

Traffic Impact Assessment

Date: August 15, 2024

To: Mr. Shawn Smith
R.J. Kelly Co., Inc.

From: Ken Cram, P.E., – Director of Traffic Engineering

Subject: Proposed Warehouse Development
600 Griffin Brook Drive
Methuen, Massachusetts

This Traffic Impact Assessment (TIA) has been prepared to assess the traffic impact associated with the change in the proposed development at 501 & 600 Griffin Brook Drive in Methuen, MA. A Traffic Impact and Access Study (TIAS) was originally prepared for the project in April 2022. This TIA has reviewed updated traffic volume data, developed trip generation projections, and prepared an updated assessment of the revised project's impacts at the intersection of Lowell Street and Griffin Brook Drive.

PROJECT DESCRIPTION

The proposed building site is located at the end of Griffin Brook Drive, north of the existing building at No. 501 Griffin Brook Drive. The project site encompasses both buildings. The site is abutted by 401 Griffin Brook Drive to the south and wooded land to the north, east and west, with the Hickory Hill golf course slightly further north and east. Currently, the site consists of wooded land.

The project originally consisted of the construction of a 101,250 square foot (sf) industrial/warehouse building. Approximately 55,000 sf would be used as light-industrial space and the remaining 46,250 sf would be warehouse space. Access to the site was to be provided by way the driveway that serves 501 Griffin Brook Drive (at the end of Griffin Brook Drive) and then provides two access ways that circumvent 501 Griffin Brook Drive.

Currently, the project has been revised and now consists of the construction of a 95,700-sf warehouse building. Access to the site will be provided by way of the driveway that serves 501 Griffin Brook Drive (at the end of Griffin Brook Drive) and then provides two access ways that circumvent 501 Griffin Brook Drive.

Figure 1 shows the site location in relation to the surrounding area.



Figure 1
Site Location Map

EXISTING CONDITIONS

Roadway Network

Lowell Street/Lowell Boulevard (Route 110)

Lowell Street (Route 110) is classified as an Urban Principal Arterial extending in a general north/south direction within the study area. About 1,500 feet south of Griffin Brook Drive, the Route 110 roadway changes name to Lowell Boulevard into Dracut where Route 110 continues as Merrimack Avenue. Route 110 is under the jurisdiction of the Massachusetts Department of Transportation (MassDOT). Near Griffin Brook Drive, Route 110 provides one travel lane in each direction separated by a double-yellow centerline. The posted speed limit on Route 110 near Griffin Brook Drive is 45 miles per hour (mph). Illumination is provided by luminaires mounted on telephone poles within the study area. Sidewalks are provided on the west side of the road in the study area. Land use along Route 110 in the study area consists of commercial properties.

Griffin Brook Drive

Griffin Brook Drive is classified as a local road extending in an easterly direction from Lowell Street. Griffin Brook Drive is under the jurisdiction of the City of Methuen. Griffin Brook Drive provides one

travel lane in each direction. Travel lanes are separated by a median or a double-yellow centerline. There is no posted speed limit on Griffin Brook Drive. Sidewalks are provided on the north side of Griffin Brook Drive. Land use along Griffin Brook Drive in the study area consists of commercial properties.

Lowell Street and Griffin Brook Drive

Lowell Street forms the north and south legs of this three-legged intersection with Griffin Brook Drive forming the west leg. The Lowell Street northbound approach consists of an exclusive left-turn lane and a two through lanes. The Lowell Street southbound approach consists of an exclusive right-turn lane and two (2) through lanes. The Griffin Brook Drive eastbound approach consists of an exclusive left-turn lane and an exclusive right-turn lane. The entering and exiting traffic on Griffin Brook Drive is separated by a landscaped median. Existing pavement markings at the intersection are faded and, in some cases, worn away completely. Sidewalks exist along the north side of Griffin Brook Drive and the west side of Lowell Street. Land use at the intersection consists of commercial properties and wooded land.

Existing Traffic Volumes

To establish base traffic conditions within the study area, manual turning movement and vehicle classification counts were originally obtained in March 2022. Peak-period turning movement counts were conducted during the weekday morning peak period (7:00 to 9:00 AM) and weekday evening period (4:00 to 6:30 PM) on Tuesday July 9, 2024.

Additional turning movement counts were conducted at the intersection of Lowell Street and Griffin Brook Drive on Wednesday July 10, 2024, during the weekday morning peak period (7:00 to 9:00 AM) and weekday evening period (4:00 to 6:30 PM).

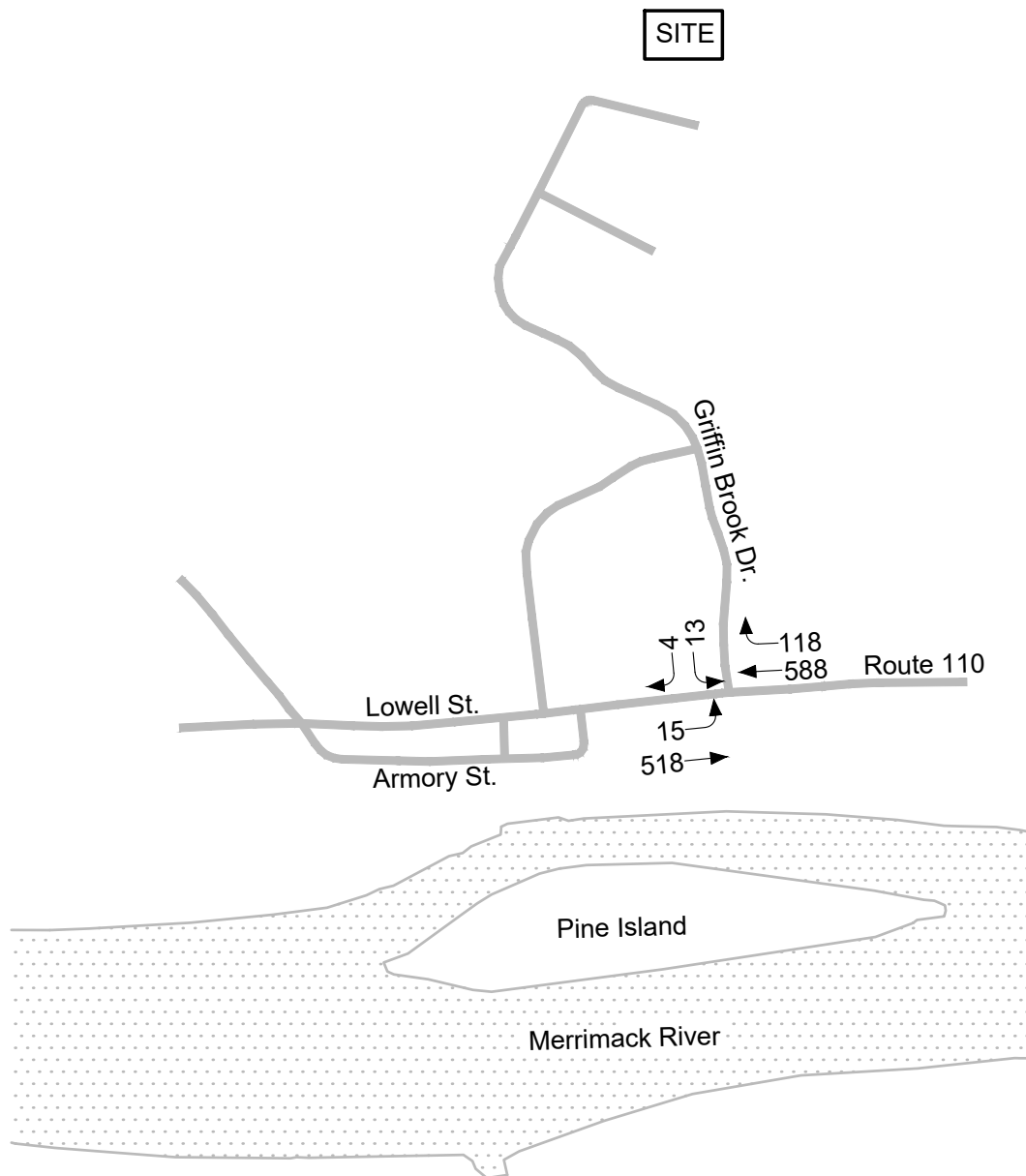
Daily traffic counts were conducted on Lowell Street for a two-day period using automatic traffic recorders (ATR) on July 10 and 11, 2024.

Analysis of the new peak-period traffic counts indicated that the weekday morning commuter peak hour generally occurs between 8:00 AM and 9:00 AM and the weekday evening commuter peak hour generally occurs between 4:30 PM and 5:30 PM. The traffic count worksheets are provided in the Appendix.

Seasonal Adjustment

The traffic-volume data gathered as part of this study was collected during the month of July 2024. Available traffic volume data from the MassDOT was reviewed to determine the monthly variations of the traffic volumes. The traffic data showed July volumes to be slightly higher than average month conditions. Therefore, the July traffic volumes were used to represent average month conditions. The 2024 existing weekday daily and peak-hour traffic volumes are summarized in Table 1. The existing weekday peak hour traffic volumes are shown on Figures 2 and 3 for the respective weekday morning and weekday evening peak hours. The seasonal worksheets are provided in the Appendix.

Lowell Street, north of Griffin Brook Drive carries approximately 17,250 vehicles per day (vpd). During the weekday morning peak hour, Lowell Street carries approximately 1,307 vehicles per hour (vph). During the weekday evening peak hour, Lowell Street carries approximately 1,563 vph.



Not To Scale

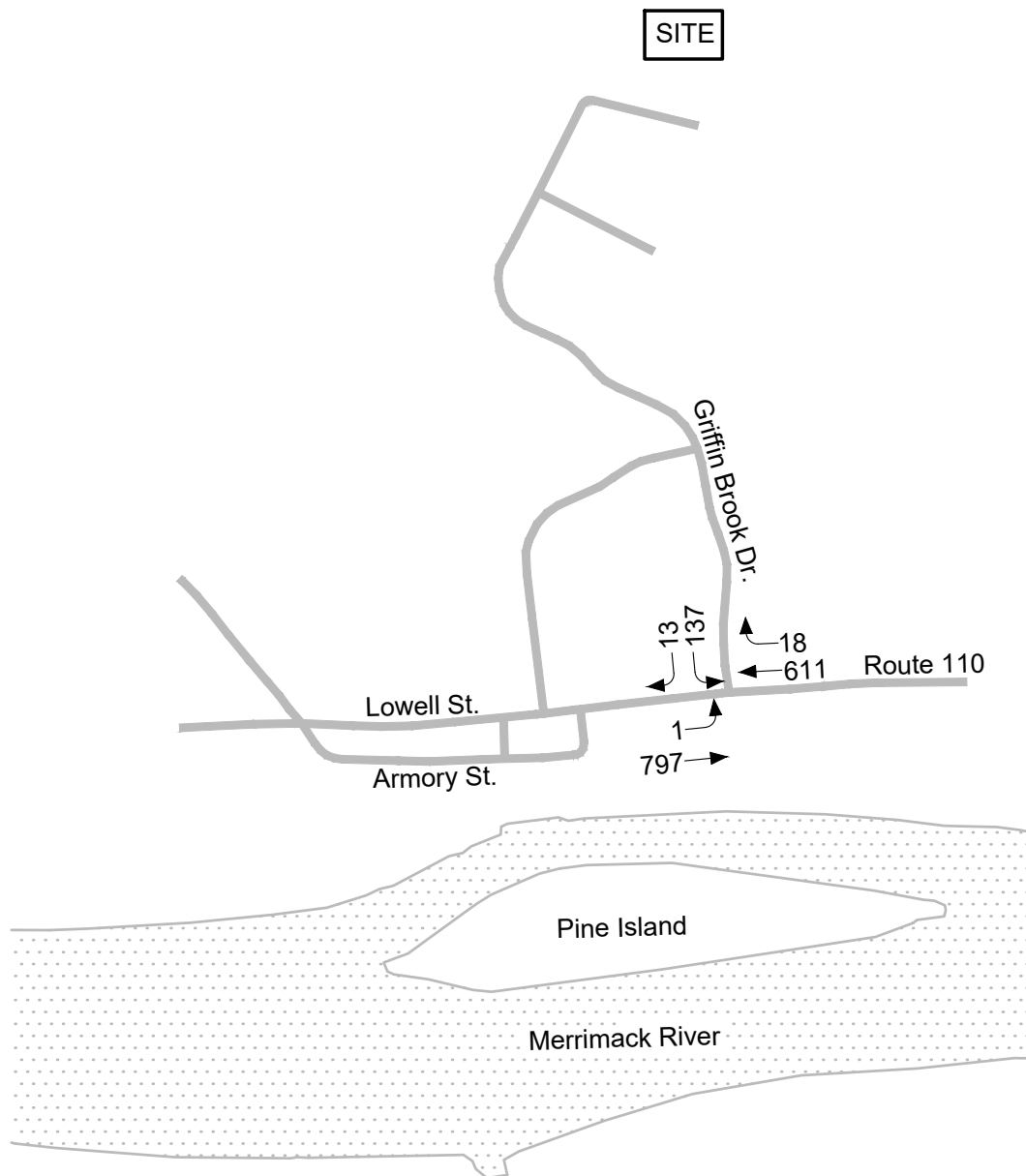
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Figure 2

2024 Existing
 Weekday Morning
 Peak Hour Traffic Volumes



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Figure 3

2024 Existing
Weekday Evening
Peak Hour Traffic Volumes

TABLE 1
EXISTING WEEKDAY TRAFFIC-VOLUME SUMMARY^a

Location	Daily Traffic Volume ^b	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
		Traffic Volume ^c	K Factor ^d	Directional Distribution ^e	Traffic Volume	K Factor	Directional Distribution
Lowell Street, north of Griffin Brook Drive	17,250	1,307	7.6	54.0% SB	1,563	9.1	59.8% NB

^aTwo-way traffic volume.

^bDaily traffic expressed in vehicles per day.

^cExpressed in vehicles per hour.

^dPercent of daily traffic volumes which occurs during the peak hour.

^ePercent of peak-hour volume in the predominant direction of travel.

NB = northbound; SB = southbound; EB = eastbound; WB = westbound.

Existing Traffic Volume Comparison

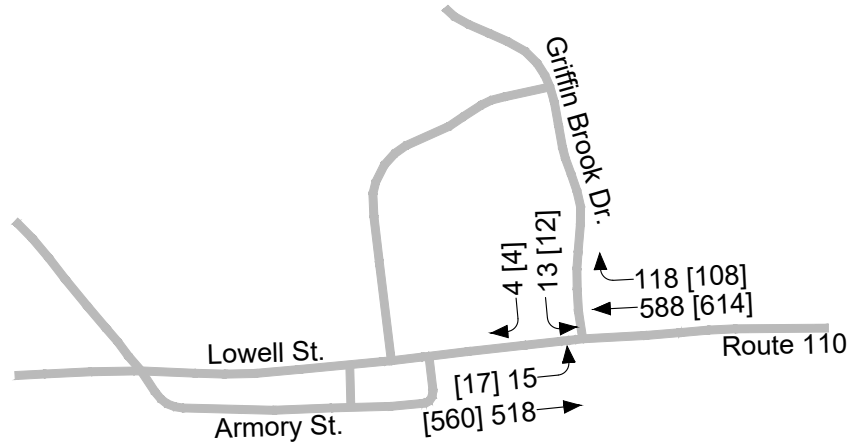
The volumes developed in the April 2022 TIAS were performed at a time when adjustments were necessary to account for the COVID pandemic. These adjustments are no longer required by MassDOT unless a project lies in an area of high office development.

The April 2022 peak hour traffic volumes were compared to the July 2024 traffic volumes as shown on Figure 4. As shown in Figure 4, the peak hour volumes observed in July 2024 were relatively close to the COVID adjusted volumes from the April 2022 TIAS. The only exception is during the weekday evening peak hour when volumes travelling northbound on Lowell Street were approximately 100 vph higher.

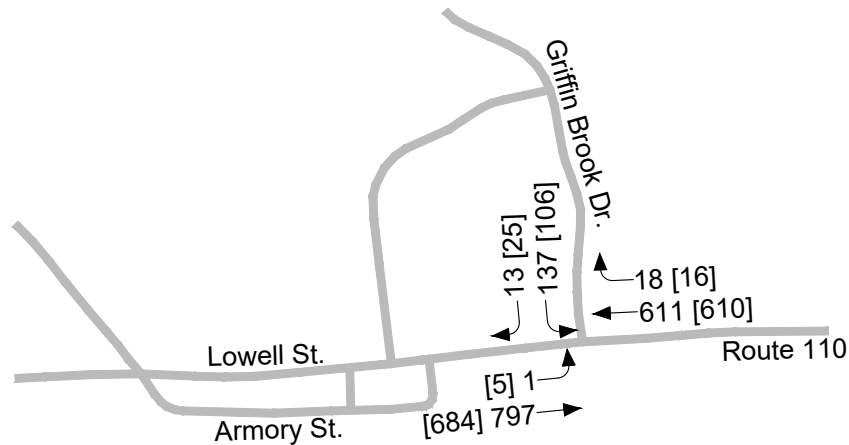
Crash Experience

Motor vehicle crash data for the study area intersections were obtained from the MassDOT Crash Portal for 2015 through the end of 2021. The motor vehicle crash data was reviewed to determine crash trends in the study area. Ten (10) crashes were reported at the intersection of Lowell Street and Griffin Brook Drive. Of the ten (10) crashes, one (1) crash was an angle collision and seven (7) were rear-end collisions. No fatalities were reported. The intersection is not on MassDOT's Highway Safety Improvement Program (HSIP) list of top crashes for 2019 through 2021. The crash data is summarized in Table 2 and included in the Appendix.

Weekday Morning



Weekday Evening



Legend:

XXX 2024 Traffic Volumes
[XXX] 2022 Traffic Volumes



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Figure 4

Peak Hour Traffic Volumes
Comparison 2022-2024

TABLE 2
MOTOR VEHICLE CRASH DATA SUMMARY^a

Scenario	Lowell Street at Griffin Brook Drive
<i>Year:</i>	
2017	5
2018	3
2019	0
2020	1
2021	0
2022	0
<u>2023</u>	<u>1</u>
Total	10
<i>Average^b:</i>	1.43
<i>Crash Rate^c:</i>	0.22
<i>Significance^d:</i>	No
<i>Type:</i>	
Angle	1
Rear-End	7
Head-On	1
Sideswipe	1
Single Vehicle Crash	0
<u>Unknown</u>	<u>0</u>
Total	10
<i>Time of Day:</i>	
Weekday (7:00 to 9:00 AM)	2
Weekday (4:00 to 6:00 PM)	2
<u>Remainder of Day</u>	<u>6</u>
Total	10
<i>Pavement Conditions:</i>	
Dry	6
Wet	4
Snow/Ice	0
<u>Unknown</u>	<u>0</u>
Total	10
<i>Severity:</i>	
Property Damage Only	8
Personal Injury	2
Fatal Accident	0
<u>Unknown</u>	<u>0</u>
Total	10

^aSource: MassDOT Impact Crash Portal.

^bAverage crashes over analysis period.

^cCrash rate per million entering vehicles (mev).

^dSignalized intersections are significant if rate >0.73 crashes per million vehicles, and unsignalized intersections are significant if rate >0.57 crashes per million vehicles.

FUTURE CONDITIONS

Future No-Build Conditions

Traffic growth on area roadways is a function of the expected land development in the immediate area as well as the surrounding region. Available traffic-volume data compiled by MassDOT from historic traffic counts in and around Methuen were reviewed in order to determine traffic growth trends. The Central Transportation Planning (CTPS) was contacted. Based on CTPS data, it was determined that traffic volumes within the study area are projected to increase over the next several years at a rate less than ½ percent. Accordingly, in this assessment, a 0.5 percent per year compounded annual background traffic growth rate was chosen to represent future conditions. The CTPS data is included in the Appendix.

Discussions with the City Community Development Department indicate that there are no Methuen development projects in the area. In the neighboring town of Dracut, there is one residential development. (Murphy Farm) which could impact traffic volumes. Traffic projections for this project were obtained from the traffic study for the project and are included in the Appendix.

Figures 5 and 6 show the future 2031 No-Build traffic volumes for the respective weekday morning and weekday evening peak hours.

Future Build Conditions

Project Description

The project originally consisted of the construction of a 101,250 square foot (sf) industrial/warehouse building. Approximately 55,000 sf would be used as light-industrial space and the remaining 46,250 sf would be warehouse space.

Currently, the project has been revised and now consists of the construction of a 95,700-sf warehouse building.

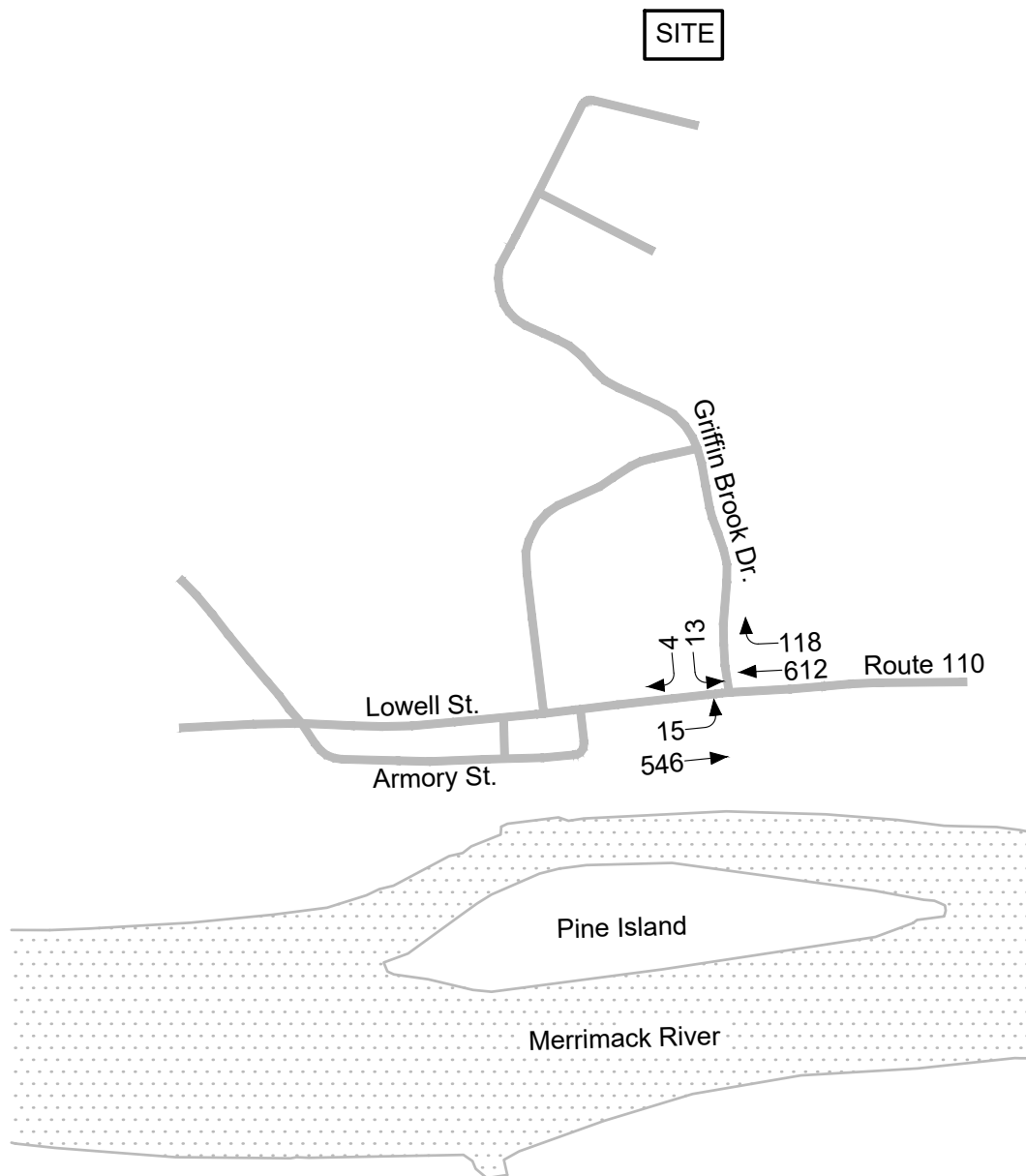
Site Traffic Generation

Site generated traffic was based on trip-generation data published by the ITE *Trip Generation* manual¹. The project consists of the construction of a 101,250-sf industrial/warehouse building. Approximately 55,000 sf would be used as light-industrial space and the remaining 46,250 sf would be warehouse space. The trip generation for the original project is summarized in the first column of Table 3.

For the current development proposal, site generated traffic was based on trip-generation data published by the ITE *Trip Generation* manual². Trip generation data for Land Use Code (LUC) 150 – Warehousing was reviewed. The trip generation for the current project is summarized in the second column of Table 3.

¹*Trip Generation*, Tenth Edition; Institute of Transportation Engineers; Washington, DC; 2017.

²*Trip Generation*, Eleventh Edition; Institute of Transportation Engineers; Washington, DC; 2021.



Not To Scale

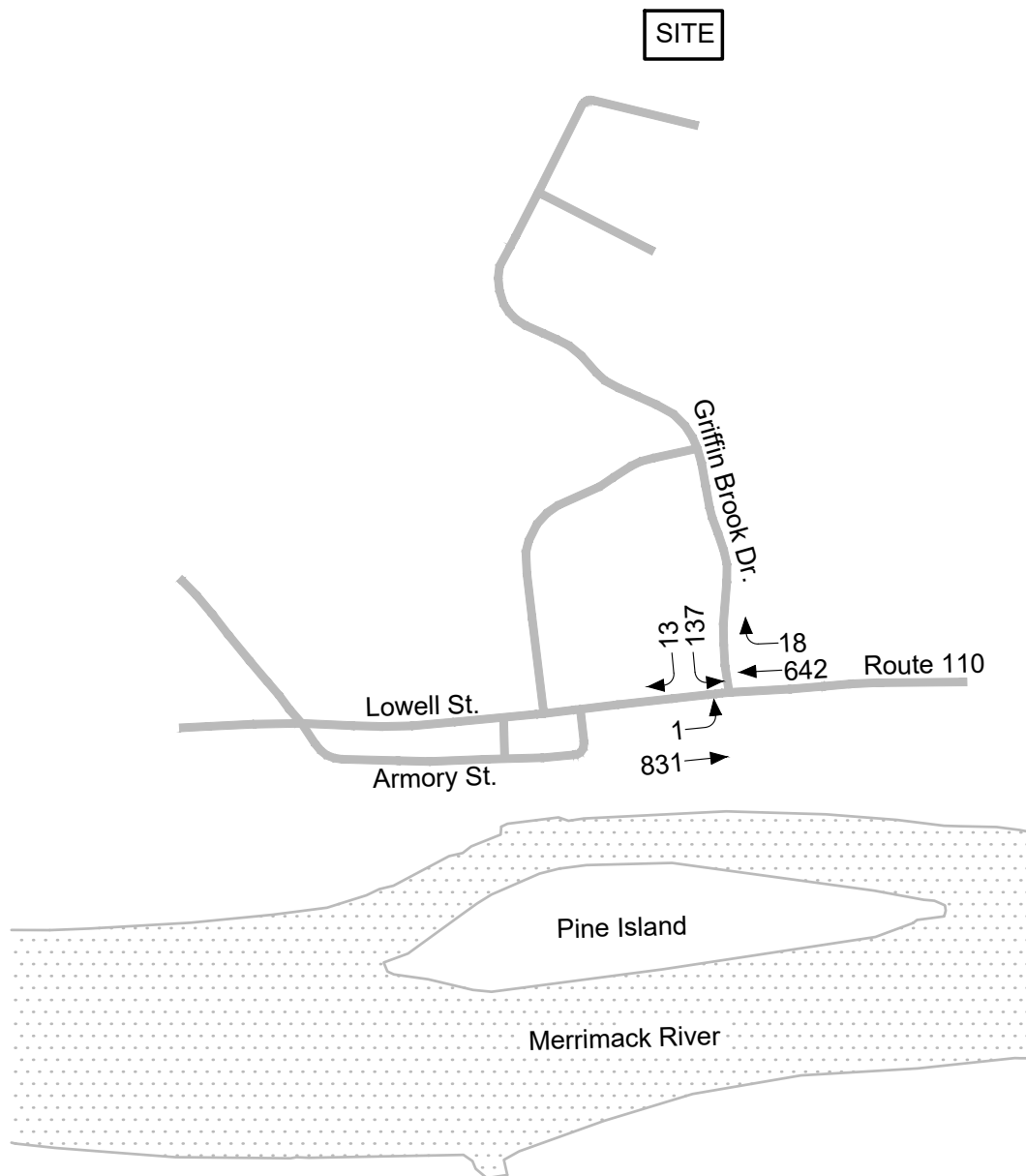
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Figure 5

2031 No-Build
 Weekday Morning
 Peak Hour Traffic Volumes



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Figure 6

2031 No-Build
 Weekday Evening
 Peak Hour Traffic Volumes

TABLE 3
TRIP-GENERATION SUMMARY

	Original Development Proposal Trips ^a	Current Development Proposal Trips ^a	Difference In Total Trips ^a
Average Weekday Daily Traffic	370	190	(180)
<i>Weekday Morning Peak Hour:</i>			
Entering	58	27	(31)
<u>Exiting</u>	<u>12</u>	<u>8</u>	<u>(4)</u>
Total	70	35	(35)
<i>Weekday Evening Peak Hour:</i>			
Entering	13	11	(2)
<u>Exiting</u>	<u>46</u>	<u>27</u>	<u>(19)</u>
Total	59	38	(21)

^aBased on ITE LUC 110 – General Light Industrial; 55,000 sf and on ITE LUC 150 – Warehousing; 46,250 sf.

^aBased on ITE LUC 150 – Warehousing; 95,700 sf.

On a typical weekday, the current proposed development is expected to generate 190 daily vehicle trips. During the weekday morning peak hour, 35 vehicle trips (27 vehicles entering and 8 vehicles exiting) are expected. During the weekday evening peak hour, 38 vehicle trips (11 vehicles entering and 27 vehicles exiting) are expected.

Compared to the original development proposal, there will be 180 *fewer* daily vehicle trips. During the weekday morning peak hour, there will be 35 fewer vehicle trips (31 vehicles entering and 4 vehicles exiting). During the weekday evening peak hour, there will be 21 fewer vehicle trips (2 vehicles entering and 19 vehicles exiting).

The volumes presented in Table 3 represent total trips generated by the project on a daily and peak hour basis. Of these vehicles, some are expected to be trucks. At this time, no tenants have been identified. ITE data from the Trip Generation Manual was used to estimate the number of truck trips and are summarized in Table 4 for the original and current proposals.

TABLE 4
TRUCK TRIP-GENERATION SUMMARY

	Original Development Proposal Truck Trips ^a	Current Development Proposal Truck Trips ^a	Difference In Total Truck Trips ^a
Average Weekday Daily Traffic	46	60	14
<i>Weekday Morning Peak Hour:</i>			
Entering	0	1	1
<u>Exiting</u>	<u>2</u>	<u>1</u>	<u>(1)</u>
Total	2	1	0
<i>Weekday Evening Peak Hour:</i>			
Entering	2	1	(1)
<u>Exiting</u>	<u>0</u>	<u>2</u>	<u>2</u>
Total	2	3	1

^aBased on ITE LUC 110 – General Light Industrial; 55,000 sf and based on ITE LUC 150 – Warehousing; 46,250 sf.

^bBased on ITE LUC 150 – Warehousing; 95,700 sf.

Compared to the original development proposal, there will be 14 additional truck trips on a daily basis. During the weekday morning peak hour, there will be no change in the number of truck trips, and, during the weekday evening peak hour, there will be 1 additional truck trip. The trip generation worksheets are contained in the Appendix.

Trip Distribution

The directional distribution of the vehicular traffic approaching and departing the site is a function of population densities, the location of employment, existing travel patterns, similar uses, and the efficiency of the existing roadway system. The volume of traffic entering and exiting Griffin Brook Park from Lowell Street was reviewed to develop the expected trip patterns. Table 5 summarizes the expected trip distribution.

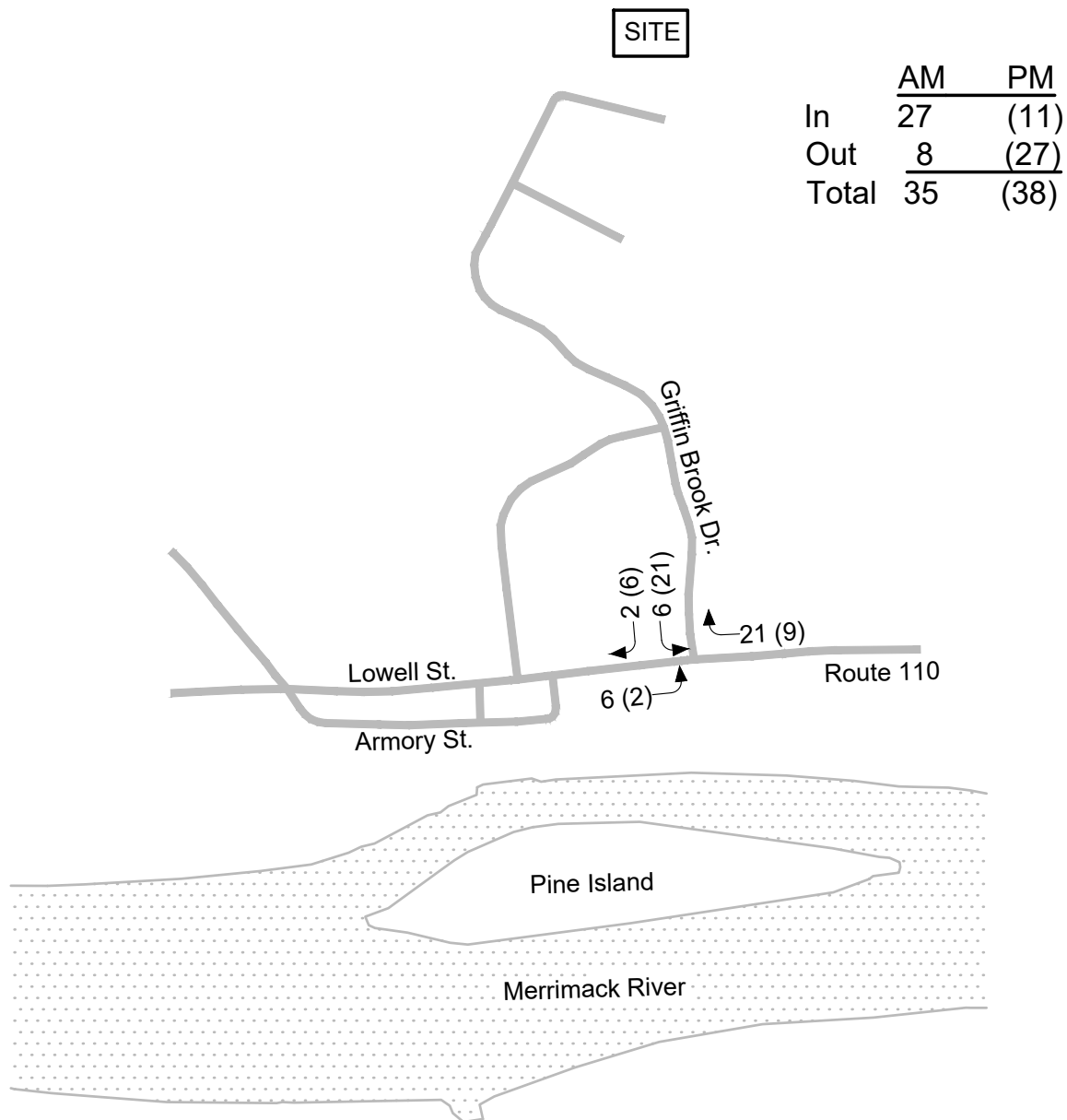
TABLE 5
TRIP-DISTRIBUTION SUMMARY

Route	Direction To or From	Percent of Trips To or From
Lowell Street	East	83
Lowell Street	West	<u>17</u>
TOTAL		100

Future Build Conditions

Trips for the project were then added to the No-Build traffic volumes in accordance with the projected trip distribution and analyzed. The site-generated traffic was distributed within the study area according to the percentages summarized in Table 5 and are shown on Figure 7. The site generated volumes were then superimposed onto the projected No-Build traffic volumes to represent the 2031 Build traffic-volume conditions. These volumes, shown on Figures 8 and 9, were used as the basis for all analyses as well as to identify potential mitigation measures to ameliorate the project's impacts.

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Legend:

XX 2024 Traffic Volumes
(XX) 2022 Traffic Volumes



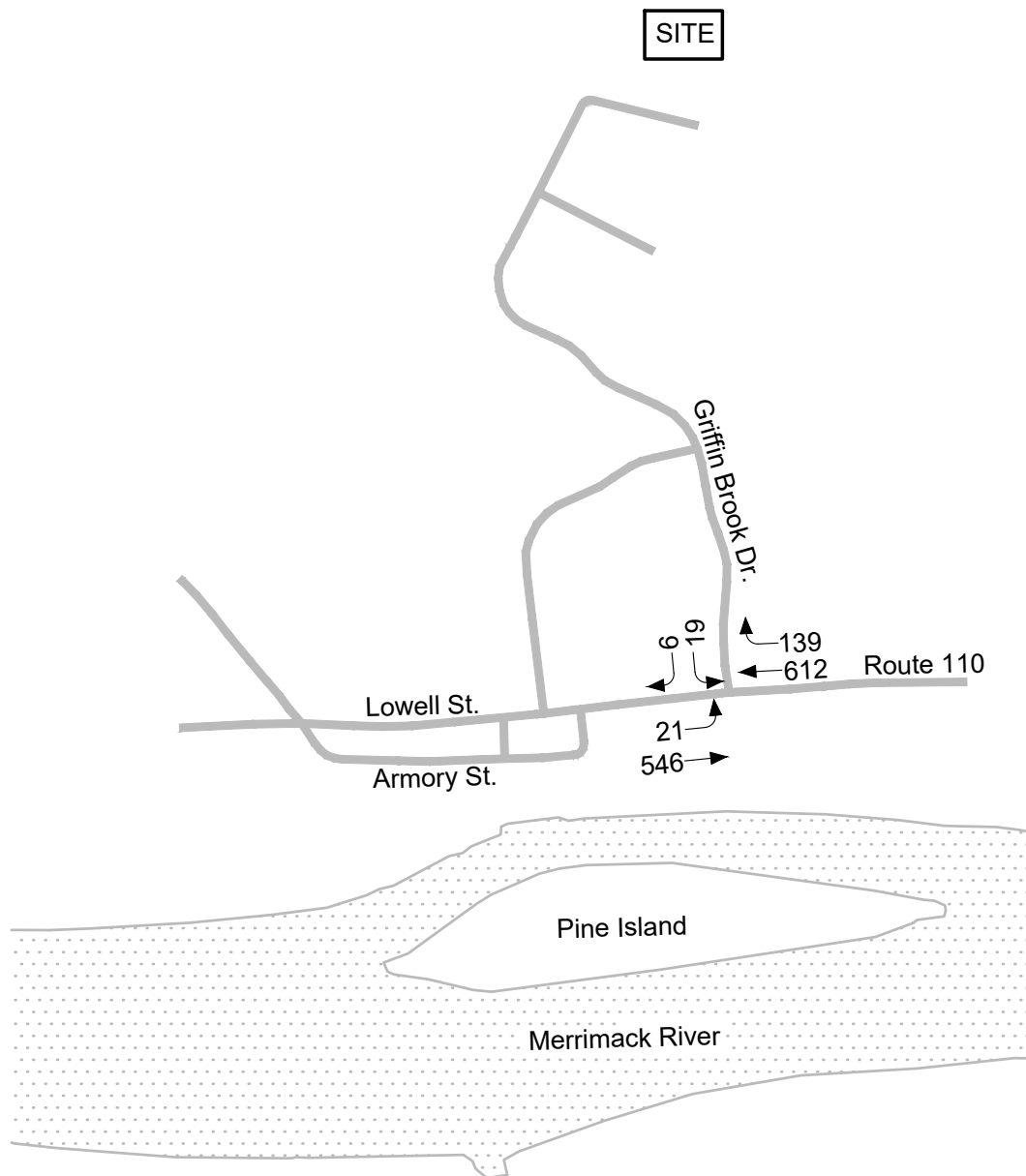
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Figure 7

Site Generated
Peak Hour Traffic Volumes



Not To Scale

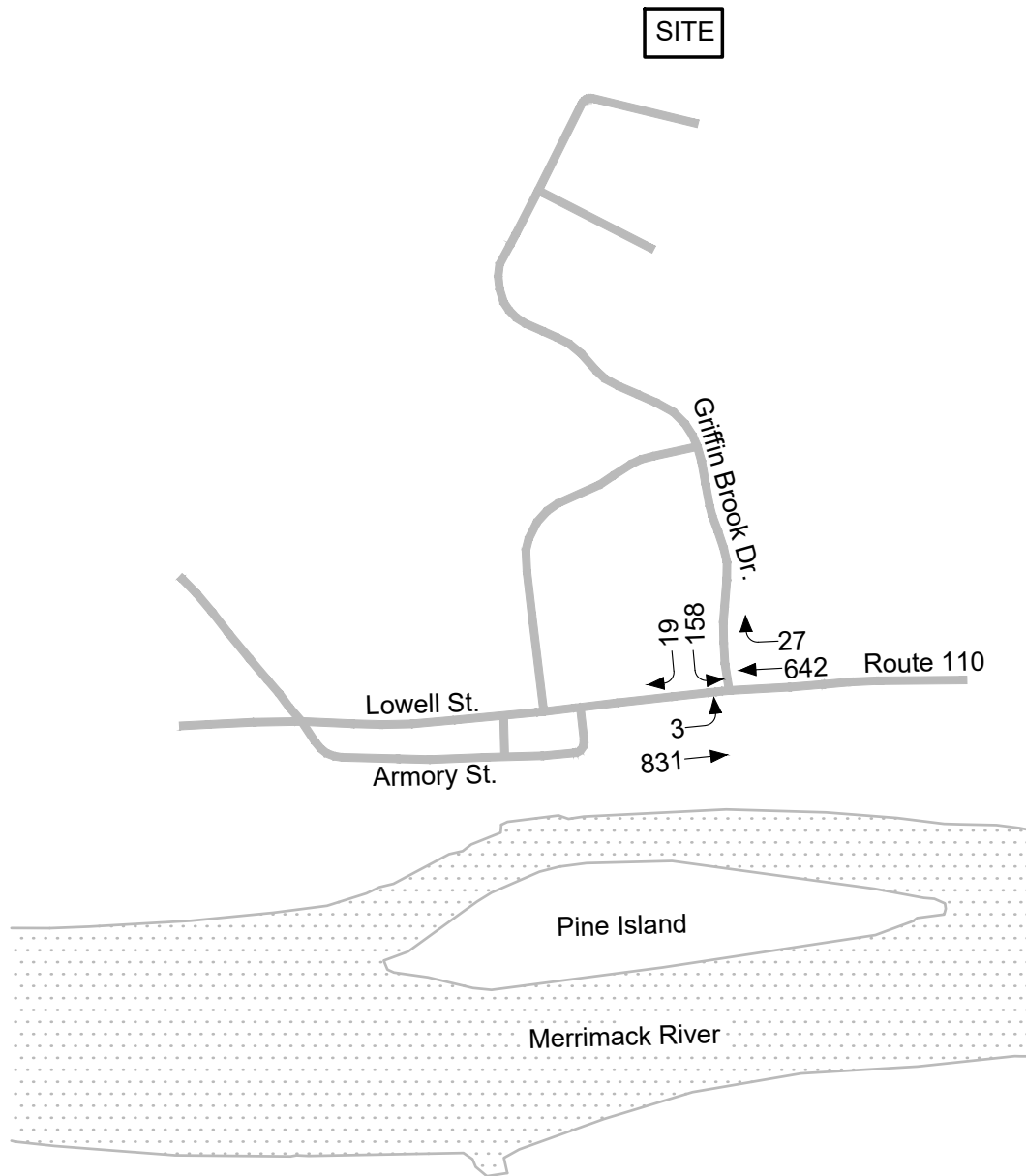
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Figure 8

2031 Build
 Weekday Morning
 Peak Hour Traffic Volumes



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Figure 9

2031 Build
 Weekday Evening
 Peak Hour Traffic Volumes

Capacity Analysis Results

To assess intersection operations, capacity analyses were conducted for Existing, No-Build, and Build traffic-volume conditions. Capacity analyses provide an indication of how well the study area intersections serve existing and projected traffic volumes. Vehicle queue analyses provide a secondary measure of the operational characteristics of an intersection or section of roadway under study in terms of lane use and demand. The level-of-service definitions are contained in the Appendix.

Level-of-service analyses were conducted for 2024 Existing, 2031 No-Build and 2031 Build conditions for the study area intersection. The results of the signalized capacity analyses are summarized in Table 6. Detailed analysis sheets are presented in the Appendix.

TABLE 6
SIGNALIZED LEVEL-OF-SERVICE SUMMARY
LOWELL STREET AND GRIFFIN BROOK DRIVE

Peak Hour/Lane Group	2024 Existing				2031 No-Build				2031 Build			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
<i>Weekday Morning</i>												
Eastbound Lt	0.42	38.8	D	10/20	0.42	38.8	D	10/20	0.47	38.4	D	17/25
Eastbound Rt	0.15	34.5	C	0/7	0.15	34.5	C	0/7	0.16	34.0	C	0/8
Northbound Lt	0.03	2.7	A	1/6	0.03	2.7	A	1/6	0.04	2.9	A	2/8
Northbound Th	0.21	1.9	A	0/50	0.22	1.9	A	0/53	0.23	2.1	A	35/56
Southbound Th	0.26	4.3	A	0/98	0.28	4.4	A	0/103	0.28	4.8	A	35/107
Southbound Rt	0.11	3.8	A	0/19	0.11	3.8	A	0/19	0.14	4.2	A	0/21
Overall	--	3.9	A	--/--	--	3.9	A	--/--	--	4.5	A	--/--
<i>Weekday Evening</i>												
Eastbound Lt	0.81	39.2	D	101/118	0.81	39.2	D	101/118	0.83	40.7	D	119/134
Eastbound Rt	0.09	29.7	C	0/11	0.09	29.7	C	0/11	0.11	29.3	C	0/12
Northbound Lt	0.00	5.2	A	0/2	0.00	5.2	A	0/2	0.01	5.7	A	1/3
Northbound Th	0.34	4.9	A	87/144	0.36	4.9	A	92/152	0.36	5.5	A	99/152
Southbound Th	0.30	7.0	A	61/150	0.32	7.1	A	64/158	0.32	7.9	A	69/160
Southbound Rt	0.02	5.5	A	0/10	0.02	5.5	A	0/10	0.03	6.2	A	0/13
Overall	--	9.9	A	--/--	--	9.8	A	--/--	--	11.1	B	--/--

^aMaximum volume-to-capacity ratio.

^bDelay in seconds per vehicle.

^cLevel of service.

^dAverage Queue (ft)/95th %tile Queue (ft)

Lt = Left; Th = Through; Rt = Right.

Under 2024 Existing conditions, this signalized intersection is modeled to operate at LOS A during the weekday morning peak hour and LOS A during the weekday evening peak hour. Under future 2031 No-Build conditions, the intersection is projected to operate at LOS A during the weekday morning peak hour and at LOS A during the weekday evening peak hour. Under 2029 Build conditions, the intersection is projected to continue to operate at LOS A during the weekday morning peak hour and at LOS B during the weekday evening peak hour.

CONCLUSION AND RECOMMENDATIONS

Bayside has examined the potential traffic impacts associated with the proposed development at 101 Lowell Street. The following is a summary of the results and conclusions of this effort:

- The project consists of a 95,700-sf warehouse facility.
- Access to the site will be provided by way of a shared main driveway that will intersect at the end of Griffin Brook Drive.
- The intersection of Lowell Street and Griffin Brook Drive experienced ten (10) reported crashes over the seven-year period.
- The intersection is not on MassDOT's Highway Safety Improvement Program (HSIP) list of top crashes for 2019 through 2021.
- The current proposed development is expected to generate 190 daily vehicle trips. During the weekday morning peak hour, 35 vehicle trips (27 vehicles entering and 8 vehicles exiting) are expected. During the weekday evening peak hour, 38 vehicle trips (11 vehicles entering and 27 vehicles exiting) are expected.
- Compared to the original development proposal, there will be 180 *fewer* daily vehicle trips. During the weekday morning peak hour, there will be 35 fewer vehicle trips (31 vehicles entering and 4 vehicles exiting). During the weekday evening peak hour, there will be 21 fewer vehicle trips (2 vehicles entering and 19 vehicles exiting).
- On average, over the peak hour, this would represent a minor increase of approximately one (1) additional vehicle every half-hour, a negligible increase.
- The intersection of Lowell Street and Griffin Brook Drive currently and will continue to operate at a good level of service, with or without the project.

The impact of the site-generated traffic does not warrant site specific traffic mitigation. There are no feasible or reasonable means of reducing delays at the study area intersection.

APPENDIX

**TRAFFIC VOLUME COUNT DATA
SEASONAL ADJUSTMENT DATA
MOTOR VEHICLE CRASH DATA
BACKGROUND DEVELOPMENT
TRIP GENERATION DATA
CAPACITY ANALYSIS METHODOLOGY
CAPACITY ANALYSIS WORKSHEETS**

TRAFFIC VOLUME COUNT DATA

Accurate Counts

978-664-2565

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 1

Groups Printed- Cars - Trucks

	Route 110 From North		Route 110 From South		Griffin Brook Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	65	21	6	110	0	1	203
07:15 AM	110	22	5	148	3	1	289
07:30 AM	131	25	1	131	4	0	292
07:45 AM	113	32	2	133	0	0	280
Total	419	100	14	522	7	2	1064
08:00 AM	156	32	3	135	3	1	330
08:15 AM	159	21	4	95	1	1	281
08:30 AM	133	25	3	143	4	0	308
08:45 AM	140	40	5	145	5	2	337
Total	588	118	15	518	13	4	1256
Grand Total	1007	218	29	1040	20	6	2320
Apprch %	82.2	17.8	2.7	97.3	76.9	23.1	
Total %	43.4	9.4	1.2	44.8	0.9	0.3	
Cars	951	218	29	978	18	6	2200
% Cars	94.4	100	100	94	90	100	94.8
Trucks	56	0	0	62	2	0	120
% Trucks	5.6	0	0	6	10	0	5.2

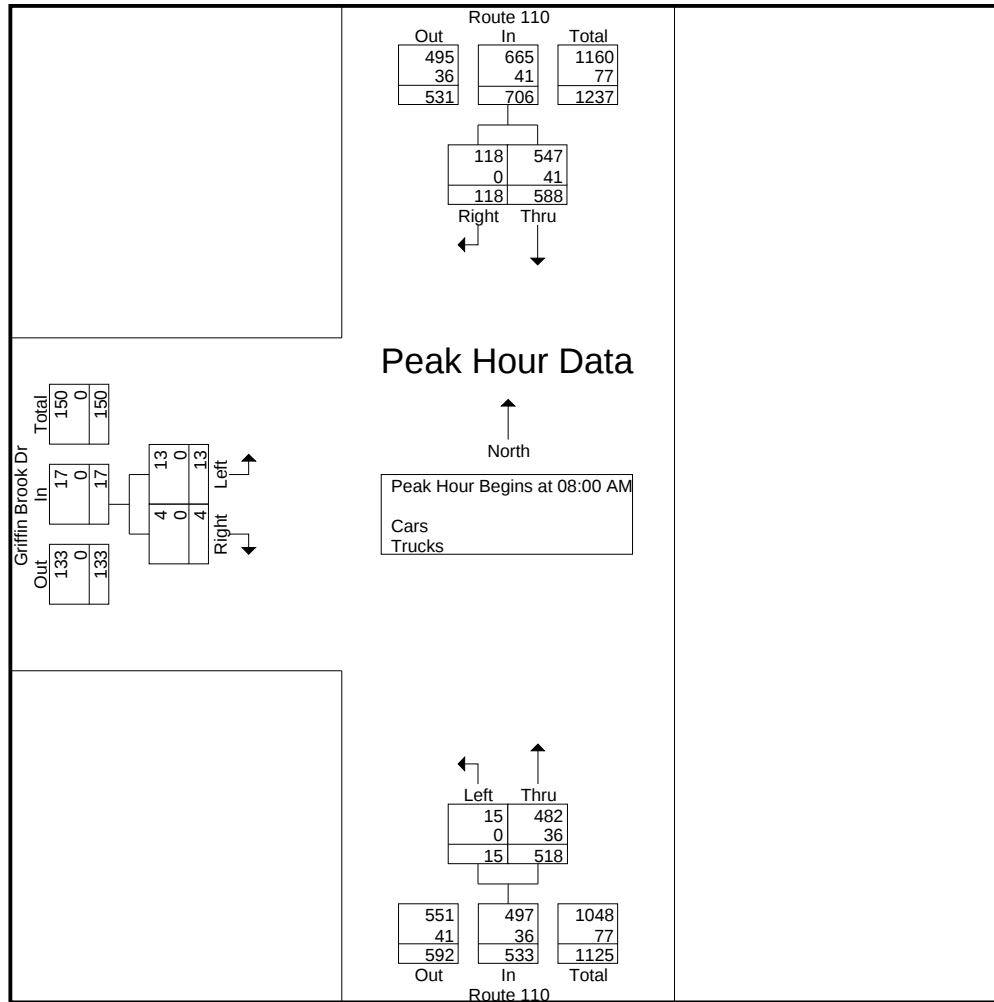
	Route 110 From North			Route 110 From South			Griffin Brook Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	156	32	188	3	135	138	3	1	4	330
08:15 AM	159	21	180	4	95	99	1	1	2	281
08:30 AM	133	25	158	3	143	146	4	0	4	308
08:45 AM	140	40	180	5	145	150	5	2	7	337
Total Volume	588	118	706	15	518	533	13	4	17	1256
% App. Total	83.3	16.7		2.8	97.2		76.5	23.5		
PHF	.925	.738	.939	.750	.893	.888	.650	.500	.607	.932
Cars	547	118	665	15	482	497	13	4	17	1179
% Cars	93.0	100	94.2	100	93.1	93.2	100	100	100	93.9
Trucks	41	0	41	0	36	36	0	0	0	77
% Trucks	7.0	0	5.8	0	6.9	6.8	0	0	0	6.1

Accurate Counts

978-664-2565

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 2



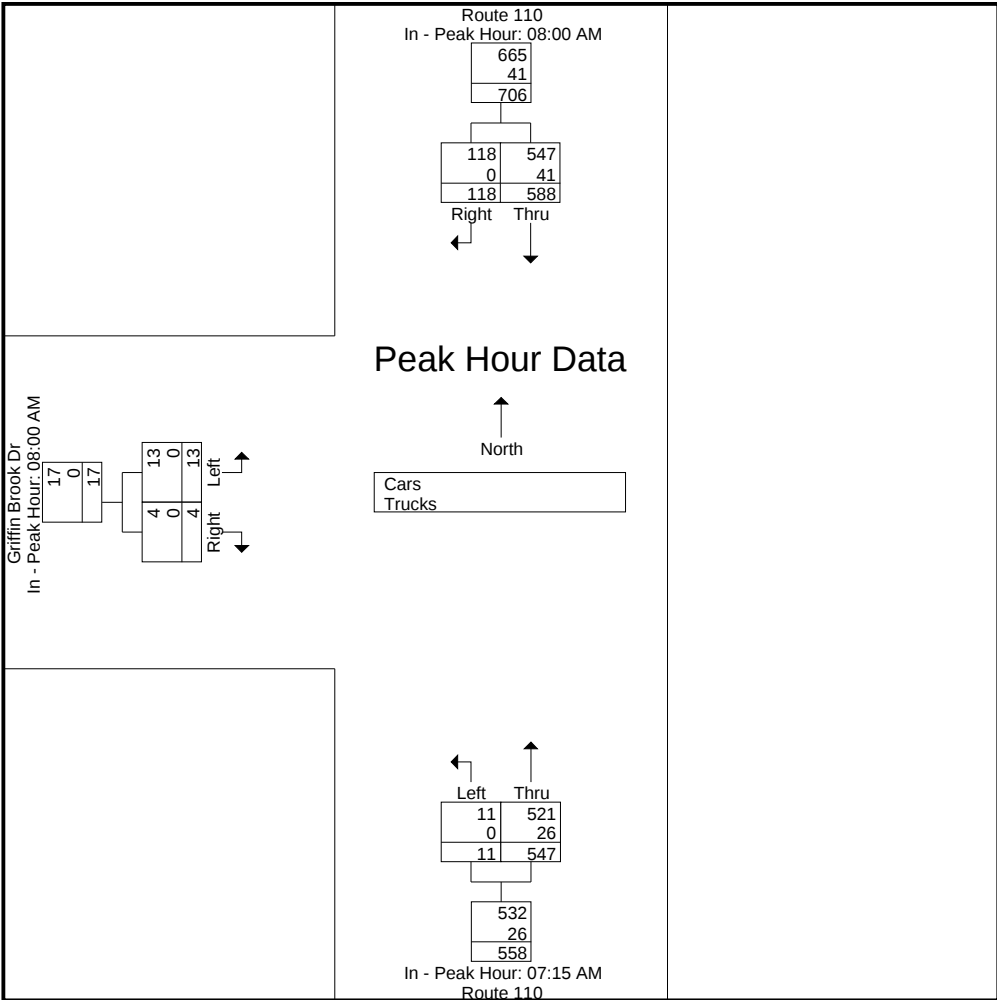
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM			07:15 AM			08:00 AM		
+0 mins.	156	32	188	5	148	153	3	1	4
+15 mins.	159	21	180	1	131	132	1	1	2
+30 mins.	133	25	158	2	133	135	4	0	4
+45 mins.	140	40	180	3	135	138	5	2	7
Total Volume	588	118	706	11	547	558	13	4	17
% App. Total	83.3	16.7		2	98		76.5	23.5	
PHF	.925	.738	.939	.550	.924	.912	.650	.500	.607
Cars	547	118	665	11	521	532	13	4	17
% Cars	93	100	94.2	100	95.2	95.3	100	100	100
Trucks	41	0	41	0	26	26	0	0	0
% Trucks	7	0	5.8	0	4.8	4.7	0	0	0

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 4

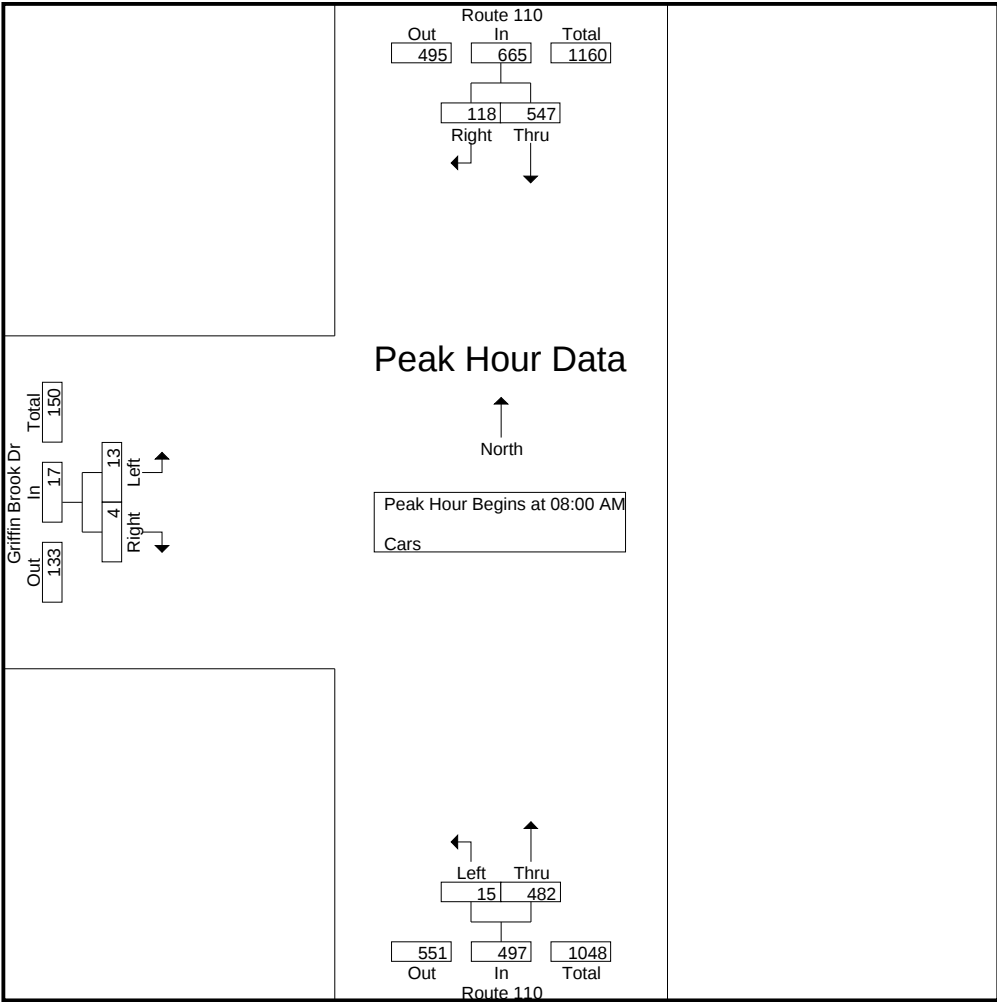
Groups Printed- Cars

	Route 110 From North		Route 110 From South		Griffin Brook Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	61	21	6	104	0	1	193
07:15 AM	107	22	5	140	3	1	278
07:30 AM	128	25	1	124	2	0	280
07:45 AM	108	32	2	128	0	0	270
Total	404	100	14	496	5	2	1021
08:00 AM	146	32	3	129	3	1	314
08:15 AM	148	21	4	91	1	1	266
08:30 AM	121	25	3	128	4	0	281
08:45 AM	132	40	5	134	5	2	318
Total	547	118	15	482	13	4	1179
Grand Total	951	218	29	978	18	6	2200
Apprch %	81.4	18.6	2.9	97.1	75	25	
Total %	43.2	9.9	1.3	44.5	0.8	0.3	

	Route 110 From North			Route 110 From South			Griffin Brook Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	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	146	32	178	3	129	132	3	1	4	314
08:15 AM	148	21	169	4	91	95	1	1	2	266
08:30 AM	121	25	146	3	128	131	4	0	4	281
08:45 AM	132	40	172	5	134	139	5	2	7	318
Total Volume	547	118	665	15	482	497	13	4	17	1179
% App. Total	82.3	17.7		3	97		76.5	23.5		
PHF	.924	.738	.934	.750	.899	.894	.650	.500	.607	.927

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 5

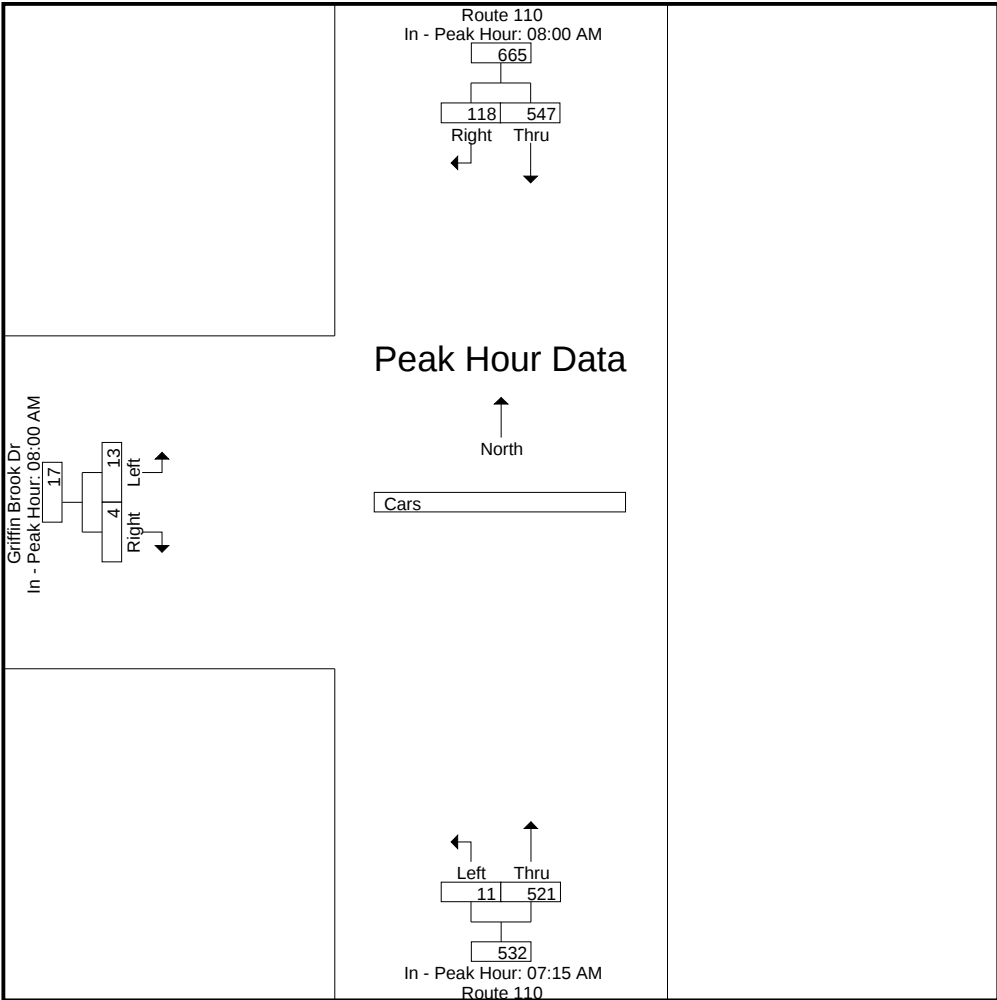


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM			07:15 AM			08:00 AM		
+0 mins.	146	32	178	5	140	145	3	1	4
+15 mins.	148	21	169	1	124	125	1	1	2
+30 mins.	121	25	146	2	128	130	4	0	4
+45 mins.	132	40	172	3	129	132	5	2	7
Total Volume	547	118	665	11	521	532	13	4	17
% App. Total	82.3	17.7		2.1	97.9		76.5	23.5	
PHF	.924	.738	.934	.550	.930	.917	.650	.500	.607

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 7

Groups Printed- Trucks

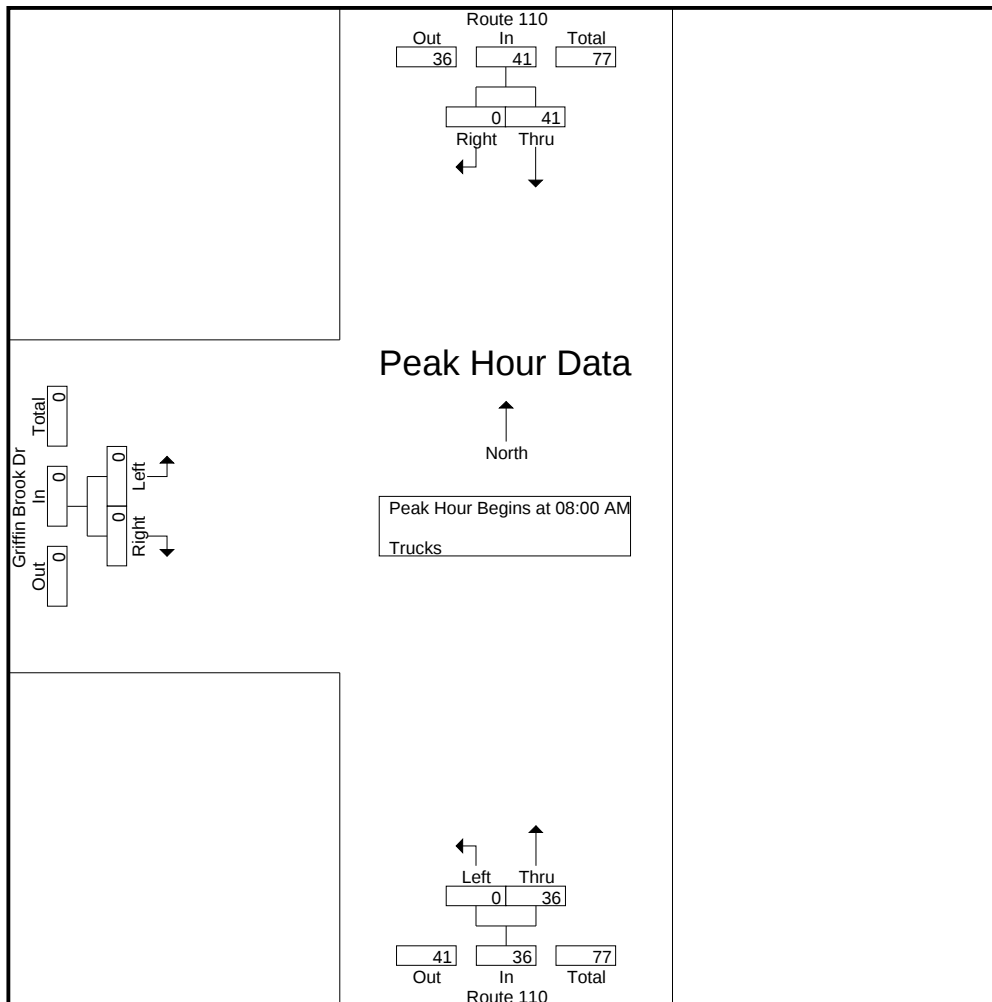
	Route 110 From North			Route 110 From South			Griffin Brook Dr From West			
Start Time	Thru	Right		Left	Thru		Left	Right		Int. Total
07:00 AM	4	0		0	6		0	0		10
07:15 AM	3	0		0	8		0	0		11
07:30 AM	3	0		0	7		2	0		12
07:45 AM	5	0		0	5		0	0		10
Total	15	0		0	26		2	0		43
08:00 AM	10	0		0	6		0	0		16
08:15 AM	11	0		0	4		0	0		15
08:30 AM	12	0		0	15		0	0		27
08:45 AM	8	0		0	11		0	0		19
Total	41	0		0	36		0	0		77
Grand Total	56	0		0	62		2	0		120
Apprch %	100	0		0	100		100	0		
Total %	46.7	0		0	51.7		1.7	0		

	Route 110 From North			Route 110 From South			Griffin Brook Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	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	10	0	10	0	6	6	0	0	0	16
08:15 AM	11	0	11	0	4	4	0	0	0	15
08:30 AM	12	0	12	0	15	15	0	0	0	27
08:45 AM	8	0	8	0	11	11	0	0	0	19
Total Volume	41	0	41	0	36	36	0	0	0	77
% App. Total	100	0		0	100		0	0		
PHF	.854	.000	.854	.000	.600	.600	.000	.000	.000	.713

978-664-2565

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 8



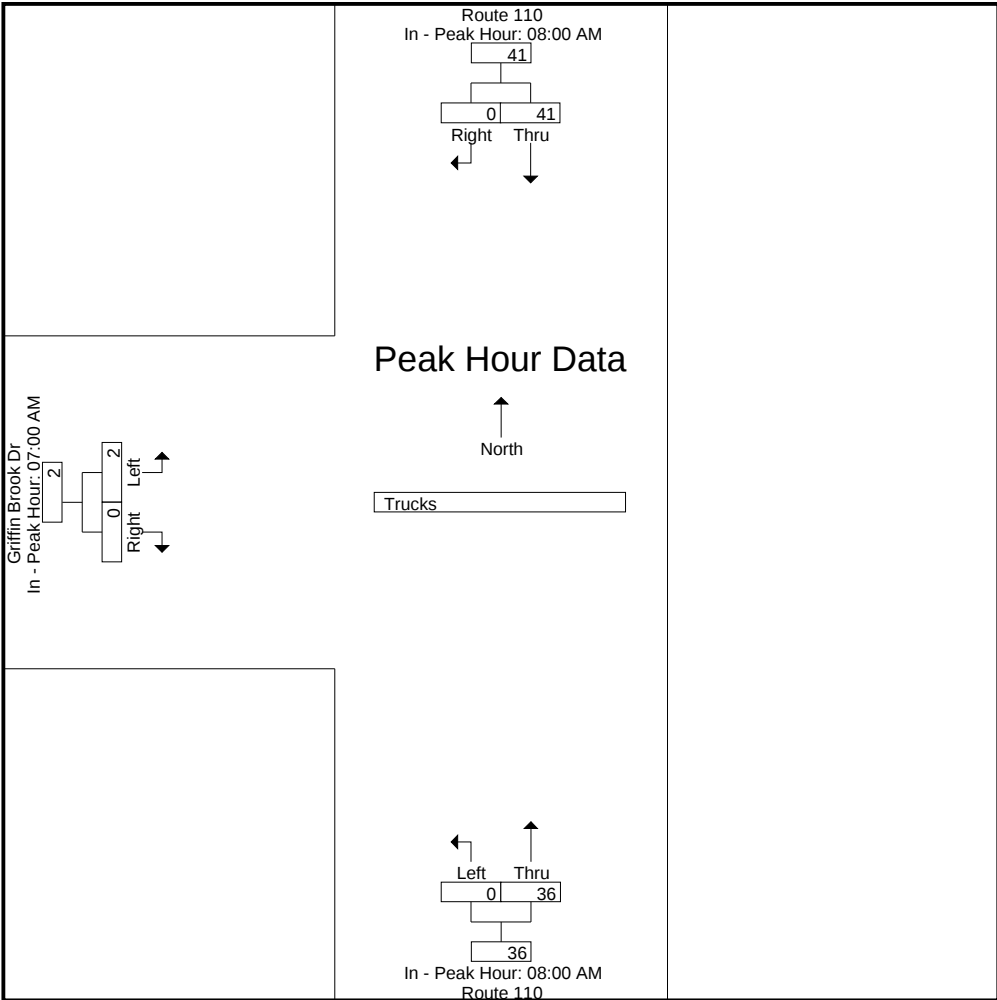
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

Peak Hour for Each Application	Peak Begins at:								
	08:00 AM			08:00 AM			07:00 AM		
+0 mins.	10	0	10	0	6	6	0	0	0
+15 mins.	11	0	11	0	4	4	0	0	0
+30 mins.	12	0	12	0	15	15	2	0	2
+45 mins.	8	0	8	0	11	11	0	0	0
Total Volume	41	0	41	0	36	36	2	0	2
% App. Total	100	0		0	100		100	0	
PHF	.854	.000	.854	.000	.600	.600	.250	.000	.250

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 10

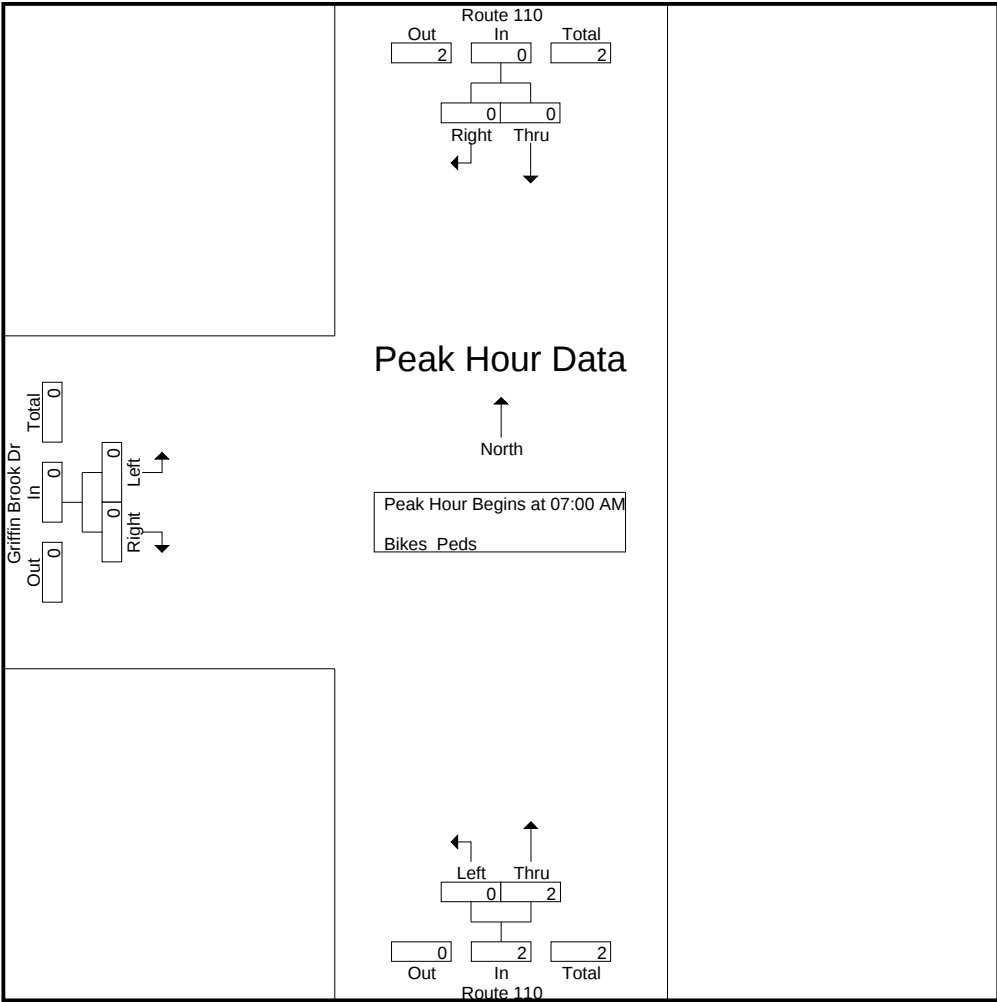
Groups Printed- Bikes Peds

	Route 110 From North			Route 110 From South			Griffin Brook Dr From West			Exclu. Total	Inclu. Total	Int. Total
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds			
07:00 AM	0	0	0	0	0	0	0	0	1	1	0	1
07:15 AM	0	0	0	0	0	0	0	0	1	1	0	1
07:30 AM	0	0	0	0	2	0	0	0	0	0	2	2
07:45 AM	0	0	0	0	0	0	0	0	1	1	0	1
Total	0	0	0	0	2	0	0	0	3	3	2	5
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	2	0	0	0	3	3	2	5
Apprch %	0	0		0	100		0	0				
Total %	0	0		0	100		0	0		60	40	

	Route 110 From North			Route 110 From South			Griffin Brook Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	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	2	2	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	2	2	0	0	0	2
% App. Total	0	0		0	100		0	0		
PHF	.000	.000	.000	.000	.250	.250	.000	.000	.000	.250

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 11

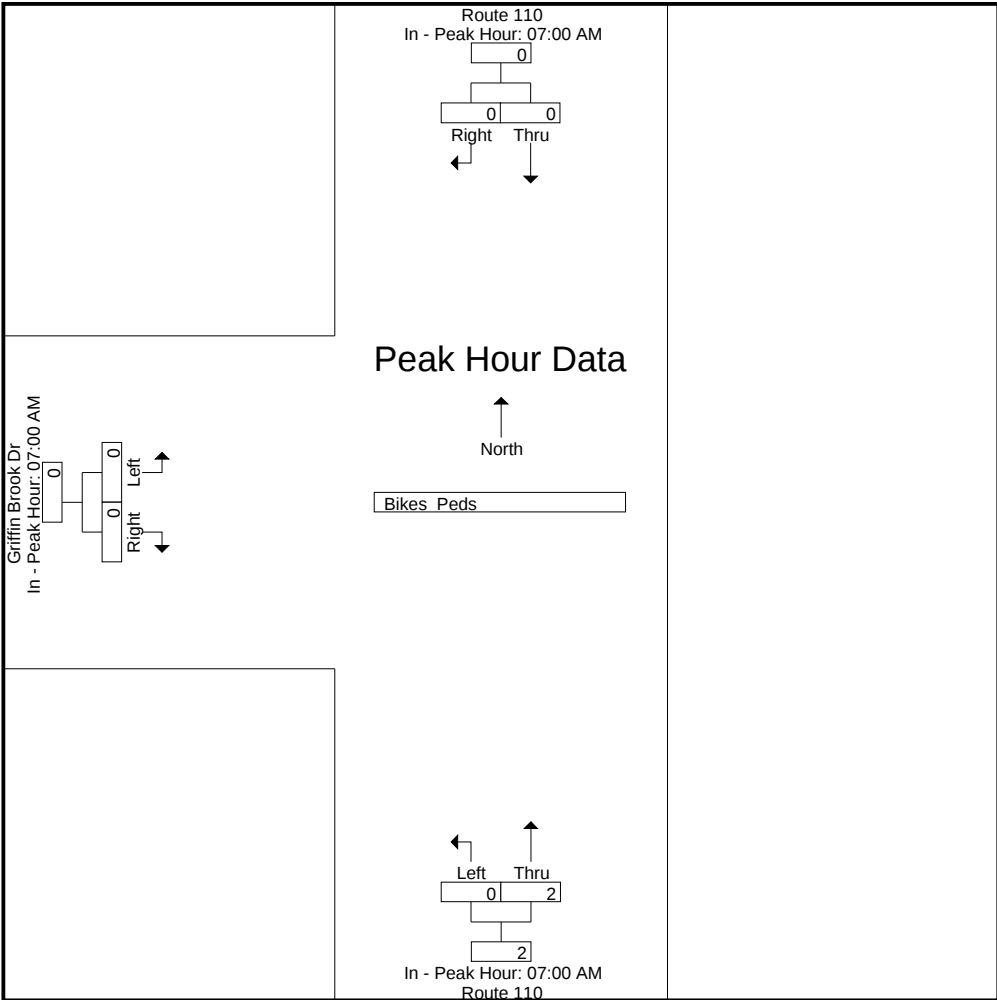


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	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	2	2	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	2	2	0	0	0
% App. Total	0	0		0	100		0	0	
PHF	.000	.000	.000	.000	.250	.250	.000	.000	.000

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 1

Groups Printed- Cars - Trucks

	Route 110 From North		Route 110 From South		Griffin Brook Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	139	4	1	179	13	4	340
04:15 PM	154	3	2	183	13	4	359
04:30 PM	151	6	0	188	51	6	402
04:45 PM	147	5	0	181	27	1	361
Total	591	18	3	731	104	15	1462
05:00 PM	140	4	0	220	33	4	401
05:15 PM	173	3	1	208	26	2	413
05:30 PM	150	1	0	197	21	9	378
05:45 PM	141	4	0	161	10	3	319
Total	604	12	1	786	90	18	1511
06:00 PM	128	2	1	167	15	5	318
06:15 PM	117	3	0	132	4	1	257
Grand Total	1440	35	5	1816	213	39	3548
Apprch %	97.6	2.4	0.3	99.7	84.5	15.5	
Total %	40.6	1	0.1	51.2	6	1.1	
Cars	1433	35	5	1804	213	39	3529
% Cars	99.5	100	100	99.3	100	100	99.5
Trucks	7	0	0	12	0	0	19
% Trucks	0.5	0	0	0.7	0	0	0.5

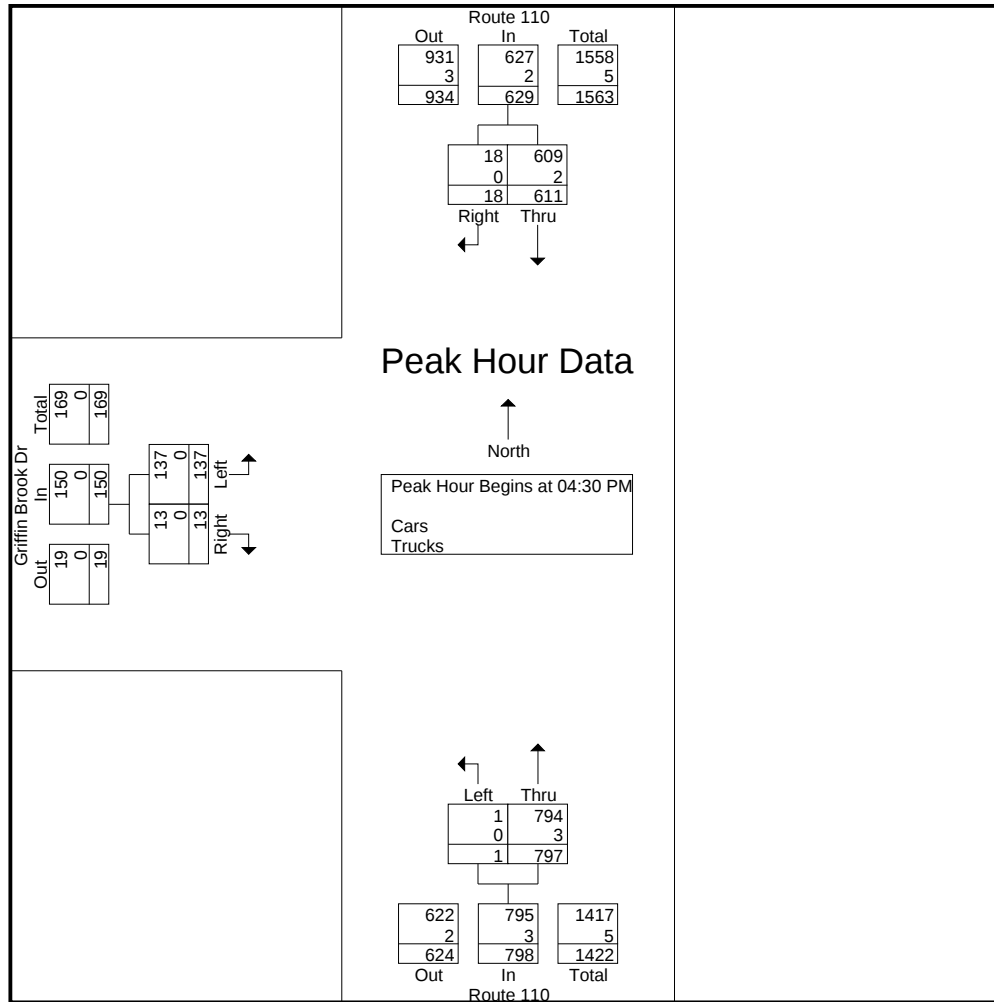
	Route 110 From North			Route 110 From South			Griffin Brook Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	151	6	157	0	188	188	51	6	57	402
04:45 PM	147	5	152	0	181	181	27	1	28	361
05:00 PM	140	4	144	0	220	220	33	4	37	401
05:15 PM	173	3	176	1	208	209	26	2	28	413
Total Volume	611	18	629	1	797	798	137	13	150	1577
% App. Total	97.1	2.9		0.1	99.9		91.3	8.7		
PHF	.883	.750	.893	.250	.906	.907	.672	.542	.658	.955
Cars	609	18	627	1	794	795	137	13	150	1572
% Cars	99.7	100	99.7	100	99.6	99.6	100	100	100	99.7
Trucks	2	0	2	0	3	3	0	0	0	5
% Trucks	0.3	0	0.3	0	0.4	0.4	0	0	0	0.3

Accurate Counts

978-664-2565

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 2



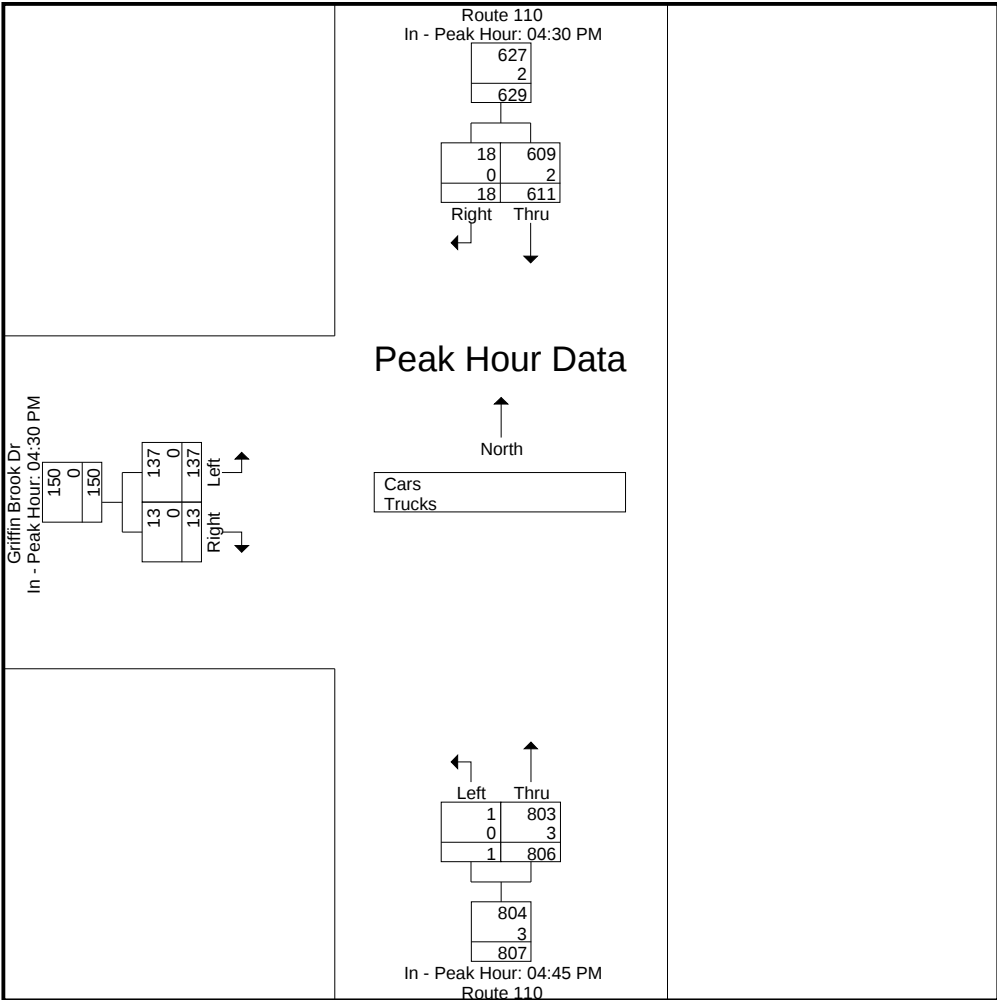
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:30 PM			04:45 PM			04:30 PM		
+0 mins.	151	6	157	0	181	181	51	6	57
+15 mins.	147	5	152	0	220	220	27	1	28
+30 mins.	140	4	144	1	208	209	33	4	37
+45 mins.	173	3	176	0	197	197	26	2	28
Total Volume	611	18	629	1	806	807	137	13	150
% App. Total	97.1	2.9		0.1	99.9		91.3	8.7	
PHF	.883	.750	.893	.250	.916	.917	.672	.542	.658
Cars	609	18	627	1	803	804	137	13	150
% Cars	99.7	100	99.7	100	99.6	99.6	100	100	100
Trucks	2	0	2	0	3	3	0	0	0
% Trucks	0.3	0	0.3	0	0.4	0.4	0	0	0

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 4

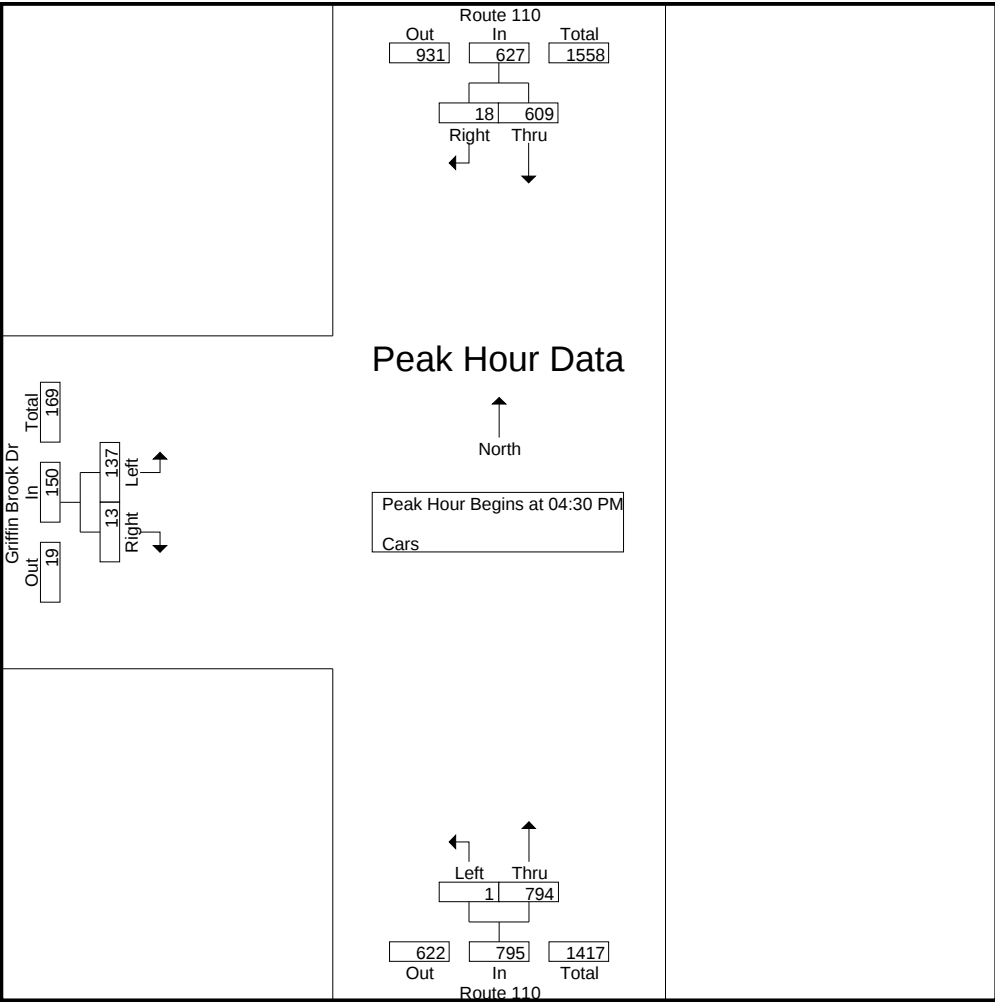
Groups Printed- Cars

	Route 110 From North			Route 110 From South			Griffin Brook Dr From West			
Start Time	Thru	Right		Left	Thru		Left	Right		Int. Total
04:00 PM	139	4		1	176		13	4		337
04:15 PM	153	3		2	181		13	4		356
04:30 PM	151	6		0	188		51	6		402
04:45 PM	146	5		0	180		27	1		359
Total	589	18		3	725		104	15		1454
05:00 PM	140	4		0	219		33	4		400
05:15 PM	172	3		1	207		26	2		411
05:30 PM	149	1		0	197		21	9		377
05:45 PM	140	4		0	160		10	3		317
Total	601	12		1	783		90	18		1505
06:00 PM	127	2		1	167		15	5		317
06:15 PM	116	3		0	129		4	1		253
Grand Total	1433	35		5	1804		213	39		3529
Apprch %	97.6	2.4		0.3	99.7		84.5	15.5		
Total %	40.6	1		0.1	51.1		6	1.1		

	Route 110 From North			Route 110 From South			Griffin Brook Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	151	6	157	0	188	188	51	6	57	402
04:45 PM	146	5	151	0	180	180	27	1	28	359
05:00 PM	140	4	144	0	219	219	33	4	37	400
05:15 PM	172	3	175	1	207	208	26	2	28	411
Total Volume	609	18	627	1	794	795	137	13	150	1572
% App. Total	97.1	2.9		0.1	99.9		91.3	8.7		
PHF	.885	.750	.896	.250	.906	.908	.672	.542	.658	.956

N/S Street : Route 110
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Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 5

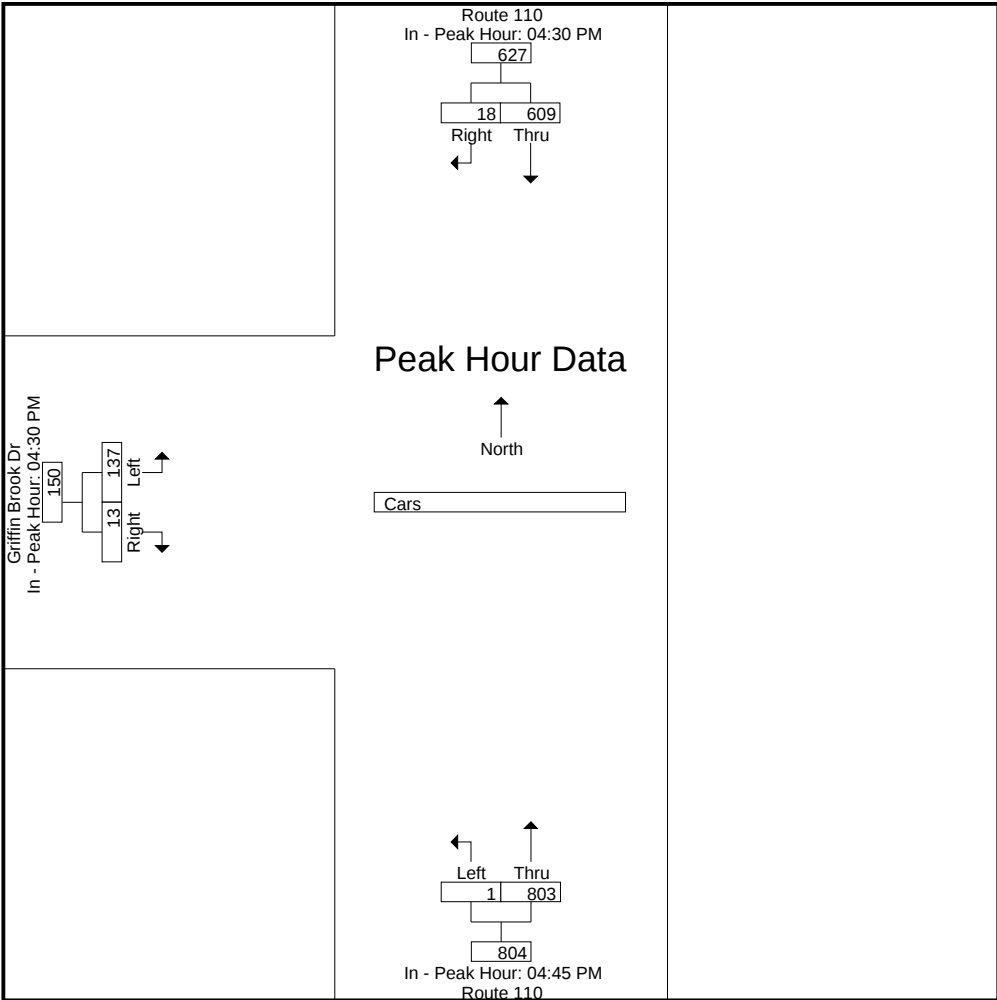


Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM			04:45 PM			04:30 PM		
+0 mins.	151	6	157	0	180	180	51	6	57
+15 mins.	146	5	151	0	219	219	27	1	28
+30 mins.	140	4	144	1	207	208	33	4	37
+45 mins.	172	3	175	0	197	197	26	2	28
Total Volume	609	18	627	1	803	804	137	13	150
% App. Total	97.1	2.9		0.1	99.9		91.3	8.7	
PHF	.885	.750	.896	.250	.917	.918	.672	.542	.658

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 7

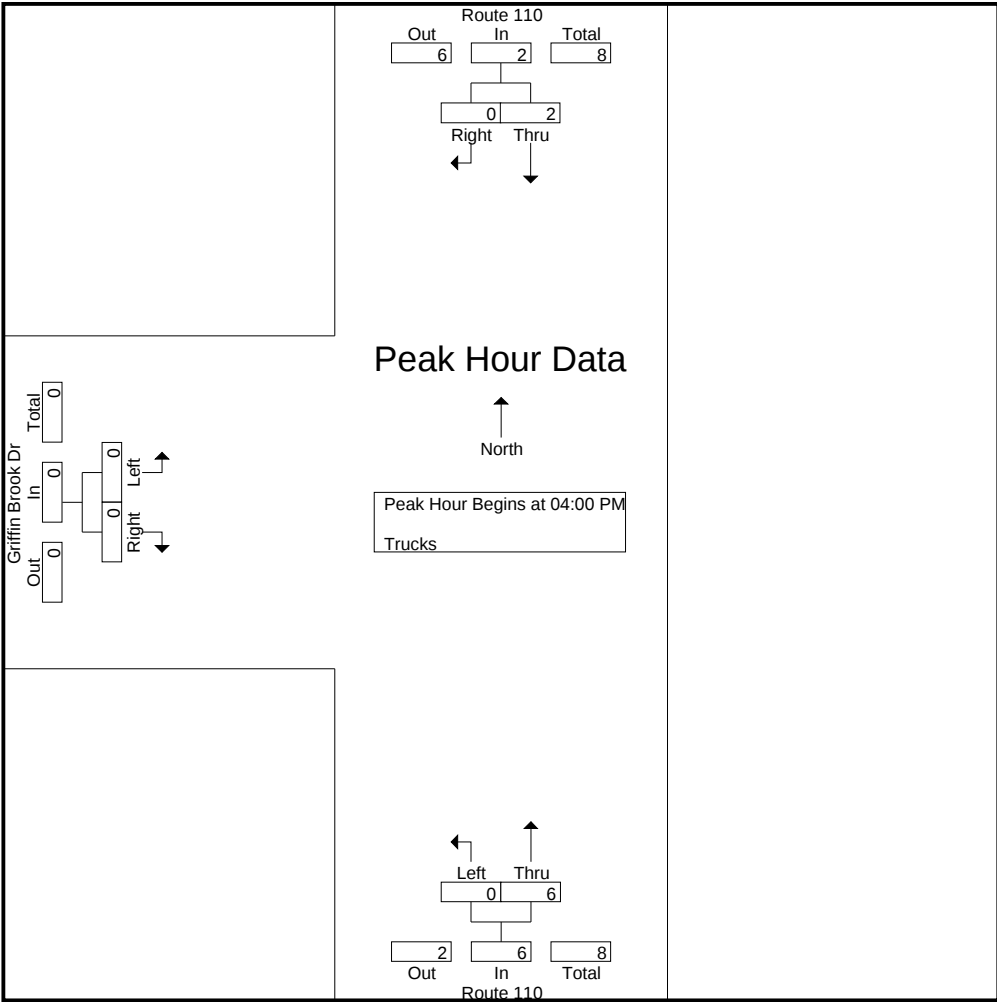
Groups Printed- Trucks

	Route 110 From North		Route 110 From South		Griffin Brook Dr From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	0	0	0	3	0	0	3
04:15 PM	1	0	0	2	0	0	3
04:30 PM	0	0	0	0	0	0	0
04:45 PM	1	0	0	1	0	0	2
Total	2	0	0	6	0	0	8
05:00 PM	0	0	0	1	0	0	1
05:15 PM	1	0	0	1	0	0	2
05:30 PM	1	0	0	0	0	0	1
05:45 PM	1	0	0	1	0	0	2
Total	3	0	0	3	0	0	6
06:00 PM	1	0	0	0	0	0	1
06:15 PM	1	0	0	3	0	0	4
Grand Total	7	0	0	12	0	0	19
Apprch %	100	0	0	100	0	0	
Total %	36.8	0	0	63.2	0	0	

	Route 110 From North			Route 110 From South			Griffin Brook Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	3	3	0	0	0	3
04:15 PM	1	0	1	0	2	2	0	0	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	1	0	1	0	1	1	0	0	0	2
Total Volume	2	0	2	0	6	6	0	0	0	8
% App. Total	100	0		0	100		0	0		
PHF	.500	.000	.500	.000	.500	.500	.000	.000	.000	.667

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 8

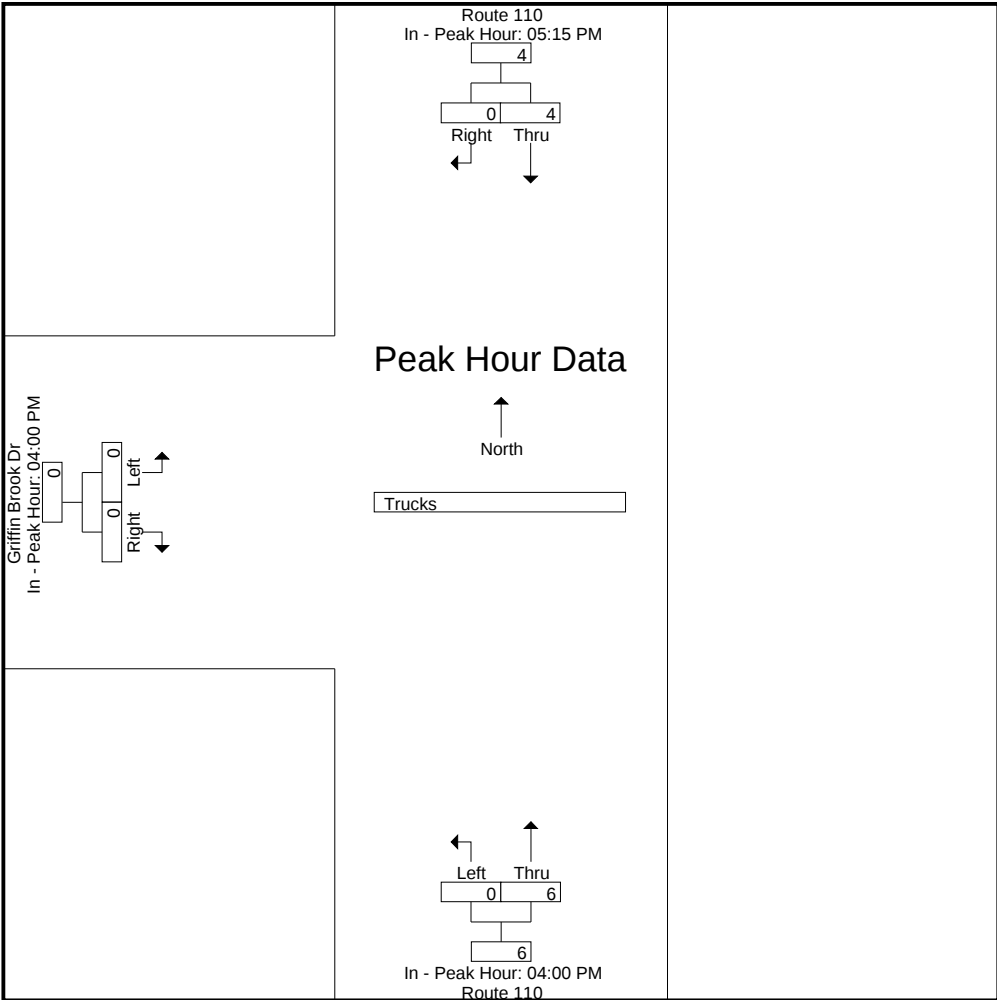


Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:15 PM			04:00 PM			04:00 PM		
+0 mins.	1	0	1	0	3	3	0	0	0
+15 mins.	1	0	1	0	2	2	0	0	0
+30 mins.	1	0	1	0	0	0	0	0	0
+45 mins.	1	0	1	0	1	1	0	0	0
Total Volume	4	0	4	0	6	6	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	1.000	.000	1.000	.000	.500	.500	.000	.000	.000

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 10

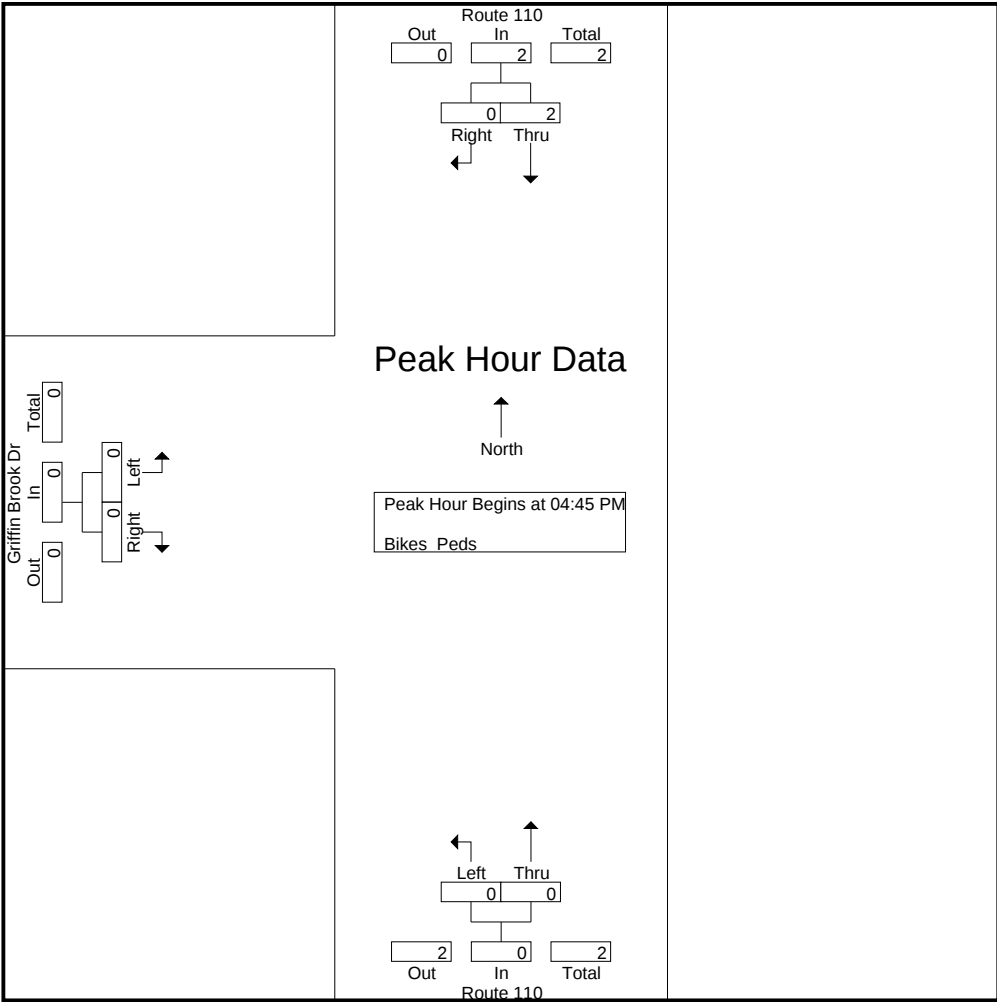
Groups Printed- Bikes Peds

	Route 110 From North			Route 110 From South			Griffin Brook Dr From West			Exclu. Total	Inclu. Total	Int. Total
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds			
04:00 PM	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
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	1	0	0	0	0	0	0	0	0	0	1	1
Total	1	0	0	0	0	0	0	0	0	0	1	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	1	0	0	0	0	0	2	3	0	3
05:30 PM	1	0	1	0	0	0	0	0	0	1	1	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	2	0	0	0	0	0	2	4	1	5
06:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
06:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	2	0	2	0	0	0	0	0	2	4	2	6
Apprch %	100	0		0	0		0	0				
Total %	100	0		0	0		0	0		66.7	33.3	

	Route 110 From North			Route 110 From South			Griffin Brook Dr From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	1	0		1	0	0	0	0	0	1
05:00 PM	0	0		0	0	0	0	0	0	0
05:15 PM	0	0		0	0	0	0	0	0	0
05:30 PM	1	0		1	0	0	0	0	0	1
Total Volume	2	0		2	0	0	0	0	0	2
% App. Total	100	0			0	0	0	0		
PHF	.500	.000		.500	.000	.000	.000	.000	.000	.500

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 11

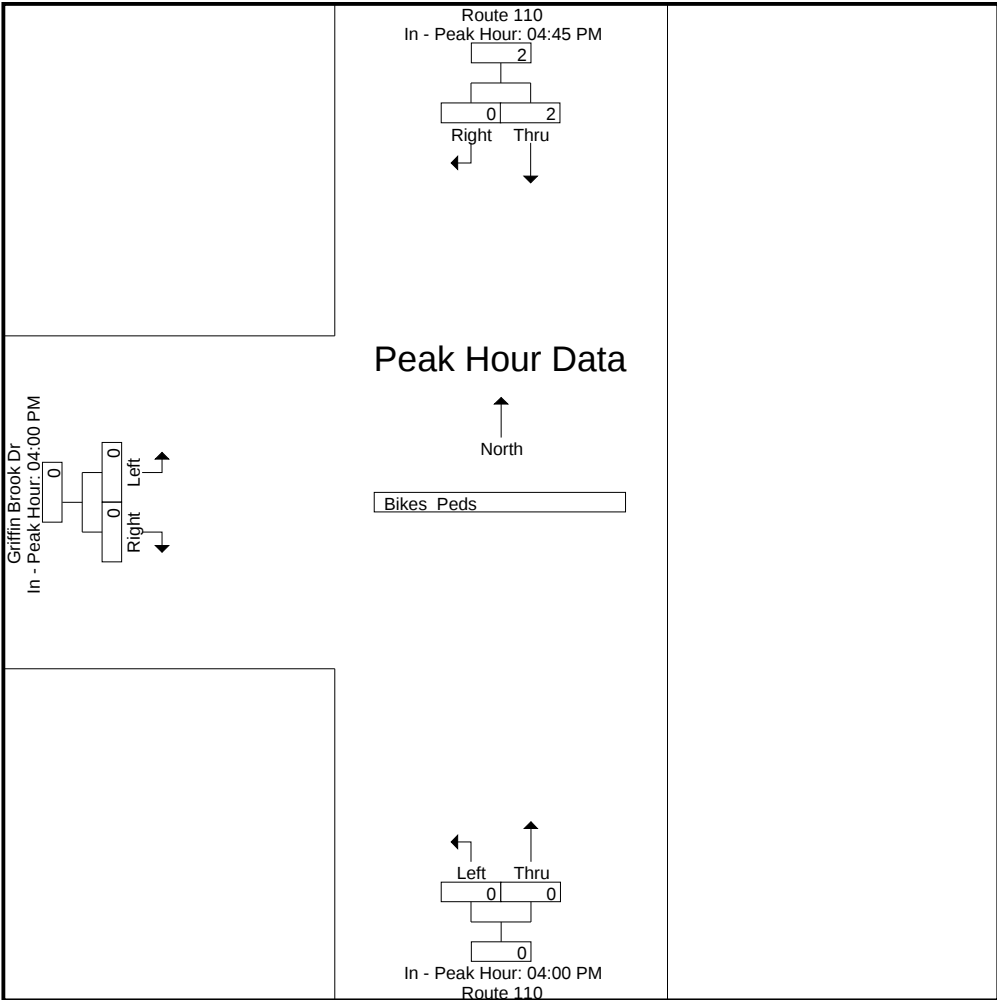


Peak Hour Analysis From 04:00 PM to 06:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:00 PM			04:00 PM		
+0 mins.	1	0	1	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.	1	0	1	0	0	0	0	0	0
Total Volume	2	0	2	0	0	0	0	0	0
% App. Total	100	0		0	0		0	0	
PHF	.500	.000	.500	.000	.000	.000	.000	.000	.000

N/S Street : Route 110
E/W Street : Griffin Brook Drive
City/State : Methuen, MA
Weather : Clear

File Name : 31680001
Site Code : 31680001
Start Date : 7/10/2024
Page No : 12



Accurate Counts
978-664-2565

Location : Lowell Street (Route 110)
Location : North of Griffin Brook Drive
City/State: Methuen, MA
Direction: SB,

Site Code: 31680001

7/10/2024	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	Total
12:00 AM	0	0	1	8	16	10	12	1	2	0	0	0	0	50
1:00	0	0	2	12	9	8	4	0	0	0	0	0	0	35
2:00	0	0	1	7	8	9	3	0	0	0	0	0	0	28
3:00	0	0	0	3	6	6	6	1	0	0	0	0	0	22
4:00	0	0	3	11	14	20	7	4	0	0	0	1	0	60
5:00	0	1	2	9	20	75	40	10	1	1	0	0	0	159
6:00	0	0	0	17	74	140	79	23	3	0	0	0	0	336
7:00	0	0	7	18	135	207	115	33	3	0	0	0	0	518
8:00	0	0	4	70	218	266	86	16	0	0	0	0	0	660
9:00	0	0	1	39	119	166	71	7	2	0	0	0	0	405
10:00	0	0	8	28	86	128	72	14	1	0	0	0	0	337
11:00	0	6	6	26	120	144	44	9	0	0	0	0	0	355
12:00 PM	0	0	7	62	135	153	49	3	0	0	0	0	0	409
1:00	0	0	10	46	135	167	64	10	0	0	0	0	0	432
2:00	0	0	5	52	154	170	68	12	0	0	0	0	0	461
3:00	0	1	6	63	144	217	66	13	0	0	0	0	0	510
4:00	0	0	3	56	168	220	75	29	1	0	0	0	0	552
5:00	0	2	8	67	195	216	72	7	1	1	0	0	0	569
6:00	0	1	6	35	144	181	63	9	2	0	0	0	0	441
7:00	0	0	3	34	125	176	61	6	1	0	0	0	0	406
8:00	0	0	0	46	131	124	32	4	2	0	0	0	0	339
9:00	0	0	6	21	88	88	40	9	1	0	0	0	0	253
10:00	0	0	5	23	61	45	30	7	3	0	0	0	0	174
11:00	0	0	0	16	41	43	29	6	0	0	0	0	0	135
Total	0	11	94	769	2346	2979	1188	233	23	2	0	1	0	7646

Percentile	15th	50th	85th	95th
Speed	30	35	40	43
Mean Speed (Average)	36.4			
10 MPH Pace Speed	31-40			
Number in Pace	5325			
Percent in Pace	70.0%			
Number > 35 MPH	4426			
Percent > 35 MPH	57.9%			

Accurate Counts
978-664-2565

Location : Lowell Street (Route 110)
Location : North of Griffin Brook Drive
City/State: Methuen, MA
Direction: SB,

Site Code: 31680001

7/11/2024 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	1	3	12	15	17	4	1	1	0	0	0	0	54
1:00	0	0	1	10	15	9	9	3	1	1	0	0	0	49
2:00	0	0	4	9	9	8	3	2	0	0	0	0	0	35
3:00	0	0	3	1	5	6	6	0	2	0	1	0	0	24
4:00	0	0	1	11	8	17	12	4	3	0	0	0	0	56
5:00	0	0	0	10	46	59	41	11	4	1	0	0	0	172
6:00	0	1	5	11	71	145	68	19	3	2	0	0	0	325
7:00	0	0	1	19	135	213	123	19	0	0	0	0	0	510
8:00	0	4	16	72	208	233	60	12	2	0	0	0	0	607
9:00	0	0	5	47	123	125	79	14	2	2	0	0	0	397
10:00	0	0	1	50	128	139	46	8	0	0	0	0	0	372
11:00	0	6	15	28	141	158	49	3	2	0	0	0	0	402
12:00 PM	0	0	6	43	164	151	51	8	0	0	0	0	0	423
1:00	0	0	4	17	129	166	40	5	4	0	0	0	0	365
2:00	2	1	9	47	134	195	84	15	0	1	0	0	0	488
3:00	0	0	15	76	214	195	56	12	3	0	0	0	0	571
4:00	4	0	14	70	228	244	67	7	0	0	0	0	0	634
5:00	0	1	11	74	207	237	64	11	0	0	0	0	0	605
6:00	0	0	7	35	148	179	63	6	6	0	0	0	0	444
7:00	0	1	4	24	102	156	78	8	0	0	0	0	0	373
8:00	0	0	5	34	121	144	60	3	0	0	0	0	0	367
9:00	0	0	3	20	105	112	35	8	3	0	0	0	0	286
10:00	0	0	2	31	46	68	31	11	2	1	0	0	0	192
11:00	0	0	1	14	28	39	21	16	3	0	0	0	0	122
Total	6	15	136	765	2530	3015	1150	206	41	8	1	0	0	7873

Percentile	15th	50th	85th	95th
Speed	30	35	39	42
Mean Speed (Average)	36.2			
10 MPH Pace Speed	31-40			
Number in Pace	5364			
Percent in Pace	71.0%			
Number > 35 MPH	4421			
Percent > 35 MPH	56.2%			

Grand Total	6	26	230	1534	4876	5994	2338	439	64	10	1	1	0	15519
Percentile				15th	50th	85th	95th							
Speed				30	35	40	42							
Mean Speed (Average)				36.3										
10 MPH Pace Speed				31-40										
Number in Pace				10803										
Percent in Pace				70.0%										
Number > 35 MPH				8847										
Percent > 35 MPH				57.0%										

Accurate Counts
978-664-2565

Location : Lowell Street (Route 110)
Location : North of Griffin Brook Drive
City/State: Methuen, MA
Direction: NB,

Site Code: 31680001

7/10/2024	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	Total
12:00 AM	0	0	1	4	15	15	17	7	2	2	1	0	0	64
1:00	0	0	1	1	4	12	9	6	0	1	0	0	0	34
2:00	0	0	1	1	8	7	5	1	1	0	0	0	0	24
3:00	0	0	0	0	4	5	10	7	5	1	0	0	0	32
4:00	0	0	0	0	6	22	33	28	9	1	0	0	0	99
5:00	0	0	0	1	11	51	78	55	18	6	0	0	0	220
6:00	0	0	1	7	31	113	210	83	19	2	0	0	0	466
7:00	0	2	6	30	43	159	181	92	20	2	0	1	0	536
8:00	0	1	5	37	102	151	133	86	17	2	0	0	2	536
9:00	0	2	10	20	81	191	121	43	5	3	1	0	0	477
10:00	0	1	5	16	95	161	126	21	1	0	0	0	0	426
11:00	0	2	15	34	83	163	127	33	9	2	0	0	0	468
12:00 PM	1	5	11	42	120	167	140	44	7	1	0	0	0	538
1:00	0	1	6	18	79	151	154	46	9	3	0	0	0	467
2:00	0	2	2	27	81	220	161	74	19	5	1	0	1	593
3:00	1	3	24	78	180	302	172	62	4	1	1	0	1	829
4:00	1	11	11	66	173	284	212	65	6	1	2	0	0	832
5:00	1	1	53	92	153	295	186	46	6	2	3	0	0	838
6:00	0	0	8	22	90	170	177	42	11	0	0	0	0	520
7:00	0	1	5	9	46	119	120	59	9	0	0	0	0	368
8:00	0	0	2	4	57	142	92	37	4	0	2	0	0	340
9:00	0	0	0	2	51	107	92	29	4	0	0	0	0	285
10:00	0	0	1	0	31	85	61	12	1	1	0	0	0	192
11:00	0	0	1	1	12	31	46	21	7	2	0	0	0	121
Total	4	32	169	512	1556	3123	2663	999	193	38	11	1	4	9305

Percentile	15th	50th	85th	95th
Speed	32	38	44	47
Mean Speed (Average)	39.2			
10 MPH Pace Speed	36-45			
Number in Pace	5786			
Percent in Pace	62.0%			
Number > 35 MPH	7032			
Percent > 35 MPH	75.6%			

Accurate Counts
978-664-2565

Location : Lowell Street (Route 110)
Location : North of Griffin Brook Drive
City/State: Methuen, MA
Direction: NB,

Site Code: 31680001

7/11/2024	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	Total
12:00 AM	0	0	0	1	6	17	14	8	4	2	0	1	0	53
1:00	0	0	1	1	3	17	10	6	1	0	1	0	0	40
2:00	0	0	0	0	3	15	11	5	1	2	0	0	0	37
3:00	0	0	0	1	5	8	12	10	5	0	0	0	0	41
4:00	0	0	0	0	2	21	36	23	6	4	0	0	0	92
5:00	0	0	0	1	10	39	79	63	21	0	0	0	1	214
6:00	0	0	4	7	24	93	175	85	16	4	0	0	0	408
7:00	0	1	4	9	48	159	221	99	13	3	0	0	0	557
8:00	0	1	4	25	58	181	207	54	17	1	1	0	0	549
9:00	0	2	4	16	62	147	172	68	12	3	0	0	0	486
10:00	0	6	11	24	63	174	105	39	11	3	0	0	0	436
11:00	0	0	11	36	100	166	137	43	6	0	0	0	3	502
12:00 PM	0	3	14	39	118	167	132	41	9	2	1	0	1	527
1:00	0	1	4	18	72	173	170	51	9	2	1	2	2	505
2:00	0	3	13	34	112	203	221	34	9	0	0	0	0	629
3:00	2	11	29	93	227	276	191	47	4	1	0	0	0	881
4:00	1	2	35	82	199	280	225	45	8	2	1	0	1	881
5:00	1	2	17	94	210	285	189	42	11	0	0	0	0	851
6:00	0	0	2	20	72	188	196	59	12	1	0	0	1	551
7:00	0	0	3	11	50	152	128	42	6	3	0	0	0	395
8:00	1	0	1	14	52	153	79	32	3	0	0	0	0	335
9:00	0	2	5	6	71	137	92	25	4	0	0	0	0	342
10:00	0	0	1	7	28	57	60	35	8	0	1	0	0	197
11:00	0	0	0	5	18	54	35	21	7	2	0	0	0	142
Total	5	34	163	544	1613	3162	2897	977	203	35	6	3	9	9651

Percentile	15th	50th	85th	95th
Speed	32	38	44	47
Mean Speed (Average)	39.2			
10 MPH Pace Speed	36-45			
Number in Pace	5853			
Percent in Pace	63.0%			
Number > 35 MPH	7292			
Percent > 35 MPH	75.6%			

Grand Total	9	66	332	1056	3169	6285	5560	1976	396	73	17	4	13	18956
Percentile				15th	50th	85th	95th							
Speed				32	38	44	47							
Mean Speed (Average)				39.2										
10 MPH Pace Speed				36-45										
Number in Pace				11756										
Percent in Pace				62.0%										
Number > 35 MPH				14324										
Percent > 35 MPH				75.6%										

Accurate Counts
978-664-2565

Location : Lowell Street (Route 110)
Location : North of Griffin Brook Drive
City/State: Methuen, MA
Direction: Combined

Site Code: 31680001

7/10/2024	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	Total
12:00 AM	0	0	2	12	31	25	29	8	4	2	1	0	0	114
1:00	0	0	3	13	13	20	13	6	0	1	0	0	0	69
2:00	0	0	2	8	16	16	8	1	1	0	0	0	0	52
3:00	0	0	0	3	10	11	16	8	5	1	0	0	0	54
4:00	0	0	3	11	20	42	40	32	9	1	0	1	0	159
5:00	0	1	2	10	31	126	118	65	19	7	0	0	0	379
6:00	0	0	1	24	105	253	289	106	22	2	0	0	0	802
7:00	0	2	13	48	178	366	296	125	23	2	0	1	0	1054
8:00	0	1	9	107	320	417	219	102	17	2	0	0	2	1196
9:00	0	2	11	59	200	357	192	50	7	3	1	0	0	882
10:00	0	1	13	44	181	289	198	35	2	0	0	0	0	763
11:00	0	8	21	60	203	307	171	42	9	2	0	0	0	823
12:00 PM	1	5	18	104	255	320	189	47	7	1	0	0	0	947
1:00	0	1	16	64	214	318	218	56	9	3	0	0	0	899
2:00	0	2	7	79	235	390	229	86	19	5	1	0	1	1054
3:00	1	4	30	141	324	519	238	75	4	1	1	0	1	1339
4:00	1	11	14	122	341	504	287	94	7	1	2	0	0	1384
5:00	1	3	61	159	348	511	258	53	7	3	3	0	0	1407
6:00	0	1	14	57	234	351	240	51	13	0	0	0	0	961
7:00	0	1	8	43	171	295	181	65	10	0	0	0	0	774
8:00	0	0	2	50	188	266	124	41	6	0	2	0	0	679
9:00	0	0	6	23	139	195	132	38	5	0	0	0	0	538
10:00	0	0	6	23	92	130	91	19	4	1	0	0	0	366
11:00	0	0	1	17	53	74	75	27	7	2	0	0	0	256
Total	4	43	263	1281	3902	6102	3851	1232	216	40	11	2	4	16951
Percentile				15th	50th	85th	95th							
Speed				31	36	42	46							
Mean Speed (Average)				37.9										
10 MPH Pace Speed				33-42										
Number in Pace				10029										
Percent in Pace				59.0%										
Number > 35 MPH				11458										
Percent > 35 MPH				67.6%										

Accurate Counts
978-664-2565

Location : Lowell Street (Route 110)
Location : North of Griffin Brook Drive
City/State: Methuen, MA
Direction: Combined

Site Code: 31680001

7/11/2024	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	Total
12:00 AM	0	1	3	13	21	34	18	9	5	2	0	1	0	107
1:00	0	0	2	11	18	26	19	9	2	1	1	0	0	89
2:00	0	0	4	9	12	23	14	7	1	2	0	0	0	72
3:00	0	0	3	2	10	14	18	10	7	0	1	0	0	65
4:00	0	0	1	11	10	38	48	27	9	4	0	0	0	148
5:00	0	0	0	11	56	98	120	74	25	1	0	0	1	386
6:00	0	1	9	18	95	238	243	104	19	6	0	0	0	733
7:00	0	1	5	28	183	372	344	118	13	3	0	0	0	1067
8:00	0	5	20	97	266	414	267	66	19	1	1	0	0	1156
9:00	0	2	9	63	185	272	251	82	14	5	0	0	0	883
10:00	0	6	12	74	191	313	151	47	11	3	0	0	0	808
11:00	0	6	26	64	241	324	186	46	8	0	0	0	3	904
12:00 PM	0	3	20	82	282	318	183	49	9	2	1	0	1	950
1:00	0	1	8	35	201	339	210	56	13	2	1	2	2	870
2:00	2	4	22	81	246	398	305	49	9	1	0	0	0	1117
3:00	2	11	44	169	441	471	247	59	7	1	0	0	0	1452
4:00	5	2	49	152	427	524	292	52	8	2	1	0	1	1515
5:00	1	3	28	168	417	522	253	53	11	0	0	0	0	1456
6:00	0	0	9	55	220	367	259	65	18	1	0	0	1	995
7:00	0	1	7	35	152	308	206	50	6	3	0	0	0	768
8:00	1	0	6	48	173	297	139	35	3	0	0	0	0	702
9:00	0	2	8	26	176	249	127	33	7	0	0	0	0	628
10:00	0	0	3	38	74	125	91	46	10	1	1	0	0	389
11:00	0	0	1	19	46	93	56	37	10	2	0	0	0	264
Total	11	49	299	1309	4143	6177	4047	1183	244	43	7	3	9	17524

Percentile	15th	50th	85th	95th
Speed	31	36	42	46
Mean Speed (Average)	37.9			
10 MPH Pace Speed	32-41			
Number in Pace	9990			
Percent in Pace	59.0%			
Number > 35 MPH	11713			
Percent > 35 MPH	66.8%			

Grand Total	15	92	562	2590	8045	12279	7898	2415	460	83	18	5	13	34475
Percentile				15th	50th	85th	95th							
Speed				31	36	42	46							
Mean Speed (Average)				37.9										
10 MPH Pace Speed				33-42										
Number in Pace				20220										
Percent in Pace				59.0%										
Number > 35 MPH				23171										
Percent > 35 MPH				67.2%										

Accurate Counts
978-664-2565

Location : Lowell Street (Route 110)
Location : North of Griffin Brook Drive
City/State: Methuen, MA

Site Code: 31680001

7/10/2024	SB,		Hour Totals		NB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	18	88			25	142				
12:15	14	98			17	151				
12:30	8	126			16	111				
12:45	10	97	50	409	6	134	64	538	114	947
1:00	10	87			5	105				
1:15	11	111			14	119				
1:30	9	122			6	132				
1:45	5	112	35	432	9	111	34	467	69	899
2:00	12	97			10	129				
2:15	4	134			7	151				
2:30	5	117			5	138				
2:45	7	113	28	461	2	175	24	593	52	1054
3:00	4	106			6	192				
3:15	6	129			8	197				
3:30	6	138			7	250				
3:45	6	137	22	510	11	190	32	829	54	1339
4:00	10	134			10	186				
4:15	15	146			26	198				
4:30	13	150			25	246				
4:45	22	122	60	552	38	202	99	832	159	1384
5:00	22	139			37	232				
5:15	41	170			41	229				
5:30	52	130			71	201				
5:45	44	130	159	569	71	176	220	838	379	1407
6:00	56	136			91	165				
6:15	52	96			110	133				
6:30	104	100			156	126				
6:45	124	109	336	441	109	96	466	520	802	961
7:00	89	107			123	91				
7:15	128	104			153	90				
7:30	153	117			138	104				
7:45	148	78	518	406	122	83	536	368	1054	774
8:00	194	79			130	99				
8:15	172	89			96	84				
8:30	147	80			167	69				
8:45	147	91	660	339	143	88	536	340	1196	679
9:00	129	72			115	78				
9:15	115	67			123	74				
9:30	61	67			119	69				
9:45	100	47	405	253	120	64	477	285	882	538
10:00	92	49			106	44				
10:15	83	39			123	58				
10:30	87	46			116	39				
10:45	75	40	337	174	81	51	426	192	763	366
11:00	93	29			100	36				
11:15	67	35			115	31				
11:30	100	43			132	27				
11:45	95	28	355	135	121	27	468	121	823	256
Total	2965	4681			3382	5923			6347	10604
Percent	38.8%	61.2%			36.3%	63.7%			37.4%	62.6%

Accurate Counts
978-664-2565

Location : Lowell Street (Route 110)
Location : North of Griffin Brook Drive
City/State: Methuen, MA

Site Code: 31680001

7/11/2024	SB,		Hour Totals		NB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	20	111			18	137				
12:15	15	102			18	161				
12:30	6	91			11	118				
12:45	13	119	54	423	6	111	53	527	107	950
1:00	10	92			8	109				
1:15	13	86			12	129				
1:30	15	84			11	123				
1:45	11	103	49	365	9	144	40	505	89	870
2:00	4	111			11	150				
2:15	15	125			9	157				
2:30	9	134			10	143				
2:45	7	118	35	488	7	179	37	629	72	1117
3:00	2	107			11	164				
3:15	3	160			7	226				
3:30	10	158			8	280				
3:45	9	146	24	571	15	211	41	881	65	1452
4:00	9	154			12	199				
4:15	15	139			18	227				
4:30	15	148			27	207				
4:45	17	193	56	634	35	248	92	881	148	1515
5:00	26	170			32	227				
5:15	31	173			42	228				
5:30	60	129			74	207				
5:45	55	133	172	605	66	189	214	851	386	1456
6:00	57	122			82	161				
6:15	55	136			92	136				
6:30	107	90			112	131				
6:45	106	96	325	444	122	123	408	551	733	995
7:00	93	109			132	90				
7:15	130	92			137	103				
7:30	135	92			155	109				
7:45	152	80	510	373	133	93	557	395	1067	768
8:00	163	99			137	85				
8:15	152	69			112	79				
8:30	155	96			157	86				
8:45	137	103	607	367	143	85	549	335	1156	702
9:00	107	86			124	84				
9:15	105	85			139	86				
9:30	75	68			120	86				
9:45	110	47	397	286	103	86	486	342	883	628
10:00	95	62			94	57				
10:15	91	46			131	66				
10:30	86	48			105	36				
10:45	100	36	372	192	106	38	436	197	808	389
11:00	94	49			135	36				
11:15	85	28			111	50				
11:30	102	26			121	32				
11:45	121	19	402	122	135	24	502	142	904	264
Total	3003	4870			3415	6236			6418	11106
Percent	38.1%	61.9%			35.4%	64.6%			36.6%	63.4%
Grand Total	5968	9551			6797	12159			12765	21710
Percent	38.5%	61.5%			35.9%	64.1%			37.0%	63.0%

ADT

ADT: 17,238

AADT: 17,238

Accurate Counts
978-664-2565

Location : Lowell Street (Route 110)
Location : North of Griffin Brook Drive
City/State: Methuen, MA

Site Code: 31680001

7/8/2024	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Week Average	
Time	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,	SB,	NB,
0:00	*	*	*	*	50	64	54	53	*	*	*	*	*	*	52	58
1:00	*	*	*	*	35	34	49	40	*	*	*	*	*	*	42	37
2:00	*	*	*	*	28	24	35	37	*	*	*	*	*	*	32	30
3:00	*	*	*	*	22	32	24	41	*	*	*	*	*	*	23	36
4:00	*	*	*	*	60	99	56	92	*	*	*	*	*	*	58	96
5:00	*	*	*	*	159	220	172	214	*	*	*	*	*	*	166	217
6:00	*	*	*	*	336	466	325	408	*	*	*	*	*	*	330	437
7:00	*	*	*	*	518	536	510	557	*	*	*	*	*	*	514	546
8:00	*	*	*	*	660	536	607	549	*	*	*	*	*	*	634	542
9:00	*	*	*	*	405	477	397	486	*	*	*	*	*	*	401	482
10:00	*	*	*	*	337	426	372	436	*	*	*	*	*	*	354	431
11:00	*	*	*	*	355	468	402	502	*	*	*	*	*	*	378	485
12:00	*	*	*	*	409	538	423	527	*	*	*	*	*	*	416	532
13:00	*	*	*	*	432	467	365	505	*	*	*	*	*	*	398	486
14:00	*	*	*	*	461	593	488	629	*	*	*	*	*	*	474	611
15:00	*	*	*	*	510	829	571	881	*	*	*	*	*	*	540	855
16:00	*	*	*	*	552	832	634	881	*	*	*	*	*	*	593	856
17:00	*	*	*	*	569	838	605	851	*	*	*	*	*	*	587	844
18:00	*	*	*	*	441	520	444	551	*	*	*	*	*	*	442	536
19:00	*	*	*	*	406	368	373	395	*	*	*	*	*	*	390	382
20:00	*	*	*	*	339	340	367	335	*	*	*	*	*	*	353	338
21:00	*	*	*	*	253	285	286	342	*	*	*	*	*	*	270	314
22:00	*	*	*	*	174	192	192	197	*	*	*	*	*	*	183	194
23:00	*	*	*	*	135	121	122	142	*	*	*	*	*	*	128	132
Total	0	0	0	0	7646	9305	7873	9651	0	0	0	0	0	0	7758	9477
Day	0		0		16951		17524		0		0		0		17235	
AM Peak					8:00	7:00	8:00	7:00							8:00	7:00
Volume					660	536	607	557							634	546
PM Peak					17:00	17:00	16:00	15:00							16:00	16:00
Volume					569	838	634	881							593	856
Comb Total	0		0		16951		17524		0		0		0		17235	

SEASONAL ADJUSTMENT DATA

Massachusetts Highway Department
511: Monthly Hourly Volume for January 2022

Location ID:	511
County:	Essex
Functional Class	1
Location:	INTERSTATE 93

Seasonal Factor Group: U1-Essex
Daily Factor Group:
Axle Factor Group: U1-Essex
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
1	1223	1283	818	633	517	669	1054	1503	1828	2749	4033	5600	6339	6722	6612	6443	5832	5200	4353	3363	2759	2210	1603	1195	74541
2	759	498	407	397	491	798	1356	1961	2796	4095	5784	7245	7923	7947	7544	7087	6679	6119	4997	3687	2757	2072	1494	1021	85914
3	609	494	513	701	1846	4762	6341	7144	6823	5731	5946	6224	6592	7314	8777	9267	8566	7476	5127	3483	2801	2086	1559	1188	111370
4	756	570	581	719	2010	5287	7185	8398	7462	6129	5698	5849	6338	7202	8851	10118	9270	8366	5638	4007	2918	2229	2042	1468	119091
5	714	625	524	668	1960	5214	6863	7991	7267	5353	4196	5025	5780	6550	8307	9592	8502	7723	5415	3831	2916	2140	1753	1357	110266
6	725	569	575	709	1970	5103	7053	8335	7775	6676	6315	6736	7001	7860	9589	9635	10473	9314	7054	5108	4000	3017	2373	1818	129783
7	988	749	710	889	1773	3094	3224	3591	2816	2277	2562	2690	3409	4298	5466	5842	5619	5296	4634	3292	2429	1891	1620	1274	70433
8	781	584	446	501	880	1851	3287	4922	4953	5464	6752	7446	7789	8047	8054	8011	7722	7287	5753	4303	3216	2716	2365	1680	104810
9	1052	686	457	407	487	918	1921	2530	2951	3715	4793	6009	6885	7101	7282	7348	6651	5673	4669	3386	2873	2106	1385	966	82251
10	652	492	482	697	1935	5237	6966	8235	7462	5966	5745	6071	6134	7120	8685	9958	8870	8156	5555	3858	2910	2150	1651	1533	116520
11	753	521	569	842	1899	4691	6629	8081	7513	5885	5430	5387	5894	6689	8623	8750	9179	7991	5453	3782	3025	2167	1716	1401	112870
12	701	581	555	656	1987	5296	7175	8349	7819	6229	5864	5944	6308	7069	8680	9791	9119	8697	5969	4173	3180	2336	2156	1575	120209
13	822	619	585	724	2048	5304	7312	8750	7888	6465	6311	6506	6730	7485	9439	10263	10090	9129	6475	4529	3504	2613	2238	1682	127511
14	995	661	614	755	2011	4985	6875	8294	7515	6560	6647	7092	7857	8916	10295	10983	10018	9096	7772	5573	4069	3080	2428	2233	135324
15	1274	845	555	608	872	1773	2587	3478	4510	5930	7697	8487	8655	8460	8474	7883	7543	6383	5297	4235	3271	2460	2218	2031	105526
16	1282	773	532	398	480	936	1852	2869	3532	4614	6174	7333	8087	7996	7986	7734	8043	6983	6108	4687	3767	2871	2082	1407	98526
17	840	576	459	567	1267	2971	4102	4358	4646	4092	4331	5263	5929	6733	8164	8298	8016	7129	5458	4055	2989	2200	1572	1222	95237
18	710	552	508	642	2079	5594	7512	9040	8259	6598	5980	6118	6364	7256	8915	10100	9737	8877	6082	4277	3176	2452	2014	1613	124455
19	859	586	585	670	2031	5517	7503	8908	8120	6573	6010	6135	6518	7148	9035	10403	9885	8978	6555	4470	3347	2465	2029	1678	126008
20	863	643	620	778	2091	5401	7161	8707	7923	6452	5820	5916	6516	7398	9001	10325	9788	9574	6795	4618	3663	2713	2363	1731	126860
21	977	698	600	761	2031	5260	7060	8467	7844	6627	6791	6969	7523	8477	9864	10823	10382	9952	8588	6029	4223	3118	2691	2221	137976
22	1314	806	627	609	957	2121	3274	4560	5233	6208	7470	8528	8856	8653	8722	8951	8216	7603	6592	4704	3968	3165	2650	1850	115637
23	1130	880	554	459	481	943	1978	3231	3666	4671	6330	7839	8725	8787	8636	8381	8082	6144	6866	5121	3487	2303	1742	1170	101606
24	686	500	470	668	2012	5406	7578	9084	8138	6489	5973	6284	6338	7045	8890	10062	8356	9622	6370	4000	3084	2334	2049	1327	122765
25	742	603	554	744	2118	5534	7408	8940	8257	6550	5939	6082	6370	6984	9031	10087	10085	8922	6239	4242	3208	2426	2135	1511	124711
26	928	618	588	739	2128	5646	7603	9260	8441	6842	6676	7154	7552	7549	8131	10134	9946	9331	6846	4516	3660	2768	2041	1627	130724
27	921	671	703	801	2093	5514	7742	9034	8467	7074	6690	6798	7072	7882	9358	10569	9640	9046	7483	5493	4079	3127	2207	1839	134303
28	1067	774	639	800	2116	5315	7291	8715	8403	7316	7002	7400	8103	8972	9900	10696	10305	9956	7519	6740	5033	3621	2900	2157	142740
29																									
30	328	212	221	220	380	632	1496	2267	2424	3086	3888	5446	6301	6970	7015	6682	6346	6173	5682	4097	3002	2288	1758	1161	78075
31	709	539	574	716	2038	5390	9130	10163	7327	6864	5764	5600	5999	6745	8531	9426	7706	8340	6832	4367	3340	2470	2166	1644	122380
																									112947

Massachusetts Highway Department
511: Monthly Hourly Volume for February 2022

Location ID: 511
County: Essex
Functional Class: 1
Location: INTERSTATE 93

Seasonal Factor Group: U1-Essex
Daily Factor Group:
Axle Factor Group: U1-Essex
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
1	894	662	617	771	2053	5745	7429	9296	8390	6835	5894	6100	6289	7036	9003	10206	9765	9208	6479	4471	3617	2513	2184	1624	127081
2	907	659	591	706	2098	5627	7816	9181	8387	6917	6301	6204	6106	7340	9165	10112	9937	9255	6816	5102	3830	2752	2271	1680	129760
3	941	718	606	756	2122	5772	7722	8969	8364	6843	6366	6344	7027	7746	8990	10145	9161	8779	7616	5374	4100	3091	2242	1777	131571
4	982	762	612	775	1789	4167	4480	4299	3644	2844	3349	3417	4008	3840	5388	5193	5037	4422	3307	3000	2000	1782	1530	1248	71875
5	942	633	497	533	900	2111	3623	4701	5538	6199	7665	8440	8687	8478	8875	8429	8179	7849	6763	4857	3934	3456	2803	2108	116200
6	1231	768	594	534	566	1115	2345	3113	3760	4963	6537	8078	8887	8758	8957	8415	7912	7811	7468	6099	3997	2728	1724	1209	107569
7	782	519	506	673	2015	5478	7656	8962	8015	6659	5988	6152	6243	6750	8502	9451	8925	8350	6137	4309	3067	2378	1844	1393	120754
8	888	579	542	724	2035	5565	7750	8837	8246	6657	5883	6039	6495	7294	9118	10263	10083	9304	6681	4539	3356	2654	2378	1623	127533
9	970	703	602	768	2247	5715	7979	7587	9080	6996	6437	6458	6800	7154	9012	10281	9980	9619	7450	4898	3812	2924	2136	1688	131296
10	987	620	637	764	2187	5832	8173	9182	8350	7099	6164	6512	7235	7855	9119	10500	9664	9379	7797	5337	4000	3074	2525	1765	134757
11	980	760	659	800	2059	5453	7593	8782	8168	7047	6768	7812	8074	8643	9870	9776	10036	9648	8747	6354	4707	3620	2967	2331	141654
12	1448	829	644	619	966	2150	3642	5016	5645	6693	8032	9209	9265	8957	9190	9104	8655	8383	7457	5579	4291	3531	2914	2048	124267
13	1335	844	568	460	554	982	1825	2956	3411	4634	5967	7398	7972	8203	8209	8092	7510	7235	4935	2798	2464	2032	2662	1831	94877
14	892	579	601	740	1911	5340	7000	8387	7934	6641	5966	6221	6603	7173	8793	10115	9743	8968	6367	4532	3428	2719	2046	1642	124341
15	957	670	611	765	2197	5830	8139	9319	8423	6791	6072	6149	6326	7130	9057	10349	9820	9324	7044	4614	3508	2670	1973	1697	129435
16	958	622	586	742	2200	5799	8097	9493	8427	7093	6141	6305	6544	7532	9142	10085	10524	9557	7013	4793	3640	2987	2209	1737	132226
17	934	633	632	776	2214	5709	7947	9385	8146	7064	6452	6547	7003	7556	9299	10574	10228	9058	7690	5049	3976	3088	2283	1800	134043
18	939	701	605	785	2027	5169	7203	8104	7839	6768	7148	8353	8131	8810	9863	10396	9672	9875	8384	6619	4881	3594	2966	2284	141116
19	1375	885	626	639	897	1908	3072	4438	5747	7231	8678	9636	9892	9270	9570	8945	8055	6697	6254	5531	4051	3359	2761	2237	121754
20	1500	865	602	509	558	982	2043	2866	3693	5459	6918	8736	9350	9316	9042	8666	8506	7903	6644	5217	3946	3004	2105	1591	110021
21	977	592	472	604	1275	3284	5233	6568	6347	6524	7390	8207	8384	8529	9335	9176	9128	8897	6763	4994	3737	2692	1980	1482	122570
22	823	575	583	769	2246	5803	7666	8764	8291	6881	6729	6935	7522	8149	9137	9698	9379	9256	6785	4131	3453	2539	2130	1585	129829
23	844	655	1066	752	2160	5687	7572	8629	8250	7233	6895	7520	7901	8072	9446	10967	10350	9597	7476	5429	4032	3102	2191	1721	137547
24	1041	701	677	858	2359	5913	7746	9071	8547	7400	7530	7928	8398	9061	10379	11258	10617	10809	9262	6792	5820	4092	3205	2261	151725
25	1288	892	711	837	1314	2610	2704	2455	1966	1634	1773	1851	2133	2560	2885	3505	2826	3041	2668	2384	1934	1676	1478	1121	48246
26	822	566	538	660	1071	2236	3747	4828	5547	6515	7641	8440	8801	8702	8644	8510	8366	8052	7127	5541	4123	3499	3026	2157	119159
27	1385	870	623	614	716	1169	2235	3042	3741	5099	6881	8095	8947	8226	9301	8955	8819	7778	6680	4314	3661	2874	1871	1221	107117
28	791	607	574	753	2169	5704	7982	8965	8274	6800	6379	6370	6657	7340	8917	10110	10003	9144	6661	4636	3438	2672	1978	1733	128657

121321

Massachusetts Highway Department

511: Monthly Hourly Volume for March 2021

Location ID: 511
 County: Essex
 Functional Class: 1
 Location: INTERSTATE 93

Seasonal Factor Group: U1-Essex
 Daily Factor Group:
 Axle Factor Group: U1-Essex
 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
1	578	455	457	582	1930	5079	6994	8082	7274	5785	5605	5824	6168	6866	8504	9387	8862	8155	5678	3875	2729	2072	1660	1536	114137
2	792	564	581	721	1996	5319	7210	8258	7406	6217	5779	5850	6184	6909	8543	9802	9253	8043	5893	4064	2949	2241	1691	1502	117767
3	744	485	522	656	1972	5450	7309	8565	7644	6259	6049	6292	6503	7217	9054	10082	9978	8824	6125	4355	3295	2300	1757	1556	122993
4	804	526	586	703	2045	5514	7611	8739	7534	6617	6107	6305	6689	7467	9181	10225	9882	8944	6633	4608	3502	2554	2003	1563	126342
5	856	642	554	725	2014	5196	7159	8376	7620	6640	6458	6911	7541	8372	9623	8919	10072	9638	7866	5684	4027	2901	2501	1925	132220
6	1075	733	525	582	920	2119	3345	4479	5151	6379	7606	8206	8417	8244	8675	8334	7928	7369	6005	4638	3586	2727	2289	1617	110949
7	961	741	475	411	494	1012	2084	2806	3292	4772	5975	7437	8284	8172	8353	8199	7654	7261	6425	4737	3243	2305	1563	1092	97748
8	624	428	480	619	1944	5364	7423	8530	7551	6072	5700	5881	6093	6765	8861	9921	9335	8381	5679	3994	2859	2046	1627	1487	117664
9	750	535	486	654	1984	5530	7473	8555	7460	6279	5902	5988	6371	6838	8863	9821	9063	8592	6185	4118	3088	2171	1769	1575	120050
10	775	553	537	693	1978	5387	7531	8589	7589	6377	5902	6319	6627	7213	8918	9751	9581	8992	6324	4574	3370	2470	1806	1575	123431
11	804	573	562	726	1908	5498	7613	8594	7616	6465	6223	6288	6526	7388	9016	10050	9614	8884	6375	4616	3460	2551	1923	1586	124859
12	864	633	524	776	1953	5317	7014	7952	7321	6570	6893	7133	7396	8296	9495	10332	9988	9338	7692	5660	4081	3005	2419	1929	132581
13	1064	660	573	521	914	2077	3287	4250	5277	6348	7583	8294	8553	8518	8464	8257	7940	7239	6229	4728	3778	2968	2316	1699	111537
14	1031	682	0	528	523	940	1595	2309	2946	4035	5547	7124	8259	8450	8258	8150	7528	7089	5891	4497	3404	2493	1760	1159	94198
15	695	467	454	689	1885	5110	6942	8590	7695	6328	5924	5899	6220	6988	8797	9882	9149	8442	5906	4231	3069	2303	1777	1622	119064
16	828	572	548	667	1943	5342	7251	8429	7810	6195	6007	5933	6348	7236	8864	10539	9075	9374	6386	4545	3210	2364	1804	1609	122879
17																									
18	917	573	579	706	1994	5311	7179	8557	7609	6509	5945	6361	6638	7437	8703	9214	9272	8886	6341	4421	3224	2478	1938	1610	122402
19	893	635	544	718	1896	4990	6699	7959	7399	6364	6447	6778	7494	8159	9392	10357	10152	9432	7658	5779	4285	3124	2642	1971	131767
20	1135	780	513	569	897	1933	3038	4422	5256	6323	7141	8796	8869	8563	8820	8285	8107	7493	6531	5178	4318	3124	2540	1761	114392
21	1149	782	456	389	501	910	1894	2674	3424	4749	6245	7246	8460	8586	8421	8226	7728	7309	6539	5194	3963	2558	1800	1200	100403
22	684	513	486	646	1916	5149	7240	8355	7680	5969	5975	6110	6313	6963	8795	9518	9209	8524	5971	4379	3097	2407	1687	1579	119165
23	877	596	502	709	1942	5485	7428	8783	7781	6348	6159	6258	6308	6967	8777	9595	9568	8723	6135	4350	3251	2372	1824	1586	122324
24	819	585	531	700	1898	5430	7205	8630	7774	6379	6248	6185	6483	7226	9100	10104	9475	9027	6294	4492	3385	2577	1833	1577	123957
25	850	561	525	713	1972	5366	7141	8493	7607	6434	6116	6186	6748	7456	9256	10252	9527	8800	6534	4808	3681	2752	2083	1669	125530
26	951	627	526	762	1802	4999	6788	7766	7221	6249	6395	6859	7552	8245	9550	10245	9564	9022	7386	5422	4168	3350	2456	1912	129817
27	1120	725	539	523	907	1970	3000	4158	5335	6553	7749	8629	8242	8414	8743	8296	7800	7421	6381	5149	4299	3146	2610	1764	113473
28	1145	756	446	371	432	864	1472	2013	2884	4356	5774	7227	7865	7865	7244	7130	6270	5629	4706	3596	2966	2051	1594	1028	85684
29	676	463	419	625	1964	5207	7383	8611	7556	6212	5801	6020	6254	6827	8671	9528	8745	8939	5811	4308	3116	2262	1844	1626	118868
30	882	559	513	680	2032	5574	7539	8679	7582	6411	6185	6285	6440	7081	8831	10015	9646	8714	6332	4587	3347	2488	1909	1664	123975
31	805	637	463	669	1953	5478	7555	8579	7833	6221	6078	6242	6760	7362	9003	8904	9399	8829	6506	4601	3386	2524	1903	1626	123316

118116

Massachusetts Highway Department

511: Monthly Hourly Volume for April 2021

Location ID: 511
 County: Essex
 Functional Class: 1
 Location: INTERSTATE 93

Seasonal Factor Group: U1-Essex
 Daily Factor Group:
 Axle Factor Group: U1-Essex
 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
1	879	579	542	688	1891	5223	7178	8130	7447	6351	5984	6349	6823	7404	9162	10273	9828	9234	6661	4737	3737	2835	2167	1786	125888
2	912	660	578	755	1865	5072	6651	7676	7237	7024	7009	7630	8008	8540	9601	10922	10075	9207	7370	5478	4279	3011	2559	1921	134040
3	1104	716	541	524	802	1806	3001	4044	5240	6561	8142	8792	9194	8857	8836	8244	7994	7464	6376	5188	4153	3294	2498	1785	115156
4	1118	685	462	393	420	655	1236	1832	2593	4274	6088	7660	8771	8022	6892	6538	7159	7700	7780	6475	4701	2902	1805	1126	97287
5	610	415	449	662	1979	5161	7498	8387	7553	6398	6138	6329	6727	7299	8971	10209	9671	8594	6078	4201	3316	2285	1829	1614	122373
6	827	594	544	667	2013	5521	7761	9055	7697	6558	5987	6234	6373	7093	9054	9982	9702	8659	6448	4377	3341	2351	1858	1638	124334
7	858	588	525	732	1953	5497	7872	8814	7906	6578	6260	6331	6878	7529	8681	10257	9188	9308	6202	4719	3521	2606	1921	1633	126357
8	833	627	581	664	2035	5580	7809	8845	7960	6563	6340	6384	6674	7375	8800	10222	9653	9101	6508	4979	3771	2829	2096	1752	127981
9	899	673	563	719	1935	5243	7439	8262	7689	6883	6903	7005	7517	8243	9314	10128	9758	9308	7553	5653	4432	3145	2558	2057	133879
10	1186	681	547	527	917	1964	3222	4344	5502	6985	7955	8526	8655	8433	8579	8069	7469	7131	6173	5057	4212	3337	2637	1849	113957
11	1149	730	509	450	476	977	1883	2574	3331	4883	6274	7481	8105	8157	7766	7663	7017	6410	5561	4187	3274	2460	1761	1086	94164
12	653	479	469	675	1932	5482	7606	8562	7301	6283	5894	6534	6359	7063	8827	9840	9306	8348	5910	4212	3121	2268	1791	1579	120494
13	808	546	583	682	2002	5594	7743	8774	7768	6381	6088	6129	6646	7039	8801	9730	9638	8548	6318	4635	3410	2385	1944	1675	123867
14	810	606	564	683	1906	5598	7715	8659	7757	6367	6265	6248	6738	7010	9064	9913	9476	8952	6296	4922	3805	2652	1896	1668	125570
15	846	632	597	780	2013	5660	7746	8935	7666	6627	6390	6404	6901	7455	9322	10211	8580	9679	6587	4634	3603	2651	1917	1606	127442
16	809	694	547	711	1828	4816	6489	7645	6927	5547	5187	5749	6362	6807	8046	9251	8671	8428	6214	4553	3490	2635	2325	1840	115571
17	1082	700	532	482	815	1851	2868	3837	4879	6278	7757	8499	8872	8742	8439	8403	7632	7120	6145	4679	4003	3162	2415	1868	111060
18	1191	796	458	384	452	957	1815	2577	3602	5113	6535	7736	8369	8161	8036	7796	7360	6638	5780	4788	3808	2663	1939	1214	98168
19	771	506	506	592	1407	3971	6327	7220	6627	6281	6484	7019	7140	7276	8481	9035	8708	8325	5977	4544	3411	2423	1915	1621	116567
20	824	576	626	753	2020	5655	7432	8311	7466	6483	6534	6583	6966	7272	8968	9296	9797	8788	6202	4717	3522	2582	2064	1689	125126
21	867	624	568	729	1934	5605	7516	8057	7339	6550	6537	6658	6915	7671	8936	9707	9373	8744	6238	4294	3418	2375	1858	1696	124209
22	864	582	573	799	2033	5635	7662	8130	7607	6809	6620	6999	7161	7932	9384	10114	9305	9406	6605	4942	3756	2782	2186	1793	129679
23	940	666	612	736	2033	5385	7123	7612	7255	6943	7120	7776	7999	8539	9457	10184	9854	9238	7266	5559	4346	3409	2731	2094	134877
24	1132	639	588	645	1099	2187	3266	4648	5893	7115	8026	8687	8897	9163	8681	8299	7775	7182	6361	5460	4480	3581	2768	1933	118505
25	1143	842	498	488	568	1034	1577	2243	3096	4455	5968	7573	8007	7893	7702	7350	6758	6127	5220	4236	3225	2415	1748	1160	91326
26	669	519	461	650	2024	5544	7832	8614	7456	6370	6257	6401	6664	6975	8964	10197	9392	8518	6005	4425	3216	2411	1934	1562	123060
27	860	575	564	697	1999	5676	7721	8709	7871	6631	6248	6280	6278	7044	8966	10059	9523	9064	6270	4630	3706	2598	1995	1606	125570
28	878	555	570	692	1892	5481	7502	8464	7787	6520	6083	6679	6939	7324	9147	10195	9519	8914	6562	4801	3583	2561	1997	1585	126230
29	926	586	574	732	1918	5656	7711	8248	7549	6650	6377	6692	6763	7334	8502	9160	8932	8656	6573	4373	3424	2490	2098	1694	123618
30	907	692	563	678	1812	5188	7313	8118	7390	6948	6892	7504	7994	8727	10030	10689	10369	9198	8191	5918	4681	3497	2778	2213	138290

120488

Massachusetts Highway Department

511: Monthly Hourly Volume for May 2021

Location ID: 511
 County: Essex
 Functional Class: 1
 Location: INTERSTATE 93

Seasonal Factor Group: U1-Essex
 Daily Factor Group:
 Axle Factor Group: U1-Essex
 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
1	1289	840	622	623	961	2067	3182	4298	5596	6988	8192	8738	8944	8855	8693	8508	7968	7407	6540	5408	4618	3609	3029	2136	119111
2	1391	926	502	464	547	1009	1847	2665	3610	5255	6795	8047	8274	8452	8234	8017	7560	6736	6161	5218	3857	2850	2002	1350	101769
3	820	570	505	649	1923	5600	7708	8543	7721	6265	5950	5954	6361	6999	8824	10018	9109	8481	6345	4368	3329	2382	1819	1525	121768
4	869	557	533	713	1968	5387	7573	8736	7405	6460	6032	6198	6658	6778	9264	10127	8292	8064	6194	4588	3501	2543	1950	1636	122026
5																									
6	855	648	615	753	2061	5830	8117	8961	7987	6832	6512	6844	6977	7565	8898	10036	9778	9467	6913	5126	4261	3144	2424	1746	132350
7	937	724	639	777	2030	5628	7531	8685	7586	7083	6947	7400	7735	8577	9824	10286	8896	9419	7902	5930	4641	3656	2750	2198	137781
8	1141	850	596	574	957	2107	3279	4397	5672	6885	8082	8917	9210	9223	9112	8664	8304	7840	6948	5677	4552	3573	2803	1950	121313
9	1231	805	523	411	514	975	1827	2632	3744	5751	7429	8874	9434	7555	8234	8180	8173	8089	7435	6160	4597	3279	1929	1310	109091
10	730	459	458	642	1963	5520	7508	8601	7672	6538	6134	6640	6634	7169	9150	10379	9436	8989	6270	4541	3736	2777	2103	1618	125667
11	828	568	572	774	2080	5929	7967	9033	7855	6736	6472	6571	6779	7282	9204	10171	9702	8441	6363	4956	3604	2710	2083	1867	128547
12	953	623	624	757	2068	5946	7997	9088	8277	6817	6511	6883	6917	7560	9233	10372	9884	9413	6955	5114	3942	3097	2473	1762	133266
13	1003	636	616	771	2067	5916	8173	9263	8317	7059	6735	6960	7242	7956	9042	10468	9845	9528	7391	5275	4439	3307	2410	1913	136332
14	1034	717	632	783	1965	5638	7477	8609	7933	7224	7256	7644	8206	8611	9674	10251	9790	9311	8178	5803	4630	3623	3002	2223	140214
15	1254	808	638	607	966	2190	3394	4624	5960	7434	7966	8938	8960	8998	8784	8224	7918	7485	6534	5451	4590	3791	3031	2107	120652
16	1322	777	536	450	516	1053	1911	2903	3953	5426	7057	8216	9025	8661	8401	8177	7941	7534	6432	5568	4228	3094	2103	1366	106650
17	852	551	550	702	1970	5759	7966	8918	7993	6533	6213	6419	6770	7306	9182	10069	9425	9031	6382	4742	3583	2498	2030	1686	127130
18	931	632	641	751	2103	5996	8177	9318	8390	6953	6701	6875	6760	7577	9218	9878	9622	9168	6589	4886	3948	2813	2084	1774	131785
19	972	616	642	723	2059	5934	8004	9112	8031	6936	6434	6746	6831	7658	9353	10183	9453	8772	6791	5163	4128	3027	2257	1943	131768
20	941	652	642	832	2105	5902	8205	9196	8168	7206	6672	7005	7101	7785	8021	7641	9088	9431	7391	5475	4374	3383	2477	1867	131560
21	988	695	596	773	2013	5544	7213	8741	7870	7229	7364	7792	8194	8744	9499	10145	9903	9388	8235	5944	4692	3795	3110	2267	140734
22	1270	828	594	646	971	2181	3353	4544	6384	7292	8194	8945	9037	9014	8709	8440	7820	7453	6492	5355	3967	4064	2937	2124	120614
23	1267	823	578	478	532	1099	1975	2892	4105	5646	7180	8430	8747	8785	8358	8091	7760	7231	6465	5439	4157	3312	2341	1422	107113
24	795	558	521	713	2053	6009	8003	9019	8075	6579	6379	6682	6824	7557	9364	9871	8513	9615	6692	4758	3693	2802	2045	1696	128816
25	905	623	619	785	2105	6115	8047	9245	8154	6790	6505	6592	6884	7540	9092	10098	9580	9000	6924	4968	3943	2973	2222	1785	131494
26	852	683	563	708	1987	6088	8074	9053	8302	6935	6667	6813	6930	7622	9329	9653	9232	9506	6762	5198	3877	2949	2181	1669	131633
27	917	659	597	778	2067	5881	8087	9210	8198	7239	6873	7292	7508	8201	9485	10056	9260	8968	7984	5954	4665	3713	2652	1916	138160
28	1143	788	687	770	1898	5543	7341	8330	7801	7655	7633	8235	8140	8360	8808	9842	9136	8453	7657	6191	4702	3432	2800	2037	137382
29	1310	748	589	536	757	1541	2561	3596	5053	6581	7749	8489	8421	8606	8387	7932	7165	6643	5886	5071	4231	3389	2634	2210	110085
30	1435	890	536	439	495	923	1494	2182	3018	4435	6063	7485	7959	8166	7791	7438	6438	6313	5405	4449	3576	2757	2357	1598	93642
31	887	593	431	403	556	983	1651	2164	2871	4171	6019	7613	8474	8751	8704	8563	8032	6968	5950	4670	3655	2709	1870	1707	98395

123895

Massachusetts Highway Department

511: Monthly Hourly Volume for June 2021

Location ID: 511
 County: Essex
 Functional Class: 1
 Location: INTERSTATE 93

Seasonal Factor Group: U1-Essex
 Daily Factor Group:
 Axle Factor Group: U1-Essex
 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
1	901	541	446	654	2022	6011	8311	9208	8218	6863	6848	7013	7157	7607	9214	9654	9804	9130	6688	5082	4021	2704	2222	1691	132010
2	946	635	596	703	2378	6199	8177	8523	8375	6962	6677	6755	7125	7723	9159	10093	9658	9271	6975	5381	4215	2989	2291	1826	133632
3	953	642	628	757	2082	6098	8228	9156	8222	7062	6900	7231	7440	8104	9605	10250	10252	9779	7557	5438	4381	3258	2472	1831	138326
4	975	733	639	779	2059	5774	7532	8774	7876	7196	7245	7968	8398	9010	10030	10326	9585	9370	8520	6039	4867	3987	3206	2467	143355
5	1427	865	704	661	1093	2438	3840	5168	6144	7594	8776	8685	9498	9136	9224	8484	7991	7821	7332	5833	4835	4133	3545	2277	127504
6	1332	875	612	429	576	1229	2215	3094	4375	6123	8058	8678	9086	9153	8958	7859	7720	7528	7562	6173	5029	3870	2481	1514	114529
7	865	560	563	714	2121	5928	8104	8826	7857	6799	6687	6740	6861	7841	9073	9923	9623	8480	6257	4829	3988	3160	2575	1812	130186
8	984	629	611	766	2186	6055	8197	9258	8041	6664	6509	6991	6957	7672	9191	10070	8933	9017	6709	4842	3723	2721	2172	1884	130782
9	882	646	548	716	2081	6111	8040	9174	8142	7003	6614	7003	7225	7788	9166	9939	9501	9520	6972	5180	4076	3288	2460	1948	134023
10	1066	692	617	807	2238	6308	8186	9226	8368	7113	6936	7183	7210	8129	9633	10435	10158	9346	7775	6083	4583	3716	2845	2175	140828
11	1206	826	711	791	2100	5783	7625	8747	8072	7431	7586	7589	8271	9195	10135	10588	10200	10016	8912	6235	5141	3784	3109	2386	146439
12	1381	891	644	645	935	2170	3335	4550	6110	7147	8816	9546	9426	9341	9308	8932	8366	7846	7418	6230	5435	4531	3574	2456	129033
13	1442	948	709	516	600	1607	2120	3276	4406	6007	8216	9121	9755	9765	8543	8530	8526	8225	7598	6776	5227	4004	2594	1630	120141
14	892	562	562	745	2126	6182	8089	8954	8027	6595	6566	7012	6996	7809	9480	9994	8404	9006	6529	4590	3511	2683	2133	1691	129138
15	847	575	550	747	2115	5883	8015	8890	8588	7101	6663	6696	7098	7852	9526	9558	9841	9450	6812	4982	4056	3210	2324	1837	133216
16	1104	710	619	791	2223	6678	8394	9368	8183	7092	7128	7400	7633	7927	9316	9644	9269	9987	7584	5574	4615	3529	2546	1899	139213
17	1071	690	636	827	2277	6187	8081	8284	8220	7693	7195	7450	7729	8319	9232	9739	9714	9827	8105	6129	5145	4128	2902	2190	141770
18	1155	819	666	885	2028	5716	7311	7684	7796	7646	8452	8694	8892	9358	9663	10101	10018	9635	9059	6707	5079	3888	3139	2407	146798
19	1331	925	738	617	1054	2317	3313	4482	5829	7588	8869	9030	9507	9397	9468	8822	8073	7945	7593	6354	5313	4489	3418	2370	128842
20	1468	896	600	498	567	1215	1841	2868	4039	6112	8247	9548	9712	9974	9221	8109	7879	8056	7997	7374	5775	4550	2918	1662	121126
21	948	623	559	754	2086	5937	7676	8321	7933	6774	6602	7153	7562	7590	8954	9364	9690	9240	6368	5365	4198	3096	2327	1779	130899
22	980	670	660	769	2124	6042	7814	8713	8161	7132	6656	6992	7387	7931	9050	9368	9267	9149	6911	5136	3794	2883	2118	1653	131360
23	989	718	619	805	2180	6384	7972	8382	7907	7502	7600	7563	7696	8051	9165	10337	9320	9763	8127	5812	4697	3767	2866	1980	140202
24	1126	725	698	865	2224	6280	7874	8451	8137	7478	7473	7352	7823	8086	9503	10298	10009	9598	8406	6161	5008	3801	2834	2065	142275
25	1152	854	707	812	2091	5680	7114	7739	7453	7120	8028	8556	9017	9309	10026	10065	9775	9957	8598	6498	5070	3824	3187	2511	145143
26	1647	989	733	702	987	2341	3351	4684	5867	7078	9056	9533	9688	9552	9846	9333	8465	7975	7763	6173	5097	4402	3401	2586	131249
27	1666	961	660	514	559	1222	1997	2980	4218	6051	8118	9431	9755	8983	8533	8445	8277	8188	7673	5198	5300	4208	2823	1752	117512
28	1109	713	651	766	2170	6042	7832	8458	7715	6965	7027	7135	7584	7961	9134	9514	9236	8843	6585	5030	4456	3323	2562	2121	132932
29	1125	801	694	792	2285	6221	7798	6644	7886	7025	6997	7213	7528	8094	8801	9717	9928	9667	6843	5319	4760	3328	2382	2205	134053
30	1150	745	663	776	2183	6160	7941	8609	8172	7364	7189	7634	7808	8313	9708	9866	9591	8887	7166	5384	4121	3242	2423	2053	137148

133455

Massachusetts Highway Department

511: Monthly Hourly Volume for July 2021

Location ID: 511
 County: Essex
 Functional Class: 1
 Location: INTERSTATE 93

Seasonal Factor Group: U1-Essex
 Daily Factor Group:
 Axle Factor Group: U1-Essex
 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
1	1043	764	645	777	2080	6019	7743	8581	8035	7567	7628	8206	8194	8818	9765	10022	9308	9454	6810	6333	4730	3495	2546	1961	140524
2	1130	805	691	844	1881	4940	6133	7074	6958	6970	7534	8002	8767	8810	9310	9738	9336	8800	7270	5827	4360	3583	2782	2186	133731
3	1303	941	721	621	793	1609	2474	3545	4544	5862	7556	8305	8504	8687	8401	7915	7030	6328	5390	4343	3847	3146	2512	1761	106138
4	1103	749	518	421	420	804	1365	1922	2652	4117	5429	6910	7754	8016	7400	6527	5766	5601	5091	4773	4178	3800	2979	2180	90475
5	1414	807	567	497	687	1258	2259	2920	3890	5059	7077	8273	8260	8070	7716	7761	7368	7330	7209	6924	5579	4155	3277	1760	110117
6	878	602	500	653	1989	5678	7387	8228	7686	6812	6863	7224	7283	8140	9631	9966	9621	8827	6733	5092	3969	2970	2125	1747	130604
7	916	678	559	712	1965	5836	7544	8478	7880	7061	7223	7225	7440	7866	8876	9818	8748	9474	7011	5586	4261	3240	2401	1880	132678
8	992	622	580	757	1977	5776	7356	8171	8088	7272	7148	7378	7938	8354	9507	9411	10038	9650	7584	5575	4299	3189	2405	1856	135923
9	1108	755	631	753	1907	5143	6318	7055	6817	6161	6312	6506	6671	7358	7940	9278	8981	8812	7262	6007	4435	3612	2926	2233	124981
10	1449	876	658	649	1007	2268	3447	4479	5832	7308	8502	8796	9266	9583	9501	8533	8426	8223	6918	6133	5517	4569	3863	2421	128224
11	1520	1217	708	528	600	1252	2106	2801	3985	5679	8134	9204	9422	9019	8470	8751	8481	7807	7367	6940	5077	3595	2365	1481	116509
12	813	611	521	684	1982	5519	7084	7588	7783	6233	6279	6616	7119	7621	8584	9611	9430	9004	6850	4949	3845	2913	2111	1714	125464
13	1007	676	643	753	2204	5859	7774	8968	8259	7215	6944	7126	7521	7916	9255	10255	10045	9739	7528	5557	4219	3153	2301	1837	136754
14	984	659	610	735	2112	5943	7833	8927	8315	7293	7312	7422	7633	7897	9137	10387	9624	9812	8053	5938	4427	3439	2498	1860	138850
15	1131	768	652	811	2120	6025	8095	8974	8390	7752	7717	7659	7831	8393	9431	10029	8647	8078	8660	6892	5304	4054	2814	2175	142402
16	1148	933	725	838	2065	5579	7385	8100	7976	7878	8286	8610	8329	8945	9383	9960	9346	8921	8506	6846	5211	4290	3631	2535	145426
17	1466	949	750	687	1067	2279	3309	4306	5556	7321	8460	9182	9637	9489	8993	8743	8356	7899	7195	5842	4734	3960	3222	2132	125534
18	1312	884	644	494	549	997	1622	2326	3304	4804	7005	8607	8847	8829	8984	8427	8022	7275	6435	5239	4283	3363	2852	1736	106840
19	897	549	532	719	2094	5745	7734	8501	7882	6776	6861	7386	7391	8073	8962	9888	9768	9255	6676	5151	4090	3026	2316	1753	132025
20																									
21	1039	689	576	727	2202	5868	7533	8685	8354	7308	6899	7285	7621	7980	9468	9950	10009	9505	7530	5789	4534	3440	2550	1858	137399
22	1044	706	659	845	2336	5926	7806	8663	8392	7418	7546	7867	7866	8419	9442	9482	9214	9175	8619	6544	5232	4017	2902	2158	142278
23	1244	935	681	892	2222	5621	7251	8310	7935	7475	8425	8791	9099	9211	9920	10100	9672	9419	7437	6287	5313	4457	3772	2754	147223
24	1591	934	685	742	1074	2258	3448	4945	6435	7924	9572	9406	9673	9649	9349	8919	8206	7834	7119	6490	5872	5150	4258	2663	134196
25	1695	990	664	579	578	1083	1737	2335	3539	5035	7364	8364	9017	9304	9075	8593	8676	7712	6665	5942	4611	3623	2403	1502	111086
26	898	634	543	738	2107	5907	8000	8619	8085	6974	7028	7188	7387	8148	9008	9861	9764	9271	6752	5181	4208	3103	2201	2001	133606
27	970	693	587	744	2260	6042	8023	8989	8458	7185	6781	6963	7349	7834	8705	9867	10270	9617	7317	5340	4120	3293	2209	1814	135430
28	969	640	560	725	2153	5810	7812	8798	8403	7257	7322	7509	7798	8126	9286	10175	10374	9944	8196	6208	4938	3685	2830	2049	141567
29	1121	728	606	808	2172	5923	7831	8951	8350	7344	7590	7700	8092	8372	9466	10278	9287	9429	7830	5799	4499	3518	2465	2001	140160
30	1173	810	619	775	2101	5410	7185	7942	7760	7654	8303	8836	9072	8922	10010	10498	9799	9573	8513	6812	5410	4465	3776	2565	147983
31	1484	906	718	723	1052	2650	3451	4835	6358	7508	8941	9469	9598	8526	8401	8731	8412	7906	7100	6305	5680	4892	3827	2494	129967

130136

Massachusetts Highway Department
511: Monthly Hourly Volume for August 2021

Location ID:	511
County:	Essex
Functional Class	1
Location:	INTERSTATE 93

Seasonal Factor Group: U1-Essex
Daily Factor Group:
Axle Factor Group: U1-Essex
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
1	1428	908	683	571	571	1175	1946	2751	3918	5794	8031	9140	9269	9388	9011	8401	7940	7769	7531	6896	5089	3567	2338	1479	115594
2	874	631	537	687	2113	5702	7772	8400	8038	6864	6071	7161	7375	7773	9102	10091	9085	9726	6755	5188	4206	2962	2247	1754	131114
3	989	644	624	799	2212	5927	8001	8873	8516	7198	6997	7192	7281	8106	9301	9849	10338	9502	7199	5408	4419	3445	2381	2260	137461
4	1059	715	587	743	2179	5950	7809	9149	8274	7443	7626	7880	7754	8062	9421	10586	10635	10011	7602	6157	4527	3318	2464	2129	142080
5	936	647	621	785	2087	5645	8803	11675	7999	6935	6891	7107	7551	7880	9031	9977	10346	8798	6628	5634	4585	3422	2638	2331	138952
6	1374	825	712	853	2037	5624	7331	8305	8010	7830	8589	8782	9065	9197	9711	10349	9741	9207	8181	6657	5497	4314	3656	2724	148571
7	1728	989	746	701	979	2293	3360	4729	6126	7920	9147	9332	9378	9814	9579	8592	8250	7743	7497	6127	5444	4668	3903	2433	131478
8	1446	1030	711	566	611	1171	1867	2672	3854	5623	7980	8937	9458	9440	9134	8462	8194	7619	6912	6405	4935	3678	2418	1776	114899
9	993	633	579	721	2071	5684	7434	8504	8029	6928	6916	6916	7109	7053	9561	9959	9622	9183	6779	5143	3945	2796	1972	1645	130175
10	969	666	578	696	2098	5782	7771	8770	8301	7190	7153	7372	7495	8110	9711	10013	10130	9727	7435	5503	4364	3507	2532	1857	137730
11	1165	648	649	744	2146	5865	7853	8848	8509	7291	7784	7676	7686	7963	8999	9337	9982	9527	7313	6010	4647	3359	2637	2054	138692
12	1054	685	668	810	2140	5789	7743	8658	8341	7355	7842	8024	8472	8667	9384	10027	9840	9766	7566	6219	5017	3484	2633	2221	142405
13	1226	836	661	855	2064	5541	7065	7881	7656	7647	8181	8904	8943	9069	9696	10063	9645	9502	7897	6305	5220	4141	3564	2453	145015
14	1411	952	760	657	1044	2224	3196	4480	5798	7470	8806	11006	10310	9372	9273	8414	7957	7293	6425	5871	5248	4388	3729	2404	128488
15	1554	967	657	545	637	1211	2074	2922	4354	6184	8425	9480	9462	9539	8951	8375	7501	8004	7565	6818	5986	3955	2594	1614	119374
16	952	652	603	730	2167	5705	7702	8481	7968	6796	6850	7136	7555	8074	9250	9773	9927	9086	6883	5265	4246	3175	2182	1763	132921
17	960	674	599	823	2157	5829	7718	8641	8312	7067	6830	7235	7369	8006	9443	9953	9951	9504	6995	5374	4318	3171	2308	1878	135115
18	938	653	591	757	2166	5627	7176	8819	8219	7427	7794	7825	7776	8132	9381	9834	9831	10246	7712	6154	4600	3304	2426	1925	139313
19	1107	749	695	776	2132	5546	7329	8190	7876	6828	6415	6509	6847	7469	9093	9417	9726	9343	7141	5586	4216	3195	2356	1922	130463
20	1062	760	703	796	2001	5356	6557	7426	7561	7622	8314	9022	9226	9553	10120	10447	10226	9465	8058	6459	5300	4070	3596	2580	146280
21	1495	1007	780	706	1084	2156	3234	4535	5945	7657	9224	9621	9767	9727	9546	8853	8024	8289	7345	6444	5661	4925	4100	2975	133100
22	1699	1087	691	575	603	968	1619	2394	3240	4474	5381	5893	5773	5653	5530	5409	4584	4194	3754	3065	2569	1985	1405	1069	73614
23	703	500	478	626	1939	5358	7068	7921	7457	6364	6376	6925	7088	7671	9216	9332	9252	8728	6313	4532	3400	2551	1867	1643	123308
24	885	575	586	743	2082	5776	7732	8578	8497	7175	7215	7479	7397	7794	9038	9825	9667	9412	7704	5485	4440	3241	2315	2005	135646
25	1218	681	610	748	2121	5742	7751	9259	8393	7321	7706	7390	7771	7944	9206	10196	10376	9961	8146	6288	4962	3444	2610	2044	141888
26	1275	706	668	774	2112	5819	7687	8791	7934	7399	7731	7935	8527	8478	9341	9124	9941	10323	8284	6369	5086	3809	2819	2148	143080
27	1223	850	653	842	2001	5419	7216	8099	7870	7686	7906	8385	9046	9059	9626	9706	9598	9605	8168	6350	5324	3991	3446	2347	144416
28	1611	969	748	668	1034	2151	3356	4459	5863	7476	9024	9309	9774	9498	9452	8745	8874	8105	7215	5839	5139	4297	3616	2409	129631
29	1720	1020	663	477	564	1118	1729	2705	3860	5895	8060	8970	8915	9134	8950	8827	8653	8000	7148	6280	4594	3088	2120	1357	113847
30	949	563	562	719	2120	5625	7675	8710	7796	6508	6612	6868	7190	7529	8743	9568	9786	9178	7088	4899	3899	2781	2033	1669	129070
31	924	667	614	752	2157	5833	8019	8310	8384	6817	6782	6931	6981	7391	8910	10009	9938	9421	7467	5432	4311	3065	2242	1785	133142
																									131834

Massachusetts Highway Department

511: Monthly Hourly Volume for September 2021

Location ID: 511
 County: Essex
 Functional Class: 1
 Location: INTERSTATE 93

Seasonal Factor Group: U1-Essex
 Daily Factor Group:
 Axle Factor Group: U1-Essex
 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
1	994	723	595	746	2124	5997	8217	9115	8563	7254	6918	7021	7265	7700	9121	9934	9741	9319	7120	5179	3793	2627	1987	1599	133652
2	947	699	571	749	1977	5282	7326	8699	8177	6807	6583	6985	7309	7902	9208	10229	9871	9490	7819	5841	4352	3404	2501	1839	134567
3	1181	944	671	768	2037	5246	7137	8084	7789	7670	8488	8630	8336	7363	9368	10120	9546	9312	8156	6676	5171	4219	3444	2437	142793
4	1533	950	741	667	954	1731	3022	4331	6226	7829	8890	9229	8891	9096	7926	8166	7626	6915	6572	6521	5482	4219	3275	2382	123174
5	1567	956	624	557	508	916	1705	2425	3463	5092	7227	8390	8594	8544	8126	7661	7126	7339	6787	5732	4345	3275	2396	1825	105180
6	1148	681	513	539	689	1036	1833	2505	3248	4806	6795	7934	7994	8047	7879	7797	7342	7596	6164	5625	4705	3040	2112	1363	101391
7	764	522	515	673	2135	5928	8070	7975	8382	6521	6579	6917	7008	7543	9297	10056	9881	9206	7015	5253	3962	2918	2284	1821	131225
8	926	643	605	749	2112	5997	8321	9362	8539	6929	6597	6664	6921	7321	8973	9805	9958	9724	7228	5273	4131	3008	2292	1908	133986
9	987	672	559	784	2124	5742	7695	8515	8404	6985	6527	6845	7053	7660	8923	9194	8742	8959	7307	4634	4156	2816	2188	1725	129196
10	1031	736	640	765	2077	5757	7925	8876	8040	7324	7171	7882	8246	8603	9770	10404	9888	9692	8654	6588	5110	3844	3059	2320	144402
11	1497	868	740	664	1067	2387	3686	4895	6281	7386	8468	8835	8426	8985	8927	8768	8417	7959	7160	6334	4943	4073	3404	2325	126495
12	1340	859	784	566	607	1118	2102	2879	4146	5935	7999	9064	9008	8590	8549	8418	7991	7147	6531	5882	4805	3416	2348	1622	111706
13	829	588	539	687	2081	5447	7952	8705	8465	6701	6430	6522	6855	7453	9120	10117	9796	9046	6804	5178	3679	2616	1972	1759	129341
14	1075	643	661	773	2208	6131	8983	6736	9095	6850	6367	6645	6976	7591	8836	10071	10148	9686	7306	5328	3980	2840	2159	1838	132926
15	966	693	602	752	2207	5849	6106	9004	8323	7068	6533	6777	6980	7846	8665	9603	9779	9597	7497	5537	3978	2948	2177	1764	131251
16	917	655	621	825	2137	6032	8188	8868	8340	7180	6780	6962	7389	8004	9698	10406	9916	9841	7806	5693	4376	3221	2525	1896	138276
17	1118	778	678	808	2096	5818	7984	8803	8046	7210	7381	7702	8232	9024	9958	10583	10042	10109	8563	6343	4690	3835	2907	2554	145262
18	1441	932	741	684	1137	2178	3314	4749	6150	7303	7951	7794	9067	9115	8912	8910	8769	8177	7707	6667	5134	3996	3272	2491	126591
19	1609	989	691	538	564	1038	1958	3005	4408	6027	8247	9145	9392	8467	8156	8172	8378	8385	7666	6521	4761	3181	2211	1500	115009
20	891	635	550	758	2243	6019	8307	8932	8394	6864	6408	6851	7063	7639	9180	9664	9877	9465	6918	4994	3709	2636	2023	1655	131675
21	893	650	591	776	2179	6092	8417	9150	8542	7090	6599	6731	7000	7779	9066	10316	10028	9773	7282	5165	3913	3004	2159	1900	135095
22	977	686	604	749	2194	6057	8166	9321	8466	6966	6512	6897	7145	7564	9094	10222	10312	10047	7215	5194	4012	2942	2209	1865	135416
23	999	661	639	797	2239	6117	8331	8979	8452	7075	6865	7013	7319	8005	8876	10133	9778	9928	7815	5836	4454	3216	2392	1888	137807
24	1056	808	697	791	2152	5662	7724	8696	7877	7185	7147	7916	8272	8802	9678	9806	10383	9453	8313	6131	4689	3820	3161	2520	142739
25	1626	978	740	765	1167	2274	3378	4859	6476	7680	8819	9043	9677	9439	9303	9077	8431	8069	7328	6230	5286	4361	3464	2654	131124
26	1638	1103	728	576	586	1040	1807	2984	4407	6066	8009	9092	10105	9368	8548	8650	8222	8174	7621	6247	4896	3106	2209	1664	116846
27	1096	633	551	691	2140	6094	8441	9369	8589	6810	6608	6703	7025	7586	9159	10273	10011	9202	6837	4835	3551	2634	1894	1630	132362
28	888	614	610	834	2181	6146	8314	9388	8487	7075	6206	6478	7041	7435	8614	9530	9314	9192	7040	4911	3625	2658	2011	1638	130230
29	885	689	605	784	2290	6232	8117	8405	8674	7270	6825	6894	7139	7692	9572	10115	9813	9917	7641	5469	4258	2949	2292	1793	136320
30	966	665	665	846	2296	6217	8582	9700	8570	7291	7014	7573	7445	8372	9941	10701	10288	9933	7851	6042	4595	3421	2571	2107	143652

130323

Massachusetts Highway Department

511: Monthly Hourly Volume for October 2021

Location ID: 511
 County: Essex
 Functional Class: 1
 Location: INTERSTATE 93

Seasonal Factor Group: U1-Essex
 Daily Factor Group:
 Axle Factor Group: U1-Essex
 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
1	1116	842	731	912	2253	5815	7989	9443	8075	7743	7635	8251	9041	9461	10106	11016	10402	10096	9386	6834	5094	4182	3354	2837	152614
2	2133	1058	750	768	1109	2143	3388	4897	6478	7908	8980	9546	9308	9423	9379	8870	8641	8340	7291	6144	5077	4382	3827	2974	132814
3	1713	1014	602	571	656	1104	1821	3013	4486	6424	8476	9467	9798	9310	8605	8402	8478	7984	6800	5659	3994	2489	1827	1353	114046
4	1158	882	780	759	1913	5415	7455	8351	8095	6706	6462	6741	6891	7521	9306	10309	9505	9252	6471	4476	3393	2470	1939	1583	127833
5																									
6	1537	854	682	776	2184	6307	8559	9561	8532	7348	6933	7099	7431	8099	9381	9902	10123	9805	7576	5646	4339	3186	2457	1916	140233
7	980	691	638	834	2276	6151	8632	9517	8731	7629	6963	7537	7688	8372	9522	10517	10147	9874	8328	6486	4884	3400	2610	1971	144378
8	1097	791	662	837	2265	5820	8040	9000	8377	7909	8086	8370	8683	9321	9874	10370	10063	9932	9115	7673	6153	4464	3648	3221	153771
9	1710	1046	798	772	1144	2331	3877	5600	7714	9066	9567	9556	9941	9707	9938	9853	9408	9194	7840	6696	5618	4928	4402	3247	143953
10	1807	1049	620	532	648	1225	2103	3444	5008	6937	8569	9374	9861	9121	9168	8839	8690	8493	7615	6478	4970	4271	3464	2258	124544
11	1121	656	537	680	1509	3646	5526	6633	6948	7061	8068	8448	8761	8826	9638	9876	10425	9215	7576	6223	4784	3218	2111	1913	133399
12	1174	691	615	801	2249	6105	6445	8672	8612	8237	7175	7216	7471	7990	9554	10403	9921	10175	7664	5386	3987	2943	2181	1771	137438
13	977	646	599	820	2265	6238	8530	9299	8548	7728	7065	7345	7549	7892	9311	9846	10228	9659	7593	5430	4180	3048	2231	1833	138860
14	966	723	632	770	2256	6383	8416	9598	8438	7660	7172	7326	7650	7639	9349	9839	10089	10280	7686	5926	4324	3197	2564	1890	140773
15	1095	782	713	907	2215	6028	7965	9129	8446	7835	7737	8405	8478	9230	10257	10743	10247	10268	8988	6663	4841	4013	3536	3173	151694
16	1601	1052	748	796	1087	2227	3344	4849	7181	7981	8861	9841	9828	9932	9706	9590	9196	8560	7760	6293	5086	4351	4089	3214	137173
17	1577	920	609	567	584	1112	2140	3423	5028	7038	8902	9912	9969	9578	8651	9055	8283	7908	7348	6797	6083	3801	2547	1598	123430
18	977	631	548	783	2296	6289	8427	9249	8562	7234	6891	7164	7281	7964	9932	10547	10403	9982	7156	4683	3555	2565	1968	1984	137071
19	1352	770	588	814	2290	6348	8526	9234	8942	7261	6772	6941	7203	7762	9576	10565	10274	10233	7551	5148	3841	2833	2157	1807	138788
20	1140	1047	603	766	2261	6277	7895	9431	8887	7360	6844	7049	7310	8085	9753	10512	10288	9983	7278	5234	4022	3215	2499	1875	139614
21	1107	728	602	848	2269	6310	8371	9195	8833	7488	7005	7240	7666	8168	9664	10879	10453	8097	7816	5724	4521	3553	2547	1955	141039
22	1106	799	738	825	2174	5868	7874	8798	8474	7594	7553	8013	8863	9211	10362	10927	10379	10021	9140	6682	5161	3997	3956	3253	151768
23	1598	986	725	726	1109	2365	3486	5167	6761	7994	9310	9672	9761	9416	9594	9700	9591	9024	7855	6413	5415	4568	3999	2997	138232
24	1904	1169	614	532	609	1082	1930	3498	4892	6719	8810	9425	9905	9310	9051	9032	9094	8963	8043	6808	5227	3038	2073	1395	123123
25	1007	659	520	721	2187	5660	7606	8557	7973	6701	6289	6511	6918	7387	8813	10075	9377	8743	6648	4432	3409	2495	1970	1791	126449
26																									
27	831	627	590	716	2073	5652	6740	8415	8158	6614	6164	6364	6593	7364	8583	9717	9581	9599	6830	4748	3686	2990	2412	1887	126934
28	1166	674	646	863	2234	6202	8499	9224	8705	7679	7172	7192	7393	8300	9761	10815	10067	10174	7727	6022	4480	3393	2642	1958	142988
29	1145	809	684	859	2174	5798	7840	8987	8139	7539	7188	7659	8345	9091	10240	10829	10401	10061	8701	6216	4606	4030	3631	3061	148033
30	1725	1101	815	750	1041	1912	2656	3668	4919	6049	7321	8209	8675	8495	8529	8325	7903	7386	5853	4773	3830	3323	2860	2240	112358
31	1519	1077	760	565	625	1001	1415	2346	3663	5296	6905	8127	8495	8235	8243	8179	7524	6220	4802	4437	4417	3101	2087	1503	100542

135307

Massachusetts Highway Department

511: Monthly Hourly Volume for November 2021

Location ID: 511
 County: Essex
 Functional Class: 1
 Location: INTERSTATE 93

Seasonal Factor Group: U1-Essex
 Daily Factor Group:
 Axle Factor Group: U1-Essex
 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
1	903	657	609	749	2228	5982	7869	9022	8356	6797	6541	6626	7086	7345	9441	9020	9996	9604	6786	4796	3533	2503	2210	1724	130383
2	996	676	646	770	2224	6073	7947	8825	8409	6971	6588	6717	7078	7498	9525	10786	10082	10001	7120	4867	3522	2686	2077	1710	133794
3	917	618	582	818	2209	6113	7903	9170	8813	7240	6235	6677	6919	7702	9290	10427	10369	9825	7452	5413	4033	2975	2321	1720	135741
4																									
5	1148	764	668	912	2160	5906	7642	8594	8261	7399	7069	7666	8213	8831	10038	10390	10217	9934	8029	5602	4605	3918	3126	2462	143554
6	1474	980	690	720	1113	2231	3261	4552	6123	7308	8752	9387	9342	9432	9358	9244	9041	8532	7261	5856	4606	3799	3233	2415	128710
7	1505	1601	461	379	554	1041	1937	3232	4632	6267	7900	8951	9508	8642	8487	8335	8330	7806	6381	5001	3616	2560	1961	1326	110413
8	879	523	496	729	2247	6331	8588	9403	8209	6853	6376	6481	6796	7320	9092	9458	9880	8804	6636	4329	3141	2350	1849	1559	128329
9	899	643	624	774	2271	6434	8540	9269	8612	6973	6564	6452	6717	6489	8999	10074	10047	9293	6740	4687	3404	2624	2254	1798	131181
10	905	614	568	822	2283	6280	8556	9171	8406	7091	6411	6716	7187	7867	9379	10340	10194	8456	7164	5034	3954	2980	2415	1778	134571
11	1019	741	635	811	1742	4526	7036	7868	8072	7817	7726	7818	7936	8247	9403	10272	9823	9242	6887	4993	3884	3027	2568	1804	133897
12	1011	763	631	816	2099	5487	7512	8805	7678	7135	6872	7253	7631	8134	8611	8493	8728	9000	6954	5050	3827	3273	2863	2314	130940
13	1331	869	673	701	1091	2198	3251	4575	6267	7297	8567	9343	9167	8897	8917	8907	8619	7710	6177	4871	3796	3503	2898	2146	121771
14	1347	825	609	523	568	951	1861	2909	4240	5829	7567	8447	9383	8689	8731	8116	8020	7553	6331	4865	3565	2561	2256	1281	107027
15	752	623	497	732	2186	6070	8434	9167	8272	6946	6747	6669	7024	7536	9384	10275	9333	8957	6510	4213	3326	2431	1848	1643	129575
16	933	630	599	826	2307	6394	8537	9321	8492	7140	6668	6572	6857	7663	9308	10608	9605	8643	6722	4866	3781	2689	2069	1721	132951
17	1016	666	633	764	2226	6193	8526	9597	8678	7417	6659	6910	7128	7758	9537	10461	10125	9174	7147	5086	4008	2918	2324	1798	136749
18	1011	720	646	848	2170	6221	8357	9445	8800	7372	6910	7088	7185	7912	9174	10270	9895	9084	6385	5220	3868	3052	2398	1884	135915
19	1089	768	679	846	2185	5884	7839	8951	8041	7520	7672	7850	8512	9063	10431	10954	9352	8500	8129	5499	4483	3892	3161	2702	144002
20	1580	976	796	768	1193	2333	3514	4624	6060	7352	8345	9024	9249	9046	9306	9520	8906	8023	6541	5129	4108	3578	3334	2447	125752
21	1485	975	711	552	638	1089	1769	2596	4068	5626	7171	8380	9094	8687	8702	8505	7964	6969	5746	4434	3485	2510	2069	1328	104553
22	915	519	492	674	2059	5520	7790	8589	7949	7077	6688	6736	7076	7782	9663	10235	9155	9661	6806	4715	3572	2602	2237	1747	130259
23	985	688	639	824	2229	6128	8128	9256	8613	7612	7452	7569	7994	8619	9712	10370	10459	9765	7745	5949	4355	3249	2733	2024	143097
24	1123	839	709	909	2091	5678	7500	8223	7832	7578	8009	9109	9359	9507	10040	9911	8959	8013	6405	5024	4307	3195	2763	2253	139336
25	1342	887	595	495	575	823	1373	2212	3001	4536	6987	9104	10189	8585	5754	5058	6205	7156	7649	6955	5438	4074	2668	1700	103361
26	962	583	478	533	1196	2461	3217	4092	4988	6505	8044	8931	8709	9060	9209	8851	7658	7218	5814	4359	3458	2790	2227	1777	113120
27	1075	705	615	562	871	1487	2380	3373	4669	6155	7923	8982	9097	9228	9227	8750	8542	7738	6164	4951	4110	3496	2765	2262	115127
28	1457	908	568	517	647	1086	1680	2504	3854	5521	7544	9215	9670	8913	8651	8203	8049	7659	6382	4916	3543	2503	2113	1266	107369
29	782	525	523	694	2220	6128	7128	9170	8356	7013	6462	6864	7100	7738	9240	10241	9827	9132	6324	4409	3407	2416	1886	1601	129186
30	886	678	606	818	2281	6196	8201	9275	8490	7090	6528	6454	6984	7647	9515	10747	10027	9242	6926	4661	3455	2745	2519	1854	133825

127396

Massachusetts Highway Department
511: Monthly Hourly Volume for December 2021

Location ID:	511
County:	Essex
Functional Class	1
Location:	INTERSTATE 93

Seasonal Factor Group: U1-Essex
Daily Factor Group:
Axle Factor Group: U1-Essex
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
1	985	693	598	799	2197	6087	8048	8977	8718	7325	6441	6707	7193	7713	9426	10361	9868	9518	6799	4802	3805	2857	2251	1935	134103
2	978	650	648	832	2233	5995	7892	9053	8305	7108	6711	6771	7179	7877	9819	10459	9469	9104	6976	4919	3873	3028	2360	2147	134386
3	1059	742	635	836	2178	5827	7641	8504	8058	7327	7148	7525	8093	8830	9647	10958	10033	9692	7664	5550	4079	3484	2861	2616	140987
4	1740	855	734	716	1189	2267	3270	4325	5514	6986	8192	8881	9100	8877	9806	9088	8742	7560	6451	4895	3922	3567	3231	2262	122170
5	1464	920	608	545	580	1057	1686	2600	3663	5214	6773	7858	8898	8706	8527	8477	8141	7055	5931	4602	3566	2607	1726	1281	102485
6	841	594	537	679	2163	5816	7505	6825	7867	6726	6237	6242	6864	7353	9283	10045	7982	9061	6010	4271	3109	2279	1680	1660	121629
7	931	635	569	768	2150	6007	8369	9217	8508	7308	6613	6611	6958	7582	9519	10761	9953	9569	6806	4674	3558	2749	2086	2006	133907
8	949	695	617	783	2134	6027	8046	8862	8437	7070	6473	6687	6902	7618	9616	10580	10012	8970	6920	4499	3429	2810	2187	1638	131961
9	898	651	672	805	2142	5819	7899	9072	8214	7312	6786	6989	7124	7994	9802	10790	9717	9619	7065	5108	3979	3077	2368	1869	135771
10	1078	754	678	886	2149	5578	7604	8393	7859	7298	7339	7687	8193	9049	10180	11109	10351	9372	7675	5676	4424	3656	3053	2296	142337
11	1357	897	687	700	1051	2024	2599	3613	4670	6041	6961	7809	8134	8721	8386	8349	7883	7244	6023	4693	4114	3433	2976	2344	110709
12	1496	1164	625	476	560	1017	1587	2454	3635	5359	7013	8290	8825	8593	8772	8390	8201	7275	6025	4790	3779	2751	2076	1219	104372
13	811	530	488	680	2151	5421	7904	8907	8096	6852	6529	6955	7569	9303	10433	9747	9462	6468	4304	3375	2696	2063	1665	129034	
14	936	615	552	816	2235	6081	8008	9279	8413	7138	6783	6927	7166	7764	9417	10298	9746	9732	7357	5015	3902	3380	2893	2056	136509
15	982	691	633	953	2278	6002	7985	9330	8698	7558	6967	6950	7285	8065	9859	11065	10021	9468	7400	4958	4039	3067	2262	1879	138395
16	1054	734	640	798	2184	5790	7704	8885	8603	7406	6883	7302	7885	8265	9673	10573	10245	9276	7540	5348	4263	3432	2616	2140	139239
17	1190	855	682	853	2098	5537	7246	9056	7990	7578	7732	8089	8303	9091	9995	10565	10166	9457	7829	6686	5004	3991	3490	2764	146247
18	1640	1017	781	724	1040	2071	3002	4391	5795	6968	8100	8890	8837	8588	7778	7151	6147	5567	4733	3770	2931	2483	2360	1930	106694
19	1195	754	531	423	510	950	1737	2596	3408	4743	6705	8212	9336	9268	8748	8849	8418	7844	6711	5193	3906	2931	2006	1363	106337
20	873	610	566	700	2119	5495	7521	8670	8167	7217	6884	7119	7670	8195	9505	10361	9242	8841	6546	4785	3676	2832	2215	1845	131654
21	967	676	584	778	2146	5498	7501	8687	8233	7409	7141	7464	7831	8415	9985	10867	9794	9820	7849	5171	4071	3167	2422	1839	138315
22	982	732	618	790	1949	5106	6747	7749	7423	6878	6807	7343	7731	8517	9731	10505	9722	9141	7117	5165	4094	3132	2779	1926	132684
23	1113	748	681	867	1925	4791	6547	7737	7482	7470	8013	8718	9627	9887	10492	10521	9401	8498	7010	5457	4320	3461	2682	2006	139454
24	1221	824	631	620	1051	1896	2415	3129	4258	5828	7271	8235	8808	8851	8588	8975	8077	6815	5107	4494	4513	4409	3670	2221	111907
25	1179	834	539	340	331	497	826	1074	1460	2234	3386	4365	5947	6317	5495	4787	4497	4497	4342	4193	3598	2681	1868	1216	66503
26	743	418	349	345	423	759	1449	2210	3056	4915	6902	8842	7926	8403	7887	7549	7130	7170	5906	4642	3436	2532	1866	1227	96085
27	783	530	543	652	1701	4379	5544	6104	6289	6348	7275	8220	8655	8792	9724	10128	9255	8009	5862	4242	3220	2636	1898	1298	122087
28	852	629	586	757	1805	4618	5781	6316	6396	6204	6793	7569	8087	8721	10097	10342	9523	8294	5902	4461	3308	2781	1966	1349	123137
29	869	631	567	753	1894	4686	5912	6849	6708	6848	7355	7952	8689	9081	10097	10912	9787	9016	6336	4540	3526	2873	2330	1587	129798
30	927	645	607	742	1733	4336	5567	6736	6564	6516	7385	8276	8909	9407	10029	10187	9337	8569	6397	4710	3689	2823	2094	1560	127745
31	1009	735	573	645	1191	2394	2958	3733	4292	5198	6678	7855	8646	8856	8630	8451	7385	6180	4946	3615	2706	2021	1729	1295	101721
																									123818

Massachusetts Highway Department

5111: Monthly Volume for 2022/2021

Location ID: 511
County: Essex
Functional Class: 1
Location: INTERSTATE 93

Seasonal Factor Group: U1-Essex
Daily Factor Group:
Axle Factor Group: U1-Essex
Growth Factor Group:

Month	Volume	Seasonal Factor
January	112947	0.90
February	121321	0.96
March	118116	0.94
April	120488	0.96
May	123895	0.99
June	133455	1.06
July	130136	1.03
August	131834	1.05
September	130323	1.04
October	135307	1.08
November	127396	1.01
December	123818	0.98

March Multiplier to Average Month

1.065

1.044

125753

MOTOR VEHICLE CRASH DATA

Crash Number	Crash Date	Crash Severity	Crash Status	Crash Time	Crash Year	Max Injury Severity Reported	Number of Vehicles	Driver Contributing Circumstances (All Drivers)	Driver Distracted By (All Vehicles)	First Harmful Event	Is Geocoded	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Total Fatalities	Total Non-Fatal Injuries	Traffic Control Device Type	Trafficway Description	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Emergency Use (All Vehicles)	Vehicle Towed From Scene (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Hit and Run	Most Harmful Event (All Vehicles)	Road Contributing Circumstance	School Bus Related	Speed Limit	Traffic Control Device Function	Vehicle Sequence of Events (All Vehicles)	Latitude	Longitude	Street Number	Roadway
4342750	03/23/2017	Non-fatal injury	Closed	9:40 AM	2017	Non-fatal injury - Possible	2	D1: (Made an improper turn) / D2: (No improper driving),(No improper driving)	D1: Not Distracted / D2: Not Distracted	Collision with motor vehicle in traffic	Yes	Daylight	Head-on	Dry	Four-way intersection	0	1	No controls	Two-way, divided, unprotected median	V1: Turning left / V2: Turning right	V1:(Passenger car) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(Yes, vehicle or trailer disabled) / V2:(No)	V1: N / V2: W	Clear/Clear	No hit and run	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	No, school bus not involved	25	Not reported	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	42.69052	-71.22892	1	GRIFFIN BROOK DR
4379430	06/16/2017	Property damage only (none injured)	Closed	5:12 PM	2017	No injury	2	D1: (Failed to yield right of way) / D2: (No improper driving)	D2: Not Distracted	Collision with motor vehicle in traffic	Yes	Daylight	Angle	Wet	Not at junction	0	0	No controls	Two-way, not divided	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(No) / V2:(No)	V1: W / V2: N	Rain/Cloudy	No hit and run	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	No, school bus not involved	35	Not reported	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	42.69052	-71.22892	1	GRIFFIN BROOK DR
4394340	07/17/2017	Property damage only (none injured)	Closed	3:16 PM	2017	No injury	2	D1: (Followed too closely) / D2: (No improper driving)	D1: Not Distracted / D2: Not Distracted	Collision with motor vehicle in traffic	Yes	Daylight	Rear-end	Dry	T-intersection	0	0	Traffic control signal	Two-way, not divided	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(No) / V2:(No)	V1: E / V2: E	Clear/Clear	No hit and run	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	No, school bus not involved	45	Yes, device functioning	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	42.69066	-71.2289		LOWELL ST / GRIFFIN BROOK DRIVE
4426088	09/15/2017	Non-fatal injury	Closed	4:51 PM	2017	Non-fatal injury - Non-incapacitating	3	D1: (No improper driving) / D2: (Failed to yield right of way),(Followed too closely) / D3: (No improper driving)	D1: Not Distracted	Collision with motor vehicle in traffic	Yes	Daylight	Rear-end	Wet	T-intersection	0	1	Traffic control signal	Two-way, not divided	V1: Slowing or stopped in traffic / V2: Travelling straight ahead / V3: Parked	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car) / V3:(Passenger car)	V1:(No) / V2:(No) / V3:(No)	V1:(No) / V2:(No) / V3:(No)	V1: E / V2: E / V3: W	Cloudy/Rain	No hit and run	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic) / V3:(Collision with motor vehicle in traffic)	None	No, school bus not involved	45	Yes, device functioning	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic),(Ran off road right),(Collision with motor vehicle in traffic) V3:(Collision with motor vehicle in traffic)	42.69066	-71.2289		LOWELL ST Rte 110 E / GRIFFIN BROOK DRIVE
4429577	09/22/2017	Property damage only (none injured)	Closed	3:14 PM	2017	No injury	3			Collision with motor vehicle in traffic	Yes	Daylight	Rear-end	Wet	T-intersection	0	0	Traffic control signal	Two-way, not divided	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Slowing or stopped in traffic	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Light truck(van, mini-van, pickup, sport utility)) / V3:(Light truck(van, mini-van, pickup, sport utility))	V1:(No) / V2:(No) / V3:(No)	V1:(No) / V2:(Yes, vehicle or trailer disabled) / V3:(No)	V1: E / V2: E / V3: E	Rain/Rain	No hit and run	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic) / V3:(Collision with motor vehicle in traffic)	Road surface condition (wet, icy, snow, slush, etc.)	No, school bus not involved	Yes, device functioning	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic) / V3:(Collision with motor vehicle in traffic)	42.69066	-71.2289		LOWELL ST / GRIFFIN BROOK DR	
4541136	05/17/2018	Property damage only (none injured)	Closed	7:50 AM	2018	No injury	2	D1: (No improper driving),(No improper driving) / D2: (Followed too closely)	D1: Not Distracted / D2: Not Distracted	Collision with motor vehicle in traffic	Yes	Daylight	Rear-end	Dry	T-intersection	0	0	No controls	Two-way, not divided	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(No) / V2:(No)	V1: E / V2: E	Clear/Clear	No hit and run	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	No, school bus not involved	40	Not reported	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	42.69066	-71.2289		LOWELL ST / GRIFFIN BROOK DR
4604353	10/02/2018	Property damage only (none injured)	Closed	10:28 AM	2018	No injury	2	D1: (No improper driving) / D2: (Followed too closely)	D1: Not Distracted	Collision with motor vehicle in traffic	Yes	Daylight	Rear-end	Wet	T-intersection	0	0	Traffic control signal	Two-way, not divided	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(No) / V2:(Yes, vehicle or trailer disabled)	V1: E / V2: E	Rain/Cloudy	No hit and run	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	Not reported	No, school bus not involved	45	Yes, device functioning	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	42.69053	-71.22891		LOWELL ST / GRIFFIN BROOK DR
4630931	11/30/2018	Property damage only (none injured)	Closed	7:50 AM	2018	No injury	2	D1: (No improper driving),(No improper driving) / D2: (Visibility obstructed)	D1: Not Distracted	Collision with motor vehicle in traffic	Yes	Daylight	Sideswipe, same direction	Dry	T-intersection	0	0	No controls	Two-way, not divided	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(No) / V2:(No)	V1: E / V2: E	Clear/Clear	No hit and run	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	No, school bus not involved	35	Not reported	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	42.69053	-71.22891		LOWELL ST / GRIFFIN BROOK DR
4839123	04/29/2020	Property damage only (none injured)	Closed	2:50 PM	2020	No Apparent Injury (0)	2	D1: (Driving too fast for conditions),(Distracted) / D2: (No improper driving)	D1: Other activity (searching, eating, personal hygiene, etc.) / D2: Not Distracted	Collision with motor vehicle in traffic	Yes	Daylight	Rear-end	Dry	T-intersection	0	0	Traffic control signal	Two-way, not divided	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(Yes, vehicle or trailer disabled) / V2:(No)	V1: E / V2: E	Clear/Clear	No hit and run	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	No, school bus not involved	40	Yes, device functioning	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	42.69053	-71.22891		LOWELL ST Rte 110 E / GRIFFIN BROOK DR
5233580	01/15/2023	Property damage only (none injured)	Open	2:58 PM	2023	No Apparent Injury (0)	2	D1: (No improper driving) / D2: (Followed too closely)	D1: Not Distracted	Collision with motor vehicle in traffic	Yes	Daylight	Rear-end	Dry	T-intersection	0	0	Traffic control signal	Two-way, not divided	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1:(No) / V2:(No)	V1:(No) / V2:(Yes, vehicle or trailer disabled)	V1: E / V2: E	Clear/Clear	No hit and run	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	None	No, school bus not involved	40	Yes, device functioning	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic),(Collision with tree),(Collision with light pole or other post/support) V2:(Collision with motor vehicle in traffic)	42.69053	-71.22891		LOWELL ST Rte E / GRIFFIN BROOK DR Rte

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Methuen COUNT DATE : July 2024

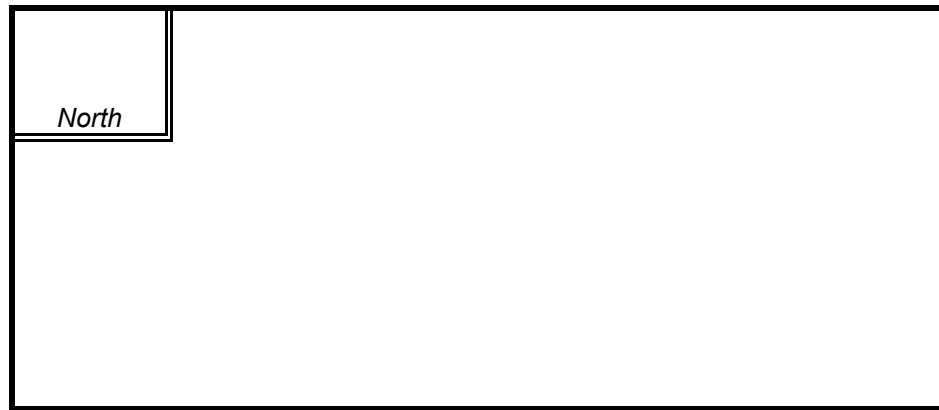
DISTRICT : 4 UNSIGNALIZED : ☐ SIGNALIZED : ☒

~ INTERSECTION DATA ~

MAJOR STREET : Lowell Street

MINOR STREET(S) : Griffin Brook Drive

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM/PM) :	150	0	798	629		1,577

" K " FACTOR :

0.090

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

17,522

TOTAL # OF CRASHES :

10

OF YEARS :

7

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

1.43

CRASH RATE CALCULATION :

0.22

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

Comments : _____

Project Title & Date: _____

BACKGROUND DEVELOPMENT

From: [Sophie Fox](#)
To: [Kenneth Cram](#)
Cc: [Steven Andrews](#)
Subject: Methuen Growth Rate
Date: Wednesday, August 28, 2024 3:01:49 PM
Attachments: [GrowthRate_ExampleCalcs_tdm23.1.0.pdf](#)



Good afternoon Kenneth,

Please see the municipality-level growth rates for **Methuen and the MVPC** below:

Compound Average Annual Growth Rate (CAGR) from 2019 to 2050:

Roadway Type	Stoneham CAGR	MVPC CAGR
Highway	0.150%	0.124%
Major Arterial	0.238%	0.190%
Minor Arterial and Collector	0.314%	0.293%
All Facilities (including local roads)	0.210%	0.190%

These growth rates are based on socioeconomic forecasts developed by MassDOT and the UMass Donahue Institute, processed by MAPC, and incorporated into the CTPS TDM23 travel demand model (version 1.0). Growth rates represent the projected change of VMT within a given geography between the base scenario (2019) and the LRTP plan scenario (2050).

Please be cautious when the table shows a negative growth rate. It may be more conservative to swap in a zero- or low-growth rate instead. To aid in your decision making, we have also included the growth rate for the entire MPO.

You may also access historic traffic data using MassDOT's MS2 platform (<https://mhd.public.ms2soft.com/tcds/tsearch.asp?loc=Mhd&mod=TCDS>).

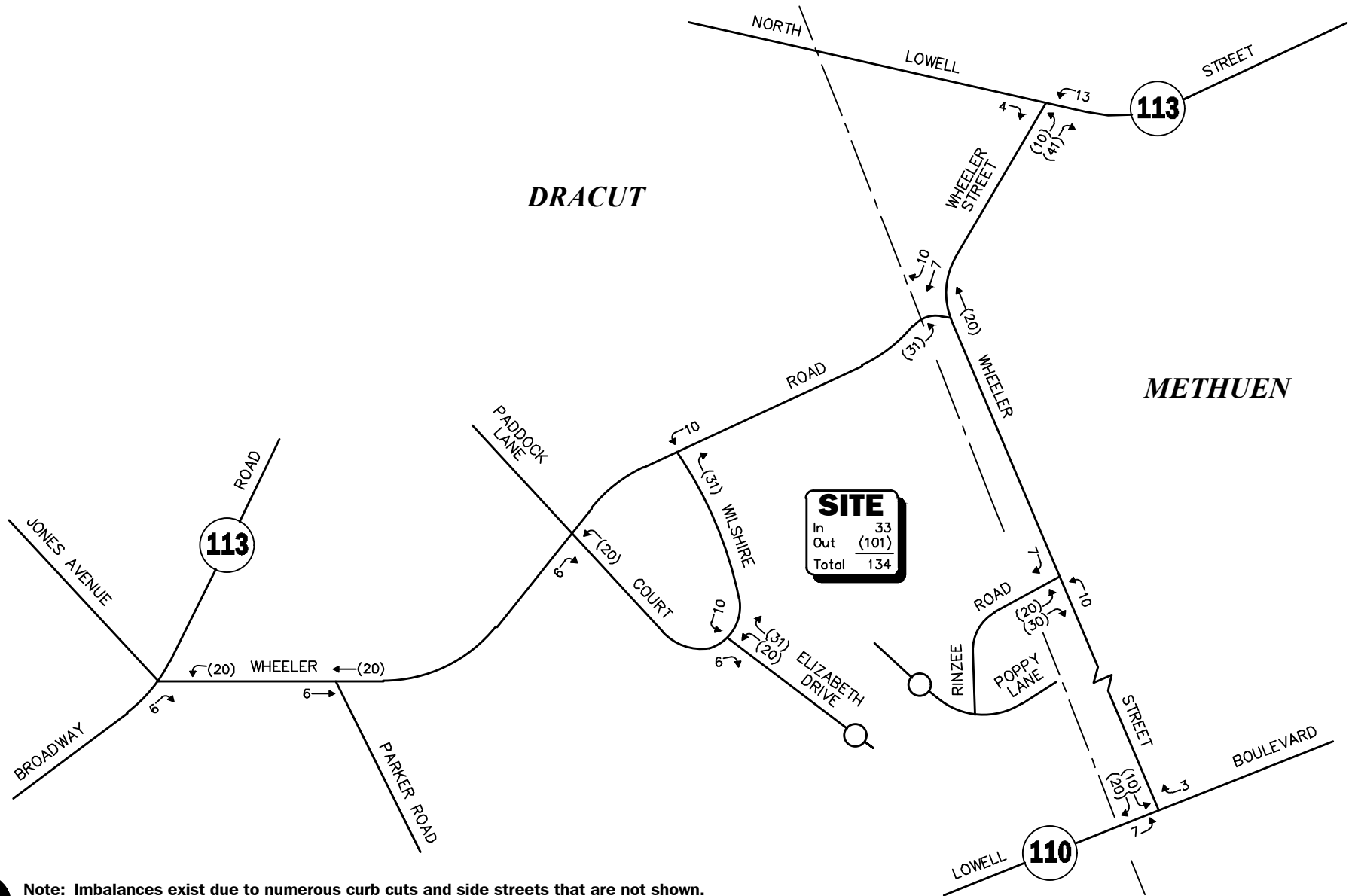
Example calculations are in the attached PDF.

Let us know if you have any questions.

Best,
Sophie

Sophie Fox | she, her, hers
Data Analyst
Central Transportation Planning Staff
Boston Region Metropolitan Planning Organization
[857.702.3665](tel:857.702.3665) | sfox@ctps.org | bostonmpo.org

Please be advised that the Massachusetts Secretary of State considers e-mail to be a public record, and therefore subject to the Massachusetts Public Records Law, M.G.L. c. 66 § 10.



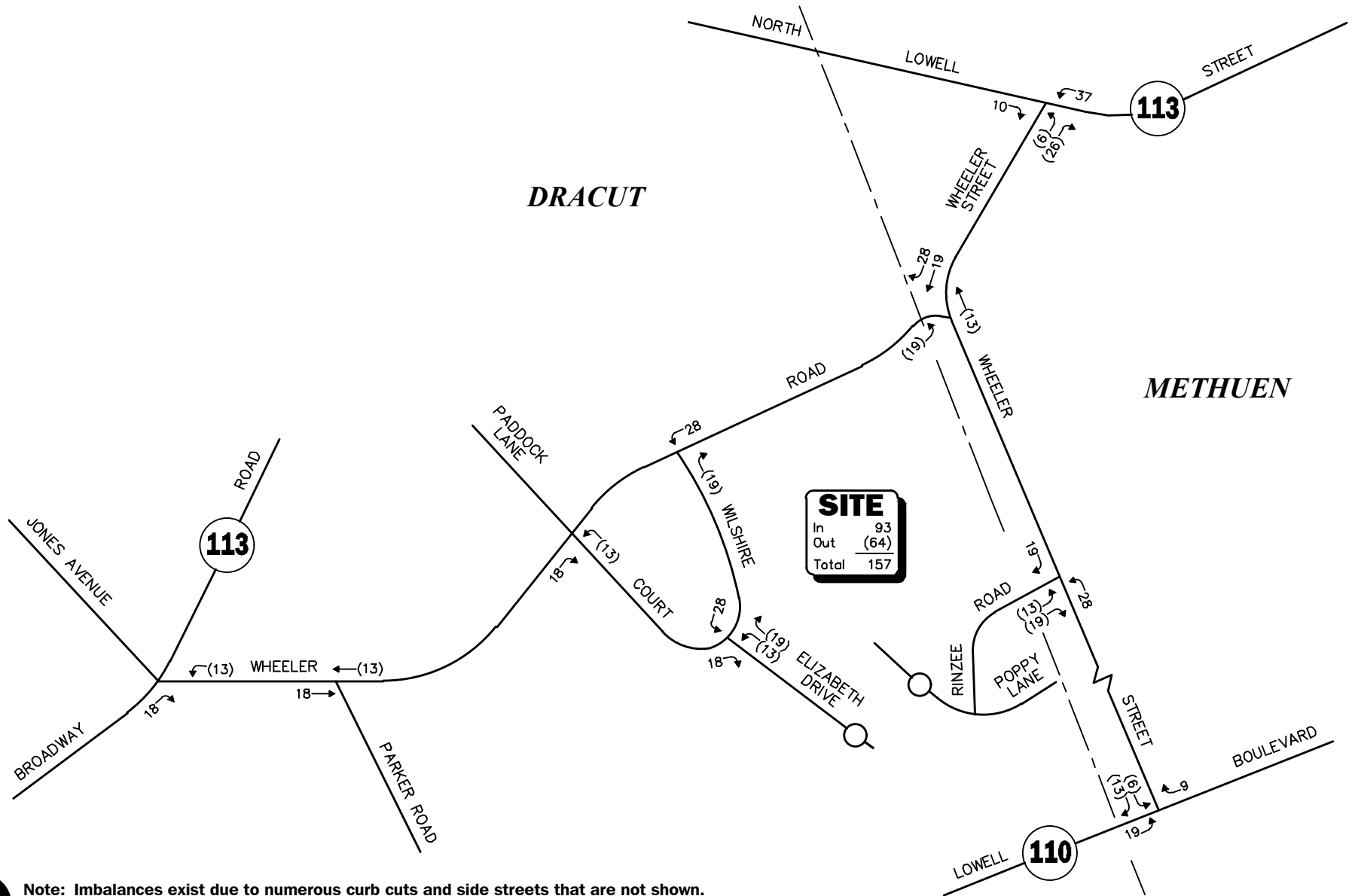
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale



Figure 7

Project-Generated
Weekday Morning
Peak-Hour Traffic Volumes



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

Not To Scale



Figure 8

Project-Generated
Weekday Evening
Peak-Hour Traffic Volumes

TRIP GENERATION DATA

Griffin Brook Drive, Methuen, MA

Griffin Brook Drive, Methuen, MA

Source: Institute of Transportation Engineers (ITE) - 11th Edition

Average Vehicle Trips Ends vs: 1000 Sq. Ft. GFA
Independent Variable (X): 95.700

AVERAGE WEEKDAY DAILY

$T = 1.58 * (X) + 38.29$ 31 Studies, Avg 1000 Sq. Ft. GFA = 292 ksf
 $T = 1.58 * (95.700) + 38.29$ $R^2 = 0.92$, AR = 1.71
 $T = 189.50$
 $T = 190$ vehicle trips
with 50% (95 vpd) entering and 50% (95 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 0.12 * (X) + 23.62$ 36 Studies, Avg 1000 Sq. Ft. GFA = 448 ksf
 $T = 0.12 * (95.700) + 23.62$ $R^2 = 0.69$, AR = 0.17
 $T = 35.10$
 $T = 35$ vehicle trips
with 77% (27 vph) entering and 23% (8 vph) exiting.

WEEKDAY MORNING PEAK HOUR OF GENERATOR

$T = 0.11 * (X) + 28.55$ 25 Studies, Avg 1000 Sq. Ft. GFA = 284 ksf
 $T = 0.11 * (95.700) + 28.55$ $R^2 = 0.85$, AR = 0.21
 $T = 39.08$
 $T = 39$ vehicle trips
with 66% (26 vph) entering and 34% (13 vph) exiting.
0.27 0.14

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$T = 0.12 * (X) + 26.48$ 47 Studies, Avg 1000 Sq. Ft. GFA = 400 ksf
 $T = 0.12 * (95.700) + 26.48$ $R^2 = 0.65$, AR = 0.19
 $T = 37.96$
 $T = 38$ vehicle trips
with 28% (11 vph) entering and 72% (27 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF GENERATOR

$\ln T = 0.83 \ln (X) - 0.05$
 $\ln T = 0.83 \ln (96) - 0.05$ 47 Studies, Avg size = 211 units
 $T = 0.15 * (X) + 20.47$ 27 Studies, Avg 1000 Sq. Ft. GFA = 284 ksf
 $T = 0.15 * (95.700) + 20.47$ $R^2 = 0.90$, AR = 0.23
 $T = 34.83$
 $T = 35$ vehicle trips
with 24% (8 vph) entering and 76% (27 vph) exiting.

SATURDAY DAILY

$$T = 0.15 * (X)$$

$$T = 0.15 * (95.700)$$

$$T = 14.36$$

$$T = 14 \text{ vehicle trips}$$

$$\text{with } 50\% (7 \text{ vpd}) \text{ entering and } 50\% (7 \text{ vpd}) \text{ exiting.}$$

Equation Not Given

3 Studies, Avg 1000 Sq. Ft. GFA = 226 ksf

 $R^2 = \text{Not Given}$, AR = 0.15**SATURDAY MIDDAY PEAK HOUR OF GENERATOR**

$$T = 0.05 * (X)$$

$$T = 0.05 * (95.700)$$

$$T = 4.79$$

$$T = 5 \text{ vehicle trips}$$

$$\text{with } 64\% (3 \text{ vph}) \text{ entering and } 36\% (2 \text{ vph}) \text{ exiting.}$$

Equation Not Given

2 Studies, Avg 1000 Sq. Ft. GFA = 129 ksf

 $R^2 = \text{Not Given}$, AR = 0.05**SUNDAY DAILY**

$$T = 0.06 * (X)$$

$$T = 0.06 * (95.700)$$

$$T = 5.74$$

$$T = 6 \text{ vehicle trips}$$

$$\text{with } 50\% (3 \text{ vph}) \text{ entering and } 50\% (3 \text{ vph}) \text{ exiting.}$$

Equation Not Given

3 Studies, Avg 1000 Sq. Ft. GFA = 226 ksf

 $R^2 = \text{Not Given}$, AR = 0.06**SUNDAY MIDDAY PEAK HOUR OF GENERATOR**

$$T = 0.04 * (X)$$

$$T = 0.04 * (95.700)$$

$$T = 3.83$$

$$T = 4 \text{ vehicle trips}$$

$$\text{with } 52\% (2 \text{ vph}) \text{ entering and } 48\% (2 \text{ vph}) \text{ exiting.}$$

Equation Not Given

2 Studies, Avg 1000 Sq. Ft. GFA = 129 ksf

 $R^2 = \text{Not Given}$, AR = 0.04

CAPACITY ANALYSIS METHODOLOGY

CAPACITY ANALYSIS METHODOLOGY

Levels of Service

Level-of-service (LOS) is a quantitative measure used to describe the operation of an intersection or roadway segment. The Level-of-Service definition is described by the quality of traffic flow and is primarily defined in terms of traffic delays. The primary result of capacity analyses³ is the assignment of a level-of-service to traffic intersections or roadway segments under various traffic-flow conditions. Six levels of service are defined for traffic intersections and roadway segments. Levels-of-service criteria range from LOS A to LOS F. LOS A represents very good operating conditions while LOS F represents very poor operating conditions.

Signalized Intersections

Levels of service for signalized intersections are calculated using the methodology and procedures described in the 7th Edition *Highway Capacity Manual*⁴ (HCM7). The methodology assesses the intersection based on type of signal operation, signal timing and phasing, progression, vehicle mix, and intersection geometrics. Level-of-service designations are based on the delay per vehicle. Table A summarizes the relationship between Level-of-Service and delay for signalized intersections. The calculated delay values result in levels-of-service designations which are applied to individual lane groups, to individual intersection approaches, and to the entire intersection. In the HCM7 methodology, the critical lane group volume to capacity ratio is reported.

TABLE A
LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS^a

Delay per Vehicle (Seconds)	Defined Level-of-Service $v/c^b < 1.0$	Defined Level-of-Service $v/c^b > 1.0$
≤ 10.0	A	F
10.1 to 20.0	B	F
20.1 to 35.0	C	F
35.1 to 55.0	D	F
55.1 to 80.0	E	F
> 80.0	F	F

^aHighway Capacity Manual 7th Edition; Transportation Research Board; Broad, DC; 2022; page 19-16.

^bVolume to capacity ratio.

³The capacity analysis methodology is based on procedures presented in the *Highway Capacity Manual 7th Edition*; Transportation Research Board; Washington, DC; 2022.

⁴Highway Capacity Manual 7th Edition; Transportation Research Board; Washington, DC; 2022.

Unsignalized Intersections

The level-of-service (LOS) for an unsignalized intersection is determined by the methodology and procedures described in the HCM7. The level-of-service for unsignalized intersections is measured in terms of average delay for the critical movements (typically side street turning movements or mainline turning movements). The delay for the critical movements is a function of the available capacity for the movement and the degree of saturation of the lane group containing the critical movement. The delay calculation 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. The definitions for level-of-service at unsignalized intersections are also provided in the *Highway Capacity Manual 7th Edition*. Table B summarizes the relationship between level-of-service and average control delay for the critical movements at unsignalized intersections.

TABLE B
LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS^a

Average Delay (seconds per vehicle)	Defined Level-of-Service $v/c^b < 1.0$	Defined Level-of-Service $v/c > 1.0$
≤ 10.0	A	F
10.1 to 15.0	B	F
15.1 to 25.0	C	F
25.1 to 35.0	D	F
35.1 to 50.0	E	F
> 50.0	F	F

^aHighway Capacity Manual 7th Edition; Transportation Research Board; Broad, DC; page 20-6

^bVolume to capacity ratio.

The analytical methodologies used for the analysis of unsignalized intersections use conservative analysis parameters, such as Lowell critical gaps. The critical gap is defined as the minimum time between successive main line vehicles for a side street vehicle to execute the appropriate turning maneuver. Actual field observations indicate that drivers at the study area intersections accept smaller gaps in traffic than those used in the analysis procedures and therefore experience less delay than calculated by the HCM methodology. **The analysis results from the HCM model overstate the actual delays experienced in the field.** It should be noted that the unsignalized intersections along heavily trafficked roadways operate at constrained levels and the resulting calculated results of the unsignalized intersection analyses should be considered highly conservative.

CAPACITY ANALYSIS WORKSHEETS

3: Lowell Street & Griffin Brook Drive Lanes, Volumes, Timings

2024 Existing AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	13	4	15	518	588	118
Future Volume (vph)	13	4	15	518	588	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300	300	240			160
Storage Lanes	1	0	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1656	1615	1805	3374	3374	1615
Flt Permitted	0.950		0.378			
Satd. Flow (perm)	1656	1615	718	3374	3374	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		7				126
Link Speed (mph)	30			30	30	
Link Distance (ft)	1184			417	477	
Travel Time (s)	26.9			9.5	10.8	
Peak Hour Factor	0.61	0.61	0.89	0.89	0.94	0.94
Heavy Vehicles (%)	9%	0%	0%	7%	7%	0%
Adj. Flow (vph)	21	7	17	582	626	126
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	7	17	582	626	126
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	

3: Lowell Street & Griffin Brook Drive Lanes, Volumes, Timings

2024 Existing AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	23.0	23.0
Total Split (s)	26.0	26.0	21.0	62.0	41.0	41.0
Total Split (%)	29.5%	29.5%	23.9%	70.5%	46.6%	46.6%
Maximum Green (s)	20.0	20.0	15.0	56.0	36.0	36.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	6.6	6.6	66.9	70.6	66.3	66.3
Actuated g/C Ratio	0.08	0.08	0.85	0.90	0.85	0.85
v/c Ratio	0.15	0.05	0.02	0.19	0.22	0.09
Control Delay	35.4	20.0	2.2	1.7	4.1	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	20.0	2.2	1.7	4.1	1.6
LOS	D	B	A	A	A	A
Approach Delay	31.5			1.7	3.6	
Approach LOS	C			A	A	

Intersection Summary

Area Type: Other

Cycle Length: 88

Actuated Cycle Length: 78.3

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.22

Intersection Signal Delay: 3.4

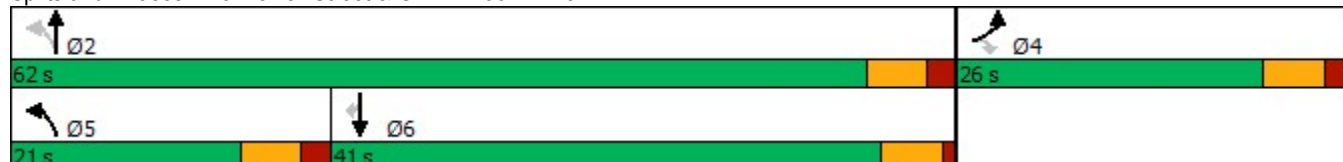
Intersection LOS: A

Intersection Capacity Utilization 29.6%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Lowell Street & Griffin Brook Drive



3: Lowell Street & Griffin Brook Drive Queues

2024 Existing AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	21	7	17	582	626	126
v/c Ratio	0.15	0.05	0.02	0.19	0.22	0.09
Control Delay	35.4	20.0	2.2	1.7	4.1	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	20.0	2.2	1.7	4.1	1.6
Queue Length 50th (ft)	10	0	1	0	0	0
Queue Length 95th (ft)	20	7	6	50	98	19
Internal Link Dist (ft)	1104			337	397	
Turn Bay Length (ft)	300	300	240			160
Base Capacity (vph)	423	418	821	3040	2855	1386
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.02	0.02	0.19	0.22	0.09
Intersection Summary						

3: Lowell Street & Griffin Brook Drive HCM 6th Signalized Intersection Summary

2024 Existing AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	4	15	518	588	118
Future Volume (veh/h)	13	4	15	518	588	118
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1767	1900	1900	1796	1796	1900
Adj Flow Rate, veh/h	21	7	17	582	626	126
Peak Hour Factor	0.61	0.61	0.89	0.89	0.94	0.94
Percent Heavy Veh, %	9	0	0	7	7	0
Cap, veh/h	50	48	590	2726	2366	1116
Arrive On Green	0.03	0.03	0.02	0.80	0.69	0.69
Sat Flow, veh/h	1682	1610	1810	3503	3503	1610
Grp Volume(v), veh/h	21	7	17	582	626	126
Grp Sat Flow(s),veh/h/ln	1682	1610	1810	1706	1706	1610
Q Serve(g_s), s	0.9	0.3	0.2	2.9	4.8	1.8
Cycle Q Clear(g_c), s	0.9	0.3	0.2	2.9	4.8	1.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	50	48	590	2726	2366	1116
V/C Ratio(X)	0.42	0.15	0.03	0.21	0.26	0.11
Avail Cap(c_a), veh/h	480	459	941	2726	2366	1116
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	33.1	2.7	1.7	4.0	3.6
Incr Delay (d2), s/veh	5.4	1.4	0.0	0.2	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.4	1.3	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	38.8	34.5	2.7	1.9	4.3	3.8
LnGrp LOS	D	C	A	A	A	A
Approach Vol, veh/h	28			599	752	
Approach Delay, s/veh	37.7			1.9	4.2	
Approach LOS	D			A	A	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	62.0			8.1	7.4	54.6
Change Period (Y+Rc), s	6.0			6.0	6.0	* 6
Max Green Setting (Gmax), s	56.0			20.0	15.0	* 36
Max Q Clear Time (g_c+I1), s	4.9			2.9	2.2	6.8
Green Ext Time (p_c), s	4.6			0.0	0.0	5.2
Intersection Summary						
HCM 6th Ctrl Delay			3.9			
HCM 6th LOS			A			
Notes						

3: Lowell Street & Griffin Brook Drive Lanes, Volumes, Timings

2024 Existing PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	137	13	1	797	611	18
Future Volume (vph)	137	13	1	797	611	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300	300	240			160
Storage Lanes	1	0	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	3610	3610	1615
Flt Permitted	0.950		0.333			
Satd. Flow (perm)	1805	1615	633	3610	3610	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		20				20
Link Speed (mph)	30			30	30	
Link Distance (ft)	1184			417	477	
Travel Time (s)	26.9			9.5	10.8	
Peak Hour Factor	0.66	0.66	0.91	0.91	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	208	20	1	876	687	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	208	20	1	876	687	20
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	

3: Lowell Street & Griffin Brook Drive Lanes, Volumes, Timings

2024 Existing PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	23.0	23.0
Total Split (s)	26.0	26.0	21.0	62.0	41.0	41.0
Total Split (%)	29.5%	29.5%	23.9%	70.5%	46.6%	46.6%
Maximum Green (s)	20.0	20.0	15.0	56.0	36.0	36.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	14.9	14.9	59.0	59.0	57.8	57.8
Actuated g/C Ratio	0.17	0.17	0.69	0.69	0.67	0.67
v/c Ratio	0.67	0.07	0.00	0.35	0.28	0.02
Control Delay	43.2	12.5	6.0	6.5	7.3	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	12.5	6.0	6.5	7.3	4.0
LOS	D	B	A	A	A	A
Approach Delay	40.5			6.5	7.2	
Approach LOS	D			A	A	

Intersection Summary

Area Type: Other

Cycle Length: 88

Actuated Cycle Length: 85.9

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 11.0

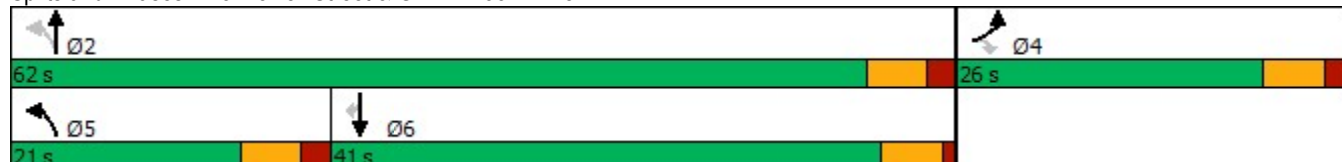
Intersection LOS: B

Intersection Capacity Utilization 39.6%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Lowell Street & Griffin Brook Drive



3: Lowell Street & Griffin Brook Drive Queues

2024 Existing PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	208	20	1	876	687	20
v/c Ratio	0.67	0.07	0.00	0.35	0.28	0.02
Control Delay	43.2	12.5	6.0	6.5	7.3	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	12.5	6.0	6.5	7.3	4.0
Queue Length 50th (ft)	101	0	0	87	61	0
Queue Length 95th (ft)	118	11	2	144	150	10
Internal Link Dist (ft)	1104			337	397	
Turn Bay Length (ft)	300	300	240			160
Base Capacity (vph)	421	391	639	2480	2427	1092
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.05	0.00	0.35	0.28	0.02
Intersection Summary						

3: Lowell Street & Griffin Brook Drive HCM 6th Signalized Intersection Summary

2024 Existing PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	137	13	1	797	611	18
Future Volume (veh/h)	137	13	1	797	611	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	208	20	1	876	687	20
Peak Hour Factor	0.66	0.66	0.91	0.91	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	256	227	502	2553	2274	1014
Arrive On Green	0.14	0.14	0.00	0.71	0.63	0.63
Sat Flow, veh/h	1810	1610	1810	3705	3705	1610
Grp Volume(v), veh/h	208	20	1	876	687	20
Grp Sat Flow(s),veh/h/ln	1810	1610	1810	1805	1805	1610
Q Serve(g_s), s	8.8	0.9	0.0	7.4	6.9	0.4
Cycle Q Clear(g_c), s	8.8	0.9	0.0	7.4	6.9	0.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	256	227	502	2553	2274	1014
V/C Ratio(X)	0.81	0.09	0.00	0.34	0.30	0.02
Avail Cap(c_a), veh/h	457	407	843	2553	2274	1014
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	29.6	5.2	4.5	6.7	5.5
Incr Delay (d2), s/veh	6.2	0.2	0.0	0.4	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.8	0.0	2.2	2.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.2	29.7	5.2	4.9	7.0	5.5
LnGrp LOS	D	C	A	A	A	A
Approach Vol, veh/h	228			877	707	
Approach Delay, s/veh	38.3			4.9	7.0	
Approach LOS	D			A	A	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	62.0			17.2	6.1	55.9
Change Period (Y+Rc), s	6.0			6.0	6.0	* 6
Max Green Setting (Gmax), s	56.0			20.0	15.0	* 36
Max Q Clear Time (g_c+l1), s	9.4			10.8	2.0	8.9
Green Ext Time (p_c), s	7.7			0.4	0.0	5.2
Intersection Summary						
HCM 6th Ctrl Delay			9.9			
HCM 6th LOS			A			
Notes						

3: Lowell Street & Griffin Brook Drive Lanes, Volumes, Timings

2031 No-Build AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	13	4	15	546	612	118
Future Volume (vph)	13	4	15	546	612	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300	300	240			160
Storage Lanes	1	0	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1656	1615	1805	3374	3374	1615
Flt Permitted	0.950		0.367			
Satd. Flow (perm)	1656	1615	697	3374	3374	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		7				126
Link Speed (mph)	30			30	30	
Link Distance (ft)	1184			417	477	
Travel Time (s)	26.9			9.5	10.8	
Peak Hour Factor	0.61	0.61	0.89	0.89	0.94	0.94
Heavy Vehicles (%)	9%	0%	0%	7%	7%	0%
Adj. Flow (vph)	21	7	17	613	651	126
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	7	17	613	651	126
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	

3: Lowell Street & Griffin Brook Drive Lanes, Volumes, Timings

2031 No-Build AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	23.0	23.0
Total Split (s)	26.0	26.0	21.0	62.0	41.0	41.0
Total Split (%)	29.5%	29.5%	23.9%	70.5%	46.6%	46.6%
Maximum Green (s)	20.0	20.0	15.0	56.0	36.0	36.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	6.6	6.6	66.9	70.6	66.3	66.3
Actuated g/C Ratio	0.08	0.08	0.85	0.90	0.85	0.85
v/c Ratio	0.15	0.05	0.03	0.20	0.23	0.09
Control Delay	35.4	20.0	2.2	1.7	4.1	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	20.0	2.2	1.7	4.1	1.6
LOS	D	B	A	A	A	A
Approach Delay	31.5			1.8	3.7	
Approach LOS	C			A	A	

Intersection Summary

Area Type: Other

Cycle Length: 88

Actuated Cycle Length: 78.3

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.23

Intersection Signal Delay: 3.4

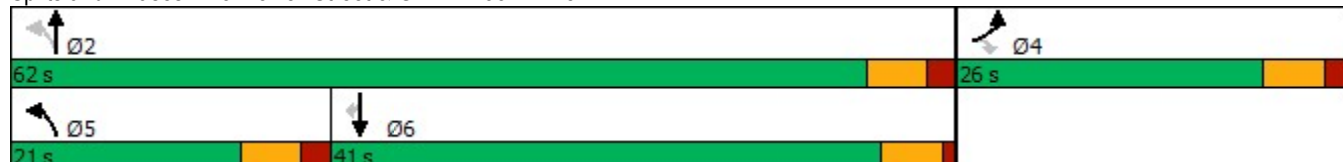
Intersection LOS: A

Intersection Capacity Utilization 30.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Lowell Street & Griffin Brook Drive



						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	21	7	17	613	651	126
v/c Ratio	0.15	0.05	0.03	0.20	0.23	0.09
Control Delay	35.4	20.0	2.2	1.7	4.1	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	20.0	2.2	1.7	4.1	1.6
Queue Length 50th (ft)	10	0	1	0	0	0
Queue Length 95th (ft)	20	7	6	53	103	19
Internal Link Dist (ft)	1104			337	397	
Turn Bay Length (ft)	300	300	240			160
Base Capacity (vph)	423	418	808	3040	2855	1386
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.02	0.02	0.20	0.23	0.09
Intersection Summary						

3: Lowell Street & Griffin Brook Drive HCM 6th Signalized Intersection Summary

2031 No-Build AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	4	15	546	612	118
Future Volume (veh/h)	13	4	15	546	612	118
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1767	1900	1900	1796	1796	1900
Adj Flow Rate, veh/h	21	7	17	613	651	126
Peak Hour Factor	0.61	0.61	0.89	0.89	0.94	0.94
Percent Heavy Veh, %	9	0	0	7	7	0
Cap, veh/h	50	48	577	2726	2366	1116
Arrive On Green	0.03	0.03	0.02	0.80	0.69	0.69
Sat Flow, veh/h	1682	1610	1810	3503	3503	1610
Grp Volume(v), veh/h	21	7	17	613	651	126
Grp Sat Flow(s),veh/h/ln	1682	1610	1810	1706	1706	1610
Q Serve(g_s), s	0.9	0.3	0.2	3.1	5.1	1.8
Cycle Q Clear(g_c), s	0.9	0.3	0.2	3.1	5.1	1.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	50	48	577	2726	2366	1116
V/C Ratio(X)	0.42	0.15	0.03	0.22	0.28	0.11
Avail Cap(c_a), veh/h	480	459	928	2726	2366	1116
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	33.1	2.7	1.7	4.1	3.6
Incr Delay (d2), s/veh	5.4	1.4	0.0	0.2	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.5	1.3	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	38.8	34.5	2.7	1.9	4.4	3.8
LnGrp LOS	D	C	A	A	A	A
Approach Vol, veh/h	28			630	777	
Approach Delay, s/veh	37.7			1.9	4.3	
Approach LOS	D			A	A	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	62.0			8.1	7.4	54.6
Change Period (Y+Rc), s	6.0			6.0	6.0	* 6
Max Green Setting (Gmax), s	56.0			20.0	15.0	* 36
Max Q Clear Time (g_c+I1), s	5.1			2.9	2.2	7.1
Green Ext Time (p_c), s	4.9			0.0	0.0	5.4
Intersection Summary						
HCM 6th Ctrl Delay			3.9			
HCM 6th LOS			A			
Notes						

3: Lowell Street & Griffin Brook Drive Lanes, Volumes, Timings

2031 No-Build PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	137	13	1	831	642	18
Future Volume (vph)	137	13	1	831	642	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300	300	240			160
Storage Lanes	1	0	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	3610	3610	1615
Flt Permitted	0.950		0.319			
Satd. Flow (perm)	1805	1615	606	3610	3610	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		20				20
Link Speed (mph)	30			30	30	
Link Distance (ft)	1184			417	477	
Travel Time (s)	26.9			9.5	10.8	
Peak Hour Factor	0.66	0.66	0.91	0.91	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	208	20	1	913	721	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	208	20	1	913	721	20
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	

3: Lowell Street & Griffin Brook Drive Lanes, Volumes, Timings

2031 No-Build PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	23.0	23.0
Total Split (s)	26.0	26.0	21.0	62.0	41.0	41.0
Total Split (%)	29.5%	29.5%	23.9%	70.5%	46.6%	46.6%
Maximum Green (s)	20.0	20.0	15.0	56.0	36.0	36.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	14.9	14.9	59.0	59.0	57.8	57.8
Actuated g/C Ratio	0.17	0.17	0.69	0.69	0.67	0.67
v/c Ratio	0.67	0.07	0.00	0.37	0.30	0.02
Control Delay	43.2	12.5	6.0	6.6	7.4	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	12.5	6.0	6.6	7.4	4.0
LOS	D	B	A	A	A	A
Approach Delay	40.5			6.6	7.3	
Approach LOS	D			A	A	

Intersection Summary

Area Type: Other

Cycle Length: 88

Actuated Cycle Length: 85.9

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 11.0

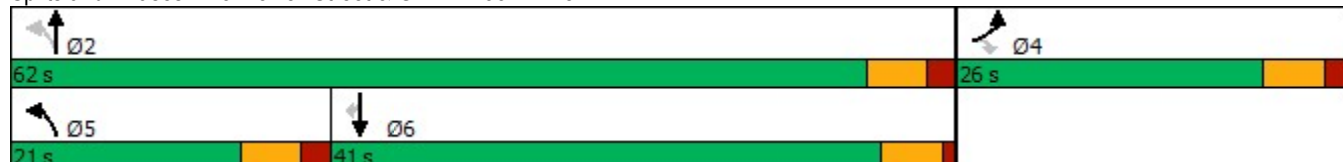
Intersection LOS: B

Intersection Capacity Utilization 40.6%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Lowell Street & Griffin Brook Drive



3: Lowell Street & Griffin Brook Drive Queues

2031 No-Build PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	208	20	1	913	721	20
v/c Ratio	0.67	0.07	0.00	0.37	0.30	0.02
Control Delay	43.2	12.5	6.0	6.6	7.4	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	12.5	6.0	6.6	7.4	4.0
Queue Length 50th (ft)	101	0	0	92	64	0
Queue Length 95th (ft)	118	11	2	152	158	10
Internal Link Dist (ft)	1104			337	397	
Turn Bay Length (ft)	300	300	240			160
Base Capacity (vph)	421	391	626	2480	2427	1092
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.05	0.00	0.37	0.30	0.02
Intersection Summary						

3: Lowell Street & Griffin Brook Drive HCM 6th Signalized Intersection Summary

2031 No-Build PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (veh/h)	137	13	1	831	642	18
Future Volume (veh/h)	137	13	1	831	642	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	208	20	1	913	721	20
Peak Hour Factor	0.66	0.66	0.91	0.91	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	256	227	486	2553	2274	1014
Arrive On Green	0.14	0.14	0.00	0.71	0.63	0.63
Sat Flow, veh/h	1810	1610	1810	3705	3705	1610
Grp Volume(v), veh/h	208	20	1	913	721	20
Grp Sat Flow(s),veh/h/ln	1810	1610	1810	1805	1805	1610
Q Serve(g_s), s	8.8	0.9	0.0	7.8	7.3	0.4
Cycle Q Clear(g_c), s	8.8	0.9	0.0	7.8	7.3	0.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	256	227	486	2553	2274	1014
V/C Ratio(X)	0.81	0.09	0.00	0.36	0.32	0.02
Avail Cap(c_a), veh/h	457	407	826	2553	2274	1014
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	29.6	5.2	4.5	6.8	5.5
Incr Delay (d2), s/veh	6.2	0.2	0.0	0.4	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.8	0.0	2.3	2.5	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.2	29.7	5.2	4.9	7.1	5.5
LnGrp LOS	D	C	A	A	A	A
Approach Vol, veh/h	228			914	741	
Approach Delay, s/veh	38.3			4.9	7.1	
Approach LOS	D			A	A	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	62.0			17.2	6.1	55.9
Change Period (Y+Rc), s	6.0			6.0	6.0	* 6
Max Green Setting (Gmax), s	56.0			20.0	15.0	* 36
Max Q Clear Time (g_c+l1), s	9.8			10.8	2.0	9.3
Green Ext Time (p_c), s	8.1			0.4	0.0	5.5
Intersection Summary						
HCM 6th Ctrl Delay			9.8			
HCM 6th LOS			A			
Notes						

3: Lowell Street & Griffin Brook Drive Lanes, Volumes, Timings

2031 Build AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	19	6	21	546	612	139
Future Volume (vph)	19	6	21	546	612	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300	300	240			160
Storage Lanes	1	0	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1656	1615	1805	3374	3374	1615
Flt Permitted	0.950		0.364			
Satd. Flow (perm)	1656	1615	692	3374	3374	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		10				148
Link Speed (mph)	30			30	30	
Link Distance (ft)	1184			417	477	
Travel Time (s)	26.9			9.5	10.8	
Peak Hour Factor	0.61	0.61	0.89	0.89	0.94	0.94
Heavy Vehicles (%)	9%	0%	0%	7%	7%	0%
Adj. Flow (vph)	31	10	24	613	651	148
Shared Lane Traffic (%)						
Lane Group Flow (vph)	31	10	24	613	651	148
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	

3: Lowell Street & Griffin Brook Drive Lanes, Volumes, Timings

2031 Build AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	23.0	23.0
Total Split (s)	26.0	26.0	21.0	62.0	41.0	41.0
Total Split (%)	29.5%	29.5%	23.9%	70.5%	46.6%	46.6%
Maximum Green (s)	20.0	20.0	15.0	56.0	36.0	36.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	7.1	7.1	65.3	67.8	63.4	63.4
Actuated g/C Ratio	0.09	0.09	0.82	0.85	0.80	0.80
v/c Ratio	0.21	0.07	0.04	0.21	0.24	0.11
Control Delay	36.4	18.2	2.7	2.4	4.9	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	18.2	2.7	2.4	4.9	1.6
LOS	D	B	A	A	A	A
Approach Delay	31.9			2.4	4.3	
Approach LOS	C			A	A	

Intersection Summary

Area Type: Other

Cycle Length: 88

Actuated Cycle Length: 79.6

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.24

Intersection Signal Delay: 4.2

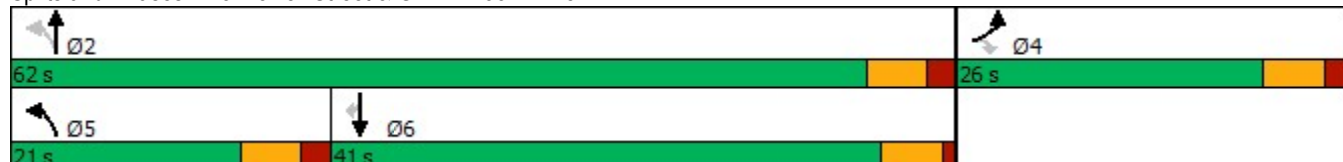
Intersection LOS: A

Intersection Capacity Utilization 31.6%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Lowell Street & Griffin Brook Drive



3: Lowell Street & Griffin Brook Drive Queues

2031 Build AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	31	10	24	613	651	148
v/c Ratio	0.21	0.07	0.04	0.21	0.24	0.11
Control Delay	36.4	18.2	2.7	2.4	4.9	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	18.2	2.7	2.4	4.9	1.6
Queue Length 50th (ft)	17	0	2	35	35	0
Queue Length 95th (ft)	25	8	8	56	107	21
Internal Link Dist (ft)	1104			337	397	
Turn Bay Length (ft)	300	300	240			160
Base Capacity (vph)	417	414	778	2874	2688	1317
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.02	0.03	0.21	0.24	0.11
Intersection Summary						

3: Lowell Street & Griffin Brook Drive HCM 6th Signalized Intersection Summary

2031 Build AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	6	21	546	612	139
Future Volume (veh/h)	19	6	21	546	612	139
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1767	1900	1900	1796	1796	1900
Adj Flow Rate, veh/h	31	10	24	613	651	148
Peak Hour Factor	0.61	0.61	0.89	0.89	0.94	0.94
Percent Heavy Veh, %	9	0	0	7	7	0
Cap, veh/h	66	63	568	2701	2321	1095
Arrive On Green	0.04	0.04	0.03	0.79	0.68	0.68
Sat Flow, veh/h	1682	1610	1810	3503	3503	1610
Grp Volume(v), veh/h	31	10	24	613	651	148
Grp Sat Flow(s),veh/h/ln	1682	1610	1810	1706	1706	1610
Q Serve(g_s), s	1.3	0.4	0.3	3.2	5.3	2.3
Cycle Q Clear(g_c), s	1.3	0.4	0.3	3.2	5.3	2.3
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	66	63	568	2701	2321	1095
V/C Ratio(X)	0.47	0.16	0.04	0.23	0.28	0.14
Avail Cap(c_a), veh/h	476	455	903	2701	2321	1095
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.3	32.9	2.9	1.9	4.5	4.0
Incr Delay (d2), s/veh	5.2	1.2	0.0	0.2	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.4	0.1	0.5	1.5	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	38.4	34.0	2.9	2.1	4.8	4.2
LnGrp LOS	D	C	A	A	A	A
Approach Vol, veh/h	41			637	799	
Approach Delay, s/veh	37.4			2.1	4.7	
Approach LOS	D			A	A	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	62.0			8.8	7.9	54.1
Change Period (Y+Rc), s	6.0			6.0	6.0	* 6
Max Green Setting (Gmax), s	56.0			20.0	15.0	* 36
Max Q Clear Time (g_c+I1), s	5.2			3.3	2.3	7.3
Green Ext Time (p_c), s	4.9			0.1	0.0	5.5
Intersection Summary						
HCM 6th Ctrl Delay			4.5			
HCM 6th LOS			A			
Notes						

3: Lowell Street & Griffin Brook Drive Lanes, Volumes, Timings

2031 Build PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	158	19	3	831	642	27
Future Volume (vph)	158	19	3	831	642	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300	300	240			160
Storage Lanes	1	0	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	3610	3610	1615
Flt Permitted	0.950		0.316			
Satd. Flow (perm)	1805	1615	600	3610	3610	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		29				30
Link Speed (mph)	30			30	30	
Link Distance (ft)	1184			417	477	
Travel Time (s)	26.9			9.5	10.8	
Peak Hour Factor	0.66	0.66	0.91	0.91	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	239	29	3	913	721	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	239	29	3	913	721	30
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	

3: Lowell Street & Griffin Brook Drive Lanes, Volumes, Timings

2031 Build PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	11.0	24.0	23.0	23.0
Total Split (s)	26.0	26.0	21.0	62.0	41.0	41.0
Total Split (%)	29.5%	29.5%	23.9%	70.5%	46.6%	46.6%
Maximum Green (s)	20.0	20.0	15.0	56.0	36.0	36.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effect Green (s)	15.9	15.9	57.7	57.7	56.4	56.4
Actuated g/C Ratio	0.19	0.19	0.67	0.67	0.66	0.66
v/c Ratio	0.72	0.09	0.01	0.38	0.30	0.03
Control Delay	44.7	11.1	5.7	7.0	7.8	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.7	11.1	5.7	7.0	7.8	3.6
LOS	D	B	A	A	A	A
Approach Delay	41.1			7.0	7.6	
Approach LOS	D			A	A	

Intersection Summary

Area Type: Other

Cycle Length: 88

Actuated Cycle Length: 85.6

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 12.0

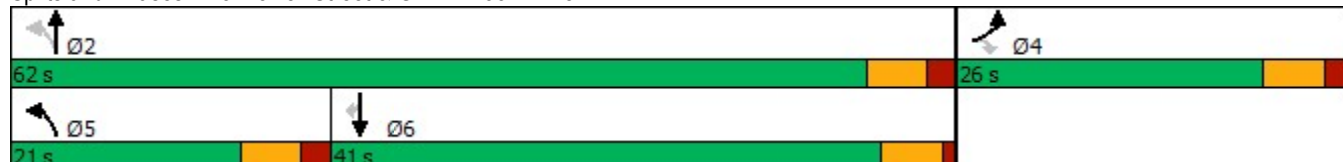
Intersection LOS: B

Intersection Capacity Utilization 41.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Lowell Street & Griffin Brook Drive



3: Lowell Street & Griffin Brook Drive Queues

2031 Build PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	239	29	3	913	721	30
v/c Ratio	0.72	0.09	0.01	0.38	0.30	0.03
Control Delay	44.7	11.1	5.7	7.0	7.8	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.7	11.1	5.7	7.0	7.8	3.6
Queue Length 50th (ft)	119	0	1	99	69	0
Queue Length 95th (ft)	134	12	3	152	160	13
Internal Link Dist (ft)	1104			337	397	
Turn Bay Length (ft)	300	300	240			160
Base Capacity (vph)	421	399	615	2434	2379	1074
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.07	0.00	0.38	0.30	0.03
Intersection Summary						

3: Lowell Street & Griffin Brook Drive HCM 6th Signalized Intersection Summary

2031 Build PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (veh/h)	158	19	3	831	642	27
Future Volume (veh/h)	158	19	3	831	642	27
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	239	29	3	913	721	30
Peak Hour Factor	0.66	0.66	0.91	0.91	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	287	255	471	2502	2219	990
Arrive On Green	0.16	0.16	0.00	0.69	0.61	0.61
Sat Flow, veh/h	1810	1610	1810	3705	3705	1610
Grp Volume(v), veh/h	239	29	3	913	721	30
Grp Sat Flow(s),veh/h/ln	1810	1610	1810	1805	1805	1610
Q Serve(g_s), s	10.3	1.2	0.0	8.4	7.8	0.6
Cycle Q Clear(g_c), s	10.3	1.2	0.0	8.4	7.8	0.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	287	255	471	2502	2219	990
V/C Ratio(X)	0.83	0.11	0.01	0.36	0.32	0.03
Avail Cap(c_a), veh/h	448	399	800	2502	2219	990
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	29.1	5.7	5.1	7.5	6.1
Incr Delay (d2), s/veh	7.7	0.2	0.0	0.4	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	1.2	0.0	2.6	2.7	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	40.7	29.3	5.7	5.5	7.9	6.2
LnGrp LOS	D	C	A	A	A	A
Approach Vol, veh/h	268			916	751	
Approach Delay, s/veh	39.4			5.5	7.8	
Approach LOS	D			A	A	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	62.0			18.8	6.3	55.7
Change Period (Y+Rc), s	6.0			6.0	6.0	* 6
Max Green Setting (Gmax), s	56.0			20.0	15.0	* 36
Max Q Clear Time (g_c+I1), s	10.4			12.3	2.0	9.8
Green Ext Time (p_c), s	8.1			0.5	0.0	5.5
Intersection Summary						
HCM 6th Ctrl Delay			11.1			
HCM 6th LOS			B			
Notes						