Transportation Impact Assessment

Elm Place Multifamily Residential Community
Pitman Road and Elm Place
Swampscott, Massachusetts

Prepared for:

WinnCompanies
Development | Residential | Military
Boston, Massachusetts

January 2021

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 community to be known as Elm Place and located off Pitman Road and Elm Place in Swampscott, Massachusetts (hereafter referred to as the Project). This assessment was prepared in consultation with the Town of Swampscott 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] and with adjustment to account for the use of public transportation and pedestrian and bicycle trips, the Project is expected to generate approximately 578 automobile trips, 118 transit trips and 16 pedestrian/bicycle trips on an average weekday (two-way, 24-hour volumes), with 36 automobile trips, 8 transit trips and 1 pedestrian/bicycle trip expected during the weekday morning peak-hour, and 46 automobile trips, 10 transit trips and 1 pedestrian/bicycle trip expected during the weekday evening peak-hour;

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

3. To the extent that a vehicular connection is advanced between Pitman Road and Doherty Circle, the connection should be one-way southbound and include pedestrian and bicycle accommodations;

4. No apparent safety deficiencies were noted with respect to the motor vehicle crash history at the study area intersections; and

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

5. Lines of sight to and from Elm Place (south) at its intersection with Essex Street and at the Project site driveway intersection with Elm Place 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 side of Elm Place approximately 190 feet south of Essex Street, the approximate location of the south access to the existing parking lot in the eastern 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 should be a minimum of 24 feet in width and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle.

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

- Vehicles exiting the Project site should be placed under STOP-sign control with a marked STOP-line provided.

- 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]

- Pedestrian connections have been provided to the sidewalks along both Essex Street and Pitman Road.

- Americans with Disabilities Act (ADA) compliant wheelchair ramps should be provided at all pedestrian crossings that are constructed or modified as a part of the Project.

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

- Snow windrows within sight triangle areas of the Project site driveway intersection should be promptly removed where such accumulations would impede sight lines.

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

- Bicycle parking should be provided at appropriate locations within the Project site.

Off Site

Essex Street/Elm Place (South)

Independent of the Project, it is recommended that a marked STOP-line be provided on the Elm Place (south) approach to Essex Street in order to defined the desired stopping point for vehicles prior to entering the intersection and the marked crosswalk. In addition, it is recommended that a double-yellow centerline be installed along Elm Place for a minimum distance of 50-feet from the STOP-line in order to separate the directions of travel approaching Essex Street and to provide proper positioning for vehicles queued on the Elm Place approach.

Transportation Demand Management

Public transportation services are provided within the study area by the Massachusetts Bay Transportation Transit Authority (MBTA), including fixed-route bus services and Commuter Rail. MBTA bus Route 455, *Salem Depot – Wonderland*, provides service between Salem Depot and Wonderland Station, where connections can be made to the Blue Line subway system and other MBTA bus routes. The Route 455 bus travels along Essex Street with a stop located at the Project site (between Pitman Street and Elm Place). Commuter Rail services are provided to the Town by way of Swampscott Station on the Newburyport/Rockport Line, which provides service to North Station in Boston. Swampscott Station located off Railroad Avenue approximately 0.3 miles to the southwest of the Project site, or an approximate 4 to 5 minute walking distance. In addition to fixed-route bus services, the MBTA operates The Ride paratransit services for eligible persons who cannot use fixed-route transit all or some of the time due to a physical, cognitive or mental disability in compliance with the ADA.

In an effort to encourage the use of alternative modes of transportation to single-occupant vehicles, the following Transportation Demand Management (TDM) measures will be implemented as a part of the Project:

- A transportation coordinator will be designated for the Project to coordinate the elements of the TDM program;
- Information regarding public transportation services, maps, schedules and fare information will be posted in a central location and/or otherwise made available to residents;
- 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 to support telecommuting by residents of the Project;
- Pedestrian accommodations will be incorporated into the Project and consist of connections to existing sidewalks and ADA compliant wheelchair ramps at all pedestrian crossings that are to be constructed or modified as a part of the Project;
- An internal mail room will be provided within the building; and
- Secure bicycle parking will be provided within the Project site.

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 community to be known as Elm Place and located off Pitman Road and Elm Place in Swampscott, 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 Essex Street, Elm Place and Pitman Road, and at the following specific intersections: Essex Street at Burrill Street; Essex Street at Pitman Road; Essex Street at Elm Place; and Essex Street at Burpee Road.

PROJECT DESCRIPTION

The Project will entail the construction of a 128-unit, multifamily residential community to be known as Elm Place and located off Pitman Road and Elm Place in Swampscott, Massachusetts. The Project site encompasses approximately 2.20± acres of land that is bounded by Essex Street to the north; railroad tracks associated with the Massachusetts Bay Transportation Authority (MBTA) Commuter Rail and a commercial building to the south; Elm Place to the east and Pitman Road 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 multifamily residential building that fronts along Essex Street, a single-family home that fronts along Pitman Road, a commercial building and associated parking areas and appurtenances that will be removed to accommodate the Project.

Access to the Project site will be provided by way of a new driveway that will intersect the west side of Elm Place approximately 190 feet south of Essex Street, the approximate location of the south access to the existing parking lot in the eastern portion of the Project site. Off-street parking will be provided for 109 vehicles, or a parking ratio of 0.85 spaces per unit, which is below the parking requirements of Section 3.1.0.0, *Off-Street Parking and Loading*, *Parking*, of the Town of Swampscott Zoning By-Laws (1.5 parking spaces per unit is required); however the parking ratio is within the range of values documented by the Institute of Transportation Engineers (ITE) for similar multifamily residential communities.[3]

[3] *Parking Generation Manual*, 5th Edition; Institute of Transportation Engineers; Washington D.C.; 2019. Observed parking demand ratios for a multifamily housing (mid-rise) residential community were found to range from 0.58 to 2.50 spaces per dwelling unit, with an average parking demand of 1.21 spaces per dwelling unit and an 85th percentile peak parking demand of 1.52 spaces per dwelling unit.

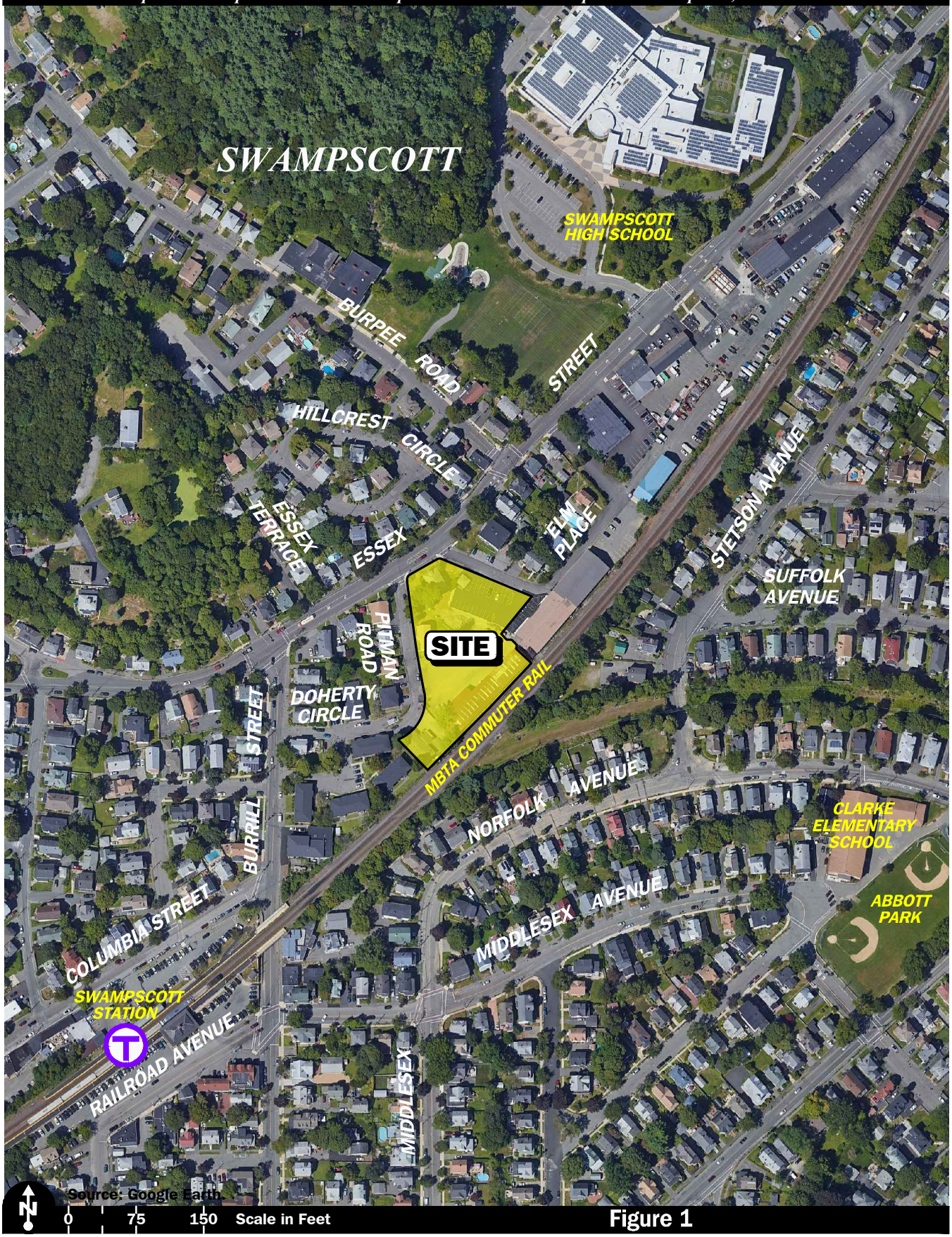

Figure 1

Site Location Map

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STUDY METHODOLOGY

This study was prepared in consultation with the Town of Swampscott and the 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 from the date of publication of this assessment 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.

EXISTING CONDITIONS

A comprehensive field inventory of existing conditions within the study area was conducted in December 2020, with traffic volume data adjusted following the guidance issued by MassDOT for TIAs conducted during the COVID-19 pandemic and the Governor's phased "Reopening Massachusetts" strategy.[4] The field investigation consisted of an inventory of existing roadway geometrics; pedestrian and bicycle facilities; public transportation services; 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 Essex Street, Elm Place and Pitman Road, and the following specific intersections: Essex Street at Burrill Street; Essex Street at Pitman Road; Essex Street at Elm Place; and Essex Street at Burpee Road.

The following describes the study area roadways and intersections.

Roadways

Essex Street

- Two-lane urban minor arterial roadway under Town jurisdiction
- Traverses study area in a general northeast-southwest alignment between Paradise Road and Central Square in Lynn
- Provides two 12 to 26 foot wide travel lanes that are separated by a double-yellow centerline with no marked shoulder and additional travel lanes at major intersections
- The posted speed limit is 30 miles per hour (mph)
- Sidewalks are provided along both sides of the roadway
- On-street parking is prohibited within the study area
- Illumination is provided by way of street lights mounted on wood poles
- Land use within the study area consists of the Project site, and residential and commercial properties

[4] *Guidance on Traffic Count Data*; MassDOT; revised April 2020.

Elm Place

- Two-lane local access roadway under Town jurisdiction
- Traverses study area in a circuitous alignment intersecting the south side of Essex Street southwest of Hillcrest Circle and northeast of Burpee Road
- Provides an approximate 20-foot wide traveled way (paved area) with no marked centerline or shoulders
- A posted speed limit is not provided
- Sidewalks are provided along both sides of the Essex Place (south) for a distance of approximately 50-feet southeast of Essex Street
- Illumination is provided by way of street lights mounted on wood poles
- Land use within the study area consists of the Project site and residential and commercial properties

Pitman Road

- Two-lane local access roadway under Town jurisdiction
- Traverses study area in a general north-south alignment terminating at 10 Pitman Road, approximately 350 feet south of Essex Street
- Provides an approximate 20-foot wide traveled way (paved area) with no marked centerline or shoulders
- A posted speed limit is not provided
- Sidewalks are provided along both sides of the roadway
- Illumination is provided by way of street lights mounted on wood poles
- Land use within the study area consists of the Project site and residential and commercial properties

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 December 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)
Essex St./ Burrill St.	TS	1 left-turn lane and 1through lane on Essex St. southbound and 1 general purpose travel lane on Essex St. northbound and Burrill St.	No	Yes; both sides of the intersecting roadways; crosswalks provided across all legs; pedestrian traffic signal equipment and phasing (exclusive) provided	Yes; Shared traveled-way[b]

See notes at end of Table.

Table 1 (Continued)
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)
Essex St./ Pitman Rd.	S	1 general purpose travel lane on all approaches	No	Yes, both sides of the intersecting roadways; crosswalk provided across Pitman Rd.	Yes; Shared traveled-way
Essex St./ Elm Pl. (South)	S	1 general purpose travel lane on all approaches	No	Yes, both sides of the intersecting roadways; crosswalk provided across Elm Pl.	Yes; Shared traveled-way
Essex St./ Burpee Rd.	TS	1 left-turn lane an 1 through travel lane on Essex St. northbound; 1 general purpose travel lane on Essex St. southbound and Burpee Rd.	No	Yes; both sides of the intersecting roadways; crosswalks provided across all legs; pedestrian traffic signal equipment and phasing (exclusive) provided	Yes; Shared traveled-way

[a]TS = Traffic Signal Control; S = STOP-sign control.
[b]Combined shoulder and travel lane width equal to or exceed 14 feet.

TRAFFIC VOLUMES

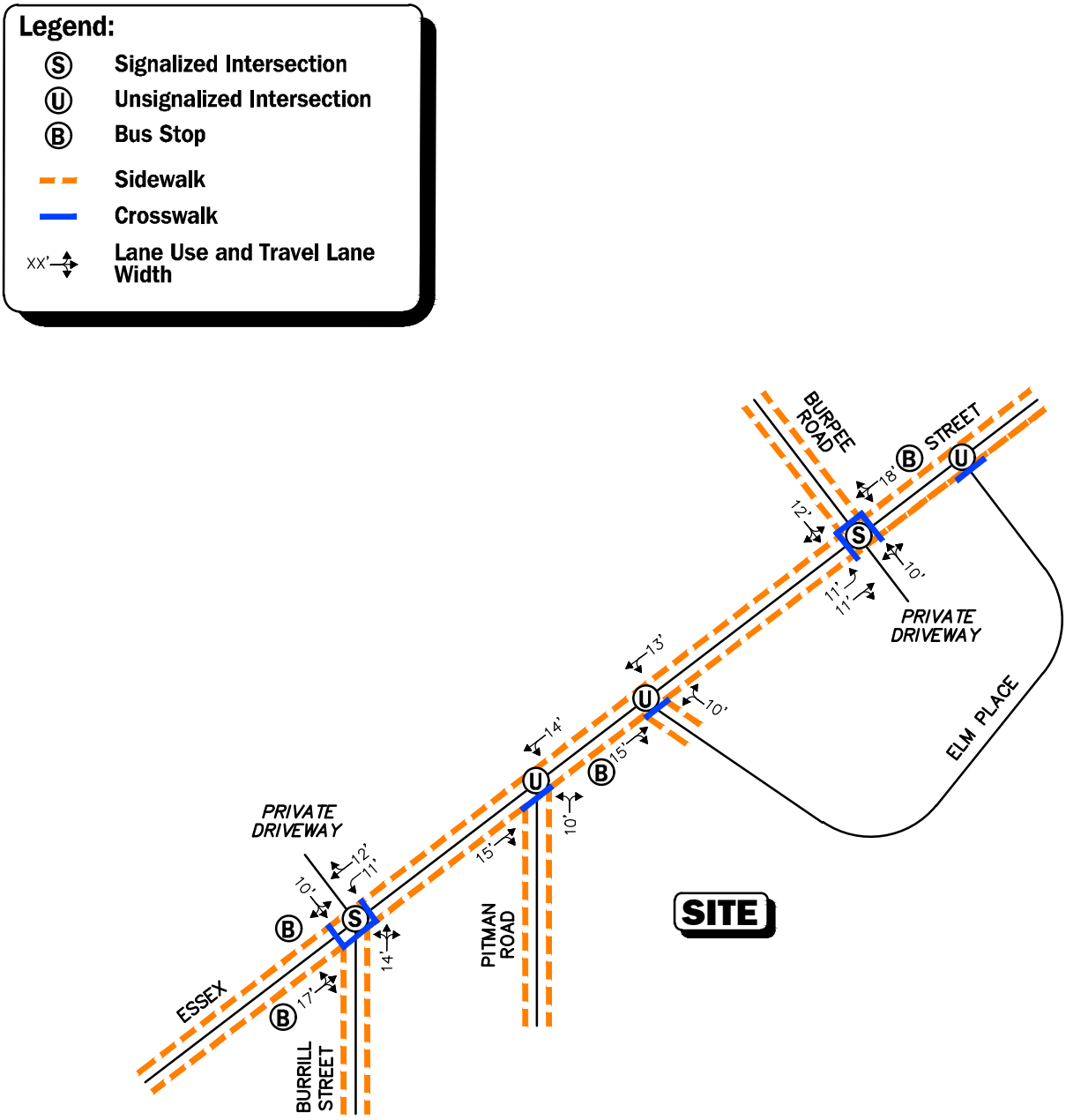
In order to determine existing traffic-volume demands and flow patterns within the study area, automatic traffic recorder (ATR) counts, manual turning movement counts (TMCs) and vehicle classification counts were completed in December 2020. The ATR counts were conducted on December 2nd and 3rd, 2020 (Wednesday through Thursday, inclusive) on Essex Street in the vicinity of the Project site in order to record weekday traffic conditions over an extended period, with weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak period manual TMCs performed at the study intersections on December 2, 2020 (Wednesday). These time periods were selected for analysis purposes as they are representative of the peak-traffic-volume hours for both the Project and the adjacent roadway network.

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. 8087 located on Lee Burbank Highway (Route 1A) in Revere were reviewed.[5] Based on a review of this data, it was determined that traffic volumes for the month of December are approximately 3.0 percent below average-month conditions. As such, the December traffic volumes were adjusted upward by 3.0 percent in order to be representative of average-month conditions.

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 collected from MassDOT Continuous Count Station No. 8087 in December 2020 was compared to

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



Not To Scale

Figure 2

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

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traffic data collected at the same station in December 2018. The 2018 traffic volumes were expanded to 2020 by applying a background traffic growth rate of 1.25 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 2020 traffic-volume data that was collected as a part of this assessment was adjusted upward by an additional 18.4 percent in order to account for the reduced traffic volumes resulting from the phased "Reopening Massachusetts" plan.

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 the TMCs and are reflected on the aforementioned figure.

Table 2
2020 EXISTING TRAFFIC VOLUMES

Location/Peak Hour	AWT[a]	VPH[b]	K Factor[c]	Directional Distribution[d]
Essex Street, east of Elm Place	16,155	--	--	--
Weekday Morning (7:30 – 8:30 AM)	--	984	6.1	55.4% NEB
Weekday Evening (4:30 – 5:30 PM)	--	1,390	8.6	53.3% SWB

[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.
SWB=southwestbound; NEB=northeastbound.

As can be seen in Table 2, Essex Street in the vicinity of the Project site was found to accommodate approximately 16,155 vehicles on an average weekday (two-way, 24-hour volume), with approximately 984 vehicles per hour (vph) during the weekday morning peak-hour and 1,390 vph during the weekday evening peak-hour.

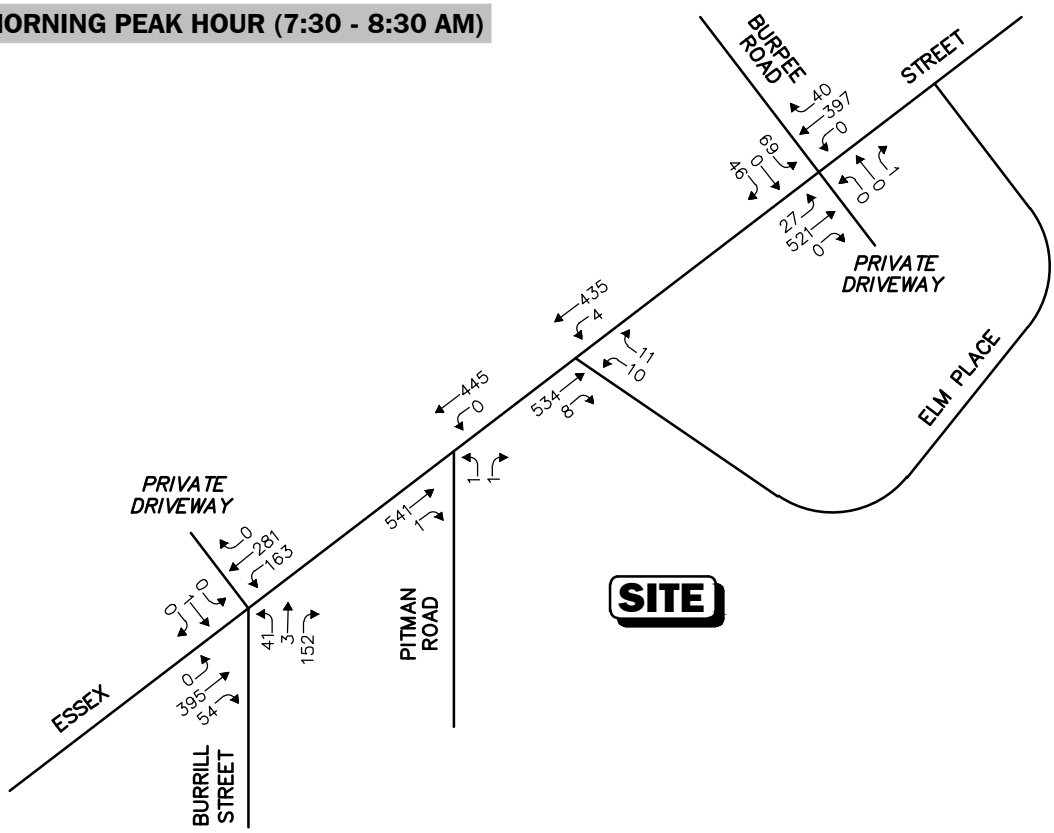
PEDESTRIAN AND BICYCLE FACILITIES

A comprehensive field inventory of pedestrian and bicycle facilities within the study area was undertaken in December 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 generally provided along both sides of the study area roadways, with crosswalks provided at the study area intersections and pedestrian traffic signal equipment and phasing provide at the signalized study area intersections.

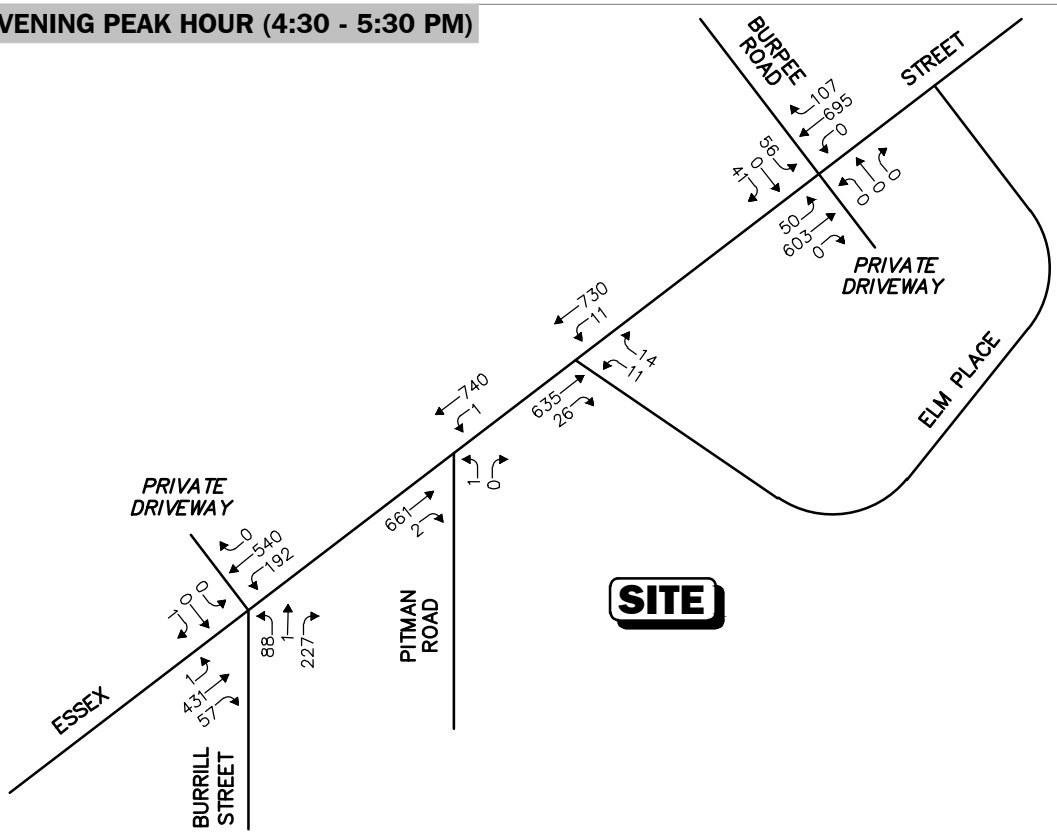
Formal bicycle facilities were not identified within the study area; however, the study area roadways were identified to generally provide sufficient width to accommodate bicycle travel in a shared traveled-way configuration (i.e., bicyclists and motor vehicles sharing the traveled-way).[6]

[6]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 (4:30 - 5:30 PM)



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

Not To Scale

Figure 3

2020 Existing
Peak Hour Traffic Volumes

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PUBLIC TRANSPORTATION

Public transportation services are provided within the study area by the Massachusetts Bay Transportation Transit Authority (MBTA), including fixed-route bus services and Commuter Rail. MBTA bus Route 455, *Salem Depot – Wonderland*, provides service between Salem Depot and Wonderland Station, where connections can be made to the Blue Line subway system and other MBTA bus routes. The Route 455 bus travels along Essex Street with a stop located at the Project site (between Pitman Street and Elm Place). Commuter Rail services are provided to the Town by way of Swampscott Station on the Newburyport/Rockport Line, which provides service to North Station in Boston. Swampscott Station located off Railroad Avenue approximately 0.3 miles to the southwest of the Project site, or an approximate 4 to 5 minute walking distance. In addition to fixed-route bus services, the MBTA operates The Ride paratransit services for eligible persons who cannot use fixed-route transit all or some of the time due to a physical, cognitive or mental disability in compliance with the Americans with Disabilities Act (ADA).

The public transportation schedules and fare information are provided in the Appendix.

SPOT SPEED MEASUREMENTS

Vehicle travel speed measurements were performed on Essex Street in the vicinity of the Project site in conjunction with the ATR counts. Table 3 summarizes the vehicle travel speed measurements.

Table 3
VEHICLE TRAVEL SPEED MEASUREMENTS

	Essex Street	
	Northeastbound	Southwestbound
Mean Travel Speed (mph)	23	25
85th Percentile Speed (mph)	28	28
Posted Speed Limit (mph)	30	30

mph = miles per hour.

As can be seen in Table 3, the mean vehicle travel speed along Essex Street in the vicinity of the Project site was found to be 23 mph northeastbound and 25 southwestbound. 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 28 mph in both directions which approximates the posted speed limit in the vicinity of the Project site (30 mph). The 85th percentile speed is used as the basis 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, no (0) motor vehicle crashes were reported to have occurred at the Essex Street/Pitman Road intersection, with the remaining study area intersections found to have experienced an average of approximately one (1) reported motor vehicle crash per year over the five-year review period and were identified to have motor vehicle crash rates 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 4). The majority of the reported crashes within the study area occurred on a weekday; during daylight; under clear weather conditions; and involved angle-type collisions that resulted in property damage only.

A review of the MassDOT statewide High Crash Location List indicated that there are no locations within the study area that 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]

	Essex St./ Burrill St.	Essex St./ Pitman Rd.	Essex St./ Elm Pl.	Essex St./ Burpee Rd.
Traffic Control Type:[b]	TS	U	U	TS
Year:				
2013	1	0	0	1
2014	0	0	0	1
2015	0	0	1	2
2016	2	0	1	0
2017	0	0	0	3
Total	3	0	2	7
Average	0.60	0.00	0.40	1.40
Rate[c]	0.10	0.00	0.07	0.22
MassDOT Crash Rate:[d]	0.78/0.73	0.57/0.57	0.57/0.57	0.78/0.73
Significant?[e]	No	No	No	No
Type:				
Angle	1	0	0	4
Rear-End	0	0	1	3
Head-On	0	0	0	0
Sideswipe	0	0	0	0
Fixed Object	0	0	0	0
Pedestrian/Bicycle	1	0	0	0
Unknown/Other	1	0	1	0
Total	3	0	2	7
Conditions:				
Clear	0	0	2	3
Cloudy	1	0	0	2
Rain	1	0	0	1
Snow/Ice	1	0	0	1
Total	3	0	2	7
Lighting:				
Daylight	2	0	2	5
Dawn/Dusk	0	0	0	0
Dark (Road Lit)	1	0	0	2
Dark (Road Unlit)	0	0	0	0
Total	3	0	2	7
Day of Week:				
Monday through Friday	2	0	2	4
Saturday	1	0	0	1
Sunday	0	0	0	2
Total	3	0	2	7
Severity:				
Property Damage Only	1	0	2	5
Personal Injury	2	0	0	2
Fatality	0	0	0	0
Total	3	0	2	7

[a]Source: MassDOT Safety Management/Traffic Operations Unit records, 2013 through 2017.
[b]Traffic Control Type: TS = traffic signal; U = unsignalized.
[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 4).

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2028, which reflects a seven-year planning horizon from the date of publication of this assessment, consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. Independent of the Project, traffic volumes on the roadway network in the year 2028 under No-Build conditions include all existing traffic and new traffic resulting from background traffic growth. Anticipated Project-generated traffic volumes superimposed upon the 2028 No-Build traffic volumes reflect 2028 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 Swampscott Community and Economic Development Department 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:

- ***Age-Qualified Residential Community, 35 Burpee Road, Swampscott, Massachusetts.*** This project will entail the construction of a 38-unit age-qualified residential community to be located at 35 Burpee Road.

- ***Overlook Acres Mixed-Use Development, 387 Highland Avenue, Salem Massachusetts.*** This project will entail the construction of a 282-unit multifamily residential community and an 8,450 square foot (sf) commercial building to be located at 387 Highland Avenue.

Traffic volumes associated with the aforementioned development projects by others were either estimated using trip-generation statistics published by the Institute of Transportation Engineers (ITE)[7] for the appropriate land uses or were obtained from the traffic study conducted for the specific development, 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 for Continuous Count Station No. 8087 in Revere was reviewed in order to determine general traffic growth trends in the area. Based on a review of this data and discussions with the Town of Swampscott Community and Economic Development Department, a 1.25 percent per year compounded annual background traffic growth rate was used in order to account for future traffic growth and presently unforeseen development within the study area.

Roadway Improvement Projects

The Town of Swampscott and MassDOT were contacted in order to determine if there were any planned future roadway improvement projects expected to be complete by 2028 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.

No-Build Traffic Volumes

The 2028 No-Build condition peak-hour traffic-volumes were developed by applying the 1.25 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 2028 No-Build weekday morning and evening peak-hour traffic volumes are shown on Figure 4.

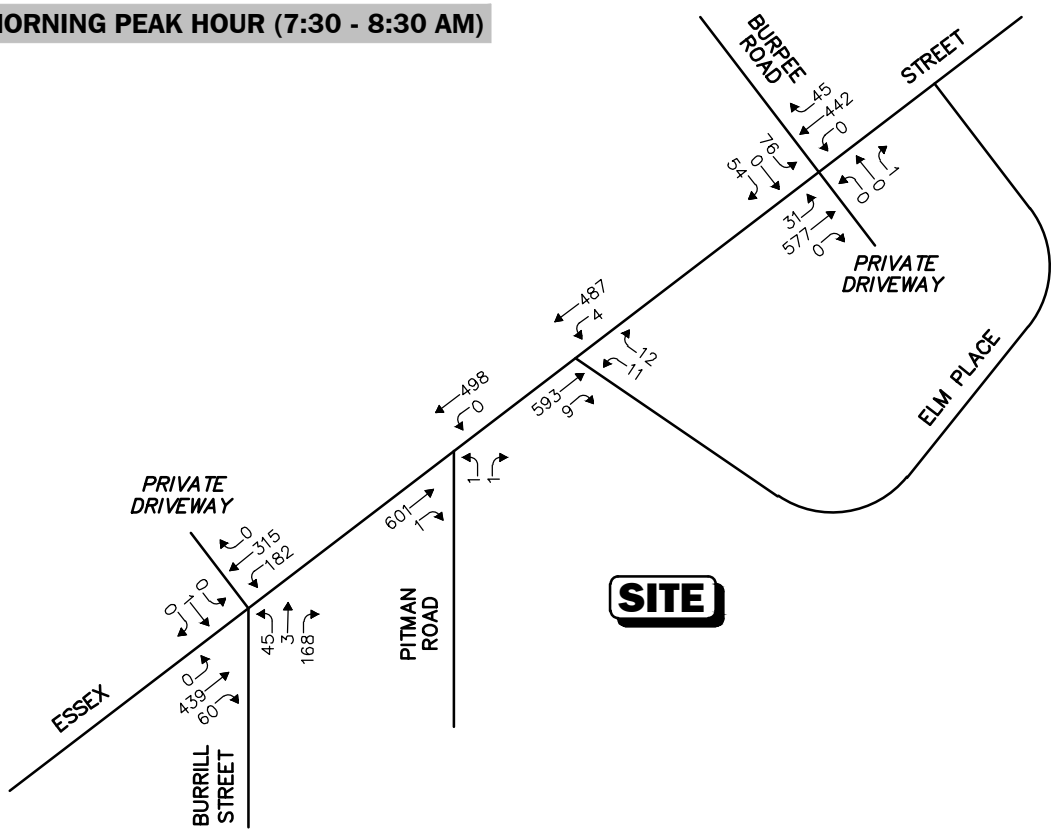
PROJECT-GENERATED TRAFFIC

Design year (2028 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.

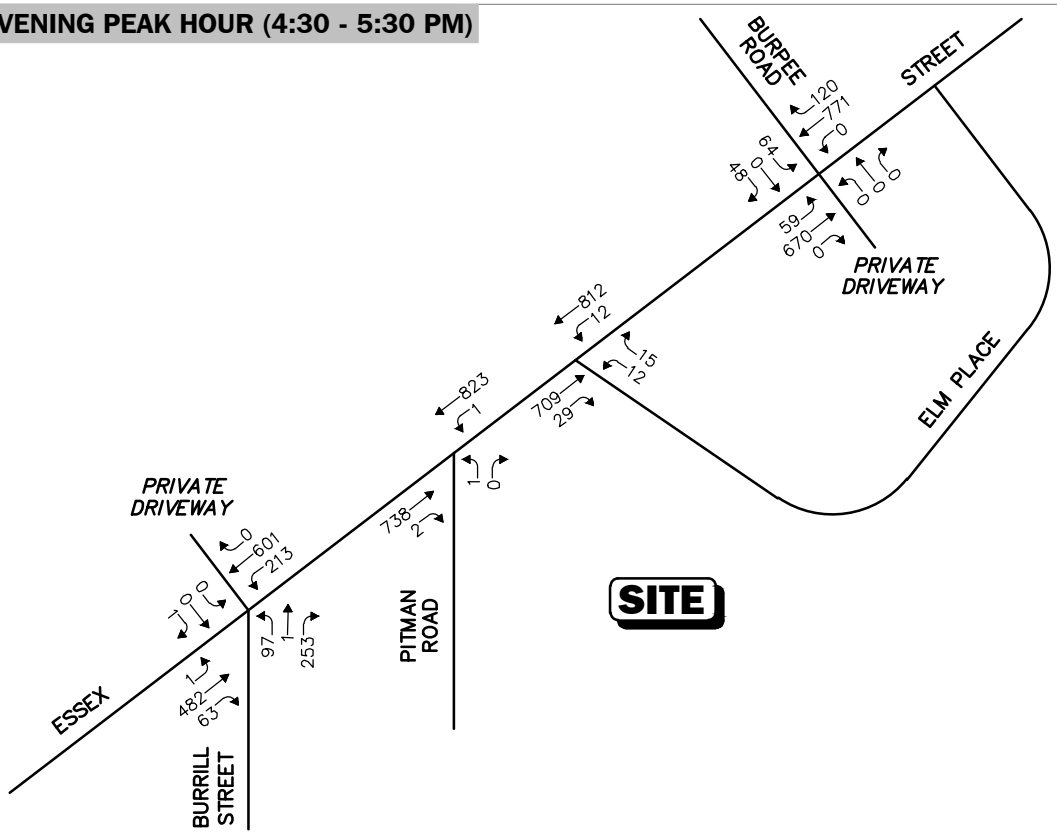
As proposed, the Project will entail the construction of a 128-unit multifamily residential community. In order to develop the traffic characteristics of the Project, trip-generation statistics published by the ITE[8] for a similar land use as that proposed were used. ITE Land Use Code (LUC)

[7]Ibid 1.
[8]Ibid 1.

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



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



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

Not To Scale

Figure 4

2028 No-Build
Peak Hour Traffic Volumes

Vanasse & Associates inc

221, *Multifamily Housing (Mid-Rise)*, was used to develop the base traffic characteristics of the Project.

Transit Use

Given the availability of public transportation services to the Project site (MBTA commuter rail and fixed-route bus services), the interconnected network of sidewalks and on-road bicycle accommodations (study area roadway system generally provide sufficient width to accommodate bicycle travel in a shared traveled-way configuration), it is expected that a portion of the residents of the Project will use public transportation services, walk or bicycle, thereby reducing the volume of traffic that may be associated with the Project. In order to determine the proportion of residents of the Project that may use public transportation, walk or bicycle as their primary mode of transportation, travel mode data obtained from the 2019 American Community Survey (ACS) for the Town of Swampscott was reviewed. The ACS data identified the following commuting modes for workers age 16 or older that reside within the Town:

- *Single-Occupant Vehicle:* 68%
- *Car/Vanpool:* 7%
- *Public Transportation:* 15%
- *Walk:* 2%
- *Bicycle:* 0%
- *Other:* 1%
- *Worked at Home:* 7%

According to the ACS, approximately 32 percent of workers that reside in the Town reported that they used an alternative mode of transportation to single-occupancy vehicles to travel to/from work, with 15 percent using public transportation, 7 percent participating in a car or vanpool, 2 percent walking/bicycling, 7 percent reporting that they work from home and 1 percent indicating an "other" mode.

In order to account for the use of alternative modes of transportation to single-occupancy vehicles, the base ITE trip-generation calculations were first converted to person trips using a vehicle occupancy ratio of 1.13 persons per vehicle, which was obtained from the 2009 National Household Travel Survey, and were then disseminated to the modes of transportation that are accessible to the residents of the Project: public transportation (transit), pedestrian/bicycle and automobile.

In order to provide conservative (high) traffic volume projections from which to assess the potential impact of the Project on the transportation infrastructure, it was assumed that 83 percent of the trips generated by the Project would consist of automobile trips, with 15 percent of trips assumed to be made using public transportation and 2 percent consisting of pedestrian/bicycle trips.

Table 5 summarizes the trip calculations for the Project using the above methodology.

Table 5
TRIP-GENERATION SUMMARY

Time Period/Direction	ITE Vehicle Trips[a]	Person Trips: Total Person Trips[b]	Person Trips: Automobile Person Trips (83%)	Person Trips: Transit Trips (15%)	Person Trips: Pedestrian/ Bicycle Trips (2%)	Automobile Trips[c]
Average Weekday Daily:						
Entering	348	393	326	59	8	289
Exiting	348	393	326	59	8	289
Total	696	786	652	118	16	578
Weekday Morning Peak Hour:						
Entering	11	13	11	2	0	10
Exiting	33	37	30	6	1	26
Total	44	50	41	8	1	36
Weekday Evening Peak Hour:						
Entering	34	38	31	6	1	27
Exiting	22	25	21	4	0	19
Total	56	63	52	10	1	46

[a]Based on ITE LUC 220, *Multifamily Housing (Mid-Rise)*, 128-units.
[b]ITE vehicle trips x 1.13 persons per vehicle.
[c]Automobile person trips divided by 1.13.

Project-Generated Traffic Volume Summary

As can be seen in Table 5, using the aforementioned methodology, the Project is expected to generate approximately 578 automobile trips, 118 transit trips and 16 pedestrian/bicycle trips on an average weekday (two-way, 24-hour volumes), with 36 automobile trips (10 vehicles entering and 26 exiting), 8 transit trips and 1 pedestrian/bicycle trip expected during the weekday morning peak-hour, and 46 automobile trips (27 vehicles entering and 19 exiting), 10 transit trips and 1 pedestrian/bicycle trip expected during the weekday evening peak-hour.

TRIP DISTRIBUTION AND ASSIGNMENT

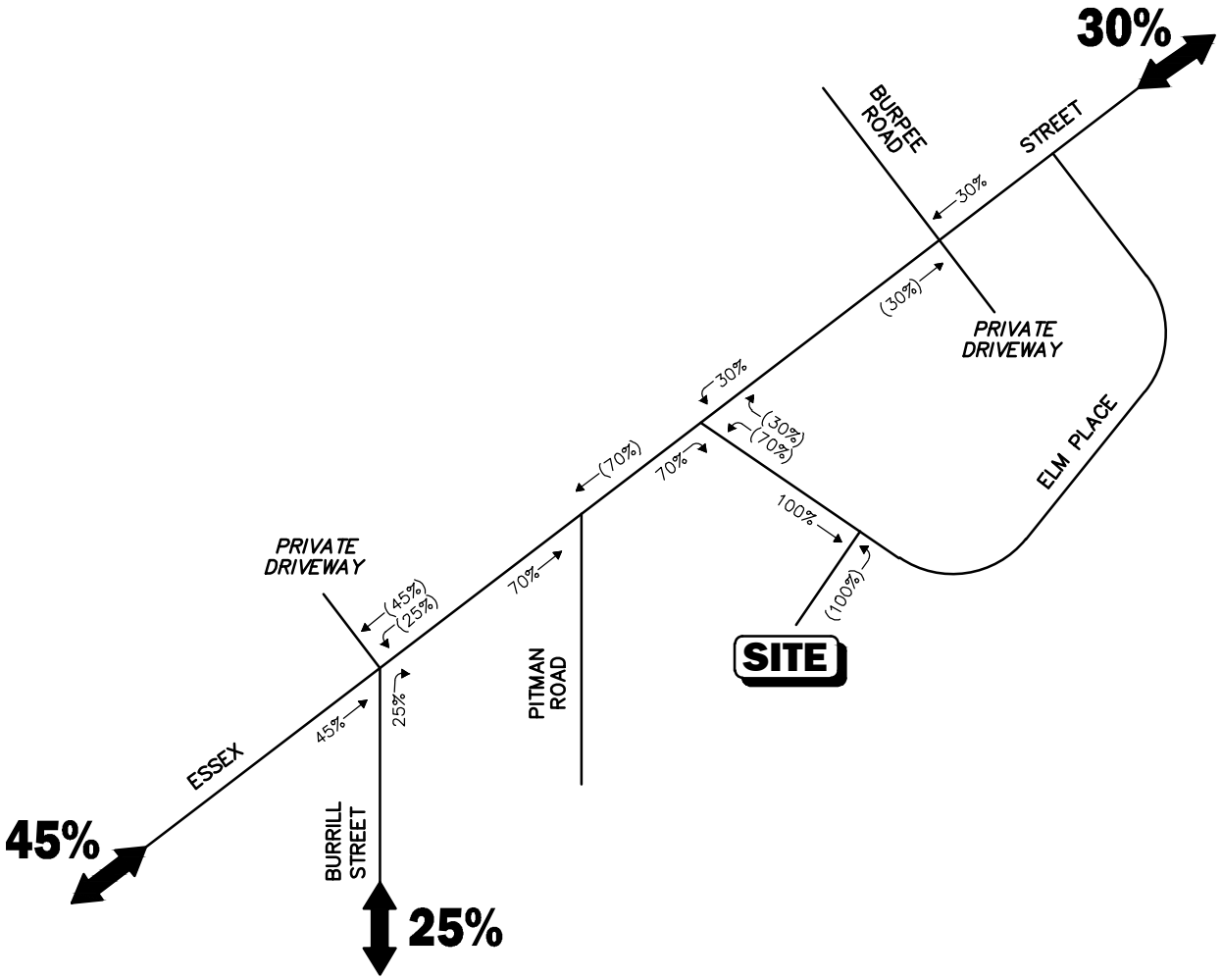
The directional distribution of generated trips to and from the Project site was determined based on a review of Journey-to-Work data obtained from the U.S. Census for persons residing in the Town of Swampscott and then refined based on existing traffic patterns within the study area. The general trip 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.

FUTURE TRAFFIC VOLUMES - BUILD CONDITION

The 2028 Build condition traffic volumes consist of the 2028 No-Build traffic volumes with the additional traffic expected to be generated by the Project added to them. The 2028 Build weekday morning and evening peak-hour traffic-volumes are graphically depicted on Figure 7.

Legend:

XX	Entering Trips
(XX)	Exiting Trips



Not To Scale

Figure 5

Trip Distribution Map

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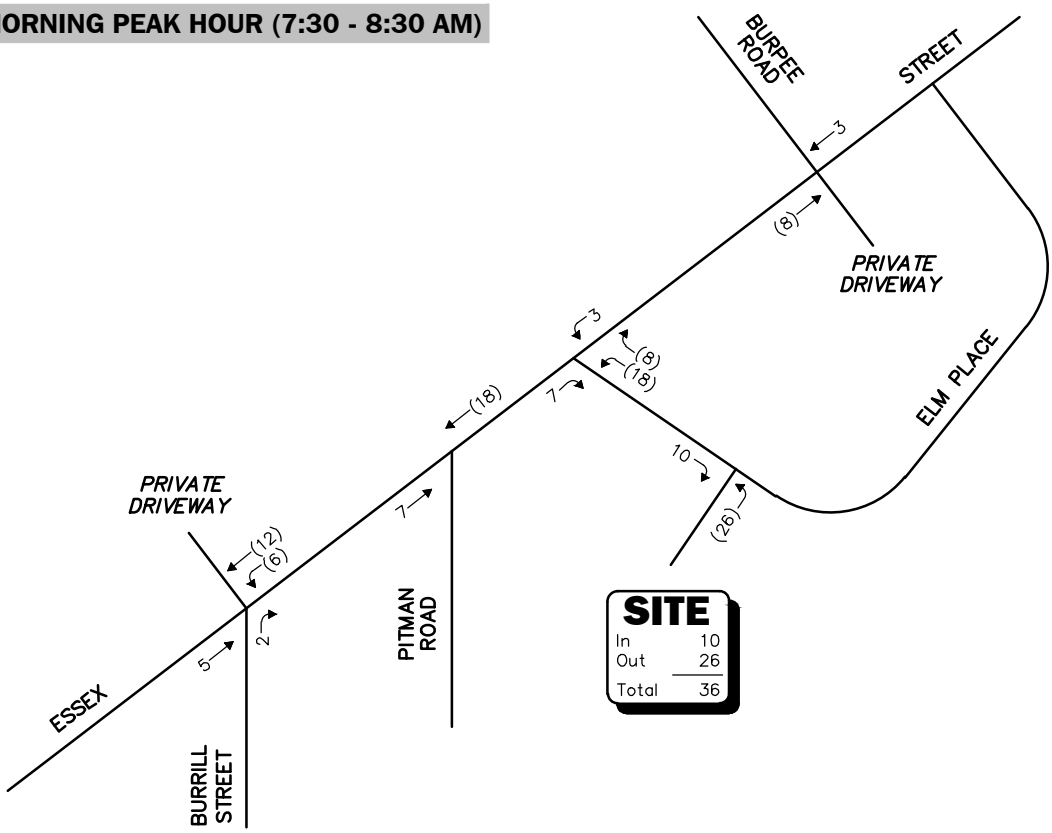
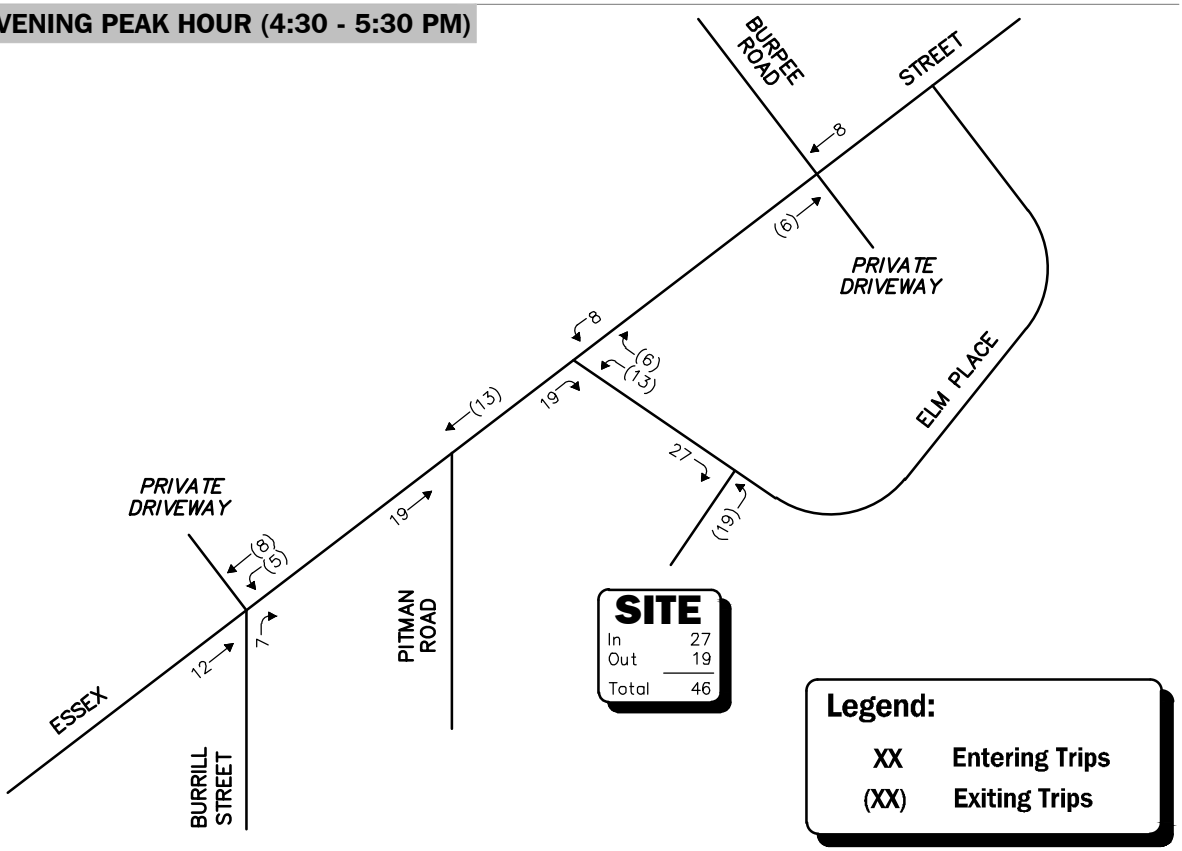
WEEKDAY MORNING PEAK HOUR (7:30 - 8:30 AM)



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



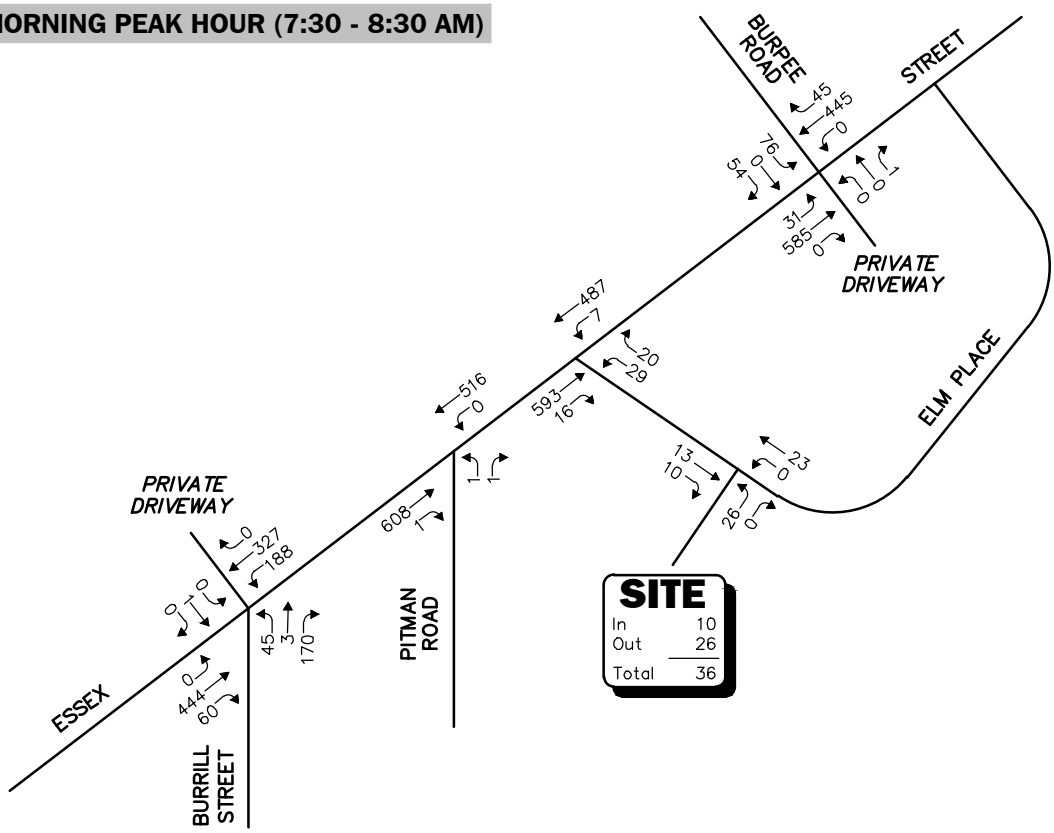
Not To Scale

Figure 6

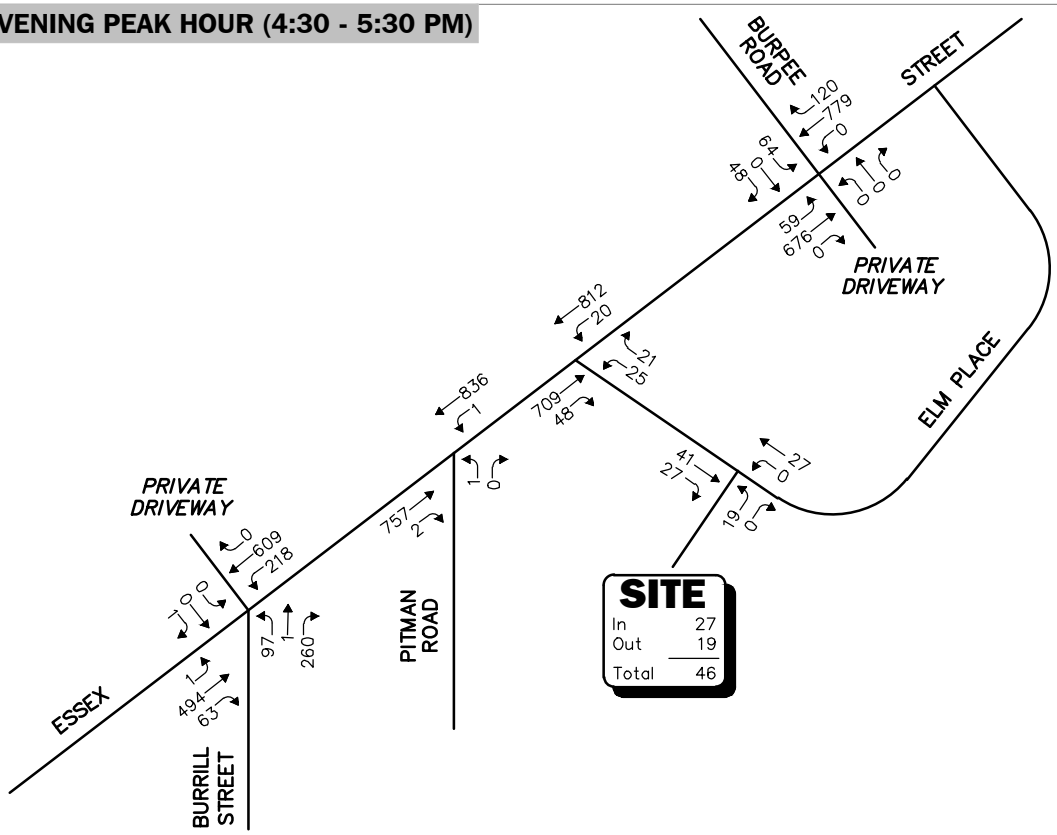
Project Generated Peak Hour Traffic Volumes

Vanasse & Associates inc

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



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



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

Not To Scale

Figure 7

2028 Build
Peak Hour Traffic Volumes

Vanasse & Associates inc

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	2028 No-Build	2028 Build	Traffic Volume Increase Over No-Build	Percent Increase Over No-Build
Essex Street, northeast of Burpee Road:					
Weekday Morning	1,028	1,141	1,152	11	1.0
Weekday Evening	1,461	1,625	1,639	14	0.9
Essex Street, southwest of Burrill Street:					
Weekday Morning	771	859	876	17	2.0
Weekday Evening	1,118	1,245	1,265	20	1.6
Burrill Street, south of Essex Street:					
Weekday Morning	414	459	467	8	1.7
Weekday Evening	565	627	639	12	1.9

As shown in Table 6, Project-related traffic-volume increases outside of the study area relative to 2028 No-Build conditions are anticipated to range from 0.9 to 2.0 percent during the peak periods, with vehicle increases shown to range from 8 to 20 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.***

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.[9] 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.

[9]The capacity analysis methodology is based on the concepts and procedures presented in the *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 are 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 7 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 7
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.

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.*[10] 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 8 summarizes the relationship between level of service and average control delay for two-way stop controlled and all-way stop controlled intersections.

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

Level-Of-Service by Volume-to-Capacity Ratio		Average Control Delay (Seconds Per Vehicle)
v/c ≤ 1.0	v/c > 1.0	
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.

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

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, 2028 No-Build and 2028 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized in Tables 9 and 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.

As can be seen in Tables 9 and 10, ***the study area intersections were shown to continue to operate under acceptable conditions (LOS "D" or better) with the addition of Project-related traffic.*** Project-related impacts at the study area intersections were identified as follows:

Essex Street at Burrill Street – No change in LOS over No-Build conditions, with Project-related impacts defined as a predicted increase in overall average motorist delay of less than 1.0 seconds and in vehicle queuing of up to one (1) vehicle.

Essex Street at Burpee Road – No change in LOS over No-Build conditions, with Project-related impacts defined as a predicted increase in overall average motorist delay of less than 1.0 seconds.

Essex Street at Pitman Road – Operating conditions for all movements from the Pitman Road approach to Essex Street were shown to degrade from LOS B to LOS C during the weekday morning peak-hour with the addition of Project-related traffic as a result of a slight increase in average motorist delay (approximately 0.4 seconds). Vehicle queuing at the intersection was shown to be negligible.

Essex Street at Elm Place (South) – Operating conditions for all movements from the Elm Place approach to Essex Street were shown to degrade from LOS C to LOS D during the weekday evening peak-hour with the addition of Project-related traffic as a result of an increase in average motorist delay of 9.5 seconds. Vehicle queuing on the Elm Place approach were shown to increase by up to two (2) vehicles with the addition of Project-related traffic. All movements along Essex Street

approaching the intersection were shown to operate at LOS A during both the weekday morning and evening peak hours with negligible vehicle queuing predicted.

Elm Place at the Project Site Driveway – All movements at this intersection were shown to operate at LOS A under all analysis conditions with negligible vehicle queuing expected.

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

Signalized Intersection/ Peak-Hour/Movement	2020 Existing				2028 No-Build				2028 Build			
	V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th
Essex Street at Burrill Street												
Weekday Morning:												
Essex Street NEB LT/TH/RT	0.72	23.2	C	5/18	0.76	25.3	C	6/22	0.77	25.9	C	6/23
Essex Street SWB LT	0.50	11.2	B	1/5	0.56	13.1	B	1/8	0.57	13.4	B	1/8
Essex Street SWB TH/RT	0.33	8.2	A	2/9	0.36	8.3	A	2/10	0.37	8.4	A	2/10
Burrill Street NB LT/TH/RT	0.43	26.3	C	1/5	0.52	29.5	C	2/6	0.52	29.7	C	2/6
Driveway SB LT/TH/RT	0.22	38.7	D	0/0	0.21	40.4	D	0/0	0.21	40.6	D	0/0
Overall	--	**18.0**	**B**	--	--	**19.7**	**B**	--	--	**19.9**	**B**	--
Weekday Evening:												
Essex Street NEB LT/TH/RT	0.81	31.7	C	4/7	0.83	34.0	C	9/25	0.84	34.0	C	9/25
Essex Street SWB LT	0.58	17.0	B	0/0	0.65	19.4	B	2/8	0.66	19.7	B	2/8
Essex Street SWB TH/RT	0.62	15.5	B	9/17	0.67	16.7	B	6/21	0.67	16.7	B	7/22
Burrill Street NB Lt/TH/RT	0.69	31.2	C	2/4	0.80	40.0	D	6/16	0.83	43.1	D	6/16
Driveway SB LT/TH/RT	0.00	38.6	D	0/0	0.00	41.6	D	0/0	0.00	42.1	D	0/0
Overall	--	**24.3**	**B**	--	--	**27.7**	**C**	--	--	**28.5**	**C**	--
Essex Street at Burpee Road												
Weekday Morning:												
Essex Street NEB LT	0.11	6.8	A	0/1	0.14	7.5	A	0/2	0.14	7.5	A	0/2
Essex Street NEB TH/RT	0.71	12.3	B	3/18	0.76	14.8	B	3/22	0.76	14.8	B	3/22
Essex Street SWB LT/TH/RT	0.50	8.7	A	2/12	0.54	9.8	A	2/14	0.53	9.8	A	2/14
Driveway NB LT/TH/RT	0.00	23.3	C	0/0	0.00	26.6	C	0/0	0.00	27.1	C	0/0
Burpee Road SB LT/TH/RT	0.27	19.2	B	1/2	0.30	20.8	C	1/3	0.31	21.5	C	1/3
Overall	--	**11.6**	**B**	--	--	**13.5**	**B**	--	--	**13.5**	**B**	--
Weekday Evening:												
Essex Street NEB LT	0.28	5.1	A	0/2	0.38	5.8	A	0/3	0.39	6.0	A	0/3
Essex Street NEB TH/RT	0.63	7.2	A	3/15	0.67	7.5	A	3/21	0.67	7.6	A	3/21
Essex Street SWB LT/TH/RT	0.66	7.4	A	3/22	0.69	7.8	A	4/27	0.70	7.9	A	4/27
Driveway NB LT/TH/RT	0.00	0.0	A	0/0	0.00	0.0	A	0/0	0.00	0.0	A	0/0
Burpee Road SB LT/TH/RT	0.06	20.4	C	0/2	0.10	23.7	C	0/2	0.10	23.7	C	0/2
Overall	--	**8.0**	**A**	--	--	**8.5**	**A**	--	--	**8.6**	**A**	--

[a]Volume-to-capacity ratio.
[b]Control (signal) delay per vehicle in seconds.
[c]Level-of-Service.
[d]Queue length in vehicles.
NB = northbound SB = southbound; NEB = northeastbound; SWB = southwestbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

Table 10
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

	2020 Existing				2028 No-Build				2028 Build			
Unsignalized Intersection/Peak-hour/Movement	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
Essex Street at Pitman Road												
Weekday Morning:												
Essex Street NEB TH/RT	542	0.0	A	0	602	0.0	A	0	609	0.0	A	0
Essex Street SWB LT/TH	445	0.0	A	0	498	0.0	A	0	516	0.0	A	0
Pitman Road NB LT/RT	2	13.8	B	0	2	14.7	B	0	2	15.1	C	0
Weekday Evening:												
Essex Street NEB TH/RT	663	0.0	A	0	740	0.0	A	0	759	0.0	A	0
Essex Street SWB LT/TH	741	0.0	A	0	824	0.0	A	0	837	0.0	A	0
Pitman Road NB LT/RT	1	20.2	C	0	1	23.6	C	0	1	24.3	C	0
Essex Street at Elm Place (South)												
Weekday Morning:												
Essex Street NEB TH/RT	542	0.0	A	0	602	0.0	A	0	609	0.0	A	0
Essex Street SWB LT/TH	439	0.1	A	0	491	0.1	A	0	494	0.3	A	0
Elm Place NB LT/RT	21	14.0	B	1	23	15.3	C	1	49	18.4	C	2
Weekday Evening:												
Essex Street NEB TH/RT	661	0.0	A	0	738	0.0	A	0	757	0.0	A	0
Essex Street SWB LT/TH	741	0.4	A	0	824	0.5	A	0	832	0.9	A	0
Elm Place NB LT/RT	25	19.2	C	1	27	23.1	C	1	46	32.6	D	3
Elm Place at the Project Site Driveway												
Weekday Morning:												
Project Site Driveway EB LT/RT	--	--	--	--	--	--	--	--	26	8.8	A	0
Elm Place NB LT/TH	--	--	--	--	--	--	--	--	23	0.0	A	0
Elm Place SB TH/RT	--	--	--	--	--	--	--	--	23	0.0	A	0
Weekday Evening:												
Project Site Driveway EB LT/RT	--	--	--	--	--	--	--	--	19	9.0	A	0
Elm Place NB LT/TH	--	--	--	--		--	--	--	27	0.0	A	0
Elm Place SB TH/RT	--	--	--	--	--	--	--	--	68	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 vehicle.
NB = northbound; SB = southbound; NEB = northeastbound; SWB = southwestbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

DOHERTY CIRCLE CONNECTOR

An evaluation of potential opportunities to re-establish a connection between Pitman Road and Doherty Circle as either a pedestrian/bicycle connection or to serve vehicles and pedestrians/bicycles was undertaken. Providing a connection between these roadways would facilitate pedestrian and bicycle access to Burrill Street and the Swampscott Commuter Rail Station, and would afford an alternative for motorists to travel between Burrill Street and Essex Street east of Pitman Road. At a baseline level, a pedestrian/bicycle connection should be formalized irrespective of advancement of a vehicular connection.

Three (3) alternatives were evaluated for a vehicular connection between Pitman Road and Doherty Circle:

1. Pitman Road to Doherty Circle one-way southbound;
2. Doherty Circle to Pitman Road one-way northbound; and
3. Pitman Road/Doherty Circle two-way circulation

In order to ascertain the diversion of traffic that may occur as a result of the connection, a review of the projected future 2028 Build traffic volumes and the traffic operations analysis for the Essex Street/Burrill Street and Essex Street/Pitman Road intersections was undertaken. The traffic operations analyses were reviewed to determine the available capacity of the Essex Street/ Pitman Road intersection to accommodate the additional traffic demands resulting from the connection. Once the theoretical capacity of the intersection is reached, motorists would not use the connection as the travel time benefit that would be achieved over the use of the Essex Street/Burrill Street intersection is diminished.

The following summarizes the assessment of each of the three vehicular connection alternatives.

Pitman Road to Doherty Circle One-Way Southbound – Based on a review of the projected vehicle queuing at the Essex Street/Burrill Street intersection, it is estimated that up to 55 vehicles from the Essex Street southwestbound approach to Burrill Street would likely divert to Pitman Road and use Doherty Circle to access to Burrill Street during the weekday peak hours with a one-way southbound connector.

Doherty Circle to Pitman Street One-Way Northbound – Based on a review of the predicted vehicle queuing on the Burrill Street northbound approach to Essex Street at the Essex Street/ Burrill Street intersection, it is estimated that up to 90 vehicles from the Burrill Street northbound

approach could divert to Doherty Circle to access to Essex Street during the weekday peak hours with a one-way northbound connector.

Pitman Road/Doherty Circle Two-Way Circulation – Based on a review of the predicted vehicle queuing at the Essex Street/Burrill Street intersection, it is estimated that up to 145 vehicles could divert from the Essex Street/Burrill Street intersection to a two-way Pitman Road/Doherty Circle Connection during the weekday peak hours.

Based on a review of the vehicular connection alternatives, the one-way southbound connection that would allow motorists from Essex Street east of Burrill Street to access Burrill Street would appear to be the least impactful to the existing uses along Pitman Road and Doherty Circle. The one-way connection can be limited to the short segment connecting the two roadways. To the extent that such a vehicular connection is advanced, it is recommended that the connection be 20-feet in width, or the minimum width required to accommodate emergency vehicle travel, and the appropriate signs ("One-Way" and "Do Not Enter") be installed to regulate the one-way traffic flow.

SIGHT DISTANCE EVALUATION

Sight distance measurements were performed at the intersection of Essex Street at Elm Place (south) and at the Project site driveway intersection with Elm Place in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)[11] requirements. 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 intersections.

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

Table 11
SIGHT DISTANCE MEASUREMENTS[a]

Intersection/Sight Distance Measurement	Feet		
	Required Minimum (SSD)	Desirable (ISD)[b]	Measured
Essex Street at Elm Place (south)			
Stopping Sight Distance:			
Essex Street approaching from the north	200	--	500+
Essex Street approaching from the south	200	--	500+
Intersection Sight Distance:			
Looking to the north from Essex Street	200	335	236
Looking to the south from Essex Street	200	290	500+
Elm Place at the Project Site Driveway			
Stopping Sight Distance:			
Elm Place approaching from the north	80	--	147[c]
Elm Place approaching from the east	80	--	95
Intersection Sight Distance:			
Looking to the north from the Site Driveway	80	145	147[c]
Looking to the east from the Site Driveway	80	170	95

[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 a 30 mph approach speed along Essex Street and a 15 mph approach speed along Elm Place.

[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.

[c]Clear line of sight is provided to/from Essex Street.

As can be seen in Table 11, the available lines of sight exceed the recommended minimum sight distances to function in a safe manner (SSD) based on a 30 mph approach speed along Essex Street, which is consistent with the posted speed limit and the measured 85th percentile vehicle travel speed (28 mph) approaching Elm Place, and a 15 mph approach speed along Elm Place, which is reflective of a reasonable approach speed given the geometry of the roadway(horizontal curvature) and proximity of the Project site access to Essex Street.

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 multifamily residential community to be known as Elm Place and located off Pitman Road and Elm Place in Swampscott, 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[12] and with adjustment to account for the use of public transportation and pedestrian and bicycle trips, the Project is expected to generate approximately 578 automobile trips, 118 transit trips and 16 pedestrian/bicycle trips on an average weekday (two-way, 24-hour volumes), with 36 automobile trips, 8 transit trips and 1 pedestrian/bicycle trip expected during the weekday morning peak-hour, and 46 automobile trips, 10 transit trips and 1 pedestrian/bicycle trip expected during the weekday evening peak-hour;

2. The Project will not result in a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions), with all movements at the study intersections shown 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. To the extent that a vehicular connection is advanced between Pitman Road and Doherty Circle, the connection should be one-way southbound and include pedestrian and bicycle accommodations;

4. No apparent safety deficiencies were noted with respect to the motor vehicle crash history at the study area intersections; and

[12]Ibid 1.

5. Lines of sight to and from Elm Place (south) at its intersection with Essex Street and at the Project site driveway intersection with Elm Place 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 side of Elm Place approximately 190 feet south of Essex Street, the approximate location of the south access to the existing parking lot in the eastern 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 should be a minimum of 24 feet in width and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle.

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

- Vehicles exiting the Project site should be placed under STOP-sign control with a marked STOP-line provided.

- 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).[13]

- Pedestrian connections have been provided to the sidewalks along both Essex Street and Pitman Road.

- Americans with Disabilities Act (ADA) compliant wheelchair ramps should be provided at all pedestrian crossings that are constructed or modified as a part of the Project.

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

- Snow windrows within sight triangle areas of the Project site driveway intersection should be promptly removed where such accumulations would impede sight lines.

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

- Bicycle parking should be provided at appropriate locations within the Project site.

Off Site

Essex Street/Elm Place (South)

Independent of the Project, it is recommended that a marked STOP-line be provided on the Elm Place (south) approach to Essex Street in order to defined the desired stopping point for vehicles prior to entering the intersection and the marked crosswalk. In addition, it is recommended that a double-yellow centerline be installed along Elm Place for a minimum distance of 50-feet from the STOP-line in order to separate the directions of travel approaching Essex Street and to provide proper positioning for vehicles queued on the Elm Place approach.

Transportation Demand Management

Public transportation services are provided within the study area by the MBTA, including fixed-route bus services and Commuter Rail. MBTA bus Route 455, *Salem Depot – Wonderland*, provides service between Salem Depot and Wonderland Station, where connections can be made to the Blue Line subway system and other MBTA bus routes. The Route 455 bus travels along Essex Street with a stop located at the Project site (between Pitman Street and Elm Place). Commuter Rail services are provided to the Town by way of Swampscott Station on the Newburyport/Rockport Line, which provides service to North Station in Boston. Swampscott Station located off Railroad Avenue approximately 0.3 miles to the southwest of the Project site, or an approximate 4 to 5 minute walking distance. In addition to fixed-route bus services, the MBTA operates The Ride paratransit services for eligible persons who cannot use fixed-route transit all or some of the time due to a physical, cognitive or mental disability in compliance with the ADA.

In an effort to encourage the use of alternative modes of transportation to single-occupant vehicles, the following Transportation Demand Management (TDM) measures will be implemented as a part of the Project:

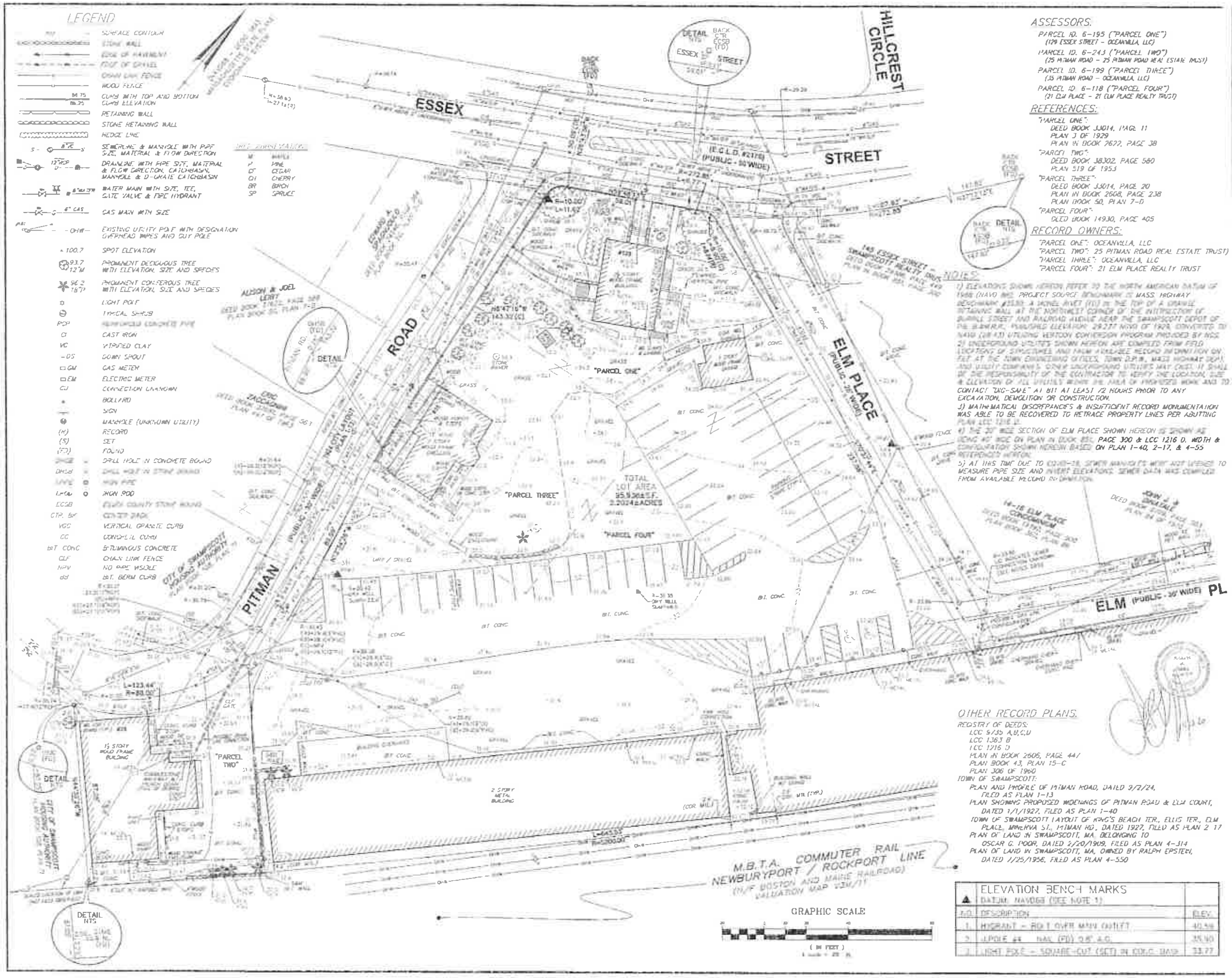
- A transportation coordinator will be designated for the Project to coordinate the elements of the TDM program;
- Information regarding public transportation services, maps, schedules and fare information will be posted in a central location and/or otherwise made available to residents;
- A "welcome 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 to support telecommuting by residents of the Project;
- Pedestrian accommodations will be incorporated into the Project and consist of connections to existing sidewalks and ADA compliant wheelchair ramps at all pedestrian crossings that are to be constructed or modified as a part of the Project;
- An internal mail room will be provided within the building; and
- Secure bicycle parking will be provided within the Project site.

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
PUBLIC TRANSPORTATION INFORMATION
VEHICLE TRAVEL SPEED DATA
MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING
BACKGROUND DEVELOPMENT TRAFFIC-VOLUME NETWORKS
GENERAL BACKGROUND TRAFFIC GROWTH
TRIP-GENERATION CALCULATIONS
MODE OF TRANSPORTATION FOR THE TOWN OF SWAMPSCOTT
JOURNEY TO WORK TRIP DISTRIBUTION
CAPACITY ANALYSIS WORKSHEETS

PROJECT SITE PLAN



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Elm Place

Sheet Name

EXISTING CONDITIONS PLAN

Project Number

23892

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November 13, 2020

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C-1

REQUIRED WAIVERS

WAIVERS REQUIRED FOR WORK IN RESIDENTIAL A-4 DISTRICT

1. WAIVER TO ZONING BYLAW §2.2.2.0
REQUIREMENT: MULTIFAMILY DWELLINGS WITH MORE THAN 8 UNITS NOT ALLOWED IN A-4 ZONE
PROPOSED: ALLOW MULTIFAMILY DWELLING WITH MORE THAN 8 UNITS IN A-4 ZONE UNDER COMPREHENSIVE PERMIT

2. WAIVER TO ZONING BYLAW §2.3.2.0:
REQUIREMENT: MINIMUM FRONT YARD SETBACK OF 20 FEET
PROPOSED: MINIMUM FRONT YARD SETBACK OF 12.9 FEET TO FACE OF BUILDING, 2.8 FEET FROM EDGE OF OVERHANG AND 5.9 TO EDGE OF OVERHANG SUPPORT COLUMN

3. WAIVER TO ZONING BYLAW §2.3.2.0:
REQUIREMENT: MAXIMUM BUILDING COVER IS 30% FOR DWELLINGS
PROPOSED: MAXIMUM BUILDING COVER OF 53%

4. WAIVER TO ZONING BYLAW §2.3.2.0:
REQUIREMENT: MAXIMUM BUILDING HEIGHT OF 2.5 STORIES OR 35 FEET
PROPOSED: MAXIMUM BUILDING HEIGHT OF 60 FEET

5. WAIVER REQUEST TO ZONING BYLAW §2.3.2.0
REQUIREMENT: MINIMUM OPEN SPACE IS 25%
PROPOSED: MINIMUM OPEN SPACE OF 15%

WAIVERS REQUIRED FOR WORK IN BUSINESS B-2 DISTRICT

1. WAIVER TO ZONING BYLAW §2.2.0.0
REQUIREMENT: MULTIFAMILY DWELLINGS WITH MORE THAN 8 UNITS ALLOWED BY SPECIAL PERMIT FROM BOARD OF APPEALS
PROPOSED: ALLOW MULTIFAMILY DWELLING WITH MORE THAN 8 UNITS IN B-2 DISTRICT UNDER COMPREHENSIVE PERMIT

2. WAIVER TO ZONING BYLAW §2.3.2.0:
REQUIREMENT: MAXIMUM BUILDING HEIGHT OF 40 FEET
PROPOSED: MAXIMUM BUILDING HEIGHT OF 60 FEET

3. WAIVER TO ZONING BYLAW §2.3.2.0
REQUIREMENT: MAXIMUM BUILDING COVER IS 30%
PROPOSED: MAXIMUM BUILDING COVER OF 50%

4. WAIVER REQUEST TO ZONING BYLAW §2.3.8.6
REQUIREMENT: MINIMUM SIDE SETBACK 30 FEET WHERE B-2 ABUTS RESIDENTIAL DISTRICT
PROPOSED: NO SETBACK

5. WAIVER REQUEST TO ZONING BYLAW §2.3.8.7
REQUIREMENT: MINIMUM REAR SETBACK 30 FEET WHERE B-2 ABUTS RESIDENTIAL DISTRICT
PROPOSED: NO SETBACK

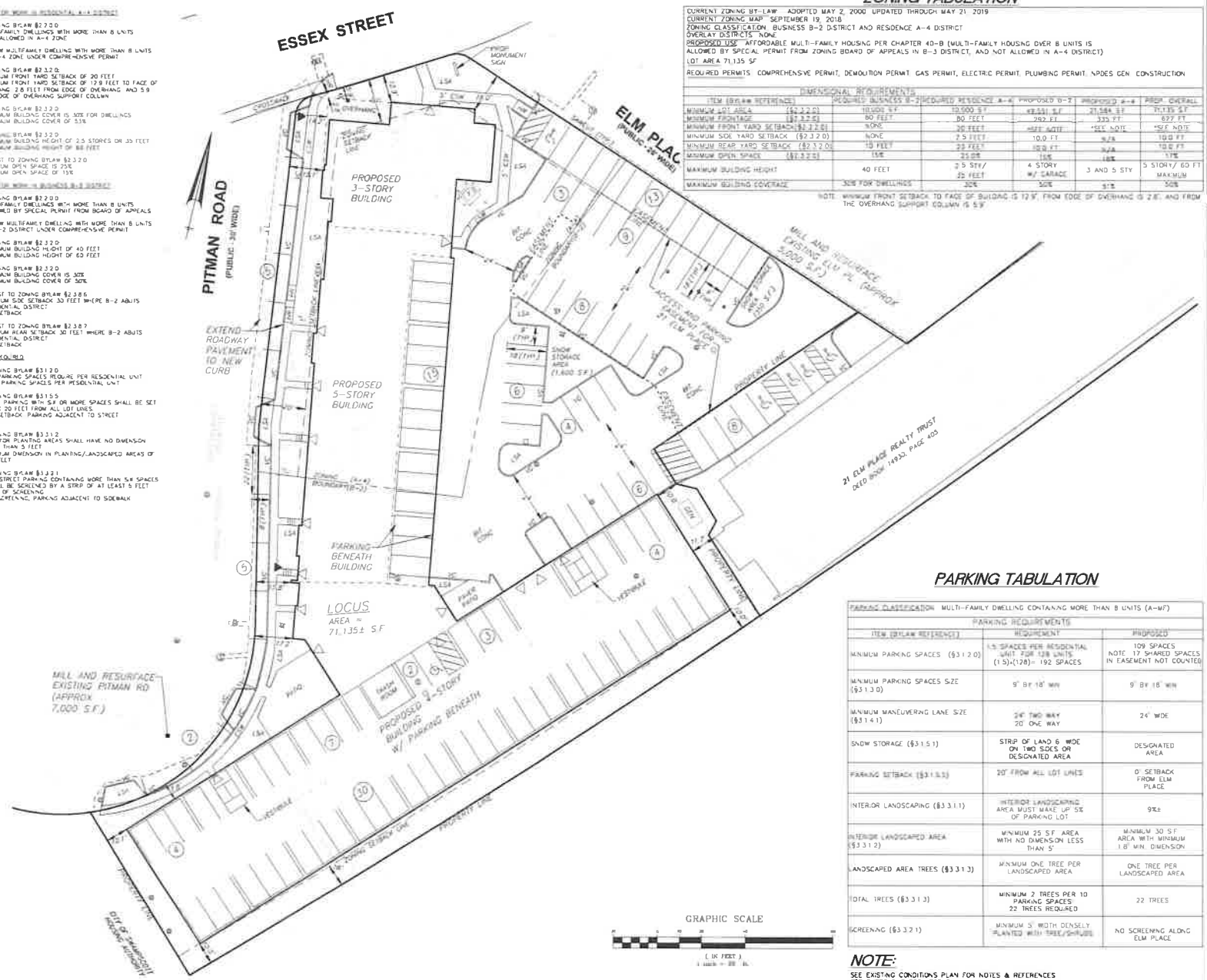
GENERAL WAIVERS REQUIRED

1. WAIVER TO ZONING BYLAW §3.1.2.0
REQUIREMENT: 1.5 PARKING SPACES REQUIRE PER RESIDENTIAL UNIT
PROPOSED: 0.85 PARKING SPACES PER RESIDENTIAL UNIT

2. WAIVER TO ZONING BYLAW §3.1.5.5
REQUIREMENT: OPEN PARKING WITH 5 OR MORE SPACES SHALL BE SET BACK 20 FEET FROM ALL LOT LINES.
PROPOSED: NO SETBACK PARKING ADJACENT TO STREET

3. WAIVER TO ZONING BYLAW §3.3.1.2
REQUIREMENT: INTERIOR PLANTING AREAS SHALL HAVE NO DIMENSION LESS THAN 5 FEET
PROPOSED: MINIMUM DIMENSION IN PLANTING/LANDSCAPED AREAS OF 1.8 FEET

4. WAIVER TO ZONING BYLAW §3.3.2.1
REQUIREMENT: OFF STREET PARKING CONTAINING MORE THAN 5# SPACES SHALL BE SCREENED BY A STRIP OF AT LEAST 5 FEET WIDE OF SCREENING
PROPOSED: NO SCREENING PARKING ADJACENT TO SIDEWALK



ZONING TABULATION

CURRENT ZONING BY-LAW: ADOPTED MAY 2, 2000 UPDATED THROUGH MAY 21, 2019
CURRENT ZONING MAP: SEPTEMBER 19, 2018
ZONING CLASSIFICATION: BUSINESS B-2 DISTRICT AND RESIDENCE A-4 DISTRICT
OVERLAY DISTRICTS: NONE
PROPOSED USE: AFFORDABLE MULTI-FAMILY HOUSING PER CHAPTER 40-B (MULTI-FAMILY HOUSING OVER 8 UNITS IS ALLOWED BY SPECIAL PERMIT FROM ZONING BOARD OF APPEALS IN B-2 DISTRICT, AND NOT ALLOWED IN A-4 DISTRICT)
LOT AREA: 71,135 SF
REQUIRED PERMITS: COMPREHENSIVE PERMIT, DEMOLITION PERMIT, GAS PERMIT, ELECTRIC PERMIT, PLUMBING PERMIT, NPDES GEN. CONSTRUCTION

DIMENSIONAL REQUIREMENTS					
ITEM (BYLAW REFERENCE)	REQUIRED BUSINESS B-2	REQUIRED RESIDENCE A-4	PROPOSED B-2	PROPOSED A-4	PROP. OVERALL
MINIMUM LOT AREA (§2.2.2.0)	10,000 S.F.	10,000 S.F.	62,551 S.F.	21,584 S.F.	71,135 S.F.
MINIMUM FRONTAGE (§2.3.2.0)	80 FEET	80 FEET	292 FT.	335 FT.	627 FT.
MINIMUM FRONT YARD SETBACK (§2.2.2.0)	NONE	20 FEET	*SEE NOTE	*SEE NOTE	*SEE NOTE
MINIMUM SIDE YARD SETBACK (§2.3.2.0)	NONE	7.5 FEET	10.0 FT.	N/A	10.0 FT.
MINIMUM REAR YARD SETBACK (§2.3.2.0)	10 FEET	20 FEET	10.0 FT.	N/A	10.0 FT.
MINIMUM OPEN SPACE (§2.3.2.0)	15%	25.0%	15%	18%	17%
MAXIMUM BUILDING HEIGHT	40 FEET	2.5 STY/ 35 FEET	4 STORY W/ GARAGE	3 AND 5 STY	5 STORY/ 60 FT MAXIMUM
MAXIMUM BUILDING COVERAGE	30% FOR DWELLINGS	30%	50%	51%	50%

NOTE: MINIMUM FRONT SETBACK TO FACE OF BUILDING IS 12.9', FROM EDGE OF OVERHANG IS 2.8', AND FROM THE OVERHANG SUPPORT COLUMN IS 5.9'

PARKING TABULATION

PARKING CLASSIFICATION: MULTI-FAMILY DWELLING CONTAINING MORE THAN 8 UNITS (A-4/B-2)

PARKING REQUIREMENTS		
ITEM (BYLAW REFERENCE)	REQUIREMENT	PROPOSED
MINIMUM PARKING SPACES (§3.1.2.0)	1.5 SPACES PER RESIDENTIAL UNIT FOR 128 UNITS (1.5)=(128)= 192 SPACES	109 SPACES NOTE: 17 SHARED SPACES IN EASEMENT NOT COUNTED
MINIMUM PARKING SPACES SIZE (§3.1.3.0)	9' BY 18' MIN	9' BY 18' MIN
MINIMUM MANEUVERING LANE SIZE (§3.1.4.1)	24' TWO WAY 20' ONE WAY	24' WIDE
SNOW STORAGE (§3.1.5.1)	STRIP OF LAND 6' WIDE ON TWO SIDES OR DESIGNATED AREA	DESIGNATED AREA
PARKING SETBACK (§3.1.5.5)	20' FROM ALL LOT LINES	0' SETBACK FROM ELM PLACE
INTERIOR LANDSCAPING (§3.3.1.1)	INTERIOR LANDSCAPING AREA MUST MAKE UP 5% OF PARKING LOT	9%±
INTERIOR LANDSCAPED AREA (§3.3.1.2)	MINIMUM 25 S.F. AREA WITH NO DIMENSION LESS THAN 5'	MINIMUM 30 S.F. AREA WITH MINIMUM 1.8' MIN. DIMENSION
LANDSCAPED AREA TREES (§3.3.1.3)	MINIMUM ONE TREE PER LANDSCAPED AREA	ONE TREE PER LANDSCAPED AREA
TOTAL TREES (§3.3.1.3)	MINIMUM 2 TREES PER 10 PARKING SPACES 22 TREES REQUIRED	22 TREES
SCREENING (§3.3.2.1)	MINIMUM 5' WIDTH DENSELY PLANTED WITH TREE/SHRUBS	NO SCREENING ALONG ELM PLACE

NOTE:
SEE EXISTING CONDITIONS PLAN FOR NOTES & REFERENCES
SEE SHEET C-3 FOR LEGEND

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HANCOCK ASSOCIATES

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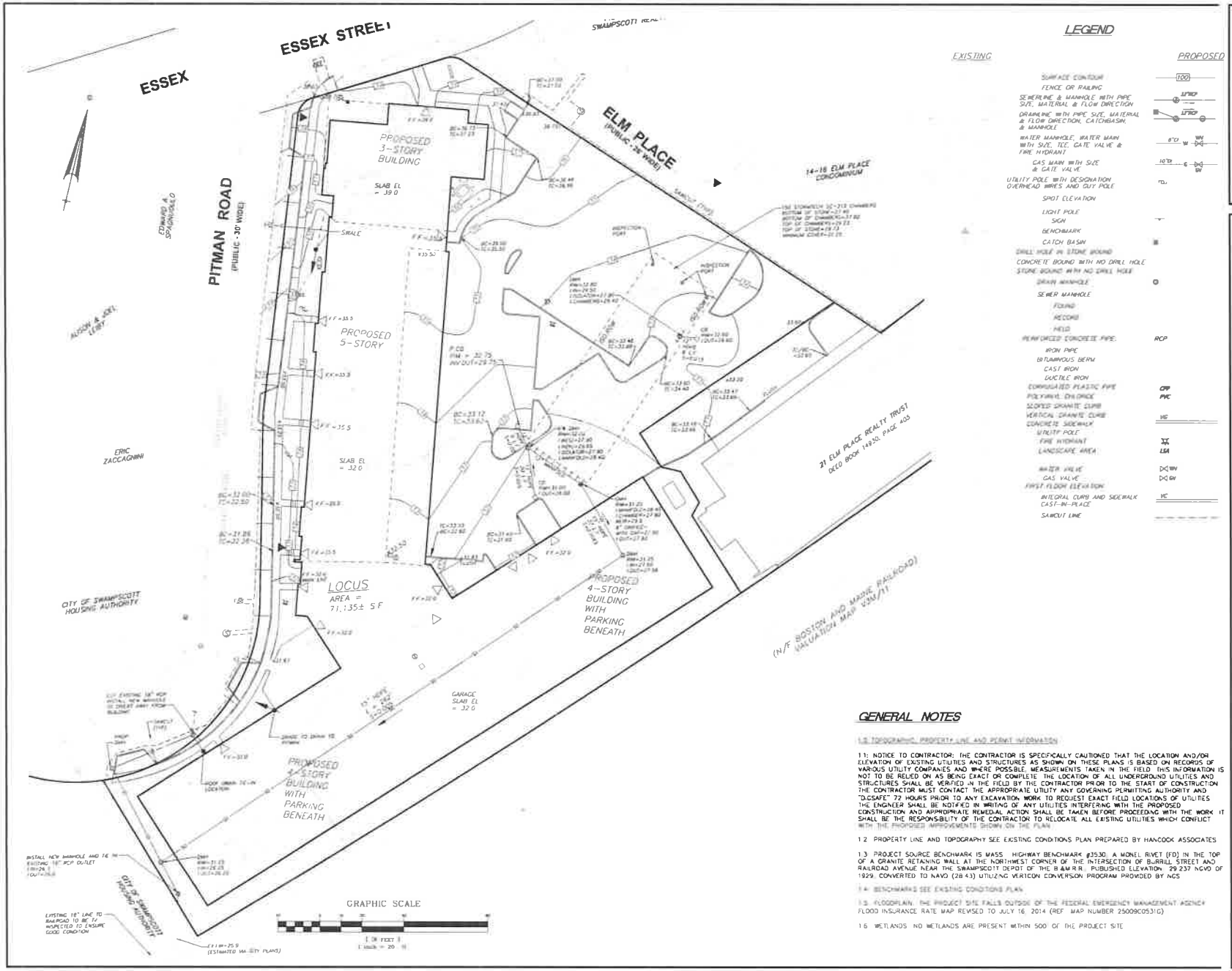
Project Name:
Elm Place

Sheet Name:
LAYOUT AND MATERIALS PLAN

Project Number:
23892

Issue Date:
November 13, 2020

Sheet Number:
C-2



LEGEND

	EXISTING	PROPOSED
SURFACE CONTOUR		100
FENCE OR RAILING		
SEWERLINE & MANHOLE WITH PIPE SIZE, MATERIAL & FLOW DIRECTION		
DRAINLINE WITH PIPE SIZE, MATERIAL & FLOW DIRECTION, CATCHBASIN, & MANHOLE		
WATER MANHOLE, WATER MAIN WITH SIZE, TEE, GATE VALVE & FIRE HYDRANT		8"D W
GAS MAIN WITH SIZE & GATE VALVE		10"G G GV
UTILITY POLE WITH DESIGNATION OVERHEAD WIRES AND GUY POLE	PD	
SPOT ELEVATION		
LIGHT POLE		
SIGN		
BENCHMARK		
CATCH BASIN		
DRILL HOLE IN STONE BOUND		
CONCRETE BOUND WITH NO DRILL HOLE		
STONE BOUND WITH NO DRILL HOLE		
DRAIN MANHOLE		
SEWER MANHOLE		
FOUND		
RECORD		
HELD		
REINFORCED CONCRETE PIPE	RCP	
IRON PIPE		
BITUMINOUS BERM		
CAST IRON		
DUCTILE IRON		
CORRUGATED PLASTIC PIPE	CPP	
POLYVINYL CHLORIDE	PVC	
SLOPED GRANITE CURB		
VERTICAL GRANITE CURB	VC	
CONCRETE SIDEWALK		
UTILITY POLE		
FIRE HYDRANT		
LANDSCAPE AREA	LSA	
WATER VALVE		WV
GAS VALVE		GV
FIRST FLOOR ELEVATION		
INTEGRAL CURB AND SIDEWALK CAST-IN-PLACE		VC
SAWCUT LINE		

GENERAL NOTES

1.0 TOPOGRAPHIC, PROPERTY LINE AND PERMIT INFORMATION

1.1 NOTICE TO CONTRACTOR: THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY ANY GOVERNING PERMITTING AUTHORITY AND "DIGSAFE" 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST EXACT FIELD LOCATIONS OF UTILITIES. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION SHALL BE TAKEN BEFORE PROCEEDING WITH THE WORK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLAN.

1.2 PROPERTY LINE AND TOPOGRAPHY SEE EXISTING CONDITIONS PLAN PREPARED BY HANCOCK ASSOCIATES

1.3 PROJECT SOURCE BENCHMARK IS MASS. HIGHWAY BENCHMARK #3530, A MONEL RIVET (FD) IN THE TOP OF A GRANITE RETAINING WALL AT THE NORTHWEST CORNER OF THE INTERSECTION OF BURRILL STREET AND RAILROAD AVENUE NEAR THE SWAMPSCOTT DEPOT OF THE B&M R.R. PUBLISHED ELEVATION: 29.237 NGVD OF 1929, CONVERTED TO NAVD (28.43) UTILIZING VERTICON CONVERSION PROGRAM PROVIDED BY NGS

1.4 BENCHMARKS SEE EXISTING CONDITIONS PLAN

1.5 FLOODPLAIN: THE PROJECT SITE FALLS OUTSIDE OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP REVISED TO JULY 16, 2014 (REF. MAP NUMBER 25009C0531G)

1.6 WETLANDS: NO WETLANDS ARE PRESENT WITHIN 500' OF THE PROJECT SITE

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Key Plan

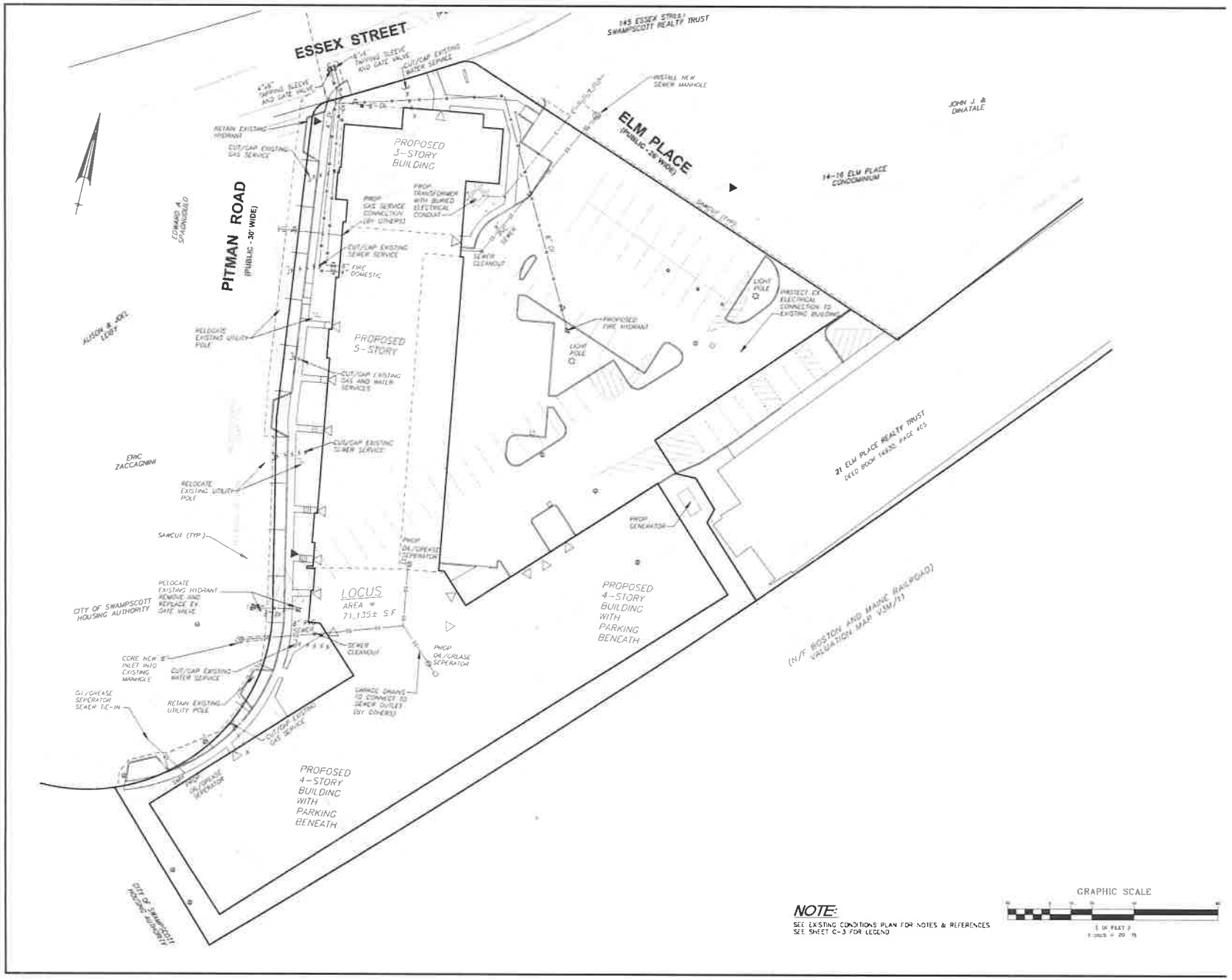
Project Name
Elm Place

Sheet Name
GRADING AND DRAINAGE PLAN

Project Number:
23892

Issue Date
November 13, 2020

Sheet Number:
C-3



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GRAPHIC SCALE

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Elm Place

Sheet Name
UTILITIES PLAN

Project Number
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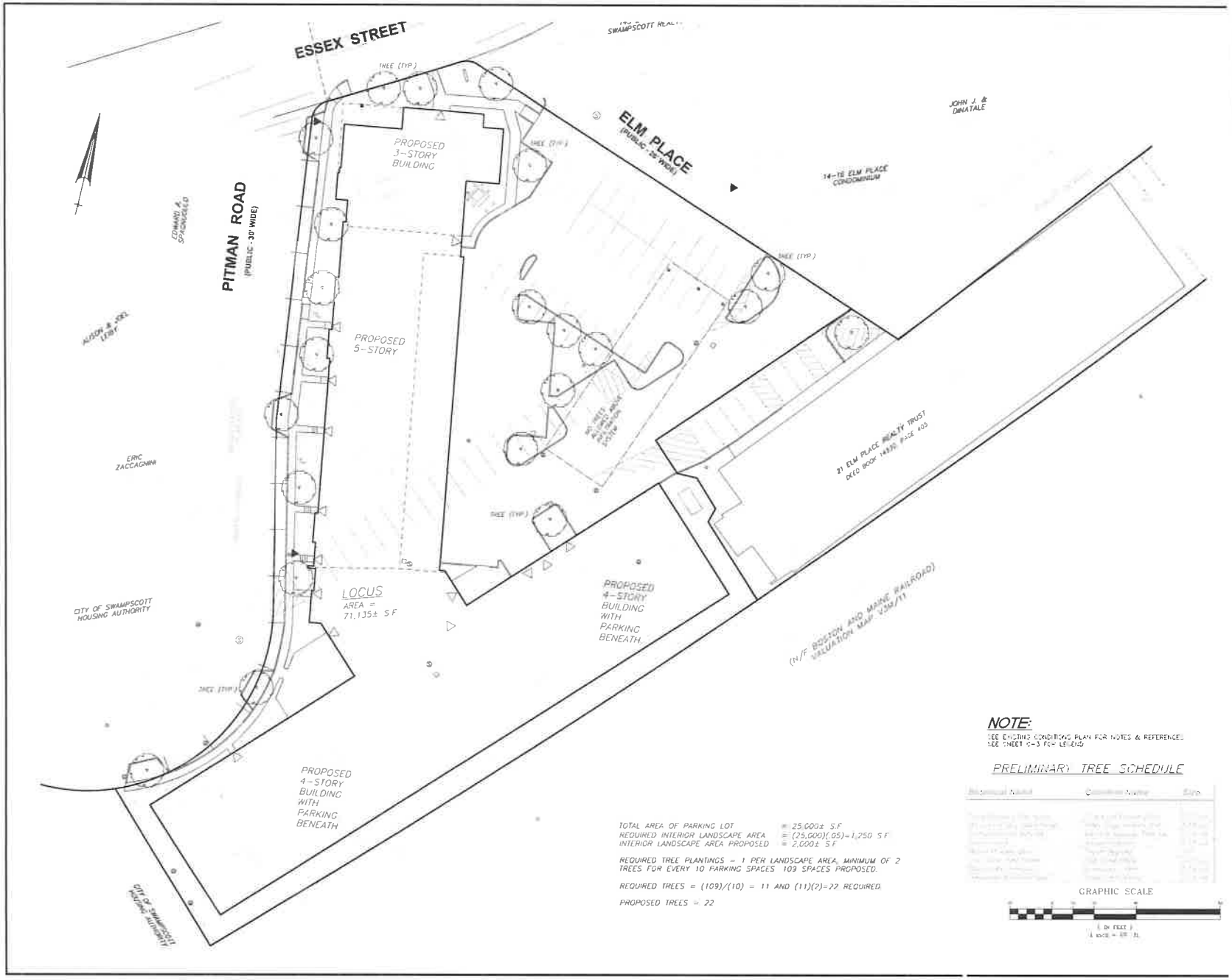
November 13, 2020

Sheet Number
C-4



TOTAL AREA OF PARKING LOT = 25,003± S.F.
REQUIRED INTERIOR LANDSCAPE AREA = (25,003)(.05)=1,250 S.F.
INTERIOR LANDSCAPE AREA PROPOSED = 2,000± S.F.

REQUIRED TREE PLANTINGS = 1 PER LANDSCAPE AREA, MINIMUM OF 2 TREES FOR EVERY 10 PARKING SPACES. 109 SPACES PROPOSED.

REQUIRED TREES = (109)/(10) = 11 AND (11)(2)=22 REQUIRED.

PROPOSED TREES = 22

NOTE:

SEE EXISTING CONDITIONS PLAN FOR NOTES & REFERENCES
SEE SHEET C-3 FOR LEGEND

PRELIMINARY TREE SCHEDULE

Botanical Name	Common Name	Size

GRAPHIC SCALE

(IN FEET)
1 INCH = 20 FT.

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Elm Place

Sheet Name

LANDSCAPING PLAN

Project Number

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Issue Date

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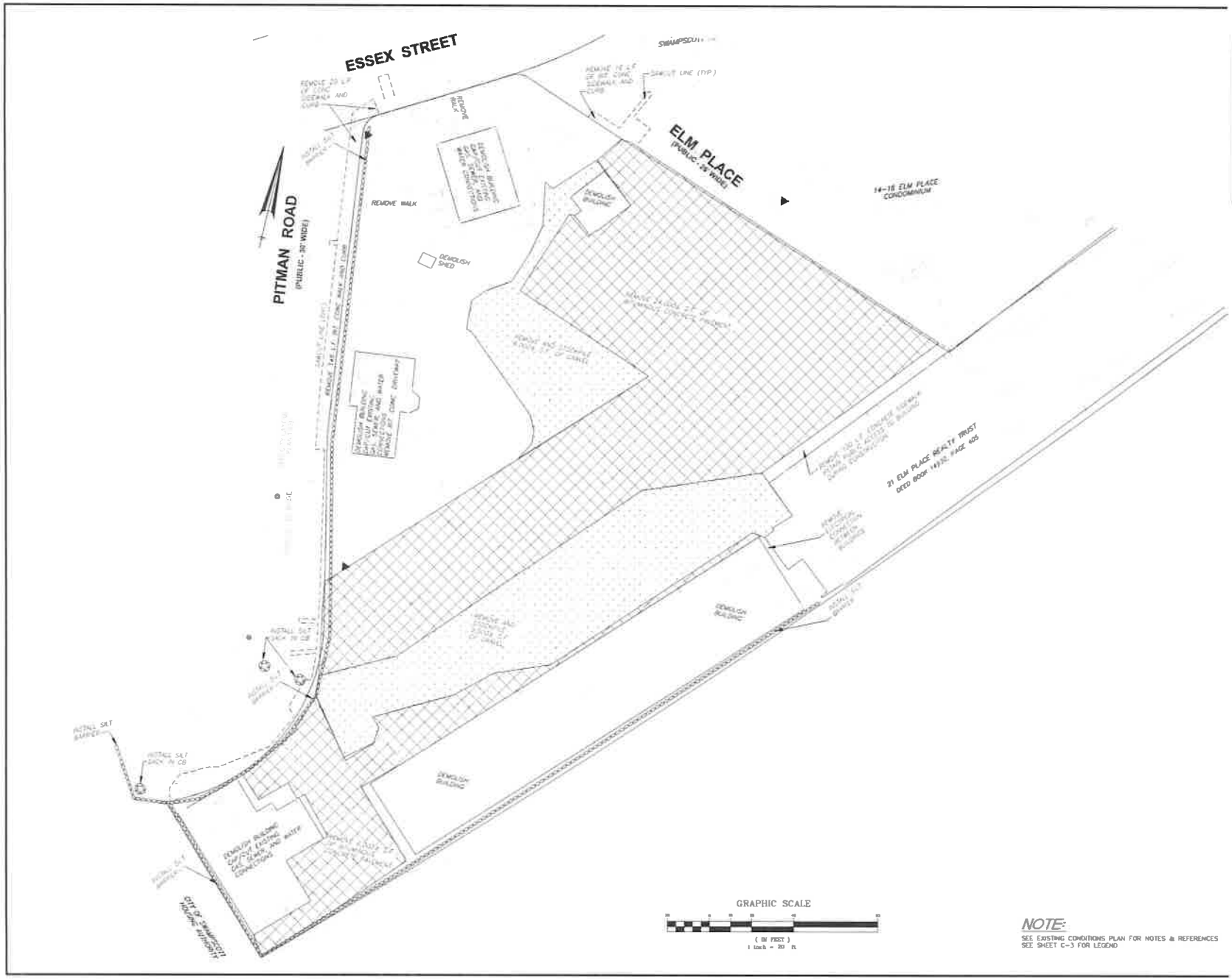
Sheet Number

C-5



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Revision:

Engineer of Record:

Drawn:
Checked:
Scale:
Key Plan:

Project Name:
Elm Place

Sheet Name:
DEMOLITION AND EROSION CONTROL PLAN

Project Number:
23892

Issue Date:
November 13, 2020

Sheet Number:
C-6

AUTOMATIC TRAFFIC RECORDER COUNT DATA

Accurate Counts
978-664-2565

Location : Essex Street
Location : East of Elm Place
City/State: Swampscott, MA

8688VL01

Start	12/2/2020	WB		Hour Totals		EB		Hour Totals		Combined Totals	
Time	Wed	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		10	105			11	114				
12:15		8	99			7	120				
12:30		6	107			15	128				
12:45		5	103	29	414	15	111	48	473	77	887
01:00		2	124			4	121				
01:15		1	130			4	112				
01:30		8	118			9	107				
01:45		2	102	13	474	2	122	19	462	32	936
02:00		5	134			5	109				
02:15		4	121			1	115				
02:30		1	132			0	86				
02:45		2	112	12	499	1	124	7	434	19	933
03:00		2	157			3	137				
03:15		4	160			2	116				
03:30		6	137			1	126				
03:45		4	169	16	623	3	137	9	516	25	1139
04:00		5	136			7	130				
04:15		3	160			5	123				
04:30		7	152			13	110				
04:45		6	160	21	608	21	155	46	518	67	1126
05:00		13	163			11	119				
05:15		26	167			10	129				
05:30		12	126			23	109				
05:45		26	129	77	585	40	121	84	478	161	1063
06:00		40	125			36	93				
06:15		49	103			69	95				
06:30		43	87			82	92				
06:45		64	88	196	403	94	91	281	371	477	774
07:00		63	80			96	87				
07:15		65	75			84	70				
07:30		87	61			114	75				
07:45		102	72	317	288	128	62	422	294	739	582
08:00		100	69			105	51				
08:15		81	61			101	36				
08:30		86	41			89	36				
08:45		70	39	337	210	104	46	399	169	736	379
09:00		76	53			91	29				
09:15		77	36			91	25				
09:30		100	41			86	22				
09:45		79	28	332	158	95	33	363	109	695	267
10:00		74	25			96	20				
10:15		90	20			95	18				
10:30		115	18			114	10				
10:45		117	16	396	79	108	18	413	66	809	145
11:00		85	26			82	19				
11:15		96	21			95	22				
11:30		98	10			97	12				
11:45		130	9	409	66	132	14	406	67	815	133
Total		2155	4407			2497	3957			4652	8364
Percent		32.8%	67.2%			38.7%	61.3%			35.7%	64.3%

Accurate Counts
978-664-2565

Location : Essex Street
Location : East of Elm Place
City/State: Swampscott, MA

8688VL01

Start Time	12/3/2020 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		5	104			13	112				
12:15		9	112			9	147				
12:30		7	162			3	116				
12:45		9	128	30	506	7	103	32	478	62	984
01:00		3	106			2	116				
01:15		3	108			7	113				
01:30		2	126			4	126				
01:45		1	110	9	450	3	106	16	461	25	911
02:00		4	111			2	135				
02:15		4	128			4	123				
02:30		1	146			1	133				
02:45		0	122	9	507	3	115	10	506	19	1013
03:00		0	162			0	123				
03:15		1	167			0	118				
03:30		6	167			1	120				
03:45		7	195	14	691	10	133	11	494	25	1185
04:00		3	144			7	135				
04:15		2	157			0	135				
04:30		4	161			8	133				
04:45		10	170	19	632	19	148	34	551	53	1183
05:00		9	179			13	123				
05:15		29	153			15	140				
05:30		17	126			29	122				
05:45		29	117	84	575	44	132	101	517	185	1092
06:00		35	113			33	107				
06:15		44	103			54	113				
06:30		48	101			84	70				
06:45		48	89	175	406	110	89	281	379	456	785
07:00		64	89			84	72				
07:15		66	83			93	61				
07:30		103	83			108	86				
07:45		100	66	333	321	118	46	403	265	736	586
08:00		105	57			148	62				
08:15		83	54			109	58				
08:30		75	56			109	43				
08:45		109	46	372	213	124	42	490	205	862	418
09:00		99	48			101	43				
09:15		86	38			85	35				
09:30		90	40			103	25				
09:45		101	24	376	150	126	29	415	132	791	282
10:00		76	36			79	29				
10:15		92	26			102	37				
10:30		74	22			90	19				
10:45		103	16	345	100	103	21	374	106	719	206
11:00		80	16			86	20				
11:15		88	24			92	14				
11:30		105	7			108	15				
11:45		107	8	380	55	125	8	411	57	791	112
Total		2146	4606			2578	4151			4724	8757
Percent		31.8%	68.2%			38.3%	61.7%			35.0%	65.0%
Grand Total		4301	9013			5075	8108			9376	17121
Percent		32.3%	67.7%			38.5%	61.5%			35.4%	64.6%
ADT		ADT 13,248		AADT 13,248							

Accurate Counts
978-664-2565

Location : Essex Street
Location : East of Elm Place
City/State: Swampscott, MA

8688VL01

Start	11/30/2020		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	*	*	*	*	29	48	30	32	*	*	*	*	*	*	30	40
01:00	*	*	*	*	13	19	9	16	*	*	*	*	*	*	11	18
02:00	*	*	*	*	12	7	9	10	*	*	*	*	*	*	10	8
03:00	*	*	*	*	16	9	14	11	*	*	*	*	*	*	15	10
04:00	*	*	*	*	21	46	19	34	*	*	*	*	*	*	20	40
05:00	*	*	*	*	77	84	84	101	*	*	*	*	*	*	80	92
06:00	*	*	*	*	196	281	175	281	*	*	*	*	*	*	186	281
07:00	*	*	*	*	317	**422**	333	403	*	*	*	*	*	*	325	412
08:00	*	*	*	*	337	399	372	**490**	*	*	*	*	*	*	354	**444**
09:00	*	*	*	*	332	363	376	415	*	*	*	*	*	*	354	389
10:00	*	*	*	*	396	413	345	374	*	*	*	*	*	*	370	394
11:00	*	*	*	*	**409**	406	**380**	411	*	*	*	*	*	*	**394**	408
12:00 PM	*	*	*	*	414	473	506	478	*	*	*	*	*	*	460	476
01:00	*	*	*	*	474	462	450	461	*	*	*	*	*	*	462	462
02:00	*	*	*	*	499	434	507	506	*	*	*	*	*	*	503	470
03:00	*	*	*	*	**623**	516	**691**	494	*	*	*	*	*	*	**657**	505
04:00	*	*	*	*	608	**518**	632	**551**	*	*	*	*	*	*	620	**534**
05:00	*	*	*	*	585	478	575	517	*	*	*	*	*	*	580	498
06:00	*	*	*	*	403	371	406	379	*	*	*	*	*	*	404	375
07:00	*	*	*	*	288	294	321	265	*	*	*	*	*	*	304	280
08:00	*	*	*	*	210	169	213	205	*	*	*	*	*	*	212	187
09:00	*	*	*	*	158	109	150	132	*	*	*	*	*	*	154	120
10:00	*	*	*	*	79	66	100	106	*	*	*	*	*	*	90	86
11:00	*	*	*	*	66	67	55	57	*	*	*	*	*	*	60	62
Lane	0	0	0	0	6562	6454	6752	6729	0	0	0	0	0	0	6655	6591
Day	0		0		13016		13481		0		0		0		13246	
AM Peak	-	-	-	-	11:00	07:00	11:00	08:00	-	-	-	-	-	-	11:00	08:00
Vol.	-	-	-	-	409	422	380	490	-	-	-	-	-	-	394	444
PM Peak	-	-	-	-	15:00	16:00	15:00	16:00	-	-	-	-	-	-	15:00	16:00
Vol.	-	-	-	-	623	518	691	551	-	-	-	-	-	-	657	534

Comb. Total	0	0	13016	13481	0	0	0	13246

ADT ADT 13,248 AADT 13,248

MANUAL TURNING MOVEMENT COUNT DATA

Accurate Counts

978-664-2565

N/S Street : Driveway / Burrill Street
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880001
Site Code : 86880001
Start Date : 12/2/2020
Page No : 1

Groups Printed- Cars - Trucks

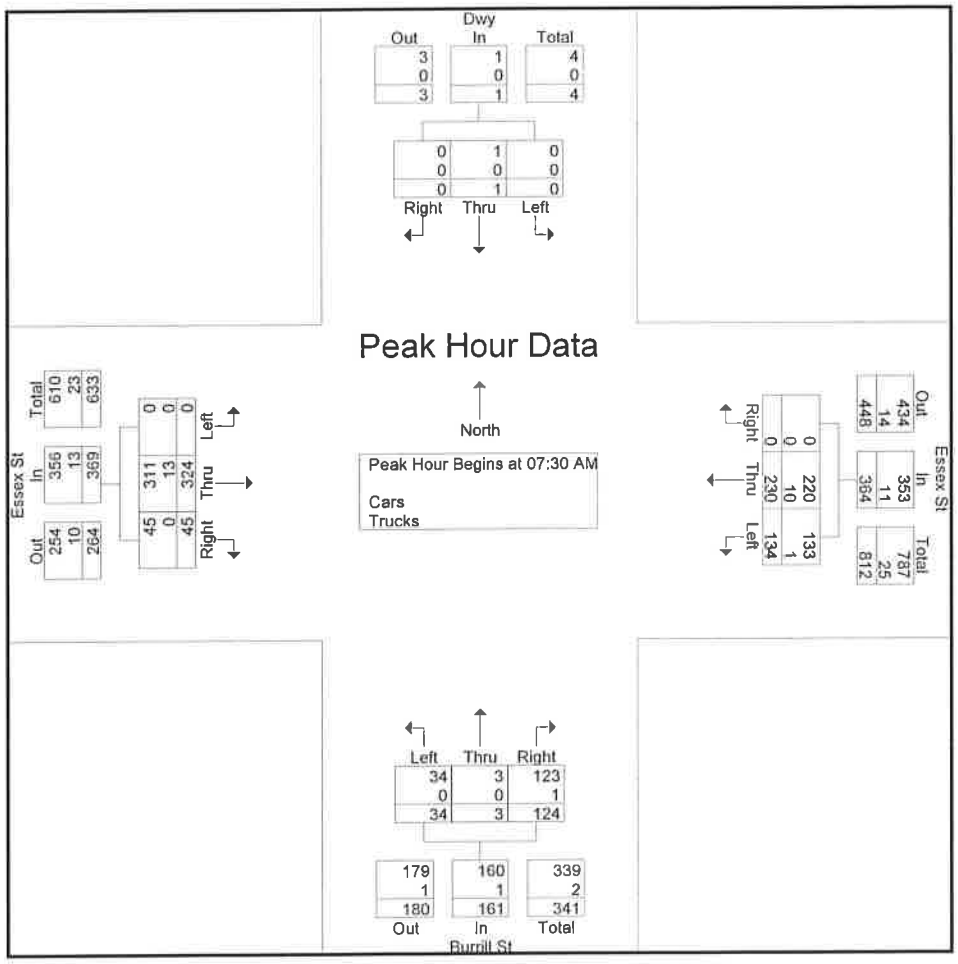
	Dwy From North			Essex St From East			Burrill St From South			Essex St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	16	48	0	4	0	22	0	73	5	168
07:15 AM	0	0	0	18	46	0	7	0	16	1	61	3	152
07:30 AM	0	0	0	30	51	0	4	1	23	0	87	12	208
07:45 AM	0	0	0	40	68	0	6	1	38	0	90	13	256
Total	0	0	0	104	213	0	21	2	99	1	311	33	784
08:00 AM	0	1	0	32	62	0	11	0	29	0	75	10	220
08:15 AM	0	0	0	32	49	0	13	1	34	0	72	10	211
08:30 AM	0	0	0	36	49	0	13	0	31	0	53	8	190
08:45 AM	0	0	0	21	48	0	8	0	34	0	70	10	191
Total	0	1	0	121	208	0	45	1	128	0	270	38	812
Grand Total	0	1	0	225	421	0	66	3	227	1	581	71	1596
Apprch %	0	100	0	34.8	65.2	0	22.3	1	76.7	0.2	89	10.9	
Total %	0	0.1	0	14.1	26.4	0	4.1	0.2	14.2	0.1	36.4	4.4	
Cars	0	1	0	223	403	0	66	3	226	1	557	69	1549
% Cars	0	100	0	99.1	95.7	0	100	100	99.6	100	95.9	97.2	97.1
Trucks	0	0	0	2	18	0	0	0	1	0	24	2	47
% Trucks	0	0	0	0.9	4.3	0	0	0	0.4	0	4.1	2.8	2.9

	Dwy From North				Essex St From East				Burrill St From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	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	0	0	0	30	51	0	81	4	**1**	23	28	0	87	12	99	208
07:45 AM	0	0	0	0	**40**	**68**	0	**108**	6	1	**38**	45	0	**90**	**13**	**103**	**256**
08:00 AM	0	**1**	0	**1**	32	62	0	94	11	0	29	40	0	75	10	85	220
08:15 AM	0	0	0	0	32	49	0	81	**13**	1	34	**48**	0	72	10	82	211
Total Volume	0	1	0	1	134	230	0	364	34	3	124	161	0	324	45	369	895
% App. Total	0	100	0		36.8	63.2	0		21.1	1.9	77		0	87.8	12.2		
PHF	.000	.250	.000	.250	.838	.846	.000	.843	.654	.750	.816	.839	.000	.900	.865	.896	.874
Cars	0	1	0	1	133	220	0	353	34	3	123	160	0	311	45	356	870
% Cars	0	100	0	100	99.3	95.7	0	97.0	100	100	99.2	99.4	0	96.0	100	96.5	97.2
Trucks	0	0	0	0	1	10	0	11	0	0	1	1	0	13	0	13	25
% Trucks	0	0	0	0	0.7	4.3	0	3.0	0	0	0.8	0.6	0	4.0	0	3.5	2.8

Accurate Counts
978-664-2565

N/S Street : Driveway / Burrill Street
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880001
Site Code : 86880001
Start Date : 12/2/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:45 AM				07:45 AM				07:30 AM			
+0 mins.	0	0	0	0	**40**	**68**	0	**108**	6	**1**	**38**	45	0	87	12	99
+15 mins.	0	0	0	0	32	62	0	94	11	0	29	**40**	0	**90**	**13**	**103**
+30 mins.	0	0	0	0	32	49	0	81	**13**	1	34	**48**	0	75	10	85
+45 mins.	0	**1**	0	**1**	36	49	0	85	13	0	31	44	0	72	10	82
Total Volume	0	1	0	1	140	228	0	368	43	2	132	177	0	324	45	369
% App. Total	0	100	0		38	62	0		24.3	1.1	74.6		0	87.8	12.2	
PHF	.000	.250	.000	.250	.875	.838	.000	.852	.827	.500	.868	.922	.000	.900	.865	.896
Cars	0	1	0	1	139	217	0	356	43	2	131	176	0	311	45	356
% Cars	0	100	0	100	99.3	95.2	0	96.7	100	100	99.2	99.4	0	96	100	96.5
Trucks	0	0	0	0	1	11	0	12	0	0	1	1	0	13	0	13
% Trucks	0	0	0	0	0.7	4.8	0	3.3	0	0	0.8	0.6	0	4	0	3.5

Accurate Counts

978-664-2565

N/S Street : Driveway / Burrill Street
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880001
Site Code : 86880001
Start Date : 12/2/2020
Page No : 4

Groups Printed- Cars

	Dwy From North			Essex St From East			Burrill St From South			Essex St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	16	47	0	4	0	22	0	72	4	165
07:15 AM	0	0	0	18	44	0	7	0	16	1	58	3	147
07:30 AM	0	0	0	30	49	0	4	1	23	0	85	12	204
07:45 AM	0	0	0	40	68	0	6	1	38	0	84	13	250
Total	0	0	0	104	208	0	21	2	99	1	299	32	766
08:00 AM	0	1	0	31	59	0	11	0	28	0	74	10	214
08:15 AM	0	0	0	32	44	0	13	1	34	0	68	10	202
08:30 AM	0	0	0	36	46	0	13	0	31	0	50	8	184
08:45 AM	0	0	0	20	46	0	8	0	34	0	66	9	183
Total	0	1	0	119	195	0	45	1	127	0	258	37	783
Grand Total	0	1	0	223	403	0	66	3	226	1	557	69	1549
Apprch %	0	100	0	35.6	64.4	0	22.4	1	76.6	0.2	88.8	11	
Total %	0	0.1	0	14.4	26	0	4.3	0.2	14.6	0.1	36	4.5	

	Dwy From North				Essex St From East				Burrill St From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	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	0	0	0	30	49	0	79	4	**1**	23	28	0	**85**	12	**97**	204
07:45 AM	0	0	0	0	**40**	**68**	0	**108**	6	1	**38**	45	0	84	**13**	97	**250**
08:00 AM	0	**1**	0	**1**	31	59	0	90	11	0	28	39	0	74	10	84	214
08:15 AM	0	0	0	0	32	44	0	76	**13**	1	34	**48**	0	68	10	78	202
Total Volume	0	1	0	1	133	220	0	353	34	3	123	160	0	311	45	356	870
% App. Total	0	100	0		37.7	62.3	0		21.2	1.9	76.9		0	87.4	12.6		
PHF	.000	.250	.000	.250	.831	.809	.000	.817	.654	.750	.809	.833	.000	.915	.865	.918	.870

Accurate Counts

978-664-2565

N/S Street : Driveway / Burrill Street
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880001
Site Code : 86880001
Start Date : 12/2/2020
Page No : 7

Groups Printed- Trucks

	Dwy From North			Essex St From East			Burrill St From South			Essex St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	1	0	0	0	0	0	1	1	3
07:15 AM	0	0	0	0	2	0	0	0	0	0	3	0	5
07:30 AM	0	0	0	0	2	0	0	0	0	0	2	0	4
07:45 AM	0	0	0	0	0	0	0	0	0	0	6	0	6
Total	0	0	0	0	5	0	0	0	0	0	12	1	18
08:00 AM	0	0	0	1	3	0	0	0	1	0	1	0	6
08:15 AM	0	0	0	0	5	0	0	0	0	0	4	0	9
08:30 AM	0	0	0	0	3	0	0	0	0	0	3	0	6
08:45 AM	0	0	0	1	2	0	0	0	0	0	4	1	8
Total	0	0	0	2	13	0	0	0	1	0	12	1	29
Grand Total	0	0	0	2	18	0	0	0	1	0	24	2	47
Apprch %	0	0	0	10	90	0	0	0	100	0	92.3	7.7	
Total %	0	0	0	4.3	38.3	0	0	0	2.1	0	51.1	4.3	

	Dwy From North				Essex St From East				Burrill St From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	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	0	0	0	**1**	3	0	4	0	0	**1**	**1**	0	1	0	1	6
08:15 AM	0	0	0	0	0	**5**	0	**5**	0	0	0	0	0	**4**	0	4	**9**
08:30 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	3	0	3	6
08:45 AM	0	0	0	0	1	2	0	3	0	0	0	0	0	4	**1**	**5**	8
Total Volume	0	0	0	0	2	13	0	15	0	0	1	1	0	12	1	13	29
% App. Total	0	0	0		13.3	86.7	0		0	0	100		0	92.3	7.7		
PHF	.000	.000	.000	.000	.500	.650	.000	.750	.000	.000	.250	.250	.000	.750	.250	.650	.806

Accurate Counts

978-664-2565

N/S Street : Driveway / Burrill Street
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880001
Site Code : 86880001
Start Date : 12/2/2020
Page No : 10

Groups Printed- Bikes Peds

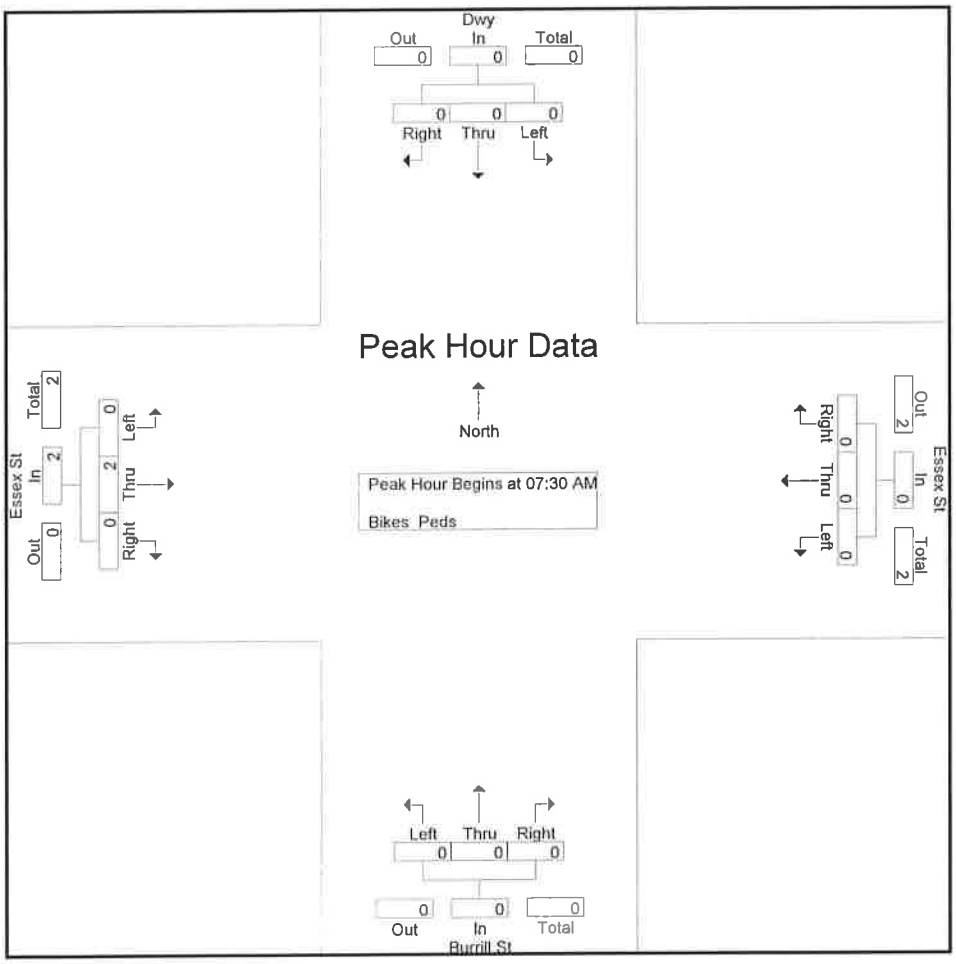
	Dwy From North				Essex St From East				Burrill St From South				Essex St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	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
Total	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	1	0	0	0	1	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
08:30 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	3	0	0	0	0	0	0	0	0	0	2	0	0	3	2	5
Grand Total	0	0	0	3	0	0	0	0	0	0	0	0	0	2	0	0	3	2	5
Apprch %	0	0	0		0	0	0		0	0	0		0	100	0				
Total %	0	0	0		0	0	0		0	0	0		0	100	0		60	40	

	Dwy From North				Essex St From East				Burrill St From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	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	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
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
% App. Total	0	0	0		0	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.500	.500

Accurate Counts
978-664-2565

N/S Street : Driveway / Burrill Street
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880001
Site Code : 86880001
Start Date : 12/2/2020
Page No : 11



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:30 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
% App. Total	0	0	0		0	0	0		0	0	0		0	100	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.500

Accurate Counts

978-664-2565

N/S Street : Driveway / Burrill Street
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880001
Site Code : 86880001
Start Date : 12/2/2020
Page No : 1

Groups Printed- Cars - Trucks

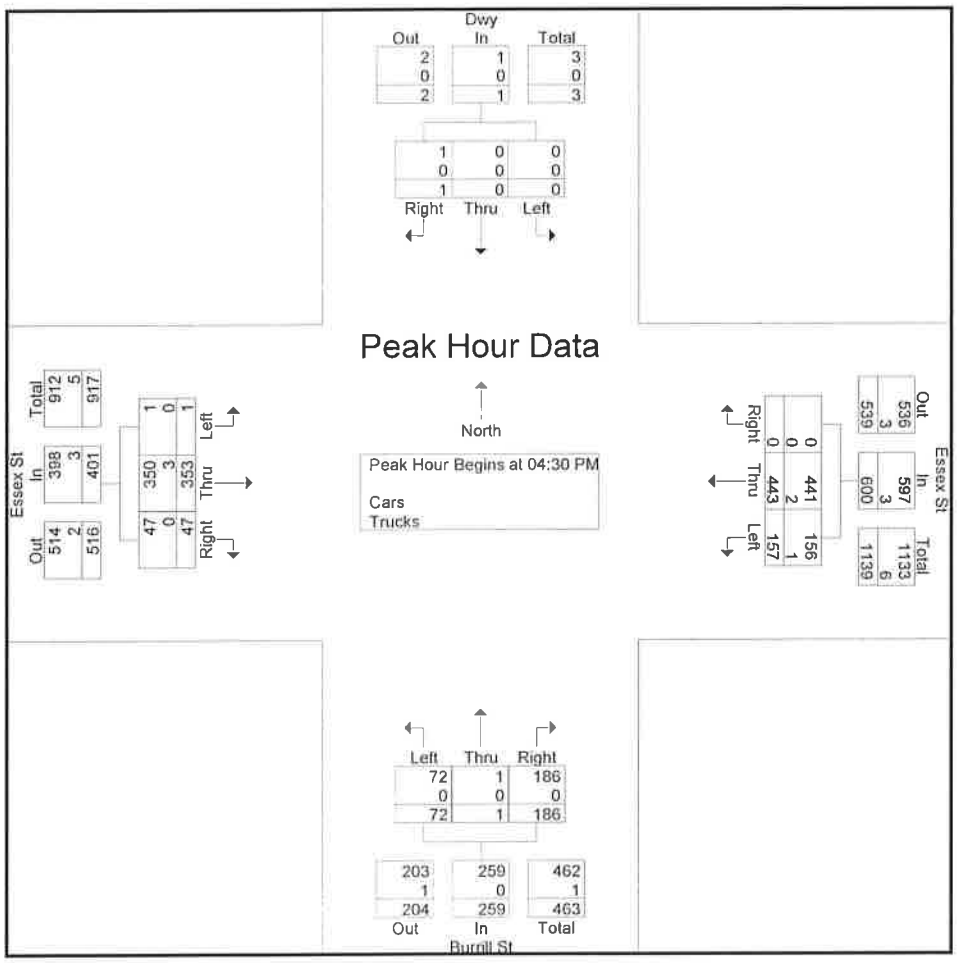
	Dwy From North			Essex St From East			Burrill St From South			Essex St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	40	96	0	13	0	46	0	98	9	302
04:15 PM	0	0	0	37	120	0	22	1	55	0	71	11	317
04:30 PM	0	0	0	43	104	0	16	0	33	1	82	19	298
04:45 PM	0	0	0	27	114	0	16	0	64	0	101	9	331
Total	0	0	0	147	434	0	67	1	198	1	352	48	1248
05:00 PM	0	0	0	39	110	0	20	0	50	0	75	8	302
05:15 PM	0	0	1	48	115	0	20	1	39	0	95	11	330
05:30 PM	0	0	0	36	86	0	13	0	33	0	77	10	255
05:45 PM	0	0	0	38	76	0	17	0	58	0	79	13	281
Total	0	0	1	161	387	0	70	1	180	0	326	42	1168
Grand Total	0	0	1	308	821	0	137	2	378	1	678	90	2416
Apprch %	0	0	100	27.3	72.7	0	26.5	0.4	73.1	0.1	88.2	11.7	
Total %	0	0	0	12.7	34	0	5.7	0.1	15.6	0	28.1	3.7	
Cars	0	0	1	307	817	0	136	2	378	1	670	89	2401
% Cars	0	0	100	99.7	99.5	0	99.3	100	100	100	98.8	98.9	99.4
Trucks	0	0	0	1	4	0	1	0	0	0	8	1	15
% Trucks	0	0	0	0.3	0.5	0	0.7	0	0	0	1.2	1.1	0.6

	Dwy From North				Essex St From East				Burrill St From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	43	104	0	147	16	0	33	49	**1**	82	**19**	102	298
04:45 PM	0	0	0	0	27	114	0	141	16	0	**64**	**80**	0	**101**	9	**110**	**331**
05:00 PM	0	0	0	0	39	110	0	149	**20**	0	50	70	0	75	8	83	302
05:15 PM	0	0	**1**	**1**	**48**	**115**	0	**163**	20	**1**	39	60	0	95	11	106	330
Total Volume	0	0	1	1	157	443	0	600	72	1	186	259	1	353	47	401	1261
% App. Total	0	0	100		26.2	73.8	0		27.8	0.4	71.8		0.2	88	11.7		
PHF	.000	.000	.250	.250	.818	.963	.000	.920	.900	.250	.727	.809	.250	.874	.618	.911	.952
Cars	0	0	1	1	156	441	0	597	72	1	186	259	1	350	47	398	1255
% Cars	0	0	100	100	99.4	99.5	0	99.5	100	100	100	100	100	99.2	100	99.3	99.5
Trucks	0	0	0	0	1	2	0	3	0	0	0	0	0	3	0	3	6
% Trucks	0	0	0	0	0.6	0.5	0	0.5	0	0	0	0	0	0.8	0	0.7	0.5

Accurate Counts
978-664-2565

N/S Street : Driveway / Burrill Street
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880001
Site Code : 86880001
Start Date : 12/2/2020
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:15 PM				04:00 PM			
+0 mins.	0	0	0	0	43	104	0	147	**22**	**1**	55	78	0	98	9	107
+15 mins.	0	0	0	0	27	114	0	141	16	0	33	49	0	71	11	82
+30 mins.	0	0	0	0	39	110	0	149	16	0	**64**	**80**	**1**	82	**19**	102
+45 mins.	0	0	**1**	**1**	**48**	**115**	0	**163**	20	0	50	70	0	**101**	9	**110**
Total Volume	0	0	1	1	157	443	0	600	74	1	202	277	1	352	48	401
% App. Total	0	0	100		26.2	73.8	0		26.7	0.4	72.9		0.2	87.8	12	
PHF	.000	.000	.250	.250	.818	.963	.000	.920	.841	.250	.789	.866	.250	.871	.632	.911
Cars	0	0	1	1	156	441	0	597	74	1	202	277	1	347	48	396
% Cars	0	0	100	100	99.4	99.5	0	99.5	100	100	100	100	100	98.6	100	98.8
Trucks	0	0	0	0	1	2	0	3	0	0	0	0	0	5	0	5
% Trucks	0	0	0	0	0.6	0.5	0	0.5	0	0	0	0	0	1.4	0	1.2

Accurate Counts

978-664-2565

N/S Street : Driveway / Burrill Street
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880001
Site Code : 86880001
Start Date : 12/2/2020
Page No : 4

Groups Printed- Cars

	Dwy From North			Essex St From East			Burrill St From South			Essex St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	40	96	0	13	0	46	0	97	9	301
04:15 PM	0	0	0	37	119	0	22	1	55	0	69	11	314
04:30 PM	0	0	0	43	103	0	16	0	33	1	81	19	296
04:45 PM	0	0	0	27	114	0	16	0	64	0	100	9	330
Total	0	0	0	147	432	0	67	1	198	1	347	48	1241
05:00 PM	0	0	0	39	109	0	20	0	50	0	75	8	301
05:15 PM	0	0	1	47	115	0	20	1	39	0	94	11	328
05:30 PM	0	0	0	36	85	0	12	0	33	0	77	9	252
05:45 PM	0	0	0	38	76	0	17	0	58	0	77	13	279
Total	0	0	1	160	385	0	69	1	180	0	323	41	1160
Grand Total	0	0	1	307	817	0	136	2	378	1	670	89	2401
Apprch %	0	0	100	27.3	72.7	0	26.4	0.4	73.3	0.1	88.2	11.7	
Total %	0	0	0	12.8	34	0	5.7	0.1	15.7	0	27.9	3.7	

	Dwy From North				Essex St From East				Burrill St From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	43	103	0	146	16	0	33	49	**1**	81	**19**	101	296
04:45 PM	0	0	0	0	27	114	0	141	16	0	**64**	**80**	0	**100**	9	**109**	**330**
05:00 PM	0	0	0	0	39	109	0	148	**20**	0	50	70	0	75	8	83	301
05:15 PM	0	0	**1**	**1**	**47**	**115**	0	**162**	20	**1**	39	60	0	94	11	105	328
Total Volume	0	0	1	1	156	441	0	597	72	1	186	259	1	350	47	398	1255
% App. Total	0	0	100		26.1	73.9	0		27.8	0.4	71.8		0.3	87.9	11.8		
PHF	.000	.000	.250	.250	.830	.959	.000	.921	.900	.250	.727	.809	.250	.875	.618	.913	.951

Accurate Counts

978-664-2565

N/S Street : Driveway / Burrill Street
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880001
Site Code : 86880001
Start Date : 12/2/2020
Page No : 7

Groups Printed- Trucks

	Dwy From North			Essex St From East			Burrill St From South			Essex St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
04:15 PM	0	0	0	0	1	0	0	0	0	0	2	0	3
04:30 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	0	2	0	0	0	0	0	5	0	7
05:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	1	0	0	0	0	0	0	1	0	2
05:30 PM	0	0	0	0	1	0	1	0	0	0	0	1	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
Total	0	0	0	1	2	0	1	0	0	0	3	1	8
Grand Total	0	0	0	1	4	0	1	0	0	0	8	1	15
Apprch %	0	0	0	20	80	0	100	0	0	0	88.9	11.1	
Total %	0	0	0	6.7	26.7	0	6.7	0	0	0	53.3	6.7	

	Dwy From North				Essex St From East				Burrill St From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	**1**	0	0	1	0	0	0	0	0	**1**	0	1	2
05:30 PM	0	0	0	0	0	1	0	1	**1**	0	0	**1**	0	0	**1**	1	**3**
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**	2
Total Volume	0	0	0	0	1	2	0	3	1	0	0	1	0	3	1	4	8
% App. Total	0	0	0		33.3	66.7	0		100	0	0		0	75	25		
PHF	.000	.000	.000	.000	.250	.500	.000	.750	.250	.000	.000	.250	.000	.375	.250	.500	.667

Accurate Counts
978-664-2565

N/S Street : Driveway / Burrill Street
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880001
Site Code : 86880001
Start Date : 12/2/2020
Page No : 10

Groups Printed- Bikes Peds

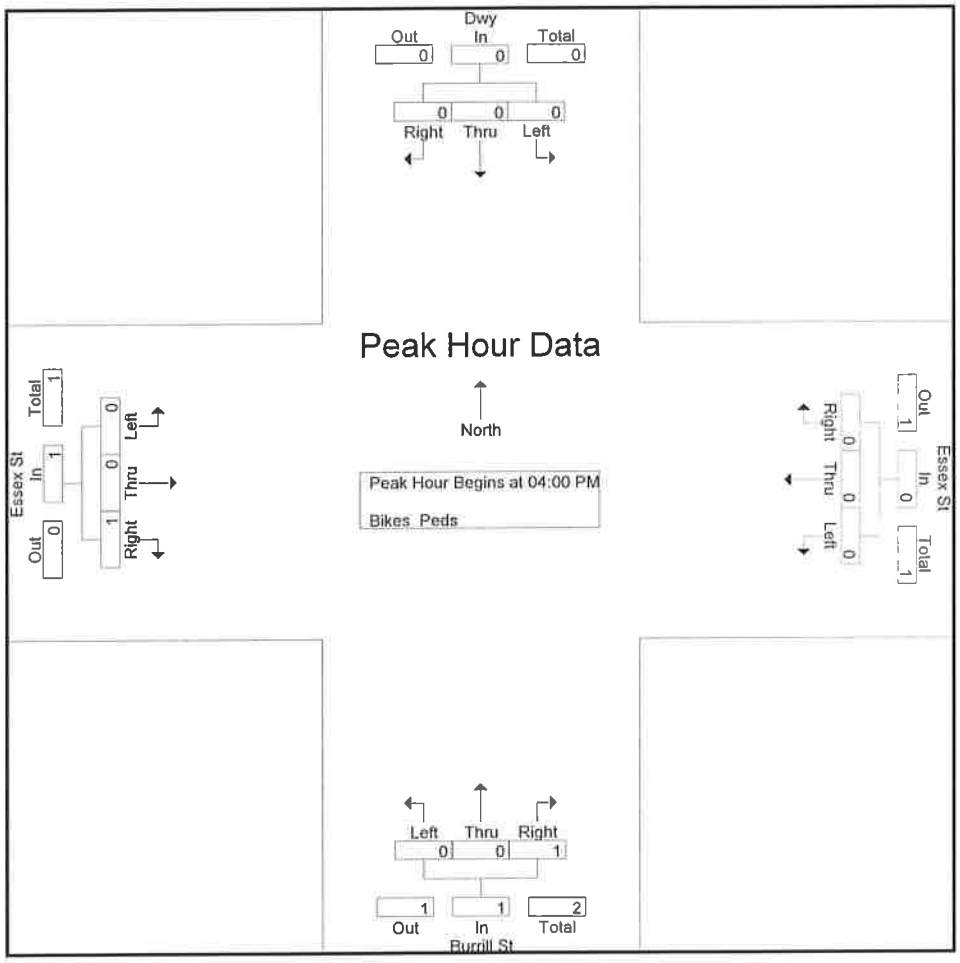
	Dwy From North				Essex St From East				Burrill St From South				Essex St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	0	2	2	4
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	1	0	0	1	1	0	0	1	0	3	2	5
05:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	2
05:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	2
05:30 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	3	0	3
05:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	2	0	0	0	3	1	0	0	0	0	0	0	2	7	1	8
Grand Total	0	0	0	3	0	0	0	4	1	0	1	1	0	0	1	2	10	3	13
Apprch %	0	0	0		0	0	0		50	0	50		0	0	100				
Total %	0	0	0		0	0	0		33.3	0	33.3		0	0	33.3		76.9	23.1	

	Dwy From North				Essex St From East				Burrill St From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	**1**	**1**	**2**
04:15 PM	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	0	0	0	0
04:45 PM	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	1	1	0	0	1	1	2
% App. Total	0	0	0		0	0	0		0	0	100		0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.250	.250	.250

Accurate Counts
978-664-2565

N/S Street : Driveway / Burrill Street
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880001
Site Code : 86880001
Start Date : 12/2/2020
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	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	1	1	0	0	1	1
% App. Total	0	0	0		0	0	0		0	0	100		0	0	100	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.250	.250

Accurate Counts

978-664-2565

N/S Street : Pitman Road
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880002
Site Code : 86880002
Start Date : 12/2/2020
Page No : 1

Groups Printed- Cars - Trucks

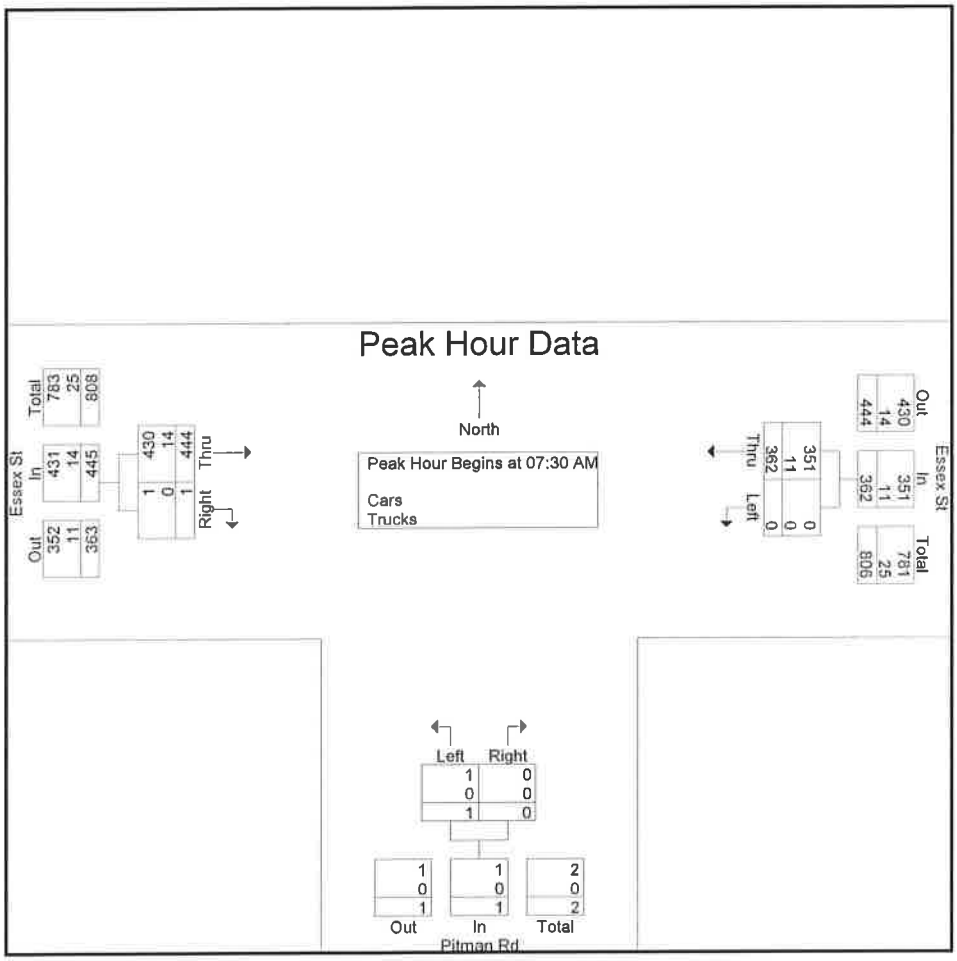
	Essex St From East		Pitman Rd From South		Essex St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	62	0	0	94	0	156
07:15 AM	0	64	1	2	76	2	145
07:30 AM	0	81	0	0	107	0	188
07:45 AM	0	106	1	0	129	0	236
Total	0	313	2	2	406	2	725
08:00 AM	0	95	0	0	104	1	200
08:15 AM	0	80	0	0	104	0	184
08:30 AM	0	85	1	1	84	1	172
08:45 AM	1	68	0	0	103	0	172
Total	1	328	1	1	395	2	728
Grand Total	1	641	3	3	801	4	1453
Apprch %	0.2	99.8	50	50	99.5	0.5	
Total %	0.1	44.1	0.2	0.2	55.1	0.3	
Cars	1	621	3	3	779	4	1411
% Cars	100	96.9	100	100	97.3	100	97.1
Trucks	0	20	0	0	22	0	42
% Trucks	0	3.1	0	0	2.7	0	2.9

	Essex St From East			Pitman Rd From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	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	**81**	81	0	0	0	107	0	107	188
07:45 AM	0	**106**	**106**	**1**	0	**1**	**129**	0	**129**	**236**
08:00 AM	0	95	95	0	0	0	104	**1**	105	200
08:15 AM	0	80	80	0	0	0	104	0	104	184
Total Volume	0	362	362	1	0	1	444	1	445	808
% App. Total	0	100		100	0		99.8	0.2		
PHF	.000	.854	.854	.250	.000	.250	.860	.250	.862	.856
Cars	0	351	351	1	0	1	430	1	431	783
% Cars	0	97.0	97.0	100	0	100	96.8	100	96.9	96.9
Trucks	0	11	11	0	0	0	14	0	14	25
% Trucks	0	3.0	3.0	0	0	0	3.2	0	3.1	3.1

Accurate Counts
978-664-2565

N/S Street : Pitman Road
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880002
Site Code : 86880002
Start Date : 12/2/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM			07:00 AM			07:30 AM		
+0 mins.	0	**106**	**106**	0	0	0	107	0	107
+15 mins.	0	95	95	**1**	**2**	**3**	**129**	0	**129**
+30 mins.	0	80	80	0	0	0	104	**1**	105
+45 mins.	0	85	85	**1**	0	1	104	0	104
Total Volume	0	366	366	2	2	4	444	1	445
% App. Total	0	100		50	50		99.8	0.2	
PHF	.000	.863	.863	.500	.250	.333	.860	.250	.862
Cars	0	353	353	2	2	4	430	1	431
% Cars	0	96.4	96.4	100	100	100	96.8	100	96.9
Trucks	0	13	13	0	0	0	14	0	14
% Trucks	0	3.6	3.6	0	0	0	3.2	0	3.1

Accurate Counts

978-664-2565

N/S Street : Pitman Road
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880002
Site Code : 86880002
Start Date : 12/2/2020
Page No : 4

Groups Printed- Cars

	Essex St From East		Pitman Rd From South		Essex St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	62	0	0	93	0	155
07:15 AM	0	62	1	2	74	2	141
07:30 AM	0	79	0	0	104	0	183
07:45 AM	0	106	1	0	123	0	230
Total	0	309	2	2	394	2	709
08:00 AM	0	91	0	0	102	1	194
08:15 AM	0	75	0	0	101	0	176
08:30 AM	0	81	1	1	82	1	166
08:45 AM	1	65	0	0	100	0	166
Total	1	312	1	1	385	2	702
Grand Total	1	621	3	3	779	4	1411
Apprch %	0.2	99.8	50	50	99.5	0.5	
Total %	0.1	44	0.2	0.2	55.2	0.3	

	Essex St From East			Pitman Rd From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	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	79	79	0	0	0	104	0	104	183
07:45 AM	0	**106**	**106**	**1**	0	**1**	**123**	0	**123**	**230**
08:00 AM	0	91	91	0	0	0	102	**1**	103	194
08:15 AM	0	75	75	0	0	0	101	0	101	176
Total Volume	0	351	351	1	0	1	430	1	431	783
% App. Total	0	100		100	0		99.8	0.2		
PHF	.000	.828	.828	.250	.000	.250	.874	.250	.876	.851

Accurate Counts

978-664-2565

N/S Street : Pitman Road
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880002
Site Code : 86880002
Start Date : 12/2/2020
Page No : 7

Groups Printed- Trucks

	Essex St From East		Pitman Rd From South		Essex St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	0	0	0	1	0	1
07:15 AM	0	2	0	0	2	0	4
07:30 AM	0	2	0	0	3	0	5
07:45 AM	0	0	0	0	6	0	6
Total	0	4	0	0	12	0	16
08:00 AM	0	4	0	0	2	0	6
08:15 AM	0	5	0	0	3	0	8
08:30 AM	0	4	0	0	2	0	6
08:45 AM	0	3	0	0	3	0	6
Total	0	16	0	0	10	0	26
Grand Total	0	20	0	0	22	0	42
Apprch %	0	100	0	0	100	0	
Total %	0	47.6	0	0	52.4	0	

	Essex St From East			Pitman Rd From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	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 07:45 AM										
07:45 AM	0	0	0	0	0	0	**6**	0	**6**	6
08:00 AM	0	4	**4**	0	0	0	2	0	2	6
08:15 AM	0	**5**	**5**	0	0	0	3	0	3	**8**
08:30 AM	0	4	4	0	0	0	2	0	2	6
Total Volume	0	13	13	0	0	0	13	0	13	26
% App. Total	0	100		0	0		100	0		
PHF	.000	.650	.650	.000	.000	.000	.542	.000	.542	.813

Accurate Counts

978-664-2565

N/S Street : Pitman Road
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880002
Site Code : 86880002
Start Date : 12/2/2020
Page No : 10

Groups Printed- Bikes Peds

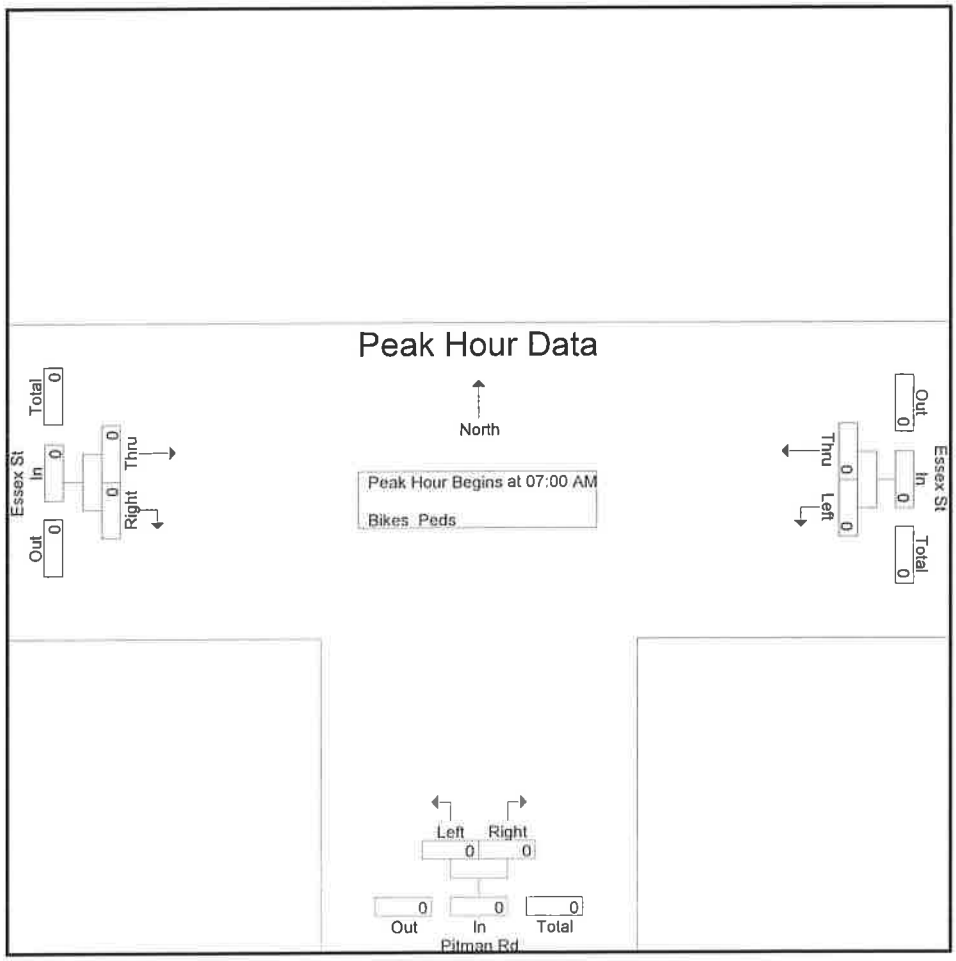
	Essex St From East			Pitman Rd From South			Essex St From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	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
08:15 AM	0	0	0	0	0	1	0	0	0	1	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	1	0	0	0	1	0	1
Total	0	0	0	0	0	2	0	0	0	2	0	2
Grand Total	0	0	0	0	0	2	0	0	0	2	0	2
Apprch %	0	0		0	0		0	0				
Total %										100	0	

	Essex St From East			Pitman Rd From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	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
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Pitman Road
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880002
Site Code : 86880002
Start Date : 12/2/2020
Page No : 11



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Pitman Road
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880002
Site Code : 86880002
Start Date : 12/2/2020
Page No : 1

Groups Printed- Cars - Trucks

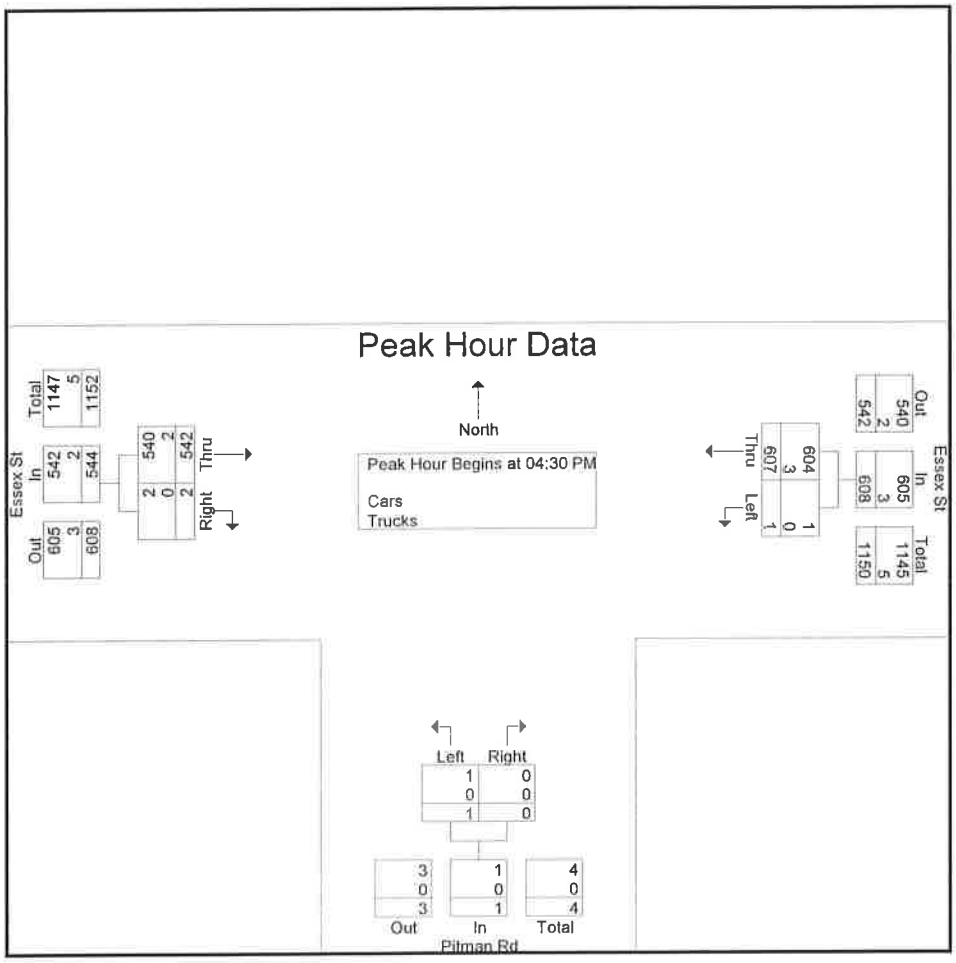
	Essex St From East		Pitman Rd From South		Essex St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	143	0	1	145	0	289
04:15 PM	0	155	0	0	128	0	283
04:30 PM	0	144	0	0	117	1	262
04:45 PM	1	145	0	0	162	0	308
Total	1	587	0	1	552	1	1142
05:00 PM	0	154	0	0	131	0	285
05:15 PM	0	164	1	0	132	1	298
05:30 PM	0	123	0	0	112	0	235
05:45 PM	0	117	0	0	132	1	250
Total	0	558	1	0	507	2	1068
Grand Total	1	1145	1	1	1059	3	2210
Apprch %	0.1	99.9	50	50	99.7	0.3	
Total %	0	51.8	0	0	47.9	0.1	
Cars	1	1139	1	1	1054	3	2199
% Cars	100	99.5	100	100	99.5	100	99.5
Trucks	0	6	0	0	5	0	11
% Trucks	0	0.5	0	0	0.5	0	0.5

	Essex St From East			Pitman Rd From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	0	144	144	0	0	0	117	**1**	118	262
04:45 PM	**1**	145	146	0	0	0	**162**	0	**162**	**308**
05:00 PM	0	154	154	0	0	0	131	0	131	285
05:15 PM	0	**164**	**164**	**1**	0	**1**	132	1	133	298
Total Volume	1	607	608	1	0	1	542	2	544	1153
% App. Total	0.2	99.8		100	0		99.6	0.4		
PHF	.250	.925	.927	.250	.000	.250	.836	.500	.840	.936
Cars	1	604	605	1	0	1	540	2	542	1148
% Cars	100	99.5	99.5	100	0	100	99.6	100	99.6	99.6
Trucks	0	3	3	0	0	0	2	0	2	5
% Trucks	0	0.5	0.5	0	0	0	0.4	0	0.4	0.4

Accurate Counts
978-664-2565

N/S Street : Pitman Road
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880002
Site Code : 86880002
Start Date : 12/2/2020
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM			04:00 PM			04:00 PM		
+0 mins.	0	144	144	0	**1**	**1**	145	0	145
+15 mins.	**1**	145	146	0	0	0	128	0	128
+30 mins.	0	154	154	0	0	0	117	**1**	118
+45 mins.	0	**164**	**164**	0	0	0	**162**	0	**162**
Total Volume	1	607	608	0	1	1	552	1	553
% App. Total	0.2	99.8		0	100		99.8	0.2	
PHF	.250	.925	.927	.000	.250	.250	.852	.250	.853
Cars	1	604	605	0	1	1	550	1	551
% Cars	100	99.5	99.5	0	100	100	99.6	100	99.6
Trucks	0	3	3	0	0	0	2	0	2
% Trucks	0	0.5	0.5	0	0	0	0.4	0	0.4

Accurate Counts

978-664-2565

N/S Street : Pitman Road
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880002
Site Code : 86880002
Start Date : 12/2/2020
Page No : 4

Groups Printed- Cars

	Essex St From East		Pitman Rd From South		Essex St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	143	0	1	145	0	289
04:15 PM	0	154	0	0	127	0	281
04:30 PM	0	143	0	0	117	1	261
04:45 PM	1	145	0	0	161	0	307
Total	1	585	0	1	550	1	1138
05:00 PM	0	153	0	0	131	0	284
05:15 PM	0	163	1	0	131	1	296
05:30 PM	0	122	0	0	112	0	234
05:45 PM	0	116	0	0	130	1	247
Total	0	554	1	0	504	2	1061
Grand Total	1	1139	1	1	1054	3	2199
Apprch %	0.1	99.9	50	50	99.7	0.3	
Total %	0	51.8	0	0	47.9	0.1	

	Essex St From East			Pitman Rd From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	0	143	143	0	0	0	117	**1**	118	261
04:45 PM	**1**	145	146	0	0	0	**161**	0	**161**	**307**
05:00 PM	0	153	153	0	0	0	131	0	131	284
05:15 PM	0	**163**	**163**	**1**	0	**1**	131	1	132	296
Total Volume	1	604	605	1	0	1	540	2	542	1148
% App. Total	0.2	99.8		100	0		99.6	0.4		
PHF	.250	.926	.928	.250	.000	.250	.839	.500	.842	.935

Accurate Counts

978-664-2565

N/S Street : Pitman Road
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880002
Site Code : 86880002
Start Date : 12/2/2020
Page No : 7

Groups Printed- Trucks

	Essex St From East		Pitman Rd From South		Essex St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0
04:15 PM	0	1	0	0	1	0	2
04:30 PM	0	1	0	0	0	0	1
04:45 PM	0	0	0	0	1	0	1
Total	0	2	0	0	2	0	4
05:00 PM	0	1	0	0	0	0	1
05:15 PM	0	1	0	0	1	0	2
05:30 PM	0	1	0	0	0	0	1
05:45 PM	0	1	0	0	2	0	3
Total	0	4	0	0	3	0	7
Grand Total	0	6	0	0	5	0	11
Apprch %	0	100	0	0	100	0	
Total %	0	54.5	0	0	45.5	0	

	Essex St From East			Pitman Rd From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	1	1	0	0	0	0	0	0	1
05:15 PM	0	1	1	0	0	0	1	0	1	2
05:30 PM	0	1	1	0	0	0	0	0	0	1
05:45 PM	0	1	1	0	0	0	2	0	2	3
Total Volume	0	4	4	0	0	0	3	0	3	7
% App. Total	0	100		0	0		100	0		
PHF	.000	1.00	1.00	.000	.000	.000	.375	.000	.375	.583

Accurate Counts

978-664-2565

N/S Street : Pitman Road
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880002
Site Code : 86880002
Start Date : 12/2/2020
Page No : 10

Groups Printed- Bikes Peds

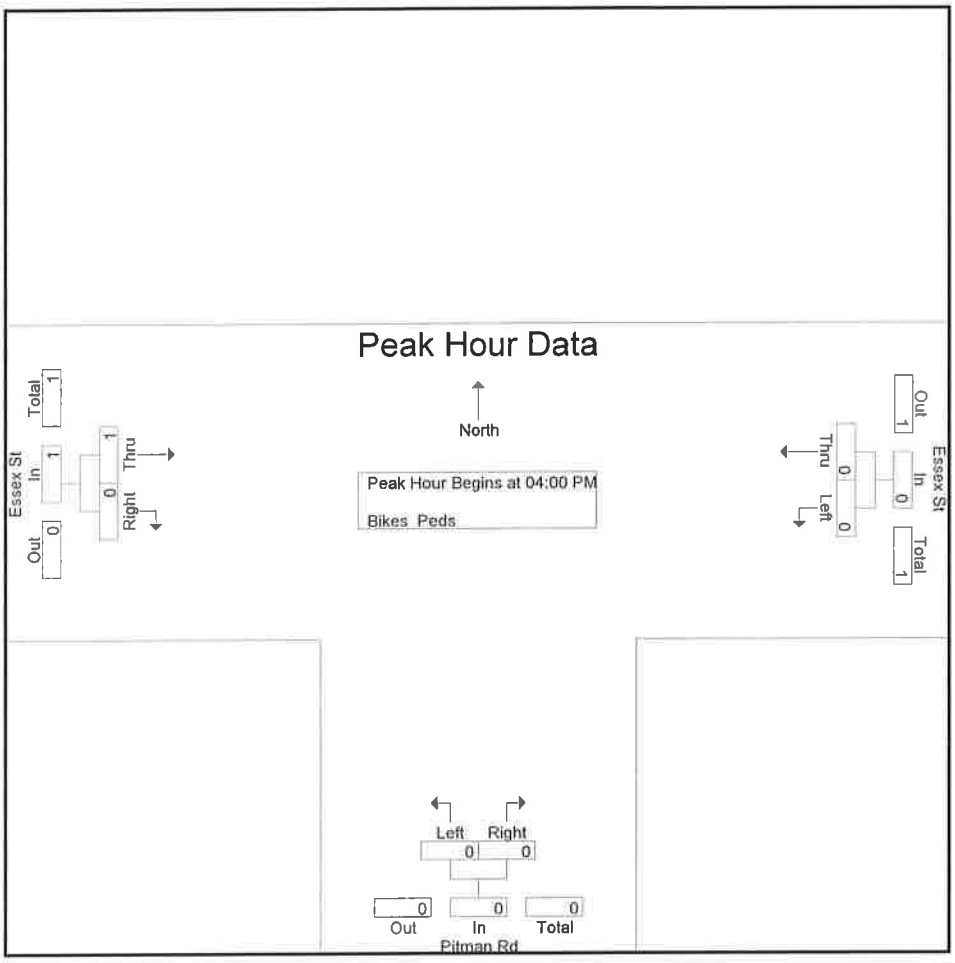
	Essex St From East			Pitman Rd From South			Essex St From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	1	0	0	0	1	0	1
04:15 PM	0	0	0	0	0	1	0	0	0	1	0	1
04:30 PM	0	0	0	0	0	2	1	0	0	2	1	3
04:45 PM	0	0	0	0	0	1	0	0	0	1	0	1
Total	0	0	0	0	0	5	1	0	0	5	1	6
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	1	0	0	0	1	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	1	0	0	0	1	0	1
Total	0	0	0	0	0	2	0	0	0	2	0	2
Grand Total	0	0	0	0	0	7	1	0	0	7	1	8
Apprch %	0	0		0	0		100	0				
Total %	0	0		0	0		100	0		87.5	12.5	

	Essex St From East			Pitman Rd From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	1	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

Accurate Counts
978-664-2565

N/S Street : Pitman Road
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880002
Site Code : 86880002
Start Date : 12/2/2020
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	**1**	0	**1**
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	1
% App. Total	0	0		0	0		100	0	
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250

Accurate Counts

978-664-2565

N/S Street : Elm Place
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880003
Site Code : 86880003
Start Date : 12/2/2020
Page No : 1

Groups Printed- Cars - Trucks

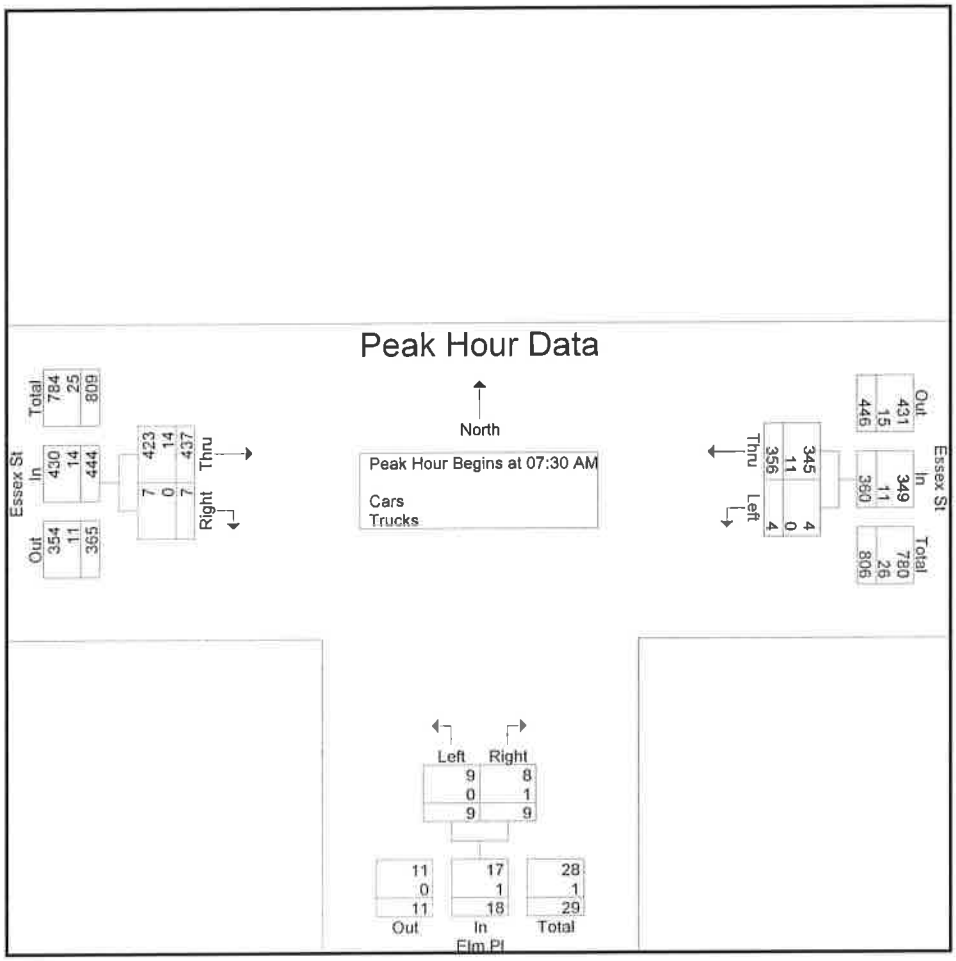
	Essex St From East		Elm Pl From South		Essex St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	2	60	1	1	94	2	160
07:15 AM	0	62	1	0	78	1	142
07:30 AM	1	85	0	1	105	3	195
07:45 AM	1	97	6	5	124	2	235
Total	4	304	8	7	401	8	732
08:00 AM	2	93	2	3	102	2	204
08:15 AM	0	81	1	0	106	0	188
08:30 AM	0	85	1	0	86	0	172
08:45 AM	0	69	0	1	100	1	171
Total	2	328	4	4	394	3	735
Grand Total	6	632	12	11	795	11	1467
Apprch %	0.9	99.1	52.2	47.8	98.6	1.4	
Total %	0.4	43.1	0.8	0.7	54.2	0.7	
Cars	5	614	12	9	773	11	1424
% Cars	83.3	97.2	100	81.8	97.2	100	97.1
Trucks	1	18	0	2	22	0	43
% Trucks	16.7	2.8	0	18.2	2.8	0	2.9

	Essex St From East			Elm Pl From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	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	1	85	86	0	1	1	105	3	108	195
07:45 AM	1	**97**	**98**	**6**	**5**	**11**	**124**	2	**126**	**235**
08:00 AM	**2**	93	95	2	3	5	102	2	104	204
08:15 AM	0	81	81	1	0	1	106	0	106	188
Total Volume	4	356	360	9	9	18	437	7	444	822
% App. Total	1.1	98.9		50	50		98.4	1.6		
PHF	.500	.918	.918	.375	.450	.409	.881	.583	.881	.874
Cars	4	345	349	9	8	17	423	7	430	796
% Cars	100	96.9	96.9	100	88.9	94.4	96.8	100	96.8	96.8
Trucks	0	11	11	0	1	1	14	0	14	26
% Trucks	0	3.1	3.1	0	11.1	5.6	3.2	0	3.2	3.2

Accurate Counts
978-664-2565

N/S Street : Elm Place
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880003
Site Code : 86880003
Start Date : 12/2/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM			07:15 AM			07:30 AM		
+0 mins.	1	85	86	1	0	1	105	3	108
+15 mins.	1	**97**	**98**	0	1	1	**124**	2	**126**
+30 mins.	**2**	93	95	**6**	**5**	**11**	102	2	104
+45 mins.	0	81	81	2	3	5	106	0	106
Total Volume	4	356	360	9	9	18	437	7	**444**
% App. Total	1.1	98.9		50	50		98.4	1.6	
PHF	.500	.918	.918	.375	.450	.409	.881	.583	.881
Cars	4	345	349	9	8	17	423	7	430
% Cars	100	96.9	96.9	100	88.9	94.4	96.8	100	96.8
Trucks	0	11	11	0	1	1	14	0	14
% Trucks	0	3.1	3.1	0	11.1	5.6	3.2	0	3.2

Accurate Counts

978-664-2565

N/S Street : Elm Place
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880003
Site Code : 86880003
Start Date : 12/2/2020
Page No : 4

Groups Printed- Cars

	Essex St From East		Elm Pl From South		Essex St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	1	60	1	0	93	2	157
07:15 AM	0	60	1	0	76	1	138
07:30 AM	1	83	0	1	102	3	190
07:45 AM	1	97	6	4	118	2	228
Total	3	300	8	5	389	8	713
08:00 AM	2	89	2	3	100	2	198
08:15 AM	0	76	1	0	103	0	180
08:30 AM	0	82	1	0	84	0	167
08:45 AM	0	67	0	1	97	1	166
Total	2	314	4	4	384	3	711
Grand Total	5	614	12	9	773	11	1424
Apprch %	0.8	99.2	57.1	42.9	98.6	1.4	
Total %	0.4	43.1	0.8	0.6	54.3	0.8	

	Essex St From East			Elm Pl From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	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	1	83	84	0	1	1	102	**3**	105	190
07:45 AM	1	**97**	**98**	**6**	**4**	**10**	**118**	2	**120**	**228**
08:00 AM	**2**	89	91	2	3	5	100	2	102	198
08:15 AM	0	76	76	1	0	1	103	0	103	180
Total Volume	4	345	349	9	8	17	423	7	430	796
% App. Total	1.1	98.9		52.9	47.1		98.4	1.6		
PHF	.500	.889	.890	.375	.500	.425	.896	.583	.896	.873

Accurate Counts

978-664-2565

N/S Street : Elm Place
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880003
Site Code : 86880003
Start Date : 12/2/2020
Page No : 7

Groups Printed- Trucks

	Essex St From East		Elm Pl From South		Essex St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	1	0	0	1	1	0	3
07:15 AM	0	2	0	0	2	0	4
07:30 AM	0	2	0	0	3	0	5
07:45 AM	0	0	0	1	6	0	7
Total	1	4	0	2	12	0	19
08:00 AM	0	4	0	0	2	0	6
08:15 AM	0	5	0	0	3	0	8
08:30 AM	0	3	0	0	2	0	5
08:45 AM	0	2	0	0	3	0	5
Total	0	14	0	0	10	0	24
Grand Total	1	18	0	2	22	0	43
Apprch %	5.3	94.7	0	100	100	0	
Total %	2.3	41.9	0	4.7	51.2	0	

	Essex St From East			Elm Pl From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	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	2	2	0	0	0	3	0	3	5
07:45 AM	0	0	0	0	**1**	**1**	**6**	0	**6**	7
08:00 AM	0	4	4	0	0	0	2	0	2	6
08:15 AM	0	**5**	**5**	0	0	0	3	0	3	**8**
Total Volume	0	11	11	0	1	1	14	0	14	26
% App. Total	0	100		0	100		100	0		
PHF	.000	.550	.550	.000	.250	.250	.583	.000	.583	.813

Accurate Counts

978-664-2565

N/S Street : Elm Place
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880003
Site Code : 86880003
Start Date : 12/2/2020

Groups Printed- Bikes Peds

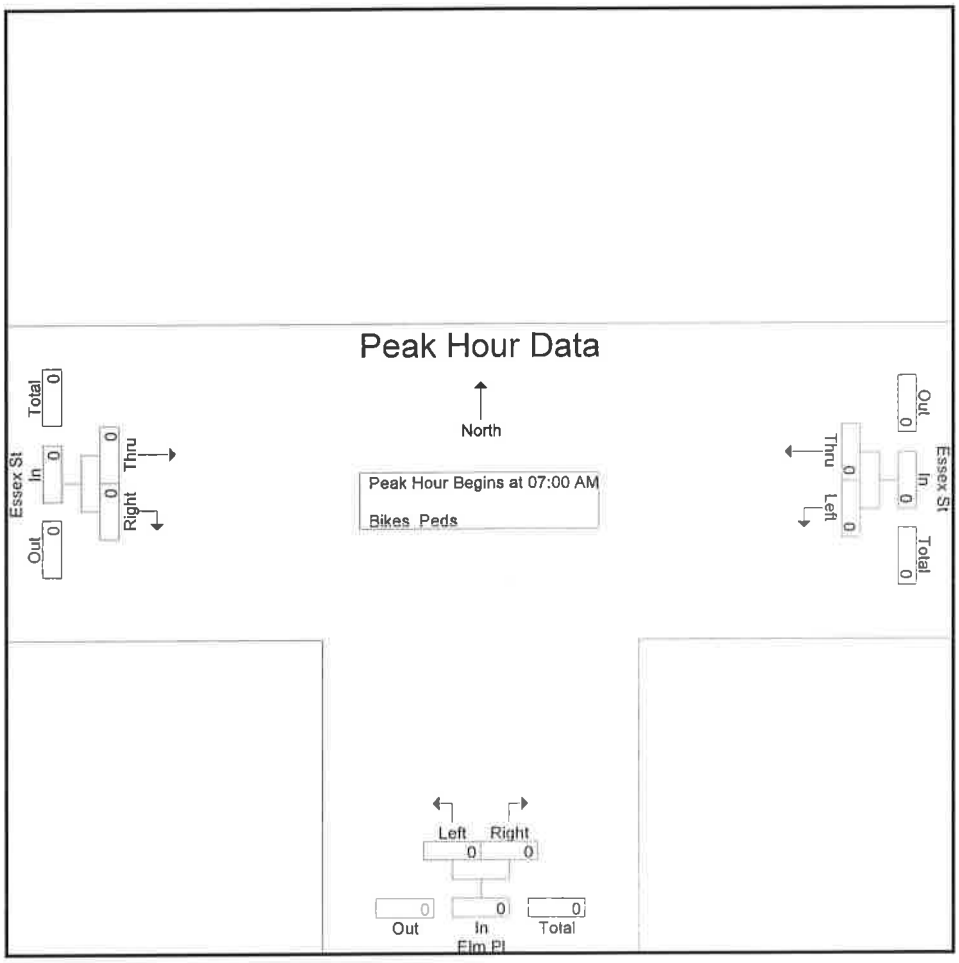
	Essex St From East			Elm Pl From South			Essex St From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	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
08:15 AM	0	0	0	0	0	1	0	0	0	1	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	1	0	0	0	1	0	1
Total	0	0	0	0	0	2	0	0	0	2	0	2
Grand Total	0	0	0	0	0	2	0	0	0	2	0	2
Apprch %	0	0		0	0		0	0				
Total %										100	0	

	Essex St From East			Elm Pl From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	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
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Elm Place
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880003
Site Code : 86880003
Start Date : 12/2/2020
Page No : 11



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Elm Place
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880003
Site Code : 86880003
Start Date : 12/2/2020
Page No : 1

Groups Printed- Cars - Trucks

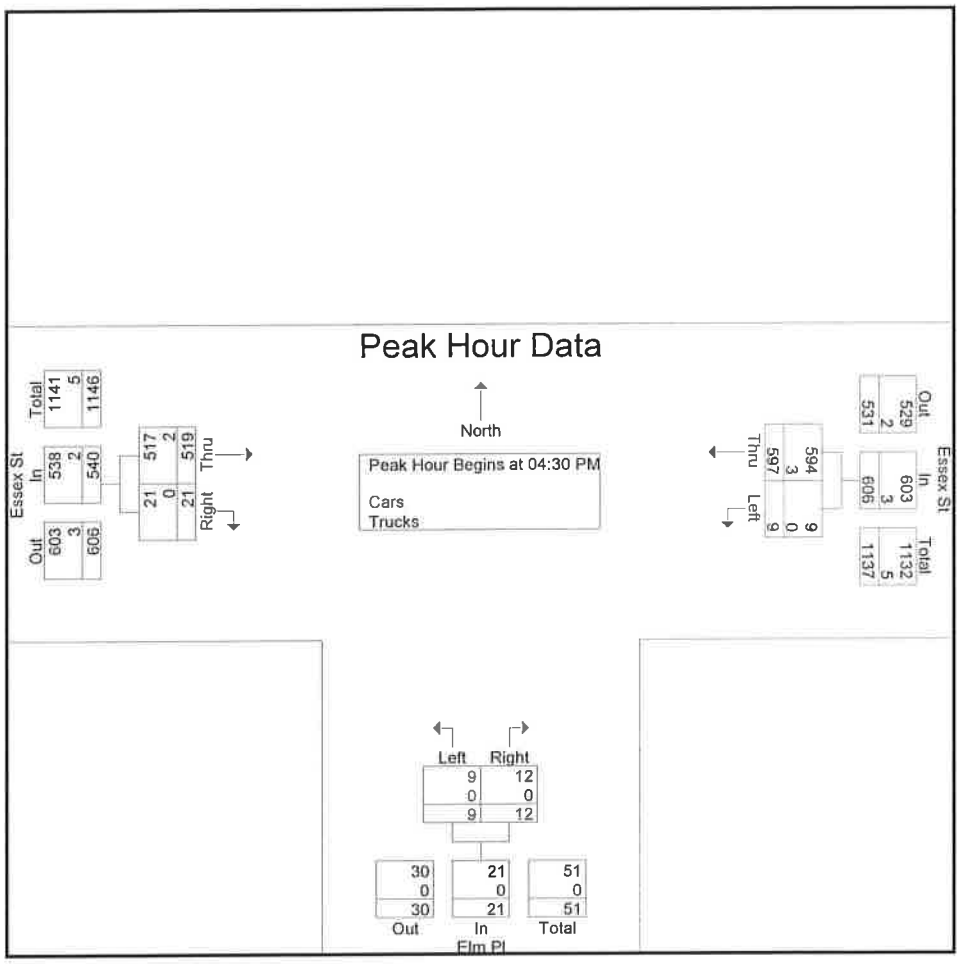
	Essex St From East		Elm Pl From South		Essex St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	2	140	4	6	140	3	295
04:15 PM	2	153	1	0	125	2	283
04:30 PM	1	141	2	2	114	2	262
04:45 PM	6	143	3	10	149	12	323
Total	11	577	10	18	528	19	1163
05:00 PM	2	151	3	0	124	7	287
05:15 PM	0	162	1	0	132	0	295
05:30 PM	2	123	0	0	111	1	237
05:45 PM	8	112	6	6	122	12	266
Total	12	548	10	6	489	20	1085
Grand Total	23	1125	20	24	1017	39	2248
Apprch %	2	98	45.5	54.5	96.3	3.7	
Total %	1	50	0.9	1.1	45.2	1.7	
Cars	23	1119	20	24	1011	39	2236
% Cars	100	99.5	100	100	99.4	100	99.5
Trucks	0	6	0	0	6	0	12
% Trucks	0	0.5	0	0	0.6	0	0.5

	Essex St From East			Elm Pl From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	1	141	142	2	2	4	114	2	116	262
04:45 PM	**6**	143	149	**3**	**10**	**13**	**149**	**12**	**161**	**323**
05:00 PM	2	151	153	3	0	3	124	7	131	287
05:15 PM	0	**162**	**162**	1	0	1	132	0	132	295
Total Volume	9	597	606	9	12	21	519	21	540	1167
% App. Total	1.5	98.5		42.9	57.1		96.1	3.9		
PHF	.375	.921	.935	.750	.300	.404	.871	.438	.839	.903
Cars	9	594	603	9	12	21	517	21	538	1162
% Cars	100	99.5	99.5	100	100	100	99.6	100	99.6	99.6
Trucks	0	3	3	0	0	0	2	0	2	5
% Trucks	0	0.5	0.5	0	0	0	0.4	0	0.4	0.4

Accurate Counts
978-664-2565

N/S Street : Elm Place
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880003
Site Code : 86880003
Start Date : 12/2/2020
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM			04:00 PM			04:00 PM		
+0 mins.	1	141	142	**4**	6	10	140	3	143
+15 mins.	**6**	143	149	1	0	1	125	2	127
+30 mins.	2	151	153	2	2	4	114	2	116
+45 mins.	0	**162**	**162**	3	**10**	13	**149**	**12**	**161**
Total Volume	9	597	606	10	18	28	528	19	547
% App. Total	1.5	98.5		35.7	64.3		96.5	3.5	
PHF	.375	.921	.935	.625	.450	.538	.886	.396	.849
Cars	9	594	603	10	18	28	525	19	544
% Cars	100	99.5	99.5	100	100	100	99.4	100	99.5
Trucks	0	3	3	0	0	0	3	0	3
% Trucks	0	0.5	0.5	0	0	0	0.6	0	0.5

Accurate Counts

978-664-2565

N/S Street : Elm Place
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880003
Site Code : 86880003
Start Date : 12/2/2020
Page No : 4

Groups Printed- Cars

	Essex St From East		Elm Pl From South		Essex St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	2	140	4	6	140	3	295
04:15 PM	2	152	1	0	123	2	280
04:30 PM	1	140	2	2	114	2	261
04:45 PM	6	143	3	10	148	12	322
Total	11	575	10	18	525	19	1158
05:00 PM	2	150	3	0	124	7	286
05:15 PM	0	161	1	0	131	0	293
05:30 PM	2	122	0	0	111	1	236
05:45 PM	8	111	6	6	120	12	263
Total	12	544	10	6	486	20	1078
Grand Total	23	1119	20	24	1011	39	2236
Apprch %	2	98	45.5	54.5	96.3	3.7	
Total %	1	50	0.9	1.1	45.2	1.7	

	Essex St From East			Elm Pl From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	1	140	141	2	2	4	114	2	116	261
04:45 PM	**6**	143	149	**3**	**10**	**13**	**148**	**12**	**160**	**322**
05:00 PM	2	150	152	3	0	3	124	7	131	286
05:15 PM	0	**161**	**161**	1	0	1	131	0	131	293
Total Volume	9	594	603	9	12	21	517	21	538	1162
% App. Total	1.5	98.5		42.9	57.1		96.1	3.9		
PHF	.375	.922	.936	.750	.300	.404	.873	.438	.841	.902

Accurate Counts
978-664-2565

N/S Street : Elm Place
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880003
Site Code : 86880003
Start Date : 12/2/2020
Page No : 7

Groups Printed- Trucks

	Essex St From East		Elm Pl From South		Essex St From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0
04:15 PM	0	1	0	0	2	0	3
04:30 PM	0	1	0	0	0	0	1
04:45 PM	0	0	0	0	1	0	1
Total	0	2	0	0	3	0	5
05:00 PM	0	1	0	0	0	0	1
05:15 PM	0	1	0	0	1	0	2
05:30 PM	0	1	0	0	0	0	1
05:45 PM	0	1	0	0	2	0	3
Total	0	4	0	0	3	0	7
Grand Total	0	6	0	0	6	0	12
Apprch %	0	100	0	0	100	0	
Total %	0	50	0	0	50	0	

	Essex St From East			Elm Pl From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	**1**	**1**	0	0	0	0	0	0	1
05:15 PM	0	1	1	0	0	0	1	0	1	2
05:30 PM	0	1	1	0	0	0	0	0	0	1
05:45 PM	0	1	1	0	0	0	**2**	0	**2**	3
Total Volume	0	4	4	0	0	0	3	0	3	7
% App. Total	0	100		0	0		100	0		
PHF	.000	1.00	1.00	.000	.000	.000	.375	.000	.375	.583

Accurate Counts

978-664-2565

N/S Street : Elm Place
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880003
Site Code : 86880003
Start Date : 12/2/2020
Page No : 10

Groups Printed- Bikes Peds

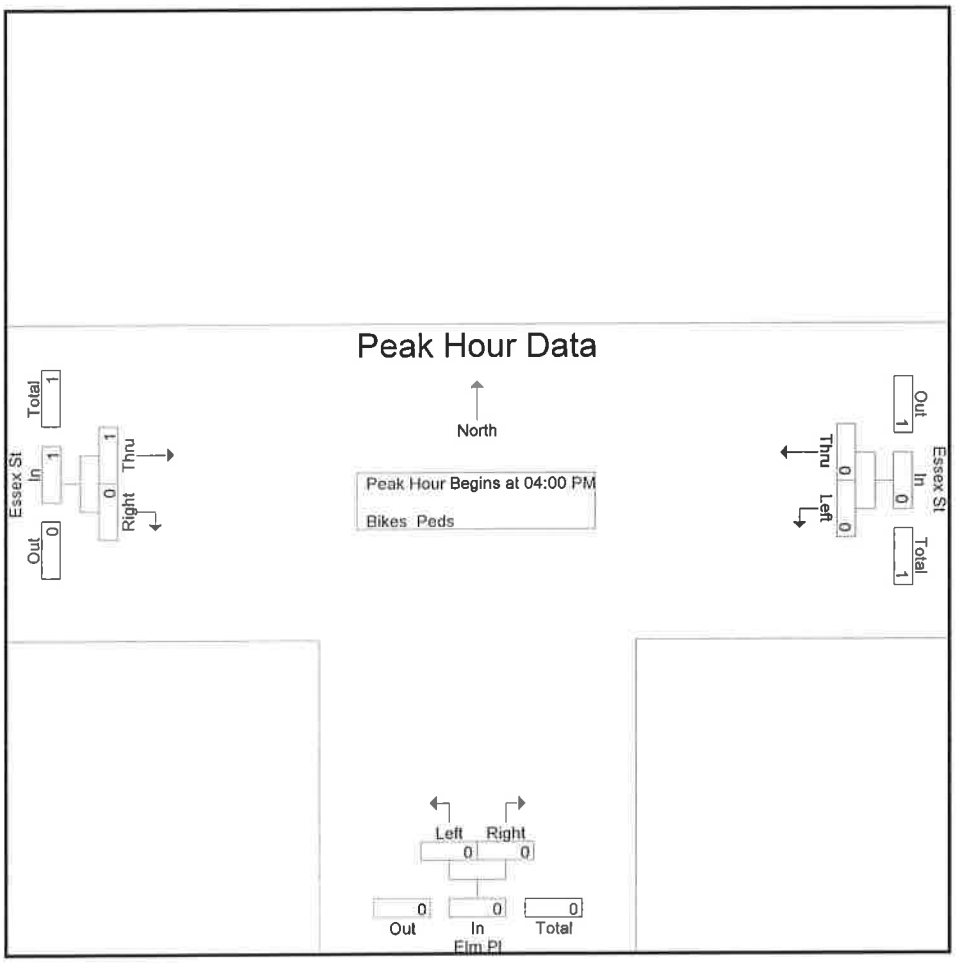
	Essex St From East			Elm Pl From South			Essex St From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	1	0	0	0	1	0	1
04:15 PM	0	0	0	0	0	1	0	0	0	1	0	1
04:30 PM	0	0	0	0	0	2	1	0	0	2	1	3
04:45 PM	0	0	0	0	0	1	0	0	0	1	0	1
Total	0	0	0	0	0	5	1	0	0	5	1	6
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	1	0	0	0	1	0	1
05:30 PM	0	0	0	0	0	0	1	0	0	0	1	1
05:45 PM	0	0	0	0	0	1	0	0	0	1	0	1
Total	0	0	0	0	0	2	1	0	0	2	1	3
Grand Total	0	0	0	0	0	7	2	0	0	7	2	9
Apprch %	0	0		0	0		100	0				
Total %	0	0		0	0		100	0		77.8	22.2	

	Essex St From East			Elm Pl From South			Essex St From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	1	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

Accurate Counts
978-664-2565

N/S Street : Elm Place
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880003
Site Code : 86880003
Start Date : 12/2/2020
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	**1**	0	**1**
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	1
% App. Total	0	0		0	0		100	0	
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250

Accurate Counts

978-664-2565

N/S Street : Burpee Road / Driveway
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880004
Site Code : 86880004
Start Date : 12/2/2020
Page No : 1

Groups Printed- Cars - Trucks

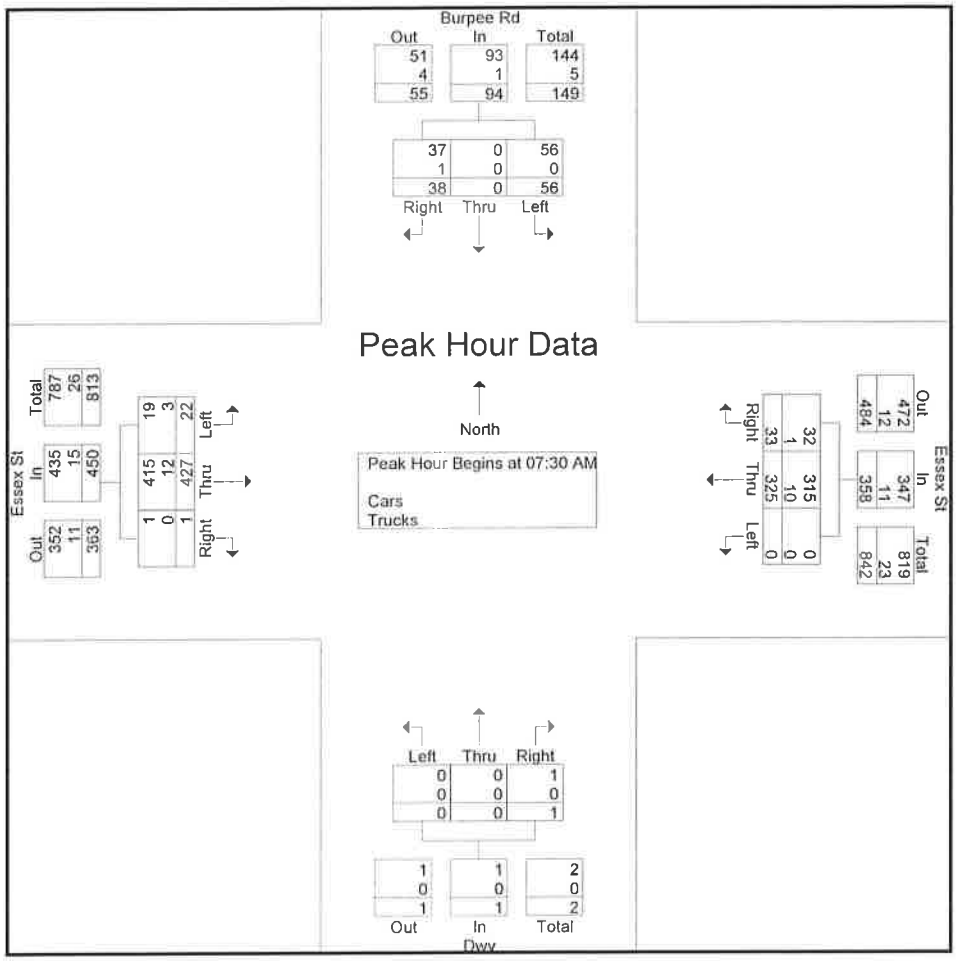
	Burpee Rd From North			Essex St From East			Dwy From South			Essex St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	13	0	4	0	57	4	0	0	0	5	92	0	175
07:15 AM	11	0	3	0	60	4	0	0	0	5	75	0	158
07:30 AM	12	0	6	0	78	3	0	0	1	4	103	0	207
07:45 AM	15	0	17	0	84	8	0	0	0	2	129	1	256
Total	51	0	30	0	279	19	0	0	1	16	399	1	796
08:00 AM	17	0	7	0	89	14	0	0	0	9	99	0	235
08:15 AM	12	0	8	0	74	8	0	0	0	7	96	0	205
08:30 AM	20	0	11	0	74	8	0	0	0	7	77	0	197
08:45 AM	18	0	6	0	61	10	0	0	0	6	98	0	199
Total	67	0	32	0	298	40	0	0	0	29	370	0	836
Grand Total	118	0	62	0	577	59	0	0	1	45	769	1	1632
Apprch %	65.6	0	34.4	0	90.7	9.3	0	0	100	5.5	94.4	0.1	
Total %	7.2	0	3.8	0	35.4	3.6	0	0	0.1	2.8	47.1	0.1	
Cars	118	0	58	0	561	58	0	0	1	41	749	1	1587
% Cars	100	0	93.5	0	97.2	98.3	0	0	100	91.1	97.4	100	97.2
Trucks	0	0	4	0	16	1	0	0	0	4	20	0	45
% Trucks	0	0	6.5	0	2.8	1.7	0	0	0	8.9	2.6	0	2.8

	Burpee Rd From North				Essex St From East				Dwy From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	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	12	0	6	18	0	78	3	81	0	0	**1**	**1**	4	103	0	107	207
07:45 AM	15	0	**17**	**32**	0	84	8	92	0	0	0	0	2	**129**	**1**	**132**	**256**
08:00 AM	**17**	0	7	24	0	**89**	**14**	**103**	0	0	0	0	**9**	99	0	108	235
08:15 AM	12	0	8	20	0	74	8	82	0	0	0	0	7	96	0	103	205
Total Volume	56	0	38	94	0	325	33	358	0	0	1	1	22	427	1	450	903
% App. Total	59.6	0	40.4		0	90.8	9.2		0	0	100		4.9	94.9	0.2		
PHF	.824	.000	.559	.734	.000	.913	.589	.869	.000	.000	.250	.250	.611	.828	.250	.852	.882
Cars	56	0	37	93	0	315	32	347	0	0	1	1	19	415	1	435	876
% Cars	100	0	97.4	98.9	0	96.9	97.0	96.9	0	0	100	100	86.4	97.2	100	96.7	97.0
Trucks	0	0	1	1	0	10	1	11	0	0	0	0	3	12	0	15	27
% Trucks	0	0	2.6	1.1	0	3.1	3.0	3.1	0	0	0	0	13.6	2.8	0	3.3	3.0

Accurate Counts
978-664-2565

N/S Street : Burpee Road / Driveway
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880004
Site Code : 86880004
Start Date : 12/2/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:00 AM				07:30 AM			
+0 mins.	15	0	**17**	**32**	0	84	8	92	0	0	0	0	4	103	0	107
+15 mins.	17	0	7	24	0	**89**	**14**	**103**	0	0	0	0	2	**129**	**1**	**132**
+30 mins.	12	0	8	20	0	74	8	82	0	0	**1**	**1**	**9**	99	0	108
+45 mins.	**20**	0	11	31	0	74	8	82	0	0	0	0	7	96	0	103
Total Volume	64	0	43	107	0	321	38	359	0	0	1	1	22	427	1	450
% App. Total	59.8	0	40.2		0	89.4	10.6		0	0	100		4.9	94.9	0.2	
PHF	.800	.000	.632	.836	.000	.902	.679	.871	.000	.000	.250	.250	.611	.828	.250	.852
Cars	64	0	41	105	0	311	37	348	0	0	1	1	19	415	1	435
% Cars	100	0	95.3	98.1	0	96.9	97.4	96.9	0	0	100	100	86.4	97.2	100	96.7
Trucks	0	0	2	2	0	10	1	11	0	0	0	0	3	12	0	15
% Trucks	0	0	4.7	1.9	0	3.1	2.6	3.1	0	0	0	0	13.6	2.8	0	3.3

Accurate Counts

978-664-2565

N/S Street : Burpee Road / Driveway
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880004
Site Code : 86880004
Start Date : 12/2/2020
Page No : 4

Groups Printed- Cars

	Burpee Rd From North			Essex St From East			Dwy From South			Essex St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	13	0	4	0	55	4	0	0	0	4	91	0	171
07:15 AM	11	0	2	0	59	4	0	0	0	5	73	0	154
07:30 AM	12	0	5	0	77	3	0	0	1	4	100	0	202
07:45 AM	15	0	17	0	84	8	0	0	0	2	123	1	250
Total	51	0	28	0	275	19	0	0	1	15	387	1	777
08:00 AM	17	0	7	0	85	13	0	0	0	9	97	0	228
08:15 AM	12	0	8	0	69	8	0	0	0	4	95	0	196
08:30 AM	20	0	9	0	73	8	0	0	0	7	75	0	192
08:45 AM	18	0	6	0	59	10	0	0	0	6	95	0	194
Total	67	0	30	0	286	39	0	0	0	26	362	0	810
Grand Total	118	0	58	0	561	58	0	0	1	41	749	1	1587
Apprch %	67	0	33	0	90.6	9.4	0	0	100	5.2	94.7	0.1	
Total %	7.4	0	3.7	0	35.3	3.7	0	0	0.1	2.6	47.2	0.1	

	Burpee Rd From North				Essex St From East				Dwy From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	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	12	0	5	17	0	77	3	80	0	0	**1**	**1**	4	100	0	104	202
07:45 AM	15	0	**17**	**32**	0	84	8	92	0	0	0	0	2	**123**	**1**	**126**	**250**
08:00 AM	**17**	0	7	24	0	**85**	**13**	**98**	0	0	0	0	**9**	97	0	106	228
08:15 AM	12	0	8	20	0	69	8	77	0	0	0	0	4	95	0	99	196
Total Volume	56	0	37	93	0	315	32	347	0	0	1	1	19	415	1	435	876
% App. Total	60.2	0	39.8		0	90.8	9.2		0	0	100		4.4	95.4	0.2		
PHF	.824	.000	.544	.727	.000	.926	.615	.885	.000	.000	.250	.250	.528	.843	.250	.863	.876

Accurate Counts

978-664-2565

N/S Street : Burpee Road / Driveway
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880004
Site Code : 86880004
Start Date : 12/2/2020
Page No : 7

Groups Printed- Trucks

	Burpee Rd From North			Essex St From East			Dwy From South			Essex St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	2	0	0	0	0	1	1	0	4
07:15 AM	0	0	1	0	1	0	0	0	0	0	2	0	4
07:30 AM	0	0	1	0	1	0	0	0	0	0	3	0	5
07:45 AM	0	0	0	0	0	0	0	0	0	0	6	0	6
Total	0	0	2	0	4	0	0	0	0	1	12	0	19
08:00 AM	0	0	0	0	4	1	0	0	0	0	2	0	7
08:15 AM	0	0	0	0	5	0	0	0	0	3	1	0	9
08:30 AM	0	0	2	0	1	0	0	0	0	0	2	0	5
08:45 AM	0	0	0	0	2	0	0	0	0	0	3	0	5
Total	0	0	2	0	12	1	0	0	0	3	8	0	26
Grand Total	0	0	4	0	16	1	0	0	0	4	20	0	45
Apprch %	0	0	100	0	94.1	5.9	0	0	0	16.7	83.3	0	
Total %	0	0	8.9	0	35.6	2.2	0	0	0	8.9	44.4	0	

	Burpee Rd From North				Essex St From East				Dwy From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	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	0	**1**	**1**	0	1	0	1	0	0	0	0	0	3	0	3	5
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**6**	0	**6**	6
08:00 AM	0	0	0	0	0	**4**	**1**	**5**	0	0	0	0	0	2	0	2	7
08:15 AM	0	0	0	0	0	**5**	0	5	0	0	0	0	**3**	1	0	4	**9**
Total Volume	0	0	1	1	0	10	1	11	0	0	0	0	3	12	0	15	27
% App. Total	0	0	100		0	90.9	9.1		0	0	0		20	80	0		
PHF	.000	.000	.250	.250	.000	.500	.250	.550	.000	.000	.000	.000	.250	.500	.000	.625	.750

Accurate Counts

978-664-2565

N/S Street : Burpee Road / Driveway
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880004
Site Code : 86880004
Start Date : 12/2/2020
Page No : 10

Groups Printed- Bikes Peds

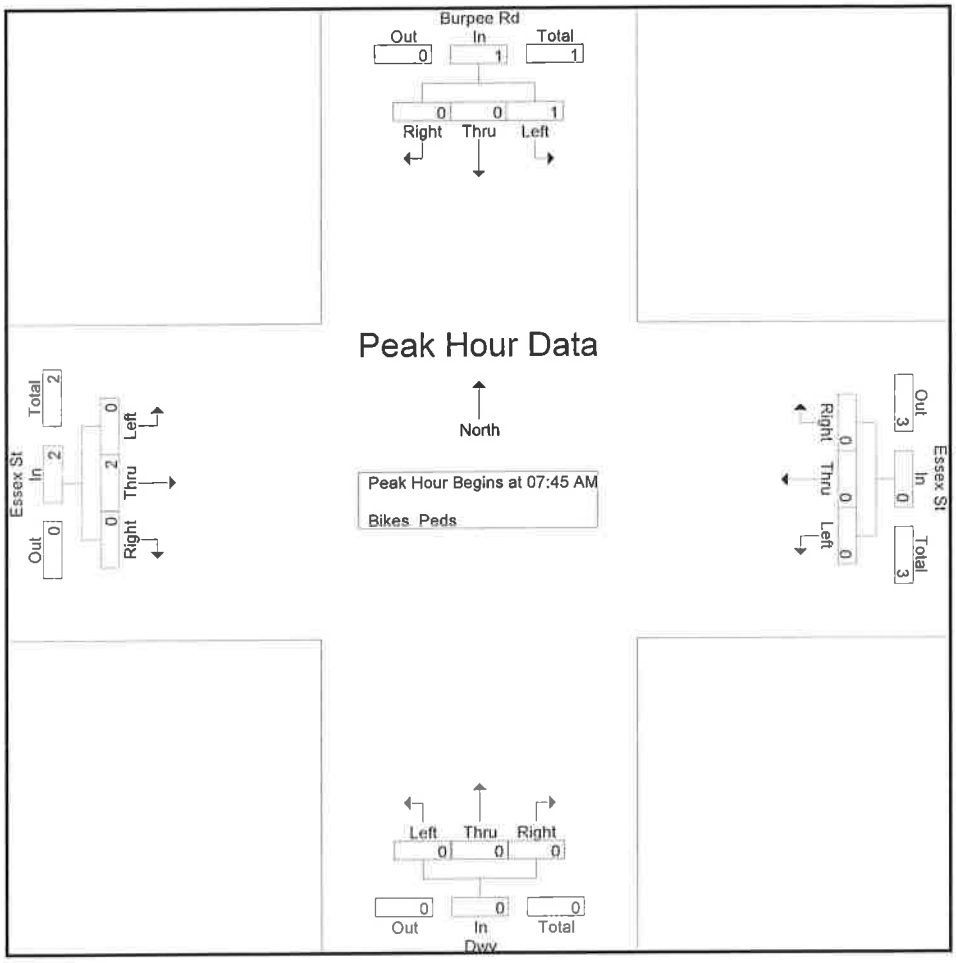
	Burpee Rd From North				Essex St From East				Dwy From South				Essex St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
07:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
07:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	2
Total	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	2	5	0	5
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	2
08:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	1	0	0	2	0	0	0	0	0	0	0	0	0	2	0	1	3	3	6
Grand Total	1	0	0	4	0	0	0	0	0	0	0	1	0	2	0	3	8	3	11
Apprch %	100	0	0		0	0	0		0	0	0		0	100	0				
Total %	33.3	0	0		0	0	0		0	0	0		0	66.7	0		72.7	27.3	

	Burpee Rd From North				Essex St From East				Dwy From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	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 07:45 AM																	
07:45 AM	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	1	0	1	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
08:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	1	0	0	1	0	0	0	0	0	0	0	0	0	2	0	2	3
% App. Total	100	0	0		0	0	0		0	0	0		0	100	0		
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.500	.750

Accurate Counts
978-664-2565

N/S Street : Burpee Road / Driveway
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880004
Site Code : 86880004
Start Date : 12/2/2020
Page No : 11



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:00 AM				07:00 AM				07:30 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+45 mins.	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1
Total Volume	1	0	0	1	0	0	0	0	0	0	0	0	0	2	0	2
% App. Total	100	0	0		0	0	0		0	0	0		0	100	0	
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.500

Accurate Counts

978-664-2565

N/S Street : Burpee Road / Driveway
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880004
Site Code : 86880004
Start Date : 12/2/2020
Page No : 1

Groups Printed- Cars - Trucks

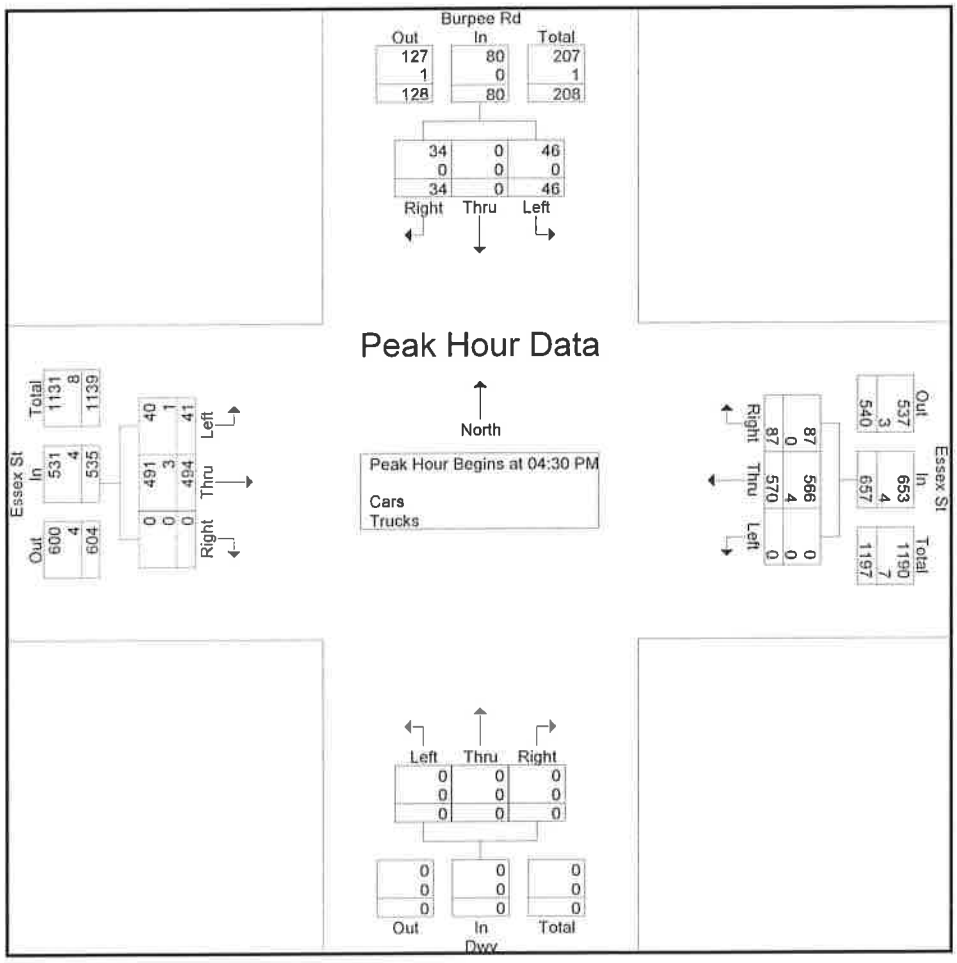
	Burpee Rd From North			Essex St From East			Dwy From South			Essex St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	9	0	4	0	139	16	0	0	0	10	137	0	315
04:15 PM	16	1	6	0	147	14	1	0	0	7	118	0	310
04:30 PM	13	0	8	0	129	19	0	0	0	6	111	0	286
04:45 PM	12	0	8	0	144	20	0	0	0	17	141	0	342
Total	50	1	26	0	559	69	1	0	0	40	507	0	1253
05:00 PM	10	0	8	0	144	25	0	0	0	8	116	0	311
05:15 PM	11	0	10	0	153	23	0	0	0	10	126	0	333
05:30 PM	10	0	7	0	118	23	0	0	1	8	104	0	271
05:45 PM	9	1	6	0	118	13	0	0	0	15	114	0	276
Total	40	1	31	0	533	84	0	0	1	41	460	0	1191
Grand Total	90	2	57	0	1092	153	1	0	1	81	967	0	2444
Apprch %	60.4	1.3	38.3	0	87.7	12.3	50	0	50	7.7	92.3	0	
Total %	3.7	0.1	2.3	0	44.7	6.3	0	0	0	3.3	39.6	0	
Cars	90	2	57	0	1085	153	1	0	1	80	958	0	2427
% Cars	100	100	100	0	99.4	100	100	0	100	98.8	99.1	0	99.3
Trucks	0	0	0	0	7	0	0	0	0	1	9	0	17
% Trucks	0	0	0	0	0.6	0	0	0	0	1.2	0.9	0	0.7

	Burpee Rd From North				Essex St From East				Dwy From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**13**	0	8	**21**	0	129	19	148	0	0	0	0	6	111	0	117	286
04:45 PM	12	0	8	20	0	144	20	164	0	0	0	0	**17**	**141**	0	**158**	**342**
05:00 PM	10	0	8	18	0	144	**25**	169	0	0	0	0	8	116	0	124	311
05:15 PM	11	0	**10**	21	0	**153**	23	**176**	0	0	0	0	10	126	0	136	333
Total Volume	46	0	34	80	0	570	87	657	0	0	0	0	41	494	0	535	1272
% App. Total	57.5	0	42.5		0	86.8	13.2		0	0	0		7.7	92.3	0		
PHF	.885	.000	.850	.952	.000	.931	.870	.933	.000	.000	.000	.000	.603	.876	.000	.847	.930
Cars	46	0	34	80	0	566	87	653	0	0	0	0	40	491	0	531	1264
% Cars	100	0	100	100	0	99.3	100	99.4	0	0	0	0	97.6	99.4	0	99.3	99.4
Trucks	0	0	0	0	0	4	0	4	0	0	0	0	1	3	0	4	8
% Trucks	0	0	0	0	0	0.7	0	0.6	0	0	0	0	2.4	0.6	0	0.7	0.6

Accurate Counts
978-664-2565

N/S Street : Burpee Road / Driveway
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880004
Site Code : 86880004
Start Date : 12/2/2020
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:30 PM				04:00 PM				04:00 PM			
+0 mins.	**16**	1	6	**23**	0	129	19	148	0	0	0	0	10	137	0	147
+15 mins.	13	0	8	21	0	144	20	164	**1**	0	0	**1**	7	118	0	125
+30 mins.	12	0	8	20	0	144	**25**	169	0	0	0	0	6	111	0	117
+45 mins.	10	0	8	18	0	**153**	23	**176**	0	0	0	0	**17**	**141**	0	**158**
Total Volume	51	1	30	82	0	570	87	657	1	0	0	1	40	507	0	547
% App. Total	62.2	1.2	36.6		0	86.8	13.2		100	0	0		7.3	92.7	0	
PHF	.797	.250	.938	.891	.000	.931	.870	.933	.250	.000	.000	.250	.588	.899	.000	.866
Cars	51	1	30	82	0	566	87	653	1	0	0	1	39	502	0	541
% Cars	100	100	100	100	0	99.3	100	99.4	100	0	0	100	97.5	99	0	98.9
Trucks	0	0	0	0	0	4	0	4	0	0	0	0	1	5	0	6
% Trucks	0	0	0	0	0	0.7	0	0.6	0	0	0	0	2.5	1	0	1.1

Accurate Counts

978-664-2565

N/S Street : Burpee Road / Driveway
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880004
Site Code : 86880004
Start Date : 12/2/2020
Page No : 4

Groups Printed- Cars

	Burpee Rd From North			Essex St From East			Dwy From South			Essex St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	9	0	4	0	139	16	0	0	0	10	136	0	314
04:15 PM	16	1	6	0	146	14	1	0	0	7	116	0	307
04:30 PM	13	0	8	0	127	19	0	0	0	6	110	0	283
04:45 PM	12	0	8	0	144	20	0	0	0	16	140	0	340
Total	50	1	26	0	556	69	1	0	0	39	502	0	1244
05:00 PM	10	0	8	0	143	25	0	0	0	8	116	0	310
05:15 PM	11	0	10	0	152	23	0	0	0	10	125	0	331
05:30 PM	10	0	7	0	117	23	0	0	1	8	104	0	270
05:45 PM	9	1	6	0	117	13	0	0	0	15	111	0	272
Total	40	1	31	0	529	84	0	0	1	41	456	0	1183
Grand Total	90	2	57	0	1085	153	1	0	1	80	958	0	2427
Apprch %	60.4	1.3	38.3	0	87.6	12.4	50	0	50	7.7	92.3	0	
Total %	3.7	0.1	2.3	0	44.7	6.3	0	0	0	3.3	39.5	0	

	Burpee Rd From North				Essex St From East				Dwy From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**13**	0	8	**21**	0	127	19	146	0	0	0	0	6	110	0	116	283
04:45 PM	12	0	8	20	0	144	20	164	0	0	0	0	**16**	**140**	0	**156**	**340**
05:00 PM	10	0	8	18	0	143	**25**	168	0	0	0	0	8	116	0	124	310
05:15 PM	11	0	**10**	21	0	**152**	23	**175**	0	0	0	0	10	125	0	135	331
Total Volume	46	0	34	80	0	566	87	653	0	0	0	0	40	491	0	531	1264
% App. Total	57.5	0	42.5		0	86.7	13.3		0	0	0		7.5	92.5	0		
PHF	.885	.000	.850	.952	.000	.931	.870	.933	.000	.000	.000	.000	.625	.877	.000	.851	.929

Accurate Counts

978-664-2565

N/S Street : Burpee Road / Driveway
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880004
Site Code : 86880004
Start Date : 12/2/2020
Page No : 7

Groups Printed- Trucks

	Burpee Rd From North			Essex St From East			Dwy From South			Essex St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
04:15 PM	0	0	0	0	1	0	0	0	0	0	2	0	3
04:30 PM	0	0	0	0	2	0	0	0	0	0	1	0	3
04:45 PM	0	0	0	0	0	0	0	0	0	1	1	0	2
Total	0	0	0	0	3	0	0	0	0	1	5	0	9
05:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
05:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	1	0	0	0	0	0	3	0	4
Total	0	0	0	0	4	0	0	0	0	0	4	0	8
Grand Total	0	0	0	0	7	0	0	0	0	1	9	0	17
Apprch %	0	0	0	0	100	0	0	0	0	10	90	0	
Total %	0	0	0	0	41.2	0	0	0	0	5.9	52.9	0	

	Burpee Rd From North				Essex St From East				Dwy From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	2	3
04:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	3
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2
Total Volume	0	0	0	0	0	3	0	3	0	0	0	0	1	5	0	6	9
% App. Total	0	0	0		0	100	0		0	0	0		16.7	83.3	0		
PHF	.000	.000	.000	.000	.000	.375	.000	.375	.000	.000	.000	.000	.250	.625	.000	.750	.750

Accurate Counts

978-664-2565

N/S Street : Burpee Road / Driveway
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880004
Site Code : 86880004
Start Date : 12/2/2020
Page No : 10

Groups Printed- Bikes Peds

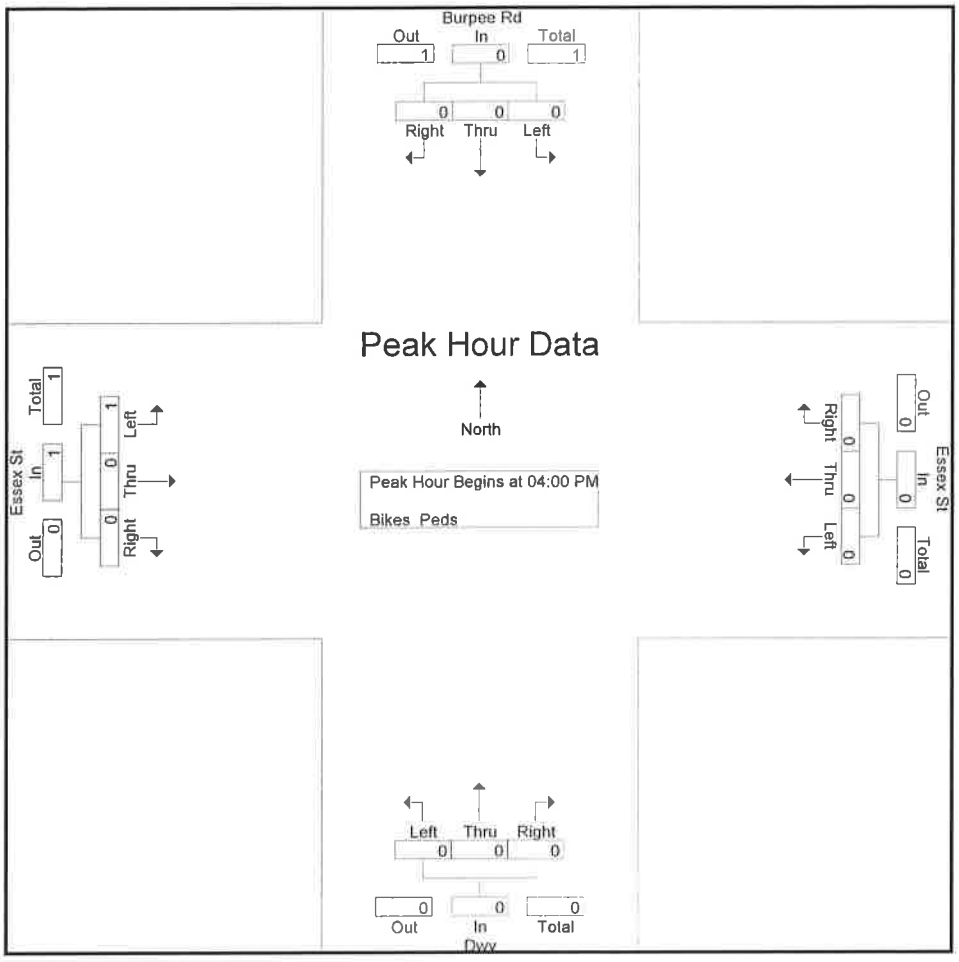
	Burpee Rd From North				Essex St From East				Dwy From South				Essex St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	2
04:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	3	0	0	0	0	0	0	0	0	1	0	0	1	4	1	5
05:00 PM	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
05:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
Total	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2
Grand Total	1	0	0	3	0	0	0	0	0	0	0	0	1	0	0	2	5	2	7
Apprch %	100	0	0		0	0	0		0	0	0		100	0	0				
Total %	50	0	0		0	0	0		0	0	0		50	0	0		71.4	28.6	

	Burpee Rd From North				Essex St From East				Dwy From South				Essex St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	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
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	**1**
04:45 PM	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	1	0	0	**1**	1
% App. Total	0	0	0		0	0	0		0	0	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.250

Accurate Counts
978-664-2565

N/S Street : Burpee Road / Driveway
E/W Street : Essex Street
City/State : Swampscott, MA
Weather : Clear

File Name : 86880004
Site Code : 86880004
Start Date : 12/2/2020
Page No : 11



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
+45 mins.	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1
% App. Total	100	0	0		0	0	0		0	0	0		100	0	0	
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250

SEASONAL ADJUSTMENT DATA

Massachusetts Highway Department

8087: Monthly Hourly Volume for December 2018

Location ID:	8087	**Seasonal Factor Group:**	U3
County:	Suffolk	**Daily Factor Group:**	
Funcationl Class	3	**Axle Factor Group:**	U3
Location:	LEE BURBANK HIGHWAY	**Growth Factor Group:**	

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	QC Status
1	1200	827	752	727	913	1434	1908	2117	2579	2914	3088	3377	3442	3628	3781	3835	3699	3448	3510	2760	2470	2286	2221	1958	58874	Accepted
2	1441	1052	893	774	850	950	1182	1377	1731	2328	2734	3168	3425	3592	3505	3382	3360	3041	2783	2679	2577	1943	1786	1372	51925	Accepted
3	928	708	478	622	1131	2479	2894	2987	3153	3412	3242	3218	3410	3551	3717	3706	3746	3546	3181	2695	2292	2139	1826	1207	60268	Accepted
4	711	510	410	568	1079	2571	2839	3046	3173	3450	3431	3195	3248	3277	3613	3722	3774	3683	3469	3008	2389	2279	1790	1261	60496	Accepted
5	732	528	471	600	1112	2389	2846	3122	3174	3237	3187	3022	3230	3565	3811	3831	3716	3668	3392	2983	2359	2450	1980	1425	60830	Accepted
6	771	508	464	598	1125	2412	2885	3029	3225	3344	3477	3300	3520	3528	3717	3904	3786	3742	3638	3027	2655	2235	2039	1599	62528	Accepted
7	930	635	509	647	1098	2353	2919	3168	3268	3369	3205	3357	3566	3624	3927	3742	3929	3773	3649	3384	2587	2523	2362	1885	64409	Accepted
8	1254	889	757	682	878	1387	1767	2133	2517	2980	3155	3417	3775	3799	3738	3752	3696	3443	3327	2825	2490	2310	2132	1792	58895	Accepted
9	1330	1111	878	699	724	982	1218	1470	1874	2368	2906	3195	3671	3759	3619	3451	3406	3604	3394	3083	2613	2068	1705	1216	54344	Accepted
10	751	554	381	575	1154	2437	2871	3085	3249	3239	3172	3149	3362	3263	3649	3829	3570	3542	3221	2835	2364	2085	1822	1249	59408	Accepted
11																										
12	720	556	493	577	1099	2480	2824	3078	3169	3396	3235	3063	3395	3548	3895	4009	3829	3805	3406	3057	2565	2324	1965	1492	61980	Accepted
13	781	562	450	611	1070	2353	2913	3188	3158	3485	3541	3327	3487	3712	3893	3869	3822	3803	3446	3088	2843	2351	2253	1743	63749	Accepted
14	1070	754	578	684	1099	2363	2975	3195	3348	3302	3439	3455	3556	3602	4001	3949	3888	3768	3604	3241	2752	2528	2377	1983	65511	Accepted
15	1472	1066	781	793	950	1378	1754	2003	2405	2830	3076	3372	3622	3672	3876	3867	3731	3492	3548	2959	2630	2501	2385	2102	60265	Accepted
16	1590	1090	969	753	773	1006	1322	1411	1841	2379	2823	3148	3493	3698	3791	3622	3440	3046	2800	2706	2542	2052	1688	1336	53319	Accepted
17	834	623	517	651	1152	2373	2786	3038	3103	3314	3289	3354	3544	3577	3785	3807	3749	3591	3483	2809	2389	2181	1904	1249	61102	Accepted
18	787	567	491	655	1166	2274	2918	3082	3237	3449	3449	3322	3479	3644	3779	3784	3922	3728	3499	3062	2546	2401	2006	1408	62655	Accepted
19	869	649	538	658	1195	2459	2910	3155	3174	3320	3482	3501	3727	3659	3903	3975	3919	3793	3545	3192	2639	2426	2117	1743	64548	Accepted
20	996	642	569	725	1253	2503	2966	3135	3282	3391	3329	3519	3782	3881	3926	3845	3652	3747	3464	3175	2854	2514	2356	1945	65451	Accepted
21	1110	839	679	762	1264	2240	2795	2972	3200	3194	3358	3448	3607	3669	3802	3615	3709	3601	3303	3011	2654	2501	2454	2136	63923	Accepted
22	1595	1361	1029	889	1049	1444	1746	2062	2386	2988	3394	3620	3663	3818	3785	3612	3559	3485	3307	3123	2725	2561	2323	2114	61638	Accepted
23	1402	1098	946	854	927	1157	1422	1526	1998	2658	3245	3513	3689	3778	3619	3402	3353	3365	3085	2715	2556	2313	1963	1586	56170	Accepted
24	1165	799	624	694	1005	1740	2121	2229	2672	2919	3215	3313	3779	3681	3721	3422	3298	3197	2719	2578	2534	2538	2284	1784	58031	Accepted
25	1275	1085	847	689	836	1022	929	997	961	1293	1724	2231	2551	2890	3048	2721	2702	2772	2772	2567	2441	2021	1565	1189	43128	Accepted
26	721	520	414	671	1079	2081	2550	2447	2584	2751	3105	3221	3588	3527	3790	3840	3662	3437	2927	2730	2223	1997	1681	1333	56879	Accepted
27	787	661	552	725	1195	2261	2779	2761	2795	2776	3075	3190	3448	3500	3676	3922	3780	3766	3006	2713	2259	2200	1863	1357	59047	Accepted
28	868	649	655	759	1187	2161	2636	2606	2691	2847	3088	3263	3642	3598	3880	3775	3634	3413	3181	2735	2353	2156	1991	1554	59322	Accepted
29	1151	909	766	849	1102	1506	1836	1810	2230	2575	2972	3292	3521	3682	3735	3665	3434	3335	3169	2741	2521	2120	2004	1681	56606	Accepted
30	1135	1005	821	809	955	1288	1308	1396	1761	2259	2755	3203	3379	3378	3448	3257	3262	3304	2911	2140	2239	1937	1762	1329	51041	Accepted
31	970	754	602	722	1055	1963	2227	2316	2512	2708	2882	3296	3772	3745	3859	3764	3367	3175	2839	2631	2369	2154	2020	1599	57301	Accepted

Average Monthly =	59121.43
Average Yearly =	60868
Adjustment Factor =	1.03

Massachusetts Highway Department

8087: Monthly Hourly Volume for December 2020

Location ID:	8087	**Seasonal Factor Group:**	U3
County:	Suffolk	**Daily Factor Group:**	
Funcationl Class	3	**Axle Factor Group:**	U3
Location:	LEE BURBANK HIGHWAY	**Growth Factor Group:**	

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	QC Status
1	538	353	309	402	754	1772	2707	3158	2849	2754	2771	2861	3145	3064	3570	3651	3556	3444	2903	2246	1891	1716	1394	817	52625	Accepted
2	471	334	301	449	829	1800	2827	3056	2826	2515	2594	2864	3070	3122	3500	3687	3451	3396	2841	2238	1932	1634	1251	864	51852	Accepted
3	524	319	268	424	760	1803	2769	2987	2788	2614	2740	2852	2952	3211	3488	3649	3552	3332	2934	2240	1906	1637	1283	848	51880	Accepted
4	478	343	284	451	787	1815	2733	2936	2832	2670	2763	2940	3137	3249	3693	3755	3667	3557	2997	2520	2127	1843	1638	1196	54411	Accepted
5	667	449	324	446	606	863	1297	1528	1736	2195	2449	2757	3013	2945	3066	2681	2436	2171	1845	1493	1300	1352	1233	849	39701	Accepted
6	667	408	313	336	421	624	955	991	1260	1767	2282	2764	2989	3332	3256	3246	2946	2525	2331	2108	1795	1624	1165	804	40909	Accepted
7	535	305	276	392	733	1669	2651	2958	2817	2532	2627	2713	2958	3094	3447	3646	3516	3177	2613	2073	1811	1566	1167	809	50085	Accepted
8	501	286	308	428	705	1722	2669	2892	2716	2643	2580	2821	2959	3053	3460	3582	3324	3246	2703	2150	1716	1536	1178	752	49930	Accepted
9	480	342	287	398	705	1752	2624	2927	2811	2460	2649	2937	2979	3142	3496	3513	3439	3333	2687	2203	1791	1703	1201	789	50648	Accepted
10	477	332	279	443	746	1785	2789	2990	2787	2554	2595	2759	2916	3087	3591	3659	3614	3476	2883	2181	1907	1540	1320	892	51602	Accepted
11	557	371	300	444	762	1747	2743	2994	2791	2642	2828	2941	3323	3388	3591	3809	3746	3599	2983	2515	2088	1911	1610	1211	54894	Accepted
12	712	511	384	436	595	1058	1411	1702	1992	2437	2889	3100	3393	3347	3458	3220	3078	2710	2508	2121	1823	1667	1427	1139	47118	Accepted
13	677	467	371	375	526	694	971	1182	1428	1969	2361	3044	3242	3490	3527	3340	3111	2935	2468	2146	1850	1567	1271	864	43876	Accepted
14	515	341	321	438	702	1733	2709	2921	2731	2517	2630	2725	2809	3027	3328	3465	3384	3217	2574	2075	1729	1522	1155	860	49428	Accepted
15	503	343	319	442	754	1856	2802	2928	2781	2629	2719	2942	3077	3170	3542	3606	3770	3469	2791	2319	1893	1656	1280	885	52476	Accepted
16	508	359	317	455	739	1859	2783	3029	2970	2692	2926	3175	3286	3332	3734	3821	3670	3671	2967	2417	1944	1612	1197	851	54314	Accepted
17	404	274	245	300	380	625	812	803	765	679	795	932	1122	1276	1539	1574	1579	1559	1517	1274	1145	1055	979	690	51880	Accepted
18	406	404	341	508	798	1685	2486	2689	2649	2611	2708	3074	3047	3326	3504	2313	1895	2969	2928	2519	2010	1855	1711	1180	49616	Accepted
19	830	558	446	532	717	1158	1644	1712	1951	2438	2909	3177	3346	3541	3497	3448	3264	3027	2653	2309	2064	1865	1585	1166	49837	Accepted
20	737	496	469	477	590	756	1066	1224	1413	2108	2508	2967	3032	3254	3070	2963	2872	2600	2270	2056	1781	1627	1339	972	42647	Accepted
21	513	374	335	474	754	1808	2548	3019	2851	2816	2966	3324	3303	3447	3690	3630	3557	3461	2831	2395	1809	1733	1298	926	53862	Accepted
22	586	413	377	530	839	1896	2660	2982	2630	2847	3045	3186	3348	3613	3667	3802	3653	3564	3190	2596	2035	1883	1434	986	55762	Accepted
23	546	374	349	502	862	1885	2585	2915	2948	2879	3168	3469	3473	3677	3990	3978	3605	3576	3177	2701	2245	2012	1673	1199	57788	Accepted
24	675	484	419	520	784	1586	2153	2321	2358	2875	3255	3549	3876	3722	3788	3457	3206	2970	2701	2164	1965	1837	1459	1163	53287	Accepted
25	803	713	555	521	534	616	661	577	684	912	1142	1482	1837	1948	2048	1931	1829	1746	1685	1651	1431	1292	1098	852	28548	Accepted
26	500	301	298	452	675	819	1246	1399	1626	2024	2520	2972	3108	3302	3210	3164	3065	2812	2516	2077	1855	1710	1400	1069	44120	Accepted
27	738	454	384	405	601	754	1092	1269	1391	1880	2344	2865	3211	3414	3335	3219	3051	2702	2285	1947	1693	1505	1288	904	42731	Accepted
28	557	332	293	406	811	1756	2491	2543	2384	2625	2936	3151	3278	3415	3634	3588	3389	3317	2682	2085	1755	1572	1228	886	51114	Accepted
29	510	381	332	485	823	1877	2552	2643	2558	2636	3023	3135	3365	3324	3590	3670	3460	3215	2929	2235	1699	1632	1265	906	52245	Accepted
30	561	351	311	484	898	1815	2552	2652	2678	2842	3098	3426	3422	3585	3787	3815	3613	3337	2846	2465	2004	1729	1456	1039	54766	Accepted
31	581	392	335	537	809	1649	2352	2354	2395	2547	2992	3187	3501	3702	3654	3588	3344	2990	2780	2253	1980	1660	1480	1059	52121	Accepted

51202.43

Vanasse & Associates, Inc.
Transportation Engineers & Planners

10 New England Business Center Drive
Suite 314
Andover, MA 01810-1066
Office 978-474-8800
Fax 978-688-6508

Calculations

Job: Prop. Residential Development
Location: Swampscott, MA
Title: Adjustment Factor
Calculated by: BG

Job Number: 8688
Date: 1/6/2021
Sheet ____ of ____
Checked by: ____

Dec. 2018 Average ≈ 59,122

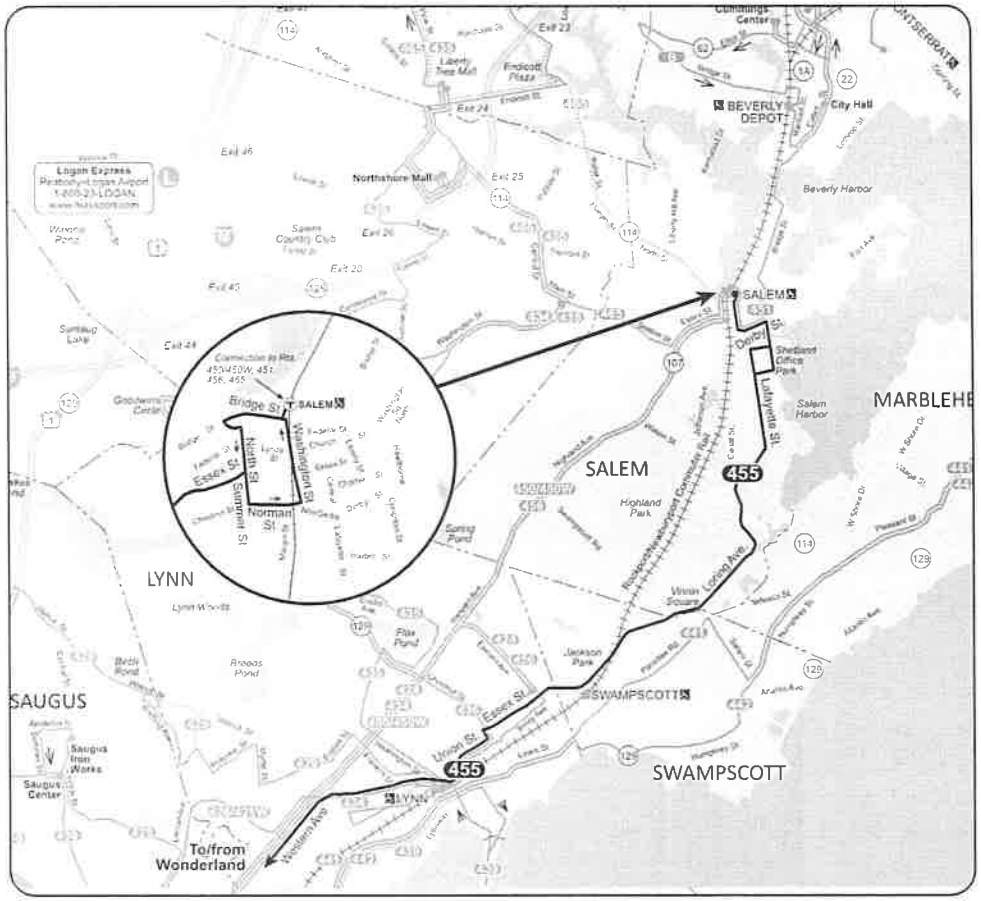
Dec. 2020 Average ≈ 51,203

$59{,}122 \times 1.0125^2 \approx 60{,}609$

$60{,}609 / 51{,}203 \approx 1.184$ = Adjustment Factor for COVID

PUBLIC TRANSPORTATION INFORMATION

Route 455 Salem Depot - Wonderland Station



Schedule/Route Change

455

Effective December 20, 2020

Salem Depot- Wonderland Station

Serving

- Vinnin Square
- Salem State University
- Shetland Office Park
- Blue Line
- Newburyport/Rockport Commuter Rail

Massachusetts Bay Transportation Authority

massDOT

Information 617-222-3200 • 1-800-392-6100
(TTY) 617-222-5146 • www.mbta.com

455 Weekday

Inbound				Outbound			
Leave Salem Depot	Arrive Vinnin Square	Lv/Arrive Central Square	Arrive Wonder-land Station	Leave Wonder-land Station	Arrive Central Square	Arrive Vinnin Square	Arrive Salem Depot
.....	.....	4:45A	5:08A	.....	a 5:28A	5:37A	5:52A
.....	.....	5:00	5:23	.....	a 6:04	6:18	6:34
.....	.....	5:20	5:43	6:15A	6:37	6:53	7:15
.....	.....	5:33	5:56	6:48	7:11	7:27	7:49
5:10A	5:23A	5:37	6:02	7:04	7:29	7:45	8:07
5:43	5:56	6:10	6:37	7:35	8:00	8:16	8:38
5:55	6:08	6:22	6:50	7:55	8:20	8:36	8:58
6:20	6:35	6:51	7:23	8:15	8:40	8:56	9:18
6:30	6:49	7:05	7:37	8:40	9:05	9:21	9:43
6:55	7:14	7:30	8:02	8:55	9:20	9:36	9:58
7:20	7:39	7:55	8:27	9:15	9:40	9:56	10:18
7:35	7:54	8:10	8:42	9:45	10:10	10:26	10:48
8:00	8:19	8:35	9:07	10:15	10:40	10:56	11:18
8:17	8:36	8:52	9:24	10:45	11:10	11:26	11:48
8:47	9:06	9:22	9:54	11:15	11:40	11:56	12:18P
9:20	9:39	9:55	10:27	11:40	12:05P	12:21P	12:43
9:53	10:12	10:28	11:00				
10:15	10:34	10:50	11:22	12:10P	12:35	12:51	1:13
10:47	11:06	11:22	11:54	12:40	1:05	1:21	1:45
11:10	11:29	11:45	12:17P	1:05	1:30	1:47	2:12
11:40	11:59	12:15P	12:46	1:35	2:09	2:26	2:51
				2:05	2:39	2:56	3:21
12:10P	12:29P	12:46	1:17	2:35	3:09	3:26	3:51
12:35	1:01	1:18	1:49	3:05	3:39	3:56	4:21
1:05	1:31	1:48	2:19	3:35	4:09	4:26	4:51
1:35	2:01	2:18	2:49	4:05	4:39	4:56	5:21
2:05	2:31	2:48	3:19	4:35	5:11	5:28	5:53
.....	e 2:35	2:49	.....	5:05	5:41	5:58	6:21
2:35	3:01	3:18	3:49	5:35	6:07	6:22	6:45
3:05	3:31	3:48	4:19	6:05	6:35	6:50	7:11
3:35	4:01	4:18	4:49	6:35	7:05	7:18	7:38
4:05	4:31	4:48	5:19	7:00	7:21	7:34	7:54
4:35	5:01	5:15	5:45	7:25	7:46	7:59	8:19
5:05	5:30	5:44	6:13	7:50	8:11	8:24	8:44
5:35	6:00	6:13	6:42	8:15	8:36	8:49	9:09
6:05	6:25	6:38	7:06	8:45	9:06	9:19	9:39
6:35	6:55	7:08	7:33	9:45	10:05	10:16	10:36
7:05	7:24	7:37	8:02	10:48	11:07	11:18	11:36
7:35	7:54	8:05	8:28	11:40	11:58	12:07A	12:22A
8:40	8:55	9:06	9:29	12:29A	12:46A	12:55	1:10
9:47	10:02	10:13	10:36				
10:44	10:59	11:10	11:33				
11:45	11:56	12:05A	12:22A				
12:30A	12:41A	12:50	1:07				

Weekday Note: All trips to/from Salem Depot serve Shetland Office Park.

455 Saturday

Inbound				Outbound			
Leave Salem Depot	Arrive Vinnin Square	Lv/Arrive Central Square	Arrive Wonder-land Station	Leave Wonder-land Station	Arrive Central Square	Arrive Vinnin Square	Arrive Salem Depot
.....	.....	5:15A	5:39A	.....	a 5:26A	5:36A	5:49A
.....	.....	5:55	6:19	.....	a 5:56	6:06	6:19
6:05A	6:16A	6:32	6:53	6:25A	6:47	6:59	7:15
6:40	6:51	7:07	7:28	6:38	7:01	7:13	7:29
7:05	7:16	7:32	7:53	7:05	7:28	7:40	7:56
7:25	7:36	7:52	8:13	7:35	7:58	8:10	8:26
8:05	8:16	8:32	8:53	8:05	8:28	8:40	8:56
8:32	8:43	8:59	9:20	8:35	8:59	9:11	9:27
9:05	9:16	9:32	10:01	9:08	9:32	9:44	10:00
9:35	9:47	10:03	10:32	9:35	9:59	10:11	10:27
10:08	10:20	10:36	11:05	10:07	10:31	10:45	11:07
10:35	10:47	11:03	11:32	10:38	11:03	11:17	11:39
11:14	11:30	11:46	12:14	11:13	11:38	11:52	12:14P
11:51	12:07P	12:24P	12:52P	11:40	12:05P	12:19P	12:41
12:26P	12:43P	1:00P	1:27P	12:22P	12:47P	1:01P	1:23P
12:55	1:11	1:26	1:53	1:05	1:30	1:44	2:06
1:35	1:51	2:06	2:33	1:36	2:01	2:15	2:37
2:15	2:31	2:46	3:13	2:05	2:30	2:44	3:06
2:47	3:03	3:18	3:45	2:41	3:06	3:20	3:42
3:16	3:32	3:47	4:14	3:20	3:45	3:59	4:21
3:55	4:11	4:26	4:53	3:56	4:21	4:35	4:57
4:31	4:47	5:02	5:29	4:25	4:50	5:04	5:26
5:07	5:23	5:38	6:05	5:05	5:30	5:43	6:03
5:36	5:52	6:07	6:33	5:40	6:01	6:14	6:34
6:15	6:31	6:44	7:07	6:15	6:36	6:49	7:09
6:45	6:58	7:11	7:34	6:43	7:04	7:17	7:36
a 7:20	7:33	a 7:46	.....	7:20	7:41	7:54	8:12
7:47	8:00	8:13	8:36	8:50	9:11	9:24	9:40
8:45	8:58	9:11	9:32	9:40	9:58	10:10	10:26
9:47	10:00	10:13	10:34	10:42	11:00	11:12	11:28
10:45	10:58	11:10	11:28	11:40	11:58	12:07A	12:19A
11:45	11:55	12:07A	12:25A				

Weekend Note: This route does not serve Shetland Office Park.

All buses are accessible to persons with disabilities

Route 455
Salem Depot-
Wonderland Station

455 Sunday

Inbound				Outbound			
Leave Salem Depot	Arrive Vinnin Square	Lv/Arrive Central Square	Arrive Wonder-land Station	Leave Wonder-land Station	Arrive Central Square	Arrive Vinnin Square	Arrive Salem Depot
.....	.....	5:40A	6:03A	.....	a 5:33A	5:43A	5:55A
6:05A	6:16A	6:33	6:56	6:15A	6:37	6:52	7:05
7:10	7:21	7:38	8:01	7:05	7:27	7:42	7:55
8:05	8:16	8:33	8:56	8:05	8:27	8:42	8:55
9:00	9:11	9:28	9:51	9:05	9:27	9:42	9:55
10:10	10:21	10:38	11:04	10:00	10:24	10:39	10:56
11:15	11:29	11:46	12:14P	11:15	11:39	11:54	12:11P
12:21P	12:35P	12:52P	1:20P	12:25P	12:49P	1:04P	1:19P
1:30	1:44	2:01	2:29	1:35	2:01	2:16	2:31
2:40	2:54	3:11	3:39	2:45	3:11	3:26	3:41
3:50	4:04	4:21	4:49	3:45	4:11	4:26	4:41
4:50	5:04	5:21	5:49	5:00	5:22	5:37	5:53
6:00	6:11	6:28	6:52	6:00	6:22	6:37	6:53
7:00	7:11	7:28	7:51	7:00	7:20	7:34	7:49
8:00	8:11	8:25	8:48	8:05	8:25	8:39	8:54
9:05	9:16	9:30	9:53	9:10	9:30	9:44	9:59
10:05	10:16	10:30	10:53	10:10	10:30	10:44	10:59
a 11:05	11:15	11:28	.....	10:58	11:18	11:32	11:47
11:35	11:45	11:58	12:18A				

a - From/to West Lynn Garage
e - From Brookline St. & Empire St and does not run during school vacation.

Fare	Local Bus	Bus + Bus	Subway	Bus + Subway
CharlieCard	$1.70	$1.70	$2.40	$2.40
CharlieTicket	$1.70	$1.70	$2.40	$4.10*
Cash-on-Board	$1.70	$3.40	$2.40	$4.10
Student/Youth**	$0.85	$0.85	$1.10	$1.10
Senior/TAP***	$0.85	$0.85	$1.10	$1.10

FREE FARES: Children 11 and under ride free when accompanied by a paying customer; Blind Access CharlieCard holders ride free and if using a guide, the guide rides free.
* Transfers Subway to Silver Line SL4 or SL5 pay $2.40
** Requires Student CharlieCard or Youth CharlieCard. Student CharlieCards available to students through participating middle and high schools. Youth CharlieCards available through community partners across Greater Boston.
*** Requires Senior/TAP CharlieCard, available to Medicare cardholders, seniors 65+, and persons with disabilities.

Winter 2021 Holidays
12/25/20 & 1/1/21 Sun; 1/18/21 & 2/15/21: Sat

! 2020/2021 REDUCED SERVICE SCHEDULE

Ride Safer. mbta.com/ridesafer — Wear a face covering — Maintain a healthy distance — Practice good hygiene

Reduced service schedule in effect when declared in advance by the MBTA. In most cases, announcement made late in the afternoon on the prior day. Stay connected to MBTA.com for up-to-the minute information.

NEWBURYPORT/ROCKPORT LINE

Monday to Friday

Inbound to Boston

ZONE	STATION	TRAIN #	AM						PM							
			7150	1100	1150	1102	1152	1104	1154	1106	1156	1108	1158	1110	1160	1112
8	Rockport	♿	-	B 6:50	-	B 9:50	-	B 11:50	-	B 1:50	-	B 5:00	-	B 7:20	-	B 9:50
7	Gloucester	♿	-	B 6:57	-	B 9:57	-	B 11:57	-	B 1:57	-	B 5:07	-	B 7:27	-	B 9:57
7	West Gloucester	♿	-	7:13	-	10:13	-	12:13	-	2:13	-	5:23	-	7:43	-	10:13
6	Manchester	♿	-	7:20	-	10:20	-	12:20	-	2:20	-	5:30	-	7:50	-	10:20
5	Beverly Farms	♿	-	7:26	-	10:26	-	12:26	-	2:26	-	5:36	-	7:56	-	10:26
4	Montserrat	♿	-	7:32	-	10:32	-	12:32	-	2:32	-	5:42	-	8:02	-	10:32
8	Newburyport	♿	5:35	-	8:52	-	10:52	-	12:52	-	2:52	-	5:52	-	9:00	-
7	Rowley	♿	5:40	-	8:58	-	10:58	-	12:58	-	2:58	-	5:58	-	9:06	-
6	Ipswich	♿	5:47	-	9:05	-	11:05	-	1:05	-	3:05	-	6:05	-	9:13	-
5	Hamilton/Wenham	♿	5:53	-	9:12	-	11:12	-	1:12	-	3:12	-	6:12	-	9:20	-
5	North Beverly	♿	5:58	-	9:15	-	11:15	-	1:15	-	3:15	-	6:15	-	9:23	-
4	Beverly	♿	6:03	7:38	9:20	10:38	11:20	12:38	1:20	2:38	3:20	5:48	6:20	8:08	9:28	10:38
3	Salem	♿	6:07	7:42	9:24	10:42	11:24	12:42	1:24	2:42	3:24	5:52	6:24	8:12	9:32	10:42
3	Swampscott	♿	6:15	7:49	9:30	10:49	11:30	12:49	1:30	2:49	3:30	5:59	6:30	8:19	9:38	10:49
2	Lynn	♿	6:19	7:54	9:34	10:54	11:34	12:54	1:34	2:54	3:34	6:04	6:34	8:24	9:42	10:54
2	River Works		f 6:22	f 7:57	f 9:37	f 10:57	f 11:37	f 12:57	f 1:37	f 2:57	f 3:37	f 6:07	f 6:37	f 8:27	f 9:45	f 10:57
1A	Chelsea		6:29	8:03	9:44	11:03	11:44	1:03	1:44	3:03	3:44	6:13	6:44	8:33	9:52	11:03
1A	North Station	♿	6:41	8:15	9:56	11:15	11:56	1:15	1:56	3:15	3:56	6:25	6:56	8:45	10:04	11:15

Monday to Friday

Outbound from Boston

ZONE	STATION	TRAIN #	AM				PM									
			1101	1151	1103	1153	1105	1155	1107	1157	1109	7151	1159	1111	1161	1113
1A	North Station	♿	8:30	9:30	10:20	11:30	12:20	1:30	2:20	4:30	5:30	6:00	7:15	8:30	10:20	11:30
1A	Chelsea		8:41	9:41	10:31	11:41	12:31	1:41	2:31	4:41	5:41	6:11	7:26	8:41	10:31	11:41
2	River Works		f 8:48	f 9:48	f 10:38	f 11:48	f 12:38	f 1:48	f 2:38	f 4:48	f 5:48	f 6:18	f 7:33	f 8:48	f 10:38	f 11:48
2	Lynn	♿	8:51	9:51	10:41	11:51	12:41	1:51	2:41	4:51	5:51	6:21	7:36	8:51	10:41	11:51
3	Swampscott	♿	8:54	9:54	10:44	11:54	12:44	1:54	2:44	4:54	5:54	6:24	7:39	8:54	10:44	11:54
3	Salem	♿	9:01	10:01	10:51	12:01	12:51	2:01	2:51	5:01	6:01	6:31	7:46	9:01	10:51	12:01
4	Beverly	♿	9:05	10:05	10:55	12:05	12:55	2:05	2:55	5:05	6:05	6:35	7:50	9:05	10:55	12:05
5	North Beverly	♿	-	10:09	-	12:09	-	2:09	-	5:09	-	6:39	7:54	-	10:59	-
5	Hamilton/Wenham	♿	-	10:13	-	12:13	-	2:13	-	5:13	-	6:43	7:58	-	11:03	-
6	Ipswich	♿	-	10:20	-	12:20	-	2:20	-	5:20	-	6:50	8:05	-	11:10	-
7	Rowley	♿	-	10:27	-	12:27	-	2:27	-	5:27	-	6:57	8:12	-	11:17	-
8	Newburyport	♿	-	10:35	-	12:35	-	2:35	-	5:35	-	7:05	8:20	-	11:25	-
4	Montserrat	♿	9:09	-	10:59	-	12:59	-	2:59	-	6:09	-	-	9:09	-	12:09
5	Beverly Farms	♿	9:14	-	11:04	-	1:04	-	3:04	-	6:14	-	-	9:14	-	12:14
6	Manchester	♿	B 9:20	-	B 11:10	-	B 1:10	-	B 3:10	-	B 6:20	-	-	B 9:20	-	B 12:20
7	West Gloucester	♿	B 9:40	-	B 11:30	-	B 1:30	-	B 3:30	-	B 6:40	-	-	B 9:40	-	B 12:40
7	Gloucester	♿	B 9:48	-	B 11:38	-	B 1:38	-	B 3:38	-	B 6:48	-	-	B 9:48	-	B 12:48
8	Rockport	♿	B 9:48	-	B 11:38	-	B 1:38	-	B 3:38	-	B 6:48	-	-	B 9:48	-	B 12:48

B: Due to construction activities for the Gloucester Drawbridge Replacement project, bus shuttles will replace train service between Rockport, Gloucester, West Gloucester (and Manchester on outbound trips) on the Rockport Line. Bicycles cannot be taken on substitute bus service.

Times in purple with "f" indicate a flag stop: Passengers must tell the conductor that they wish to leave. Passengers waiting to board must be visible on the platform for the train to stop.

Reduced Schedule advisory system The MBTA and Keolis closely monitor events to determine if changes to the Commuter Rail schedule are needed. During this time, the symbols to the right will communicate service level and impact on passengers.

REGULAR SCHEDULE
Trains will operate on a normal schedule.

REDUCED SCHEDULE
Major changes to the regular schedule. Schedules also available on MBTA.com and in Boston stations.

NO SERVICE
No passenger service on Commuter Rail.

NEWBURYPORT/ROCKPORT LINE

Effective November 2, 2020

mbta.com/ridesafer — Wear a face covering · Maintain a healthy distance · Practice good hygiene

Bus shuttles will replace train service between Rockport, Gloucester, West Gloucester (and Manchester on designated outbound trips) on the Rockport Line
Bicycles cannot be taken on substitute bus service.

Monday to Friday

Inbound to Boston

		AM																			PM																
	TRAIN #	140	100	142	102	144	182	104	146	106	184	148	108	150	186	110	152	188	112	154	190	114	156	192	116	158	194	118	160	120	196	162	122	198	164	124	166	126	168	128	170
8	Rockport		B 4:35		B 5:27			B 6:20		B 6:55			B 7:40			B 9:05			B 10:33			B 12:03			B 1:35			B 3:18		B 4:21			B 5:30			B 6:58		B 8:03		B 10:03	
7	Gloucester		B 4:42		B 5:34			B 6:27		B 7:02			B 7:47			B 9:12			B 10:40			B 12:10			B 1:42			B 3:25		B 4:28			B 5:37			B 7:05		B 8:10		B 10:10	
7	West Gloucester		4:58		5:50			6:43		7:18			8:03			9:28			10:56			12:26			1:58			3:41		4:44			5:53			7:21		8:26		10:26	
6	Manchester		5:05		5:57			6:50		7:25			8:10			9:35			11:03			12:33			2:05			3:48		4:51			6:00			7:28		8:33		10:33	
5	Beverly Farms		5:12		6:04			6:57		7:32			8:17			f 9:41			f 11:09			f 12:39			f 2:11			f 3:54		f 4:57			f 6:06			f 7:34		f 8:39		f 10:39	
5	Prides Crossing				f 6:06			f 6:59		f 7:34																															
4	Montserrat		5:16		6:11			7:04		7:39			8:23			f 9:47			f 11:15			f 12:45			f 2:17			f 4:00		f 5:03			f 6:12			f 7:40		f 8:45		f 10:45	
8	Newburyport	4:35		5:22		6:08			6:55		7:48		8:35				9:54			11:24			12:54			2:37			4:04			5:28			6:39		8:02		9:24		10:50	
7	Rowley	4:40		5:27		6:13			7:00		7:53		8:40				f 9:59			f 11:29			f 12:59			f 2:42			f 4:09			5:33			f 6:44		f 8:07		f 9:29		f 10:55	
6	Ipswich	4:46		5:33		6:20			7:07		7:59		8:46				10:05			11:35			1:05			2:48			4:15			5:39			6:50		8:13		9:35		11:01	
5	Hamilton/Wenham	4:52		5:39		6:26			7:13		8:05		8:52				f 10:11			f 11:41			f 1:11			f 2:54			f 4:28			5:45			f 7:03		f 8:19		f 9:41		f 11:07	
5	North Beverly	4:56		5:44		6:31			7:18		8:10		8:56				f 10:15			f 11:45			f 1:15			f 2:58			f 4:32			5:49			f 7:07		f 8:23		f 9:45		f 11:11	
4	Beverly	5:02	5:23	5:49	6:16	6:36	6:50	7:09	7:23	7:44	7:55	8:16	8:28	9:02	9:30	9:52	10:20	10:50	11:20	11:50	12:20	12:50	1:20	1:50	2:22	3:04	3:35	4:05	4:37	5:08	5:27	5:54	6:18	6:45	7:13	7:45	8:29	8:50	9:50	10:50	11:16
3	Salem	5:06	5:27	5:53	6:20	6:41	6:54	7:13	7:27	7:49	7:59	8:21	8:32	9:06	9:34	9:56	10:24	10:54	11:24	11:54	12:24	12:54	1:24	1:54	2:26	3:08	3:39	4:10	4:43	5:12	5:31	5:58	6:25	6:49	7:17	7:49	8:34	8:54	9:54	10:54	11:20
3	Swampscott	5:13	5:34	6:00	6:27		7:01		7:34		8:06		8:39	9:13	9:41	10:03	10:31	11:01	11:31	12:01	12:31	1:01	1:31	2:01	2:33	3:15	3:46	4:17	4:50		5:38	6:05	6:32	6:56	7:24	7:56	8:41	9:01	10:01	11:01	11:27
2	Lynn	5:16	5:37	6:03	6:30		7:05		7:35		8:10		8:42	9:16	9:44	10:06	10:34	11:04	11:34	12:04	12:34	1:04	1:34	2:04	2:36	3:18	3:49	4:20	4:53		5:42	6:08	6:35	6:59	7:27	7:59	8:44	9:04	10:04	11:04	11:30
2	River Works	f 5:19	f 5:40	f 6:06	f 6:33			f 7:41		f 8:13			f 8:45												f 2:39	f 3:21	f 3:52	f 4:23	f 4:56		f 5:45	f 6:11	f 6:38					f 9:07			f 11:33	
1A	Chelsea	5:26	5:47	6:13	6:40		7:18		7:49		8:21		8:52	9:25	f 9:53	f 10:15	f 10:43	f 11:13	f 11:43	f 12:13	f 12:43	f 1:13	f 1:43	f 2:13	f 2:46	f 3:28	f 3:59	f 4:30	f 5:03		f 5:52	f 6:18	f 6:45	f 7:08	f 7:36	f 8:08	f 8:53	f 9:14	f 10:13	f 11:13	f 11:40	
1A	North Station	5:40	6:02	6:27	6:55	7:08	7:30	7:41	8:03	8:17	8:34	8:48	9:07	9:40	10:06	10:30	10:57	11:26	11:58	12:27	12:56	1:28	1:57	2:26	3:01	3:41	4:12	4:44	5:17	5:40	6:05	6:32	6:59	7:21	7:49	8:22	9:06	9:28	10:26	11:27	11:53

Monday to Friday

Outbound from Boston

		AM																PM																				AM	
	TRAIN #	101	141	181	103	183	143	105	185	145	107	187	147	109	189	149	111	191	151	113	193	153	115	155	117	157	195	119	159	121	197	161	123	163	125	165	127	167	129	169	131	171
1A	North Station	5:04	5:30	6:00	6:20	6:55	7:05	7:45	8:10	8:30	9:00	9:35	10:05	10:35	11:05	11:35	12:05	12:35	1:05	1:35	2:05	2:30	3:00	3:30	4:05	4:25	4:35	5:00	5:15	5:40	5:50	6:12	6:25	6:55	7:30	8:00	8:45	9:30	10:15	11:00	12:15	
1A	Chelsea	f 5:15	f 5:41	f 6:11	f 6:31		f 7:16	f 7:56	f 8:21	f 8:41	f 9:11	f 9:46	f 10:16	f 10:46	f 11:16	f 11:46	f 12:16	f 12:46	f 1:16	f 1:46	f 2:16	f 2:41	f 3:11	3:41	4:16		4:46		5:26		6:01		6:36	7:06	f 7:41	f 8:11	f 8:56	f 9:41	f 10:26	f 11:11	f 12:26	
2	River Works	f 5:22	f 5:48	f 6:18	f 6:38		f 7:23	f 8:04	f 8:29											f 1:54		f 2:49	f 3:19	f 3:49	f 4:24				f 5:34				f 6:44	f 7:14	f 7:48				f 10:33			
2	Lynn	5:24	5:50	6:20	6:40		7:25	8:06	8:31	8:50	9:20	9:55	10:25	10:55	11:25	11:55	12:25	12:55	1:25	1:56	2:25	2:51	3:21	3:51	4:27		4:55		5:37		6:10		6:47	7:17	7:51	8:20	9:05	9:50	10:36	11:20	12:35	
3	Swampscott	5:27	5:53	6:23	6:43		7:28	8:09	8:34	8:53	9:23	9:58	10:28	10:58	11:28	11:58	12:28	12:58	1:28	1:59	2:28	2:55	3:25	3:55	4:31		4:59		5:41		6:14		6:51	7:21	7:56	8:23	9:08	9:53	10:39	11:23	12:38	
3	Salem	5:34	6:00	6:30	6:50	7:21	7:35	8:16	8:41	9:00	9:30	10:05	10:35	11:05	11:35	12:05	12:35	1:05	1:35	2:06	2:35	3:03	3:33	4:03	4:39	4:51	5:06	5:26	5:49	6:06	6:21	6:38	6:59	7:28	8:03	8:30	9:15	10:01	10:46	11:30	12:45	12:55
4	Beverly	5:38	6:04	6:35	6:54	7:26	7:39	8:20	8:46	9:04	9:34	10:10	10:39	11:09	11:40	12:09	12:39	1:10	1:39	2:10	2:40	3:07	3:37	4:07	4:43	4:55	5:12	5:30	5:53	6:10	6:26	6:42	7:03	7:32	8:07	8:34	9:19	10:05	10:50	11:34	12:49	12 59
5	North Beverly		f 6:08				f 7:43			f 9:08			f 10:43			f 12:13			f 1:43			f 3:11		4:12		5:00			5:58			6:47		7:37		8:39		f 10:09		f 11:38		f 1:03
5	Hamilton/Wenham		f 6:12				f 7:47			f 9:12			f 10:47			f 12:17			f 1:47			f 3:15		4:16		5:04			6:02			6:51		7:41		8:43		f 10:13		f 11:42		f 1:07
6	Ipswich		6:24				8:02			9:18			10:53			12:23			1:53			3:21		4:22		5:10			6:08			6:57		7:47		8:49		10:19		11:48		1:13
7	Rowley		f 6:30				f 8:09			f 9:24			f 10:59			f 12:29			f 1:59			f 3:27		4:29		5:17			6:15			7:04		7:53		f 8:56		f 10:25		f 11:54		f 1:19
8	Newburyport		5:40				8:18			9:34			11:09			12:39			2:09			3:37		4:39		5:27			6:24			7:14		8:03		9:06		10:34		12:04		1:28
4	Montserrat	f 5:42			f 6:58			f 8:24			f 9:38			f 11:13			f 12:43			f 2:14			f 3:41		4:47			5:34		6:14		7:07		f 8:11		f 9:23		f 10:54		f 12:53	
5	Prides Crossing																																									
5	Beverly Farms	f 5:48			f 7:05			f 8:30			f 9:44			f 11:19			f 12:49			f 2:20			f 3:46		4:53			5:42		6:22		7:13		f 8:17		f 9:29		f 11:00		f 12:59	
6	Manchester	B 5:53			B 7:11			B 8:36			B 9:50			B 11:25			B 12:55			B 2:26			B 3:52		B 4:59			5:48		B 6:28			B 7:19		8:23		B 9:35		B 11:06		B 1:05	
7	West Gloucester	B 6:13			B 7:31			B 8:56			B 10:10			B 11:45			B 1:15			B 2:46			B 4:12		B 5:19			B 5:54		B 6:48			B 7:39		B 8:29		B 9:55		B 11:26		B 1:25	
7	Gloucester	B 6:21			B 7:39			B 9:04			B 10:18			B 11:53			B 1:23			B 2:54			B 4:20		B 5:27			B 6:07		B 6:56			B 7:47		B 8:49		B 10:03		B 11:34		B 1:33	
8	Rockport	B 6:21			B 7:39			B 9:04			B 10:18			B 11:53			B 1:23			B 2:54			B 4:20		B 5:27			B 6:14		B 6:56			B 7:47		B 8:49		B 10:03		B 11:34		B 1:32	

Saturday & Sunday

Inbound to Boston

		AM				PM									
	SATURDAY TRAIN #	1100	1150	1102	1152	1104	1154	1106	1156	1108	1158	1110	1160	1112	
	SUNDAY TRAIN #	2100	2150	2102	2152	2104	2154	2106	2156	2108	2158	2110	2160	2112	
8	Rockport	B 6:50		B 9:50		B 11:50		B 1:50		B 5:00		B 7:20		B 9:50	
7	Gloucester	B 6:57		B 9:57		B 11:57		B 1:57		B 5:07		B 7:27		B 9:57	
7	West Gloucester	7:13		10:13		12:13		2:13		5:23		7:43		10:13	
6	Manchester	7:20		10:20		12:20		2:20		5:30		7:50		10:20	
5	Beverly Farms	f 7:26		f 10:26		f 12:26		f 2:26		f 5:36		f 7:56		f 10:26	
4	Montserrat	f 7:32		f 10:32		f 12:32		f 2:32		f 5:42		f 8:02		f 10:32	
8	Newburyport		8:52		10:52		12:52		2:52		5:52		9:00		
7	Rowley		8:58		10:58		12:58		2:58		5:58		9:06		
6	Ipswich		9:05		11:05		1:05		3:05		6:05		9:13		
5	Hamilton/Wenham		9:12		11:12		1:12		3:12		6:12		9:20		
5	North Beverly		f 9:15		f 11:15		f 1:15		f 3:15		f 6:15		f 9:23		
4	Beverly	7:38	9:20	10:38	11:20	12:38	1:20	2:38	3:20	5:48	6:20	8:08	9:28	10:38	
3	Salem	7:42	9:24	10:42	11:24	12:42	1:24	2:42	3:24	5:52	6:24	8:12	9:32	10:42	
3	Swampscott	7:49	9:30	10:49	11:30	12:49	1:30	2:49	3:30	5:59	6:30	8:19	9:38	10:49	
2	Lynn	7:54	9:34	10:54	11:34	12:54	1:34	2:54	3:34	6:04	6:34	8:24	9:42	10:54	
1A	Chelsea	f 8:03	f 9:44	f 11:03	f 11:44	f 1:03	f 1:44	f 3:03	f 3:44	f 6:13	f 6:44	f 8:33	f 9:52	f 11:03	
1A	North Station	8:15	9:56	11:15	11:56	1:15	1:56	3:15	3:56	6:25	6:56	8:45	10:04	11:15	

Saturday & Sunday

Outbound from Boston

		AM				PM									
ZONE	SATURDAY TRAIN #	1101	1151	1103	1153	1105	1155	1107	1157	1109	1159	1111	1161	1113	
	STATION SUNDAY TRAIN #	2101	2151	2103	2153	2105	2155	2107	2157	2109	2159	2111	2161	2113	
1A	North Station	8:30	9:30	10:20	11:30	12:20	1:30	2:20	4:30	5:30	7:15	8:30	10:20	11:30	
1A	Chelsea	f 8:41	f 9:41	f 10:31	f 11:41	f 12:31	f 1:41	f 2:31	f 4:41	f 5:41	f 7:26	f 8:41	f 10:31	f 11:41	
2	Lynn	8:51	9:51	10:41	11:51	12:41	1:51	2:41	4:51	5:51	7:36	8:51	10:41	11:51	
3	Swampscott	8:54	9:54	10:44	11:54	12:44	1:54	2:44	4:54	5:54	7:39	8:54	10:44	11:54	
3	Salem	9:01	10:01	10:51	12:01	12:51	2:01	2:51	5:01	6:01	7:46	9:01	10:51	12:01	
4	Beverly	9:05	10:05	10:55	12:05	12:55	2:05	2:55	5:05	6:05	7:50	9:05	10:55	12:05	
5	North Beverly		f 10:09		f 12:09		f 2:09		f 5:09		f 7:54		f 10:59		
5	Hamilton/Wenham		10:13		12:13		2:13		5:13		7:58		11:03		
6	Ipswich		10:20		12:20		2:20		5:20		8:05		11:10		
7	Rowley		10:28		12:28		2:28		5:28		8:13		11:18		
8	Newburyport		10:35		12:35		2:35		5:35		8:20		11:25		
4	Montserrat	f 9:09		f 10:59		f 12:59		f 2:59		f 6:09		f 9:09		f 12:09	
5	Beverly Farms	f 9:14		f 11:04		f 1:04		f 3:04		f 6:14		f 9:14		f 12:14	
6	Manchester	B 9:20		B 11:10		B 1:10		B 3:10		B 6:20		B 9:20		B 12:20	
7	West Gloucester	B 9:40		B 11:30		B 1:30		B 3:30		B 6:40		B 9:40		B 12:40	
7	Gloucester	B 9:48		B 11:38		B 1:38		B 3:38		B 6:48		B 9:48		B 12:48	
8	Rockport	B 9:48		B 11:38		B 1:38		B 3:38		B 6:48		B 9:48		B 12:48	

Schedules may change in the event of severe weather

During weather events, the symbols below will communicate service level and impact on passengers. These modified schedules are available on MBTA.com.

REGULAR SCHEDULE
Trains will operate on a normal schedule.

STORM SCHEDULE
Major changes to the regular schedule. Schedules will be available on mbta.com and in Boston stations

NO SERVICE
No passenger service

Keep in Mind:

This schedule will be effective from November 2, 2020 and will replace the schedule of June 22, 2020.

Holiday Service
New Year's Day, Thanksgiving Day, and Christmas Day operate on a Sunday schedule. For all holiday schedules, visit MBTA.com or call 617-222-3200.

Times in purple with "f" indicate a flag stop: Passengers must tell the conductor that they wish to leave. Passengers waiting to board must be visible on the platform for the train to stop.

Times in blue indicate an early departure (L stop): The train may leave ahead of schedule at these stops.

Bikes: Bicycles are allowed on trains with the bicycle symbol shown below the train number.

High level platform and bridge plate available. Visit **mbta.com/accessibility** for more information.

VEHICLE TRAVEL SPEED DATA

Accurate Counts
978-664-2565

Location : Essex Street
Location : East of Elm Place
City/State: Swampscott, MA

8688SP01

WB

Start	1	4	7	10	13	16	19	22	25	28	31	34	37	40	
Time	3	6	9	12	15	18	21	24	27	30	33	36	39	999	Total
12/02/20	0	0	0	0	0	0	1	6	3	12	2	3	2	0	29
01:00	0	0	0	0	0	0	1	2	2	4	2	1	1	0	13
02:00	0	0	0	0	0	0	1	1	4	3	2	1	0	0	12
03:00	0	0	0	0	0	0	0	1	4	6	2	3	0	0	16
04:00	0	0	1	0	0	0	1	0	2	8	4	3	0	2	21
05:00	0	0	2	0	0	1	4	3	13	19	19	10	5	1	77
06:00	0	0	0	2	1	8	5	29	62	55	24	7	3	0	196
07:00	0	0	1	1	0	2	26	66	92	91	20	16	2	0	317
08:00	0	0	1	1	3	5	27	93	93	72	26	13	3	0	337
09:00	0	0	1	3	1	3	21	75	98	80	33	14	3	0	332
10:00	0	0	5	3	2	6	15	84	151	90	29	9	2	0	396
11:00	0	0	4	1	5	18	29	116	131	80	21	4	0	0	409
12 PM	0	0	1	2	4	17	30	73	164	86	27	9	1	0	414
13:00	0	0	2	3	1	2	47	123	133	119	36	6	2	0	474
14:00	0	0	1	3	0	10	131	170	131	40	10	3	0	0	499
15:00	0	0	3	6	10	36	85	205	218	39	17	4	0	0	623
16:00	0	0	6	5	9	45	128	212	156	44	2	1	0	0	608
17:00	0	0	4	3	11	10	58	223	194	70	8	3	1	0	585
18:00	0	0	2	0	7	7	27	119	150	66	21	3	1	0	403
19:00	0	0	2	0	2	6	27	78	99	60	9	4	1	0	288
20:00	0	0	2	0	0	2	5	41	66	67	16	10	0	1	210
21:00	0	0	1	0	0	1	5	19	34	61	24	11	2	0	158
22:00	0	0	2	0	1	0	5	3	16	23	13	9	4	3	79
23:00	0	0	0	0	0	0	1	5	12	26	11	9	1	1	66
Total	0	0	41	33	57	179	680	1747	2028	1221	378	156	34	8	6562

Daily

15th Percentile :	20 MPH
50th Percentile :	24 MPH
85th Percentile :	28 MPH
95th Percentile :	31 MPH
Mean Speed(Average) :	25 MPH
10 MPH Pace Speed :	21-30 MPH
Number in Pace :	5223
Percent in Pace :	79.6%
Number of Vehicles > 25 MPH :	3149
Percent of Vehicles > 25 MPH :	48.0%

Location : Essex Street
Location : East of Elm Place
City/State: Swampscott, MA

8688SP01

WB

Start Time	1 3	4 6	7 9	10 12	13 15	16 18	19 21	22 24	25 27	28 30	31 33	34 36	37 39	40 999	Total
12/03/20	0	0	0	0	0	0	2	4	6	5	5	6	1	1	30
01:00	0	0	0	0	0	0	0	0	1	5	2	0	0	1	9
02:00	0	0	0	0	0	0	1	0	2	3	1	1	1	0	9
03:00	0	0	0	0	0	0	1	4	2	3	1	2	1	0	14
04:00	0	0	1	0	0	0	0	6	3	5	1	1	2	0	19
05:00	0	0	1	0	0	3	4	15	15	20	15	7	2	2	84
06:00	0	0	0	0	1	3	19	29	58	38	12	12	2	1	175
07:00	0	0	4	1	2	5	45	80	88	70	24	12	2	0	333
08:00	0	0	2	0	1	6	45	69	95	105	37	11	1	0	372
09:00	0	0	5	4	1	9	21	63	124	91	41	13	2	2	376
10:00	0	0	2	2	4	7	30	73	105	92	22	6	2	0	345
11:00	0	0	0	5	0	12	42	128	117	55	18	3	0	0	380
12 PM	0	0	1	2	1	12	43	141	198	86	16	4	2	0	506
13:00	0	0	5	1	0	3	22	99	179	106	26	9	0	0	450
14:00	0	0	4	1	5	23	61	135	169	87	12	10	0	0	507
15:00	0	0	9	9	23	40	143	265	143	48	4	7	0	0	691
16:00	0	0	6	2	4	11	94	228	159	113	13	2	0	0	632
17:00	0	0	10	5	3	29	98	192	146	76	13	3	0	0	575
18:00	0	0	2	1	2	13	28	112	139	80	20	9	0	0	406
19:00	0	0	1	3	1	4	14	63	129	75	21	7	2	1	321
20:00	0	0	2	0	1	5	4	23	77	66	27	8	0	0	213
21:00	0	0	0	0	0	1	5	20	45	49	18	10	2	0	150
22:00	0	0	1	0	0	0	1	7	31	30	17	12	1	0	100
23:00	0	0	0	1	0	0	1	0	13	25	6	7	1	1	55
Total	0	0	56	37	49	186	724	1756	2044	1333	372	162	24	9	6752

Daily

15th Percentile	20 MPH
50th Percentile	24 MPH
85th Percentile	28 MPH
95th Percentile	31 MPH
Mean Speed(Average)	25 MPH
10 MPH Pace Speed	21-30 MPH
Number in Pace	5374
Percent in Pace	79.6%
Number of Vehicles > 25 MPH	3263
Percent of Vehicles > 25 MPH	48.3%

Grand Total	0	0	97	70	106	365	1404	3503	4072	2554	750	318	58	17	13314

Overall

15th Percentile	20 MPH
50th Percentile	24 MPH
85th Percentile	28 MPH
95th Percentile	31 MPH
Mean Speed(Average)	25 MPH
10 MPH Pace Speed	21-30 MPH
Number in Pace	10597
Percent in Pace	79.6%
Number of Vehicles > 25 MPH	6412
Percent of Vehicles > 25 MPH	48.2%

Location : Essex Street
Location : East of Elm Place
City/State: Swampscott, MA

8688SP01

EB

Start Time	1 3	4 6	7 9	10 12	13 15	16 18	19 21	22 24	25 27	28 30	31 33	34 36	37 39	40 999	Total
12/02/20	0	0	1	0	0	0	2	3	13	13	7	5	2	2	48
01:00	0	0	0	0	0	0	0	0	3	3	5	3	3	2	19
02:00	0	0	1	0	0	0	0	0	0	3	1	2	0	0	7
03:00	0	0	0	0	0	0	0	3	2	1	2	0	1	0	9
04:00	0	0	0	2	1	1	1	4	7	8	12	8	1	1	46
05:00	0	0	2	5	0	6	5	11	13	16	16	5	4	1	84
06:00	0	0	1	7	9	24	14	42	86	65	20	3	0	10	281
07:00	0	0	13	19	14	32	50	74	93	80	27	13	2	5	422
08:00	0	0	17	24	43	42	42	78	77	44	15	10	1	6	399
09:00	0	0	11	15	16	31	37	48	91	74	25	7	0	8	363
10:00	0	0	10	18	36	41	40	52	93	91	19	3	1	9	413
11:00	0	0	21	28	24	44	48	64	98	51	22	2	0	4	406
12 PM	0	0	8	13	21	38	65	88	114	85	20	17	2	2	473
13:00	0	0	23	14	35	42	48	84	106	72	22	9	1	6	462
14:00	0	0	38	26	69	84	70	60	56	27	2	0	0	2	434
15:00	0	0	24	35	40	80	107	94	62	57	11	1	0	5	516
16:00	0	0	33	49	81	114	84	82	39	24	5	3	0	4	518
17:00	0	0	19	27	36	58	71	114	91	51	7	2	0	2	478
18:00	0	0	6	13	17	34	36	62	114	54	21	9	2	3	371
19:00	0	0	8	5	20	22	28	46	70	67	16	9	2	1	294
20:00	0	0	0	0	2	4	9	22	49	42	22	17	1	1	169
21:00	0	0	0	0	1	4	5	4	27	41	18	5	2	2	109
22:00	0	0	0	0	0	1	2	3	15	21	12	9	2	1	66
23:00	0	0	0	0	1	1	0	10	9	27	12	6	1	0	67
Total	0	0	236	300	466	703	764	1048	1328	1017	339	148	28	77	6454

Daily

15th Percentile :	14 MPH
50th Percentile :	23 MPH
85th Percentile :	28 MPH
95th Percentile :	31 MPH
Mean Speed(Average) :	23 MPH
10 MPH Pace Speed :	21-30 MPH
Number in Pace :	3648
Percent in Pace :	56.5%
Number of Vehicles > 25 MPH :	2494
Percent of Vehicles > 25 MPH :	38.6%

Location : Essex Street
Location : East of Elm Place
City/State: Swampscott, MA

8688SP01

EB

Start Time	1 3	4 6	7 9	10 12	13 15	16 18	19 21	22 24	25 27	28 30	31 33	34 36	37 39	40 999	Total
12/03/20	0	0	0	0	0	0	1	4	6	10	4	4	2	1	32
01:00	0	0	0	0	0	0	1	3	2	3	3	1	2	1	16
02:00	0	0	0	0	0	0	1	0	1	2	1	2	2	1	10
03:00	0	0	0	0	1	3	1	1	1	1	0	1	1	1	11
04:00	0	0	4	1	7	9	3	3	1	3	1	2	0	0	34
05:00	0	0	0	3	3	7	3	16	18	21	13	12	3	2	101
06:00	0	0	5	12	12	22	25	50	79	47	18	6	2	3	281
07:00	0	0	19	34	29	36	40	66	97	51	20	5	1	5	403
08:00	0	0	21	23	44	40	50	81	112	84	26	5	0	4	490
09:00	0	0	12	21	24	31	42	53	116	77	29	5	2	3	415
10:00	0	0	7	18	24	36	54	48	83	73	23	4	0	4	374
11:00	0	0	22	29	43	61	46	49	76	57	15	5	3	5	411
12 PM	0	0	16	22	34	57	63	114	108	42	13	3	0	6	478
13:00	0	0	16	16	20	43	62	66	113	82	22	13	4	4	461
14:00	0	0	22	25	35	50	77	110	99	68	10	6	1	3	506
15:00	0	0	27	21	36	82	64	83	95	63	11	3	2	7	494
16:00	0	0	12	22	27	64	76	96	140	74	23	9	0	8	551
17:00	0	0	10	21	29	63	68	109	126	70	13	2	1	5	517
18:00	0	0	2	16	17	29	38	74	111	62	16	10	4	0	379
19:00	0	0	2	4	14	27	26	48	57	52	23	9	2	1	265
20:00	0	0	2	6	2	6	11	29	63	49	30	4	3	0	205
21:00	0	0	2	0	2	3	6	12	32	44	15	11	3	2	132
22:00	0	0	0	0	0	0	12	10	22	29	15	11	5	2	106
23:00	0	0	0	0	0	0	6	5	3	22	11	5	4	1	57
Total	0	0	201	294	403	669	776	1130	1561	1086	355	138	47	69	6729

Daily

15th Percentile :	15 MPH
50th Percentile :	23 MPH
85th Percentile :	28 MPH
95th Percentile :	31 MPH
Mean Speed(Average) :	23 MPH
10 MPH Pace Speed :	21-30 MPH
Number in Pace :	4036
Percent in Pace :	60.0%
Number of Vehicles > 25 MPH :	2736
Percent of Vehicles > 25 MPH :	40.7%

Grand Total	0	0	437	594	869	1372	1540	2178	2889	2103	694	286	75	146	13183

Overall

15th Percentile :	15 MPH
50th Percentile :	23 MPH
85th Percentile :	28 MPH
95th Percentile :	31 MPH
Mean Speed(Average) :	23 MPH
10 MPH Pace Speed :	21-30 MPH
Number in Pace :	7683
Percent in Pace :	58.3%
Number of Vehicles > 25 MPH :	5230
Percent of Vehicles > 25 MPH :	39.7%

Location : Essex Street
Location : East of Elm Place
City/State: Swampscott, MA

8688SP01

WB, EB

Start	1	4	7	10	13	16	19	22	25	28	31	34	37	40	
Time	3	6	9	12	15	18	21	24	27	30	33	36	39	999	Total
12/02/20	0	0	1	0	0	0	3	9	16	25	9	8	4	2	77
01:00	0	0	0	0	0	0	1	2	5	7	7	4	4	2	32
02:00	0	0	1	0	0	0	1	1	4	6	3	3	0	0	19
03:00	0	0	0	0	0	0	0	4	6	7	4	3	1	0	25
04:00	0	0	1	2	1	1	2	4	9	16	16	11	1	3	67
05:00	0	0	4	5	0	7	9	14	26	35	35	15	9	2	161
06:00	0	0	1	9	10	32	19	71	148	120	44	10	3	10	477
07:00	0	0	14	20	14	34	76	140	185	171	47	29	4	5	739
08:00	0	0	18	25	46	47	69	171	170	116	41	23	4	6	736
09:00	0	0	12	18	17	34	58	123	189	154	58	21	3	8	695
10:00	0	0	15	21	38	47	55	136	244	181	48	12	3	9	809
11:00	0	0	25	29	29	62	77	180	229	131	43	6	0	4	815
12 PM	0	0	9	15	25	55	95	161	278	171	47	26	3	2	887
13:00	0	0	25	17	36	44	95	207	239	191	58	15	3	6	936
14:00	0	0	39	29	69	94	201	230	187	67	12	3	0	2	933
15:00	0	0	27	41	50	116	192	299	280	96	28	5	0	5	1139
16:00	0	0	39	54	90	159	212	294	195	68	7	4	0	4	1126
17:00	0	0	23	30	47	68	129	337	285	121	15	5	1	2	1063
18:00	0	0	8	13	24	41	63	181	264	120	42	12	3	3	774
19:00	0	0	10	5	22	28	55	124	169	127	25	13	3	1	582
20:00	0	0	2	0	2	6	14	63	115	109	38	27	1	2	379
21:00	0	0	1	0	1	5	10	23	61	102	42	16	4	2	267
22:00	0	0	2	0	1	1	7	6	31	44	25	18	6	4	145
23:00	0	0	0	0	1	1	1	15	21	53	23	15	2	1	133
Total	0	0	277	333	523	882	1444	2795	3356	2238	717	304	62	85	13016

Daily

15th Percentile :	17 MPH
50th Percentile :	24 MPH
85th Percentile :	28 MPH
95th Percentile :	31 MPH
Mean Speed(Average) :	24 MPH
10 MPH Pace Speed :	21-30 MPH
Number in Pace :	8870
Percent in Pace :	68.1%
Number of Vehicles > 25 MPH :	5643
Percent of Vehicles > 25 MPH :	43.4%

Location : Essex Street
Location : East of Elm Place
City/State: Swampscott, MA

8688SP01

WB, EB

Start Time	1 3	4 6	7 9	10 12	13 15	16 18	19 21	22 24	25 27	28 30	31 33	34 36	37 39	40 999	Total
12/03/20	0	0	0	0	0	0	3	8	12	15	9	10	3	2	62
01:00	0	0	0	0	0	0	1	3	3	8	5	1	2	2	25
02:00	0	0	0	0	0	0	2	0	3	5	2	3	3	1	19
03:00	0	0	0	0	1	3	2	5	3	4	1	3	2	1	25
04:00	0	0	5	1	7	9	3	9	4	8	2	3	2	0	53
05:00	0	0	1	3	3	10	7	31	33	41	28	19	5	4	185
06:00	0	0	5	12	13	25	44	79	137	85	30	18	4	4	456
07:00	0	0	23	35	31	41	85	146	185	121	44	17	3	5	736
08:00	0	0	23	23	45	46	95	150	207	189	63	16	1	4	862
09:00	0	0	17	25	25	40	63	116	240	168	70	18	4	5	791
10:00	0	0	9	20	28	43	84	121	188	165	45	10	2	4	719
11:00	0	0	22	34	43	73	88	177	193	112	33	8	3	5	791
12 PM	0	0	17	24	35	69	106	255	306	128	29	7	2	6	984
13:00	0	0	21	17	20	46	84	165	292	188	48	22	4	4	911
14:00	0	0	26	26	40	73	138	245	268	155	22	16	1	3	1013
15:00	0	0	36	30	59	122	207	348	238	111	15	10	2	7	1185
16:00	0	0	18	24	31	75	170	324	299	187	36	11	0	8	1183
17:00	0	0	20	26	32	92	166	301	272	146	26	5	1	5	1092
18:00	0	0	4	17	19	42	66	186	250	142	36	19	4	0	785
19:00	0	0	3	7	15	31	40	111	186	127	44	16	4	2	586
20:00	0	0	4	6	3	11	15	52	140	115	57	12	3	0	418
21:00	0	0	2	0	2	4	11	32	77	93	33	21	5	2	282
22:00	0	0	1	0	0	0	13	17	53	59	32	23	6	2	206
23:00	0	0	0	1	0	0	7	5	16	47	17	12	5	2	112
Total	0	0	257	331	452	855	1500	2886	3605	2419	727	300	71	78	13481

Daily

15th Percentile :	18 MPH
50th Percentile :	24 MPH
85th Percentile :	28 MPH
95th Percentile :	31 MPH
Mean Speed(Average) :	24 MPH
10 MPH Pace Speed :	21-30 MPH
Number in Pace :	9410
Percent in Pace :	69.8%
Number of Vehicles > 25 MPH :	5998
Percent of Vehicles > 25 MPH :	44.5%

Grand Total	0	0	534	664	975	1737	2944	5681	6961	4657	1444	604	133	163	26497

Overall

15th Percentile :	18 MPH
50th Percentile :	24 MPH
85th Percentile :	28 MPH
95th Percentile :	31 MPH
Mean Speed(Average) :	24 MPH
10 MPH Pace Speed :	21-30 MPH
Number in Pace :	18280
Percent in Pace :	69.0%
Number of Vehicles > 25 MPH :	11642
Percent of Vehicles > 25 MPH :	43.9%

MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING

Moving Massachusetts Forward. massDOT Highway

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Swampscott COUNT DATE : Dec-20

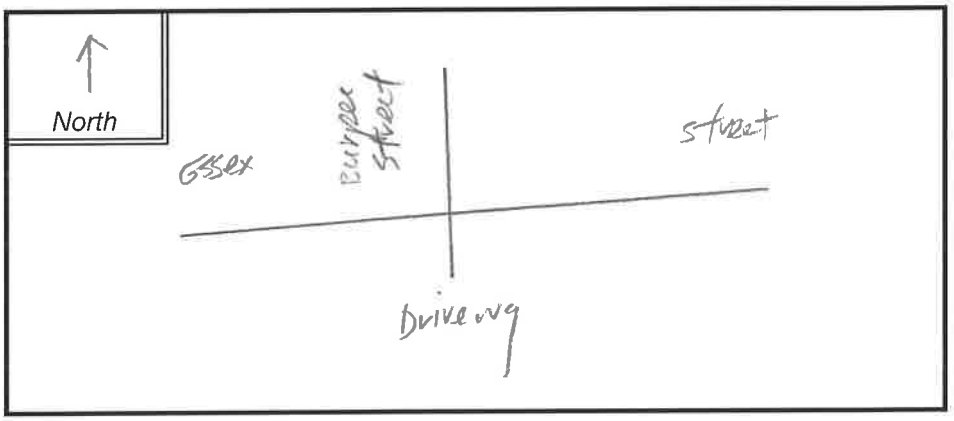
DISTRICT : 4 UNSIGNALIZED : [ ] SIGNALIZED : [X]

~ INTERSECTION DATA ~

MAJOR STREET : Essex Street

MINOR STREET(S) : Burpee Road

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	653	802	0	97		1,552

" K " FACTOR : **0.090**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **17,244**

TOTAL # OF CRASHES : 7

OF YEARS : 5

AVERAGE # OF CRASHES PER YEAR (**A**) : **1.40**

CRASH RATE CALCULATION : **0.22**

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

Comments : Below MassDOT District 4 crash rate

Project Title & Date: Proposed Residential Development - January 2021

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Swampscott COUNT DATE : Dec-20

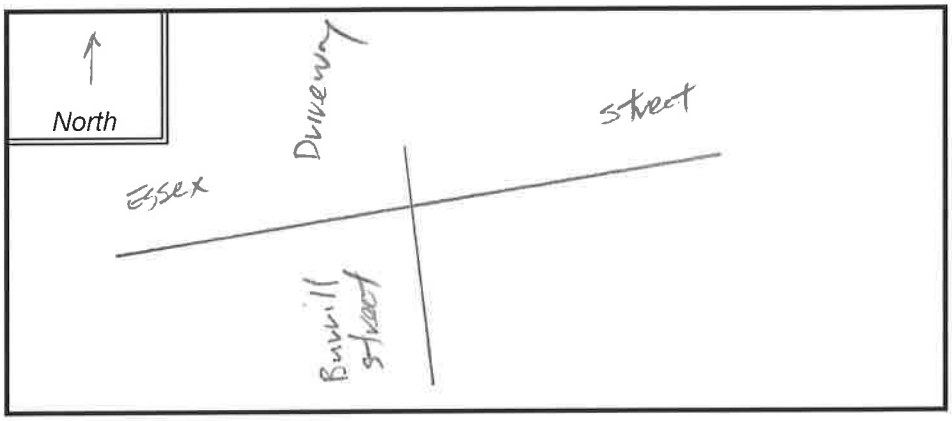
DISTRICT : 4 UNSIGNALIZED : [ ] SIGNALIZED : [X]

~ INTERSECTION DATA ~

MAJOR STREET : Essex Street

MINOR STREET(S) : Burrill Street

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	489	732	316	1		1,538

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **17,089**

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

CRASH RATE CALCULATION : **0.10** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : Below MassDOT District 4 crash rate

Project Title & Date: Proposed Residential Development - January 2021

Moving Massachusetts Forward
massDOT Highway

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Swampscott COUNT DATE : Dec-20

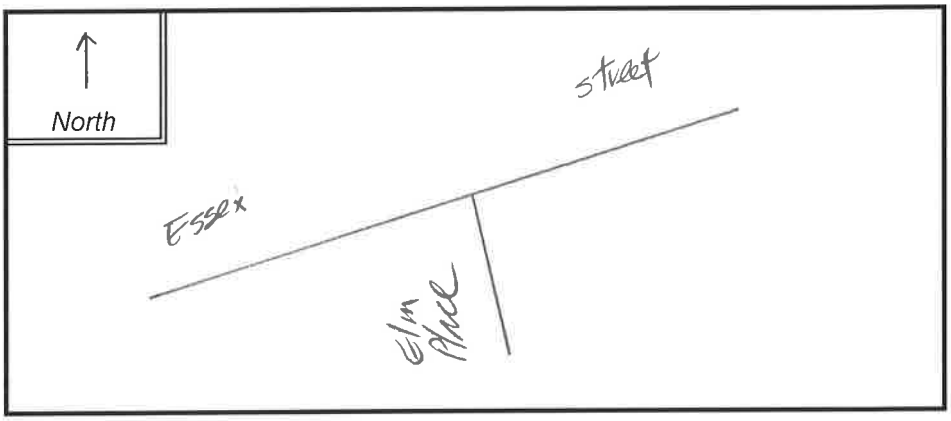
DISTRICT : 4 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Essex Street

MINOR STREET(S) : Elm Place

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	661	741	25			1,427

" K " FACTOR : 0.090

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : 15,856

TOTAL # OF CRASHES : 2

OF YEARS : 5

AVERAGE # OF CRASHES PER YEAR (**A**) : 0.40

CRASH RATE CALCULATION : 0.07

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

Comments : Below MassDOT District 4 crash rate

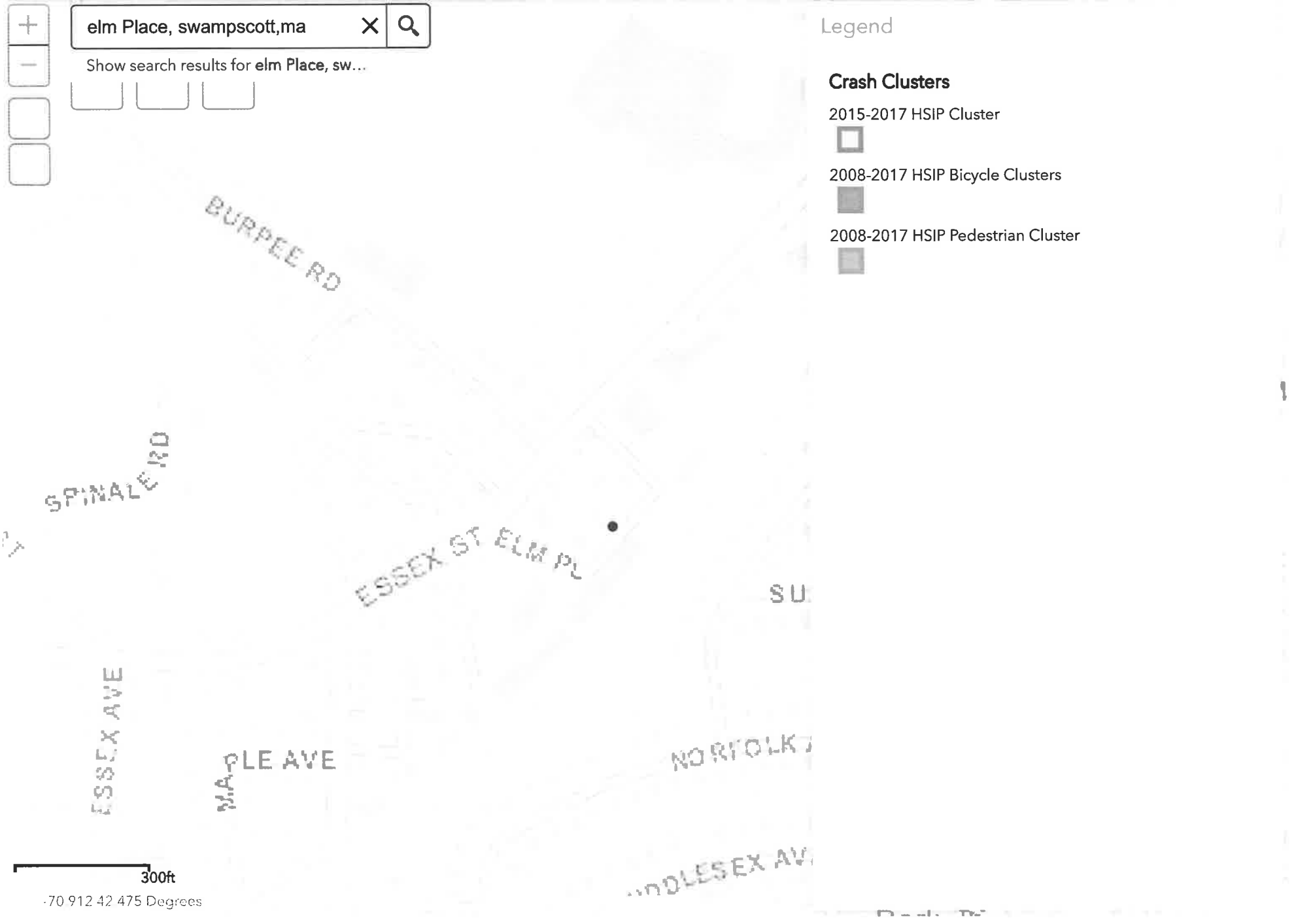
Project Title & Date: Proposed Residential Development - January 2021

Top Crash Locations

Accessible Version

elm Place, swampscott,ma

Show search results for **elm Place, sw...**



Legend

Crash Clusters

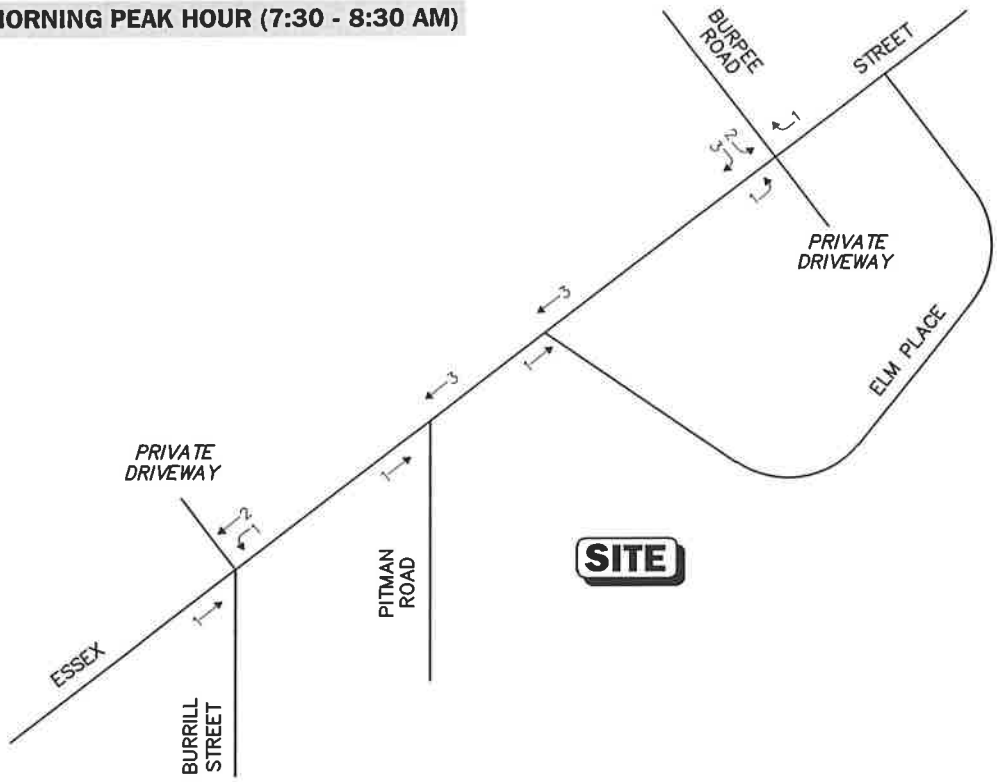
2015-2017 HSIP Cluster

2008-2017 HSIP Bicycle Clusters

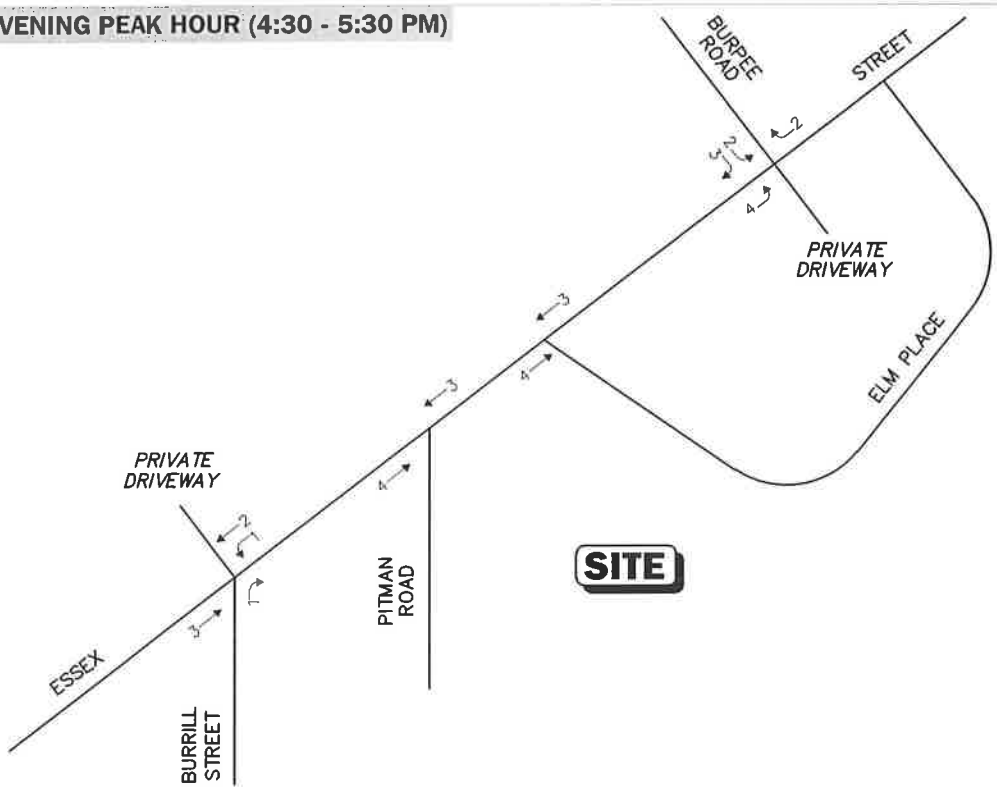
2008-2017 HSIP Pedestrian Cluster

BACKGROUND DEVELOPMENT TRAFFIC-VOLUME NETWORKS

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



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



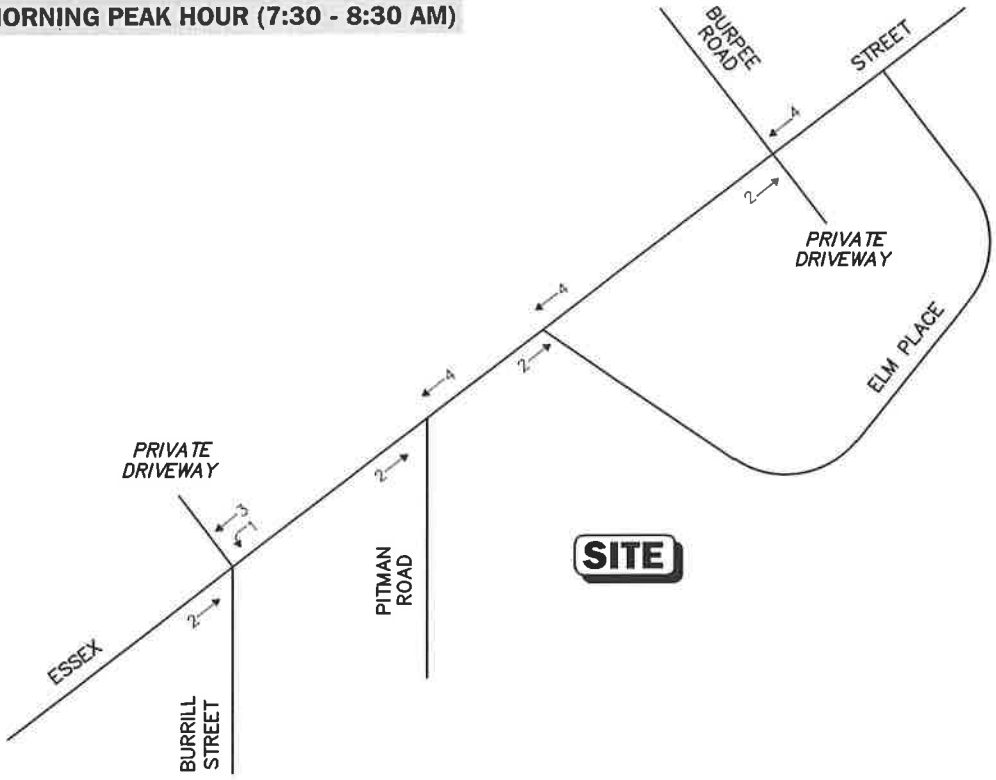
Not To Scale

Figure A-1

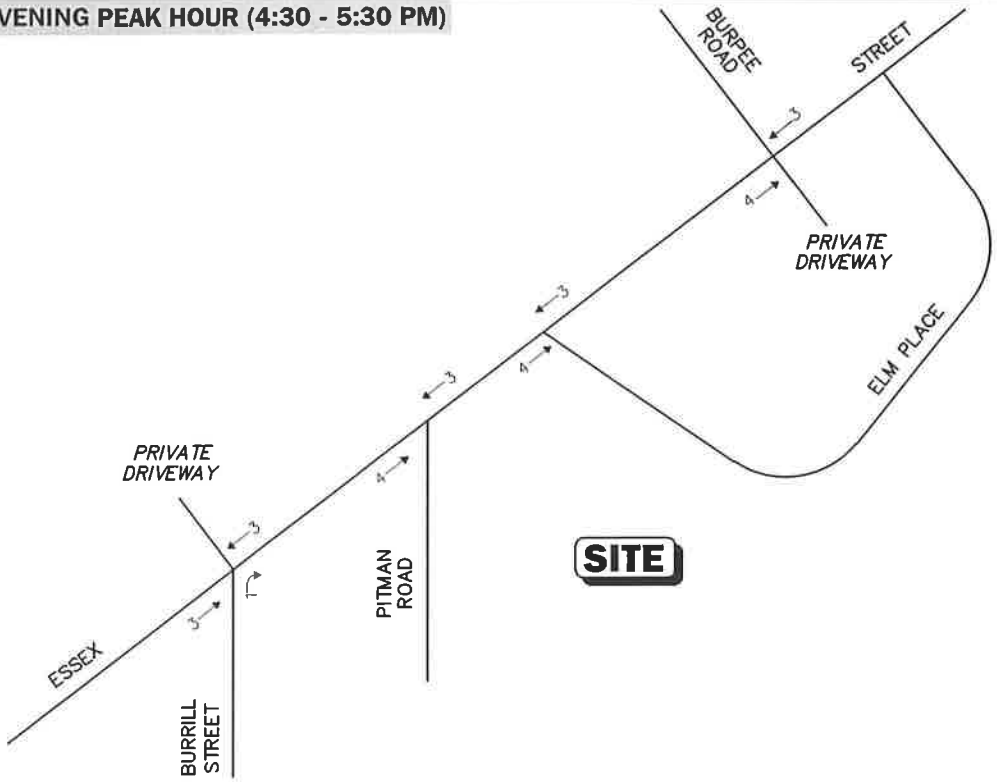
35 Burpee Road
Peak Hour Traffic Volumes

Vanasse & Associates inc

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



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



Not To Scale

Figure A-2

Vanasse & Associates inc

Overlook Acres
Mixed-Use Development
387 Highland Avenue
Peak Hour Traffic Volumes

GENERAL BACKGROUND TRAFFIC GROWTH

General Background Traffic Growth

STA.	CITY/TOWN	ROUTE/STREET	LOCATION	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average Annual Growth Rate
8087	Revere	Route 1A	Boston/Revere Line	55,853	56,942	56,677	53,534	60,089	58,092	59,364	58,745	60,868	62,467	1.11%
														1.25%

TRIP-GENERATION CALCULATIONS

Graph Look Up

Query | Filter

DATA SOURCE:
Trip Gen Manual, 10th Ed + Supplement

SEARCH BY LAND USE CODE:
221

LAND USE GROUP:
(200-299) Residential

LAND USE :
221 - Multifamily Housing (Mid-Rise)

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
Dwelling Units

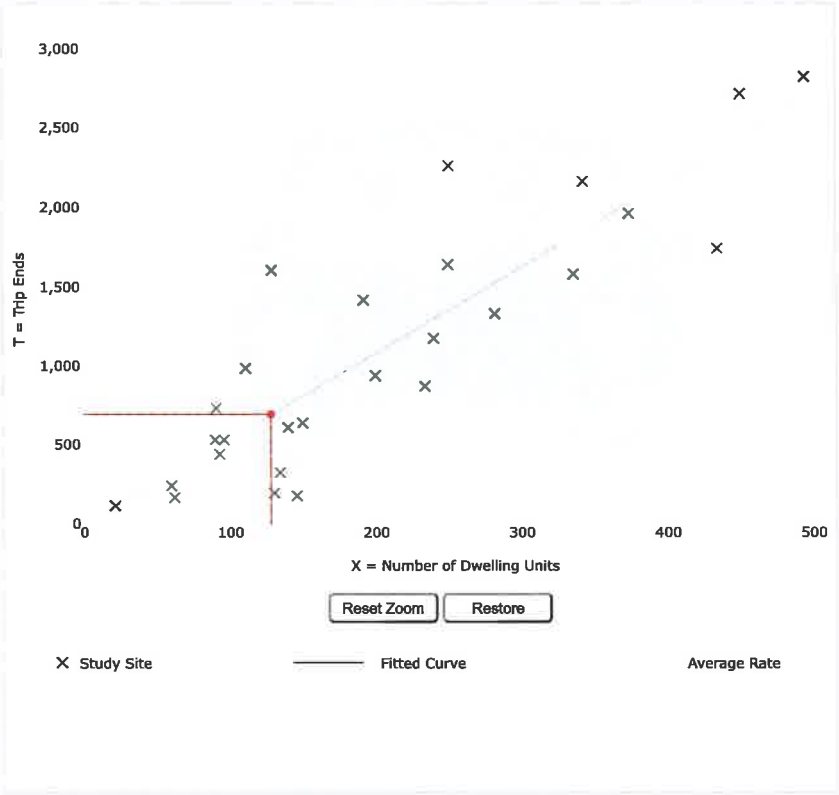
TIME PERIOD:
Weekday

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
128 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) (221) Click for more details

Independent Variable:
Dwelling Units

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
27

Avg. Num. of Dwelling Units:
205

Average Rate:
5.44

Range of Rates:
1.27 - 12.50

Standard Deviation:
2.03

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

R^2:
0.77

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 696 (Total), 348 (Entry), 348 (Exit)
Fitted Curve: 698 (Total), 348 (Entry), 348 (Exit)

Graph Look Up

Query | Filter

DATA SOURCE:
Trip Gen Manual, 10th Ed + Supplement

SEARCH BY LAND USE CODE:
221

LAND USE GROUP:
(200-299) Residential

LAND USE :
221 - Multifamily Housing (Mid-Rise)

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
Dwelling Units

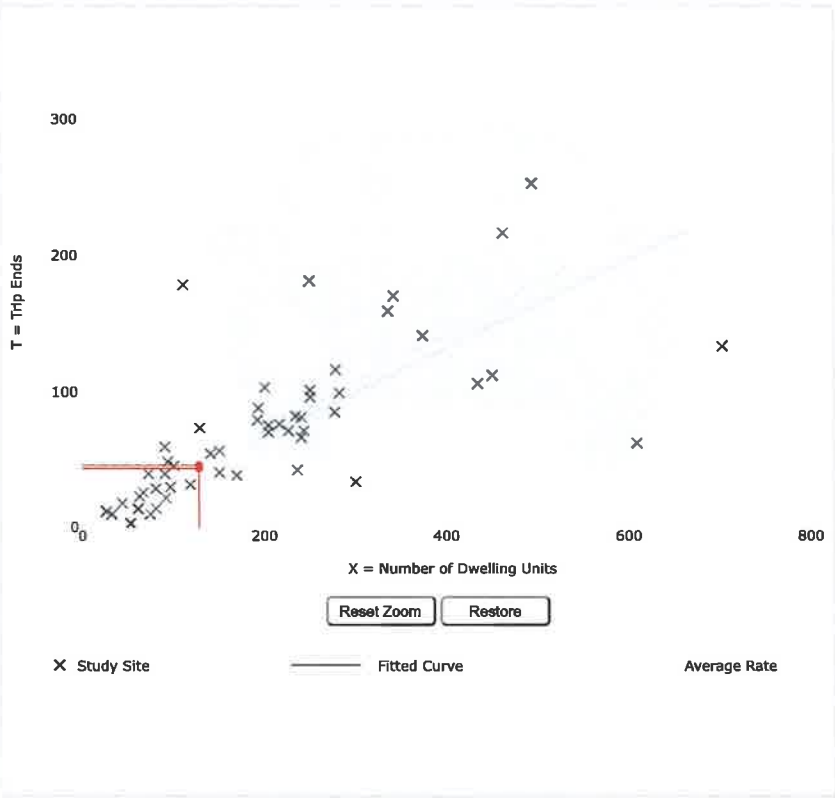
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
128 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) (221) Click for more details

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
53

Avg. Num. of Dwelling Units:
207

Average Rate:
0.36

Range of Rates:
0.06 - 1.61

Standard Deviation:
0.19

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

R^2:
0.67

Directional Distribution:
26% entering, 74% exiting

Calculated Trip Ends:
Average Rate: 46 (Total), 12 (Entry), 34 (Exit)
Fitted Curve: 44 (Total), 11 (Entry), 33 (Exit)

Graph Look Up

Query | Filter

DATA SOURCE:
Trip Gen Manual, 10th Ed + Supplement

SEARCH BY LAND USE CODE:
221

LAND USE GROUP:
(200-299) Residential

LAND USE :
221 - Multifamily Housing (Mid-Rise)

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
Dwelling Units

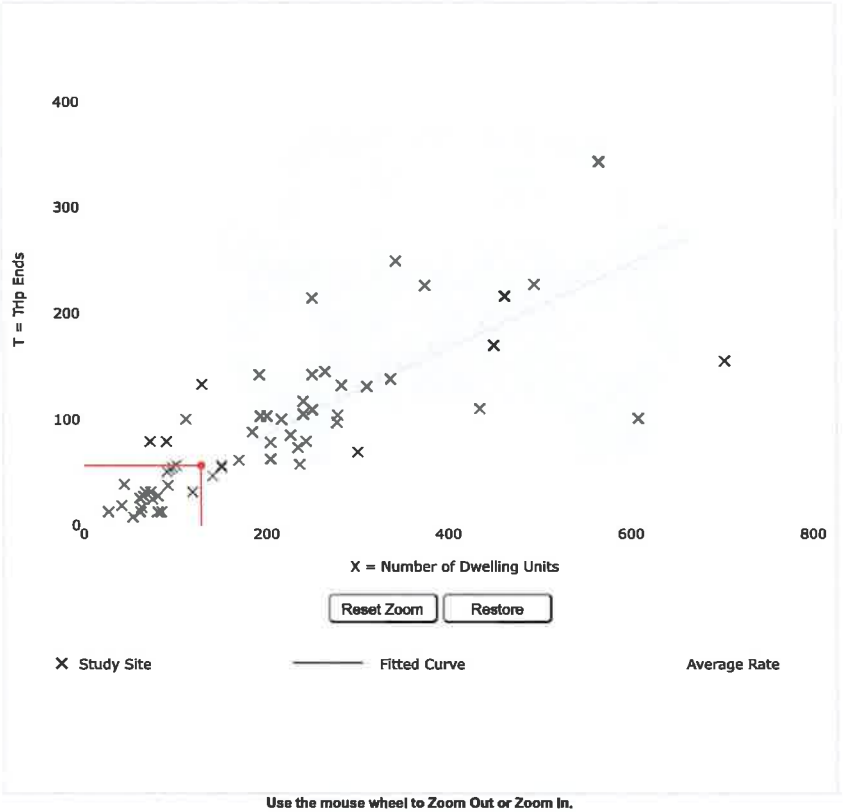
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
128 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) (221) Click for more details

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
60

Avg. Num. of Dwelling Units:
208

Average Rate:
0.44

Range of Rates:
0.15 - 1.11

Standard Deviation:
0.19

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

R^2:
0.72

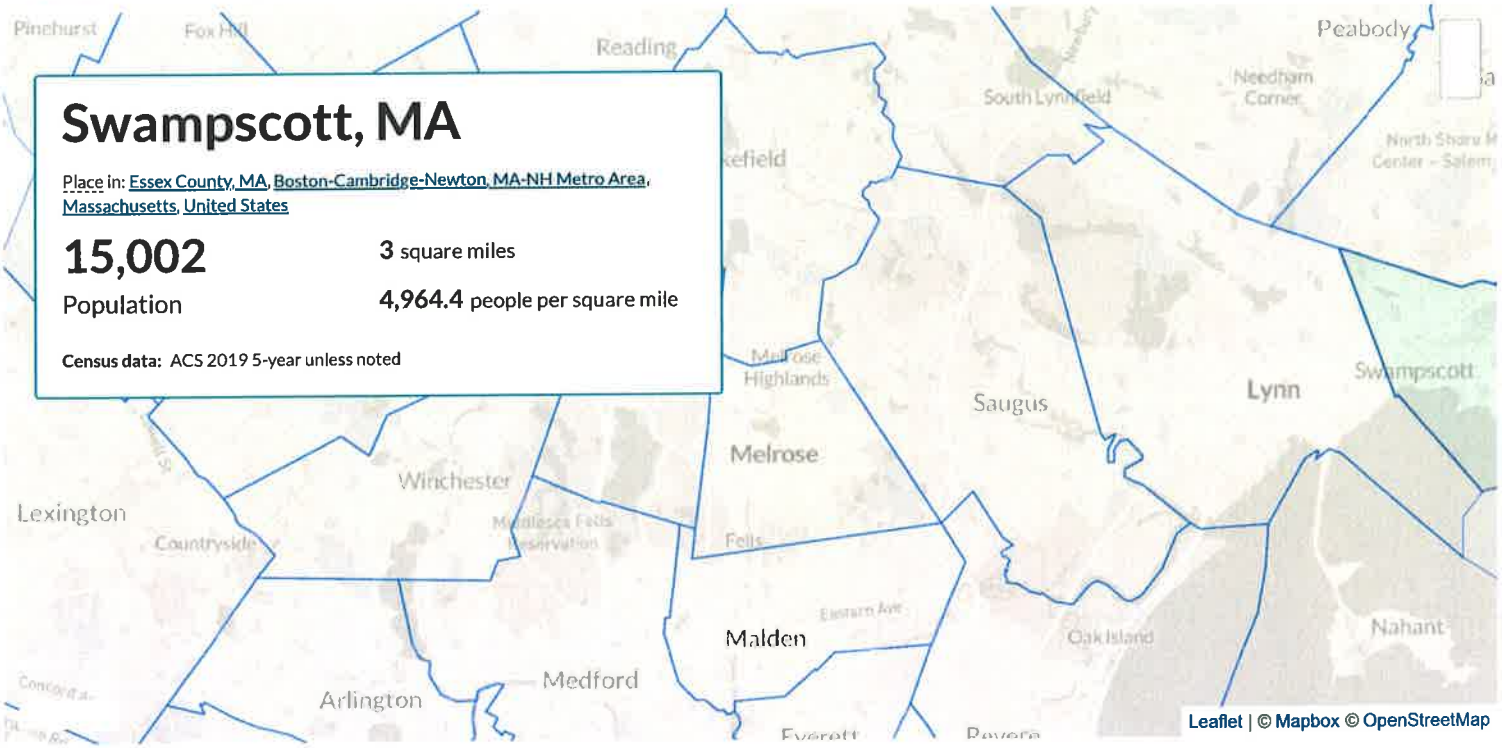
Directional Distribution:
61% entering, 39% exiting

Calculated Trip Ends:
Average Rate: 56 (Total), 34 (Entry), 22 (Exit)
Fitted Curve: 56 (Total), 34 (Entry), 22 (Exit)

MODE OF TRANSPORTATION FOR THE TOWN OF SWAMPSCOTT

Census Reporter

Search for places, tables, topics, or glossaries



Swampscott, MA

Place in: Essex County, MA, Boston-Cambridge-Newton, MA-NH Metro Area, Massachusetts, United States

15,002
Population

3 square miles

4,964.4 people per square mile

Census data: ACS 2019 5-year unless noted

Find data for this place Search by table or column name...

Interact with charts and statistics for margins of error and additional information.

Demographics

† Margin of error is at least 10 percent of the total value. Take care with this statistic.

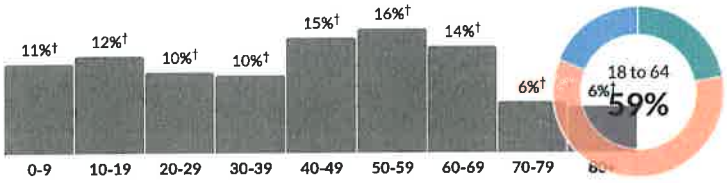
Age

44.8
Median age

about 20 percent higher than the figure in the Boston-Cambridge-Newton, MA-NH Metro Area: 38.7

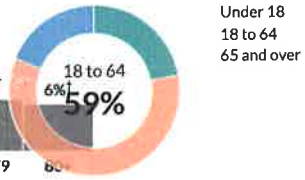
about 10 percent higher than the figure in Massachusetts: 39.5

Population by age range



Show data / Embed

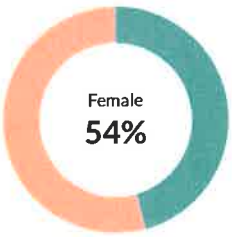
Population by age category



Show data / Embed

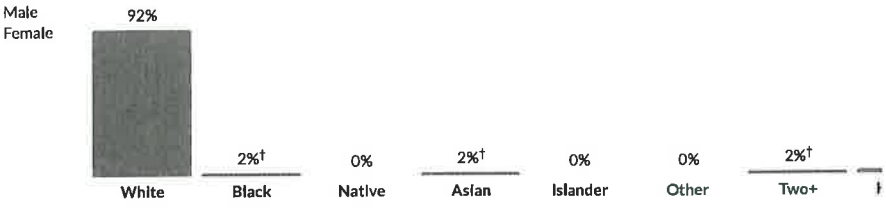
† Margin of error is at least 10 percent of the total value. Take care with this statistic.

Sex



Show data / Embed

Race & Ethnicity



* Hispanic includes respondents of any race. Other categories are non-Hispanic.

Show data / Embed

Economics

Income

† Margin of error is at least 10 percent of the total value. Take care with this statistic.

$56,405
Per capita income

about 20 percent higher than the amount in the Boston-Cambridge-Newton, MA-NH Metro Area: $47,604

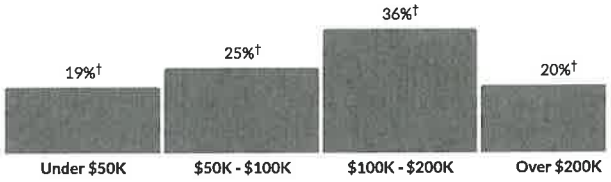
about 1.3 times the amount in Massachusetts: $43,761

$113,407
Median household income

about 25 percent higher than the amount in the Boston-Cambridge-Newton, MA-NH Metro Area: $90,333

about 1.4 times the amount in Massachusetts: $81,215

Household income



Show data / Embed

Poverty

† Margin of error is at least 10 percent of the total value. Take care with this statistic.

3.1%
Persons below poverty line

about one-third of the rate in the Boston-Cambridge-Newton, MA-NH Metro Area: 9.4%

about one-third of the rate in Massachusetts: 10.3%

Children (Under 18)

Show data / Embed

Seniors (65 and over)

Show data / Embed

Transportation to work

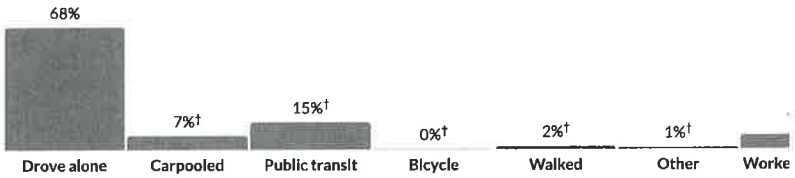
† Margin of error is at least 10 percent of the total value. Take care with this statistic.

35.4 minutes
Mean travel time to work

about 10 percent higher than the figure in the Boston-Cambridge-Newton, MA-NH Metro Area: 31.8

about 20 percent higher than the figure in Massachusetts: 30.2

Means of transportation to work



* Universe: Workers 16 years and over

Show data / Embed

Families

Households

5,780
Number of households

the Boston-Cambridge-Newton, MA-NH Metro Area: 1,831,217

Massachusetts: 2,617,497

2.6
Persons per household

about the same as the figure in the Boston-Cambridge-Newton, MA-NH Metro Area: 2.6

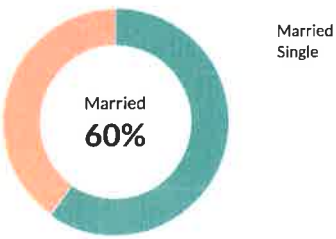
about the same as the figure in Massachusetts: 2.5

Population by household type

Show data / Embed

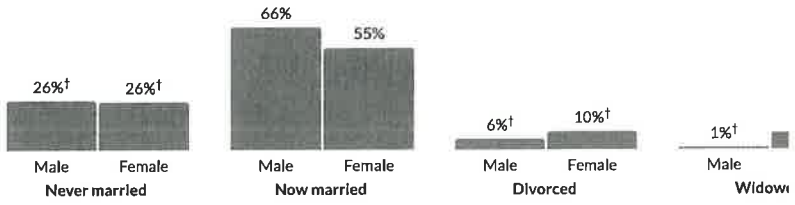
Marital status

† Margin of error is at least 10 percent of the total value. Take care with this statistic.



* Universe: Population 15 years and over

Marital status, by sex



JOURNEY TO WORK TRIP DISTRIBUTION

Proposed Residential Development - Swampscott, MA

Residence			Workplace							
State	County	MCD	State/U.S. Island Area/Foreign Country	County	MCD	Number	Essex Street (East)	Essex Street (West)	Burrill Street (South)	Burpee Road (North)
Massachusetts	Essex County	Swampscott town	Massachusetts	Suffolk County	Boston city	1,630		978	652	
Massachusetts	Essex County	Swampscott town	Massachusetts	Essex County	Swampscott town	1,322	529	132	661	
Massachusetts	Essex County	Swampscott town	Massachusetts	Essex County	Lynn city	869		869		
Massachusetts	Essex County	Swampscott town	Massachusetts	Essex County	Salem city	561	421	140		
Massachusetts	Essex County	Swampscott town	Massachusetts	Essex County	Beverly city	310	310			
Massachusetts	Essex County	Swampscott town	Massachusetts	Essex County	Peabody city	284	142	142		
Massachusetts	Essex County	Swampscott town	Massachusetts	Middlesex County	Cambridge city	243		146	97	
Massachusetts	Essex County	Swampscott town	Massachusetts	Essex County	Marblehead town	174	174			
Massachusetts	Essex County	Swampscott town	Massachusetts	Essex County	Danvers town	154	154			
Massachusetts	Essex County	Swampscott town	Massachusetts	Middlesex County	Burlington town	141		141		
Massachusetts	Essex County	Swampscott town	Massachusetts	Suffolk County	Chelsea city	91		55	36	
Massachusetts	Essex County	Swampscott town	Massachusetts	Middlesex County	Woburn city	87		87		
						5,866	1,730	2,690	1,446	0
							29%	46%	25%	0%
						SAY	30%	45%	25%	

CAPACITY ANALYSIS WORKSHEETS

Essex Street at Burrill Street
Essex Street at Burpee Road
Essex Street at Pitman Road
Essex Street at Elm Place (South)
Elm Place at the Project Site Driveway

Essex Street at Burrill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↑			↕			↕	
Traffic Volume (vph)	0	395	54	168	281	0	41	3	152	0	1	0
Future Volume (vph)	0	395	54	168	281	0	41	3	152	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	11	12	12	12	14	12	12	10	12
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		475			300			389			94	
Travel Time (s)		10.8			6.8			8.8			2.1	
Peak Hour Factor	0.90	0.90	0.90	0.84	0.84	0.84	0.84	0.84	0.84	0.25	0.25	0.25
Heavy Vehicles (%)	2%	4%	0%	1%	4%	0%	0%	0%	1%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	499	0	200	335	0	0	234	0	0	4	0
Turn Type		NA		pm+pt	NA		Split	NA			NA	
Protected Phases		4		3	8		2	2			6	
Permitted Phases	4			8						6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		10.0	22.5		19.0	19.0		12.0	12.0	
Total Split (s)	39.0	39.0		15.0	54.0		19.0	19.0		12.0	12.0	
Total Split (%)	37.1%	37.1%		14.3%	51.4%		18.1%	18.1%		11.4%	11.4%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-1.0		-1.0	-1.0			0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0			4.0			4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	
v/c Ratio		0.67		0.46	0.30			0.57			0.02	
Control Delay		23.0		12.3	9.2			19.1			36.0	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		23.0		12.3	9.2			19.1			36.0	
Queue Length 50th (ft)		109		17	32			25			1	
Queue Length 95th (ft)		418		117	195			125			4	
Internal Link Dist (ft)		395			220			309			14	
Turn Bay Length (ft)				175								
Base Capacity (vph)		1402		497	1594			619			277	
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		0.36		0.40	0.21			0.38			0.01	

Intersection Summary

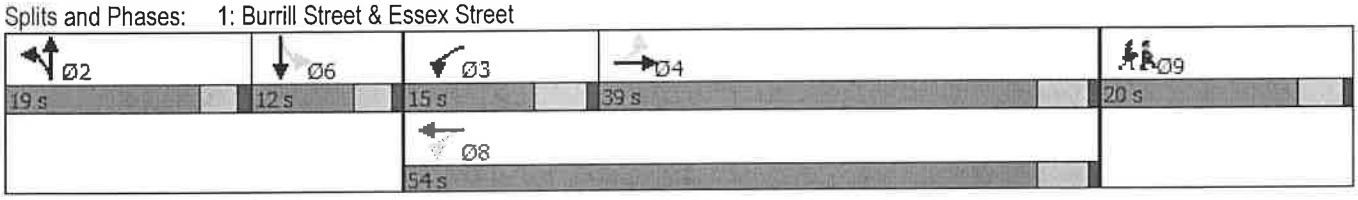
Area Type: Other
Cycle Length: 105

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	22.5
Total Split (s)	20.0
Total Split (%)	19%
Yellow Time (s)	3.5
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 58.3
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Burrill Street & Essex Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↑			↕			↕	
Traffic Volume (vph)	0	395	54	168	281	0	41	3	152	0	1	0
Future Volume (vph)	0	395	54	168	281	0	41	3	152	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	12	12	14	12	12	10	12
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		0.98		1.00	1.00			0.90			1.00	
Flt Protected		1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		2046		1728	1827			1782			1773	
Flt Permitted		1.00		0.17	1.00			0.99			1.00	
Satd. Flow (perm)		2046		314	1827			1782			1773	
Peak-hour factor, PHF	0.90	0.90	0.90	0.84	0.84	0.84	0.84	0.84	0.84	0.25	0.25	0.25
Adj. Flow (vph)	0	439	60	200	335	0	49	4	181	0	4	0
RTOR Reduction (vph)	0	5	0	0	0	0	0	116	0	0	0	0
Lane Group Flow (vph)	0	494	0	200	335	0	0	118	0	0	4	0
Heavy Vehicles (%)	2%	4%	0%	1%	4%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		pm+pt	NA		Split	NA			NA	
Protected Phases		4		3	8		2	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		20.7		34.7	34.7			9.7			0.7	
Effective Green, g (s)		21.7		35.7	35.7			9.7			0.7	
Actuated g/C Ratio		0.34		0.55	0.55			0.15			0.01	
Clearance Time (s)		5.0		5.0	5.0			4.0			4.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		687		392	1009			267			19	
v/s Ratio Prot		c0.24		c0.08	0.18			c0.07			c0.00	
v/s Ratio Perm				0.20								
v/c Ratio		0.72		0.51	0.33			0.44			0.21	
Uniform Delay, d1		18.8		10.0	7.9			25.0			31.7	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		3.6		1.1	0.2			1.2			5.5	
Delay (s)		22.4		11.2	8.1			26.1			37.1	
Level of Service		C		B	A			C			D	
Approach Delay (s)		22.4			9.2			26.1			37.1	
Approach LOS		C			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	64.6	Sum of lost time (s)	20.5
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↑			↕			↕	
Traffic Volume (vph)	1	431	57	192	540	0	88	1	227	0	0	1
Future Volume (vph)	1	431	57	192	540	0	88	1	227	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	11	12	12	12	14	12	12	10	12
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		475			300			389			94	
Travel Time (s)		10.8			6.8			8.8			2.1	
Peak Hour Factor	0.91	0.91	0.91	0.92	0.92	0.92	0.81	0.81	0.81	0.25	0.25	0.25
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	538	0	209	587	0	0	390	0	0	4	0
Turn Type	Perm	NA		pm+pt	NA		Split	NA			NA	
Protected Phases		4		3	8		2	2			6	
Permitted Phases	4			8						6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		10.0	22.5		19.0	19.0		12.0	12.0	
Total Split (s)	39.0	39.0		15.0	54.0		19.0	19.0		12.0	12.0	
Total Split (%)	37.1%	37.1%		14.3%	51.4%		18.1%	18.1%		11.4%	11.4%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-1.0		-1.0	-1.0			0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0			4.0			4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	
v/c Ratio		0.73		0.51	0.55			0.75			0.01	
Control Delay		27.0		14.1	13.5			31.4			0.0	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		27.0		14.1	13.5			31.4			0.0	
Queue Length 50th (ft)		152		28	101			90			0	
Queue Length 95th (ft)		447		130	414			#357			0	
Internal Link Dist (ft)		395			220			309			14	
Turn Bay Length (ft)				175								
Base Capacity (vph)		1200		448	1529			518			580	
Starvation Cap Reductn		0		0	28			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.45		0.47	0.39			0.75			0.01	

Intersection Summary

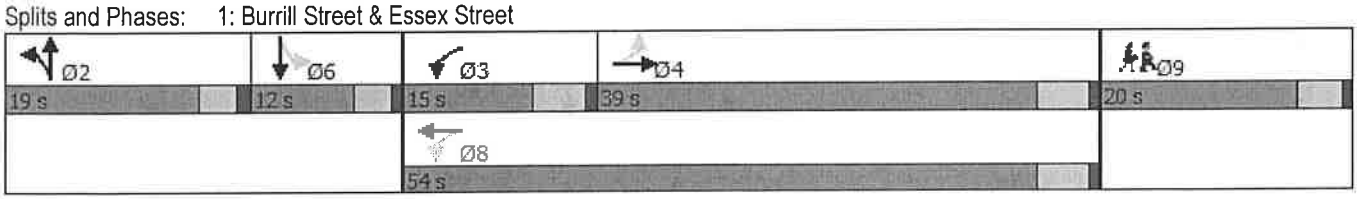
Area Type: Other
Cycle Length: 105

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	22.5
Total Split (s)	20.0
Total Split (%)	19%
Yellow Time (s)	3.5
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 65.8
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Burrill Street & Essex Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↕			↕			↕	
Traffic Volume (vph)	1	431	57	192	540	0	88	1	227	0	0	1
Future Volume (vph)	1	431	57	192	540	0	88	1	227	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	12	12	14	12	12	10	12
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		0.98		1.00	1.00			0.90			0.86	
Flt Protected		1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		2101		1745	1881			1805			1534	
Flt Permitted		1.00		0.19	1.00			0.99			1.00	
Satd. Flow (perm)		2099		352	1881			1805			1534	
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.81	0.81	0.81	0.25	0.25	0.25
Adj. Flow (vph)	1	474	63	209	587	0	109	1	280	0	0	4
RTOR Reduction (vph)	0	5	0	0	0	0	0	79	0	0	4	0
Lane Group Flow (vph)	0	533	0	209	587	0	0	311	0	0	0	0
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Split	NA			NA	
Protected Phases		4		3	8		2	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		22.1		36.0	36.0			16.1			0.7	
Effective Green, g (s)		23.1		37.0	37.0			16.1			0.7	
Actuated g/C Ratio		0.32		0.51	0.51			0.22			0.01	
Clearance Time (s)		5.0		5.0	5.0			4.0			4.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		667		369	958			400			14	
v/s Ratio Prot				0.08	c0.31			c0.17			c0.00	
v/s Ratio Perm		c0.25		0.21								
v/c Ratio		0.80		0.57	0.61			0.78			0.00	
Uniform Delay, d1		22.6		13.2	12.7			26.6			35.6	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		6.7		2.0	1.2			9.1			0.1	
Delay (s)		29.3		15.2	13.9			35.7			35.7	
Level of Service		C		B	B			D			D	
Approach Delay (s)		29.3			14.2			35.7			35.7	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	72.6	Sum of lost time (s)	20.5
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↑			↕			↕	
Traffic Volume (vph)	0	439	60	182	315	0	45	3	168	0	1	0
Future Volume (vph)	0	439	60	182	315	0	45	3	168	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	11	12	12	12	14	12	12	10	12
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		475			300			389			94	
Travel Time (s)		10.8			6.8			8.8			2.1	
Peak Hour Factor	0.90	0.90	0.90	0.84	0.84	0.84	0.84	0.84	0.84	0.25	0.25	0.25
Heavy Vehicles (%)	2%	4%	0%	1%	4%	0%	0%	0%	1%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	555	0	217	375	0	0	258	0	0	4	0
Turn Type		NA		pm+pt	NA		Split	NA			NA	
Protected Phases		4		3	8		2	2			6	
Permitted Phases	4			8						6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		10.0	22.5		19.0	19.0		12.0	12.0	
Total Split (s)	39.0	39.0		15.0	54.0		19.0	19.0		12.0	12.0	
Total Split (%)	37.1%	37.1%		14.3%	51.4%		18.1%	18.1%		11.4%	11.4%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-1.0		-1.0	-1.0			0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0			4.0			4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	
v/c Ratio		0.71		0.50	0.33			0.63			0.02	
Control Delay		25.0		15.3	9.4			22.4			37.0	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		25.0		15.3	9.4			22.4			37.0	
Queue Length 50th (ft)		142		21	41			35			1	
Queue Length 95th (ft)		#512		#164	221			145			4	
Internal Link Dist (ft)		395			220			309			14	
Turn Bay Length (ft)				175								
Base Capacity (vph)		1262		447	1524			571			249	
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		0.44		0.49	0.25			0.45			0.02	

Intersection Summary

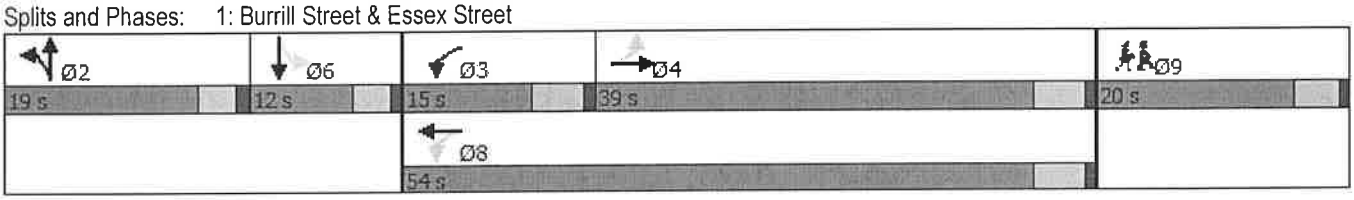
Area Type: Other
Cycle Length: 105

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	22.5
Total Split (s)	20.0
Total Split (%)	19%
Yellow Time (s)	3.5
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 62.9
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Burrill Street & Essex Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↑			↕			↕	
Traffic Volume (vph)	0	439	60	182	315	0	45	3	168	0	1	0
Future Volume (vph)	0	439	60	182	315	0	45	3	168	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	12	12	14	12	12	10	12
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		0.98		1.00	1.00			0.90			1.00	
Flt Protected		1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		2046		1728	1827			1782			1773	
Flt Permitted		1.00		0.14	1.00			0.99			1.00	
Satd. Flow (perm)		2046		258	1827			1782			1773	
Peak-hour factor, PHF	0.90	0.90	0.90	0.84	0.84	0.84	0.84	0.84	0.84	0.25	0.25	0.25
Adj. Flow (vph)	0	488	67	217	375	0	54	4	200	0	4	0
RTOR Reduction (vph)	0	5	0	0	0	0	0	117	0	0	0	0
Lane Group Flow (vph)	0	550	0	217	375	0	0	141	0	0	4	0
Heavy Vehicles (%)	2%	4%	0%	1%	4%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		pm+pt	NA		Split	NA			NA	
Protected Phases		4		3	8		2	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		23.2		38.6	38.6			10.4			0.8	
Effective Green, g (s)		24.2		39.6	39.6			10.4			0.8	
Actuated g/C Ratio		0.35		0.57	0.57			0.15			0.01	
Clearance Time (s)		5.0		5.0	5.0			4.0			4.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		713		388	1042			267			20	
v/s Ratio Prot		c0.27		c0.09	0.21			c0.08			c0.00	
v/s Ratio Perm				0.23								
v/c Ratio		0.77		0.56	0.36			0.53			0.20	
Uniform Delay, d1		20.1		11.2	8.1			27.2			34.0	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		5.2		1.8	0.2			1.9			4.9	
Delay (s)		25.3		12.9	8.3			29.1			38.9	
Level of Service		C		B	A			C			D	
Approach Delay (s)		25.3			10.0			29.1			38.9	
Approach LOS		C			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	69.4	Sum of lost time (s)	20.5
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↕			↕			↕	
Traffic Volume (vph)	1	482	63	213	601	0	97	1	253	0	0	1
Future Volume (vph)	1	482	63	213	601	0	97	1	253	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	11	12	12	12	14	12	12	10	12
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		475			300			389			94	
Travel Time (s)		10.8			6.8			8.8			2.1	
Peak Hour Factor	0.91	0.91	0.91	0.92	0.92	0.92	0.81	0.81	0.81	0.25	0.25	0.25
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	600	0	232	653	0	0	433	0	0	4	0
Turn Type	Perm	NA		pm+pt	NA		Split	NA			NA	
Protected Phases		4		3	8		2	2			6	
Permitted Phases	4			8						6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		10.0	22.5		19.0	19.0		12.0	12.0	
Total Split (s)	39.0	39.0		15.0	54.0		19.0	19.0		12.0	12.0	
Total Split (%)	37.1%	37.1%		14.3%	51.4%		18.1%	18.1%		11.4%	11.4%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-1.0		-1.0	-1.0			0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0			4.0			4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	
v/c Ratio		0.76		0.55	0.59			0.89			0.01	
Control Delay		27.8		15.5	13.9			44.9			0.0	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		27.8		15.5	13.9			44.9			0.0	
Queue Length 50th (ft)		183		32	118			121			0	
Queue Length 95th (ft)		#559		#167	483			#417			0	
Internal Link Dist (ft)		395			220			309			14	
Turn Bay Length (ft)				175								
Base Capacity (vph)		1115		436	1423			489			543	
Starvation Cap Reductn		0		0	26			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.54		0.53	0.47			0.89			0.01	

Intersection Summary

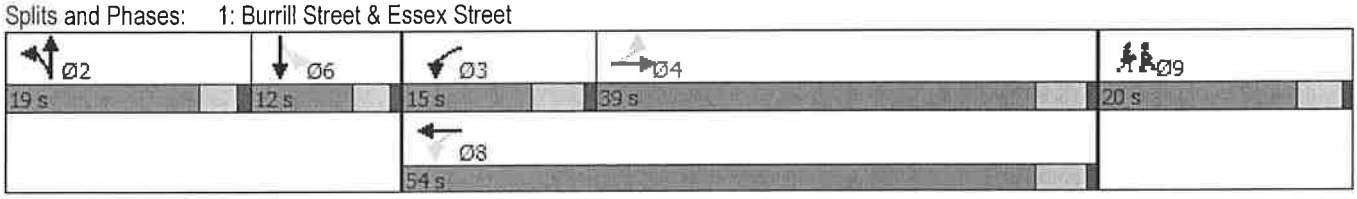
Area Type: Other
Cycle Length: 105

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	22.5
Total Split (s)	20.0
Total Split (%)	19%
Yellow Time (s)	3.5
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 69.7
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Burrill Street & Essex Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↑			↕			↕	
Traffic Volume (vph)	1	482	63	213	601	0	97	1	253	0	0	1
Future Volume (vph)	1	482	63	213	601	0	97	1	253	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	12	12	14	12	12	10	12
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		0.98		1.00	1.00			0.90			0.86	
Flt Protected		1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		2101		1745	1881			1805			1534	
Flt Permitted		1.00		0.19	1.00			0.99			1.00	
Satd. Flow (perm)		2100		345	1881			1805			1534	
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.81	0.81	0.81	0.25	0.25	0.25
Adj. Flow (vph)	1	530	69	232	653	0	120	1	312	0	0	4
RTOR Reduction (vph)	0	5	0	0	0	0	0	82	0	0	4	0
Lane Group Flow (vph)	0	595	0	232	653	0	0	351	0	0	0	0
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Split	NA			NA	
Protected Phases		4		3	8		2	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		25.4		40.1	40.1			15.8			0.7	
Effective Green, g (s)		26.4		41.1	41.1			15.8			0.7	
Actuated g/C Ratio		0.35		0.54	0.54			0.21			0.01	
Clearance Time (s)		5.0		5.0	5.0			4.0			4.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		724		381	1010			372			14	
v/s Ratio Prot				0.09	c0.35			c0.19			c0.00	
v/s Ratio Perm		c0.28		0.24								
v/c Ratio		0.82		0.61	0.65			0.94			0.00	
Uniform Delay, d1		22.9		13.3	12.5			29.9			37.6	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		7.5		2.8	1.4			32.4			0.1	
Delay (s)		30.4		16.1	14.0			62.3			37.6	
Level of Service		C		B	B			E			D	
Approach Delay (s)		30.4			14.5			62.3			37.6	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	20.5
Intersection Capacity Utilization	98.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↰	↑			↔			↔	
Traffic Volume (vph)	0	444	60	188	327	0	45	3	170	0	1	0
Future Volume (vph)	0	444	60	188	327	0	45	3	170	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	11	12	12	12	14	12	12	10	12
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		475			300			389			94	
Travel Time (s)		10.8			6.8			8.8			2.1	
Peak Hour Factor	0.90	0.90	0.90	0.84	0.84	0.84	0.84	0.84	0.84	0.25	0.25	0.25
Heavy Vehicles (%)	2%	4%	0%	1%	4%	0%	0%	0%	1%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	560	0	224	389	0	0	260	0	0	4	0
Turn Type		NA		pm+pt	NA		Split	NA			NA	
Protected Phases		4		3	8		2	2			6	
Permitted Phases	4			8						6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		10.0	22.5		19.0	19.0		12.0	12.0	
Total Split (s)	39.0	39.0		15.0	54.0		19.0	19.0		12.0	12.0	
Total Split (%)	37.1%	37.1%		14.3%	51.4%		18.1%	18.1%		11.4%	11.4%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-1.0		-1.0	-1.0			0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0			4.0			4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	
v/c Ratio		0.71		0.52	0.34			0.64			0.02	
Control Delay		25.1		16.1	9.5			22.8			37.0	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		25.1		16.1	9.5			22.8			37.0	
Queue Length 50th (ft)		145		22	43			36			1	
Queue Length 95th (ft)		#519		#176	230			147			4	
Internal Link Dist (ft)		395			220			309			14	
Turn Bay Length (ft)				175								
Base Capacity (vph)		1241		441	1510			565			245	
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		0.45		0.51	0.26			0.46			0.02	

Intersection Summary

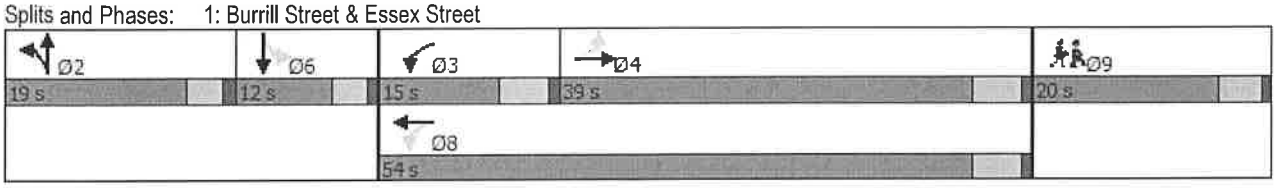
Area Type: Other
Cycle Length: 105

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	22.5
Total Split (s)	20.0
Total Split (%)	19%
Yellow Time (s)	3.5
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 63.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Burrill Street & Essex Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	444	60	188	327	0	45	3	170	0	1	0
Future Volume (vph)	0	444	60	188	327	0	45	3	170	0	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	12	12	14	12	12	10	12
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		0.98		1.00	1.00			0.90			1.00	
Flt Protected		1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		2046		1728	1827			1782			1773	
Flt Permitted		1.00		0.14	1.00			0.99			1.00	
Satd. Flow (perm)		2046		253	1827			1782			1773	
Peak-hour factor, PHF	0.90	0.90	0.90	0.84	0.84	0.84	0.84	0.84	0.84	0.25	0.25	0.25
Adj. Flow (vph)	0	493	67	224	389	0	54	4	202	0	4	0
RTOR Reduction (vph)	0	5	0	0	0	0	0	118	0	0	0	0
Lane Group Flow (vph)	0	555	0	224	389	0	0	142	0	0	4	0
Heavy Vehicles (%)	2%	4%	0%	1%	4%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		pm+pt	NA		Split	NA			NA	
Protected Phases		4		3	8		2	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		23.7		39.4	39.4			10.4			0.8	
Effective Green, g (s)		24.7		40.4	40.4			10.4			0.8	
Actuated g/C Ratio		0.35		0.57	0.57			0.15			0.01	
Clearance Time (s)		5.0		5.0	5.0			4.0			4.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		718		390	1049			263			20	
v/s Ratio Prot		c0.27		c0.10	0.21			c0.08			c0.00	
v/s Ratio Perm				0.23								
v/c Ratio		0.77		0.57	0.37			0.54			0.20	
Uniform Delay, d1		20.3		11.3	8.1			27.7			34.4	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		5.2		2.0	0.2			2.1			4.9	
Delay (s)		25.5		13.4	8.3			29.8			39.3	
Level of Service		C		B	A			C			D	
Approach Delay (s)		25.5			10.2			29.8			39.3	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	70.3	Sum of lost time (s)	20.5
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	494	63	218	609	0	97	1	260	0	0	1
Future Volume (vph)	1	494	63	218	609	0	97	1	260	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	11	12	12	12	14	12	12	10	12
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		475			300			389			94	
Travel Time (s)		10.8			6.8			8.8			2.1	
Peak Hour Factor	0.91	0.91	0.91	0.92	0.92	0.92	0.81	0.81	0.81	0.25	0.25	0.25
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	613	0	237	662	0	0	442	0	0	4	0
Turn Type	Perm	NA		pm+pt	NA		Split	NA			NA	
Protected Phases		4		3	8		2	2			6	
Permitted Phases	4			8						6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		10.0	22.5		19.0	19.0		12.0	12.0	
Total Split (s)	39.0	39.0		15.0	54.0		19.0	19.0		12.0	12.0	
Total Split (%)	37.1%	37.1%		14.3%	51.4%		18.1%	18.1%		11.4%	11.4%	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-1.0		-1.0	-1.0			0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0			4.0			4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	
v/c Ratio		0.76		0.56	0.59			0.91			0.01	
Control Delay		28.0		15.8	13.9			48.8			0.0	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		28.0		15.8	13.9			48.8			0.0	
Queue Length 50th (ft)		190		33	121			128			0	
Queue Length 95th (ft)		#579		#176	494			#427			0	
Internal Link Dist (ft)		395			220			309			14	
Turn Bay Length (ft)				175								
Base Capacity (vph)		1097		435	1400			485			539	
Starvation Cap Reductn		0		0	25			0			0	
Spillback Cap Reductn		0		0	0			0			0	
Storage Cap Reductn		0		0	0			0			0	
Reduced v/c Ratio		0.56		0.54	0.48			0.91			0.01	

Intersection Summary

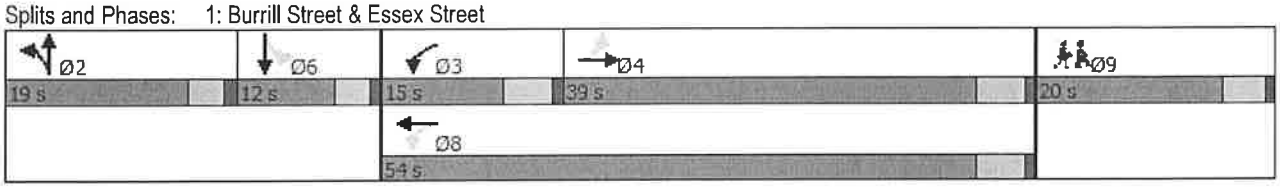
Area Type: Other
Cycle Length: 105

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	22.5
Total Split (s)	20.0
Total Split (%)	19%
Yellow Time (s)	3.5
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 70.6
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Burrill Street & Essex Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	494	63	218	609	0	97	1	260	0	0	1
Future Volume (vph)	1	494	63	218	609	0	97	1	260	0	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	12	12	14	12	12	10	12
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		0.98		1.00	1.00			0.90			0.86	
Flt Protected		1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)		2102		1745	1881			1803			1534	
Flt Permitted		1.00		0.19	1.00			0.99			1.00	
Satd. Flow (perm)		2101		345	1881			1803			1534	
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.81	0.81	0.81	0.25	0.25	0.25
Adj. Flow (vph)	1	543	69	237	662	0	120	1	321	0	0	4
RTOR Reduction (vph)	0	5	0	0	0	0	0	84	0	0	4	0
Lane Group Flow (vph)	0	608	0	237	662	0	0	358	0	0	0	0
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Split	NA			NA	
Protected Phases		4		3	8		2	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		26.2		41.1	41.1			15.8			0.7	
Effective Green, g (s)		27.2		42.1	42.1			15.8			0.7	
Actuated g/C Ratio		0.35		0.54	0.54			0.20			0.01	
Clearance Time (s)		5.0		5.0	5.0			4.0			4.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		737		384	1021			367			13	
v/s Ratio Prot				0.09	c0.35			c0.20			c0.00	
v/s Ratio Perm		c0.29		0.25								
v/c Ratio		0.83		0.62	0.65			0.97			0.00	
Uniform Delay, d1		23.0		13.3	12.5			30.6			38.1	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		7.5		2.9	1.4			39.9			0.1	
Delay (s)		30.5		16.3	13.9			70.5			38.1	
Level of Service		C		B	B			E			D	
Approach Delay (s)		30.5			14.5			70.5			38.1	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	77.5	Sum of lost time (s)	20.5
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Essex Street at Burpee Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	521	0	0	397	40	0	0	1	69	0	46
Future Volume (vph)	27	521	0	0	397	40	0	0	1	69	0	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	16	12	12	12	12	12	12	12
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		228			590			449			248	
Travel Time (s)		5.2			13.4			10.2			5.6	
Peak Hour Factor	0.85	0.85	0.85	0.87	0.87	0.87	0.25	0.25	0.25	0.73	0.73	0.73
Heavy Vehicles (%)	14%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	613	0	0	502	0	0	4	0	0	158	0
Turn Type	Perm	NA			NA			NA		Split	NA	
Protected Phases		4			8			2		6	6	
Permitted Phases	4			8			2					
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		12.0	12.0		19.0	19.0	
Total Split (s)	39.0	39.0		39.0	39.0		12.0	12.0		19.0	19.0	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		13.8%	13.8%		21.8%	21.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None		None	None	
v/c Ratio	0.09	0.56			0.39			0.01			0.34	
Control Delay	10.7	13.7			10.2			0.0			11.5	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	10.7	13.7			10.2			0.0			11.5	
Queue Length 50th (ft)	2	57			40			0			7	
Queue Length 95th (ft)	29	#451			299			0			50	
Internal Link Dist (ft)		148			510			369			168	
Turn Bay Length (ft)	75											
Base Capacity (vph)	508	1537			1782			754			910	
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	0.06	0.40			0.28			0.01			0.17	

Intersection Summary

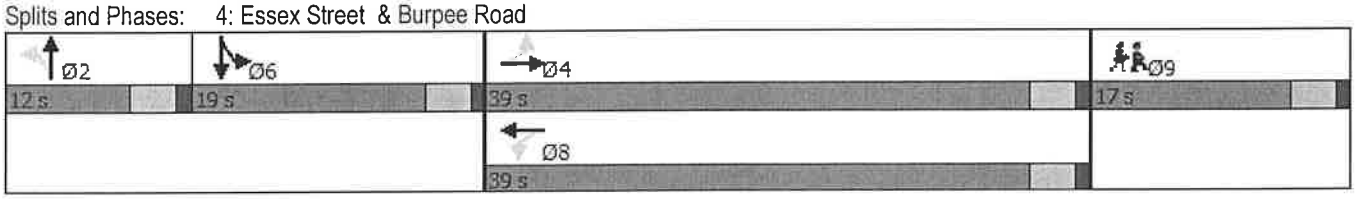
Area Type: Other
Cycle Length: 87

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	17.0
Total Split (s)	17.0
Total Split (%)	20%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 40.9
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Essex Street & Burpee Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	521	0	0	397	40	0	0	1	69	0	46
Future Volume (vph)	27	521	0	0	397	40	0	0	1	69	0	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	16	12	12	12	12	12	12	12
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	1.00			0.99			0.86			0.95	
Flt Protected	0.95	1.00			1.00			1.00			0.97	
Satd. Flow (prot)	1531	1783			2065			1644			1725	
Flt Permitted	0.37	1.00			1.00			1.00			0.97	
Satd. Flow (perm)	590	1783			2065			1644			1725	
Peak-hour factor, PHF	0.85	0.85	0.85	0.87	0.87	0.87	0.25	0.25	0.25	0.73	0.73	0.73
Adj. Flow (vph)	32	613	0	0	456	46	0	0	4	95	0	63
RTOR Reduction (vph)	0	0	0	0	4	0	0	4	0	0	98	0
Lane Group Flow (vph)	32	613	0	0	498	0	0	0	0	0	60	0
Heavy Vehicles (%)	14%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%	3%
Turn Type	Perm	NA			NA			NA		Split	NA	
Protected Phases		4			8			2		6	6	
Permitted Phases	4			8			2					
Actuated Green, G (s)	23.0	23.0			23.0			0.5			6.2	
Effective Green, g (s)	23.0	23.0			23.0			0.5			6.2	
Actuated g/C Ratio	0.49	0.49			0.49			0.01			0.13	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	286	865			1002			17			225	
v/s Ratio Prot		c0.34			0.24			c0.00			c0.03	
v/s Ratio Perm	0.05											
v/c Ratio	0.11	0.71			0.50			0.00			0.27	
Uniform Delay, d1	6.6	9.6			8.3			23.2			18.6	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.2	2.7			0.4			0.1			0.6	
Delay (s)	6.8	12.3			8.7			23.3			19.2	
Level of Service	A	B			A			C			B	
Approach Delay (s)		12.0			8.7			23.3			19.2	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	47.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	603	0	0	695	107	0	0	0	56	0	41
Future Volume (vph)	50	603	0	0	695	107	0	0	0	56	0	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	16	12	12	12	12	12	12	12
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		228			590			449			248	
Travel Time (s)		5.2			13.4			10.2			5.6	
Peak Hour Factor	0.85	0.85	0.85	0.93	0.93	0.93	0.25	0.25	0.25	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	709	0	0	862	0	0	0	0	0	102	0
Turn Type	Perm	NA			NA					Split	NA	
Protected Phases		4			8			2		6	6	
Permitted Phases	4			8			2					
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		12.0	12.0		19.0	19.0	
Total Split (s)	39.0	39.0		39.0	39.0		12.0	12.0		19.0	19.0	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		13.8%	13.8%		21.8%	21.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None		None	None	
v/c Ratio	0.25	0.56			0.58						0.29	
Control Delay	10.9	10.4			10.3						8.2	
Queue Delay	0.0	0.0			0.0						0.0	
Total Delay	10.9	10.4			10.3						8.2	
Queue Length 50th (ft)	4	61			75						0	
Queue Length 95th (ft)	45	372			#554						36	
Internal Link Dist (ft)		148			510			369			168	
Turn Bay Length (ft)	75											
Base Capacity (vph)	275	1457			1697						702	
Starvation Cap Reductn	0	0			0						0	
Spillback Cap Reductn	0	0			0						0	
Storage Cap Reductn	0	0			0						0	
Reduced v/c Ratio	0.21	0.49			0.51						0.15	

Intersection Summary

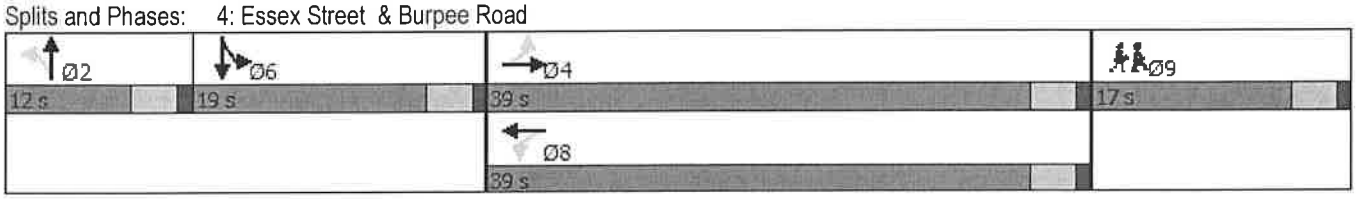
Area Type: Other
Cycle Length: 87

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	17.0
Total Split (s)	17.0
Total Split (%)	20%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 45.4
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Essex Street & Burpee Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	603	0	0	695	107	0	0	0	56	0	41
Future Volume (vph)	50	603	0	0	695	107	0	0	0	56	0	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0						4.0	
Lane Util. Factor	1.00	1.00			1.00						1.00	
Frt	1.00	1.00			0.98						0.94	
Flt Protected	0.95	1.00			1.00						0.97	
Satd. Flow (prot)	1711	1818			2115						1742	
Flt Permitted	0.19	1.00			1.00						0.97	
Satd. Flow (perm)	344	1818			2115						1742	
Peak-hour factor, PHF	0.85	0.85	0.85	0.93	0.93	0.93	0.25	0.25	0.25	0.95	0.95	0.95
Adj. Flow (vph)	59	709	0	0	747	115	0	0	0	59	0	43
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	92	0
Lane Group Flow (vph)	59	709	0	0	858	0	0	0	0	0	10	0
Heavy Vehicles (%)	2%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA					Split	NA	
Protected Phases		4			8			2		6	6	
Permitted Phases	4			8			2					
Actuated Green, G (s)	30.4	30.4			30.4						4.8	
Effective Green, g (s)	30.4	30.4			30.4						4.8	
Actuated g/C Ratio	0.62	0.62			0.62						0.10	
Clearance Time (s)	4.0	4.0			4.0						4.0	
Vehicle Extension (s)	3.0	3.0			3.0						3.0	
Lane Grp Cap (vph)	211	1118			1301						169	
v/s Ratio Prot		0.39			c0.41						c0.01	
v/s Ratio Perm	0.17											
v/c Ratio	0.28	0.63			0.66						0.06	
Uniform Delay, d1	4.4	6.0			6.1						20.2	
Progression Factor	1.00	1.00			1.00						1.00	
Incremental Delay, d2	0.7	1.2			1.2						0.1	
Delay (s)	5.1	7.2			7.4						20.4	
Level of Service	A	A			A						C	
Approach Delay (s)		7.0			7.4			0.0			20.4	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	49.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	577	0	0	442	45	0	0	1	76	0	54
Future Volume (vph)	31	577	0	0	442	45	0	0	1	76	0	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	16	12	12	12	12	12	12	12
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		228			590			449			248	
Travel Time (s)		5.2			13.4			10.2			5.6	
Peak Hour Factor	0.85	0.85	0.85	0.87	0.87	0.87	0.25	0.25	0.25	0.73	0.73	0.73
Heavy Vehicles (%)	14%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	679	0	0	560	0	0	4	0	0	178	0
Turn Type	Perm	NA			NA			NA		Split	NA	
Protected Phases		4			8			2		6	6	
Permitted Phases	4			8			2					
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		12.0	12.0		19.0	19.0	
Total Split (s)	39.0	39.0		39.0	39.0		12.0	12.0		19.0	19.0	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		13.8%	13.8%		21.8%	21.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None		None	None	
v/c Ratio	0.13	0.68			0.48			0.01			0.45	
Control Delay	11.6	16.4			11.4			0.0			14.4	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	11.6	16.4			11.4			0.0			14.4	
Queue Length 50th (ft)	3	72			49			0			13	
Queue Length 95th (ft)	34	#544			353			0			60	
Internal Link Dist (ft)		148			510			369			168	
Turn Bay Length (ft)	75											
Base Capacity (vph)	409	1429			1655			642			684	
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	0.09	0.48			0.34			0.01			0.26	

Intersection Summary

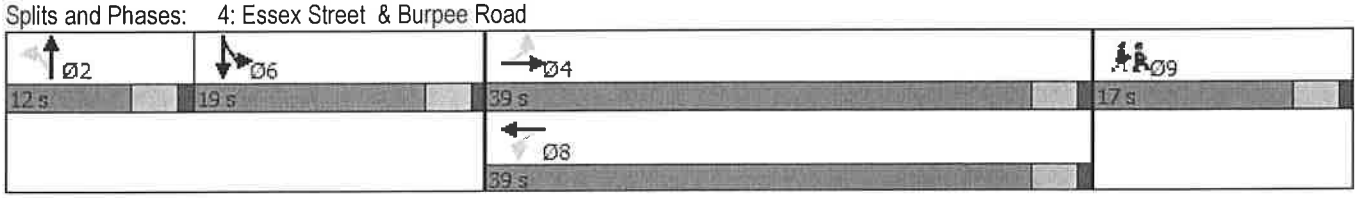
Area Type: Other
Cycle Length: 87

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	17.0
Total Split (s)	17.0
Total Split (%)	20%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 48.3
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Essex Street & Burpee Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	577	0	0	442	45	0	0	1	76	0	54
Future Volume (vph)	31	577	0	0	442	45	0	0	1	76	0	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	16	12	12	12	12	12	12	12
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	1.00			0.99			0.86			0.94	
Flt Protected	0.95	1.00			1.00			1.00			0.97	
Satd. Flow (prot)	1531	1783			2064			1644			1721	
Flt Permitted	0.32	1.00			1.00			1.00			0.97	
Satd. Flow (perm)	510	1783			2064			1644			1721	
Peak-hour factor, PHF	0.85	0.85	0.85	0.87	0.87	0.87	0.25	0.25	0.25	0.73	0.73	0.73
Adj. Flow (vph)	36	679	0	0	508	52	0	0	4	104	0	74
RTOR Reduction (vph)	0	0	0	0	3	0	0	4	0	0	95	0
Lane Group Flow (vph)	36	679	0	0	557	0	0	0	0	0	83	0
Heavy Vehicles (%)	14%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%	3%
Turn Type	Perm	NA			NA			NA		Split	NA	
Protected Phases		4			8			2		6	6	
Permitted Phases	4			8			2					
Actuated Green, G (s)	27.2	27.2			27.2			0.6			8.6	
Effective Green, g (s)	27.2	27.2			27.2			0.6			8.6	
Actuated g/C Ratio	0.50	0.50			0.50			0.01			0.16	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	255	893			1033			18			272	
v/s Ratio Prot		c0.38			0.27			c0.00			c0.05	
v/s Ratio Perm	0.07											
v/c Ratio	0.14	0.76			0.54			0.00			0.30	
Uniform Delay, d1	7.3	10.9			9.3			26.6			20.2	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.3	3.9			0.5			0.1			0.6	
Delay (s)	7.5	14.8			9.8			26.6			20.8	
Level of Service	A	B			A			C			C	
Approach Delay (s)		14.4			9.8			26.6			20.8	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	54.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	670	0	0	771	120	0	0	0	64	0	48
Future Volume (vph)	59	670	0	0	771	120	0	0	0	64	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	16	12	12	12	12	12	12	12
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		228			590			449			248	
Travel Time (s)		5.2			13.4			10.2			5.6	
Peak Hour Factor	0.85	0.85	0.85	0.93	0.93	0.93	0.25	0.25	0.25	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	69	788	0	0	958	0	0	0	0	0	118	0
Turn Type	Perm	NA			NA					Split	NA	
Protected Phases		4			8			2		6	6	
Permitted Phases	4			8			2					
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		12.0	12.0		19.0	19.0	
Total Split (s)	39.0	39.0		39.0	39.0		12.0	12.0		19.0	19.0	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		13.8%	13.8%		21.8%	21.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None		None	None	
v/c Ratio	0.34	0.60			0.63						0.37	
Control Delay	15.5	11.5			11.4						10.7	
Queue Delay	0.0	0.0			0.0						0.0	
Total Delay	15.5	11.5			11.4						10.7	
Queue Length 50th (ft)	5	74			91						1	
Queue Length 95th (ft)	#71	#507			#671						46	
Internal Link Dist (ft)		148			510			369			168	
Turn Bay Length (ft)	75											
Base Capacity (vph)	204	1314			1532						603	
Starvation Cap Reductn	0	0			0						0	
Spillback Cap Reductn	0	0			0						0	
Storage Cap Reductn	0	0			0						0	
Reduced v/c Ratio	0.34	0.60			0.63						0.20	

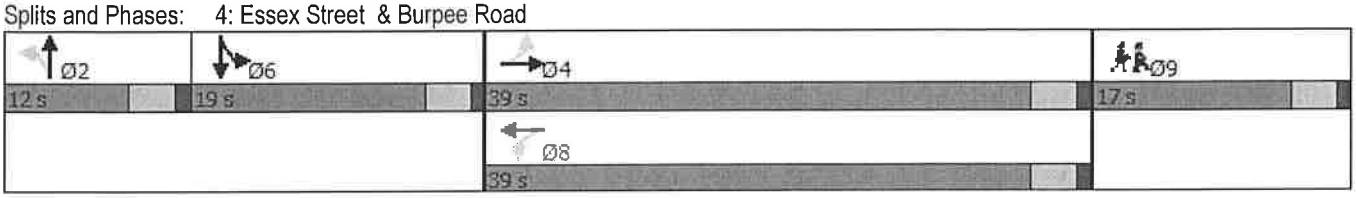
Intersection Summary

Area Type: Other
Cycle Length: 87

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	17.0
Total Split (s)	17.0
Total Split (%)	20%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Actuated Cycle Length: 52.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Essex Street & Burpee Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	670	0	0	771	120	0	0	0	64	0	48
Future Volume (vph)	59	670	0	0	771	120	0	0	0	64	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0						4.0	
Lane Util. Factor	1.00	1.00			1.00						1.00	
Frt	1.00	1.00			0.98						0.94	
Flt Protected	0.95	1.00			1.00						0.97	
Satd. Flow (prot)	1711	1818			2114						1740	
Flt Permitted	0.16	1.00			1.00						0.97	
Satd. Flow (perm)	282	1818			2114						1740	
Peak-hour factor, PHF	0.85	0.85	0.85	0.93	0.93	0.93	0.25	0.25	0.25	0.95	0.95	0.95
Adj. Flow (vph)	69	788	0	0	829	129	0	0	0	67	0	51
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	103	0
Lane Group Flow (vph)	69	788	0	0	954	0	0	0	0	0	15	0
Heavy Vehicles (%)	2%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA					Split	NA	
Protected Phases		4			8			2		6	6	
Permitted Phases	4			8			2					
Actuated Green, G (s)	36.6	36.6			36.6						5.1	
Effective Green, g (s)	36.6	36.6			36.6						5.1	
Actuated g/C Ratio	0.65	0.65			0.65						0.09	
Clearance Time (s)	4.0	4.0			4.0						4.0	
Vehicle Extension (s)	3.0	3.0			3.0						3.0	
Lane Grp Cap (vph)	183	1183			1376						157	
v/s Ratio Prot		0.43			c0.45						c0.01	
v/s Ratio Perm	0.24											
v/c Ratio	0.38	0.67			0.69						0.10	
Uniform Delay, d1	4.5	6.0			6.2						23.4	
Progression Factor	1.00	1.00			1.00						1.00	
Incremental Delay, d2	1.3	1.4			1.5						0.3	
Delay (s)	5.8	7.5			7.8						23.7	
Level of Service	A	A			A						C	
Approach Delay (s)		7.3			7.8			0.0			23.7	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	56.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	585	0	0	445	45	0	0	1	76	0	54
Future Volume (vph)	31	585	0	0	445	45	0	0	1	76	0	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	16	12	12	12	12	12	12	12
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		228			590			449			248	
Travel Time (s)		5.2			13.4			10.2			5.6	
Peak Hour Factor	0.85	0.85	0.85	0.87	0.87	0.87	0.25	0.25	0.25	0.73	0.73	0.73
Heavy Vehicles (%)	14%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	688	0	0	563	0	0	4	0	0	178	0
Turn Type	Perm	NA			NA			NA		Split	NA	
Protected Phases		4			8			2		6	6	
Permitted Phases	4			8			2					
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		12.0	12.0		19.0	19.0	
Total Split (s)	39.0	39.0		39.0	39.0		12.0	12.0		19.0	19.0	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		13.8%	13.8%		21.8%	21.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None		None	None	
v/c Ratio	0.12	0.67			0.47			0.01			0.46	
Control Delay	11.5	16.3			11.3			0.0			14.7	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	11.5	16.3			11.3			0.0			14.7	
Queue Length 50th (ft)	3	73			50			0			13	
Queue Length 95th (ft)	34	#555			356			0			60	
Internal Link Dist (ft)		148			510			369			168	
Turn Bay Length (ft)	75											
Base Capacity (vph)	405	1407			1632			634			666	
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	0.09	0.49			0.34			0.01			0.27	

Intersection Summary

Area Type: Other

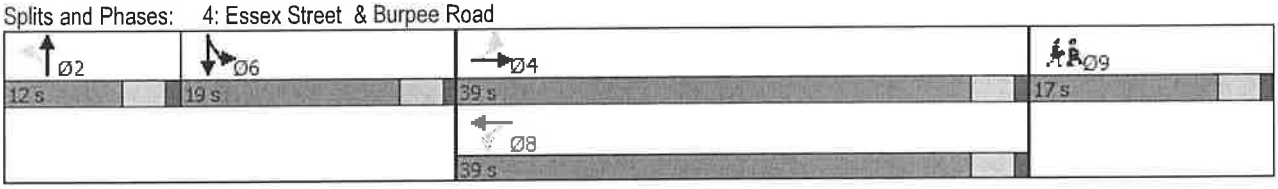
Cycle Length: 87

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	17.0
Total Split (s)	17.0
Total Split (%)	20%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 49.3
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Essex Street & Burpee Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	585	0	0	445	45	0	0	1	76	0	54
Future Volume (vph)	31	585	0	0	445	45	0	0	1	76	0	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	16	12	12	12	12	12	12	12
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	1.00			0.99			0.86			0.94	
Flt Protected	0.95	1.00			1.00			1.00			0.97	
Satd. Flow (prot)	1531	1783			2065			1644			1721	
Flt Permitted	0.32	1.00			1.00			1.00			0.97	
Satd. Flow (perm)	514	1783			2065			1644			1721	
Peak-hour factor, PHF	0.85	0.85	0.85	0.87	0.87	0.87	0.25	0.25	0.25	0.73	0.73	0.73
Adj. Flow (vph)	36	688	0	0	511	52	0	0	4	104	0	74
RTOR Reduction (vph)	0	0	0	0	3	0	0	4	0	0	96	0
Lane Group Flow (vph)	36	688	0	0	560	0	0	0	0	0	82	0
Heavy Vehicles (%)	14%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%	3%
Turn Type	Perm	NA			NA			NA		Split	NA	
Protected Phases		4			8			2		6	6	
Permitted Phases	4			8			2					
Actuated Green, G (s)	28.2	28.2			28.2			0.6			8.5	
Effective Green, g (s)	28.2	28.2			28.2			0.6			8.5	
Actuated g/C Ratio	0.51	0.51			0.51			0.01			0.15	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	262	909			1053			17			264	
v/s Ratio Prot		c0.39			0.27			c0.00			c0.05	
v/s Ratio Perm	0.07											
v/c Ratio	0.14	0.76			0.53			0.00			0.31	
Uniform Delay, d1	7.1	10.8			9.1			27.1			20.8	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	0.2	3.6			0.5			0.1			0.7	
Delay (s)	7.4	14.5			9.6			27.1			21.5	
Level of Service	A	B			A			C			C	
Approach Delay (s)		14.1			9.6			27.1			21.5	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	55.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	676	0	0	779	120	0	0	0	64	0	48
Future Volume (vph)	59	676	0	0	779	120	0	0	0	64	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	16	12	12	12	12	12	12	12
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		228			590			449			248	
Travel Time (s)		5.2			13.4			10.2			5.6	
Peak Hour Factor	0.85	0.85	0.85	0.93	0.93	0.93	0.25	0.25	0.25	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	69	795	0	0	967	0	0	0	0	0	118	0
Turn Type	Perm	NA			NA					Split	NA	
Protected Phases		4			8			2		6	6	
Permitted Phases	4			8			2					
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		12.0	12.0		19.0	19.0	
Total Split (s)	39.0	39.0		39.0	39.0		12.0	12.0		19.0	19.0	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		13.8%	13.8%		21.8%	21.8%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	None		None	None	
v/c Ratio	0.35	0.61			0.63						0.37	
Control Delay	16.4	11.7			11.5						10.7	
Queue Delay	0.0	0.0			0.0						0.0	
Total Delay	16.4	11.7			11.5						10.7	
Queue Length 50th (ft)	5	75			93						1	
Queue Length 95th (ft)	#73	#513			#680						46	
Internal Link Dist (ft)		148			510			369			168	
Turn Bay Length (ft)	75											
Base Capacity (vph)	198	1314			1532						603	
Starvation Cap Reductn	0	0			0						0	
Spillback Cap Reductn	0	0			0						0	
Storage Cap Reductn	0	0			0						0	
Reduced v/c Ratio	0.35	0.61			0.63						0.20	

Intersection Summary

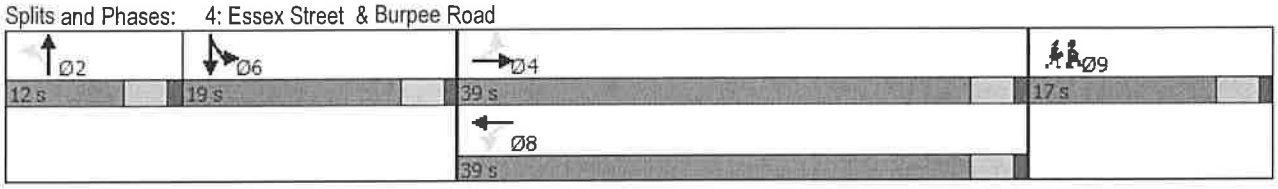
Area Type: Other
Cycle Length: 87

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	17.0
Total Split (s)	17.0
Total Split (%)	20%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 52.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
 # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Essex Street & Burpee Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	676	0	0	779	120	0	0	0	64	0	48
Future Volume (vph)	59	676	0	0	779	120	0	0	0	64	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0			4.0						4.0	
Lane Util. Factor	1.00	1.00			1.00						1.00	
Frt	1.00	1.00			0.98						0.94	
Flt Protected	0.95	1.00			1.00						0.97	
Satd. Flow (prot)	1711	1818			2115						1740	
Flt Permitted	0.15	1.00			1.00						0.97	
Satd. Flow (perm)	273	1818			2115						1740	
Peak-hour factor, PHF	0.85	0.85	0.85	0.93	0.93	0.93	0.25	0.25	0.25	0.95	0.95	0.95
Adj. Flow (vph)	69	795	0	0	838	129	0	0	0	67	0	51
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	103	0
Lane Group Flow (vph)	69	795	0	0	963	0	0	0	0	0	15	0
Heavy Vehicles (%)	2%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA			NA					Split	NA	
Protected Phases		4			8			2		6	6	
Permitted Phases	4			8			2					
Actuated Green, G (s)	36.6	36.6			36.6						5.1	
Effective Green, g (s)	36.6	36.6			36.6						5.1	
Actuated g/C Ratio	0.65	0.65			0.65						0.09	
Clearance Time (s)	4.0	4.0			4.0						4.0	
Vehicle Extension (s)	3.0	3.0			3.0						3.0	
Lane Grp Cap (vph)	177	1183			1377						157	
v/s Ratio Prot		0.44			c0.46						c0.01	
v/s Ratio Perm	0.25											
v/c Ratio	0.39	0.67			0.70						0.10	
Uniform Delay, d1	4.6	6.1			6.3						23.4	
Progression Factor	1.00	1.00			1.00						1.00	
Incremental Delay, d2	1.4	1.5			1.6						0.3	
Delay (s)	6.0	7.6			7.9						23.7	
Level of Service	A	A			A						C	
Approach Delay (s)		7.5			7.9			0.0			23.7	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	56.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Essex Street at Pitman Road

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	541	1	0	445	1	1
Future Volume (vph)	541	1	0	445	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	14	12	12
Link Speed (mph)	30			30	30	
Link Distance (ft)	300			106	236	
Travel Time (s)	6.8			2.4	5.4	
Peak Hour Factor	0.86	0.86	0.85	0.85	0.25	0.25
Heavy Vehicles (%)	3%	0%	0%	3%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	630	0	0	524	8	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	541	1	0	445	1	1
Future Volume (Veh/h)	541	1	0	445	1	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.85	0.85	0.25	0.25
Hourly flow rate (vph)	629	1	0	524	4	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	300			334		
pX, platoon unblocked			0.78		0.86	0.78
vC, conflicting volume			630		1154	630
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			389		689	389
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			924		357	520

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	630	524	8
Volume Left	0	0	4
Volume Right	1	0	4
cSH	1700	924	424
Volume to Capacity	0.37	0.00	0.02
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	13.7
Lane LOS			B
Approach Delay (s)	0.0	0.0	13.7
Approach LOS			B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	661	2	1	740	1	0
Future Volume (vph)	661	2	1	740	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	14	12	12
Link Speed (mph)	30			30	30	
Link Distance (ft)	300			106	236	
Travel Time (s)	6.8			2.4	5.4	
Peak Hour Factor	0.84	0.84	0.93	0.93	0.25	0.25
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	789	0	0	797	4	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	661	2	1	740	1	0
Future Volume (Veh/h)	661	2	1	740	1	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.93	0.93	0.25	0.25
Hourly flow rate (vph)	787	2	1	796	4	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	300			334		
pX, platoon unblocked			0.76		0.83	0.76
vC, conflicting volume			789		1586	788
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			563		949	562
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			773		241	403

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	789	797	4
Volume Left	0	1	4
Volume Right	2	0	0
cSH	1700	773	241
Volume to Capacity	0.46	0.00	0.02
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	20.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.0	20.2
Approach LOS			C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	601	1	0	498	1	1
Future Volume (vph)	601	1	0	498	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	14	12	12
Link Speed (mph)	30			30	30	
Link Distance (ft)	300			106	236	
Travel Time (s)	6.8			2.4	5.4	
Peak Hour Factor	0.86	0.86	0.85	0.85	0.25	0.25
Heavy Vehicles (%)	3%	0%	0%	3%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	700	0	0	586	8	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	601	1	0	498	1	1
Future Volume (Veh/h)	601	1	0	498	1	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.85	0.85	0.25	0.25
Hourly flow rate (vph)	699	1	0	586	4	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	300			334		
pX, platoon unblocked			0.75		0.84	0.75
vC, conflicting volume			700		1286	700
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			438		761	437
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			853		318	470

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	700	586	8
Volume Left	0	0	4
Volume Right	1	0	4
cSH	1700	853	379
Volume to Capacity	0.41	0.00	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	14.7
Lane LOS			B
Approach Delay (s)	0.0	0.0	14.7
Approach LOS			B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	738	2	1	823	1	0
Future Volume (vph)	738	2	1	823	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	14	12	12
Link Speed (mph)	30			30	30	
Link Distance (ft)	300			106	236	
Travel Time (s)	6.8			2.4	5.4	
Peak Hour Factor	0.84	0.84	0.93	0.93	0.25	0.25
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	881	0	0	886	4	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	738	2	1	823	1	0
Future Volume (Veh/h)	738	2	1	823	1	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.93	0.93	0.25	0.25
Hourly flow rate (vph)	879	2	1	885	4	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	300			334		
pX, platoon unblocked			0.73		0.81	0.73
vC, conflicting volume			881		1767	880
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			652		1079	650
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			689		197	345

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	881	886	4
Volume Left	0	1	4
Volume Right	2	0	0
cSH	1700	689	197
Volume to Capacity	0.52	0.00	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	23.6
Lane LOS		A	C
Approach Delay (s)	0.0	0.0	23.6
Approach LOS			C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	608	1	0	516	1	1
Future Volume (vph)	608	1	0	516	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	14	12	12
Link Speed (mph)	30			30	30	
Link Distance (ft)	300			106	236	
Travel Time (s)	6.8			2.4	5.4	
Peak Hour Factor	0.86	0.86	0.85	0.85	0.25	0.25
Heavy Vehicles (%)	3%	0%	0%	3%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	708	0	0	607	8	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	608	1	0	516	1	1
Future Volume (Veh/h)	608	1	0	516	1	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.85	0.85	0.25	0.25
Hourly flow rate (vph)	707	1	0	607	4	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	300			334		
pX, platoon unblocked			0.75		0.84	0.75
vC, conflicting volume			708		1314	708
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			445		800	445
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			845		300	464

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	708	607	8
Volume Left	0	0	4
Volume Right	1	0	4
cSH	1700	845	364
Volume to Capacity	0.42	0.00	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	15.1
Lane LOS			C
Approach Delay (s)	0.0	0.0	15.1
Approach LOS			C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	757	2	1	836	1	0
Future Volume (vph)	757	2	1	836	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	14	12	12
Link Speed (mph)	30			30	30	
Link Distance (ft)	300			106	236	
Travel Time (s)	6.8			2.4	5.4	
Peak Hour Factor	0.84	0.84	0.93	0.93	0.25	0.25
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	903	0	0	900	4	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	757	2	1	836	1	0
Future Volume (Veh/h)	757	2	1	836	1	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.93	0.93	0.25	0.25
Hourly flow rate (vph)	901	2	1	899	4	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	300			334		
pX, platoon unblocked			0.72		0.81	0.72
vC, conflicting volume			903		1803	902
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			675		1109	674
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			670		190	332

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	903	900	4
Volume Left	0	1	4
Volume Right	2	0	0
cSH	1700	670	190
Volume to Capacity	0.53	0.00	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	24.3
Lane LOS		A	C
Approach Delay (s)	0.0	0.0	24.3
Approach LOS			C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

Essex Street at Elm Place (South)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	534	8	4	435	10	11
Future Volume (vph)	534	8	4	435	10	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	13	10	12
Link Speed (mph)	30			30	30	
Link Distance (ft)	106			228	383	
Travel Time (s)	2.4			5.2	8.7	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.41	0.41
Heavy Vehicles (%)	3%	0%	0%	3%	0%	11%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	616	0	0	477	51	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	534	8	4	435	10	11
Future Volume (Veh/h)	534	8	4	435	10	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.41	0.41
Hourly flow rate (vph)	607	9	4	473	24	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	406			228		
pX, platoon unblocked			0.79		0.87	0.79
vC, conflicting volume			616		1092	612
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			377		611	371
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			100		94	95
cM capacity (veh/h)			939		398	516

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	616	477	51
Volume Left	0	4	24
Volume Right	9	0	27
cSH	1700	939	453
Volume to Capacity	0.36	0.00	0.11
Queue Length 95th (ft)	0	0	9
Control Delay (s)	0.0	0.1	14.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	14.0
Approach LOS			B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	635	26	11	730	11	14
Future Volume (vph)	635	26	11	730	11	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	13	10	12
Link Speed (mph)	30			30	30	
Link Distance (ft)	106			228	383	
Travel Time (s)	2.4			5.2	8.7	
Peak Hour Factor	0.84	0.84	0.94	0.94	0.40	0.40
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	787	0	0	789	63	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	635	26	11	730	11	14
Future Volume (Veh/h)	635	26	11	730	11	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.94	0.94	0.40	0.40
Hourly flow rate (vph)	756	31	12	777	28	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	406			228		
pX, platoon unblocked			0.76		0.83	0.76
vC, conflicting volume			787		1572	772
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			559		931	539
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		89	92
cM capacity (veh/h)			774		244	414

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	787	789	63
Volume Left	0	12	28
Volume Right	31	0	35
cSH	1700	774	316
Volume to Capacity	0.46	0.02	0.20
Queue Length 95th (ft)	0	1	18
Control Delay (s)	0.0	0.4	19.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.4	19.2
Approach LOS			C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	593	9	4	487	11	12
Future Volume (vph)	593	9	4	487	11	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	13	10	12
Link Speed (mph)	30			30	30	
Link Distance (ft)	106			228	383	
Travel Time (s)	2.4			5.2	8.7	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.41	0.41
Heavy Vehicles (%)	3%	0%	0%	3%	0%	11%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	684	0	0	533	56	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	593	9	4	487	11	12
Future Volume (Veh/h)	593	9	4	487	11	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.41	0.41
Hourly flow rate (vph)	674	10	4	529	27	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	406			228		
pX, platoon unblocked			0.76		0.85	0.76
vC, conflicting volume			684		1216	679
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			421		676	415
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			100		92	94
cM capacity (veh/h)			869		357	468

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	684	533	56
Volume Left	0	4	27
Volume Right	10	0	29
cSH	1700	869	407
Volume to Capacity	0.40	0.00	0.14
Queue Length 95th (ft)	0	0	12
Control Delay (s)	0.0	0.1	15.3
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	15.3
Approach LOS			C

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	41.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	709	29	12	812	12	15
Future Volume (vph)	709	29	12	812	12	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	13	10	12
Link Speed (mph)	30			30	30	
Link Distance (ft)	106			228	383	
Travel Time (s)	2.4			5.2	8.7	
Peak Hour Factor	0.84	0.84	0.94	0.94	0.40	0.40
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	879	0	0	877	68	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	709	29	12	812	12	15
Future Volume (Veh/h)	709	29	12	812	12	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.94	0.94	0.40	0.40
Hourly flow rate (vph)	844	35	13	864	30	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	406			228		
pX, platoon unblocked			0.73		0.81	0.73
vC, conflicting volume			879		1752	862
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			647		1057	623
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		85	89
cM capacity (veh/h)			690		201	357

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	879	877	68
Volume Left	0	13	30
Volume Right	35	0	38
cSH	1700	690	266
Volume to Capacity	0.52	0.02	0.26
Queue Length 95th (ft)	0	1	25
Control Delay (s)	0.0	0.5	23.1
Lane LOS		A	C
Approach Delay (s)	0.0	0.5	23.1
Approach LOS			C

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	593	16	7	487	29	20
Future Volume (vph)	593	16	7	487	29	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	13	10	12
Link Speed (mph)	30			30	30	
Link Distance (ft)	106			228	265	
Travel Time (s)	2.4			5.2	6.0	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.41	0.41
Heavy Vehicles (%)	3%	0%	0%	3%	0%	11%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	692	0	0	537	120	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	593	16	7	487	29	20
Future Volume (Veh/h)	593	16	7	487	29	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.92	0.92	0.41	0.41
Hourly flow rate (vph)	674	18	8	529	71	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	406			228		
pX, platoon unblocked			0.75		0.85	0.75
vC, conflicting volume			692		1228	683
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			428		691	416
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			99		79	89
cM capacity (veh/h)			861		346	466

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	692	537	120
Volume Left	0	8	71
Volume Right	18	0	49
cSH	1700	861	387
Volume to Capacity	0.41	0.01	0.31
Queue Length 95th (ft)	0	1	32
Control Delay (s)	0.0	0.3	18.4
Lane LOS		A	C
Approach Delay (s)	0.0	0.3	18.4
Approach LOS			C

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	709	48	20	812	25	21
Future Volume (vph)	709	48	20	812	25	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	12	12	13	10	12
Link Speed (mph)	30			30	30	
Link Distance (ft)	106			228	296	
Travel Time (s)	2.4			5.2	6.7	
Peak Hour Factor	0.84	0.84	0.94	0.94	0.40	0.40
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	901	0	0	885	116	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	709	48	20	812	25	21
Future Volume (Veh/h)	709	48	20	812	25	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.94	0.94	0.40	0.40
Hourly flow rate (vph)	844	57	21	864	63	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	406			228		
pX, platoon unblocked			0.72		0.81	0.72
vC, conflicting volume			901		1778	872
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			670		1071	630
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		67	85
cM capacity (veh/h)			671		194	350

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	901	885	116
Volume Left	0	21	63
Volume Right	57	0	53
cSH	1700	671	243
Volume to Capacity	0.53	0.03	0.48
Queue Length 95th (ft)	0	2	59
Control Delay (s)	0.0	0.9	32.6
Lane LOS		A	D
Approach Delay (s)	0.0	0.9	32.6
Approach LOS			D

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

Elm Place at the Project Site Driveway

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	26	0	0	23	13	10
Future Volume (vph)	26	0	0	23	13	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30			30	30	
Link Distance (ft)	106			100	265	
Travel Time (s)	2.4			2.3	6.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	0	0	25	25	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	0	0	23	13	10
Future Volume (Veh/h)	26	0	0	23	13	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	0	0	25	14	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	44	20	25			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	44	20	25			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	966	1058	1589			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	28	25	25
Volume Left	28	0	0
Volume Right	0	0	11
cSH	966	1589	1700
Volume to Capacity	0.03	0.00	0.01
Queue Length 95th (ft)	2	0	0
Control Delay (s)	8.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.8	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	19	0	0	27	41	27
Future Volume (vph)	19	0	0	27	41	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	30			30	30	
Link Distance (ft)	97			98	296	
Travel Time (s)	2.2			2.2	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	0	0	29	74	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	0	0	27	41	27
Future Volume (Veh/h)	19	0	0	27	41	27
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	0	0	29	45	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	88	60	74			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	88	60	74			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	912	1006	1526			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	21	29	74
Volume Left	21	0	0
Volume Right	0	0	29
cSH	912	1526	1700
Volume to Capacity	0.02	0.00	0.04
Queue Length 95th (ft)	2	0	0
Control Delay (s)	9.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	13.8%	ICU Level of Service	A
Analysis Period (min)	15		