	0	0	3767	3734	3757	3607	0	0	0	0	0	0	3759	3672
Day	0		0		7501		7364		0		0		0		7431	
AM Peak	-	-	-	-	11:00	07:00	11:00	08:00	-	-	-	-	-	-	11:00	08:00
Vol.	-	-	-	-	267	279	247	264	-	-	-	-	-	-	257	266
PM Peak	-	-	-	-	15:00	12:00	15:00	15:00	-	-	-	-	-	-	15:00	15:00
Vol.	-	-	-	-	414	297	402	302	-	-	-	-	-	-	408	298

Comb. Total	0	0	7501	7364	0	0	0	7431

ADT ADT 7,432 AADT 7,432

Accurate Counts
978-664-2565

Location : Hunting Lane
Location : at # 31
City/State: Sherborn, MA

8586VOL1

Start	4/15/2020	WB		Hour Totals		EB		Hour Totals		Combined Totals	
Time	Wed	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		0	3			0	5				
12:15		0	5			1	4				
12:30		0	4			0	3				
12:45		0	7	0	19	0	9	1	21	1	40
01:00		0	2			0	6				
01:15		0	4			0	7				
01:30		0	4			0	2				
01:45		0	4	0	14	0	3	0	18	0	32
02:00		0	5			2	4				
02:15		0	6			0	4				
02:30		0	6			0	4				
02:45		0	5	0	22	0	4	2	16	2	38
03:00		0	2			0	3				
03:15		0	4			0	1				
03:30		0	4			0	4				
03:45		0	1	0	11	0	1	0	9	0	20
04:00		0	2			0	6				
04:15		1	3			1	3				
04:30		0	1			0	0				
04:45		0	2	1	8	0	6	1	15	2	23
05:00		0	1			0	3				
05:15		0	7			1	1				
05:30		0	2			0	1				
05:45		0	5	0	15	0	2	1	7	1	22
06:00		0	2			0	3				
06:15		0	1			1	1				
06:30		1	2			2	1				
06:45		0	3	1	8	0	1	3	6	4	14
07:00		2	1			2	1				
07:15		0	1			1	0				
07:30		2	1			0	1				
07:45		1	2	5	5	1	1	4	3	9	8
08:00		2	1			2	0				
08:15		1	2			3	4				
08:30		4	0			1	1				
08:45		3	0	10	3	2	0	8	5	18	8
09:00		1	0			1	0				
09:15		2	0			3	0				
09:30		1	0			3	0				
09:45		5	0	9	0	5	0	12	0	21	0
10:00		2	0			5	0				
10:15		2	0			5	0				
10:30		2	1			2	0				
10:45		0	0	6	1	1	0	13	0	19	1
11:00		3	0			3	0				
11:15		1	0			4	0				
11:30		8	0			4	0				
11:45		2	0	14	0	7	0	18	0	32	0
Total		46	106			63	100			109	206
Percent		30.3%	69.7%			38.7%	61.3%			34.6%	65.4%

Location : Hunting Lane
Location : at # 31
City/State: Sherborn, MA

8586VOL1

Start Time	4/16/2020 Thu	WB Morning	WB Afternoon	Hour Totals Morning	Hour Totals Afternoon	EB Morning	EB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		0	2			0	5				
12:15		0	2			0	2				
12:30		0	4			0	5				
12:45		0	2	0	10	0	5	0	17	0	27
01:00		0	2			0	2				
01:15		0	1			0	2				
01:30		0	5			0	2				
01:45		0	4	0	12	0	3	0	9	0	21
02:00		0	6			0	1				
02:15		0	0			0	1				
02:30		0	3			0	2				
02:45		0	2	0	11	0	5	0	9	0	20
03:00		0	5			0	2				
03:15		0	4			0	3				
03:30		0	4			0	4				
03:45		1	3	1	16	1	4	1	13	2	29
04:00		0	2			0	5				
04:15		0	5			0	2				
04:30		0	4			0	5				
04:45		0	2	0	13	0	2	0	14	0	27
05:00		0	8			0	2				
05:15		0	0			1	2				
05:30		0	2			0	0				
05:45		0	0	0	10	1	3	2	7	2	17
06:00		0	0			0	0				
06:15		1	1			0	1				
06:30		0	2			1	2				
06:45		0	1	1	4	1	0	2	3	3	7
07:00		1	4			3	1				
07:15		1	1			1	0				
07:30		1	1			3	0				
07:45		2	0	5	6	2	0	9	1	14	7
08:00		1	0			1	1				
08:15		3	0			5	1				
08:30		2	0			3	0				
08:45		4	2	10	2	2	2	11	4	21	6
09:00		4	0			4	1				
09:15		2	0			3	0				
09:30		2	0			2	1				
09:45		2	0	10	0	1	0	10	2	20	2
10:00		1	0			5	1				
10:15		3	0			11	0				
10:30		1	1			4	2				
10:45		1	0	6	1	3	0	23	3	29	4
11:00		2	1			2	0				
11:15		5	0			8	0				
11:30		5	0			0	0				
11:45		5	0	17	1	1	0	11	0	28	1
Total		50	86			69	82			119	168
Percent		36.8%	63.2%			45.7%	54.3%			41.5%	58.5%
Grand Total		96	192			132	182			228	374
Percent		33.3%	66.7%			42.0%	58.0%			37.9%	62.1%

ADT ADT 301 AADT 301

Accurate Counts
978-664-2565

Location : Hunting Lane
Location : at # 31
City/State: Sherborn, MA

8586VOL1

Start	4/13/2020		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 AM	*	*	*	*	0	1	0	0	*	*	*	*	*	*	0	0
01:00	*	*	*	*	0	0	0	0	*	*	*	*	*	*	0	0
02:00	*	*	*	*	0	2	0	0	*	*	*	*	*	*	0	1
03:00	*	*	*	*	0	0	1	1	*	*	*	*	*	*	0	0
04:00	*	*	*	*	1	1	0	0	*	*	*	*	*	*	0	0
05:00	*	*	*	*	0	1	0	2	*	*	*	*	*	*	0	2
06:00	*	*	*	*	1	3	1	2	*	*	*	*	*	*	1	2
07:00	*	*	*	*	5	4	5	9	*	*	*	*	*	*	5	6
08:00	*	*	*	*	10	8	10	11	*	*	*	*	*	*	10	10
09:00	*	*	*	*	9	12	10	10	*	*	*	*	*	*	10	11
10:00	*	*	*	*	6	13	6	**23**	*	*	*	*	*	*	6	**18**
11:00	*	*	*	*	**14**	**18**	**17**	11	*	*	*	*	*	*	**16**	14
12:00 PM	*	*	*	*	19	**21**	10	**17**	*	*	*	*	*	*	14	**19**
01:00	*	*	*	*	14	18	12	9	*	*	*	*	*	*	13	14
02:00	*	*	*	*	**22**	16	11	9	*	*	*	*	*	*	**16**	12
03:00	*	*	*	*	11	9	**16**	13	*	*	*	*	*	*	14	11
04:00	*	*	*	*	8	15	13	14	*	*	*	*	*	*	10	14
05:00	*	*	*	*	15	7	10	7	*	*	*	*	*	*	12	7
06:00	*	*	*	*	8	6	4	3	*	*	*	*	*	*	6	4
07:00	*	*	*	*	5	3	6	1	*	*	*	*	*	*	6	2
08:00	*	*	*	*	3	5	2	4	*	*	*	*	*	*	2	4
09:00	*	*	*	*	0	0	0	2	*	*	*	*	*	*	0	1
10:00	*	*	*	*	1	0	1	3	*	*	*	*	*	*	1	2
11:00	*	*	*	*	0	0	1	0	*	*	*	*	*	*	0	0
Lane	0	0	0	0	152	163	136	151	0	0	0	0	0	0	142	154
Day	0		0		315		287		0		0		0		296	
AM Peak	-	-	-	-	11:00	11:00	11:00	10:00	-	-	-	-	-	-	11:00	10:00
Vol.	-	-	-	-	14	18	17	23	-	-	-	-	-	-	16	18
PM Peak	-	-	-	-	14:00	12:00	15:00	12:00	-	-	-	-	-	-	14:00	12:00
Vol.	-	-	-	-	22	21	16	17	-	-	-	-	-	-	16	19

Comb. Total	0	0	315	287	0	0	0	296

ADT ADT 301 AADT 301

MANUAL TURNING MOVEMENT COUNT DATA

N/S: N. Main Street (Route 27/16)
E/W: Eliot Street (Route 16)/ Driveway
City, State: Sherborn, MA
Client: Green/ J. Sobel

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

File Name : 165403 A
Site Code : TBA
Start Date : 12/7/2016
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	North Main Street (Route 27) From North				Eliot Street (Route 16) From East				North Main Street (Route 27/16) From South				Driveway From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	78	5	0	3	1	28	0	156	194	0	0	0	0	2	0	467
07:15 AM	0	93	8	0	3	0	41	0	106	141	0	0	0	0	1	0	393
07:30 AM	0	115	4	0	3	0	27	0	138	196	0	0	0	0	0	0	483
07:45 AM	0	117	4	0	1	0	27	0	137	205	0	0	0	0	0	0	491
Total	0	403	21	0	10	1	123	0	537	736	0	0	0	0	3	0	1834
08:00 AM	0	88	4	0	1	0	27	0	124	206	0	0	0	0	0	0	450
08:15 AM	0	90	8	0	17	0	47	0	107	202	0	0	0	0	0	0	471
08:30 AM	0	87	6	0	4	0	51	0	115	201	0	0	0	0	0	0	464
08:45 AM	0	99	6	0	4	0	25	0	122	214	0	0	0	0	1	0	471
Total	0	364	24	0	26	0	150	0	468	823	0	0	0	0	1	0	1856
Grand Total	0	767	45	0	36	1	273	0	1005	1559	0	0	0	0	4	0	3690
Apprch %	0	94.5	5.5	0	11.6	0.3	88.1	0	39.2	60.8	0	0	0	0	100	0	
Total %	0	20.8	1.2	0	1	0	7.4	0	27.2	42.2	0	0	0	0	0.1	0	
Cars	0	726	38	0	29	1	259	0	964	1500	0	0	0	0	4	0	3521
% Cars	0	94.7	84.4	0	80.6	100	94.9	0	95.9	96.2	0	0	0	0	100	0	95.4
Heavy Vehicles	0	41	7	0	7	0	14	0	41	59	0	0	0	0	0	0	169
% Heavy Vehicles	0	5.3	15.6	0	19.4	0	5.1	0	4.1	3.8	0	0	0	0	0	0	4.6

	North Main Street (Route 27) From North					Eliot Street (Route 16) From East					North Main Street (Route 27/16) From South					Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	115	4	0	119	3	0	27	0	30	138	196	0	0	334	0	0	0	0	0	483
07:45 AM	0	117	4	0	121	1	0	27	0	28	137	205	0	0	342	0	0	0	0	0	491
08:00 AM	0	88	4	0	92	1	0	27	0	28	124	206	0	0	330	0	0	0	0	0	450
08:15 AM	0	90	8	0	98	17	0	47	0	64	107	202	0	0	309	0	0	0	0	0	471
Total Volume	0	410	20	0	430	22	0	128	0	150	506	809	0	0	1315	0	0	0	0	0	1895
% App. Total	0	95.3	4.7	0		14.7	0	85.3	0		38.5	61.5	0	0		0	0	0	0		
PHF	.000	.876	.625	.000	.888	.324	.000	.681	.000	.586	.917	.982	.000	.000	.961	.000	.000	.000	.000	.000	.965
Cars	0	387	17	0	404	16	0	124	0	140	487	780	0	0	1267	0	0	0	0	0	1811
% Cars	0	94.4	85.0	0	94.0	72.7	0	96.9	0	93.3	96.2	96.4	0	0	96.3	0	0	0	0	0	95.6
Heavy Vehicles	0	23	3	0	26	6	0	4	0	10	19	29	0	0	48	0	0	0	0	0	84
% Heavy Vehicles	0	5.6	15.0	0	6.0	27.3	0	3.1	0	6.7	3.8	3.6	0	0	3.7	0	0	0	0	0	4.4

N/S: N. Main Street (Route 27/16)
E/W: Eliot Street (Route 16)/ Driveway
City, State: Sherborn, MA
Client: Green/ J. Sobel

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

File Name : 165403 A
Site Code : TBA
Start Date : 12/7/2016
Page No : 1

Groups Printed- Cars

	North Main Street (Route 27) From North				Eliot Street (Route 16) From East				North Main Street (Route 27/16) From South				Driveway From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	76	3	0	3	1	25	0	147	188	0	0	0	0	2	0	445
07:15 AM	0	88	8	0	3	0	39	0	102	138	0	0	0	0	1	0	379
07:30 AM	0	110	4	0	3	0	26	0	135	191	0	0	0	0	0	0	469
07:45 AM	0	110	4	0	1	0	27	0	133	196	0	0	0	0	0	0	471
Total	0	384	19	0	10	1	117	0	517	713	0	0	0	0	3	0	1764
08:00 AM	0	84	3	0	1	0	27	0	119	195	0	0	0	0	0	0	429
08:15 AM	0	83	6	0	11	0	44	0	100	198	0	0	0	0	0	0	442
08:30 AM	0	85	5	0	3	0	48	0	109	189	0	0	0	0	0	0	439
08:45 AM	0	90	5	0	4	0	23	0	119	205	0	0	0	0	1	0	447
Total	0	342	19	0	19	0	142	0	447	787	0	0	0	0	1	0	1757
Grand Total	0	726	38	0	29	1	259	0	964	1500	0	0	0	0	4	0	3521
Apprch %	0	95	5	0	10	0.3	89.6	0	39.1	60.9	0	0	0	0	100	0	
Total %	0	20.6	1.1	0	0.8	0	7.4	0	27.4	42.6	0	0	0	0	0.1	0	

	North Main Street (Route 27) From North					Eliot Street (Route 16) From East					North Main Street (Route 27/16) From South					Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	110	4	0	114	3	0	26	0	29	135	191	0	0	326	0	0	0	0	0	469
07:45 AM	0	110	4	0	114	1	0	27	0	28	133	196	0	0	329	0	0	0	0	0	471
08:00 AM	0	84	3	0	87	1	0	27	0	28	119	195	0	0	314	0	0	0	0	0	429
08:15 AM	0	83	6	0	89	11	0	44	0	55	100	198	0	0	298	0	0	0	0	0	442
Total Volume	0	387	17	0	404	16	0	124	0	140	487	780	0	0	1267	0	0	0	0	0	1811
% App. Total	0	95.8	4.2	0		11.4	0	88.6	0		38.4	61.6	0	0		0	0	0	0		
PHF	.000	.880	.708	.000	.886	.364	.000	.705	.000	.636	.902	.985	.000	.000	.963	.000	.000	.000	.000	.000	.961

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

N/S: N. Main Street (Route 27/16)
E/W: Eliot Street (Route 16)/ Driveway
City, State: Sherborn, MA
Client: Green/ J. Sobel

File Name : 165403 A
Site Code : TBA
Start Date : 12/7/2016

Groups Printed- Heavy Vehicles

	North Main Street (Route 27) From North				Eliot Street (Route 16) From East				North Main Street (Route 27/16) From South				Driveway From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	2	2	0	0	0	3	0	9	6	0	0	0	0	0	0	22
07:15 AM	0	5	0	0	0	0	2	0	4	3	0	0	0	0	0	0	14
07:30 AM	0	5	0	0	0	0	1	0	3	5	0	0	0	0	0	0	14
07:45 AM	0	7	0	0	0	0	0	0	4	9	0	0	0	0	0	0	20
Total	0	19	2	0	0	0	6	0	20	23	0	0	0	0	0	0	70
08:00 AM	0	4	1	0	0	0	0	0	5	11	0	0	0	0	0	0	21
08:15 AM	0	7	2	0	6	0	3	0	7	4	0	0	0	0	0	0	29
08:30 AM	0	2	1	0	1	0	3	0	6	12	0	0	0	0	0	0	25
08:45 AM	0	9	1	0	0	0	2	0	3	9	0	0	0	0	0	0	24
Total	0	22	5	0	7	0	8	0	21	36	0	0	0	0	0	0	99
Grand Total	0	41	7	0	7	0	14	0	41	59	0	0	0	0	0	0	169
Apprch %	0	85.4	14.6	0	33.3	0	66.7	0	41	59	0	0	0	0	0	0	
Total %	0	24.3	4.1	0	4.1	0	8.3	0	24.3	34.9	0	0	0	0	0	0	

	North Main Street (Route 27) From North					Eliot Street (Route 16) From East					North Main Street (Route 27/16) From South					Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	4	1	0	5	0	0	0	0	0	5	11	0	0	16	0	0	0	0	0	21
08:15 AM	0	7	2	0	9	6	0	3	0	9	7	4	0	0	11	0	0	0	0	0	29
08:30 AM	0	2	1	0	3	1	0	3	0	4	6	12	0	0	18	0	0	0	0	0	25
08:45 AM	0	9	1	0	10	0	0	2	0	2	3	9	0	0	12	0	0	0	0	0	24
Total Volume	0	22	5	0	27	7	0	8	0	15	21	36	0	0	57	0	0	0	0	0	99
% App. Total	0	81.5	18.5	0		46.7	0	53.3	0		36.8	63.2	0	0		0	0	0	0		
PHF	.000	.611	.625	.000	.675	.292	.000	.667	.000	.417	.750	.750	.000	.000	.792	.000	.000	.000	.000	.000	.853

N/S: N. Main Street (Route 27/16)
E/W: Eliot Street (Route 16)/ Driveway
City, State: Sherborn, MA
Client: Green/ J. Sobel

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

File Name : 165403 A
Site Code : TBA
Start Date : 12/7/2016
Page No : 1

Groups Printed- Peds and Bikes

	North Main Street (Route 27) From North					Eliot Street (Route 16) From East					North Main Street (Route 27/16) From South					Driveway From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %																					

	North Main Street (Route 27) From North						Eliot Street (Route 16) From East						North Main Street (Route 27/16) From South						Driveway From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 07:00 AM																									
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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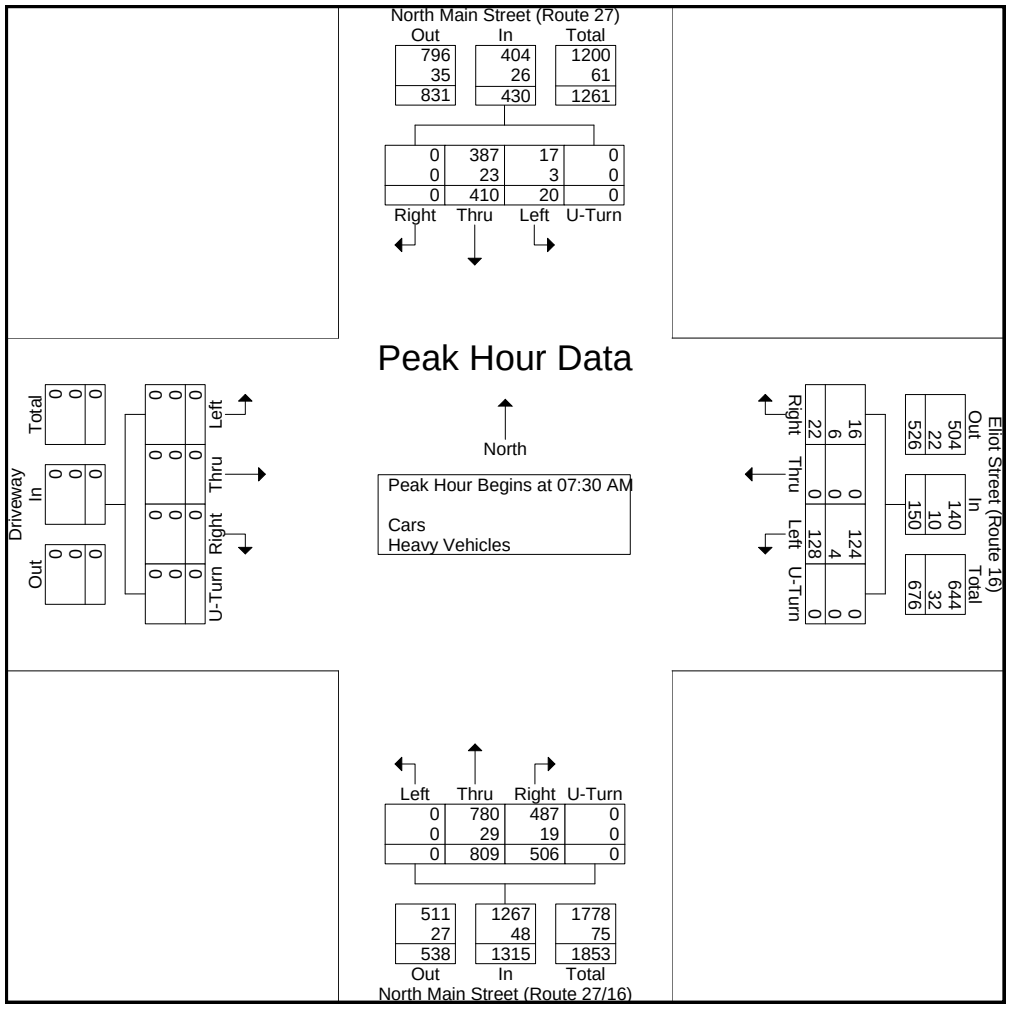
	North Main Street (Route 27) From North					Eliot Street (Route 16) From East					North Main Street (Route 27/16) From South					Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	115	4	0	119	3	0	27	0	30	138	196	0	0	334	0	0	0	0	0	483
07:45 AM	0	117	4	0	121	1	0	27	0	28	137	205	0	0	342	0	0	0	0	0	491
08:00 AM	0	88	4	0	92	1	0	27	0	28	124	206	0	0	330	0	0	0	0	0	450
08:15 AM	0	90	8	0	98	17	0	47	0	64	107	202	0	0	309	0	0	0	0	0	471
Total Volume	0	410	20	0	430	22	0	128	0	150	506	809	0	0	1315	0	0	0	0	0	1895
% App. Total	0	95.3	4.7	0		14.7	0	85.3	0		38.5	61.5	0	0		0	0	0	0		
PHF	.000	.876	.625	.000	.888	.324	.000	.681	.000	.586	.917	.982	.000	.000	.961	.000	.000	.000	.000	.000	.965
Cars	0	387	17	0	404	16	0	124	0	140	487	780	0	0	1267	0	0	0	0	0	1811
% Cars	0	94.4	85.0	0	94.0	72.7	0	96.9	0	93.3	96.2	96.4	0	0	96.3	0	0	0	0	0	95.6
Heavy Vehicles	0	23	3	0	26	6	0	4	0	10	19	29	0	0	48	0	0	0	0	0	84
% Heavy Vehicles	0	5.6	15.0	0	6.0	27.3	0	3.1	0	6.7	3.8	3.6	0	0	3.7	0	0	0	0	0	4.4



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Groups Printed- Cars - Heavy Vehicles

	North Main Street (Route 27) From North				Eliot Street (Route 16) From East				North Main Street (Route 27/16) From South				Driveway From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	189	1	0	2	0	121	0	46	109	0	0	0	0	0	0	468
04:15 PM	0	169	0	0	1	0	131	0	30	128	0	0	0	0	0	0	459
04:30 PM	0	169	1	0	3	0	120	0	52	116	0	0	0	0	0	0	461
04:45 PM	0	173	0	0	0	0	111	0	61	111	0	0	0	0	0	0	456
Total	0	700	2	0	6	0	483	0	189	464	0	0	0	0	0	0	1844
05:00 PM	0	168	1	0	0	0	134	0	45	98	0	0	0	0	0	0	446
05:15 PM	0	162	1	0	0	0	140	0	55	132	0	0	0	0	0	0	490
05:30 PM	0	187	1	0	2	0	126	0	55	108	0	0	0	0	0	0	479
05:45 PM	1	168	2	0	3	0	129	0	45	107	0	0	0	0	0	0	455
Total	1	685	5	0	5	0	529	0	200	445	0	0	0	0	0	0	1870
Grand Total	1	1385	7	0	11	0	1012	0	389	909	0	0	0	0	0	0	3714
Apprch %	0.1	99.4	0.5	0	1.1	0	98.9	0	30	70	0	0	0	0	0	0	
Total %	0	37.3	0.2	0	0.3	0	27.2	0	10.5	24.5	0	0	0	0	0	0	
Cars	1	1364	7	0	11	0	988	0	389	883	0	0	0	0	0	0	3643
% Cars	100	98.5	100	0	100	0	97.6	0	100	97.1	0	0	0	0	0	0	98.1
Heavy Vehicles	0	21	0	0	0	0	24	0	0	26	0	0	0	0	0	0	71
% Heavy Vehicles	0	1.5	0	0	0	0	2.4	0	0	2.9	0	0	0	0	0	0	1.9

	North Main Street (Route 27) From North					Eliot Street (Route 16) From East					North Main Street (Route 27/16) From South					Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	173	0	0	173	0	0	111	0	111	61	111	0	0	172	0	0	0	0	0	456
05:00 PM	0	168	1	0	169	0	0	134	0	134	45	98	0	0	143	0	0	0	0	0	446
05:15 PM	0	162	1	0	163	0	0	140	0	140	55	132	0	0	187	0	0	0	0	0	490
05:30 PM	0	187	1	0	188	2	0	126	0	128	55	108	0	0	163	0	0	0	0	0	479
Total Volume	0	690	3	0	693	2	0	511	0	513	216	449	0	0	665	0	0	0	0	0	1871
% App. Total	0	99.6	0.4	0		0.4	0	99.6	0		32.5	67.5	0	0		0	0	0	0		
PHF	.000	.922	.750	.000	.922	.250	.000	.913	.000	.916	.885	.850	.000	.000	.889	.000	.000	.000	.000	.000	.955
Cars	0	682	3	0	685	2	0	495	0	497	216	442	0	0	658	0	0	0	0	0	1840
% Cars	0	98.8	100	0	98.8	100	0	96.9	0	96.9	100	98.4	0	0	98.9	0	0	0	0	0	98.3
Heavy Vehicles	0	8	0	0	8	0	0	16	0	16	0	7	0	0	7	0	0	0	0	0	31
% Heavy Vehicles	0	1.2	0	0	1.2	0	0	3.1	0	3.1	0	1.6	0	0	1.1	0	0	0	0	0	1.7

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Groups Printed- Cars

	North Main Street (Route 27) From North				Eliot Street (Route 16) From East				North Main Street (Route 27/16) From South				Driveway From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	186	1	0	2	0	119	0	46	99	0	0	0	0	0	0	453
04:15 PM	0	166	0	0	1	0	127	0	30	124	0	0	0	0	0	0	448
04:30 PM	0	164	1	0	3	0	118	0	52	111	0	0	0	0	0	0	449
04:45 PM	0	170	0	0	0	0	101	0	61	109	0	0	0	0	0	0	441
Total	0	686	2	0	6	0	465	0	189	443	0	0	0	0	0	0	1791
05:00 PM	0	166	1	0	0	0	131	0	45	96	0	0	0	0	0	0	439
05:15 PM	0	161	1	0	0	0	138	0	55	130	0	0	0	0	0	0	485
05:30 PM	0	185	1	0	2	0	125	0	55	107	0	0	0	0	0	0	475
05:45 PM	1	166	2	0	3	0	129	0	45	107	0	0	0	0	0	0	453
Total	1	678	5	0	5	0	523	0	200	440	0	0	0	0	0	0	1852
Grand Total	1	1364	7	0	11	0	988	0	389	883	0	0	0	0	0	0	3643
Apprch %	0.1	99.4	0.5	0	1.1	0	98.9	0	30.6	69.4	0	0	0	0	0	0	
Total %	0	37.4	0.2	0	0.3	0	27.1	0	10.7	24.2	0	0	0	0	0	0	

	North Main Street (Route 27) From North					Eliot Street (Route 16) From East					North Main Street (Route 27/16) From South					Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	166	1	0	167	0	0	131	0	131	45	96	0	0	141	0	0	0	0	0	439
05:15 PM	0	161	1	0	162	0	0	138	0	138	55	130	0	0	185	0	0	0	0	0	485
05:30 PM	0	185	1	0	186	2	0	125	0	127	55	107	0	0	162	0	0	0	0	0	475
05:45 PM	1	166	2	0	169	3	0	129	0	132	45	107	0	0	152	0	0	0	0	0	453
Total Volume	1	678	5	0	684	5	0	523	0	528	200	440	0	0	640	0	0	0	0	0	1852
% App. Total	0.1	99.1	0.7	0		0.9	0	99.1	0		31.2	68.8	0	0		0	0	0	0		
PHF	.250	.916	.625	.000	.919	.417	.000	.947	.000	.957	.909	.846	.000	.000	.865	.000	.000	.000	.000	.000	.955

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Groups Printed- Heavy Vehicles

	North Main Street (Route 27) From North				Eliot Street (Route 16) From East				North Main Street (Route 27/16) From South				Driveway From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	3	0	0	0	0	2	0	0	10	0	0	0	0	0	0	15
04:15 PM	0	3	0	0	0	0	4	0	0	4	0	0	0	0	0	0	11
04:30 PM	0	5	0	0	0	0	2	0	0	5	0	0	0	0	0	0	12
04:45 PM	0	3	0	0	0	0	10	0	0	2	0	0	0	0	0	0	15
Total	0	14	0	0	0	0	18	0	0	21	0	0	0	0	0	0	53
05:00 PM	0	2	0	0	0	0	3	0	0	2	0	0	0	0	0	0	7
05:15 PM	0	1	0	0	0	0	2	0	0	2	0	0	0	0	0	0	5
05:30 PM	0	2	0	0	0	0	1	0	0	1	0	0	0	0	0	0	4
05:45 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	7	0	0	0	0	6	0	0	5	0	0	0	0	0	0	18
Grand Total	0	21	0	0	0	0	24	0	0	26	0	0	0	0	0	0	71
Apprch %	0	100	0	0	0	0	100	0	0	100	0	0	0	0	0	0	
Total %	0	29.6	0	0	0	0	33.8	0	0	36.6	0	0	0	0	0	0	

	North Main Street (Route 27) From North					Eliot Street (Route 16) From East					North Main Street (Route 27/16) From South					Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	3	0	0	3	0	0	2	0	2	0	10	0	0	10	0	0	0	0	0	15
04:15 PM	0	3	0	0	3	0	0	4	0	4	0	4	0	0	4	0	0	0	0	0	11
04:30 PM	0	5	0	0	5	0	0	2	0	2	0	5	0	0	5	0	0	0	0	0	12
04:45 PM	0	3	0	0	3	0	0	10	0	10	0	2	0	0	2	0	0	0	0	0	15
Total Volume	0	14	0	0	14	0	0	18	0	18	0	21	0	0	21	0	0	0	0	0	53
% App. Total	0	100	0	0		0	0	100	0		0	100	0	0		0	0	0	0		
PHF	.000	.700	.000	.000	.700	.000	.000	.450	.000	.450	.000	.525	.000	.000	.525	.000	.000	.000	.000	.000	.883

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Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Apprch %	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	
Total %	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	

	North Main Street (Route 27) From North						Eliot Street (Route 16) From East						North Main Street (Route 27/16) From South						Driveway From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:00 PM																									
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
% App. Total	0	0	0	0	0		0	0	0	0	0		0	100	0	0	0		0	0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.000	.250	.000	.000	.000	.000	.000	.000	.250

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46 Morton Street, Framingham, MA 01702
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Email: datarequests@pdillc.com

File Name : 165403 AA
Site Code : TBA
Start Date : 12/7/2016
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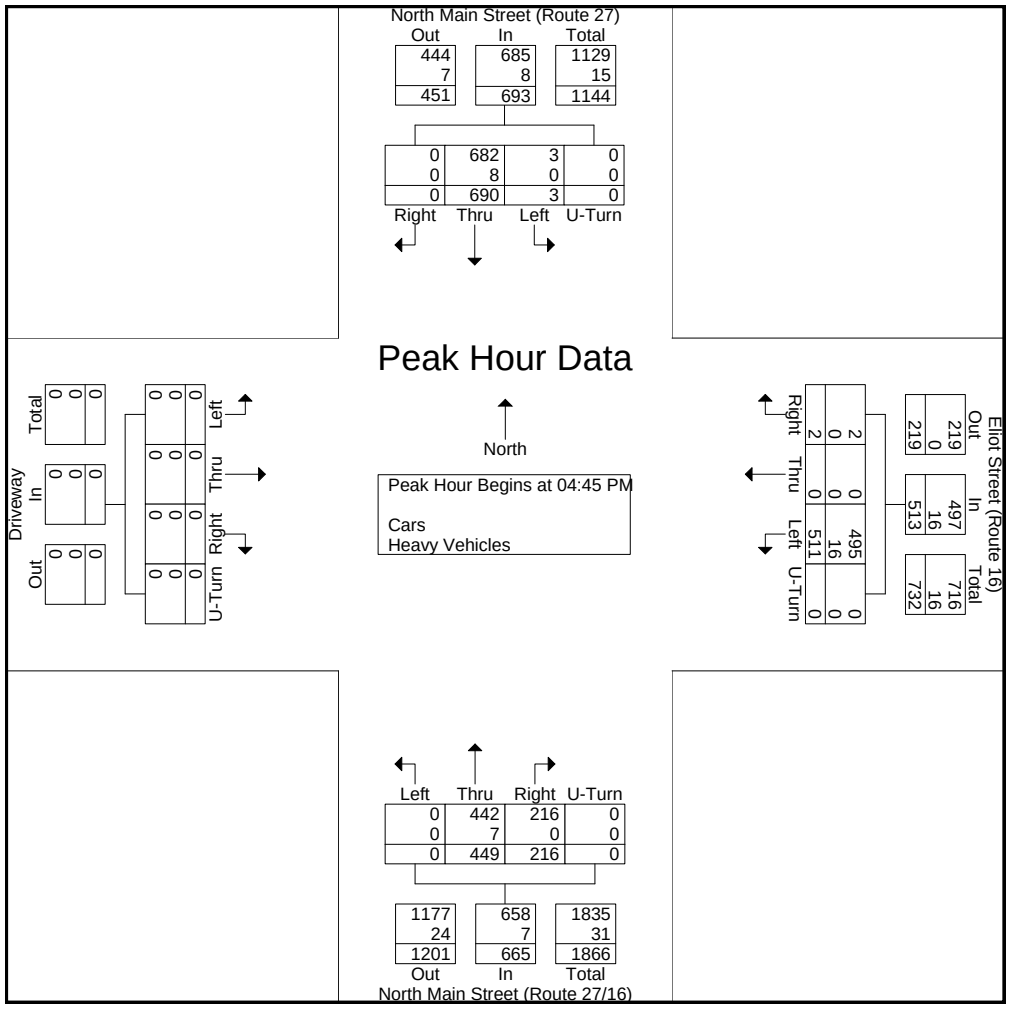
	North Main Street (Route 27) From North					Eliot Street (Route 16) From East					North Main Street (Route 27/16) From South					Driveway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	173	0	0	173	0	0	111	0	111	61	111	0	0	172	0	0	0	0	0	456
05:00 PM	0	168	1	0	169	0	0	134	0	134	45	98	0	0	143	0	0	0	0	0	446
05:15 PM	0	162	1	0	163	0	0	140	0	140	55	132	0	0	187	0	0	0	0	0	490
05:30 PM	0	187	1	0	188	2	0	126	0	128	55	108	0	0	163	0	0	0	0	0	479
Total Volume	0	690	3	0	693	2	0	511	0	513	216	449	0	0	665	0	0	0	0	0	1871
% App. Total	0	99.6	0.4	0		0.4	0	99.6	0		32.5	67.5	0	0		0	0	0	0		
PHF	.000	.922	.750	.000	.922	.250	.000	.913	.000	.916	.885	.850	.000	.000	.889	.000	.000	.000	.000	.000	.955
Cars	0	682	3	0	685	2	0	495	0	497	216	442	0	0	658	0	0	0	0	0	1840
% Cars	0	98.8	100	0	98.8	100	0	96.9	0	96.9	100	98.4	0	0	98.9	0	0	0	0	0	98.3
Heavy Vehicles	0	8	0	0	8	0	0	16	0	16	0	7	0	0	7	0	0	0	0	0	31
% Heavy Vehicles	0	1.2	0	0	1.2	0	0	3.1	0	3.1	0	1.6	0	0	1.1	0	0	0	0	0	1.7



N/S: N. Main Street (Route 27/16)
W: Powderhouse Lane
City, State: Sherborn, MA
Client: Green/ J. Sobel

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
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File Name : 165403 B
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Groups Printed- Cars - Heavy Vehicles

	North Main Street (Route 27/16) From North			North Main Street (Route 27/16) From South			Powderhouse Lane From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
07:00 AM	1	105	0	352	0	0	2	1	0	461
07:15 AM	0	128	0	247	1	0	0	2	0	378
07:30 AM	5	145	0	335	2	0	1	0	0	488
07:45 AM	1	144	0	342	0	0	1	0	0	488
Total	7	522	0	1276	3	0	4	3	0	1815
08:00 AM	2	113	0	329	3	0	3	2	0	452
08:15 AM	1	136	0	316	0	0	2	2	0	457
08:30 AM	4	134	0	304	1	0	3	1	0	447
08:45 AM	2	125	0	333	2	0	3	2	0	467
Total	9	508	0	1282	6	0	11	7	0	1823
Grand Total	16	1030	0	2558	9	0	15	10	0	3638
Apprch %	1.5	98.5	0	99.6	0.4	0	60	40	0	
Total %	0.4	28.3	0	70.3	0.2	0	0.4	0.3	0	
Cars	16	970	0	2455	8	0	13	9	0	3471
% Cars	100	94.2	0	96	88.9	0	86.7	90	0	95.4
Heavy Vehicles	0	60	0	103	1	0	2	1	0	167
% Heavy Vehicles	0	5.8	0	4	11.1	0	13.3	10	0	4.6

	North Main Street (Route 27/16) From North				North Main Street (Route 27/16) From South				Powderhouse Lane From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	5	145	0	150	335	2	0	337	1	0	0	1	488
07:45 AM	1	144	0	145	342	0	0	342	1	0	0	1	488
08:00 AM	2	113	0	115	329	3	0	332	3	2	0	5	452
08:15 AM	1	136	0	137	316	0	0	316	2	2	0	4	457
Total Volume	9	538	0	547	1322	5	0	1327	7	4	0	11	1885
% App. Total	1.6	98.4	0		99.6	0.4	0		63.6	36.4	0		
PHF	.450	.928	.000	.912	.966	.417	.000	.970	.583	.500	.000	.550	.966
Cars	9	508	0	517	1273	4	0	1277	7	4	0	11	1805
% Cars	100	94.4	0	94.5	96.3	80.0	0	96.2	100	100	0	100	95.8
Heavy Vehicles	0	30	0	30	49	1	0	50	0	0	0	0	80
% Heavy Vehicles	0	5.6	0	5.5	3.7	20.0	0	3.8	0	0	0	0	4.2

N/S: N. Main Street (Route 27/16)
W: Powderhouse Lane
City, State: Sherborn, MA
Client: Green/ J. Sobel

PRECISION DATA INDUSTRIES, LLC
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File Name : 165403 B
Site Code : TBA
Start Date : 12/7/2016
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Groups Printed- Cars

	North Main Street (Route 27/16) From North			North Main Street (Route 27/16) From South			Powderhouse Lane From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
07:00 AM	1	100	0	335	0	0	0	0	0	436
07:15 AM	0	121	0	239	1	0	0	2	0	363
07:30 AM	5	138	0	327	1	0	1	0	0	472
07:45 AM	1	136	0	329	0	0	1	0	0	467
Total	7	495	0	1230	2	0	2	2	0	1738
08:00 AM	2	108	0	313	3	0	3	2	0	431
08:15 AM	1	126	0	304	0	0	2	2	0	435
08:30 AM	4	130	0	287	1	0	3	1	0	426
08:45 AM	2	111	0	321	2	0	3	2	0	441
Total	9	475	0	1225	6	0	11	7	0	1733
Grand Total	16	970	0	2455	8	0	13	9	0	3471
Apprch %	1.6	98.4	0	99.7	0.3	0	59.1	40.9	0	
Total %	0.5	27.9	0	70.7	0.2	0	0.4	0.3	0	

	North Main Street (Route 27/16) From North				North Main Street (Route 27/16) From South				Powderhouse Lane From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	5	138	0	143	327	1	0	328	1	0	0	1	472
07:45 AM	1	136	0	137	329	0	0	329	1	0	0	1	467
08:00 AM	2	108	0	110	313	3	0	316	3	2	0	5	431
08:15 AM	1	126	0	127	304	0	0	304	2	2	0	4	435
Total Volume	9	508	0	517	1273	4	0	1277	7	4	0	11	1805
% App. Total	1.7	98.3	0		99.7	0.3	0		63.6	36.4	0		
PHF	.450	.920	.000	.904	.967	.333	.000	.970	.583	.500	.000	.550	.956

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N/S: N. Main Street (Route 27/16)
W: Powderhouse Lane
City, State: Sherborn, MA
Client: Green/ J. Sobel

File Name : 165403 B
Site Code : TBA
Start Date : 12/7/2016
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Groups Printed- Heavy Vehicles

	North Main Street (Route 27/16) From North			North Main Street (Route 27/16) From South			Powderhouse Lane From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
07:00 AM	0	5	0	17	0	0	2	1	0	25
07:15 AM	0	7	0	8	0	0	0	0	0	15
07:30 AM	0	7	0	8	1	0	0	0	0	16
07:45 AM	0	8	0	13	0	0	0	0	0	21
Total	0	27	0	46	1	0	2	1	0	77
08:00 AM	0	5	0	16	0	0	0	0	0	21
08:15 AM	0	10	0	12	0	0	0	0	0	22
08:30 AM	0	4	0	17	0	0	0	0	0	21
08:45 AM	0	14	0	12	0	0	0	0	0	26
Total	0	33	0	57	0	0	0	0	0	90
Grand Total	0	60	0	103	1	0	2	1	0	167
Apprch %	0	100	0	99	1	0	66.7	33.3	0	
Total %	0	35.9	0	61.7	0.6	0	1.2	0.6	0	

	North Main Street (Route 27/16) From North				North Main Street (Route 27/16) From South				Powderhouse Lane From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00 AM													
08:00 AM	0	5	0	5	16	0	0	16	0	0	0	0	21
08:15 AM	0	10	0	10	12	0	0	12	0	0	0	0	22
08:30 AM	0	4	0	4	17	0	0	17	0	0	0	0	21
08:45 AM	0	14	0	14	12	0	0	12	0	0	0	0	26
Total Volume	0	33	0	33	57	0	0	57	0	0	0	0	90
% App. Total	0	100	0		100	0	0		0	0	0		
PHF	.000	.589	.000	.589	.838	.000	.000	.838	.000	.000	.000	.000	.865

N/S: N. Main Street (Route 27/16)
W: Powderhouse Lane
City, State: Sherborn, MA
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Groups Printed- Peds and Bikes

	North Main Street (Route 27/16) From North				North Main Street (Route 27/16) From South				Powderhouse Lane From West				
Start Time	Right	Thru	Peds EB	Peds WB	Thru	Left	Peds WB	Peds EB	Right	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	
Total %													

	North Main Street (Route 27/16) From North					North Main Street (Route 27/16) From South					Powderhouse Lane From West					
Start Time	Right	Thru	Peds EB	Peds WB	App. Total	Thru	Left	Peds WB	Peds EB	App. Total	Right	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 07:00 AM																
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S: N. Main Street (Route 27/16)
W: Powderhouse Lane
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Client: Green/ J. Sobel

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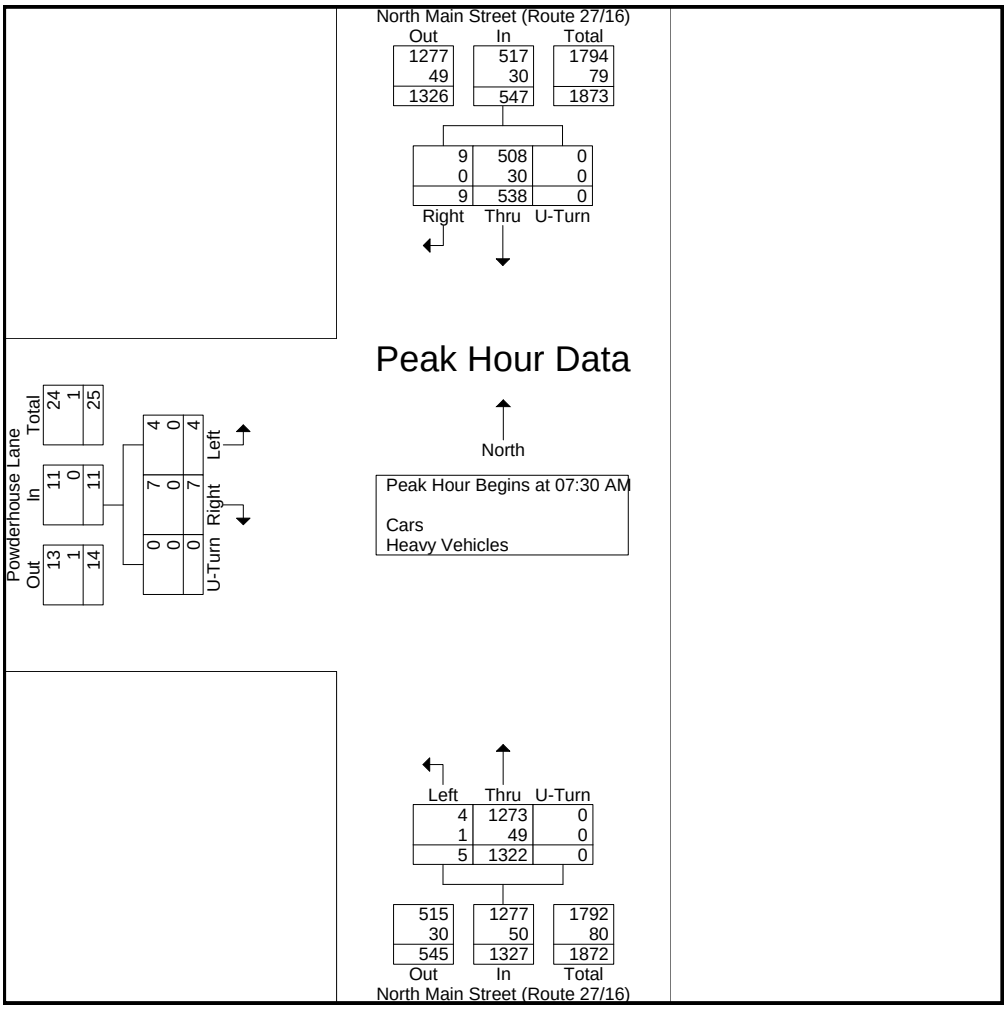
	North Main Street (Route 27/16) From North				North Main Street (Route 27/16) From South				Powderhouse Lane From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	5	145	0	150	335	2	0	337	1	0	0	1	488
07:45 AM	1	144	0	145	342	0	0	342	1	0	0	1	488
08:00 AM	2	113	0	115	329	3	0	332	3	2	0	5	452
08:15 AM	1	136	0	137	316	0	0	316	2	2	0	4	457
Total Volume	9	538	0	547	1322	5	0	1327	7	4	0	11	1885
% App. Total	1.6	98.4	0		99.6	0.4	0		63.6	36.4	0		
PHF	.450	.928	.000	.912	.966	.417	.000	.970	.583	.500	.000	.550	.966
Cars	9	508	0	517	1273	4	0	1277	7	4	0	11	1805
% Cars	100	94.4	0	94.5	96.3	80.0	0	96.2	100	100	0	100	95.8
Heavy Vehicles	0	30	0	30	49	1	0	50	0	0	0	0	80
% Heavy Vehicles	0	5.6	0	5.5	3.7	20.0	0	3.8	0	0	0	0	4.2



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Groups Printed- Cars - Heavy Vehicles

	North Main Street (Route 27/16) From North			North Main Street (Route 27/16) From South			Powderhouse Lane From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:00 PM	4	303	0	154	1	0	9	2	0	473
04:15 PM	5	294	0	161	3	0	14	2	0	479
04:30 PM	5	281	0	167	3	0	9	4	0	469
04:45 PM	11	276	0	171	1	0	6	5	0	470
Total	25	1154	0	653	8	0	38	13	0	1891
05:00 PM	2	298	0	145	2	0	7	6	0	460
05:15 PM	4	301	0	188	3	0	5	3	0	504
05:30 PM	3	313	0	151	1	0	2	2	0	472
05:45 PM	6	285	0	154	5	0	5	3	0	458
Total	15	1197	0	638	11	0	19	14	0	1894
Grand Total	40	2351	0	1291	19	0	57	27	0	3785
Apprch %	1.7	98.3	0	98.5	1.5	0	67.9	32.1	0	
Total %	1.1	62.1	0	34.1	0.5	0	1.5	0.7	0	
Cars	38	2312	0	1265	17	0	57	27	0	3716
% Cars	95	98.3	0	98	89.5	0	100	100	0	98.2
Heavy Vehicles	2	39	0	26	2	0	0	0	0	69
% Heavy Vehicles	5	1.7	0	2	10.5	0	0	0	0	1.8

	North Main Street (Route 27/16) From North				North Main Street (Route 27/16) From South				Powderhouse Lane From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	11	276	0	287	171	1	0	172	6	5	0	11	470
05:00 PM	2	298	0	300	145	2	0	147	7	6	0	13	460
05:15 PM	4	301	0	305	188	3	0	191	5	3	0	8	504
05:30 PM	3	313	0	316	151	1	0	152	2	2	0	4	472
Total Volume	20	1188	0	1208	655	7	0	662	20	16	0	36	1906
% App. Total	1.7	98.3	0		98.9	1.1	0		55.6	44.4	0		
PHF	.455	.949	.000	.956	.871	.583	.000	.866	.714	.667	.000	.692	.945
Cars	20	1166	0	1186	649	7	0	656	20	16	0	36	1878
% Cars	100	98.1	0	98.2	99.1	100	0	99.1	100	100	0	100	98.5
Heavy Vehicles	0	22	0	22	6	0	0	6	0	0	0	0	28
% Heavy Vehicles	0	1.9	0	1.8	0.9	0	0	0.9	0	0	0	0	1.5

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Groups Printed- Cars

	North Main Street (Route 27/16) From North			North Main Street (Route 27/16) From South			Powderhouse Lane From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:00 PM	4	298	0	144	1	0	9	2	0	458
04:15 PM	4	289	0	156	2	0	14	2	0	467
04:30 PM	4	276	0	162	2	0	9	4	0	457
04:45 PM	11	265	0	169	1	0	6	5	0	457
Total	23	1128	0	631	6	0	38	13	0	1839
05:00 PM	2	293	0	143	2	0	7	6	0	453
05:15 PM	4	298	0	186	3	0	5	3	0	499
05:30 PM	3	310	0	151	1	0	2	2	0	469
05:45 PM	6	283	0	154	5	0	5	3	0	456
Total	15	1184	0	634	11	0	19	14	0	1877
Grand Total	38	2312	0	1265	17	0	57	27	0	3716
Apprch %	1.6	98.4	0	98.7	1.3	0	67.9	32.1	0	
Total %	1	62.2	0	34	0.5	0	1.5	0.7	0	

	North Main Street (Route 27/16) From North				North Main Street (Route 27/16) From South				Powderhouse Lane From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	11	265	0	276	169	1	0	170	6	5	0	11	457
05:00 PM	2	293	0	295	143	2	0	145	7	6	0	13	453
05:15 PM	4	298	0	302	186	3	0	189	5	3	0	8	499
05:30 PM	3	310	0	313	151	1	0	152	2	2	0	4	469
Total Volume	20	1166	0	1186	649	7	0	656	20	16	0	36	1878
% App. Total	1.7	98.3	0		98.9	1.1	0		55.6	44.4	0		
PHF	.455	.940	.000	.947	.872	.583	.000	.868	.714	.667	.000	.692	.941

N/S: N. Main Street (Route 27/16)
W: Powderhouse Lane
City, State: Sherborn, MA
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File Name : 165403 BB
Site Code : TBA
Start Date : 12/7/2016
Page No : 1

Groups Printed- Heavy Vehicles

	North Main Street (Route 27/16) From North			North Main Street (Route 27/16) From South			Powderhouse Lane From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
04:00 PM	0	5	0	10	0	0	0	0	0	15
04:15 PM	1	5	0	5	1	0	0	0	0	12
04:30 PM	1	5	0	5	1	0	0	0	0	12
04:45 PM	0	11	0	2	0	0	0	0	0	13
Total	2	26	0	22	2	0	0	0	0	52
05:00 PM	0	5	0	2	0	0	0	0	0	7
05:15 PM	0	3	0	2	0	0	0	0	0	5
05:30 PM	0	3	0	0	0	0	0	0	0	3
05:45 PM	0	2	0	0	0	0	0	0	0	2
Total	0	13	0	4	0	0	0	0	0	17
Grand Total	2	39	0	26	2	0	0	0	0	69
Apprch %	4.9	95.1	0	92.9	7.1	0	0	0	0	
Total %	2.9	56.5	0	37.7	2.9	0	0	0	0	

	North Main Street (Route 27/16) From North				North Main Street (Route 27/16) From South				Powderhouse Lane From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	5	0	5	10	0	0	10	0	0	0	0	15
04:15 PM	1	5	0	6	5	1	0	6	0	0	0	0	12
04:30 PM	1	5	0	6	5	1	0	6	0	0	0	0	12
04:45 PM	0	11	0	11	2	0	0	2	0	0	0	0	13
Total Volume	2	26	0	28	22	2	0	24	0	0	0	0	52
% App. Total	7.1	92.9	0		91.7	8.3	0		0	0	0		
PHF	.500	.591	.000	.636	.550	.500	.000	.600	.000	.000	.000	.000	.867

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

N/S: N. Main Street (Route 27/16)
W: Powderhouse Lane
City, State: Sherborn, MA
Client: Green/ J. Sobel

File Name : 165403 BB
Site Code : TBA
Start Date : 12/7/2016
Page No : 1

Groups Printed- Peds and Bikes

	North Main Street (Route 27/16) From North				North Main Street (Route 27/16) From South				Powderhouse Lane From West				
Start Time	Right	Thru	Peds EB	Peds WB	Thru	Left	Peds WB	Peds EB	Right	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	1	0	0	0	0	0	1	1	3
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	0	0	0	1	1	3
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	1	0	0	0	0	0	1	1	3
Apprch %	0	0	0	0	100	0	0	0	0	0	50	50	
Total %	0	0	0	0	33.3	0	0	0	0	0	33.3	33.3	

	North Main Street (Route 27/16) From North					North Main Street (Route 27/16) From South					Powderhouse Lane From West					
Start Time	Right	Thru	Peds EB	Peds WB	App. Total	Thru	Left	Peds WB	Peds EB	App. Total	Right	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 04:00 PM																
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	1	0	0	0	1	0	0	1	1	2	3
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	0	0	1	0	0	1	1	2	3
% App. Total	0	0	0	0		100	0	0	0		0	0	50	50		
PHF	.000	.000	.000	.000	.000	.250	.000	.000	.000	.250	.000	.000	.250	.250	.250	.250

N/S: N. Main Street (Route 27/16)
W: Powderhouse Lane
City, State: Sherborn, MA
Client: Green/ J. Sobel

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
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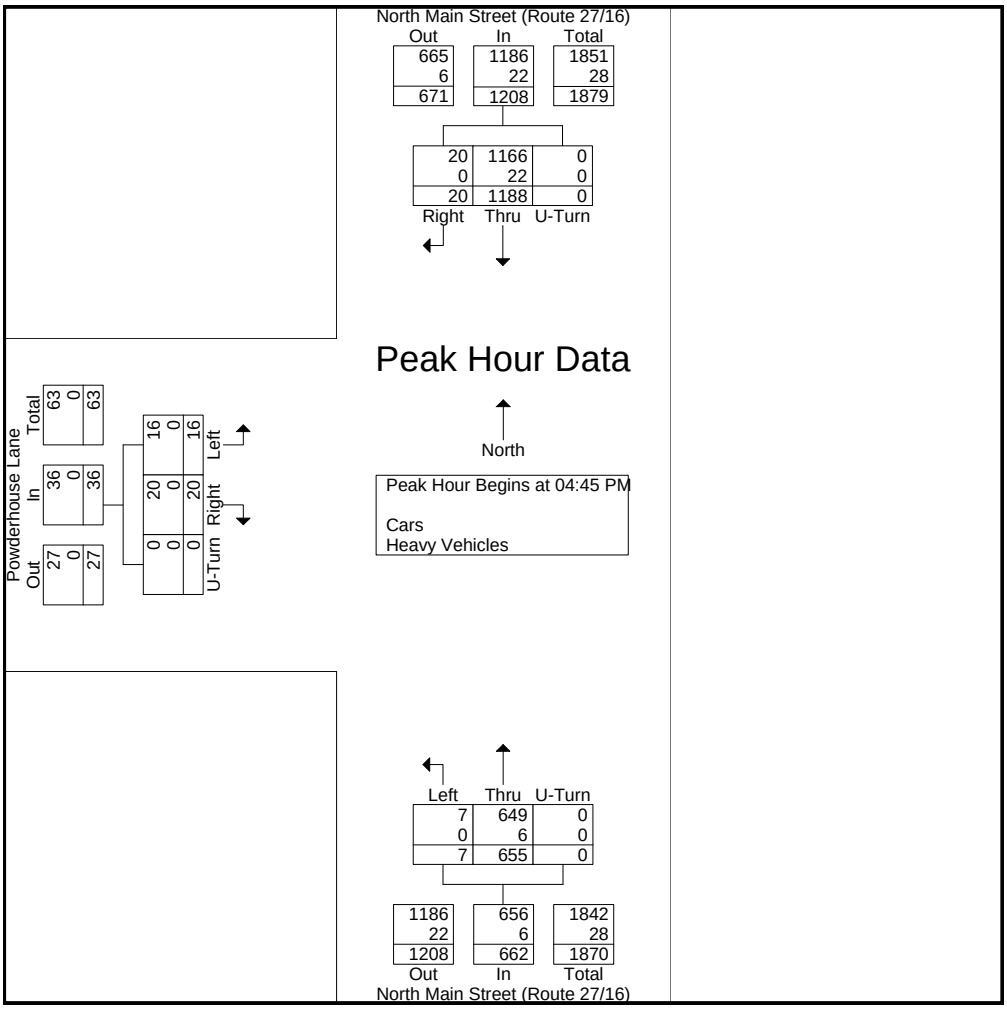
File Name : 165403 BB
Site Code : TBA
Start Date : 12/7/2016
Page No : 1

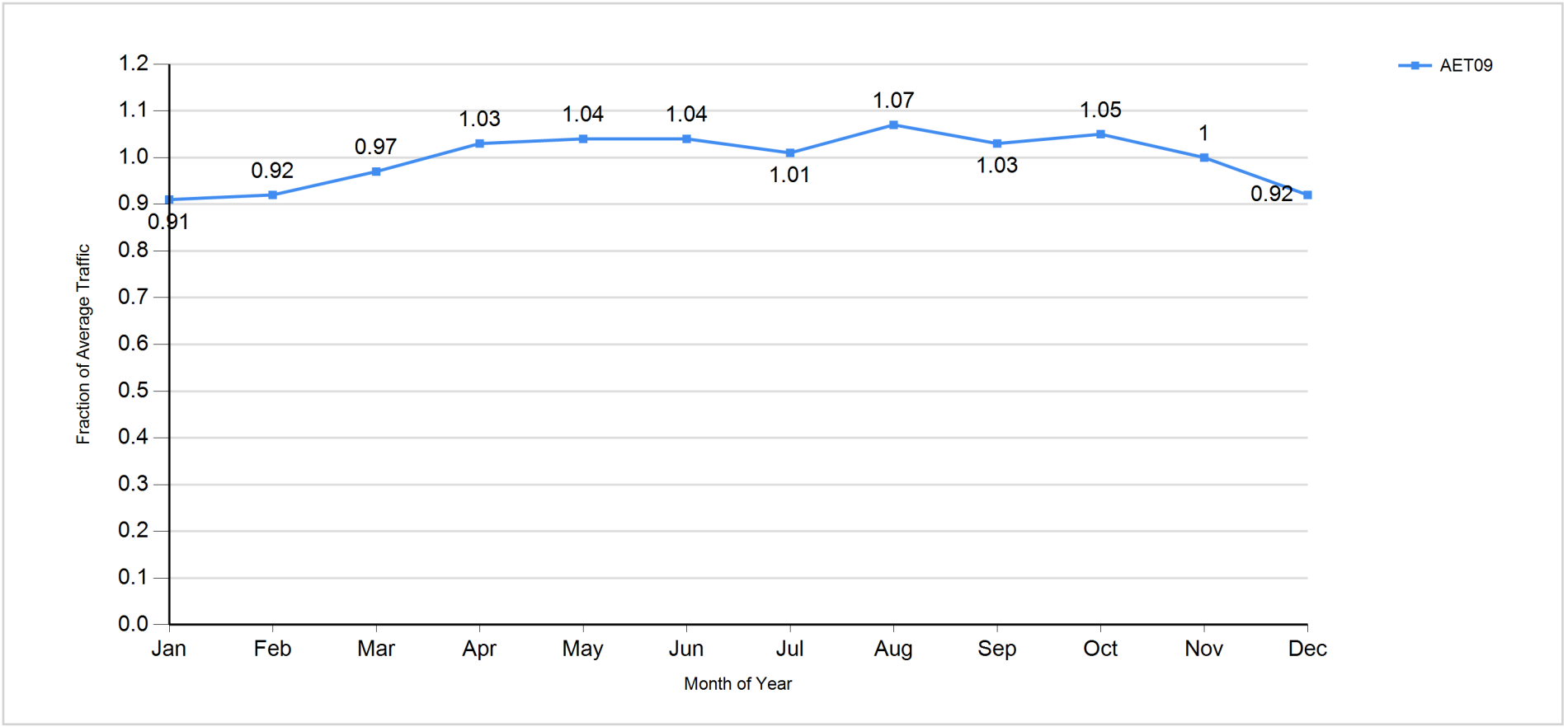
	North Main Street (Route 27/16) From North				North Main Street (Route 27/16) From South				Powderhouse Lane From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	11	276	0	287	171	1	0	172	6	5	0	11	470
05:00 PM	2	298	0	300	145	2	0	147	7	6	0	13	460
05:15 PM	4	301	0	305	188	3	0	191	5	3	0	8	504
05:30 PM	3	313	0	316	151	1	0	152	2	2	0	4	472
Total Volume	20	1188	0	1208	655	7	0	662	20	16	0	36	1906
% App. Total	1.7	98.3	0		98.9	1.1	0		55.6	44.4	0		
PHF	.455	.949	.000	.956	.871	.583	.000	.866	.714	.667	.000	.692	.945
Cars	20	1166	0	1186	649	7	0	656	20	16	0	36	1878
% Cars	100	98.1	0	98.2	99.1	100	0	99.1	100	100	0	100	98.5
Heavy Vehicles	0	22	0	22	6	0	0	6	0	0	0	0	28
% Heavy Vehicles	0	1.9	0	1.8	0.9	0	0	0.9	0	0	0	0	1.5



SEASONAL ADJUSTMENT DATA

Massachusetts Highway Department

Traffic Pattern by Month for 1/1/2019 - 12/31/2019



Traffic Pattern by Month for 1/1/2019 - 12/31/2019

Factor Group	Station	Weight	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
U1-Boston	AET09	0	0.907	0.921	0.967	1.033	1.039	1.043	1.014	1.071	1.034	1.051	1.003	0.916
	Average of Weighted Factors		**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**

VEHICLE SPEED DATA

Accurate Counts
978-664-2565

Location : South Main Street
Location : North of Eliot Street
City/State: Sherborn, MA

8587SPD1

SB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
04/15/20	0	1	1	4	9	2	0	0	0	0	0	0	0	0	17
01:00	0	0	0	4	1	1	0	0	0	0	0	0	0	0	6
02:00	0	0	0	1	2	0	1	0	0	0	0	0	0	0	4
03:00	0	0	0	1	1	1	0	0	0	0	0	0	0	0	3
04:00	0	0	0	2	3	1	0	0	0	0	0	0	0	0	6
05:00	0	0	2	10	21	4	0	0	0	0	0	0	0	0	37
06:00	1	0	9	60	62	12	2	0	0	0	0	0	0	0	146
07:00	0	2	27	69	57	13	1	0	0	0	0	0	0	0	169
08:00	0	6	28	70	66	10	0	0	0	0	0	0	0	0	180
09:00	0	3	26	74	76	15	1	0	0	0	0	0	0	0	195
10:00	0	8	38	83	67	17	2	0	0	0	0	0	0	0	215
11:00	0	3	33	105	97	27	2	0	0	0	0	0	0	0	267
12 PM	9	13	63	99	106	25	1	0	0	0	0	0	0	0	316
13:00	5	7	28	152	105	31	2	0	0	0	0	0	0	0	330
14:00	0	5	47	169	112	16	2	0	0	0	0	0	0	0	351
15:00	10	21	64	177	128	11	3	0	0	0	0	0	0	0	414
16:00	6	21	39	149	130	26	0	0	0	0	0	0	0	0	371
17:00	1	10	40	106	112	23	1	0	0	0	0	0	0	0	293
18:00	1	0	12	62	67	27	4	0	0	0	0	0	0	0	173
19:00	0	0	6	36	55	14	1	1	0	0	0	0	0	0	113
20:00	2	8	10	28	21	9	0	0	0	0	0	0	0	0	78
21:00	0	0	3	9	13	6	2	0	0	0	0	0	0	0	33
22:00	0	0	1	9	16	3	1	0	0	0	0	0	0	0	30
23:00	0	0	0	7	8	5	0	0	0	0	0	0	0	0	20
Total	35	108	477	1486	1335	299	26	1	0	0	0	0	0	0	3767

Daily

15th Percentile :	24 MPH
50th Percentile :	29 MPH
85th Percentile :	34 MPH
95th Percentile :	37 MPH
Mean Speed(Average) :	30 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	2821
Percent in Pace :	74.9%
Number of Vehicles > 30 MPH :	1661
Percent of Vehicles > 30 MPH :	44.1%

Location : South Main Street
Location : North of Eliot Street
City/State: Sherborn, MA

8587SPD1

SB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
04/16/20	0	0	2	3	4	4	3	0	0	0	0	0	0	0	16
01:00	0	0	0	1	3	0	0	0	0	0	0	0	0	0	4
02:00	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
03:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
04:00	0	0	0	0	1	2	0	0	0	0	0	0	0	0	3
05:00	0	0	3	6	15	10	0	0	0	0	0	0	0	0	34
06:00	0	1	4	47	72	22	1	0	0	0	0	0	0	0	147
07:00	0	3	18	74	71	22	3	0	0	0	0	0	0	0	191
08:00	0	1	18	68	88	18	1	0	0	0	0	0	0	0	194
09:00	0	2	16	96	67	24	1	0	0	0	0	0	0	0	206
10:00	1	5	29	101	79	20	1	1	0	0	0	0	0	0	237
11:00	1	9	27	96	94	19	0	1	0	0	0	0	0	0	247
12 PM	0	11	71	92	96	19	1	0	0	0	0	0	0	0	290
13:00	1	3	27	144	93	22	0	0	0	0	0	0	0	0	290
14:00	2	4	61	134	129	14	3	0	0	0	0	0	0	0	347
15:00	14	27	94	149	94	21	3	0	0	0	0	0	0	0	402
16:00	7	6	61	148	95	20	1	0	0	0	0	0	0	0	338
17:00	1	10	52	108	129	32	2	0	0	0	0	0	0	0	334
18:00	0	1	12	67	93	24	3	0	0	0	0	0	0	0	200
19:00	0	0	16	37	47	21	2	0	0	0	0	0	0	0	123
20:00	0	4	1	12	25	12	1	0	0	0	0	0	0	0	55
21:00	0	0	4	12	12	6	1	2	0	0	0	0	0	0	37
22:00	0	1	0	7	15	7	1	0	0	0	0	0	0	0	31
23:00	0	0	3	6	9	7	1	0	0	0	0	0	0	0	26
Total	27	88	519	1408	1336	346	29	4	0	0	0	0	0	0	3757

Daily

15th Percentile :	24 MPH
50th Percentile :	29 MPH
85th Percentile :	34 MPH
95th Percentile :	37 MPH
Mean Speed(Average) :	30 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	2744
Percent in Pace :	73.0%
Number of Vehicles > 30 MPH :	1715
Percent of Vehicles > 30 MPH :	45.6%

Grand Total	62	196	996	2894	2671	645	55	5	0	0	0	0	0	0	7524

Overall

15th Percentile :	24 MPH
50th Percentile :	29 MPH
85th Percentile :	34 MPH
95th Percentile :	37 MPH
Mean Speed(Average) :	30 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	5565
Percent in Pace :	74.0%
Number of Vehicles > 30 MPH :	3376
Percent of Vehicles > 30 MPH :	44.9%

Location : South Main Street
Location : North of Eliot Street
City/State: Sherborn, MA

8587SPD1

NB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
04/15/20	0	0	0	1	4	4	1	0	0	0	0	0	0	0	10
01:00	0	0	2	0	2	1	0	0	0	0	0	0	0	0	5
02:00	0	0	0	3	4	2	1	0	0	0	0	0	0	0	10
03:00	0	0	0	1	2	6	1	1	0	0	0	0	0	0	11
04:00	0	0	1	3	6	4	2	0	0	0	0	0	0	0	16
05:00	0	0	1	10	48	35	6	2	0	0	0	0	0	1	103
06:00	0	0	5	41	110	52	9	0	0	0	0	0	0	0	217
07:00	2	3	6	36	136	75	15	1	1	4	0	0	0	0	279
08:00	4	3	10	63	111	62	12	4	0	0	0	0	0	0	269
09:00	1	4	12	48	97	44	7	1	1	0	0	2	1	0	218
10:00	2	4	13	69	101	40	6	3	0	0	0	0	0	0	238
11:00	0	7	28	95	99	31	5	1	2	0	1	0	0	0	269
12 PM	0	8	22	89	133	38	4	0	2	1	0	0	0	0	297
13:00	0	5	21	52	109	55	7	3	1	0	0	0	0	0	253
14:00	5	8	15	75	113	49	5	0	1	0	2	0	1	0	274
15:00	7	10	26	105	104	32	8	1	1	0	0	0	0	0	294
16:00	1	14	26	83	115	31	4	3	0	2	0	0	0	0	279
17:00	1	8	11	63	102	40	10	2	1	0	0	0	0	0	238
18:00	0	2	5	41	97	38	8	1	1	0	0	0	0	0	193
19:00	0	1	2	24	55	21	2	0	1	0	0	0	0	0	106
20:00	2	1	3	15	28	12	6	0	0	0	0	0	0	0	67
21:00	0	0	0	6	15	8	4	1	0	0	0	0	0	0	34
22:00	0	0	2	5	11	10	5	0	0	0	0	0	0	0	33
23:00	0	0	0	5	6	5	1	3	1	0	0	0	0	0	21
Total	25	78	211	933	1608	695	129	27	13	7	3	2	2	1	3734

Daily

15th Percentile :	26 MPH
50th Percentile :	31 MPH
85th Percentile :	37 MPH
95th Percentile :	39 MPH
Mean Speed(Average) :	32 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	2541
Percent in Pace :	68.1%
Number of Vehicles > 30 MPH :	2487
Percent of Vehicles > 30 MPH :	66.6%

Location : South Main Street
Location : North of Eliot Street
City/State: Sherborn, MA

8587SPD1

NB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
04/16/20	0	0	1	0	5	5	0	0	0	0	0	0	0	0	11
01:00	0	0	0	1	2	0	0	0	0	0	0	0	0	0	3
02:00	0	0	0	1	1	3	0	0	0	0	0	0	0	0	5
03:00	0	0	0	0	0	3	0	1	0	0	0	0	0	0	4
04:00	0	0	0	0	10	3	2	0	0	0	0	0	0	0	15
05:00	0	1	2	12	37	26	8	1	0	0	0	0	0	0	87
06:00	0	0	1	24	117	72	14	2	0	0	0	0	0	0	230
07:00	0	3	15	48	91	70	7	2	0	0	1	0	0	0	237
08:00	2	5	19	53	104	67	11	0	1	0	1	0	0	1	264
09:00	1	1	11	46	103	50	7	1	0	0	1	0	0	0	221
10:00	3	6	11	48	95	39	9	1	1	2	0	0	1	0	216
11:00	5	10	16	69	103	37	5	4	1	0	0	1	0	0	251
12 PM	6	11	23	73	95	34	9	2	1	3	0	1	0	0	258
13:00	0	2	19	77	136	49	7	3	1	1	2	0	1	0	298
14:00	3	7	21	70	93	34	6	1	2	1	1	0	0	0	239
15:00	5	18	32	93	108	40	5	0	0	1	0	0	0	0	302
16:00	4	10	24	85	94	36	10	1	1	0	0	0	1	0	266
17:00	2	7	18	59	110	48	5	1	0	0	0	0	0	0	250
18:00	0	4	10	42	78	37	8	3	0	0	0	1	0	0	183
19:00	0	0	6	21	53	26	6	1	0	0	0	0	0	0	113
20:00	1	0	3	10	35	18	3	1	0	0	0	0	0	0	71
21:00	0	0	0	7	17	8	3	0	0	0	0	0	0	0	35
22:00	0	0	2	5	11	5	2	2	0	0	0	0	0	0	27
23:00	0	0	0	7	5	4	5	0	0	0	0	0	0	0	21
Total	32	85	234	851	1503	714	132	27	8	8	6	3	3	1	3607

Daily

15th Percentile :	26 MPH
50th Percentile :	31 MPH
85th Percentile :	37 MPH
95th Percentile :	40 MPH
Mean Speed(Average) :	32 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	2354
Percent in Pace :	65.3%
Number of Vehicles > 30 MPH :	2405
Percent of Vehicles > 30 MPH :	66.7%

Grand Total	57	163	445	1784	3111	1409	261	54	21	15	9	5	5	2	7341

Overall

15th Percentile :	26 MPH
50th Percentile :	31 MPH
85th Percentile :	37 MPH
95th Percentile :	40 MPH
Mean Speed(Average) :	32 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	4895
Percent in Pace :	66.7%
Number of Vehicles > 30 MPH :	4892
Percent of Vehicles > 30 MPH :	66.6%

Location : South Main Street
Location : North of Eliot Street
City/State: Sherborn, MA

8587SPD1

SB, NB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
04/15/20	0	1	1	5	13	6	1	0	0	0	0	0	0	0	27
01:00	0	0	2	4	3	2	0	0	0	0	0	0	0	0	11
02:00	0	0	0	4	6	2	2	0	0	0	0	0	0	0	14
03:00	0	0	0	2	3	7	1	1	0	0	0	0	0	0	14
04:00	0	0	1	5	9	5	2	0	0	0	0	0	0	0	22
05:00	0	0	3	20	69	39	6	2	0	0	0	0	0	1	140
06:00	1	0	14	101	172	64	11	0	0	0	0	0	0	0	363
07:00	2	5	33	105	193	88	16	1	1	4	0	0	0	0	448
08:00	4	9	38	133	177	72	12	4	0	0	0	0	0	0	449
09:00	1	7	38	122	173	59	8	1	1	0	0	2	1	0	413
10:00	2	12	51	152	168	57	8	3	0	0	0	0	0	0	453
11:00	0	10	61	200	196	58	7	1	2	0	1	0	0	0	536
12 PM	9	21	85	188	239	63	5	0	2	1	0	0	0	0	613
13:00	5	12	49	204	214	86	9	3	1	0	0	0	0	0	583
14:00	5	13	62	244	225	65	7	0	1	0	2	0	1	0	625
15:00	17	31	90	282	232	43	11	1	1	0	0	0	0	0	708
16:00	7	35	65	232	245	57	4	3	0	2	0	0	0	0	650
17:00	2	18	51	169	214	63	11	2	1	0	0	0	0	0	531
18:00	1	2	17	103	164	65	12	1	1	0	0	0	0	0	366
19:00	0	1	8	60	110	35	3	1	1	0	0	0	0	0	219
20:00	4	9	13	43	49	21	6	0	0	0	0	0	0	0	145
21:00	0	0	3	15	28	14	6	1	0	0	0	0	0	0	67
22:00	0	0	3	14	27	13	6	0	0	0	0	0	0	0	63
23:00	0	0	0	12	14	10	1	3	1	0	0	0	0	0	41
Total	60	186	688	2419	2943	994	155	28	13	7	3	2	2	1	7501

Daily

15th Percentile :	25 MPH
50th Percentile :	30 MPH
85th Percentile :	35 MPH
95th Percentile :	39 MPH
Mean Speed(Average) :	31 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	5362
Percent in Pace :	71.5%
Number of Vehicles > 30 MPH :	4148
Percent of Vehicles > 30 MPH :	55.3%

Location : South Main Street
Location : North of Eliot Street
City/State: Sherborn, MA

8587SPD1

SB, NB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
04/16/20	0	0	3	3	9	9	3	0	0	0	0	0	0	0	27
01:00	0	0	0	2	5	0	0	0	0	0	0	0	0	0	7
02:00	0	0	0	1	4	3	0	0	0	0	0	0	0	0	8
03:00	0	0	0	0	2	3	0	1	0	0	0	0	0	0	6
04:00	0	0	0	0	11	5	2	0	0	0	0	0	0	0	18
05:00	0	1	5	18	52	36	8	1	0	0	0	0	0	0	121
06:00	0	1	5	71	189	94	15	2	0	0	0	0	0	0	377
07:00	0	6	33	122	162	92	10	2	0	0	1	0	0	0	428
08:00	2	6	37	121	192	85	12	0	1	0	1	0	0	1	458
09:00	1	3	27	142	170	74	8	1	0	0	1	0	0	0	427
10:00	4	11	40	149	174	59	10	2	1	2	0	0	1	0	453
11:00	6	19	43	165	197	56	5	5	1	0	0	1	0	0	498
12 PM	6	22	94	165	191	53	10	2	1	3	0	1	0	0	548
13:00	1	5	46	221	229	71	7	3	1	1	2	0	1	0	588
14:00	5	11	82	204	222	48	9	1	2	1	1	0	0	0	586
15:00	19	45	126	242	202	61	8	0	0	1	0	0	0	0	704
16:00	11	16	85	233	189	56	11	1	1	0	0	0	1	0	604
17:00	3	17	70	167	239	80	7	1	0	0	0	0	0	0	584
18:00	0	5	22	109	171	61	11	3	0	0	0	1	0	0	383
19:00	0	0	22	58	100	47	8	1	0	0	0	0	0	0	236
20:00	1	4	4	22	60	30	4	1	0	0	0	0	0	0	126
21:00	0	0	4	19	29	14	4	2	0	0	0	0	0	0	72
22:00	0	1	2	12	26	12	3	2	0	0	0	0	0	0	58
23:00	0	0	3	13	14	11	6	0	0	0	0	0	0	0	47
Total	59	173	753	2259	2839	1060	161	31	8	8	6	3	3	1	7364

Daily

15th Percentile :	25 MPH
50th Percentile :	30 MPH
85th Percentile :	35 MPH
95th Percentile :	39 MPH
Mean Speed(Average) :	31 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	5098
Percent in Pace :	69.2%
Number of Vehicles > 30 MPH :	4120
Percent of Vehicles > 30 MPH :	55.9%

Grand Total	119	359	1441	4678	5782	2054	316	59	21	15	9	5	5	2	14865

Overall

15th Percentile :	25 MPH
50th Percentile :	30 MPH
85th Percentile :	35 MPH
95th Percentile :	39 MPH
Mean Speed(Average) :	31 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	10460
Percent in Pace :	70.4%
Number of Vehicles > 30 MPH :	8268
Percent of Vehicles > 30 MPH :	55.6%

MOTOR VEHICLE CRASH DATA

Crash Number	City Town Name	Crash Severity	Crash Status	Crash Time	Crash Year	Injury Severity Reported	Driver - Youngest Known	Driver Contributing Circumstances (All Drivers)	Light Conditions	Manner of Collision	MassDOT District	Road Surface Condition	Roadway Junction Type	Total Fatalities	Actions Prior to Crash (All Vehicles)	Travel Directions (All	Weather Conditions	Vehicle Sequence of Events (All Vehicles)	Latitude	Longitude
3660670	SHERBORN	Property damage only (none injured)	Closed	5:28 PM	2013	No injury	35-44	D1: (Over-correcting/over-steering)	Dark - lighted roadway	Single vehicle crash	3	Snow	Not at junction	0	V1: Travelling	V1: E	Clear	V1:(Ran off road left),(Collision with tree)	42.248	-71.37
3660671	SHERBORN	Property damage only (none injured)	Closed	2:21 AM	2013	No injury	18-20	D1: (Operating vehicle in erratic, reckless, careless, negligent or aggressive manner),(Inattention)	Dark - lighted roadway	Single vehicle crash	3	Dry	T-intersection	0	V1: Travelling	V1: W	Clear	V1:(Collision with curb),(Collision with light pole or other post/support),(Collision with highway traffic sign post),(Collision with fence)	42.248	-71.37
3660751	SHERBORN	Non-fatal injury	Closed	7:00 PM	2013	al injury - F	25-34	D1: (No improper driving) / D2: (Unknown)	Daylight	Rear-end	3	Wet	Y-intersection	0	V1: Slowing o	V1: S / V2: S	Cloudy/Rain	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.248	-71.37
3661167	SHERBORN	Property damage only (none injured)	Closed	9:42 AM	2013	No injury	25-34	D1: (Failed to yield right of way) / D2: (No improper driving)	Daylight	Sideswipe, same direction	3	Wet	T-intersection	0	V1: Travelling	V1: N / V2: N	Rain	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.248	-71.37
3747449	SHERBORN	Property damage only (none injured)	Closed	2:56 PM	2013	No injury	18-20	D1: (Driving too fast for conditions) / D2: (No improper driving)	Daylight	Rear-end	3	Snow	T-intersection	0	V1: Travelling	V1: E / V2: E	Snow/Cloudy	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.248	-71.37
3799138	SHERBORN	Property damage only (none injured)	Closed	3:54 PM	2014	No injury	35-44	D1: (Inattention) / D2: (No improper driving)	Daylight	Rear-end	3	Wet	T-intersection	0	V1: Slowing o	V1: S / V2: S	Rain	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.248	-71.37
3822065	SHERBORN	Property damage only (none injured)	Closed	3:59 PM	2014	No injury	55-64	D1: (No improper driving) / D2: (Inattention),(Followed too closely)	Daylight	Rear-end	3	Wet	Not at junction	0	V1: Slowing o	V1: E / V2: E	Rain	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.248	-71.37
3886031	SHERBORN	Property damage only (none injured)	Closed	6:27 PM	2014	No injury	18-20	D1: (Other improper action) / D2: (No improper driving) / D3: (No improper driving)	Daylight	Rear-end	3	Wet	Not at junction	0	V1: Travelling	V1: W / V2: W / V3: W	Rain	V1:(Collision with parked motor vehicle) V2:(Collision with motor vehicle in traffic),(Collision with parked motor vehicle) V3:(Collision with motor vehicle in traffic)	42.248	-71.37
3886932	SHERBORN	Property damage only (none injured)	Closed	6:09 PM	2014	No injury	65-74	D1: (Made an improper turn) / D2: (Unknown)	Daylight	Angle	3	Dry	T-intersection	0	V1: Making U	V1: E / V2: E	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.248	-71.37
3980455	SHERBORN	Property damage only (none injured)	Closed	9:30 PM	2014	No injury	16-17	D1: (Other improper action) / D2: (No improper driving)	Dark - lighted roadway	Rear-end	3	Wet	T-intersection	0	V1: Travelling	V1: S / V2: S	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.248	-71.37
4025736	SHERBORN	Property damage only (none injured)	Closed	9:13 PM	2015	No injury	35-44	D1: (Driving too fast for conditions)	Dark - lighted roadway	Single vehicle crash	3	Snow	Not at junction	0	V1: Travelling	V1: E	Snow	V1:(Collision with curb),(Collision with highway traffic sign post)	42.248	-71.37
4065729	SHERBORN	Property damage only (none injured)	Closed	1:23 AM	2015	No injury	25-34	D1: (Inattention),(Distracted) / D2: (No improper driving)	Daylight	Rear-end	3	Dry	T-intersection	0	V1: Travelling	V1: N / V2: N	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.248	-71.37
4066046	SHERBORN	Non-fatal injury	Closed	2:48 PM	2015	ury - Non-i	25-34	D1: (No improper driving) / D2: (Driving too fast for conditions),(Other improper action)	Daylight	Rear-end	3	Dry	T-intersection	0	V1: Slowing o	V1: S / V2: S	Clear	V1:(Other) V2:(Other)	42.248	-71.37
4132419	SHERBORN	Non-fatal injury	Closed	12:18 PM	2015	ury - Non-i	55-64	D1: (Physical impairment)	Daylight	Single vehicle crash	3	Dry	Not at junction	0	V1: Turning le	V1: E	Clear	V1:(Collision with other fixed object(wall, building, tunnel, etc.))	42.248	-71.37

Crash Number	City Town Name	Crash Severity	Crash Status	Crash Time	Crash Year	Injury Severity Reported	Driver - Youngest Known	Driver Contributing Circumstances (All Drivers)	Light Conditions	Manner of Collision	MassDOT District	Road Surface Condition	Roadway Junction Type	Total Fatalities	Actions Prior to Crash (All Vehicles)	Travel Directions (All	Weather Conditions	Vehicle Sequence of Events (All Vehicles)	Latitude	Longitude
4162274	SHERBORN	Non-fatal injury	Closed	3:51 PM	2016	ury - Non-i	16-17	D1: (No improper driving) / D2: (Followed too closely),(Unknown)	Daylight	Rear-end	3	Dry	T-intersection	0	V1: Slowing o	V1: N / V2: N	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.248	-71.37
4162530	SHERBORN	Property damage only (none injured)	Closed	4:37 PM	2016	No injury	21-24	D1: (No improper driving) / D2: (Followed too closely),(Inattention)	Daylight	Rear-end	3	Dry	T-intersection	0	V1: Slowing o	V1: S / V2: S	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.248	-71.37
4182406	SHERBORN	Non-fatal injury	Closed	7:34 AM	2016	ury - Non-i	18-20	D1: (No improper driving) / D2: (No improper driving)	Daylight	Angle	3	Dry	T-intersection	0	V1: Travelling	V1: N / V2: E	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.248	-71.37
4258931	SHERBORN	Property damage only (none injured)	Closed	9:46 AM	2016	No injury	75-84	D1: (Unknown) / D2: (Unknown)	Daylight	Unknown	3	Dry	T-intersection	0	V1: Slowing o	V1: W / V2: W	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.248	-71.37
4322777	SHERBORN	Non-fatal injury	Closed	3:18 PM	2017	al injury - I	45-54		Daylight	Rear-end	3	Dry	Four-way intersection	0	V1: Slowing o	V1: S / V2: S / V3: S	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic) V3:(Collision with motor vehicle in traffic)	42.248	-71.37
4354309	SHERBORN	Property damage only (none injured)	Closed	3:41 PM	2017	No injury	45-54	D1: (Inattention) / D2: (No improper driving)	Daylight	Rear-end	3	Dry	T-intersection	0	V1: Slowing o	V1: W / V2: W	Cloudy	V1:(Other),(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.248	-71.37
4423819	SHERBORN	Property damage only (none injured)	Closed	12:31 PM	2017	No injury	21-24	D1: (No improper driving) / D2: (Driving too fast for conditions),(Over-correcting/over-steering)	Daylight	Angle	3	Wet	T-intersection	0	V1: Slowing o	V1: W / V2: E	Cloudy/Rain	V1:(Collision with motor vehicle in traffic) V2:(Cross median or centerline),(Collision with motor vehicle in traffic)	42.248	-71.37
4428119	SHERBORN	Property damage only (none injured)	Closed	10:12 PM	2017	No injury	65-74	D1: (Driving too fast for conditions)	Dark - lighted roadway	Single vehicle crash	3	Dry	T-intersection	0	V1: Travelling	V1: W	Clear	V1:(Collision with other fixed object(wall, building, tunnel, etc.)),(Collision with curb),(Collision with highway traffic sign post)	42.248	-71.37
4474422	SHERBORN	Non-fatal injury	Closed	5:16 PM	2017	ury - Non-i	45-54	D1: (Fatigued/asleep),(Followed too closely) / D2: (No improper driving) / D3: (No improper driving)	Dark - lighted roadway	Rear-end	3	Dry	Not at junction	0	V1: Travelling	V1: W / V2: W / V3: W	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic) V3:(Collision with motor vehicle in traffic)	42.248	-71.37
3747457	SHERBORN	Property damage only (none injured)	Closed	2:34 PM	2013	No injury	65-74	D1: (Inattention) / D2: (No improper driving)	Daylight	Rear-end	3	Dry	Not at junction	0	V1: Slowing o	V1: S / V2: S	Cloudy	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.25	-71.37
3747493	SHERBORN	Property damage only (none injured)	Closed	1:02 PM	2014	No injury	35-44	D1: (No improper driving) / D2: (Inattention),(Followed too closely)	Daylight	Rear-end	3	Wet	Not at junction	0	V1: Slowing o	V1: N / V2: N	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.25	-71.37
3748343	SHERBORN	Non-fatal injury	Closed	4:48 PM	2013	al injury - I	45-54	D1: (No improper driving)	Dark - lighted roadway	Rear-end	3	Wet	Not at junction	0	V1: Slowing o	V1: S	Clear	V1:(Collision with motor vehicle in traffic)	42.25	-71.37
3791714	SHERBORN	Property damage only (none injured)	Closed	8:18 AM	2014	No injury	25-34	D1: (No improper driving) / D2: (Unknown)	Daylight	Rear-end	3	Dry	Not at junction	0	V1: Slowing o	V1: S / V2: S	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.25	-71.37
3869335	SHERBORN	Property damage only (none injured)	Closed	9:09 AM	2014	No injury	25-34	D1: (No improper driving) / D2: (Unknown)	Daylight	Rear-end	3	Dry	Not at junction	0	V1: Slowing o	V1: N / V2: N	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.25	-71.37

Crash Number	City Town Name	Crash Severity	Crash Year	Max Injury Severity Reported	Number of Vehicles	Age of Driver - Youngest	Age of Driver - Oldest	Driver Contributing Circumstances (All Drivers)	Light Conditions	Manner of Collision	Road Surface Condition	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Speed Limit	Latitude	Longitude
3660669	SHERBORN	Property damage only (none injured)	2013	No injury	2	35-44	65-74	D1: (No improper driving) / D2: (No improper driving)	Daylight	Sideswipe, opposite direction	Dry	V1: Parked / V2: Backing	V1: W / V2: E	Clear		42.2467	-71.369
3822066	SHERBORN	Property damage only (none injured)	2014	No injury	2	45-54	45-54	D1: (No improper driving) / D2: (Followed too closely)	Daylight	Rear-end	Wet	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: N / V2: N	Rain		42.2466	-71.369
3963837	SHERBORN	Non-fatal injury	2014	Non-fatal injury - Possible	2	45-54	45-54	D1: (Inattention) / D2: (No improper driving)	Daylight	Rear-end	Dry	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1: S / V2: S	Clear	30	42.2471	-71.369
4078654	SHERBORN	Non-fatal injury	2015	Non-fatal injury - Non-incapacitating	2	25-34	55-64	D1: (No improper driving) / D2: (Visibility obstructed),(Followed too closely)	Dark - lighted roadway	Rear-end	Wet	V1: Turning left / V2: Turning left	V1: W / V2: W	Rain/Cloudy	30	42.2475	-71.369
4101856	SHERBORN	Property damage only (none injured)	2015	No injury	3	21-24	45-54	D1: (No improper driving) / D2: (No improper driving) / D3: (Driving too fast for conditions),(Followed too closely)	Dark - lighted roadway	Rear-end	Wet	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Travelling straight ahead	V1: S / V2: S / V3: S	Rain	30	42.2467	-71.369
4185828	SHERBORN	Property damage only (none injured)	2016	No injury	3	21-24	45-54	D1: (No improper driving) / D2: (No improper driving) / D3: (Followed too closely)	Daylight	Rear-end	Wet	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Slowing or stopped in traffic	V1: S / V2: S / V3: S	Rain	30	42.2472	-71.369
4193029	SHERBORN	Property damage only (none injured)	2016	No injury	2	18-20	65-74	D1: (Other improper action) / D2: (No improper driving)	Daylight	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1: N / V2: N	Clear	30	42.2467	-71.369
4197428	SHERBORN	Property damage only (none injured)	2016	No injury	2	55-64	55-64	D1: (Visibility obstructed)	Daylight	Angle	Dry	V1: Travelling straight ahead / V2: Parked	V1: E / V2: Not Reported	Clear		42.2467	-71.369
4276033	SHERBORN	Property damage only (none injured)	2016	No injury	3	35-44	55-64	D1: (No improper driving) / D2: (No improper driving) / D3: (Followed too closely)	Daylight	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Travelling straight ahead	V1: N / V2: N / V3: N	Clear	30	42.2472	-71.369
4317560	SHERBORN	Property damage only (none injured)	2017	No injury	2	45-54	65-74	D1: (Followed too closely) / D2: (No improper driving)	Dark - lighted roadway	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1: N / V2: N	Clear		42.2471	-71.369
4326336	SHERBORN	Property damage only (none injured)	2017	No injury	2	18-20	35-44	D1: (Followed too closely) / D2: (No improper driving)	Dark - lighted roadway	Rear-end	Wet	V1: Travelling straight ahead / V2: Travelling straight ahead	V1: N / V2: N	Clear	30	42.2471	-71.369
4392911	SHERBORN	Property damage only (none injured)	2017	No injury	2	35-44	55-64	D1: (No improper driving) / D2: (Followed too closely)	Daylight	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: S / V2: S	Clear		42.2475	-71.369
4400547	SHERBORN	Property damage only (none injured)	2017	No injury	2	55-64	75-84	D1: (Failed to yield right of way) / D2: (No improper driving)	Daylight	Angle	Dry	V1: Entering traffic lane / V2: Travelling straight ahead	V1: S / V2: W	Clear	30	42.2471	-71.369
4462334	SHERBORN	Property damage only (none injured)	2017	No injury	1	21-24	21-24	D1: (Operating vehicle in erratic, reckless, careless, negligent or aggressive manner),(Fatigued/asleep)	Dark - lighted roadway	Single vehicle crash	Wet	V1: Travelling straight ahead	V1: W	Rain		42.2475	-71.369

Crash Number	City Town Name	Crash Severity	Crash Status	Crash Time	Crash Year	Injury Severity Reported	Driver - Youngest Known	Driver Contributing Circumstances (All Drivers)	Light Conditions	Manner of Collision	MassDOT District	Road Surface Condition	Roadway Junction Type	Total Fatalities	Actions Prior to Crash (All Vehicles)	Travel Directions (All	Weather Conditions	Vehicle Sequence of Events (All Vehicles)	Latitude	Longitude
3895832	SHERBORN	Property damage only (none injured)	Closed	5:57 PM	2014	No injury	25-34	D1: (No improper driving) / D2: (Made an improper turn)	Daylight	Angle	3	Dry	Not at junction	0	V1: Slowing o	V1: N / V2: N	Clear	V1:(Other) V2:(Other)	42.25	-71.37
4049431	SHERBORN	Property damage only (none injured)	Closed	6:03 PM	2015	No injury	18-20	D1: (No improper driving) / D2: (Inattention)	Daylight	Rear-end	3	Dry	T-intersection	0	V1: Slowing o	V1: N / V2: N	Clear	V1:(Other) V2:(Other)	42.25	-71.37
4057958	SHERBORN	Property damage only (none injured)	Closed	10:49 AM	2015	No injury	45-54	D1: (No improper driving) / D2: (Failed to yield right of way)	Daylight	Sideswipe, opposite direction	3	Dry	Driveway	0	V1: Travelling	V1: N / V2: S	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.249	-71.37
4069696	SHERBORN	Non-fatal injury	Closed	4:41 PM	2015	al injury - F	25-34	D1: (No improper driving) / D2: (Driving too fast for conditions),(Followed too closely)	Daylight	Rear-end	3	Wet	T-intersection	0	V1: Slowing o	V1: N / V2: N	Cloudy/Rain	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.25	-71.37
4078655	SHERBORN	Non-fatal injury	Closed	5:40 AM	2015	ury - Non-i	55-64	D1: (Fatigued/asleep),(Operating vehicle in erratic, reckless, careless, negligent or aggressive manner)	Dawn	Single vehicle crash	3	Dry	Not at junction	0	V1: Travelling	V1: N	Clear	V1:(Ran off road right),(Collision with utility pole),(Overturn/rollover)	42.249	-71.37
4099834	SHERBORN	Property damage only (none injured)	Closed	10:08 AM	2015	No injury	45-54	D1: (No improper driving) / D2: (Unknown)	Daylight	Rear-end	3	Dry	T-intersection	0	V1: Slowing o	V1: N / V2: N	Clear	V1:(Collision with motor vehicle in traffic),(Ran off road right) V2:(Collision with motor vehicle in traffic)	42.25	-71.37
4185829	SHERBORN	Property damage only (none injured)	Closed	7:47 AM	2016	No injury	18-20	D1: (No improper driving) / D2: (No improper driving) / D3: (No improper driving) / D4: (Driving too fast for conditions)	Daylight	Rear-end	3	Wet	Not at junction	0	V1: Slowing o	V1: N / V2: N / V3: N / V4: N	Cloudy/Rain	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic) V3:(Collision with motor vehicle in traffic) V4:(Collision with motor vehicle in traffic)	42.249	-71.37
4326334	SHERBORN	Property damage only (none injured)	Closed	6:22 PM	2017	No injury	25-34	D1: (Followed too closely) / D2: (No improper driving)	Dark - roadway not lighted	Rear-end	3	Dry	Not at junction	0	V1: Travelling	V1: S / V2: S	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.25	-71.37
4327533	SHERBORN	Property damage only (none injured)	Closed	3:56 PM	2017	No injury	16-17	D1: (Inattention) / D2: (No improper driving)	Daylight	Rear-end	3	Dry	Not at junction	0	V1: Travelling	V1: N / V2: N	Clear	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.25	-71.37

CRASH RATE WORKSHEETS

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : Franklin COUNT DATE : 2020

DISTRICT : 3 UNSIGNALIZED : SIGNALIZED : x

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Route 27 ST #

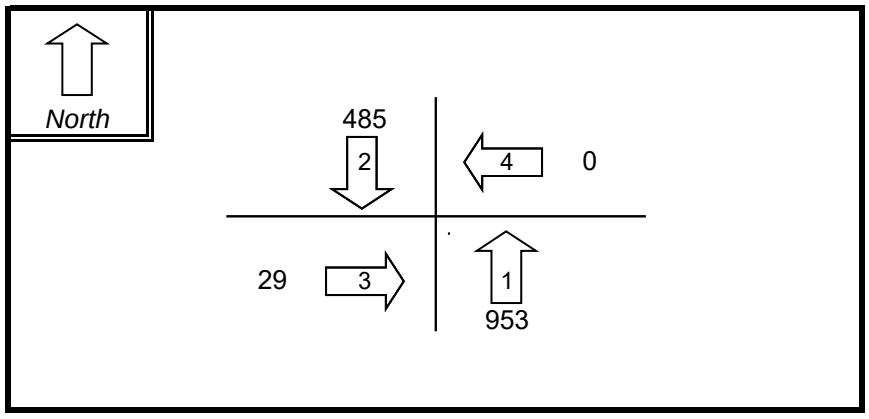
MINOR STREET(S) : Hunting Lane ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (PM) :	953	485	29	0		1,467

" K " FACTOR : 0.083 APPROACH ADT : 17,675 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 14 # OF YEARS : 5 AVERAGE # OF ACCIDENTS (**A**) : 2.80

CRASH RATE CALCULATION : 0.43 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Accident Rate for District 3 signalized intersections = 0.89

Accident Rate for District 3 unsignalized intersections = 0.61

Statewide Accident Rate for Signalized Inteserction = 0.78 and Unsignalized/Inteserction = 0.57

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : Franklin COUNT DATE : 2020

DISTRICT : 3 UNSIGNALIZED : SIGNALIZED : x

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Route 27 ST #

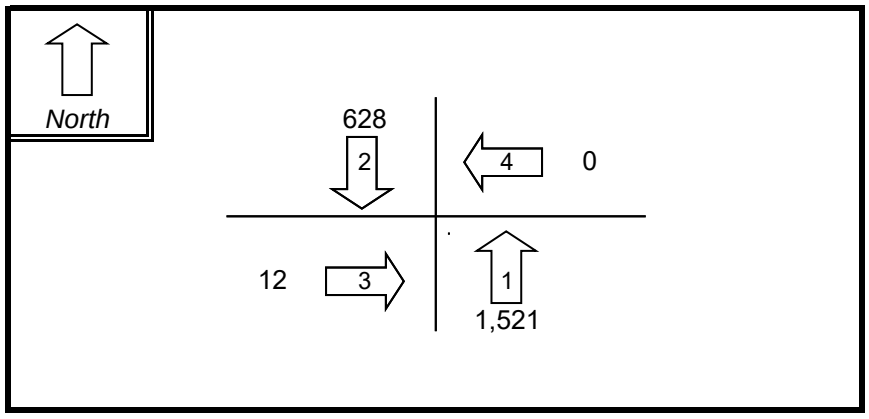
MINOR STREET(S) : Powderhouse Lane ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB			
VOLUMES (PM) :	1,521	628	12			**2,161**

" K " FACTOR : **0.083** APPROACH ADT : **26,036** **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 14 # OF YEARS : 5 AVERAGE # OF ACCIDENTS (**A**) : **2.80**

CRASH RATE CALCULATION : **0.29** RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Accident Rate for District 3 signalized intersections = 0.89

Accident Rate for District 3 unsignalized intersections = 0.61

Statewide Accident Rate for Signalized Inteserction = 0.78 and Unsignalized/Inteserction = 0.57

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : Franklin COUNT DATE : 2020

DISTRICT : 3 UNSIGNALIZED : SIGNALIZED : x

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Route 27 ST #

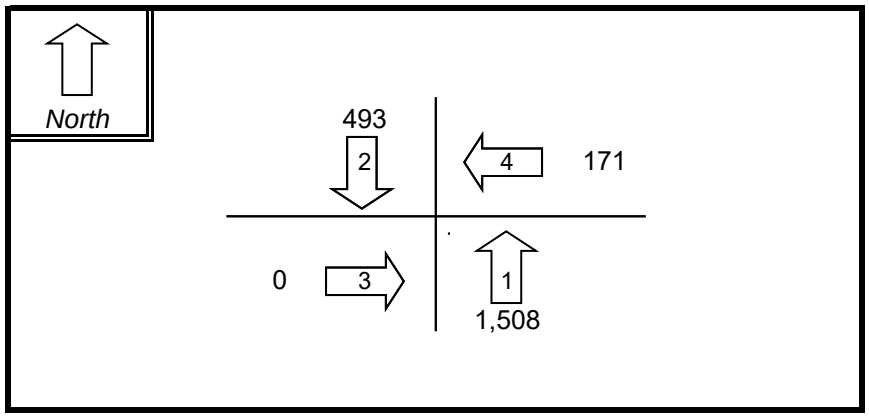
MINOR STREET(S) : Route 16 ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (PM) :	1,508	493	0	171		2,172

" K " FACTOR : **0.083** APPROACH ADT : **26,169** **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 23 # OF YEARS : 5 AVERAGE # OF ACCIDENTS (**A**) : **4.60**

CRASH RATE CALCULATION : **0.48** RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Accident Rate for District 3 signalized intersections = 0.89

Accident Rate for District 3 unsignalized intersections = 0.61

Statewide Accident Rate for Signalized Inteserction = 0.78 and Unsignalized/Inteserction = 0.57

GENERAL BACKGROUND TRAFFIC GROWTH

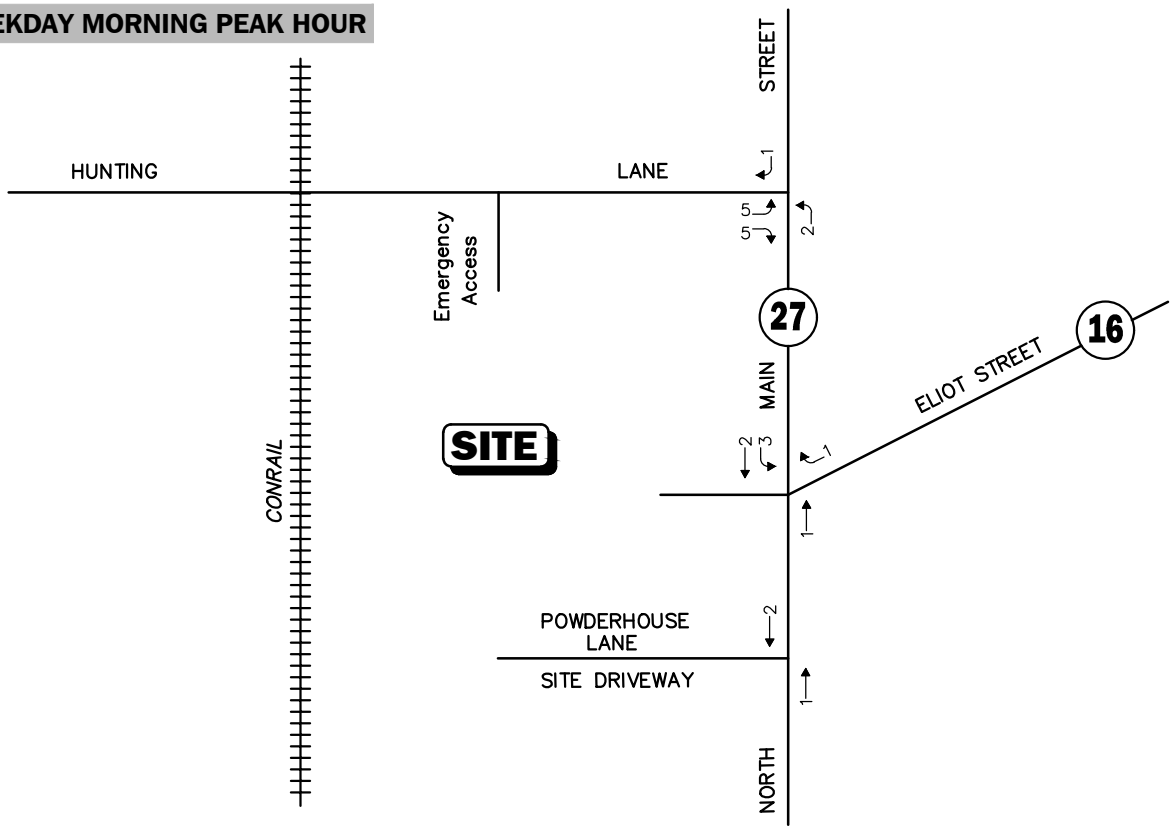
General Background Traffic Growth - Daily Traffic Volumes

Station Number	ROUTE/STREET	LOCATION	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Annual Growth Rate
411	NORTH MAIN STREET	Middlesex County	7,457		8,100					8,791	8,905	*9,003*	*9,113*	1.8%
39	NORTH MEADOWS ROAD	Norfolk County	7,500										*8,513*	1.3%
														1.50%

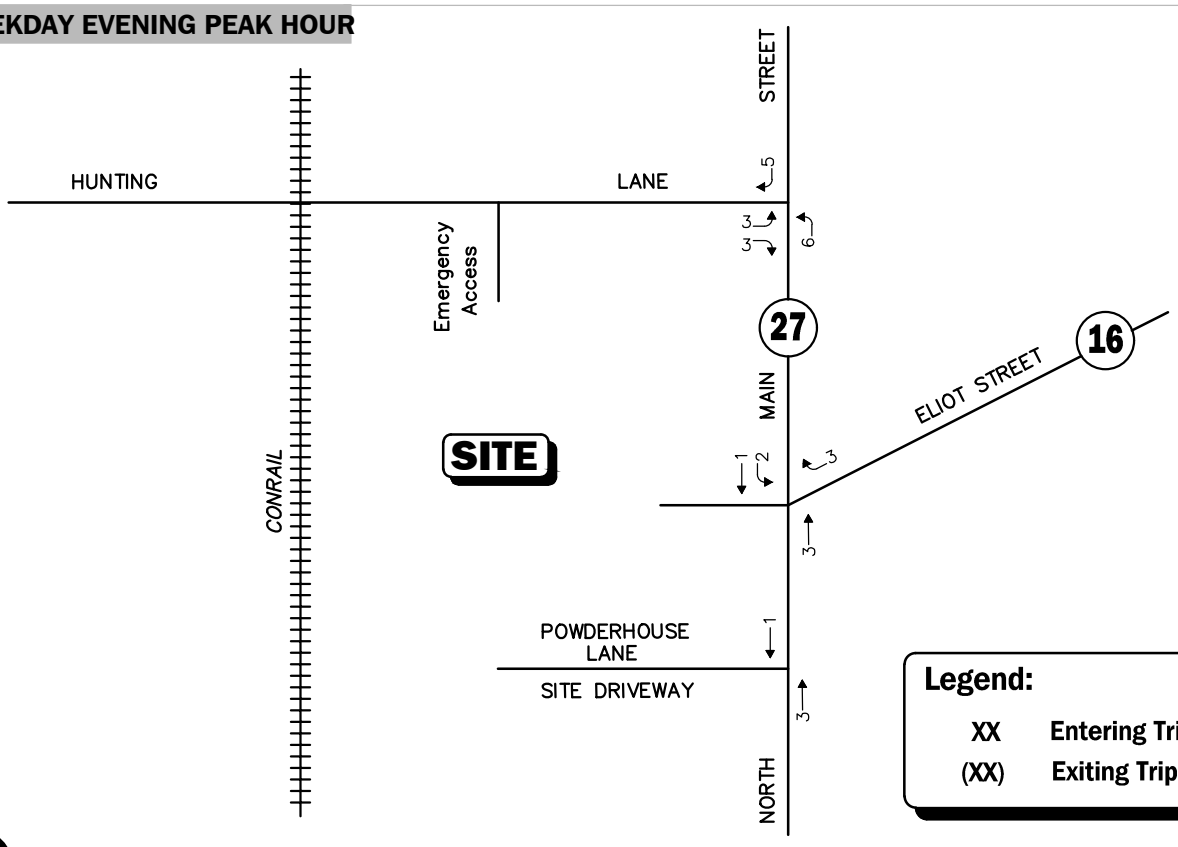
Adjusted Rate: 1.5

BACKGROUND DEVELOPMENT NETWORKS

WEEKDAY MORNING PEAK HOUR



WEEKDAY EVENING PEAK HOUR



Legend:

XX	Entering Trips
(XX)	Exiting Trips

Not To Scale

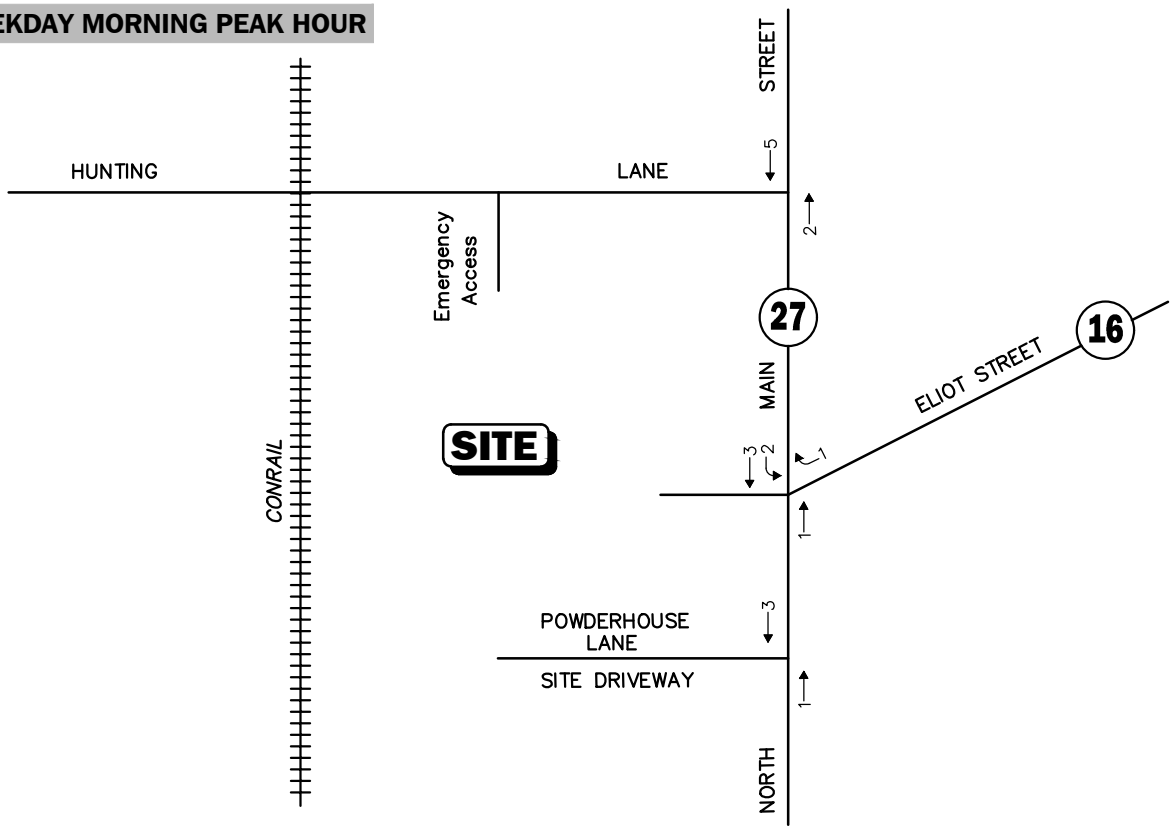
Figure A

Background Development
31 Hunting Lane

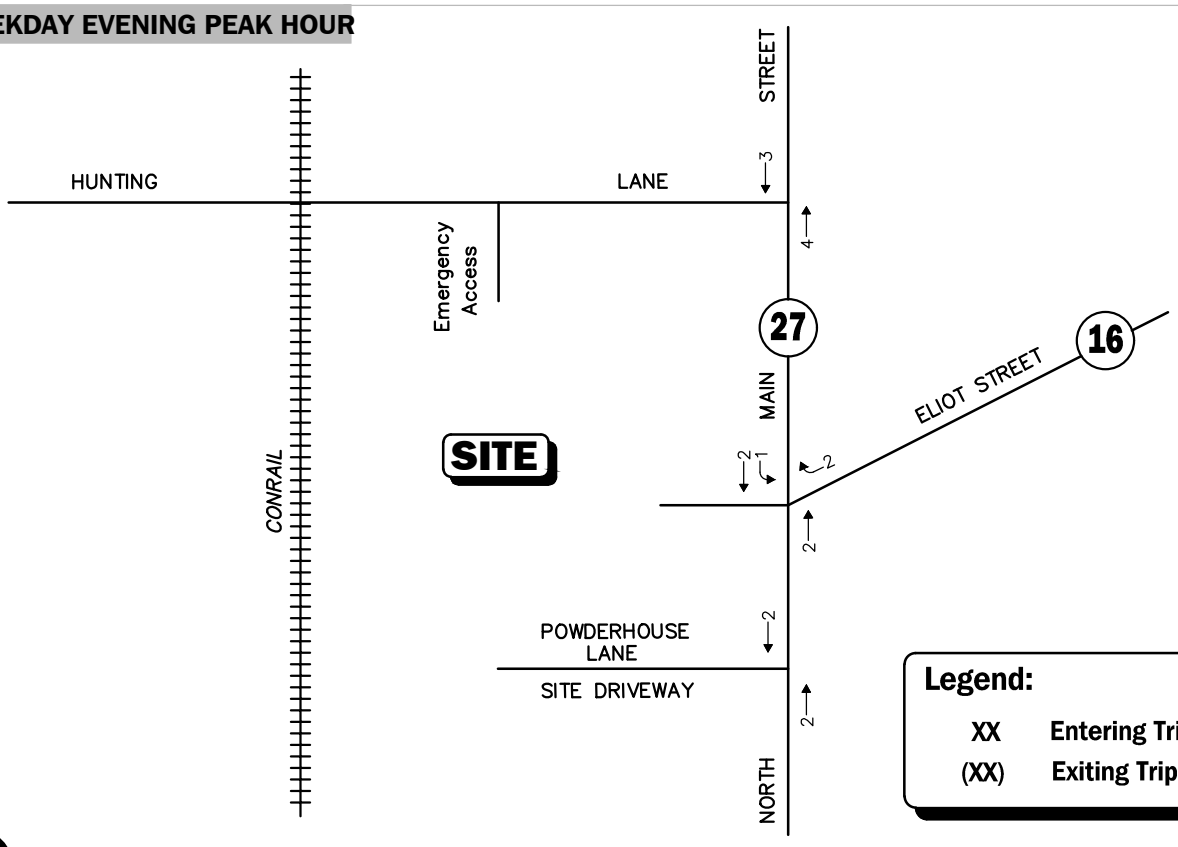
Vanasse & Associates inc

10/2/2020 9:34:07 AM, R:\8582

WEEKDAY MORNING PEAK HOUR



WEEKDAY EVENING PEAK HOUR



Legend:

XX	Entering Trips
(XX)	Exiting Trips

Not To Scale

Figure B

Background Development
59 North Main Street

Vanasse & Associates inc

10/2/2020 9:34:28 AM, R:\8582

TRIP-GENERATION CALCULATIONS

Land Use: 221
Multifamily Housing (Mid-Rise)

Description

Mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have between three and 10 levels (floors). Multifamily housing (low-rise) (Land Use 220), multifamily housing (high-rise) (Land Use 222), off-campus student apartment (Land Use 225), and mid-rise residential with 1st-floor commercial (Land Use 231) are related land uses.

Additional Data

In prior editions of *Trip Generation Manual*, the mid-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of vehicle trip data found no clear differences in trip making patterns between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

For the six sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.46 residents per occupied dwelling unit.

For the five sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 95.7 percent of the total dwelling units were occupied.

Time-of-day distribution data for this land use are presented in Appendix A. For the eight general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:00 and 8:00 a.m. and 4:45 and 5:45 p.m., respectively.

For the four dense multi-use urban sites with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:15 and 5:15 p.m., respectively. For the three center city core sites with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 6:45 and 7:45 a.m. and 5:00 and 6:00 p.m., respectively.

For the six sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.46 residents per occupied dwelling unit.

For the five sites for which data were provided for both occupied dwelling units and total dwelling units, an average of 95.7 percent of the units were occupied.

The average numbers of person trips per vehicle trip at the five center city core sites at which both person trip and vehicle trip data were collected were as follows:

- 1.84 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.94 during Weekday, AM Peak Hour of Generator
- 2.07 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.59 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the 32 dense multi-use urban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.90 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.90 during Weekday, AM Peak Hour of Generator
- 2.00 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.08 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the 13 general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.56 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.88 during Weekday, AM Peak Hour of Generator
- 1.70 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 2.07 during Weekday, PM Peak Hour of Generator

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), British Columbia (CAN), California, Delaware, District of Columbia, Florida, Georgia, Illinois, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, Ontario, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Utah, Virginia, and Wisconsin.

Source Numbers

168, 188, 204, 305, 306, 321, 357, 390, 436, 525, 530, 579, 638, 818, 857, 866, 901, 904, 910, 912, 918, 934, 936, 939, 944, 947, 948, 949, 959, 963, 964, 966, 967, 969, 970

Multifamily Housing (Mid-Rise)
(221)

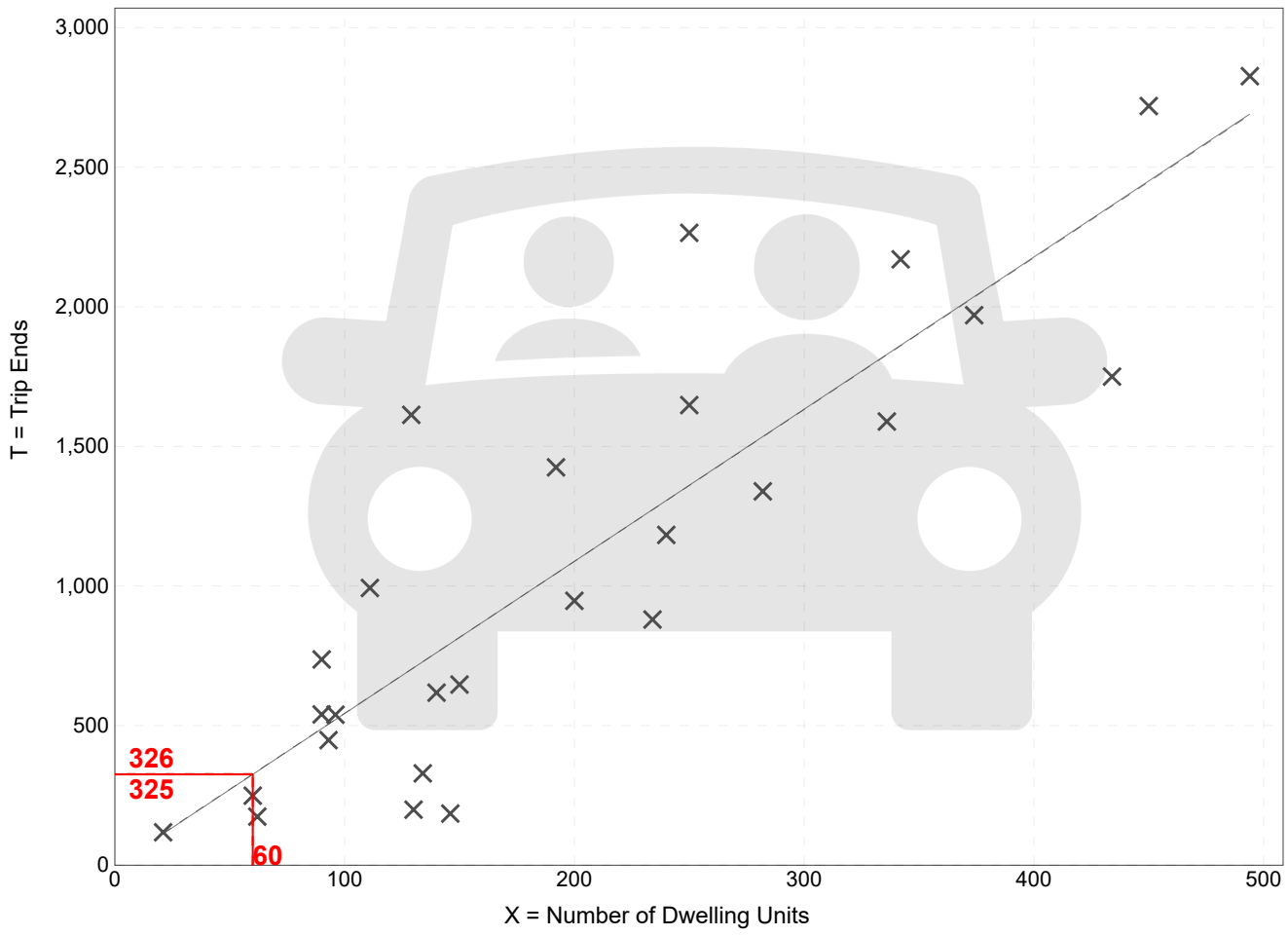
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 27
Avg. Num. of Dwelling Units: 205
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
5.44	1.27 - 12.50	2.03

Data Plot and Equation



Fitted Curve Equation: T = 5.45(X) - 1.75

R^2= 0.77

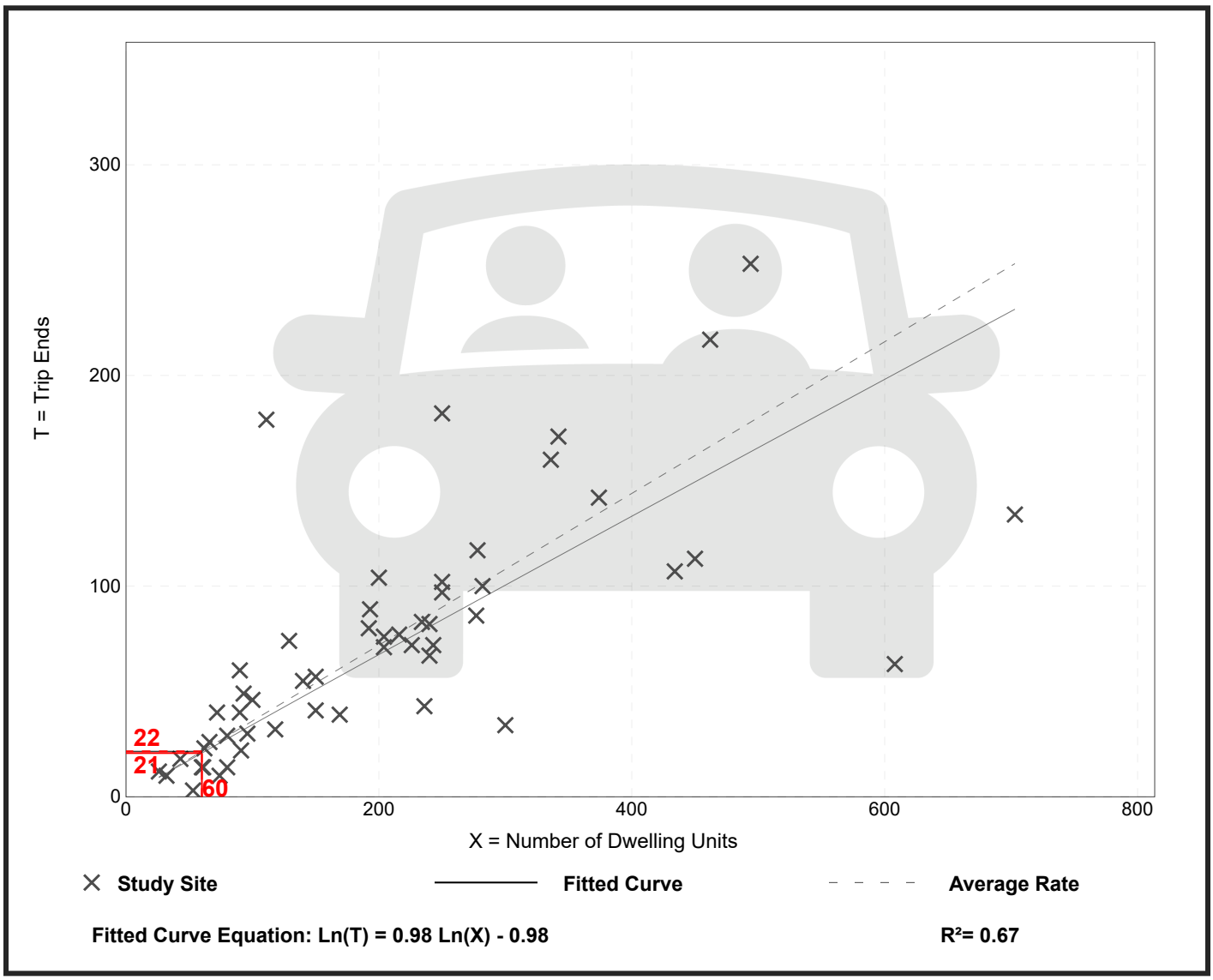
Multifamily Housing (Mid-Rise)
(221)

Vehicle Trip Ends vs: **Dwelling Units**
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: 53
Avg. Num. of Dwelling Units: 207
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.36	0.06 - 1.61	0.19

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.98 Ln(X) - 0.98

R^2= 0.67

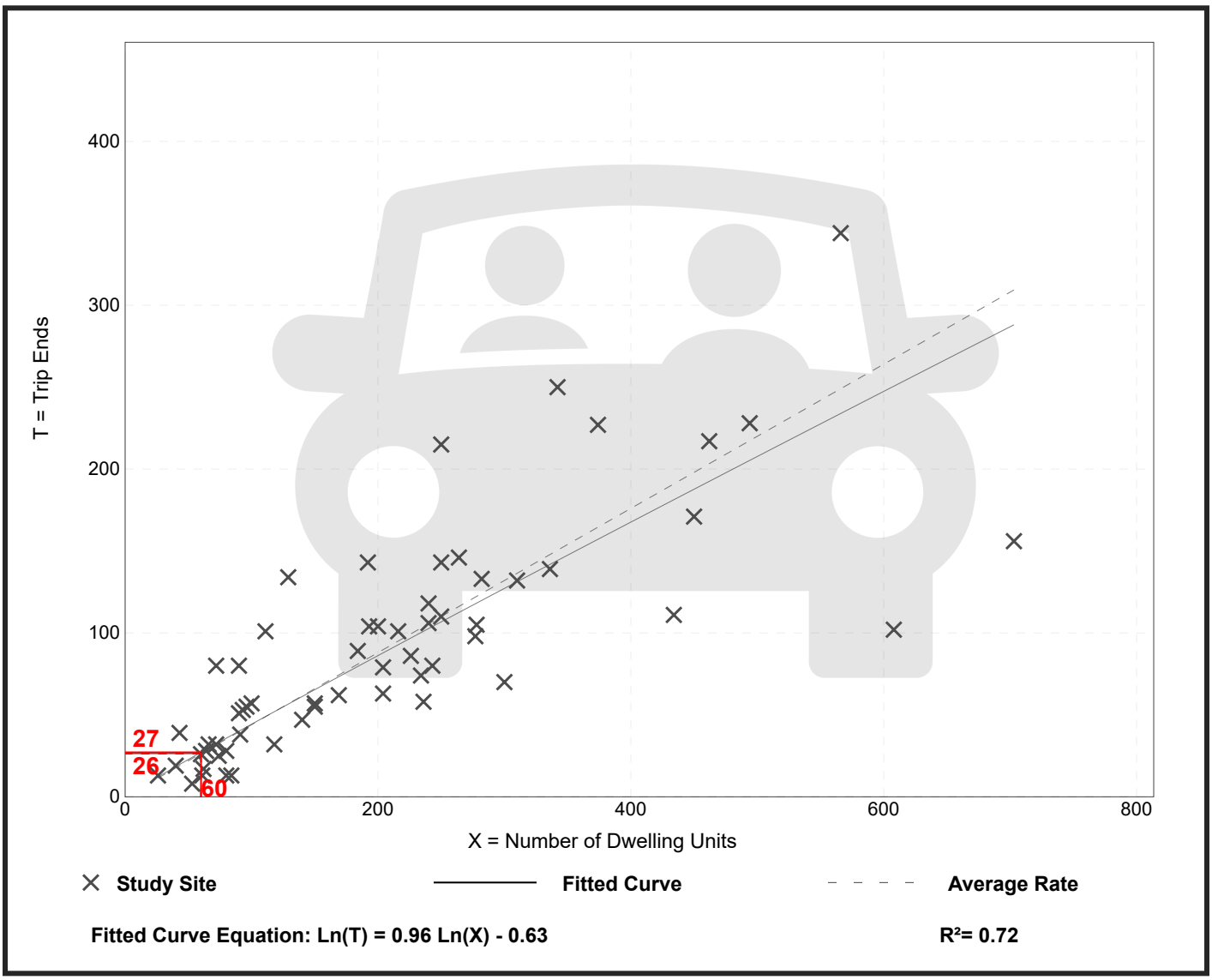
Multifamily Housing (Mid-Rise)
(221)

Vehicle Trip Ends vs: **Dwelling Units**
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: 60
Avg. Num. of Dwelling Units: 208
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.44	0.15 - 1.11	0.19

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.96 Ln(X) - 0.63

R^2= 0.72

TRIP-DISTRIBUTION CALCULATIONS

Table 3. Residence MCD/County to Workplace MCD/County Commuting Flows for the United

For more information on sampling and estimation methods, confidentiality protection, and sampling and
Universe: Workers 16 years and over.

Commuting flows are sorted by residence state, residence county, and residence minor civil division.

Residence						Place of Work			Commuting Flow		
State FIPS Code	County FIPS Code	Minor Civil Division FIPS Code	State Name	County Name	Minor Civil Division Name	State Name	County Name	Minor Civil Division Name	Workers in Commuting Flow		
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Suffolk	Boston	331	16.4%	20.1%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Sherborn	299	14.8%	18.2%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Natick	194	9.6%	11.8%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Framingh	155	7.7%	9.4%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Norfolk	Wellesley	127	6.3%	7.7%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Newton	106	5.3%	6.4%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Waltham	98	4.9%	6.0%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Worcester	Worcester	50	2.5%	3.0%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Concord	42	2.1%	2.6%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Norfolk	Dover	42	2.1%	2.6%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Worcester	Westboro	42	2.1%	2.6%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Weston	31	1.5%	1.9%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Wayland	29	1.4%	1.8%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Norfolk	Needham	28	1.4%	1.7%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Norfolk	Westwoo	26	1.3%	1.6%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Cambridg	24	1.2%	1.5%
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Holliston	23	1.1%	1.4%

Exiting				%	Entering				%
Matrix %					Matrix %				
Hunting Lane	Route 27 North	Eliot Street East	Route 27 South		Hunting Lane	Route 27 North	Eliot Street East	Route 27 South	
	0.5	0.5		1		0.5	0.5		1
	0.2		0.8	1		0.2		0.8	1
	1			1		1			1
0.8	0.2			1	0.8	0.2			1
	0.5	0.5		1		0.5	0.5		1
	0.5	0.5		1		0.5	0.5		1
	0.5	0.5		1		0.5	0.5		1
	0.9		0.1	1		0.9		0.1	1
	1			1		1			1
		0.6	0.4	1			0.6	0.4	1
	0.4		0.6	1		0.4		0.6	1
	0.5	0.5		1		0.5	0.5		1
	1			1		1			1
		0.6	0.4	1			0.6	0.4	1
			1	1				1	1
	0.5	0.5		1		0.5	0.5		1
			1	1				1	1

Table 3. Residence MCD/County to Workplace MCD/County Commuting Flows for the United

For more information on sampling and estimation methods, confidentiality protection, and sampling and
Universe: Workers 16 years and over.

Commuting flows are sorted by residence state, residence county, and residence minor civil division.

Residence						Place of Work			Commuting Flow												
												Exiting				%	Entering				%
												Trip Distribution					Trip Disribution				
State FIPS Code	County FIPS Code	Minor Civil Division FIPS Code	State Name	County Name	Minor Civil Division Name	State Name	County Name	Minor Civil Division Name	Workers in Commuting Flow			Hunting Lane	Route 27 North	Eliot Street East	Route 27 South		Hunting Lane	Route 27 North	Eliot Street East	Route 27 South	
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Suffolk	Boston	331	16.4%	20.1%	0	165.5	165.5	0	331	0	165.5	165.5	0	331
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Sherborn	299	14.8%	18.2%	0	59.8	0	239.2	299	0	59.8	0	239.2	299
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Natick	194	9.6%	11.8%	0	194	0	0	194	0	194	0	0	194
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Framingh	155	7.7%	9.4%	124	31	0	0	155	124	31	0	0	155
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Norfolk	Wellesley	127	6.3%	7.7%	0	63.5	63.5	0	127	0	63.5	63.5	0	127
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Newton	106	5.3%	6.4%	0	53	53	0	106	0	53	53	0	106
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Waltham	98	4.9%	6.0%	0	49	49	0	98	0	49	49	0	98
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Worcester	Worcester	50	2.5%	3.0%	0	45	0	5	50	0	45	0	5	50
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Concord	42	2.1%	2.6%	0	42	0	0	42	0	42	0	0	42
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Norfolk	Dover	42	2.1%	2.6%	0	0	25.2	16.8	42	0	0	25.2	16.8	42
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Worcester	Westboro	42	2.1%	2.6%	0	16.8	0	25.2	42	0	16.8	0	25.2	42
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Weston	31	1.5%	1.9%	0	15.5	15.5	0	31	0	15.5	15.5	0	31
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Wayland	29	1.4%	1.8%	0	29	0	0	29	0	29	0	0	29
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Norfolk	Needham	28	1.4%	1.7%	0	0	16.8	11.2	28	0	0	16.8	11.2	28
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Norfolk	Westwoo	26	1.3%	1.6%	0	0	0	26	26	0	0	0	26	26
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Cambridg	24	1.2%	1.5%	0	12	12	0	24	0	12	12	0	24
25	017	61380	Massachu	Middlesex	Sherborn	Massachu	Middlesex	Holliston	23	1.1%	1.4%	0	0	0	23	23	0	0	0	23	23
																1647					1647
									2,019			124	776.1	400.5	346.4		124	776.1	400.5	346.4	
									1,647			7.5%	47.1%	24.3%	21.0%		7.5%	47.1%	24.3%	21.0%	
											Use	5%	45%	25%	25%		5%	45%	25%	25%	

CAPACITY ANALYSIS

Route 27/Hunting Lane
Route 27/Route 16
Route 27/Powderhouse Lane

Route 27/Hunting Lane

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	18	16	937	475	10
Future Vol, veh/h	11	18	16	937	475	10
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	12	20	17	1018	516	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1574	522	527	0	-	0
Stage 1	522	-	-	-	-	-
Stage 2	1052	-	-	-	-	-
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	121	555	1040	-	-	-
Stage 1	595	-	-	-	-	-
Stage 2	336	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	116	555	1040	-	-	-
Mov Cap-2 Maneuver	116	-	-	-	-	-
Stage 1	572	-	-	-	-	-
Stage 2	336	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.3	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1040	-	228	-	-
HCM Lane V/C Ratio	0.017	-	0.138	-	-
HCM Control Delay (s)	8.5	0	23.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	18	16	501	776	10
Future Vol, veh/h	13	18	16	501	776	10
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	14	20	17	545	843	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1428	849	854	0	-	0
Stage 1	849	-	-	-	-	-
Stage 2	579	-	-	-	-	-
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	149	361	785	-	-	-
Stage 1	419	-	-	-	-	-
Stage 2	560	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	144	361	785	-	-	-
Mov Cap-2 Maneuver	144	-	-	-	-	-
Stage 1	406	-	-	-	-	-
Stage 2	560	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.2	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	785	-	221	-	-
HCM Lane V/C Ratio	0.022	-	0.152	-	-
HCM Control Delay (s)	9.7	0	24.2	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	20	19	1049	536	11
Future Vol, veh/h	12	20	19	1049	536	11
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	13	22	21	1140	583	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1771	589	595	0	-	0
Stage 1	589	-	-	-	-	-
Stage 2	1182	-	-	-	-	-
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	91	508	981	-	-	-
Stage 1	554	-	-	-	-	-
Stage 2	291	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	86	508	981	-	-	-
Mov Cap-2 Maneuver	86	-	-	-	-	-
Stage 1	522	-	-	-	-	-
Stage 2	291	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	29.9	0.2	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	981	-	179	-	-
HCM Lane V/C Ratio	0.021	-	0.194	-	-
HCM Control Delay (s)	8.7	0	29.9	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	21	18	565	871	11
Future Vol, veh/h	14	21	18	565	871	11
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	15	23	20	614	947	12

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1607	953	959	0	-	0
Stage 1	953	-	-	-	-	-
Stage 2	654	-	-	-	-	-
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	116	314	717	-	-	-
Stage 1	375	-	-	-	-	-
Stage 2	517	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	111	314	717	-	-	-
Mov Cap-2 Maneuver	111	-	-	-	-	-
Stage 1	359	-	-	-	-	-
Stage 2	517	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	30.1	0.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	717	-	181	-	-
HCM Lane V/C Ratio	0.027	-	0.21	-	-
HCM Control Delay (s)	10.2	0	30.1	-	-
HCM Lane LOS	B	A	D	-	-
HCM 95th %tile Q(veh)	0.1	-	0.8	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	25	21	1049	536	12
Future Vol, veh/h	17	25	21	1049	536	12
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	18	27	23	1140	583	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1776	590	596	0	-	0
Stage 1	590	-	-	-	-	-
Stage 2	1186	-	-	-	-	-
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	91	508	980	-	-	-
Stage 1	554	-	-	-	-	-
Stage 2	290	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	85	508	980	-	-	-
Mov Cap-2 Maneuver	85	-	-	-	-	-
Stage 1	519	-	-	-	-	-
Stage 2	290	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	34	0.2	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	980	-	169	-	-
HCM Lane V/C Ratio	0.023	-	0.27	-	-
HCM Control Delay (s)	8.8	0	34	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0.1	-	1	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	24	24	565	871	16
Future Vol, veh/h	17	24	24	565	871	16
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	18	26	26	614	947	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1622	956	964	0	-	0
Stage 1	956	-	-	-	-	-
Stage 2	666	-	-	-	-	-
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	113	313	714	-	-	-
Stage 1	373	-	-	-	-	-
Stage 2	511	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	107	313	714	-	-	-
Mov Cap-2 Maneuver	107	-	-	-	-	-
Stage 1	352	-	-	-	-	-
Stage 2	511	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	32.7	0.4	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	714	-	174	-	-
HCM Lane V/C Ratio	0.037	-	0.256	-	-
HCM Control Delay (s)	10.2	0	32.7	-	-
HCM Lane LOS	B	A	D	-	-
HCM 95th %tile Q(veh)	0.1	-	1	-	-

Route 27/Route 16

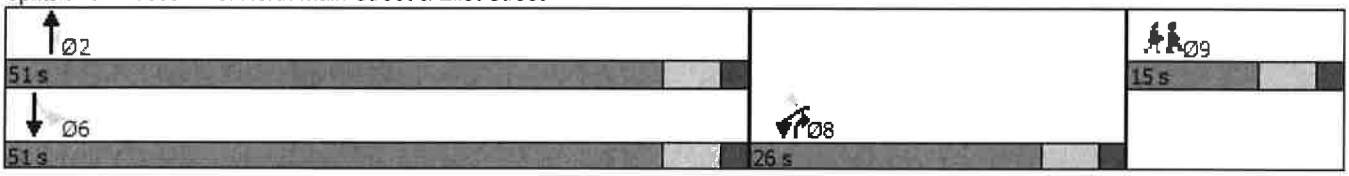
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	146	25	928	580	23	470	
Future Volume (vph)	146	25	928	580	23	470	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	90		155	0		
Storage Lanes	1	1		1	0		
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850		0.850			
Flt Protected	0.950					0.998	
Satd. Flow (prot)	1752	1272	1827	1553	0	1782	
Flt Permitted	0.950					0.854	
Satd. Flow (perm)	1752	1272	1827	1553	0	1525	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		40		604			
Link Speed (mph)	40		30			30	
Link Distance (ft)	285		340			370	
Travel Time (s)	4.9		7.7			8.4	
Lane Group Flow (vph)	247	42	967	604	0	554	
Turn Type	Prot	Perm	NA	pm+ov	Perm	NA	
Protected Phases	8		2	8		6	9
Permitted Phases	8	8		2	6		
Detector Phase	8	8	2	8	6	6	
Switch Phase							
Minimum Initial (s)	1.0	1.0	5.0	1.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	26.0	26.0	51.0	26.0	51.0	51.0	15.0
Total Split (%)	28.3%	28.3%	55.4%	28.3%	55.4%	55.4%	16%
Maximum Green (s)	20.0	20.0	45.0	20.0	45.0	45.0	9.0
Yellow Time (s)	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
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0		4.0	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	None	None	None	None
Walk Time (s)							7.0
Flash Dont Walk (s)							11.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	17.8	17.8	47.1	72.9		47.1	
Actuated g/C Ratio	0.24	0.24	0.65	1.00		0.65	
v/c Ratio	0.58	0.12	0.82	0.39		0.56	
Control Delay	29.9	8.6	18.6	0.7		10.8	
Queue Delay	0.0	0.0	0.0	0.0		0.0	
Total Delay	29.9	8.6	18.6	0.7		10.8	
LOS	C	A	B	A		B	
Approach Delay	26.8		11.7			10.8	
Approach LOS	C		B			B	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Queue Length 50th (ft)	98	1	288	0		122	
Queue Length 95th (ft)	99	10	#637	0		233	
Internal Link Dist (ft)	205		260			290	
Turn Bay Length (ft)		90		155			
Base Capacity (vph)	529	412	1180	1543		985	
Starvation Cap Reductn	0	0	0	0		0	
Spillback Cap Reductn	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0		0	
Reduced v/c Ratio	0.47	0.10	0.82	0.39		0.56	

Intersection Summary

Area Type: Other
Cycle Length: 92
Actuated Cycle Length: 72.9
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 13.3 Intersection LOS: B
Intersection Capacity Utilization 68.6% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

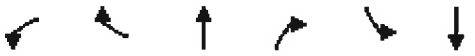
Splits and Phases: 5: North Main Street & Eliot Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	146	25	928	580	23	470
Future Volume (vph)	146	25	928	580	23	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1752	1272	1827	1553		1781
Flt Permitted	0.95	1.00	1.00	1.00		0.85
Satd. Flow (perm)	1752	1272	1827	1553		1525
Peak-hour factor, PHF	0.59	0.59	0.96	0.96	0.89	0.89
Adj. Flow (vph)	247	42	967	604	26	528
RTOR Reduction (vph)	0	30	0	66	0	0
Lane Group Flow (vph)	247	12	967	538	0	554
Heavy Vehicles (%)	3%	27%	4%	4%	15%	6%
Turn Type	Prot	Perm	NA	pm+ov	Perm	NA
Protected Phases	8		2	8		6
Permitted Phases	8	8		2	6	
Actuated Green, G (s)	15.8	15.8	45.1	60.9		45.1
Effective Green, g (s)	17.8	17.8	47.1	64.9		47.1
Actuated g/C Ratio	0.24	0.24	0.65	0.89		0.65
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	427	310	1180	1553		985
v/s Ratio Prot	c0.14		c0.53	0.08		
v/s Ratio Perm		0.01		0.26		0.36
v/c Ratio	0.58	0.04	0.82	0.35		0.56
Uniform Delay, d1	24.2	21.0	9.7	0.6		7.2
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.9	0.1	4.6	0.1		0.7
Delay (s)	26.1	21.1	14.3	0.8		7.9
Level of Service	C	C	B	A		A
Approach Delay (s)	25.4		9.1			7.9
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	72.9	Sum of lost time (s)	14.0
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	586	2	515	247	3	791	
Future Volume (vph)	586	2	515	247	3	791	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	90		155	0		
Storage Lanes	1	1		1	0		
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850		0.850			
Flt Protected	0.950						
Satd. Flow (prot)	1752	1615	1863	1615	0	1900	
Flt Permitted	0.950					0.999	
Satd. Flow (perm)	1752	1615	1863	1615	0	1898	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		1		278			
Link Speed (mph)	40		30			30	
Link Distance (ft)	285		340			370	
Travel Time (s)	4.9		7.7			8.4	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.92	0.92	
Heavy Vehicles (%)	3%	0%	2%	0%	1%	0%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	637	2	579	278	0	863	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	12		0			0	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Protected Phases	8		2	8		6	9
Permitted Phases	8	8		2	6		
Minimum Initial (s)	1.0	1.0	5.0	1.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	26.0	26.0	51.0	26.0	51.0	51.0	15.0
Total Split (%)	28.3%	28.3%	55.4%	28.3%	55.4%	55.4%	16%
Maximum Green (s)	20.0	20.0	45.0	20.0	45.0	45.0	9.0
Yellow Time (s)	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
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	None	None	None	None
Walk Time (s)							7.0
Flash Dont Walk (s)							11.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	22.3	22.3	39.9	70.3		39.9	
Actuated g/C Ratio	0.32	0.32	0.57	1.00		0.57	
v/c Ratio	1.15	0.00	0.55	0.17		0.80	



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Control Delay	114.0	17.0	11.4	0.2		18.4	
Queue Delay	0.0	0.0	0.0	0.0		0.0	
Total Delay	114.0	17.0	11.4	0.2		18.4	
LOS	F	B	B	A		B	
Approach Delay	113.7		7.8			18.4	
Approach LOS	F		A			B	
Queue Length 50th (ft)	~356	0	140	0		264	
Queue Length 95th (ft)	#587	5	213	0		414	
Internal Link Dist (ft)	205		260			290	
Turn Bay Length (ft)		90		155			
Base Capacity (vph)	554	512	1260	1615		1283	
Starvation Cap Reductn	0	0	0	0		0	
Spillback Cap Reductn	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0		0	
Reduced v/c Ratio	1.15	0.00	0.46	0.17		0.67	

Intersection Summary

Area Type: Other
Cycle Length: 92
Actuated Cycle Length: 70.3
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.15
Intersection Signal Delay: 40.4 Intersection LOS: D
Intersection Capacity Utilization 83.1% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	586	2	515	247	3	791
Future Volume (vph)	586	2	515	247	3	791
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1752	1615	1863	1615		1900
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	1752	1615	1863	1615		1897
Peak-hour factor, PHF	0.92	0.92	0.89	0.89	0.92	0.92
Adj. Flow (vph)	637	2	579	278	3	860
RTOR Reduction (vph)	0	1	0	32	0	0
Lane Group Flow (vph)	637	1	579	246	0	863
Heavy Vehicles (%)	3%	0%	2%	0%	1%	0%
Turn Type	Prot	Perm	NA	pm+ov	Perm	NA
Protected Phases	8		2	8		6
Permitted Phases	8	8		2	6	
Actuated Green, G (s)	20.2	20.2	37.9	58.1		37.9
Effective Green, g (s)	22.2	22.2	39.9	62.1		39.9
Actuated g/C Ratio	0.32	0.32	0.57	0.89		0.57
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	554	511	1060	1615		1079
v/s Ratio Prot	c0.36		0.31	0.05		
v/s Ratio Perm		0.00		0.10		c0.45
v/c Ratio	1.15	0.00	0.55	0.15		0.80
Uniform Delay, d1	23.9	16.4	9.4	0.5		11.9
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	86.8	0.0	0.6	0.0		4.2
Delay (s)	110.7	16.4	10.0	0.6		16.2
Level of Service	F	B	B	A		B
Approach Delay (s)	110.4		7.0			16.2
Approach LOS	F		A			B

Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	70.1	Sum of lost time (s)	14.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	163	29	1039	648	28	528	
Future Volume (vph)	163	29	1039	648	28	528	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	90		155	0		
Storage Lanes	1	1		1	0		
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850		0.850			
Flt Protected	0.950					0.998	
Satd. Flow (prot)	1752	1272	1827	1553	0	1781	
Flt Permitted	0.950					0.617	
Satd. Flow (perm)	1752	1272	1827	1553	0	1101	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		42		675			
Link Speed (mph)	40		30			30	
Link Distance (ft)	285		340			370	
Travel Time (s)	4.9		7.7			8.4	
Peak Hour Factor	0.59	0.59	0.96	0.96	0.89	0.89	
Heavy Vehicles (%)	3%	27%	4%	4%	15%	6%	
Adj. Flow (vph)	276	49	1082	675	31	593	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	276	49	1082	675	0	624	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	12		0			0	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Number of Detectors	1	1	2	1	1	2	
Detector Template	Left	Right	Thru	Right	Left	Thru	
Leading Detector (ft)	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)			94			94	
Detector 2 Size(ft)			6			6	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type	Prot	Perm	NA	pm+ov	Perm	NA	
Protected Phases	8		2	8		6	9

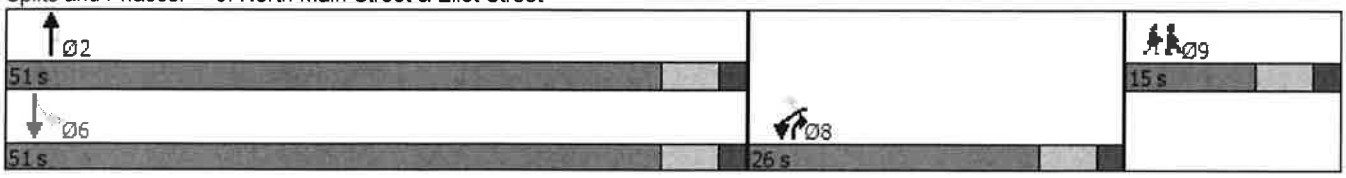
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Permitted Phases	8	8		2	6		
Detector Phase	8	8	2	8	6	6	
Switch Phase							
Minimum Initial (s)	1.0	1.0	5.0	1.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	26.0	26.0	51.0	26.0	51.0	51.0	15.0
Total Split (%)	28.3%	28.3%	55.4%	28.3%	55.4%	55.4%	16%
Maximum Green (s)	20.0	20.0	45.0	20.0	45.0	45.0	9.0
Yellow Time (s)	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
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0		4.0	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	None	None	None	None
Walk Time (s)							7.0
Flash Dont Walk (s)							11.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	18.7	18.7	47.1	73.9		47.1	
Actuated g/C Ratio	0.25	0.25	0.64	1.00		0.64	
v/c Ratio	0.62	0.14	0.93	0.43		0.89	
Control Delay	31.0	9.4	29.1	0.9		30.8	
Queue Delay	0.0	0.0	0.0	0.0		0.0	
Total Delay	31.0	9.4	29.1	0.9		30.8	
LOS	C	A	C	A		C	
Approach Delay	27.8		18.3			30.8	
Approach LOS	C		B			C	
Queue Length 50th (ft)	111	2	417	0		226	
Queue Length 95th (ft)	110	12	#760	0		#476	
Internal Link Dist (ft)	205		260			290	
Turn Bay Length (ft)		90		155			
Base Capacity (vph)	523	409	1165	1547		702	
Starvation Cap Reductn	0	0	0	0		0	
Spillback Cap Reductn	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0		0	
Reduced v/c Ratio	0.53	0.12	0.93	0.44		0.89	

Intersection Summary			
Area Type:	Other		
Cycle Length: 92			
Actuated Cycle Length: 73.9			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 22.3		Intersection LOS: C	
Intersection Capacity Utilization 76.1%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: North Main Street & Eliot Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	163	29	1039	648	28	528
Future Volume (vph)	163	29	1039	648	28	528
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1752	1272	1827	1553		1781
Flt Permitted	0.95	1.00	1.00	1.00		0.62
Satd. Flow (perm)	1752	1272	1827	1553		1101
Peak-hour factor, PHF	0.59	0.59	0.96	0.96	0.89	0.89
Adj. Flow (vph)	276	49	1082	675	31	593
RTOR Reduction (vph)	0	31	0	73	0	0
Lane Group Flow (vph)	276	18	1082	602	0	624
Heavy Vehicles (%)	3%	27%	4%	4%	15%	6%
Turn Type	Prot	Perm	NA	pm+ov	Perm	NA
Protected Phases	8		2	8		6
Permitted Phases	8	8		2	6	
Actuated Green, G (s)	16.7	16.7	45.1	61.8		45.1
Effective Green, g (s)	18.7	18.7	47.1	65.8		47.1
Actuated g/C Ratio	0.25	0.25	0.64	0.89		0.64
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	443	322	1166	1553		702
v/s Ratio Prot	c0.16		c0.59	0.10		
v/s Ratio Perm		0.01		0.29		0.57
v/c Ratio	0.62	0.05	0.93	0.39		0.89
Uniform Delay, d1	24.4	20.9	11.8	0.7		11.2
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	2.7	0.1	12.5	0.2		13.1
Delay (s)	27.1	20.9	24.4	0.8		24.3
Level of Service	C	C	C	A		C
Approach Delay (s)	26.2		15.3			24.3
Approach LOS	C		B			C

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	654	4	579	277	4	888	
Future Volume (vph)	654	4	579	277	4	888	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	90		155	0		
Storage Lanes	1	1		1	0		
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850		0.850			
Flt Protected	0.950						
Satd. Flow (prot)	1752	1615	1863	1615	0	1900	
Flt Permitted	0.950					0.998	
Satd. Flow (perm)	1752	1615	1863	1615	0	1896	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		1		311			
Link Speed (mph)	40		30			30	
Link Distance (ft)	285		340			370	
Travel Time (s)	4.9		7.7			8.4	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.92	0.92	
Heavy Vehicles (%)	3%	0%	2%	0%	1%	0%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	711	4	651	311	0	969	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	12		0			0	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Turn Type	Prot	Perm	NA	pm+ov	Perm	NA	
Protected Phases	8		2	8		6	9
Permitted Phases	8	8		2	6		
Minimum Initial (s)	1.0	1.0	5.0	1.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	26.0	26.0	51.0	26.0	51.0	51.0	24.0
Total Split (%)	25.7%	25.7%	50.5%	25.7%	50.5%	50.5%	24%
Maximum Green (s)	20.0	20.0	45.0	20.0	45.0	45.0	18.0
Yellow Time (s)	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
Total Lost Time (s)	4.0	4.0	4.0	4.0		4.0	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	None	Min	Min	None
Walk Time (s)							7.0
Flash Dont Walk (s)							11.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	22.0	22.0	47.0	77.0		47.0	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Actuated g/C Ratio	0.29	0.29	0.61	1.00		0.61	
v/c Ratio	1.42	0.01	0.57	0.19		0.84	
Control Delay	227.5	18.2	11.5	0.3		20.6	
Queue Delay	0.0	0.0	0.0	0.0		0.0	
Total Delay	227.5	18.2	11.5	0.3		20.6	
LOS	F	B	B	A		C	
Approach Delay	226.4		7.9			20.6	
Approach LOS	F		A			C	
Queue Length 50th (ft)	~468	1	167	0		331	
Queue Length 95th (ft)	#669	8	253	0		#567	
Internal Link Dist (ft)	205		260			290	
Turn Bay Length (ft)		90		155			
Base Capacity (vph)	500	462	1137	1615		1157	
Starvation Cap Reductn	0	0	0	0		0	
Spillback Cap Reductn	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0		0	
Reduced v/c Ratio	1.42	0.01	0.57	0.19		0.84	

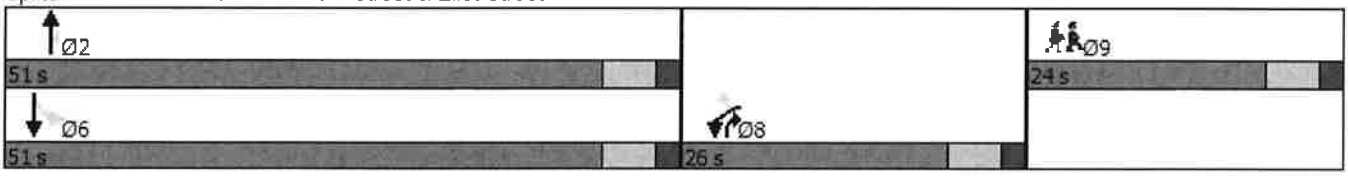
Intersection Summary

Area Type: Other
Cycle Length: 101
Actuated Cycle Length: 77
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.42
Intersection Signal Delay: 71.6 Intersection LOS: E
Intersection Capacity Utilization 92.8% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: North Main Street & Eliot Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	654	4	579	277	4	888
Future Volume (vph)	654	4	579	277	4	888
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1752	1615	1863	1615		1900
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	1752	1615	1863	1615		1896
Peak-hour factor, PHF	0.92	0.92	0.89	0.89	0.92	0.92
Adj. Flow (vph)	711	4	651	311	4	965
RTOR Reduction (vph)	0	1	0	32	0	0
Lane Group Flow (vph)	711	3	651	279	0	969
Heavy Vehicles (%)	3%	0%	2%	0%	1%	0%
Turn Type	Prot	Perm	NA	pm+ov	Perm	NA
Protected Phases	8		2	8		6
Permitted Phases	8	8		2	6	
Actuated Green, G (s)	20.0	20.0	45.0	65.0		45.0
Effective Green, g (s)	22.0	22.0	47.0	69.0		47.0
Actuated g/C Ratio	0.29	0.29	0.61	0.90		0.61
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	500	461	1137	1615		1157
v/s Ratio Prot	c0.41		0.35	0.05		
v/s Ratio Perm		0.00		0.12		c0.51
v/c Ratio	1.42	0.01	0.57	0.17		0.84
Uniform Delay, d1	27.5	19.7	9.0	0.5		12.0
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	201.3	0.0	0.7	0.1		5.4
Delay (s)	228.8	19.7	9.7	0.5		17.4
Level of Service	F	B	A	A		B
Approach Delay (s)	227.7		6.7			17.4
Approach LOS	F		A			B

Intersection Summary			
HCM 2000 Control Delay	70.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	77.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

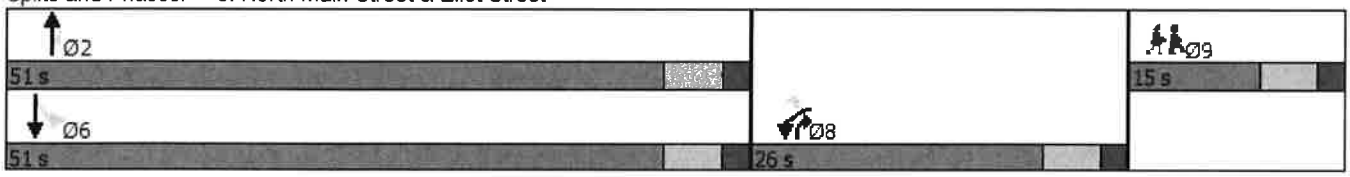
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	163	30	1040	648	31	530	
Future Volume (vph)	163	30	1040	648	31	530	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	90		155	0		
Storage Lanes	1	1		1	0		
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850		0.850			
Flt Protected	0.950					0.997	
Satd. Flow (prot)	1752	1272	1827	1553	0	1893	
Flt Permitted	0.950					0.587	
Satd. Flow (perm)	1752	1272	1827	1553	0	1115	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		44		675			
Link Speed (mph)	40		30			30	
Link Distance (ft)	285		340			370	
Travel Time (s)	4.9		7.7			8.4	
Peak Hour Factor	0.59	0.59	0.96	0.96	0.89	0.89	
Heavy Vehicles (%)	3%	27%	4%	4%	1%	0%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	276	51	1083	675	0	631	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	12		0			0	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Turn Type	Prot	Perm	NA	pm+ov	Perm	NA	
Protected Phases	8		2	8		6	9
Permitted Phases	8	8		2	6		
Detector Phase	8	8	2	8	6	6	
Switch Phase							
Minimum Initial (s)	1.0	1.0	5.0	1.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	26.0	26.0	51.0	26.0	51.0	51.0	15.0
Total Split (%)	28.3%	28.3%	55.4%	28.3%	55.4%	55.4%	16%
Maximum Green (s)	20.0	20.0	45.0	20.0	45.0	45.0	9.0
Yellow Time (s)	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
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0		4.0	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	None	Min	Min	None
Walk Time (s)							7.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Flash Dont Walk (s)							11.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	18.7	18.7	47.1	73.9		47.1	
Actuated g/C Ratio	0.25	0.25	0.64	1.00		0.64	
v/c Ratio	0.62	0.14	0.93	0.43		0.89	
Control Delay	31.0	9.4	29.2	0.9		30.5	
Queue Delay	0.0	0.0	0.0	0.0		0.0	
Total Delay	31.0	9.4	29.2	0.9		30.5	
LOS	C	A	C	A		C	
Approach Delay	27.6		18.3			30.5	
Approach LOS	C		B			C	
Queue Length 50th (ft)	111	2	419	0		228	
Queue Length 95th (ft)	110	12	#761	0		#480	
Internal Link Dist (ft)	205		260			290	
Turn Bay Length (ft)		90		155			
Base Capacity (vph)	523	410	1165	1547		711	
Starvation Cap Reductn	0	0	0	0		0	
Spillback Cap Reductn	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0		0	
Reduced v/c Ratio	0.53	0.12	0.93	0.44		0.89	

Intersection Summary

Area Type: Other
Cycle Length: 92
Actuated Cycle Length: 73.9
Natural Cycle: 130
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 22.3 Intersection LOS: C
Intersection Capacity Utilization 76.4% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: North Main Street & Eliot Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	163	30	1040	648	31	530
Future Volume (vph)	163	30	1040	648	31	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1752	1272	1827	1553		1894
Flt Permitted	0.95	1.00	1.00	1.00		0.59
Satd. Flow (perm)	1752	1272	1827	1553		1115
Peak-hour factor, PHF	0.59	0.59	0.96	0.96	0.89	0.89
Adj. Flow (vph)	276	51	1083	675	35	596
RTOR Reduction (vph)	0	33	0	73	0	0
Lane Group Flow (vph)	276	18	1083	602	0	631
Heavy Vehicles (%)	3%	27%	4%	4%	1%	0%
Turn Type	Prot	Perm	NA	pm+ov	Perm	NA
Protected Phases	8		2	8		6
Permitted Phases	8	8		2	6	
Actuated Green, G (s)	16.7	16.7	45.1	61.8		45.1
Effective Green, g (s)	18.7	18.7	47.1	65.8		47.1
Actuated g/C Ratio	0.25	0.25	0.64	0.89		0.64
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	443	322	1166	1553		711
v/s Ratio Prot	c0.16		c0.59	0.10		
v/s Ratio Perm		0.01		0.29		0.57
v/c Ratio	0.62	0.06	0.93	0.39		0.89
Uniform Delay, d1	24.4	20.9	11.9	0.7		11.1
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	2.7	0.1	12.6	0.2		12.9
Delay (s)	27.1	20.9	24.5	0.8		24.0
Level of Service	C	C	C	A		C
Approach Delay (s)	26.2		15.4			24.0
Approach LOS	C		B			C

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	654	7	582	277	6	889	
Future Volume (vph)	654	7	582	277	6	889	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	90		155	0		
Storage Lanes	1	1		1	0		
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850		0.850			
Flt Protected	0.950						
Satd. Flow (prot)	1752	1615	1863	1615	0	1900	
Flt Permitted	0.950					0.996	
Satd. Flow (perm)	1752	1615	1863	1615	0	1892	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		3		311			
Link Speed (mph)	40		30			30	
Link Distance (ft)	285		340			370	
Travel Time (s)	4.9		7.7			8.4	
Peak Hour Factor	0.92	0.92	0.89	0.89	0.92	0.92	
Heavy Vehicles (%)	3%	0%	2%	0%	1%	0%	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	711	8	654	311	0	973	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	12		0			0	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Turn Type	Prot	Perm	NA	pm+ov	Perm	NA	
Protected Phases	8		2	8		6	9
Permitted Phases	8	8		2	6		
Minimum Initial (s)	1.0	1.0	5.0	1.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	26.0	26.0	51.0	26.0	51.0	51.0	15.0
Total Split (%)	28.3%	28.3%	55.4%	28.3%	55.4%	55.4%	16%
Maximum Green (s)	20.0	20.0	45.0	20.0	45.0	45.0	9.0
Yellow Time (s)	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
Total Lost Time (s)	4.0	4.0	4.0	4.0		4.0	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	None	Min	Min	None
Walk Time (s)							7.0
Flash Dont Walk (s)							11.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	22.0	22.0	47.0	77.0		47.0	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Actuated g/C Ratio	0.29	0.29	0.61	1.00		0.61	
v/c Ratio	1.42	0.02	0.58	0.19		0.84	
Control Delay	227.5	17.0	11.5	0.3		20.9	
Queue Delay	0.0	0.0	0.0	0.0		0.0	
Total Delay	227.5	17.0	11.5	0.3		20.9	
LOS	F	B	B	A		C	
Approach Delay	225.2		7.9			20.9	
Approach LOS	F		A			C	
Queue Length 50th (ft)	~468	2	168	0		334	
Queue Length 95th (ft)	#669	11	254	0		#624	
Internal Link Dist (ft)	205		260			290	
Turn Bay Length (ft)		90		155			
Base Capacity (vph)	500	463	1137	1615		1154	
Starvation Cap Reductn	0	0	0	0		0	
Spillback Cap Reductn	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0		0	
Reduced v/c Ratio	1.42	0.02	0.58	0.19		0.84	

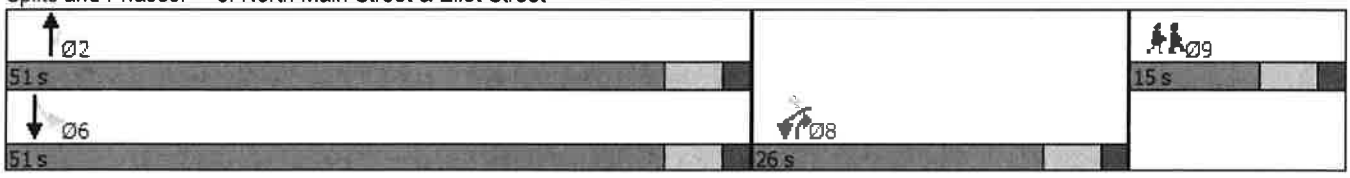
Intersection Summary

Area Type: Other
Cycle Length: 92
Actuated Cycle Length: 77
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.42
Intersection Signal Delay: 71.5 Intersection LOS: E
Intersection Capacity Utilization 94.5% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: North Main Street & Eliot Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	654	7	582	277	6	889
Future Volume (vph)	654	7	582	277	6	889
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1752	1615	1863	1615		1899
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	1752	1615	1863	1615		1892
Peak-hour factor, PHF	0.92	0.92	0.89	0.89	0.92	0.92
Adj. Flow (vph)	711	8	654	311	7	966
RTOR Reduction (vph)	0	2	0	32	0	0
Lane Group Flow (vph)	711	6	654	279	0	973
Heavy Vehicles (%)	3%	0%	2%	0%	1%	0%
Turn Type	Prot	Perm	NA	pm+ov	Perm	NA
Protected Phases	8		2	8		6
Permitted Phases	8	8		2	6	
Actuated Green, G (s)	20.0	20.0	45.0	65.0		45.0
Effective Green, g (s)	22.0	22.0	47.0	69.0		47.0
Actuated g/C Ratio	0.29	0.29	0.61	0.90		0.61
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	500	461	1137	1615		1154
v/s Ratio Prot	c0.41		0.35	0.05		
v/s Ratio Perm		0.00		0.12		c0.51
v/c Ratio	1.42	0.01	0.58	0.17		0.84
Uniform Delay, d1	27.5	19.7	9.0	0.5		12.0
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	201.3	0.0	0.7	0.1		5.8
Delay (s)	228.8	19.7	9.7	0.5		17.8
Level of Service	F	B	A	A		B
Approach Delay (s)	226.5		6.8			17.8
Approach LOS	F		A			B

Intersection Summary			
HCM 2000 Control Delay	70.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	77.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Lane Configurations							
Traffic Volume (vph)	163	30	1040	648	31	530	
Future Volume (vph)	163	30	1040	648	31	530	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	90		155	0		
Storage Lanes	1	1		1	0		
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850		0.850			
Flt Protected	0.950					0.997	
Satd. Flow (prot)	1752	1272	1827	1553	0	1893	
Flt Permitted	0.950					0.470	
Satd. Flow (perm)	1752	1272	1827	1553	0	893	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		43		577			
Link Speed (mph)	40		30			30	
Link Distance (ft)	285		340			370	
Travel Time (s)	4.9		7.7			8.4	
Peak Hour Factor	0.59	0.59	0.96	0.96	0.89	0.89	
Heavy Vehicles (%)	3%	27%	4%	4%	1%	0%	
Adj. Flow (vph)	276	51	1083	675	35	596	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	276	51	1083	675	0	631	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	12		0			0	
Link Offset(ft)	0		0			0	
Crosswalk Width(ft)	16		16			16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15	9		9	15		
Number of Detectors	1	1	2	1	1	2	
Detector Template	Left	Right	Thru	Right	Left	Thru	
Leading Detector (ft)	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	
Detector 1 Size(ft)	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)			94			94	
Detector 2 Size(ft)			6			6	
Detector 2 Type			Cl+Ex			Cl+Ex	
Detector 2 Channel							
Detector 2 Extend (s)			0.0			0.0	
Turn Type	Prot	Perm	NA	pm+ov	Perm	NA	
Protected Phases	8		2	8		6	9

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø9
Permitted Phases	8	8		2	6		
Detector Phase	8	8	2	8	6	6	
Switch Phase							
Minimum Initial (s)	1.0	1.0	5.0	1.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	28.0	28.0	43.0	28.0	43.0	43.0	24.0
Total Split (%)	29.5%	29.5%	45.3%	29.5%	45.3%	45.3%	25%
Maximum Green (s)	22.0	22.0	37.0	22.0	37.0	37.0	18.0
Yellow Time (s)	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
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		-2.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0		4.0	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Min	None	Min	Min	None
Walk Time (s)							7.0
Flash Dont Walk (s)							11.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	18.3	18.3	39.2	65.5		39.2	
Actuated g/C Ratio	0.28	0.28	0.60	1.00		0.60	
v/c Ratio	0.56	0.13	0.99	0.43		1.18	
Control Delay	24.8	7.9	42.6	0.9		119.8	
Queue Delay	0.0	0.0	0.0	0.0		0.0	
Total Delay	24.8	7.9	42.6	0.9		119.8	
LOS	C	A	D	A		F	
Approach Delay	22.1		26.6			119.8	
Approach LOS	C		C			F	
Queue Length 50th (ft)	93	2	~396	0		~317	
Queue Length 95th (ft)	94	11	#763	0		#538	
Internal Link Dist (ft)	205		260			290	
Turn Bay Length (ft)		90		155			
Base Capacity (vph)	644	495	1092	1549		533	
Starvation Cap Reductn	0	0	0	0		0	
Spillback Cap Reductn	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0		0	
Reduced v/c Ratio	0.43	0.10	0.99	0.44		1.18	

Intersection Summary			
Area Type:	Other		
Cycle Length: 95			
Actuated Cycle Length: 65.5			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.18			
Intersection Signal Delay: 47.7		Intersection LOS: D	
Intersection Capacity Utilization 76.4%		ICU Level of Service D	
Analysis Period (min) 15			

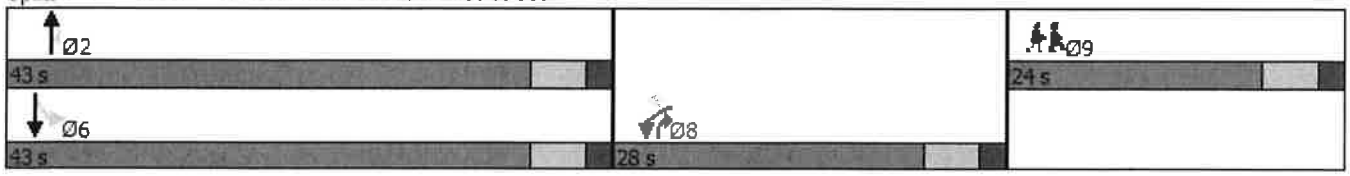
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: North Main Street & Eliot Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	163	30	1040	648	31	530
Future Volume (vph)	163	30	1040	648	31	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1752	1272	1827	1553		1894
Flt Permitted	0.95	1.00	1.00	1.00		0.47
Satd. Flow (perm)	1752	1272	1827	1553		893
Peak-hour factor, PHF	0.59	0.59	0.96	0.96	0.89	0.89
Adj. Flow (vph)	276	51	1083	675	35	596
RTOR Reduction (vph)	0	31	0	70	0	0
Lane Group Flow (vph)	276	20	1083	605	0	631
Heavy Vehicles (%)	3%	27%	4%	4%	1%	0%
Turn Type	Prot	Perm	NA	pm+ov	Perm	NA
Protected Phases	8		2	8		6
Permitted Phases	8	8		2	6	
Actuated Green, G (s)	16.3	16.3	37.2	53.5		37.2
Effective Green, g (s)	18.3	18.3	39.2	57.5		39.2
Actuated g/C Ratio	0.28	0.28	0.60	0.88		0.60
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	489	355	1093	1553		534
v/s Ratio Prot	c0.16		0.59	0.11		
v/s Ratio Perm		0.02		0.28		c0.71
v/c Ratio	0.56	0.06	0.99	0.39		1.18
Uniform Delay, d1	20.2	17.3	13.0	0.7		13.1
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.5	0.1	24.9	0.2		99.7
Delay (s)	21.7	17.3	37.9	0.9		112.9
Level of Service	C	B	D	A		F
Approach Delay (s)	21.0		23.7			112.9
Approach LOS	C		C			F

Intersection Summary			
HCM 2000 Control Delay	44.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	65.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	654	7	582	277	6	889
Future Volume (vph)	654	7	582	277	6	889
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1752	1615	1863	1615		1899
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	1752	1615	1863	1615		1891
Peak-hour factor, PHF	0.92	0.92	0.89	0.89	0.92	0.92
Adj. Flow (vph)	711	8	654	311	7	966
RTOR Reduction (vph)	0	2	0	35	0	0
Lane Group Flow (vph)	711	6	654	276	0	973
Heavy Vehicles (%)	3%	0%	2%	0%	1%	0%
Turn Type	Prot	Perm	NA	pm+ov	Perm	NA
Protected Phases	8		2	8		6
Permitted Phases	8	8		2	6	
Actuated Green, G (s)	25.0	25.0	34.0	59.0		34.0
Effective Green, g (s)	27.0	27.0	36.0	63.0		36.0
Actuated g/C Ratio	0.38	0.38	0.51	0.89		0.51
Clearance Time (s)	6.0	6.0	6.0	6.0		6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	666	614	944	1615		958
v/s Ratio Prot	c0.41		0.35	0.06		
v/s Ratio Perm		0.00		0.11		c0.51
v/c Ratio	1.07	0.01	0.69	0.17		1.02
Uniform Delay, d1	22.0	13.7	13.3	0.5		17.5
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	54.3	0.0	2.2	0.1		33.0
Delay (s)	76.3	13.7	15.5	0.6		50.5
Level of Service	E	B	B	A		D
Approach Delay (s)	75.6		10.7			50.5
Approach LOS	E		B			D

Intersection Summary			
HCM 2000 Control Delay	42.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	71.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Route 27/Powderhouse Lane

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	8	5	1516	617	9
Future Vol, veh/h	4	8	5	1516	617	9
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	55	55	97	97	91	91
Heavy Vehicles, %	0	0	20	4	6	0
Mvmt Flow	7	15	5	1563	678	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2256	683	688	0	-	0
Stage 1	683	-	-	-	-	-
Stage 2	1573	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.3	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.38	-	-	-
Pot Cap-1 Maneuver	46	453	828	-	-	-
Stage 1	505	-	-	-	-	-
Stage 2	190	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	44	453	828	-	-	-
Mov Cap-2 Maneuver	44	-	-	-	-	-
Stage 1	482	-	-	-	-	-
Stage 2	190	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	45.2	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	828	-	111	-	-
HCM Lane V/C Ratio	0.006	-	0.197	-	-
HCM Control Delay (s)	9.4	0	45.2	-	-
HCM Lane LOS	A	A	E	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	4	8	5	1516	617	9
Future Volume (vph)	4	8	5	1516	617	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.908				0.998	
Flt Protected	0.984					
Satd. Flow (prot)	1698	0	0	1826	1790	0
Flt Permitted	0.984					
Satd. Flow (perm)	1698	0	0	1826	1790	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	160			137	383	
Travel Time (s)	3.6			3.1	8.7	
Lane Group Flow (vph)	22	0	0	1568	688	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 93.8%		ICU Level of Service F	
Analysis Period (min) 15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	18	23	8	750	1362	23
Future Volume (vph)	18	23	8	750	1362	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.924				0.998	
Flt Protected	0.978			0.999		
Satd. Flow (prot)	1717	0	0	1879	1860	0
Flt Permitted	0.978			0.999		
Satd. Flow (perm)	1717	0	0	1879	1860	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	125			138	310	
Travel Time (s)	2.8			3.1	7.0	
Peak Hour Factor	0.69	0.69	0.87	0.87	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	1%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	59	0	0	871	1443	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 83.1%		ICU Level of Service E	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	23	8	750	1362	23
Future Vol, veh/h	18	23	8	750	1362	23
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	69	69	87	87	96	96
Heavy Vehicles, %	0	0	0	1	2	0
Mvmt Flow	26	33	9	862	1419	24

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2311	1431	1443	0	-	0
Stage 1	1431	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	42	167	476	-	-	-
Stage 1	223	-	-	-	-	-
Stage 2	409	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	40	167	476	-	-	-
Mov Cap-2 Maneuver	40	-	-	-	-	-
Stage 1	215	-	-	-	-	-
Stage 2	409	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	166.7	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	476	-	70	-	-
HCM Lane V/C Ratio	0.019	-	0.849	-	-
HCM Control Delay (s)	12.7	0	166.7	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	4.1	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.906				0.998	
Flt Protected	0.985					
Satd. Flow (prot)	1696	0	0	1826	1788	0
Flt Permitted	0.985					
Satd. Flow (perm)	1696	0	0	1826	1788	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	167			128	314	
Travel Time (s)	3.8			2.9	7.1	
Adj. Flow (vph)	7	16	6	1737	758	13
Lane Group Flow (vph)	23	0	0	1743	771	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 103.4%		ICU Level of Service G	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	9	6	1685	690	12
Future Vol, veh/h	4	9	6	1685	690	12
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	55	55	97	97	91	91
Heavy Vehicles, %	0	0	20	4	6	10
Mvmt Flow	7	16	6	1737	758	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2514	765	771	0	-	0
Stage 1	765	-	-	-	-	-
Stage 2	1749	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.3	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.38	-	-	-
Pot Cap-1 Maneuver	32	406	769	-	-	-
Stage 1	463	-	-	-	-	-
Stage 2	155	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	25	406	769	-	-	-
Mov Cap-2 Maneuver	25	-	-	-	-	-
Stage 1	360	-	-	-	-	-
Stage 2	155	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	79.2	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	769	-	71	-	-
HCM Lane V/C Ratio	0.008	-	0.333	-	-
HCM Control Delay (s)	9.7	0	79.2	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0	-	1.2	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	20	26	9	837	1515	26
Future Volume (vph)	20	26	9	837	1515	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.923				0.998	
Flt Protected	0.979			0.999		
Satd. Flow (prot)	1717	0	0	1879	1860	0
Flt Permitted	0.979			0.999		
Satd. Flow (perm)	1717	0	0	1879	1860	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	147			153	360	
Travel Time (s)	3.3			3.5	8.2	
Peak Hour Factor	0.69	0.69	0.87	0.87	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	1%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	67	0	0	972	1605	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 91.3%		ICU Level of Service F	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	9.8

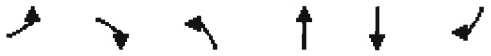
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	26	9	837	1515	26
Future Vol, veh/h	20	26	9	837	1515	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	87	87	96	96
Heavy Vehicles, %	0	0	0	1	2	0
Mvmt Flow	29	38	10	962	1578	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2574	1592	1605	0	-	0
Stage 1	1592	-	-	-	-	-
Stage 2	982	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	29	134	413	-	-	-
Stage 1	186	-	-	-	-	-
Stage 2	366	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 27	134	413	-	-	-
Mov Cap-2 Maneuver	~ 27	-	-	-	-	-
Stage 1	176	-	-	-	-	-
Stage 2	366	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s$	386.7	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	413	-	49	-	-
HCM Lane V/C Ratio	0.025	-	1.361	-	-
HCM Control Delay (s)	13.9	0$	386.7	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	6.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	16	13	7	1685	690	16
Future Volume (vph)	16	13	7	1685	690	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.939				0.997	
Flt Protected	0.973					
Satd. Flow (prot)	1736	0	0	1826	1789	0
Flt Permitted	0.973					
Satd. Flow (perm)	1736	0	0	1826	1789	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	154			160	359	
Travel Time (s)	3.5			3.6	8.2	
Peak Hour Factor	0.55	0.55	0.97	0.97	0.91	0.91
Heavy Vehicles (%)	0%	0%	20%	4%	6%	0%
Adj. Flow (vph)	29	24	7	1737	758	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	53	0	0	1744	776	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 104.2%		ICU Level of Service G	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	8.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	13	7	1685	690	16
Future Vol, veh/h	16	13	7	1685	690	16
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	55	55	97	97	91	91
Heavy Vehicles, %	0	0	20	4	6	0
Mvmt Flow	29	24	7	1737	758	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2518	767	776	0	-	0
Stage 1	767	-	-	-	-	-
Stage 2	1751	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.3	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.38	-	-	-
Pot Cap-1 Maneuver	31	405	765	-	-	-
Stage 1	462	-	-	-	-	-
Stage 2	155	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 23	405	765	-	-	-
Mov Cap-2 Maneuver	~ 23	-	-	-	-	-
Stage 1	341	-	-	-	-	-
Stage 2	155	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s$	408.5	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	765	-	40	-	-
HCM Lane V/C Ratio	0.009	-	1.318	-	-
HCM Control Delay (s)	9.8	0$	408.5	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0	-	5.3	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	28	29	13	837	1515	38
Future Volume (vph)	28	29	13	837	1515	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932				0.997	
Flt Protected	0.976			0.999		
Satd. Flow (prot)	1728	0	0	1880	1858	0
Flt Permitted	0.976			0.999		
Satd. Flow (perm)	1728	0	0	1880	1858	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	133			166	311	
Travel Time (s)	3.0			3.8	7.1	
Lane Group Flow (vph)	83	0	0	977	1618	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	19

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	28	29	13	837	1515	38
Future Vol, veh/h	28	29	13	837	1515	38
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	69	69	87	87	96	96
Heavy Vehicles, %	0	0	0	1	2	0
Mvmt Flow	41	42	15	962	1578	40

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2590	1598	1618	0	-	0
Stage 1	1598	-	-	-	-	-
Stage 2	992	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	~ 28	133	408	-	-	-
Stage 1	184	-	-	-	-	-
Stage 2	362	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 26	133	408	-	-	-
Mov Cap-2 Maneuver	~ 26	-	-	-	-	-
Stage 1	169	-	-	-	-	-
Stage 2	362	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 613	0.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	408	-	44	-	-
HCM Lane V/C Ratio	0.037	-	1.877	-	-
HCM Control Delay (s)	14.2	0	$ 613	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.1	-	8.5	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon