

Transportation Impact Assessment

Proposed Mixed-Use Development
297 Lincoln Street
Marlborough, Massachusetts

Prepared for:

Alta Marlborough, LLC
Marlborough, Massachusetts

May 2022

Prepared by:

 **Vanasse &
Associates inc**
Transportation Engineers & Planners

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Dear Reviewer:

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

Sincerely,

VANASSE & ASSOCIATES, INC.

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

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EXECUTIVE SUMMARY

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a 276-unit mixed-use development to be located at 297 Lincoln Street in Marlborough, Massachusetts (hereafter referred to as the Project). This assessment was prepared in consultation with the City of Marlborough and the Massachusetts Department of Transportation (MassDOT), and was performed in accordance with MassDOT's *Transportation Impact Assessment (TIA) Guidelines* and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports.

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

1. Using trip-generation statistics published by the Institute of Transportation Engineers (ITE)¹ and with appropriate adjustments to account for pass-by trips for the commercial component of the Project, the Project is expected to generate approximately 1,582 new vehicle trips on an average weekday (two-way, 24-hour volume), with approximately 134 new vehicle trips expected during the weekday morning peak-hour and 154 new vehicle trips expected during the weekday evening peak-hour;
2. The Project will not result in a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions), with all movements at the study area intersections shown to continue to operate at a level-of-service (LOS) D or better with the addition of Project-related traffic, where an LOS of "D" or better is defined as "acceptable" traffic operations;
3. All movements exiting the Project site driveway to Mechanic Street and the public parking lot to Lincoln Street are predicted to operate at LOS C or better during the peak hours with queues of up to one (1) vehicle;
4. Independent of the Project, the Mechanic Street/Lincoln Street intersection was found to have a motor vehicle crash rate that is above the MassDOT average crash rate for similar intersections. A Road Safety Audit (RSA) was conducted in April 2021 that included this intersection² and resulted in specific suggestions for improvements to enhance safety. A

¹*Trip Generation*, 11th Edition; Institute of Transportation Engineers; Washington, DC; 2021.

²*Road Safety Audit*, Lincoln Street at Pleasant Street/Lincoln Street at Mechanic Street, City of Marlborough; The Engineering Corporation (TEC); April 2021.

- number of the suggested improvements have been advanced by the City and are expected to result in a reduction in the frequency and severity of the crashes occurring at the intersection; and
5. Lines of sight at the Project site driveway and public parking lot were found to meet, exceed or could be made to meet or exceed the recommended minimum sight distance to function in a safe manner based on the appropriate approach speed.

RECOMMENDATIONS

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

Project Access

Access to the Project site will be provided by way of a full-access driveway that will intersect the east side of Mechanic Street generally opposite Hastings Street that will provide access to a surface parking lot and the parking garage that will be connected to the proposed residential building. Secondary access for delivery trucks and emergency vehicles will be provided by way of an easement through the City of Marlborough public parking lot that is being constructed as a part of the Project and will be accessed from a driveway that will intersect the north side of Lincoln Street approximately 100 ft to the west of the Lincoln Street/Cashman Street/Highland Street intersection. The following recommendations are offered with respect to the design and operation of the Project site access and internal circulation:

- The Project site driveway, public parking lot easement and subsequent vehicle turnaround should be a minimum of 24 feet in width and designed to accommodate the turning and maneuvering requirements of service/delivery vehicles and emergency vehicles.
- Where perpendicular parking is proposed, the drive aisle behind the parking should be a minimum of 23 feet in order to facilitate parking maneuvers.
- Vehicles exiting the Project site should be placed under STOP-sign control with a marked STOP-line provided.
- All signs and pavement markings to be installed within the Project site shall conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).³
- Sidewalks should be provided to link the building entrances to the sidewalks along Lincoln Street and Mechanic Street.
- Americans with Disabilities Act (ADA) compliant wheelchair ramps should be provided for crossing the Project site driveway and public parking lot entrance, or the driveway and

³*Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, DC; 2009.

entrance should be designed such that the sidewalks along Lincoln Street and Mechanic Street are flush with (i.e., crosses) the driveway and entrance.

- Signs and landscaping to be installed as a part of the Project within the intersection sight triangle areas of the Project site driveway and public parking lot entrance should be designed and maintained so as not to restrict lines of sight.
- Snow accumulations (windrows) within the sight triangle areas of the Project site driveway and public parking lot entrance should be promptly removed where such accumulations would impede sight lines.
- Consideration should be given to providing electric vehicle (EV) charging stations for use by residents, employees, and patrons of the Project.

Off-Site

Mechanic Street at Lincoln Street

Independent of the Project, the Mechanic Street/Lincoln Street intersection was identified to have a motor vehicle crash rate that is above the MassDOT average crash rate for similar intersections and the intersection has been identified by MassDOT as a high crash location for the period 2017-2019. A RSA has been conducted that included this intersection and the intersection of Lincoln Street at Pleasant Street, and the City has advanced a number of the safety enhancements that were suggested as an outcome of the RSA. To the extent that additional safety enhancements are deemed necessary at the intersection by the City, the Project proponent will work with the City to provide a reasonable financial contribution to the City for the design and construction of the additional safety enhancements.

Transportation Demand Management

Public transportation services are provided within the study area by the MetroWest Regional Transit Authority (MWRTA). The MWRTA provides fixed-route bus service along Lincoln Street and Mechanic Street adjacent to the Project site by way of bus Route 7C, *Inner City Marlborough*. The Route 7C bus provides service between The Wayside Inn Country Store and the Solomon Pond Mall, with the closest regular stop located at the intersection of Lincoln Street at Pleasant Street, approximately 0.4 miles (8-minute walk) to the west of the Project site; however, MWRTA buses also operate in a “flag stop” mode, where a rider can request a stop (pick-up or drop-off) anywhere along the service route where it is safe for the bus to stop by signaling to the driver. In addition, the MWRTA also operates Americans with Disabilities Act (ADA) paratransit services for eligible persons who cannot use fixed-route transit all or some of the time due to a physical, cognitive, or mental disability in compliance with the ADA.

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

- A transportation coordinator will be assigned for the Project to coordinate the TDM program;

- Information regarding public transportation services, maps, schedules, and fare information will be posted in a central location and/or otherwise made available to residents and employees;
- A “welcome packet” will be provided to residents and employees detailing available public transportation services, bicycle and walking alternatives, and commuter options available;
- Work-at-home workspaces will be provided to support telecommuting by residents of the Project;
- Pedestrian accommodations will be incorporated within the Project site and consist of walkways that connect to the existing sidewalks along Lincoln Street and Mechanic Street;
- A central maildrop will be provided within the building for residents; and
- Secure bicycle parking will be provided for residents, visitors/patrons and commercial tenants, including weather protected bicycle parking in a bike room located within the garage.

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

INTRODUCTION

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a 276-unit mixed-use development to be located at 297 Lincoln Street in Marlborough, Massachusetts (hereafter referred to as the Project). This study evaluates the following specific areas as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; and identifies and analyzes existing traffic conditions and future traffic conditions, both with and without the Project, along Lincoln Street and Mechanic Street, and at major intersections located along these roadways through which Project-related traffic will travel.

PROJECT DESCRIPTION

As proposed, the Project will entail the construction of a four and five-story building that will include 276 multifamily residential units, approximately 10,074± square feet (sf) of retail space and a five-story parking garage. The Project site encompasses approximately 4.71± acres of land that is generally bounded by commercial properties and the Assabet River Rail Trail to the north; Lincoln Street to the south; the Assabet River Rail Trail to the east; and Mechanic Street and residential and commercial properties to the west. The Project site currently contains vacant buildings and an auto sales and repair shop, with associated appurtenances, that will be removed to accommodate the Project. Figure 1 depicts the Project site location in relation to the existing roadway network.

Access to the Project site will be provided by way of a full-access driveway that will intersect the east side of Mechanic Street generally opposite Hastings Street that will provide access to a surface parking lot and the parking garage that will be connected to the proposed residential building. Secondary access for delivery trucks and emergency vehicles will be provided by way of an easement through the City of Marlborough public parking lot that is being constructed as a part of the Project and will be accessed from a driveway that will intersect the north side of Lincoln Street approximately 100 ft to the west of the Lincoln Street/Cashman Street/Highland Street intersection.

MARLBOROUGH

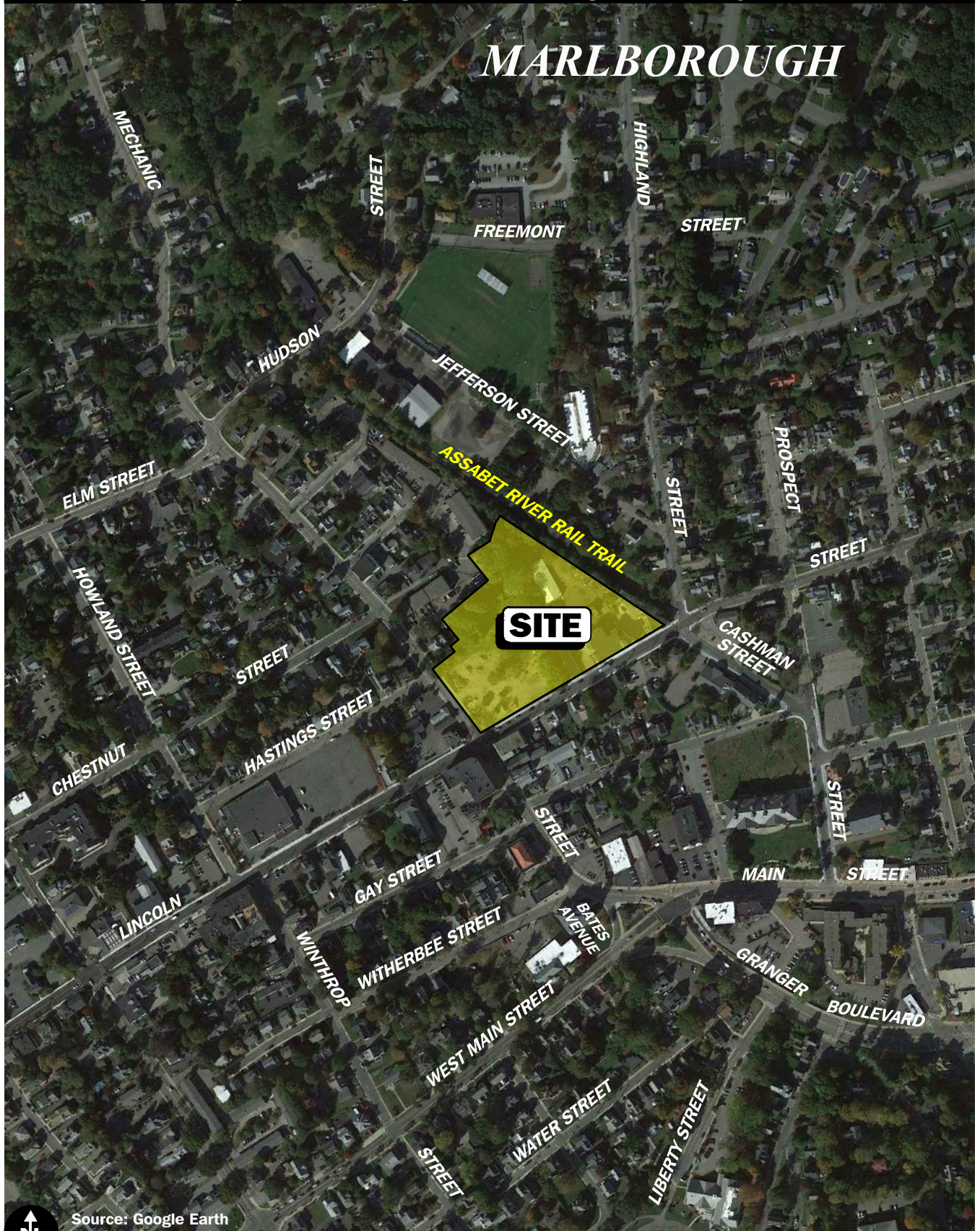


Figure 1

Site Location Map



On-site parking will be provided for 481 vehicles to accommodate residents, employees, visitors, and patrons. The proposed parking supply (481 parking spaces) exceeds the parking requirements of Section 650-48, *Off-Street Parking*, of the City of Marlborough Zoning Bylaw for the proposed mix of uses.⁴

STUDY METHODOLOGY

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

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

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

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

⁴The Zoning Bylaw requires a minimum of 1.0 parking spaces per multifamily dwelling unit plus 1.0 parking spaces per additional bedroom, and 1.0 parking spaces per 350 sf of retail space.

EXISTING CONDITIONS

A comprehensive field inventory of existing conditions within the study area was conducted in March and April 2022. The field investigation consisted of an inventory of existing roadway geometrics; pedestrian and bicycle facilities; public transportation services; traffic volumes; and operating characteristics; as well as posted speed limits and land use information within the study area. The study area that was assessed for the Project consisted of Lincoln Street and Mechanic Street, and the following intersections: Mechanic Street at Hastings Street; Mechanic Street at Lincoln Street; Lincoln Street at Cashman Street and Highland Street; Main Street at West Main Street, Mechanic Street, and Granger Boulevard; and West Main Street at Bates Avenue.

The following describes the study area roadways and intersections.

ROADWAYS

Lincoln Street

- Two-lane urban principal arterial roadway under City jurisdiction;
- Traverses the study area in a general northeast-southwest direction;
- Provides two 11 to 14-foot wide travel lanes that are separated by a double-yellow centerline;
- The statutory limit pursuant to M.G.L c. 90 § 17 is 30 miles per hour (mph);⁵
- Sidewalks are provided along both sides of the roadway within the study area;
- Illumination is provided by way of streetlights mounted on wooden poles; and
- Land use within the study area consists of the Project site and residential and commercial properties.

⁵The statutory or “prima facie” speed is defined in M.G.L Chapter 90, Section 17, as the speed which would be deemed reasonable and proper to operate a motor vehicle.

Mechanic Street

- Two-lane urban collector roadway under City jurisdiction;
- Traverses the study area in a general northwest-southeast direction;
- Provides two 14 to 16-foot-wide travel lanes that are separated by a double-yellow centerline;
- The statutory speed limit pursuant to M.G.L c. 90 § 17 is 30 mph;
- Sidewalks are provided along both sides of the roadway within the study area;
- Illumination is provided by way of streetlights mounted on wooden poles; and
- Land use within the study area consists of the Project site and residential and commercial properties.

INTERSECTIONS

Table 1 and Figure 2 summarize existing lane use, traffic control, and pedestrian and bicycle accommodations at the study area intersections as observed in April 2022.

Table 1
STUDY AREA INTERSECTIONS DESCRIPTION

Intersection	Traffic Control Type^a	No. of Travel Lanes Provided	Shoulder Provided? (Yes/No/Width)	Pedestrian Accommodations? (Yes/No/Description)	Bicycle Accommodations? (Yes/No/Description)
Mechanic St./Hastings St.	S	1 general-purpose lane on all approaches	No	Yes; sidewalks provided along both sides of Mechanic St. and along the north side of Hastings St.; crosswalk provided for crossing Hasting St.	Yes; Shared-traveled-way ^b on Mechanic St.
Mechanic St./Lincoln St.	TS	1 general-purpose lane on all approaches, on-street parking provided along the south side of Lincoln St. west of the intersection and along the west side of Mechanic St., south of the intersection; a ‘No Turn on Red’ prohibition is posted for the Mechanic St. northbound approach	Yes; 3 to 4-feet along Lincoln St.	Yes; sidewalks provided along both sides of Mechanic St. and Lincoln St.; crosswalks provided for crossing all intersection legs that include pedestrian traffic signal equipment and phasing (exclusive)	Yes; Shared-traveled-way

See notes at end of Table.

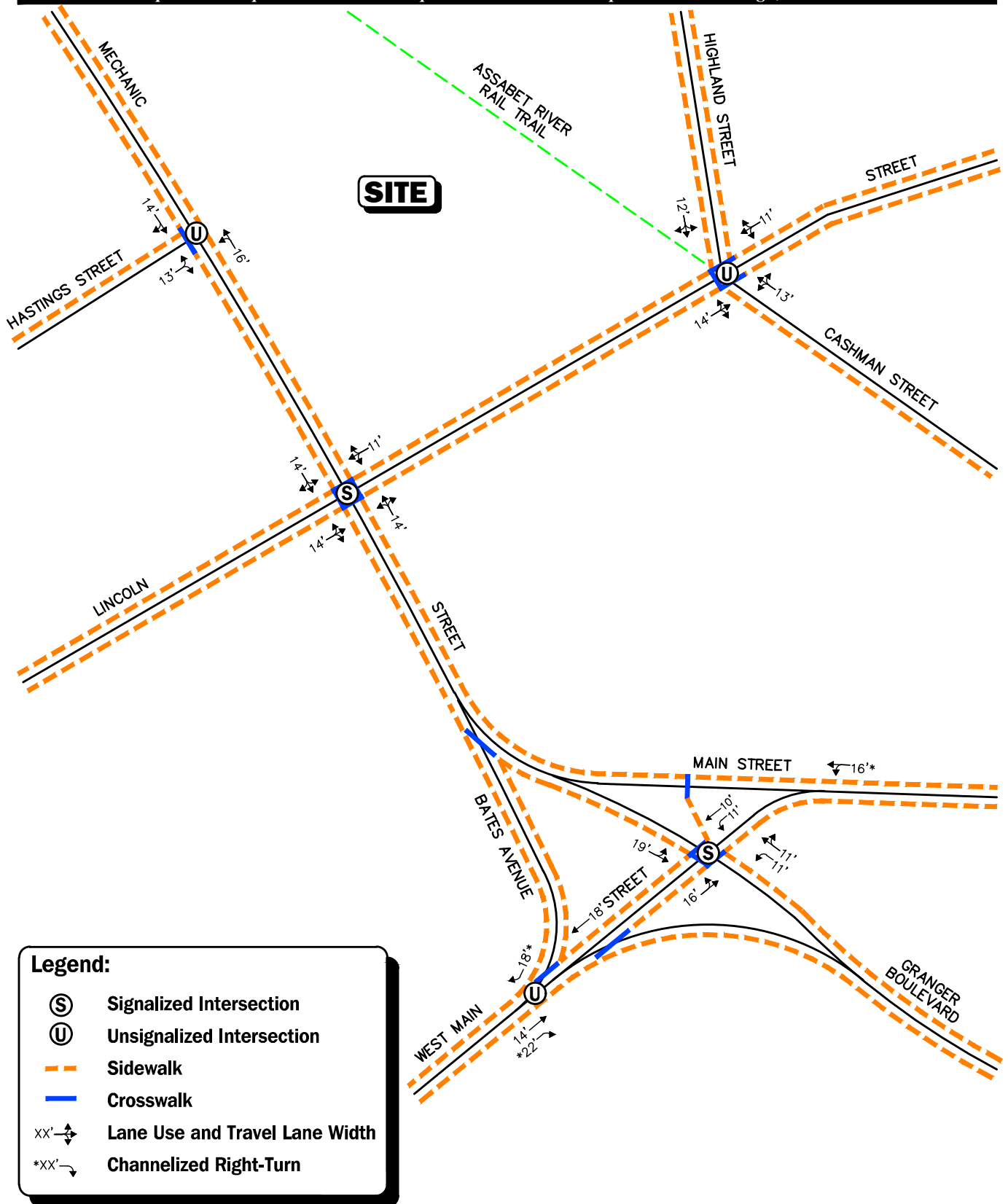


Figure 2

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

Table 1 (Continued)
STUDY AREA INTERSECTIONS DESCRIPTION

Intersection	Traffic Control Type^a	No. of Travel Lanes Provided	Shoulder Provided? (Yes/No/Width)	Pedestrian Accommodations? (Yes/No/Description)	Bicycle Accommodations? (Yes/No/Description)
Lincoln St./ Cashman St./ Highland St.	S	1 general-purpose lane on all approaches	Yes; 2 to 3-feet along Lincoln St.	Yes; sidewalks provided along both sides of Lincoln St. and Highland St., and along the west side of Cashman St.; crosswalks provided for crossing Highland St., Cashman St. and the Lincoln St. west leg	Yes; Assabet River Rail Trail access is situated on the northwest corner of the intersection and crosses Lincoln St. via the crosswalk that includes bicycle crossing pavement markings
Granger Blvd./ West Main St./ Main St./ Mechanic St.	TS	1 general-purpose lane on West Main St. approach, 1 left-turn lane and 1-through lane on Main St. approach with right turns exiting prior to the intersection by way of a channelized right-turn lane, 1 left-turn lane and 1 through/right-turn lane on Granger Blvd. approach, and 1 left-turn/through lane on Mechanic St. approach with right turns exiting prior to the intersection by way of Bates Ave.; on street parking provided along both sides of Main St. east of the intersection	Yes; 1-foot along all legs	Yes; sidewalks generally provided along both sides of all legs; crosswalks provide for crossing Mechanic St., Granger Blvd. and West Main St. that include pedestrian traffic signal equipment and phasing (exclusive)	Yes; Shared-traveled-way
West Main St./ Bates Ave.	S	1 general-purpose lane on all approaches; Bates Ave. is one-way toward West Main St. and restricted to right-turn only	Yes; 1 to 2-feet on all legs	Yes; sidewalks provided along both sides of the intersecting roadways; crosswalks provided for crossing Bates Ave. and channelized right-turn to Granger Blvd.	Yes; Shared-traveled-way

^aTS = traffic signal control, S = STOP-sign control.

^bCombined shoulder and travel lane width equal to or exceed 14 feet.

TRAFFIC VOLUMES

In order to determine existing traffic-volume demands and flow patterns within the study area, automatic traffic recorder (ATR) counts, turning movement counts (TMCs), and vehicle classification counts were completed in March 2022. The ATR counts were conducted on Lincoln Street and Mechanic Street in the vicinity of the Project site on March 23rd through 24th, 2022 (Wednesday through Thursday, inclusive) in order to record weekday traffic conditions over an extended period, with peak period TMCs performed at the study intersections during the weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak periods on Thursday,

March 23rd and Thursday, March 30th, 2022. These time periods were selected for analysis purposes as they are representative of the peak-traffic-volume hours for both the Project and the adjacent roadway network.

Traffic-Volume Adjustments

In order to evaluate the potential for seasonal fluctuation of traffic volumes within the study area, traffic-volume data from MassDOT Continuous Count Station AET08 located on the Massachusetts Turnpike, east of Cordaville, in Southborough were reviewed.⁶ Based on a review of this data, it was determined that traffic volumes for the month of March are approximately 3.4 percent *below* average-month conditions. As such, the March traffic volumes were adjusted upward by 3.4 percent in order to be representative of average-month conditions.

In order to account for the impact on traffic volumes and trip patterns resulting from the COVID-19 pandemic, traffic-volume data collected at MassDOT Continuous Count Station AET08 in March 2022 was compared to data collected at the same count station in March 2019. Based on this pre- and post-COVID-19 traffic-volume comparison, the traffic-volume data that was collected as part of this assessment was found to be approximately 11.8 percent *below* the conditions that existed prior to the COVID-19 pandemic. As such, the seasonally adjusted March traffic volumes were adjusted upward by an additional 11.8 percent.

The 2022 Existing traffic volumes are summarized in Table 2, with the weekday morning and weekday evening peak-hour traffic volumes graphically depicted on Figures 3 and 4, respectively. Note that the peak-hour traffic volumes that are presented in Table 2 were obtained from the aforementioned figures.

Table 2
2022 EXISTING TRAFFIC VOLUMES

Location/Peak Hour	AWT ^a	VPH ^b	K Factor ^c	Directional Distribution ^d
<i>Lincoln St., east of Mechanic St.:</i>	9,920	--	--	--
Weekday Morning (8:00 – 9:00 AM)	--	803	8.1	58.5% WB
Weekday Evening (5:00 – 6:00 PM)	--	938	9.5	55.3% WB
<i>Mechanic St., north of Lincoln St.:</i>	5,080	--	--	--
Weekday Morning (8:00 – 9:00 AM)	--	414	8.1	57.2% SB
Weekday Evening (5:00 – 6:00 PM)	--	593	11.7	51.3% NB

^aAverage weekday traffic in vehicles per day.

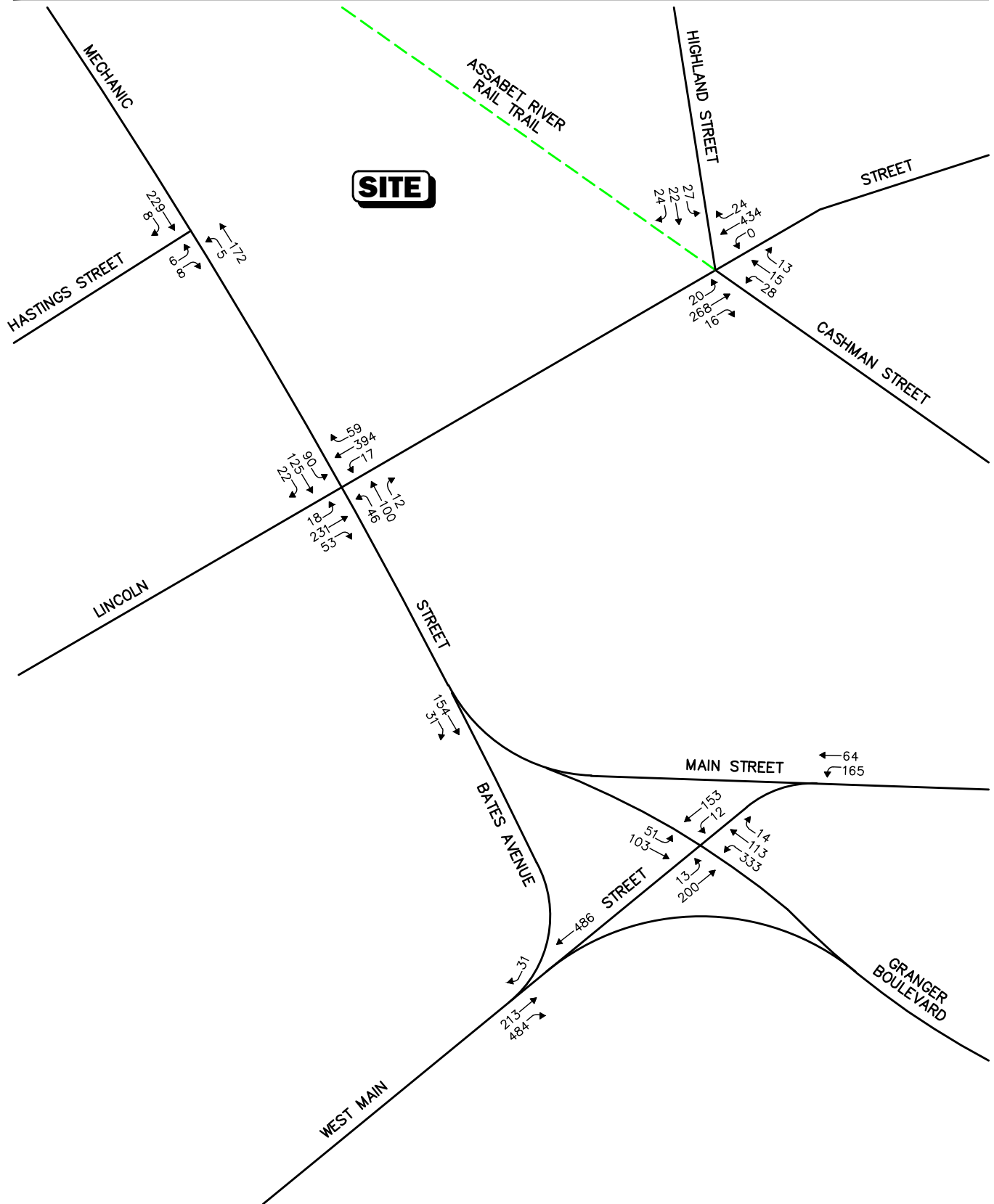
^bVehicles per hour.

^cPercent of daily traffic occurring during the peak hour.

^dPercent traveling in peak direction.

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

⁶MassDOT Traffic Volumes for the Commonwealth of Massachusetts; 2022.



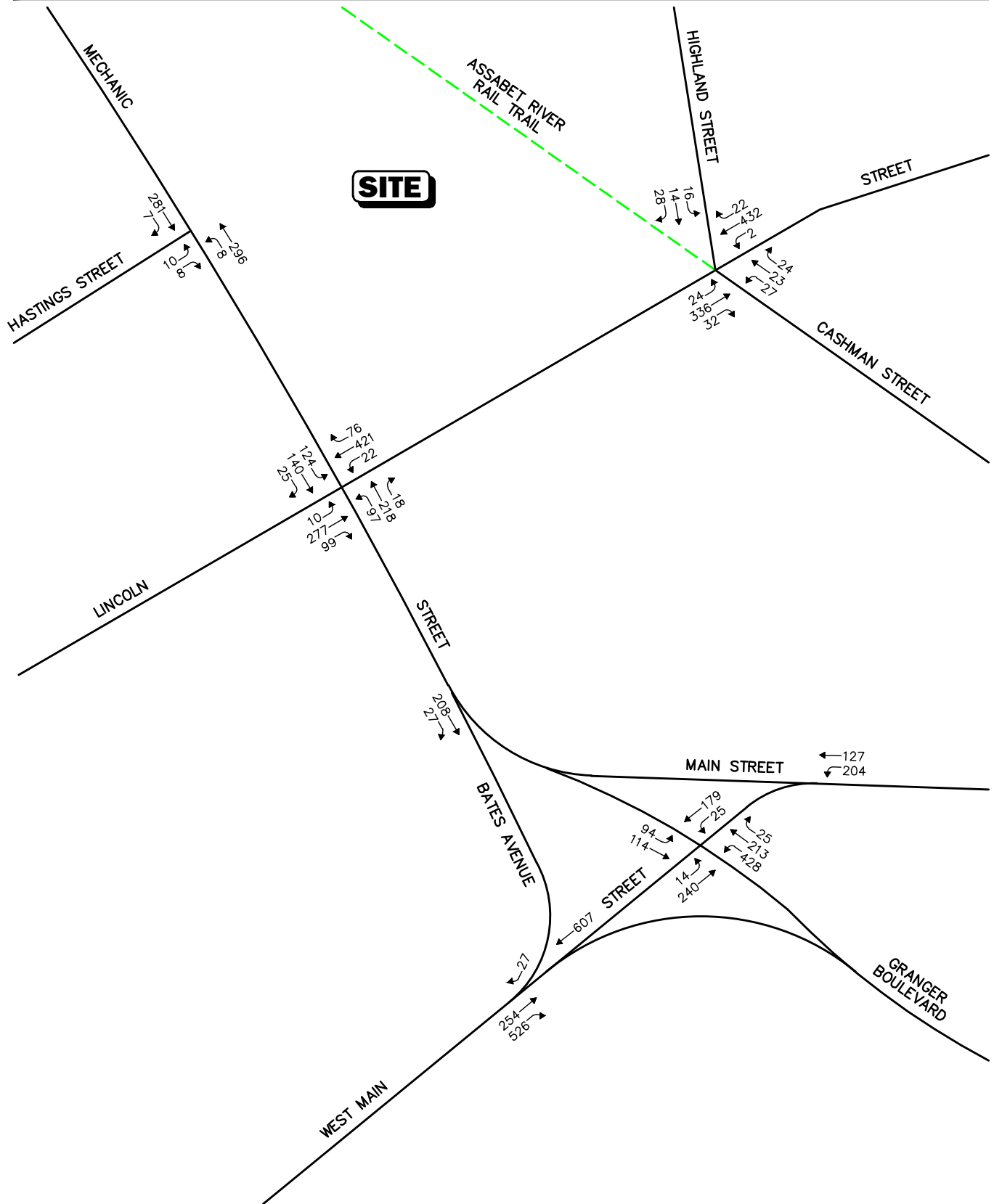
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 3

2022 Existing
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 4

2022 Existing
Weekday Evening
Peak-Hour Traffic Volumes



As can be seen in Table 2, Lincoln Street in the vicinity of the Project site was found to accommodate approximately 9,920 vehicles on an average weekday (two-way, 24-hour volume), with approximately 803 vehicles per hour (vph) during the weekday morning peak-hour and 938 vph during the weekday evening peak-hour. Mechanic Street in the vicinity of the Project site was found to accommodate approximately 5,080 vehicles on an average weekday, with approximately 414 vph during the weekday morning peak-hour and 593 vph during the weekday evening peak-hour.

PEDESTRIAN AND BICYCLE FACILITIES

A comprehensive field inventory of pedestrian and bicycle facilities within the study area was undertaken in April 2022. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study roadways and at the study area intersections. As detailed on Figure 2, sidewalks are generally provided along one or both sides of the study area roadways, with marked crosswalks provided for crossing one or more legs of the study area intersections and pedestrian traffic signal equipment provided for the crossings that are located at the signalized intersections within the study area.

The study area roadways generally provide sufficient width (combined travel lane and shoulder) to support bicycle travel in a shared-traveled-way configuration.⁷ In addition, the Assabet River Rail Trail, a 12.5 mile multi-purpose travel that traverses a former railroad right-of-way between the South Acton Commuter Rail station in Acton and Lincoln Street in Marlborough, bounding the Project site to the north and east, and is accessible by way of a trail head on the northwest corner of the Lincoln Street/Cashman Street/Highland Street intersection.

PUBLIC TRANSPORTATION

Public transportation services are provided within the study area by the MetroWest Regional Transit Authority (MWRTA). The MWRTA provides fixed-route bus service along Lincoln Street and Mechanic Street adjacent to the Project site by way of bus Route 7C, *Inner City Marlborough*. The Route 7C bus provides service between The Wayside Inn Country Store and the Solomon Pond Mall, with the closest regular stop located at the intersection of Lincoln Street at Pleasant Street, approximately 0.4 miles (8-minute walk) to the west of the Project site; however, MWRTA buses also operate in a “flag stop” mode, where a rider can request a stop (pick-up or drop-off) anywhere along the service route where it is safe for the bus to stop by signaling to the driver. In addition, the MWRTA also operates Americans with Disabilities Act (ADA) paratransit services for eligible persons who cannot use fixed-route transit all or some of the time due to a physical, cognitive, or mental disability in compliance with the ADA.

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

⁷A minimum combined travel lane and paved shoulder width of 14-feet is required to support bicycle travel in a shared traveled-way condition.

SPOT SPEED MEASUREMENTS

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

Table 3
VEHICLE TRAVEL SPEED MEASUREMENTS

	Lincoln Street		Mechanic Street	
	Eastbound	Westbound	Northbound	Southbound
Mean Travel Speed (mph)	27	20	27	23
85 th Percentile Speed (mph)	31	28	30	27
Statutory Speed Limit (mph)	30	30	30	30

mph = miles per hour.

As can be seen in Table 3, the mean vehicle travel speed along Lincoln Street in the vicinity of the Project site was found to be 27 mph in the eastbound direction and 20 mph westbound. The measured 85th percentile vehicle travel speed, or the speed at which 85 percent of the observed vehicles traveled at or below, was found to be 31 mph eastbound and 28 mph westbound, which is generally consistent with the statutory speed limit in the vicinity of the Project site (30 mph). The 85th percentile speed is used as the basis of engineering design and in the evaluation of sight distances and is often used in establishing posted speed limits.

The mean vehicle travel speed along Mechanic Street in the vicinity of the Project site was found to be 27 mph in the northbound direction and 23 mph southbound, with the measured 85th percentile vehicle travel speed was found to be 30 mph northbound and 27 mph southbound, which is also generally consistent with the statutory speed limit (30 mph).

MOTOR VEHICLE CRASH DATA

Motor vehicle crash information for the study area intersections was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2015 through 2019, inclusive) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized by intersection, type, severity, roadway and weather conditions, and day of occurrence, and presented in Table 4.

As can be seen in Table 4, with the exception of the Mechanic Street/Lincoln Street intersection, the study area intersections were found to have experienced an average of 4.4 or fewer reported motor vehicle crashes per year over the five-year review period and were found to have motor vehicle crash rates *below* MassDOT statewide and District average crash rates for similar intersections for the MassDOT Highway Division District in which the intersections are located (District 3). The majority of the reported crashes occurred on a weekday; under clear weather conditions; during daylight; and involved angle-type collisions that resulted in property damage only.

Table 4
MOTOR VEHICLE CRASH DATA SUMMARY^a

	Mechanic St./ Hastings St.	Mechanic St./ Lincoln St.	Lincoln St./ Cashman St./ Highland St.	Main St./West Main St./ Mechanic St./ Granger Blvd.	West Main St./ Bates Ave.
Traffic Control Type: ^b	S	TS	S	TS	S
<i>Year:</i>					
2015	0	10	1	3	0
2016	1	4	3	6	0
2017	0	5	2	1	0
2018	1	5	4	6	1
<u>2019</u>	<u>0</u>	<u>9</u>	<u>1</u>	<u>6</u>	<u>1</u>
Total	2	33	11	22	2
Average	0.4	6.6	2.2	4.4	0.4
Rate ^c	0.16	1.07	0.55	0.74	0.07
MassDOT Crash Rate: ^d	0.61/0.	0.89/0.	0.61/0.5	0.89/0.78	0.61/0.
Significant? ^e	57 No	78 Yes	7 No	No	55 No
<i>Type:</i>					
Angle	1	18	7	6	0
Rear-End	1	6	3	7	1
Head-On	0	2	0	2	0
Sideswipe	0	5	0	5	0
Fixed Object	0	1	1	1	1
Pedestrian/Bicycle	0	0	0	0	0
<u>Unknown/Other</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>0</u>
Total	2	33	11	22	2
<i>Conditions:</i>					
Clear	1	27	7	18	1
Cloudy	0	5	1	2	1
Rain	0	0	2	1	0
<u>Snow/Ice</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>0</u>
Total	2	33	11	22	2
<i>Lighting:</i>					
Daylight	1	22	9	15	1
Dawn/Dusk	0	2	0	3	1
Dark (Road Lit)	1	9	2	3	0
<u>Dark (Road Unlit)</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>
Total	2	33	11	22	2
<i>Day of Week:</i>					
Monday through Friday	2	25	8	19	2
Saturday	0	6	3	3	0
<u>Sunday</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	2	33	11	22	2
<i>Severity:</i>					
Property Damage Only	1	17	8	21	2
Personal Injury	0	14	3	1	0
Fatality	0	0	0	0	0
<u>Unknown</u>	<u>1</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	2	33	11	22	2

^aSource: MassDOT Safety Management/Traffic Operations Unit records, 2015 through 2019.

^bTraffic Control Type: TS = traffic signal control; S = stop control.

^cCrash rate per million vehicles entering the intersection.

^dDistrictwide/Statewide crash rate.

^eThe intersection crash rate is significant if it is found to exceed the MassDOT crash rate for the MassDOT Highway Division District in which the Project is located (District 3).

The Mechanic Street/Lincoln Street intersection was found to have experienced 33 reported motor vehicle crashes over the five-year review period, or an average of 6.6 crashes per year, the majority of which occurred on a weekday; during daylight; under clear weather conditions; and involved angle-type collisions that resulted in property damage only. A Road Safety Audit (RSA) was conducted in April 2021 that included the intersections of Lincoln Street at Mechanic Street and Lincoln Street at Pleasant Street.⁸ The RSA provided specific suggestions for improvements to be advanced at both intersections to enhance safety, many of which have been completed and are expected to result in a reduction in crash frequency and severity.

A review of the MassDOT statewide high crash location list indicated that the Mechanic Street/Lincoln Street intersection is included on MassDOT's HSIP listing as a high crash cluster location for 2017 through 2019. MassDOT defines a HSIP eligible cluster as: "*...a cluster in which the total number of 'equivalent property damage only' crashes is within the top 5 percent of all clusters in that region. 'Equivalent property damage only' is a method of combining the number of crashes with the severity of crashes based on a weighted scale where a fatal crash is worth 10, an injury crash is worth 5 and a property damage only crash is worth 1.*" Designation as a HSIP location allows for MassDOT to prioritize funding for safety-related improvements in a specific region of the state.

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

⁸Ibid 2.

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2029, which reflects a seven-year planning horizon consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. Independent of the Project, traffic volumes on the roadway network in the year 2029 under No-Build conditions include all existing traffic and new traffic resulting from background traffic growth. Anticipated Project-generated traffic volumes superimposed upon the 2029 No-Build traffic volumes reflect 2029 Build traffic-volume conditions with the Project.

FUTURE TRAFFIC GROWTH

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

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

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

Specific Development by Others

The City of Marlborough Site Plan Review Committee was contacted in order to determine if there were any projects planned within the study area that would have an impact on future traffic volumes at the study intersections. Based on this consultation, no developments were identified at this time that are expected to result in an increase in traffic within the study area beyond the general background traffic growth rate (discussion follows).

General Background Traffic Growth

Traffic-volume data compiled by MassDOT from permanent count stations located in Marlborough were reviewed in order to determine general traffic growth trends in the area. This data indicates that traffic volumes have fluctuated over the past several years, with the average traffic growth rate found to be approximately 1.29 percent. In order to provide a prudent planning condition for the Project, a slightly higher 1.5 percent per year compounded annual background traffic growth rate was used in order to account for future traffic growth and presently unforeseen development within the study area.

Roadway Improvement Projects

The City of Marlborough and MassDOT were contacted in order to determine if there were any planned future roadway improvement projects expected to be complete by 2029 within the study area. Based on these discussions, no roadway improvement projects aside from routine maintenance activities were identified to be planned within the study area at this time.

No-Build Traffic Volumes

The 2029 No-Build condition peak-hour traffic volumes were developed by applying the 1.5 percent per year compounded annual background traffic growth rate to the 2022 Existing peak-hour traffic volumes. The resulting 2029 No-Build weekday morning and evening peak-hour traffic volumes are shown on Figures 5 and 6, respectively.

PROJECT-GENERATED TRAFFIC

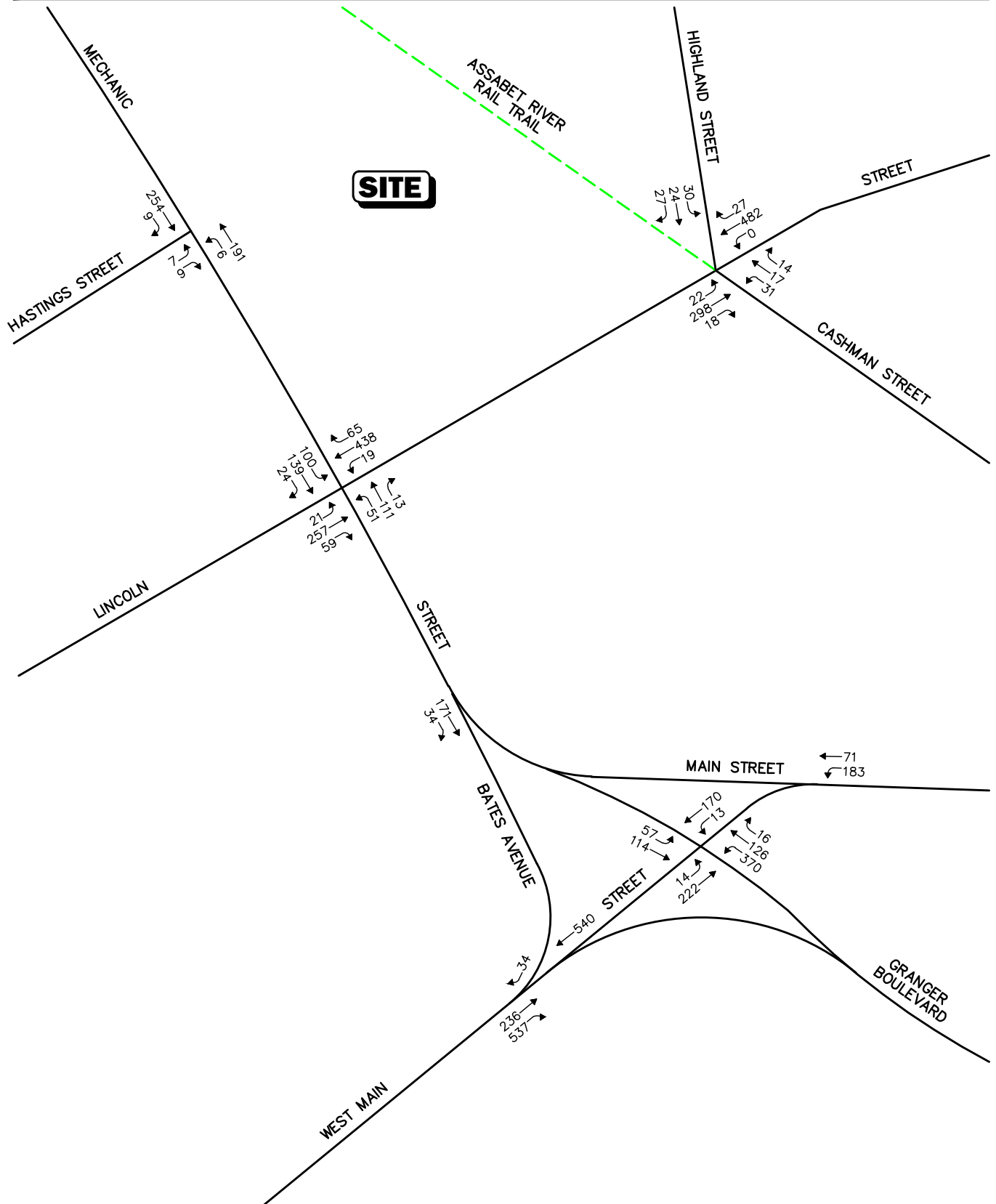
Design year (2029 Build) traffic volumes for the study area roadways were determined by estimating Project-generated traffic volumes and assigning those volumes on the study roadways. The following sections describe the methodology used to develop the anticipated traffic characteristics of the Project.

As proposed, the Project will entail the construction of a four and five-story building that will include 276 multifamily residential units and 10,074± sf of retail space. In order to develop the traffic characteristics of the Project, trip-generation statistics published by the Institute of Transportation Engineers (ITE)⁹ for similar land uses as those proposed were used. ITE Land Use Codes (LUCs) 221, *Multifamily Housing (Mid-Rise)*, and 822, *Strip Retail Plaza (<40k)*, were used to develop the base trip-generation calculations for the residential and retail components of the Project, respectively.

Internal Trips

A portion of the trips expected to be generated by the Project will consist of internal or dual-purpose trips. An internal trip consists of a resident, customer, and/or employee that patronizes more than one of the uses planned within a development and is common in mixed-use projects with appropriate accommodations to facilitate trips between uses. By way of example, a resident of the Project may patronize the retail space that is to be located within the Project site. In order to provide conservative (high) traffic volumes from which to assess the potential impact of the Project on the

⁹Ibid 1.



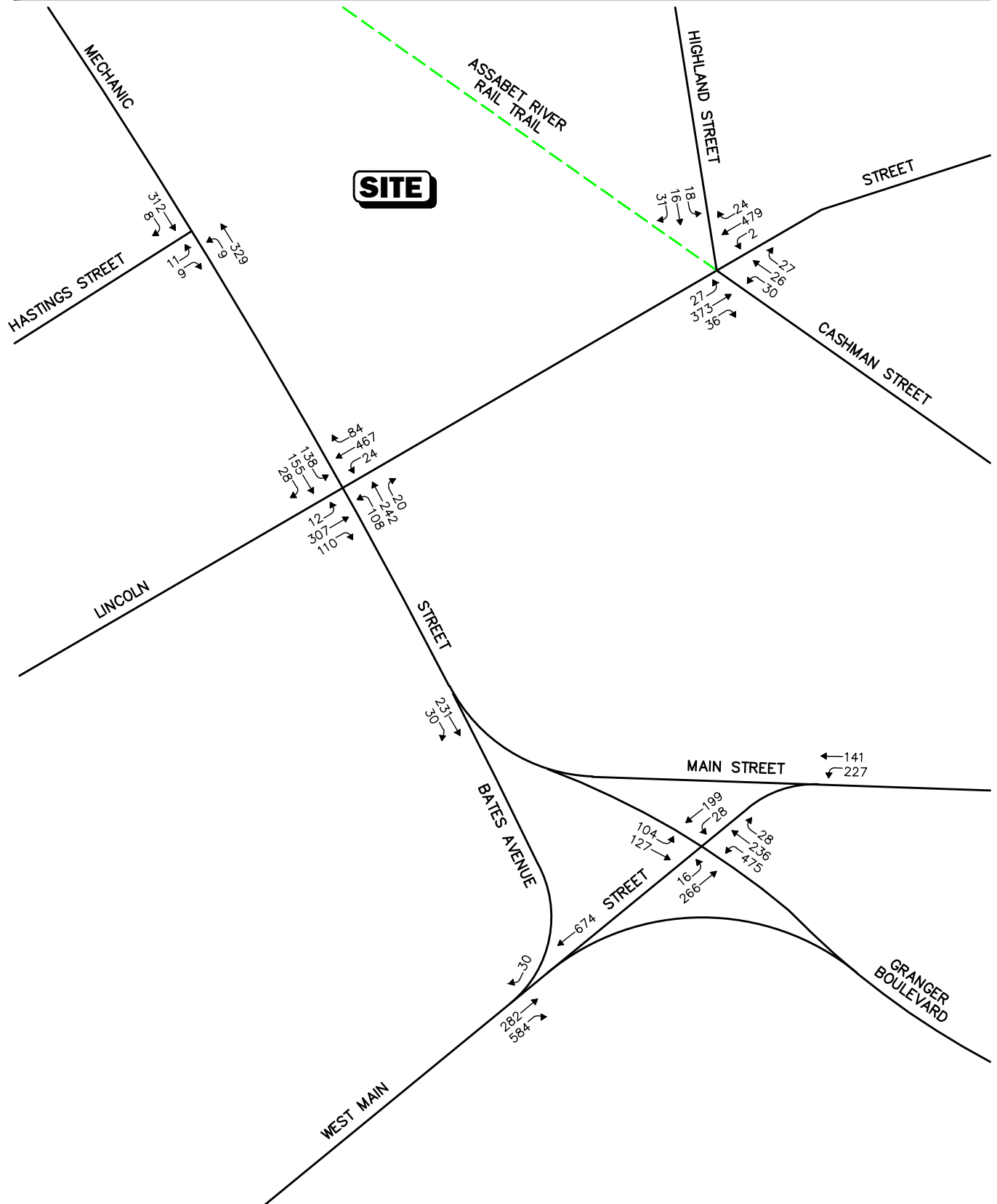
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 5

2029 No-Build
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 6

**2029 No-Build
Weekday Evening
Peak-Hour Traffic Volumes**

transportation infrastructure, a reduction to the base ITE trip-generation calculations was not applied to account for this interaction.

Pass-By Trips

Not all of the trips expected to be generated by the retail component of the Project will be new trips on the roadway network. A significant portion of these trips will consist of pass-by trips or vehicles already traveling along adjacent roadways for other purposes that will patronize the Project in conjunction with their trip and then continue to their original destination. These trips are not new trips on the roadway network as a result of the Project. Statistics published by the ITE¹⁰ indicate that, on average, up to 40 percent of the trips generated by a retail use may consist of pass-by trips. In accordance with MassDOT guidelines which limits pass-by trips to the lesser of: i) 15 percent of the adjacent roadway traffic volume; or ii) the ITE pass-by trip rate for the specific use; the methodology that resulted in the lower volume of pass-by trips was applied to the base trip-generation calculations for the retail component of the Project.

Table 5 summarizes the anticipated traffic characteristics of the Project using the above methodology.

Table 5
TRIP GENERATION SUMMARY

Time Period/Direction	Vehicle Trips				
	Residential Component	Retail Component			(E=A+D) Total New Trips
	(A) Proposed Multifamily Units (276 Units) ^a	(B) Proposed Retail Space (10,074 sf) ^b	(C) Pass-By Trips ^c	(D=B-C) New Retail Trips	
<i>Average Weekday Daily:</i>					
Entering	627	274	110	164	791
<u>Exiting</u>	<u>627</u>	<u>274</u>	<u>110</u>	<u>164</u>	<u>791</u>
Total	1,254	548	220	328	1,582
<i>Weekday Morning Peak Hour:</i>					
Entering	25	14	0	14	39
<u>Exiting</u>	<u>85</u>	<u>10</u>	<u>0</u>	<u>10</u>	<u>95</u>
Total	110	24	0	24	134
<i>Weekday Evening Peak Hour:</i>					
Entering	66	39	16	23	89
<u>Exiting</u>	<u>42</u>	<u>39</u>	<u>16</u>	<u>23</u>	<u>65</u>
Total	108	78	32	46	154

^aBased on ITE LUC 221, *Multifamily Housing (Mid-Rise)*.

^bBased on ITE LUC 822, *Strip Retail Plaza (<40k)*.

^cPass-by trip rate obtained from ITE LUC 821, *Shopping Plaza (40 – 150k)*, and were applied as follows: average weekday and weekday evening peak-hour = 40 percent; weekday morning peak-hour = 0 percent.

¹⁰Ibid 1.

Project-Generated Traffic-Volume Summary

As can be seen in Table 5, using the aforementioned methodology and after applying adjustments to account for pass-by trips, the Project is expected to generate approximately 1,582 new vehicle trips on an average weekday (two-way, 24-hour volume), with approximately 134 new vehicle trips (39 vehicles entering and 95 exiting) expected during the weekday morning peak-hour and 154 new vehicle trips (89 vehicles entering and 65 exiting) expected during the weekday evening peak-hour.

TRIP DISTRIBUTION AND ASSIGNMENT

Separate trip-distribution patterns were developed for the residential and commercial components of the Project given the differing nature and purpose of the trips associated with these uses. For the residential component of the Project, the directional distribution was determined based on a review of Journey-to-Work data obtained from the U.S. Census for persons residing in the City of Marlborough and then refined based on a review of existing traffic patterns within the study area during the peak periods. For the commercial component of the Project, the directional distribution was determined based on a review of existing traffic patterns within the study area. The general trip distribution for the residential and commercial components of the Project are graphically depicted on Figures 7 and 8, respectively. Traffic volumes expected to be generated by the residential component of the Project were assigned onto the study area roadway network as shown on Figures 9 and 10. Traffic volumes expected to be generated by the commercial component of the Project were assigned onto the study area roadway network as shown on Figures 11 and 12.

FUTURE TRAFFIC VOLUMES – BUILD CONDITION

The 2029 Build condition traffic volumes consist of the 2029 No-Build traffic volumes with the additional traffic expected to be generated by the Project added to them. The 2029 Build weekday morning and evening peak-hour traffic volumes are graphically depicted on Figures 13 and 14, respectively.

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

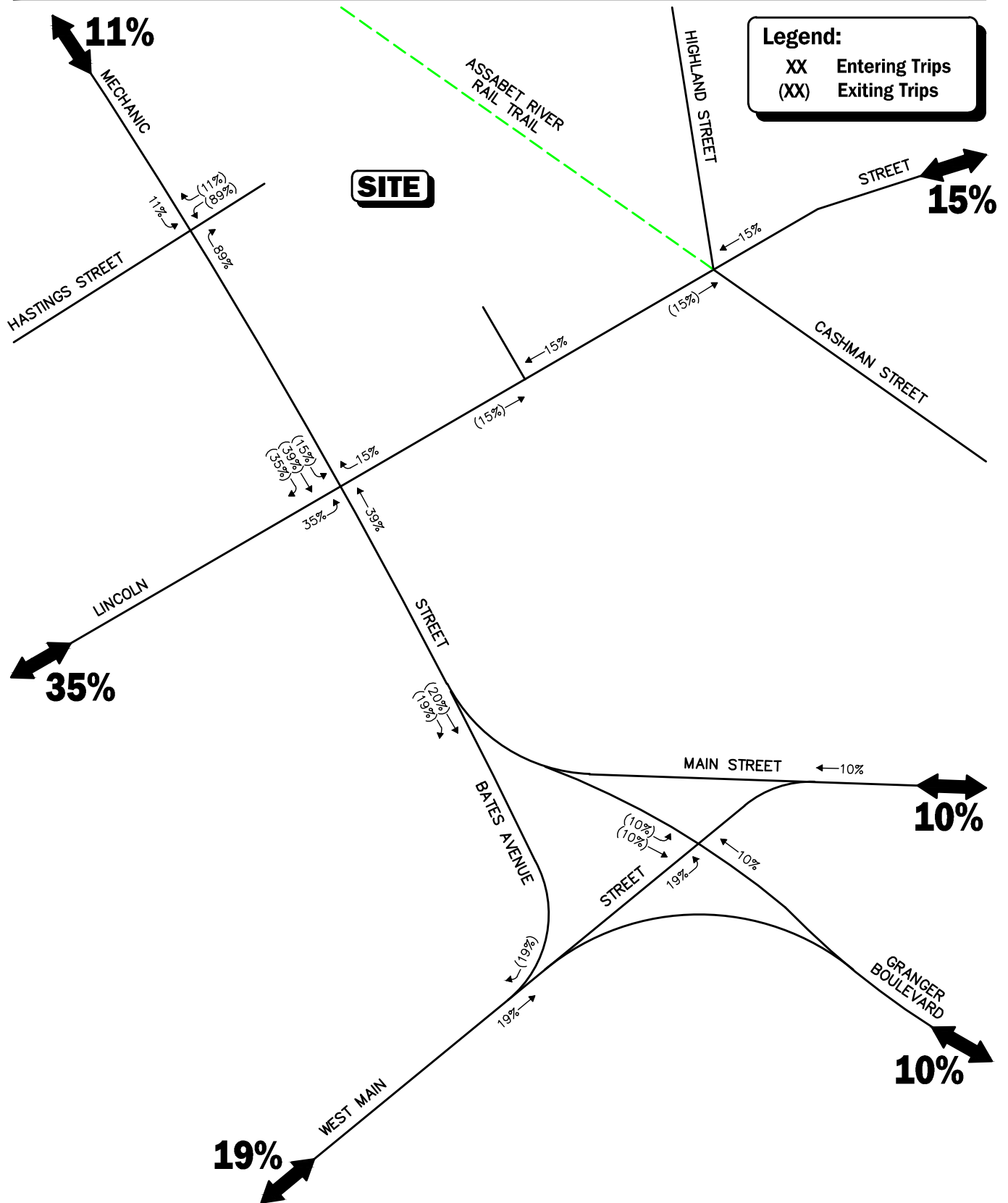


Figure 7

Residential Trip Distribution Map

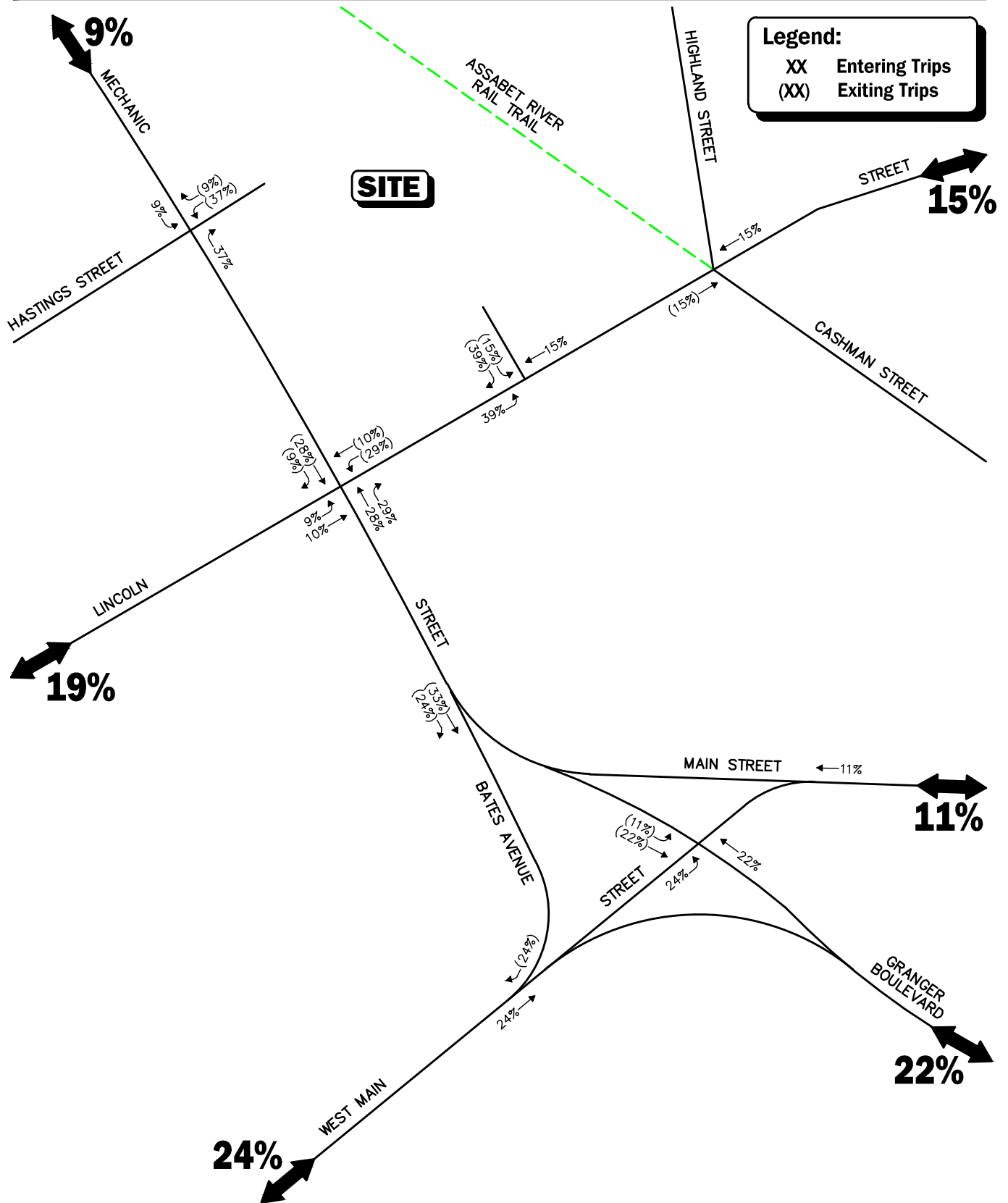
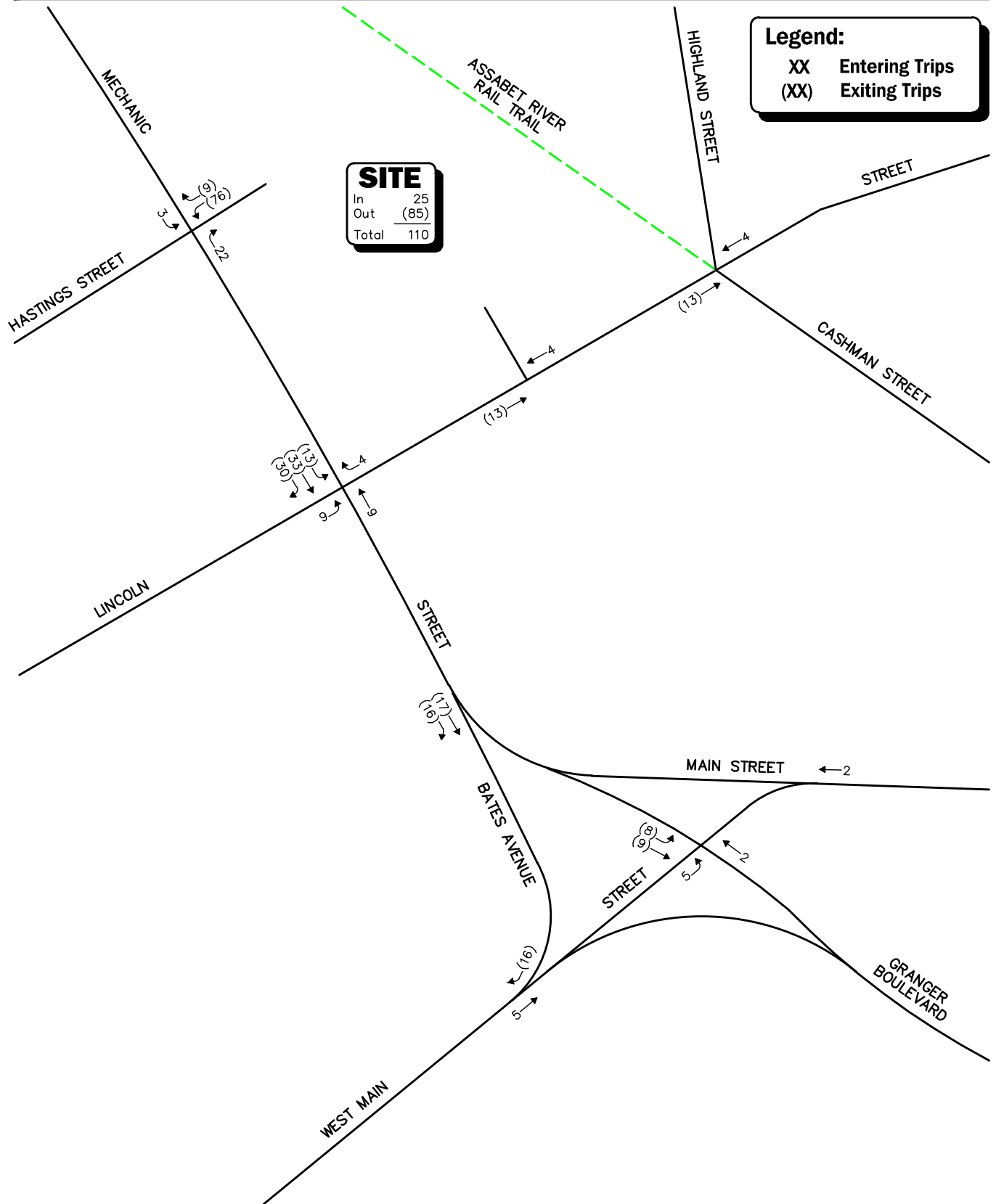


Figure 8

Commercial Trip Distribution Map





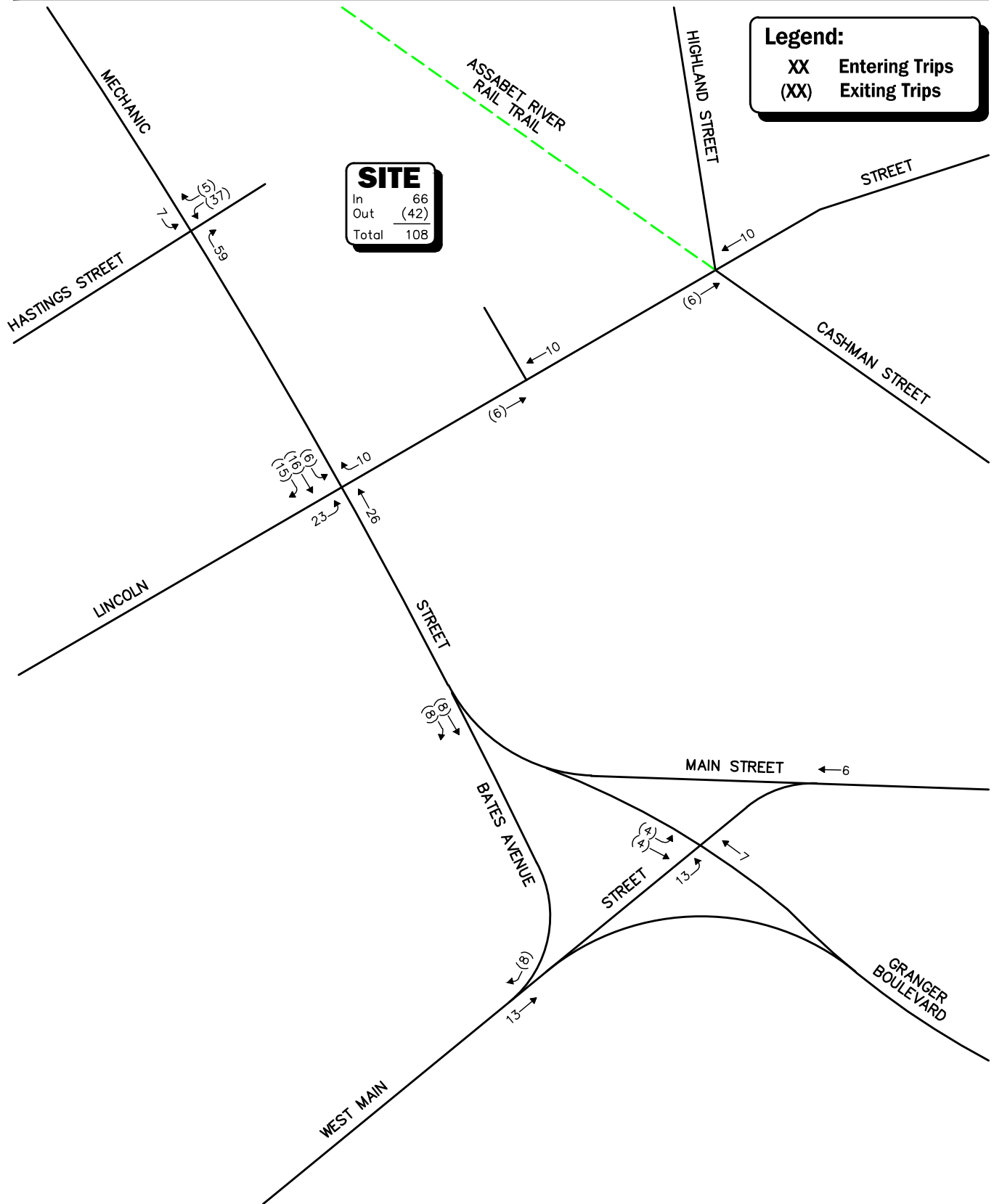
Not To Scale



Vanasse &
Associates inc

Figure 9

Project-Generated - Residential
Weekday Morning
Peak-Hour Traffic Volumes



Not To Scale



Vanasse &
Associates inc

Figure 10

Project-Generated - Residential
Weekday Evening
Peak-Hour Traffic Volumes

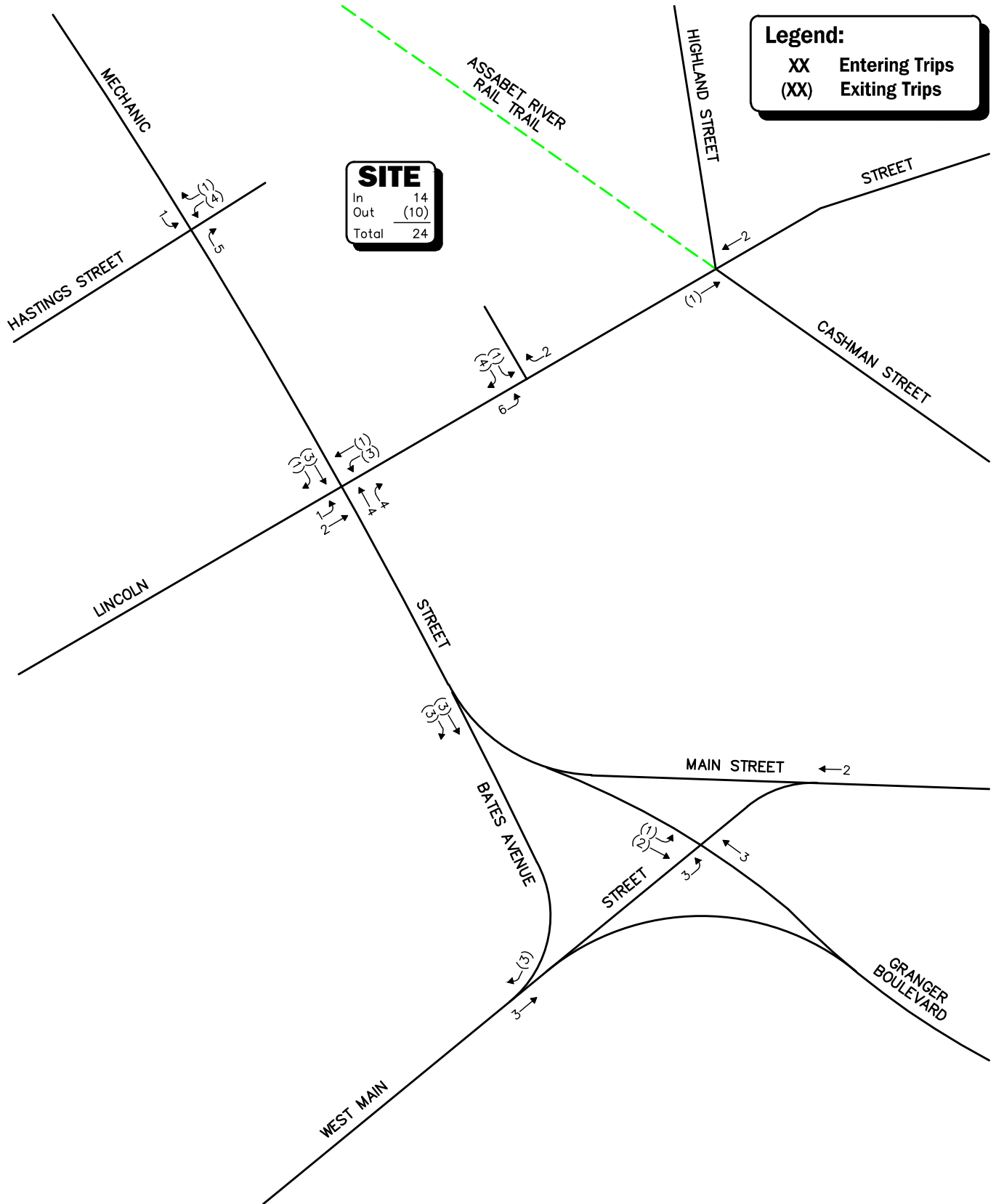


Figure 11

**Project-Generated - Commercial
 Weekday Morning
 Peak-Hour Traffic Volumes**

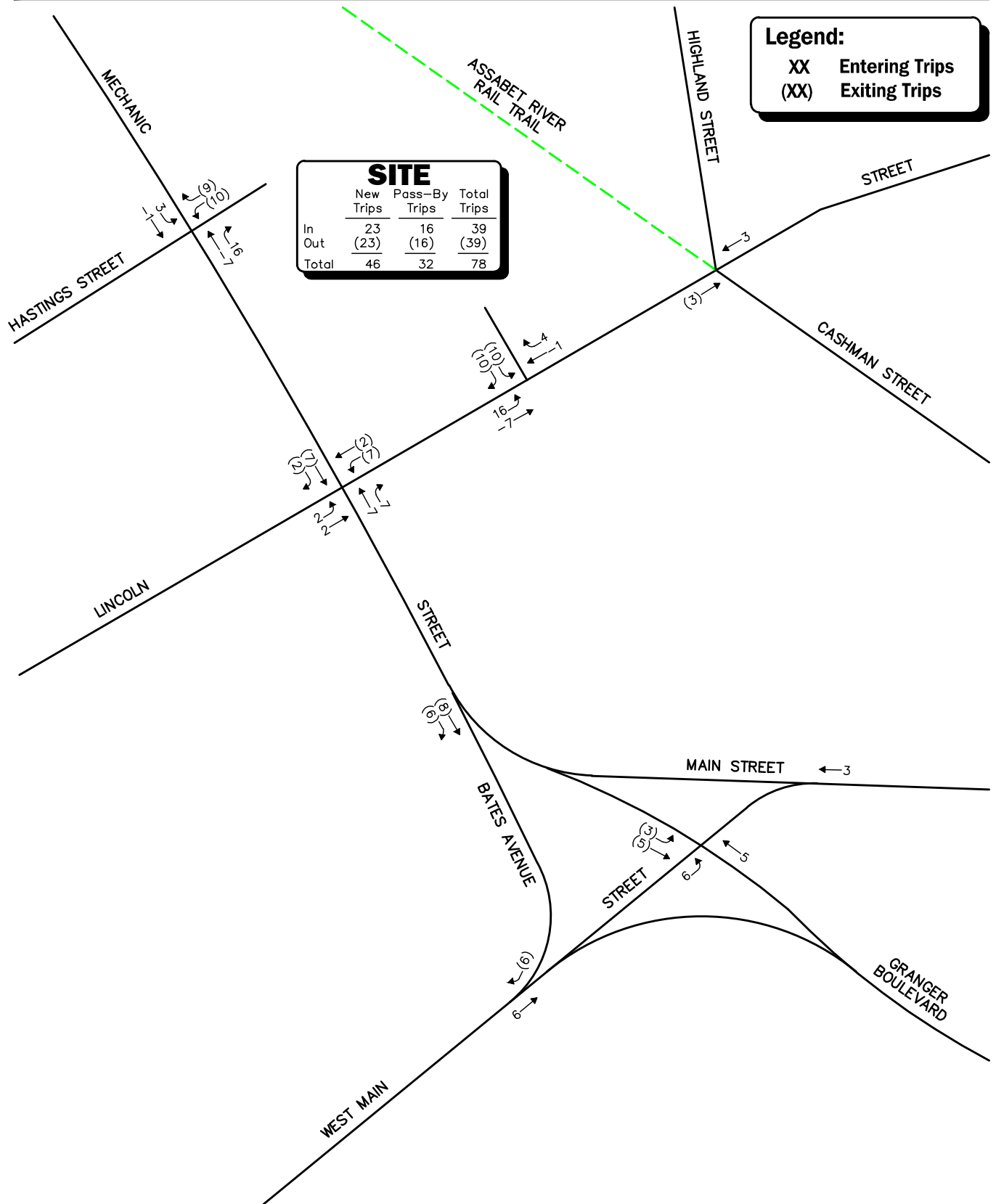
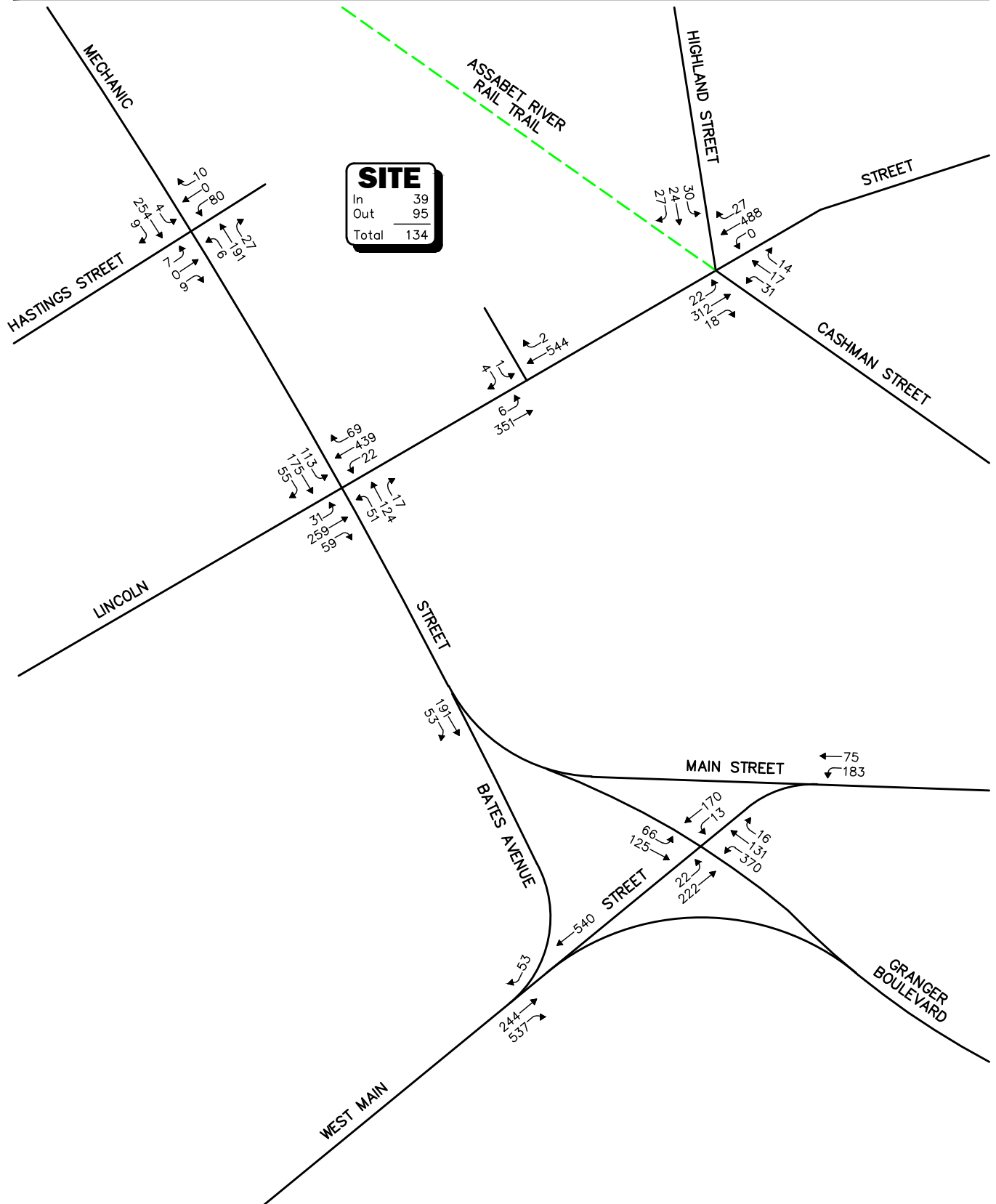


Figure 12

Project-Generated - Commercial Weekday Evening Peak-Hour Traffic Volumes



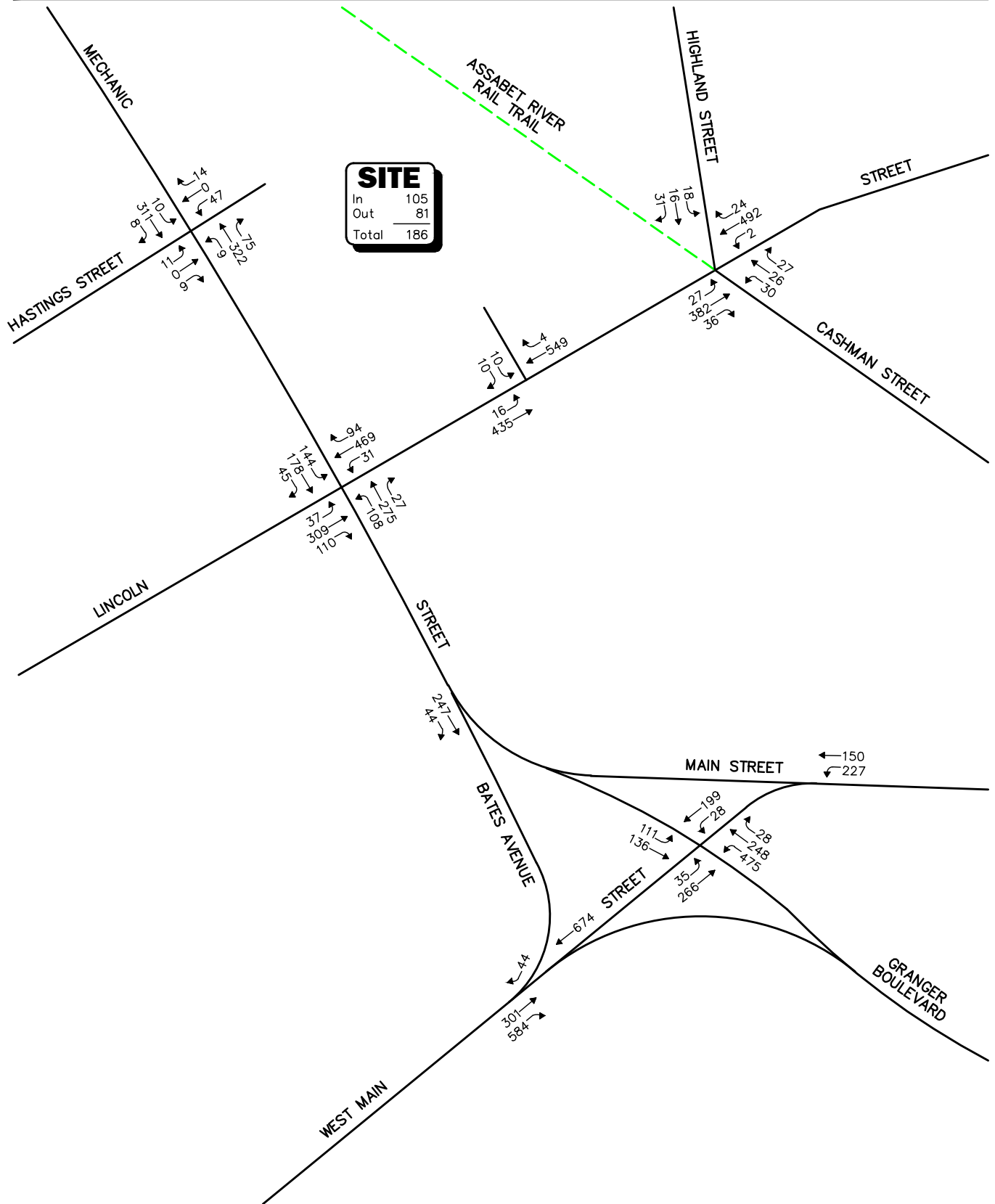
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 13

2029 Build
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 14

2029 Build
Weekday Evening
Peak-Hour Traffic Volumes



Table 6
PEAK-HOUR TRAFFIC-VOLUME INCREASES

Location/Peak Hour	2022 Existing	2029 No-Build	2029 Build	Traffic-Volume Increase Over No-Build	Percent Increase Over No-Build
<i>Mechanic St. north of Hastings St.:</i>					
Weekday Morning	415	461	475	14	3.0
Weekday Evening	594	660	676	16	2.4
<i>Lincoln St. west of Mechanic St.:</i>					
Weekday Morning	764	850	894	44	5.2
Weekday Evening	929	1,032	1,078	46	4.5
<i>Lincoln St. east of Cashman St.:</i>					
Weekday Morning	766	851	871	20	2.4
Weekday Evening	832	923	945	22	2.4
<i>West Main St. west of Bates Ave.:</i>					
Weekday Morning	1,214	1,347	1,374	27	2.0
Weekday Evening	1,414	1,570	1,603	33	2.1
<i>Granger Blvd. east of West Main St.:</i>					
Weekday Morning	1,059	1,176	1,192	16	1.4
Weekday Evening	1,331	1,478	1,499	21	1.4
<i>Main St. east of Mechanic St.:</i>					
Weekday Morning	494	549	562	13	2.4
Weekday Evening	690	766	782	16	2.1

As shown in Table 6, Project-related traffic-volume increases outside of the study area relative to 2029 No-Build conditions are anticipated to range from 1.4 to 5.2 percent during the peak periods, with vehicle increases shown to range from 13 to 46 vehicles. ***When dispersed over the respective peak hours and to the roadway network that serves the Project site, the identified traffic volume increases outside of the immediate study area are not expected to result in a significant increase in motorist delays or vehicle queuing over anticipated future conditions without the Project (i.e., No-Build conditions).***

TRAFFIC OPERATIONS ANALYSIS

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

METHODOLOGY

Levels of Service

A primary result of capacity analyses is the assignment of level of service to traffic facilities under various traffic-flow conditions.¹¹ The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

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

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

¹¹The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010.

Signalized Intersections

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

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

Levels of service for signalized intersections are calculated using the operational analysis methodology of the 2000 *Highway Capacity Manual*¹² and implemented as a part of the Synchro® 11 software. This method assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on delay. Level-of-service designations are based on the criterion of control or signal delay per vehicle. Control or signal delay is a measure of driver discomfort, frustration, and fuel consumption, and includes initial deceleration delay approaching the traffic signal, queue move-up time, stopped delay and final acceleration delay. Table 7 summarizes the relationship between level of service and control delay. The tabulated control delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to entire intersections.

Table 7
LEVEL-OF-SERVICE CRITERIA
FOR SIGNALIZED INTERSECTIONS^a

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

^aSource: *Highway Capacity Manual*, Transportation Research Board; Washington, DC; 2000; page 16-2.

¹²*Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2000.

Unsignalized Intersections

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

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

The levels of service of unsignalized intersections are determined by application of a procedure described in the 2010 *Highway Capacity Manual*.¹³ Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the 2010 *Highway Capacity Manual*. Table 8 summarizes the relationship between level of service and average control delay for two-way stop controlled and all-way stop controlled intersections.

Table 8
LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS^a

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

^aSource: *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010; page 19-2.

¹³*Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010.

Vehicle Queue Analysis

Vehicle queue analyses are a direct measurement of an intersection's ability to process vehicles under various traffic control and volume scenarios and lane use arrangements. The vehicle queue analysis was performed using the Synchro® intersection capacity analysis software which is based upon the methodology and procedures presented in the 2010 *Highway Capacity Manual*. The Synchro® vehicle queue analysis methodology is a simulation based model which reports the number of vehicles that experience a delay of six seconds or more at an intersection. For signalized intersections, Synchro® reports both the average (50th percentile) the 95th percentile vehicle queue. For unsignalized intersections, Synchro® reports the 95th percentile vehicle queue. Vehicle queue lengths are a function of the capacity of the movement under study and the volume of traffic being processed by the intersection during the analysis period. The 95th percentile vehicle queue is the vehicle queue length that will be exceeded only 5 percent of the time, or approximately 3 minutes out of 60 minutes during the peak one hour of the day (during the remaining 57 minutes, the vehicle queue length will be less than the 95th percentile queue length).

ANALYSIS RESULTS

Level-of-service and vehicle queue analyses were conducted for 2022 Existing, 2029 No-Build, and 2029 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized in Tables 9 and 10, with the detailed analysis results presented in the Appendix.

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

Signalized Intersection

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

Mechanic Street at Lincoln Street

The addition of Project-related traffic was shown to result in an increase in overall motorist delay of 3.6 seconds during the weekday evening peak-hour that resulted in a degradation in overall level-of-service over No-Build conditions from LOS B to LOS C, with vehicle queues at the intersection shown to increase by up to three vehicles (3). Focusing on individual movements, operating conditions for the Lincoln Street westbound and Mechanic Street southbound approaches were shown to degrade over No-Build conditions from LOS B to LOS C during the weekday morning peak-hour as a result on a predicated increase in average motorist delay of 5.7 seconds and 2.3 seconds, respectively.

Main Street at West Main Street, Mechanic Street and Granger Boulevard

No change in overall level-of-service was shown to occur over No-Build conditions, with all movements predicted to operate at LOS D or better and vehicle queues shown to increase by up to two (2) vehicles with the addition of Project-related traffic. Operating conditions for the Mechanic Street southbound approach were shown to degrade over No-Build conditions from

LOS C to LOS D during the weekday evening peak hour as a result of a predicted increase in average motorist delay of 4.2 seconds.

Unsignalized Intersections

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

Mechanic Street at Hastings Street and the Project Site Driveway

No change in level-of-service is predicted to occur for any movement over No-Build conditions, with Project-related impacts generally defined as an increase in average motorist delay of up to 1.9 seconds that resulted in an increase in vehicle queuing of up to one (1) vehicle. All movements exiting the Project site driveway to Mechanic Street were shown to operate at LOS C during both peak hours with vehicle queues of up to one (1) vehicle. All movements along Mechanic Street approaching the Project site driveway predicted to operate at LOS A during both peak hours with negligible vehicle queuing predicted.

Lincoln Street at Cashman Street and Highland Street

No change in level-of-service or vehicle queuing is predicted to occur for any movement over No-Build conditions, with Project-related impacts generally defined as an increase in average motorist delay of up to 1.5 seconds with no material increase in vehicle queuing.

West Main Street at Bates Avenue

The addition of Project-related traffic was shown to result in an increase in average motorist delay of 0.7 seconds on the Bates Avenue approach during the weekday evening peak-hour that resulted in a degradation in level-of-service over No-Build conditions from LOS B to LOS C with no material increase in vehicle queuing shown to occur.

Lincoln Street at the Public Parking Lot

All movements exiting the public parking lot onto Lincoln Street were shown to operate at LOS B during the weekday morning peak-hour and at LOS C during the weekday evening peak-hour with no material vehicle queuing predicted. All movements along Lincoln Street approaching the public parking lot are expected to operate at LOS A during the peak hours with negligible vehicle queuing predicted.

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

Signalized Intersection/Peak Hour/Movement	2022 Existing				2029 No-Build				2029 Build			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d 50 th /95 th	V/C	Delay	LOS	Queue 50 th /95 th	V/C	Delay	LOS	Queue 50 th /95 th
<i>Mechanic St. at Lincoln St.</i>												
<i>Weekday Morning:</i>												
Lincoln Street EB: LT/TH/RT	0.40	10.1	B	2/8	0.42	10.6	B	3/9	0.47	13.4	B	4/9
Lincoln Street WB: LT/TH/RT	0.71	14.7	B	4/16	0.74	16.2	B	6/18	0.80	21.9	C	8/19
Mechanic Street NB: LT/TH/RT	0.35	13.1	B	2/5	0.40	15.4	B	3/5	0.40	15.3	B	3/5
Mechanic Street SB: LT/TH/RT	0.52	14.4	B	3/7	0.64	18.3	B	4/8	0.70	20.6	C	5/10
Overall	--	13.3	B	--	--	15.2	B	--	--	18.7	B	--
<i>Weekday Evening:</i>												
Lincoln Street EB: LT/TH/RT	0.49	13.7	B	4/10	0.53	14.7	B	5/11	0.61	17.2	B	5/12
Lincoln Street WB: LT/TH/RT	0.76	20.1	C	6/17	0.81	23.3	C	8/20	0.86	28.5	C	9/21
Mechanic Street NB: LT/TH/RT	0.54	14.7	B	4/10	0.62	18.1	B	5/11	0.67	19.8	B	6/14
Mechanic Street SB: LT/TH/RT	0.58	15.7	B	4/9	0.70	21.1	C	5/12	0.79	25.7	C	6/14
Overall	--	16.5	B	--	--	19.6	B	--	--	23.2	C	--
<i>Main St. at West Main St. and Mechanic St. and Granger Blvd.</i>												
<i>Weekday Morning:</i>												
West Main Street EB: LT/TH	0.58	25.5	C	3/9	0.61	26.2	C	3/10	0.63	27.0	C	4/10
Main Street WB: LT	0.07	17.7	B	0/1	0.08	17.9	B	0/1	0.08	18.1	B	0/1
Main Street WB: TH	0.35	18.5	B	2/6	0.38	18.8	B	2/6	0.38	19.0	B	3/6
Granger Boulevard NB: LT	0.56	12.0	B	2/11	0.64	14.1	B	3/15	0.65	15.0	B	3/15
Granger Boulevard NB: TH/RT	0.15	8.6	A	1/4	0.16	9.1	A	1/4	0.17	9.5	A	1/5
Mechanic Street SB: LT/TH	0.47	24.6	C	2/7	0.52	25.7	C	2/7	0.57	27.0	C	3/8
Overall	--	17.7	B	--	--	18.8	B	--	--	19.7	B	--
<i>Weekday Evening:</i>												
West Main Street EB: LT/TH	0.64	30.6	C	4/11	0.69	33.0	C	5/12	0.71	33.7	C	5/14
Main Street WB: LT	0.13	20.3	C	1/1	0.15	21.4	C	1/2	0.15	21.4	C	1/2
Main Street WB: TH	0.36	20.9	C	3/6	0.39	22.0	C	3/7	0.39	22.0	C	3/7
Granger Boulevard NB: LT	0.70	16.4	B	4/20	0.80	21.4	C	4/23	0.82	24.3	C	5/24
Granger Boulevard NB: TH/RT	0.27	9.9	A	2/7	0.30	10.6	B	2/8	0.32	11.4	B	3/9
Mechanic Street SB: LT/TH	0.66	29.1	C	4/10	0.69	30.9	C	4/11	0.76	35.1	D	5/13
Overall	--	20.8	C	--	--	23.4	C	--	--	25.4	C	--

^aVolume-to-capacity ratio.

^bControl (signal) delay per vehicle in seconds.

^cLevel of service.

^dQueue length in vehicles based on 25-feet per vehicle.

NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movement

Table 10

UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Unsignalized Intersection/Peak Hour/Movement	2022 Existing				2029 No-Build				2029 Build			
	Demand ^a	Delay ^b	LOS ^c	Queue ^d 95 th	Demand	Delay	LOS	Queue 95 th	Demand	Delay	LOS	Queue 95 th
<i>Mechanic St. at Hastings St. and Project Site Driveway</i>												
<i>Weekday Morning:</i>												
Hastings Street EB: LT/TH/RT	14	10.7	B	0	16	11.2	B	0	16	11.8	B	0
Project Site Driveway WB: LT/TH/RT	--	--	--	--	--	--	--	--	90	15.6	C	1
Mechanic Street NB: LT/TH/RT	177	0.2	A	0	197	0.2	A	0	224	0.2	A	0
Mechanic Street SB: LT/TH/RT	237	0.0	A	0	263	0.0	A	0	267	0.1	A	0
<i>Weekday Evening:</i>												
Hastings Street EB: LT/TH/RT	18	12.2	B	0	20	12.9	B	0	20	14.8	B	1
Project Site Driveway WB: LT/TH/RT	--	--	--	--	--	--	--	--	61	18.1	C	1
Mechanic Street NB: LT/TH/RT	304	0.2	A	0	338	0.2	A	0	406	0.2	A	0
Mechanic Street SB: LT/TH/RT	288	0.0	A	0	320	0.0	A	0	329	0.2	A	0
<i>Lincoln St. at Cashman St. and Highland St.</i>												
<i>Weekday Morning:</i>												
Lincoln Street EB: LT/TH/RT	304	0.6	A	0	338	0.6	A	0	352	0.6	A	0
Lincoln Street WB: LT/TH/RT	458	0.0	A	0	509	0.0	A	0	515	0.0	A	0
Cashman Street NB: LT/TH/RT	56	22.8	C	1	62	28.9	D	2	62	30.4	D	2
Highland Street SB: LT/TH/RT	73	21.4	C	1	81	26.4	D	2	81	27.6	D	2
<i>Weekday Evening:</i>												
Lincoln Street EB: LT/TH/RT	392	0.5	A	0	436	0.5	A	0	445	0.5	A	0
Lincoln Street WB: LT/TH/RT	456	0.0	A	0	505	0.0	A	0	518	0.0	A	0
Cashman Street NB: LT/TH/RT	74	22.4	C	1	83	28.4	D	2	83	29.7	D	2
Highland Street SB: LT/TH/RT	58	19.2	C	1	65	23.0	C	1	65	23.9	C	1
<i>West Main St. at Bates Ave.</i>												
<i>Weekday Morning:</i>												
West Main Street EB: TH	213	0.0	A	0	236	0.0	A	0	244	0.0	A	0
West Main Street WB: TH	486	0.0	A	0	540	0.0	A	0	540	0.0	A	0
Bates Avenue SB: RT	31	12.3	B	1	34	13.0	B	1	53	13.7	B	1
<i>Weekday Evening:</i>												
West Main Street EB: TH	254	0.0	A	0	282	0.0	A	0	301	0	A	0
West Main Street WB: TH	607	0.0	A	0	674	0.0	A	0	674	0	A	0
Bates Avenue SB: RT	27	13.5	B	1	30	14.6	B	1	44	15.2	C	1

See notes at end of Table.

Table 10 (Continued)

UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Unsignalized Intersection/Peak Hour/Movement	2022 Existing				2029 No-Build				2029 Build			
	Demand ^a	Delay ^b	LOS ^c	Queue ^d 95 th	Demand	Delay	LOS	Queue 95 th	Demand	Delay	LOS	Queue 95 th
Lincoln St. at the Public Parking Lot												
<i>Weekday Morning:</i>												
Lincoln Street EB: LT/TH	--	--	--	--	--	--	--	--	357	0.1	A	0
Lincoln Street WB: TH/TH	--	--	--	--	--	--	--	--	546	0.0	A	0
Public Lot SB: LT/RT	--	--	--	--	--	--	--	--	5	13.7	B	0
<i>Weekday Evening:</i>												
Lincoln Street EB: LT/TH	--	--	--	--	--	--	--	--	451	0.3	A	0
Lincoln Street WB: TH/TH	--	--	--	--	--	--	--	--	553	0.0	A	0
Public Lot SB: LT/RT	--	--	--	--	--	--	--	--	10	17.5	C	0

^aDemand in vehicles per hour.

^bAverage control delay per vehicle (in seconds).

^cLevel of service.

^dQueue length in vehicles.

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

SIGHT DISTANCE EVALUATION

Sight distance measurements were performed at the Mechanic Street/Project site driveway and the Lincoln Street/public parking lot intersections in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)¹⁴ requirements. Both stopping sight distance (SSD) and intersection sight distance (ISD) measurements were performed. In brief, SSD is the distance required by a vehicle traveling at the design speed of a roadway, on wet pavement, to stop prior to striking an object in its travel path. ISD or corner sight distance (CSD) is the sight distance required by a driver entering or crossing an intersecting roadway to perceive an on-coming vehicle and safely complete a turning or crossing maneuver with on-coming traffic. In accordance with AASHTO standards, if the measured ISD is at least equal to the required SSD value for the appropriate design speed, the intersection can operate in a safe manner. Table 11 presents the measured SSD and ISD at the subject intersections.

¹⁴ *A Policy on Geometric Design of Highway and Streets*, 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2018.

Table 11
SIGHT DISTANCE MEASUREMENTS^a

Intersection/Sight Distance Measurement	Feet		
	Required Minimum (SSD)	Desirable (ISD) ^b	Measured
<i>Mechanic Street at the Project Site Driveway</i>			
<i>Stopping Sight Distance:</i>			
Mechanic Street approaching from the north	200	--	500+
Mechanic Street approaching from the south	200	--	417
<i>Intersection Sight Distance:</i>			
Looking to the north from the Project Site Driveway	200	335	138/273 ^c
Looking to the south from the Project Site Driveway	200	290	500
<i>Lincoln Street at the Public Parking Lot</i>			
<i>Stopping Sight Distance:</i>			
Lincoln Street approaching from the east	250	--	500+
Lincoln Street approaching from the west	250	--	500+
<i>Intersection Sight Distance:</i>			
Looking to the east from the Public Parking Lot	250	335	500+
Looking to the west from the Public Parking Lot	250	390	500+

^aRecommended minimum values obtained from *A Policy on Geometric Design of Highways and Streets*, 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018; and based on a 35 mph approach speed along Lincoln Street and a 30 mph approach speed along Mechanic Street.

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

^cAvailable sight distance with the selective trimming/removal of trees and vegetation located within the sight triangle area of the Project site driveway.

As can be seen in Table 11, with the selective trimming/removal of a tree and vegetation located within the sight triangle to the north of the Project site driveway intersection with Mechanic Street, the available lines of sight at the Project site driveway intersection were found to exceed the recommended minimum sight distance to function in a safe manner (SSD) based on a 30 mph approach speed, with is consistent with both the measured 85th percentile speed along Mechanic Street (30/27 mph) and the statutory speed limit in the vicinity of the Project site (30 mph).

The available lines of sight at the public parking lot intersection with Lincoln Street were found to exceed the recommended minimum sight distances to function in a safe (SSD) and efficient (ISD) manner based on a 35 mph approach speed, which is slightly above both the measured 85th percentile vehicle travel speed along Lincoln Street (31/28 mph) and the statutory speed limit in the vicinity of the Project site (30 mph).

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

VAI has conducted a TIA in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a 276-unit mixed-use development to be located at 297 Lincoln Street in Marlborough, Massachusetts. The following specific areas have been evaluated as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; under existing and future conditions, both with and without the Project. Based on this assessment, we have concluded the following with respect to the Project:

1. Using trip-generation statistics published by the ITE¹⁵ and with appropriate adjustments to account for pass-by trips for the commercial component of the Project, the Project is expected to generate approximately 1,582 new vehicle trips on an average weekday (two-way, 24-hour volume), with approximately 134 new vehicle trips expected during the weekday morning peak-hour and 154 new vehicle trips expected during the weekday evening peak-hour;
2. The Project will not result in a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions), with all movements at the study area intersections shown to continue to operate at LOS D or better with the addition of Project-related traffic, where an LOS of “D” or better is defined as “acceptable” traffic operations;
3. All movements exiting the Project site driveway to Mechanic Street and the public parking lot to Lincoln Street are predicted to operate at LOS C or better during the peak hours with queues of up to one (1) vehicle;
4. Independent of the Project, the Mechanic Street/Lincoln Street intersection was found to have a motor vehicle crash rate that is above the MassDOT average crash rate for similar intersections. A Road Safety Audit (RSA) was conducted in April 2021 that included this intersection¹⁶ and resulted in specific suggestions for improvements to enhance safety. A number of the suggested improvements have been advanced by the City and are expected

¹⁵Ibid 1.

¹⁶Ibid 2.

to result in a reduction in the frequency and severity of the crashes occurring at the intersection; and

5. Lines of sight at the Project site driveway and public parking lot were found to meet, exceed or could be made to meet or exceed the recommended minimum sight distance to function in a safe manner based on the appropriate approach speed.

RECOMMENDATIONS

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

Project Access

Access to the Project site will be provided by way of a full-access driveway that will intersect the east side of Mechanic Street generally opposite Hastings Street that will provide access to a surface parking lot and the parking garage that will be connected to the proposed residential building. Secondary access for delivery trucks and emergency vehicles will be provided by way of an easement through the City of Marlborough public parking lot that is being constructed as a part of the Project and will be accessed from a driveway that will intersect the north side of Lincoln Street approximately 100 ft to the west of the Lincoln Street/Cashman Street/Highland Street intersection. The following recommendations are offered with respect to the design and operation of the Project site access and internal circulation:

- The Project site driveway, public parking lot easement and subsequent vehicle turnaround should be a minimum of 24 feet in width and designed to accommodate the turning and maneuvering requirements of service/delivery vehicles and emergency vehicles.
- Where perpendicular parking is proposed, the drive aisle behind the parking should be a minimum of 23 feet in order to facilitate parking maneuvers.
- Vehicles exiting the Project site should be placed under STOP-sign control with a marked STOP-line provided.
- All signs and pavement markings to be installed within the Project site shall conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).¹⁷
- Sidewalks should be provided to link the building entrances to the sidewalks along Lincoln Street and Mechanic Street.
- Americans with Disabilities Act (ADA) compliant wheelchair ramps should be provided for crossing the Project site driveway and public parking lot entrance, or the driveway and entrance should be designed such that the sidewalks along Lincoln Street and Mechanic Street are flush with (i.e., crosses) the driveway and entrance.

¹⁷ Ibid 3.

- Signs and landscaping to be installed as a part of the Project within the intersection sight triangle areas of the Project site driveway and public parking lot entrance should be designed and maintained so as not to restrict lines of sight.
- Snow accumulations (windrows) within the sight triangle areas of the Project site driveway and public parking lot entrance should be promptly removed where such accumulations would impede sight lines.
- Consideration should be given to providing electric vehicle (EV) charging stations for use by residents, employees, and patrons of the Project.

Off-Site

Mechanic Street at Lincoln Street

Independent of the Project, the Mechanic Street/Lincoln Street intersection was identified to have a motor vehicle crash rate that is above the MassDOT average crash rate for similar intersections and the intersection has been identified by MassDOT as a high crash location for the period 2017-2019. A RSA has been conducted that included this intersection and the intersection of Lincoln Street at Pleasant Street, and the City has advanced a number of the safety enhancements that were suggested as an outcome of the RSA. To the extent that additional safety enhancements are deemed necessary at the intersection by the City, the Project proponent will work with the City to provide a reasonable financial contribution to the City for the design and construction of the additional safety enhancements.

Transportation Demand Management

Public transportation services are provided within the study area by the MWRTA. The MWRTA provides fixed-route bus service along Lincoln Street and Mechanic Street adjacent to the Project site by way of bus Route 7C, *Inner City Marlborough*. The Route 7C bus provides service between The Wayside Inn Country Store and the Solomon Pond Mall, with the closest regular stop located at the intersection of Lincoln Street at Pleasant Street, approximately 0.4 miles (8-minute walk) to the west of the Project site; however, MWRTA buses also operate in a “flag stop” mode, where a rider can request a stop (pick-up or drop-off) anywhere along the service route where it is safe for the bus to stop by signaling to the driver. In addition, the MWRTA also operates Americans with Disabilities Act (ADA) paratransit services for eligible persons who cannot use fixed-route transit all or some of the time due to a physical, cognitive, or mental disability in compliance with the ADA.

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

- A transportation coordinator will be assigned for the Project to coordinate the TDM program;
- Information regarding public transportation services, maps, schedules, and fare information will be posted in a central location and/or otherwise made available to residents and employees;

- A “welcome packet” will be provided to residents and employees detailing available public transportation services, bicycle and walking alternatives, and commuter options available;
- Commercial tenants will be encouraged to offer specific amenities to discourage off-site trips, including providing a breakroom equipped with a microwave and refrigerator; offering direct deposit of paychecks; and other such measures to reduce overall traffic volumes and travel during peak-traffic-volume periods;
- Work-at-home workspaces will be provided to support telecommuting by residents of the Project;
- Pedestrian accommodations will be incorporated within the Project site and consist of walkways that connect to the existing sidewalks along Lincoln Street and Mechanic Street;
- A central maildrop will be provided within the building for residents; and
- Secure bicycle parking will be provided for residents, visitors/patrons and commercial tenants, including weather protected bicycle parking in a bike room located within the garage.

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

APPENDIX

PROJECT SITE PLAN

AUTOMATIC TRAFFIC RECORDER COUNT DATA

TURNING MOVEMENT COUNT DATA

SEASONAL ADJUSTMENT DATA

COVID ADJUSTMENT

PUBLIC TRANSPORTATION SCHEDULES

VEHICLE TRAVEL SPEED DATA

MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION
MAPPING

GENERAL BACKGROUND TRAFFIC GROWTH

TRIP-GENERATION CALCULATIONS

JOURNEY TO WORK TRIP DISTRIBUTIONS

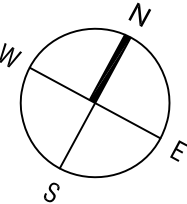
CAPACITY ANALYSIS WORKSHEETS



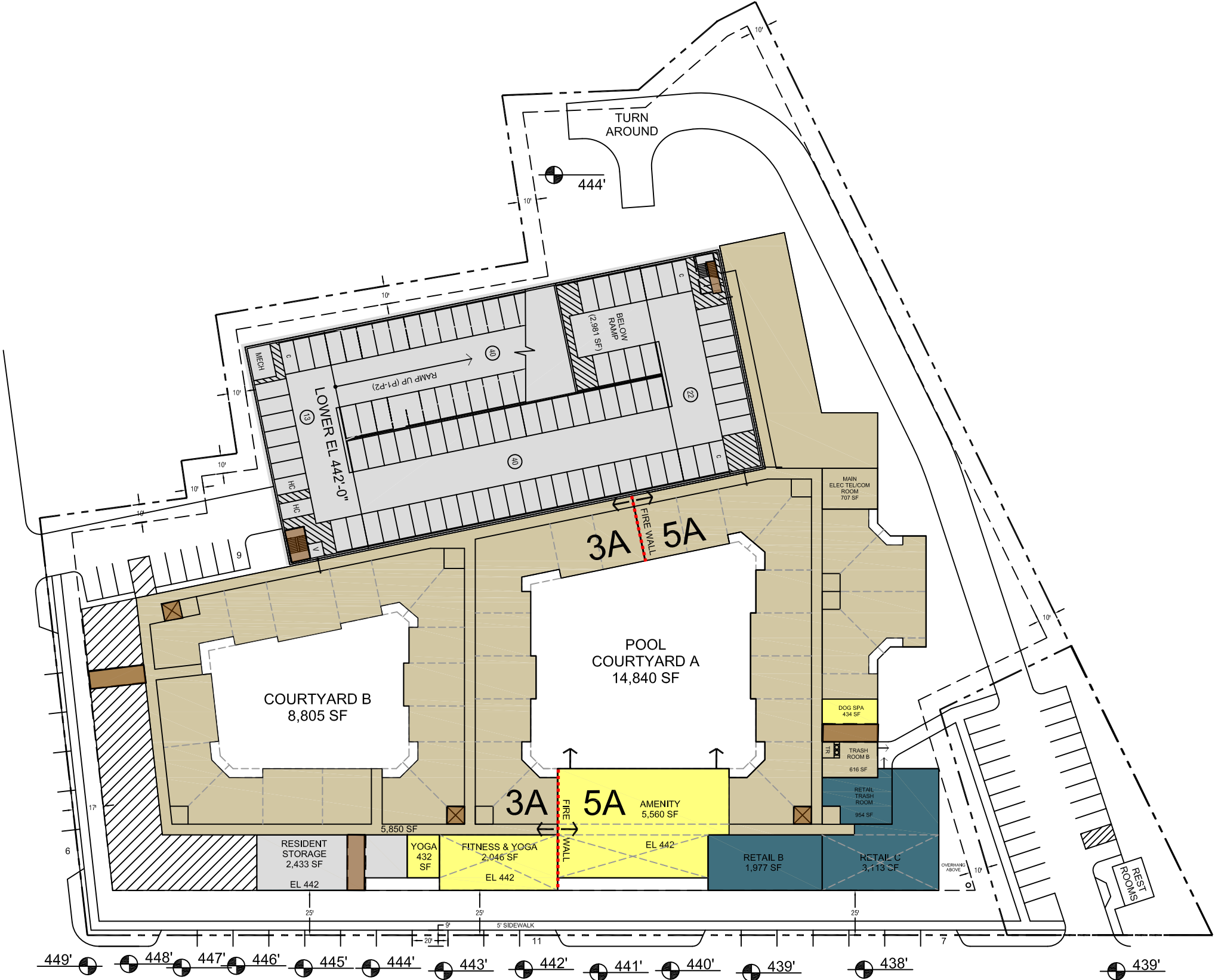
PROJECT SITE PLAN



LINCOLN ST
Marlborough, MA.



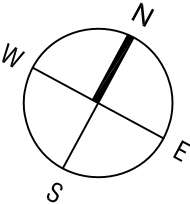
CONCEPT PLAN
3.14.22



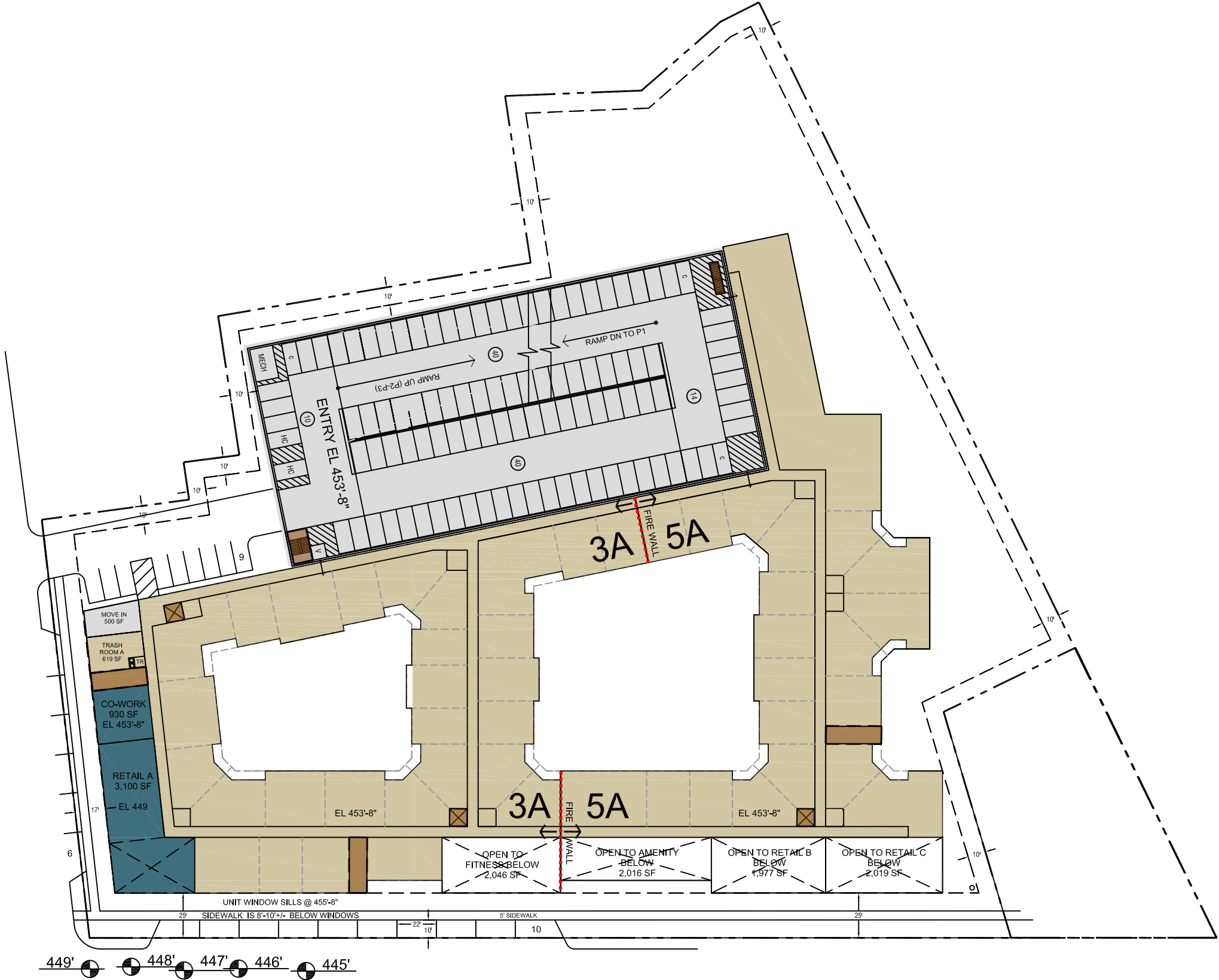
3A: 32,277

5A: 34,835

L1



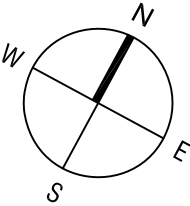
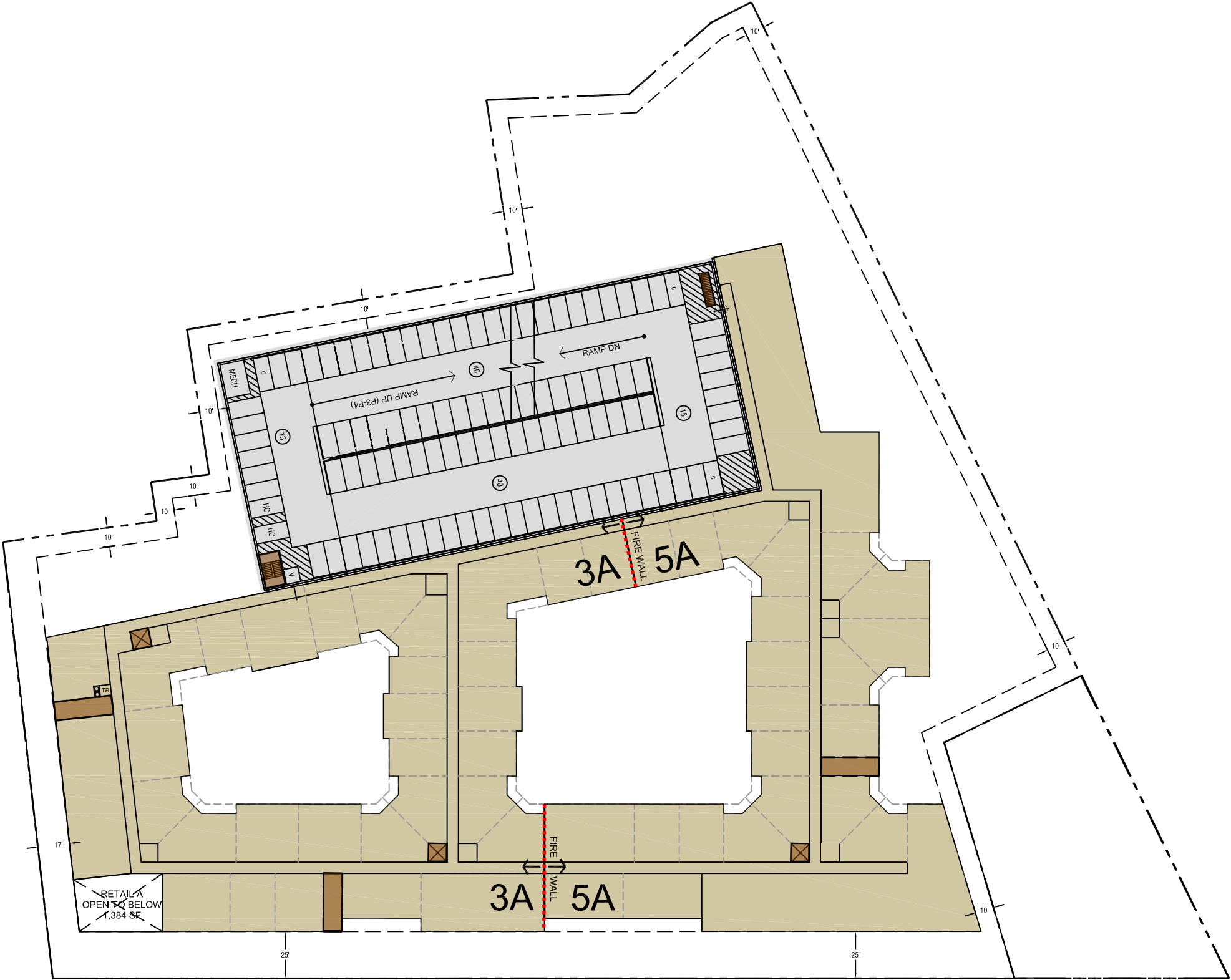
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3A: 38,551

5A: 34,710

L2



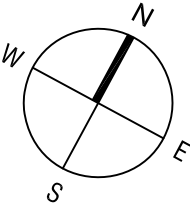
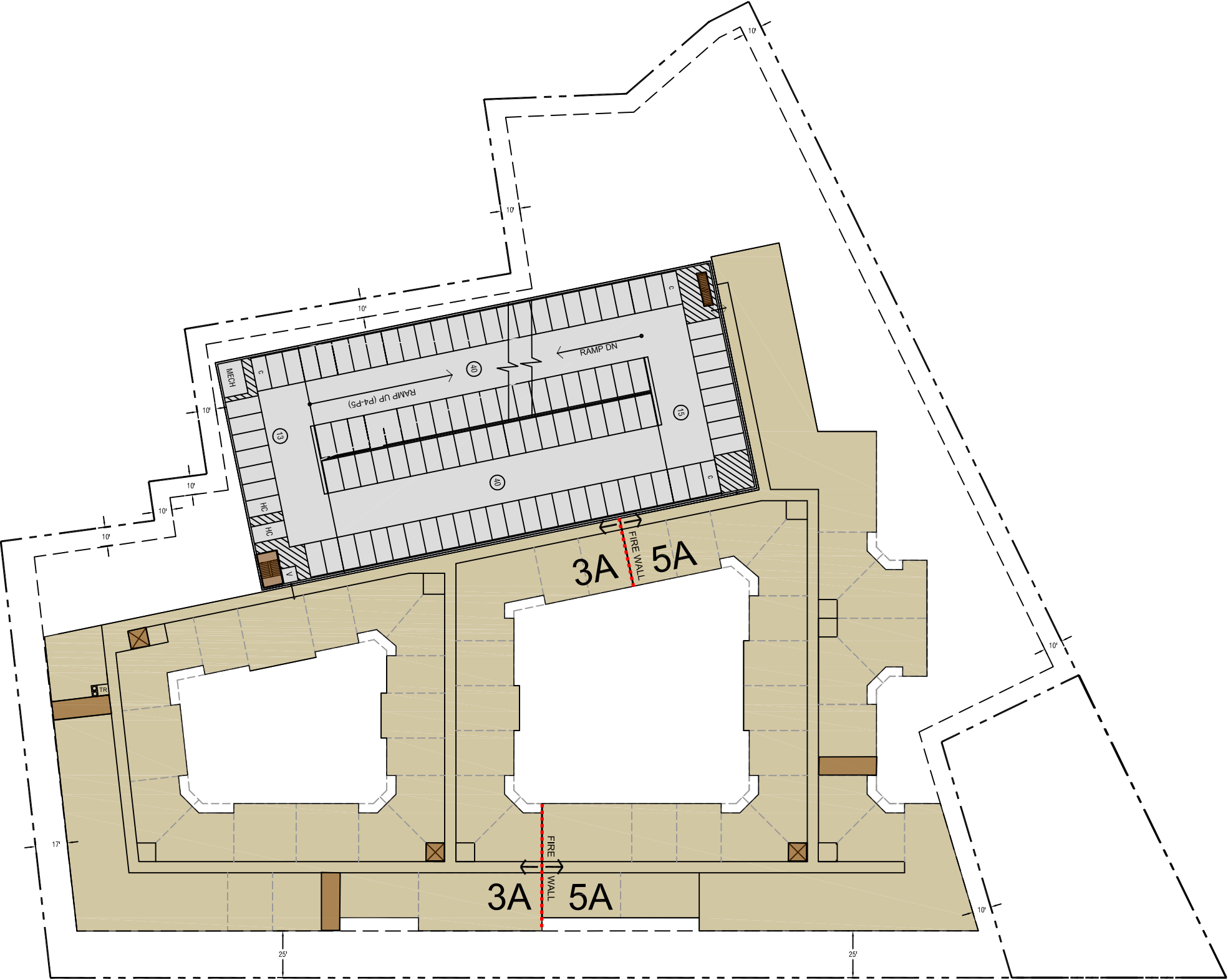
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3A: 38,551

5A: 35,401

L3





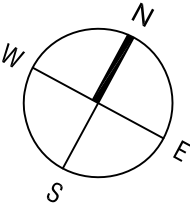
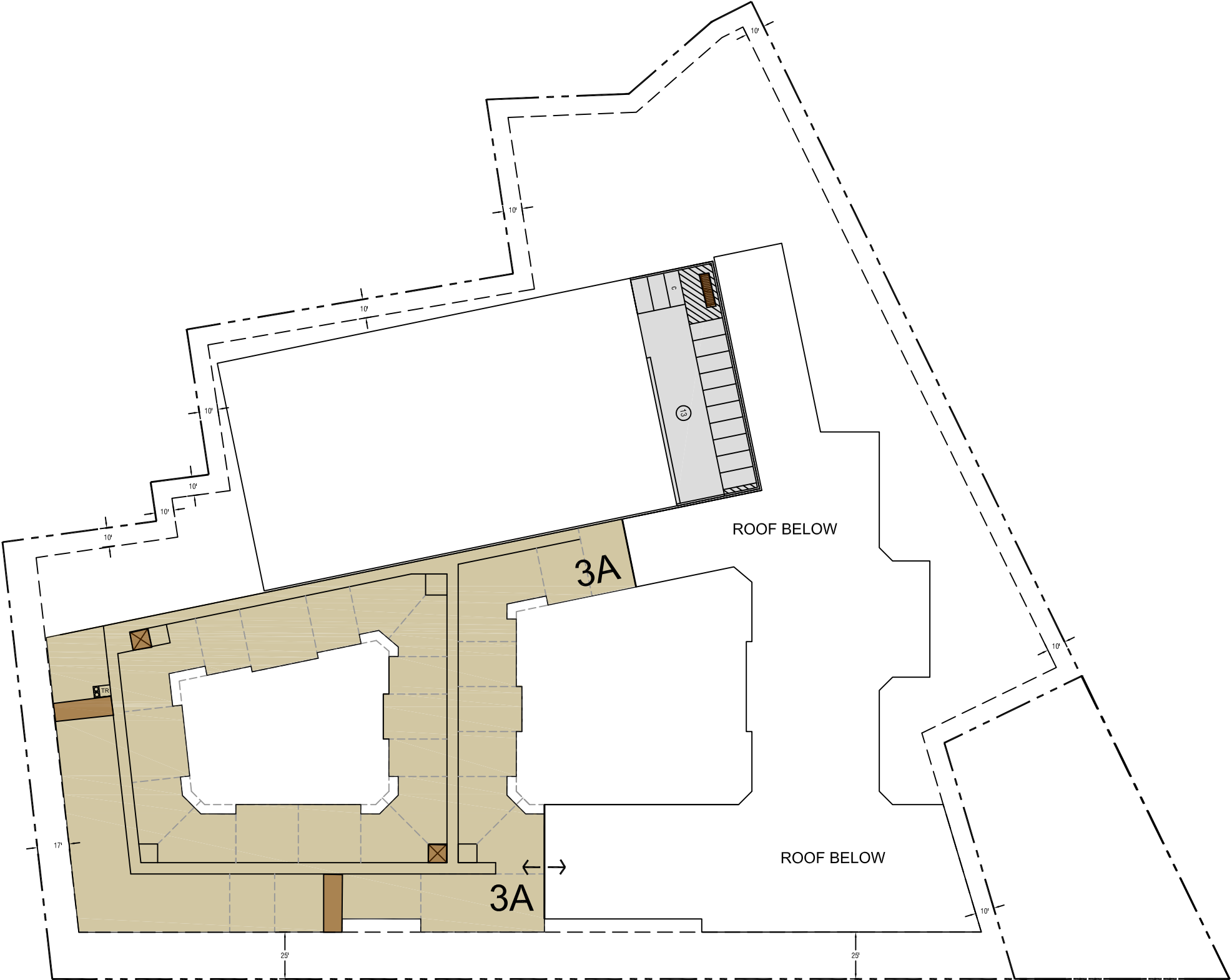
CONCEPT PLAN
3.14.22

3A: 38,551

5A: 35,401

L4





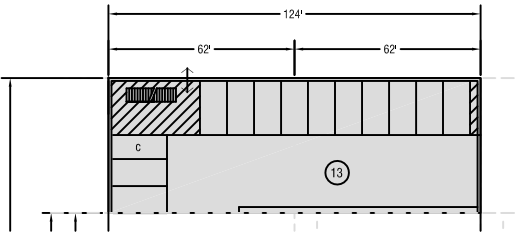
CONCEPT PLAN
3.14.22

3A: 38,551

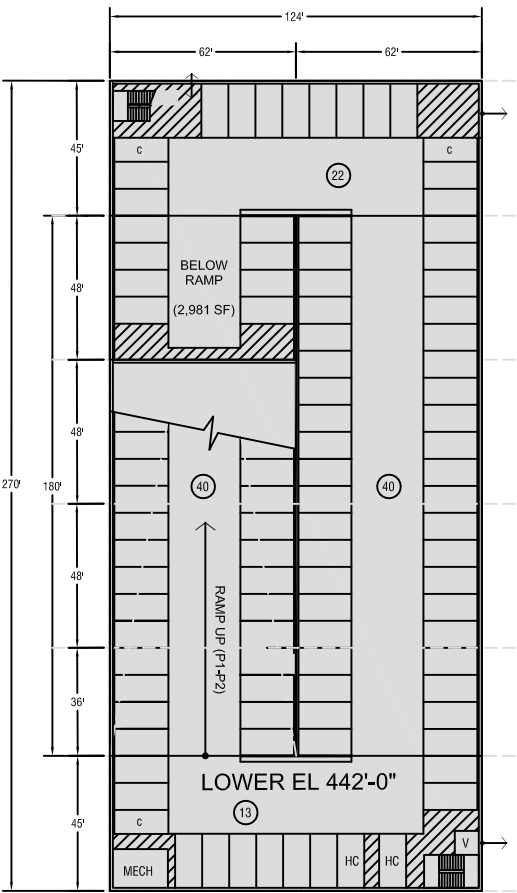
L5



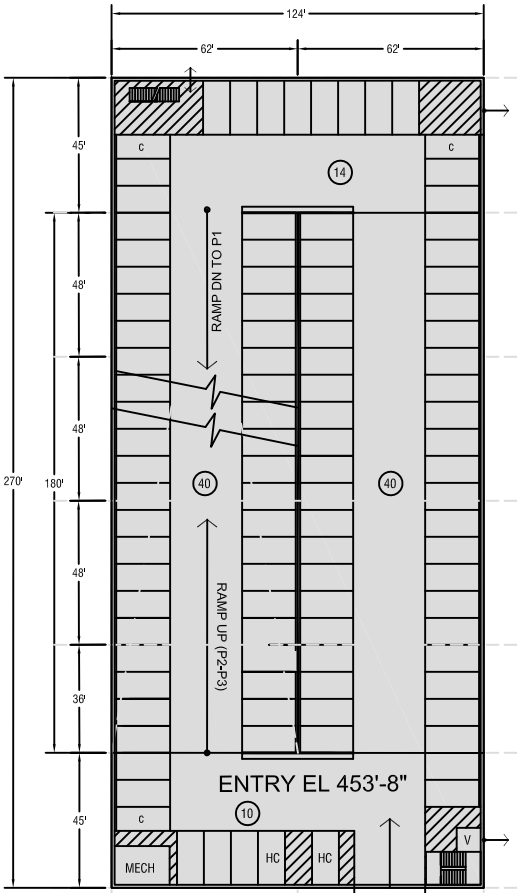
LINCOLN ST
Marlborough, MA.



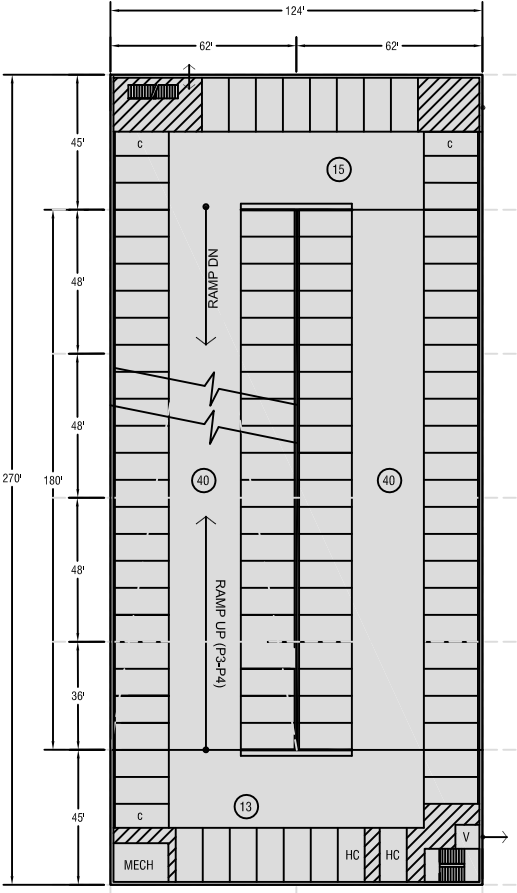
P5: : 5,580 GSF (ROOF)



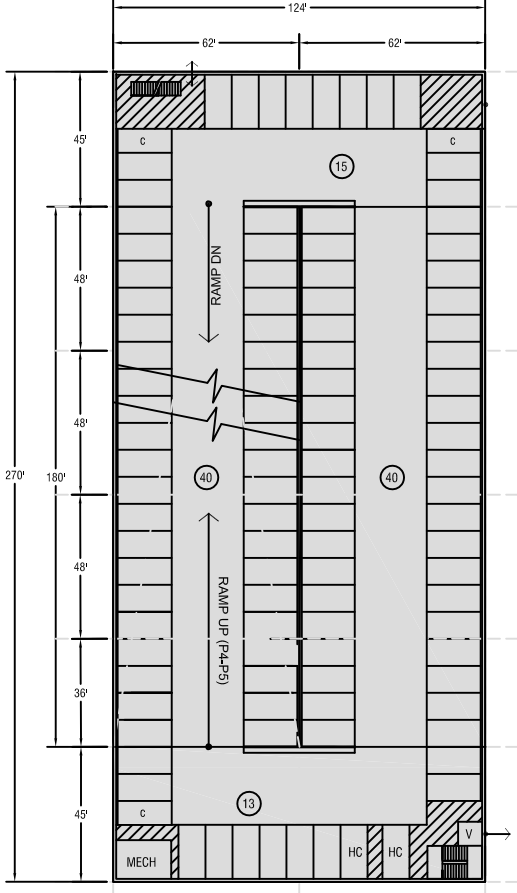
P1: 36,461 GSF
115 SPACES



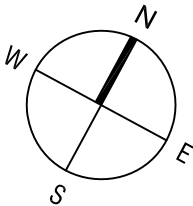
P2: 33,480 GSF
104 SPACES



P3: 33,480 GSF
108 SPACES

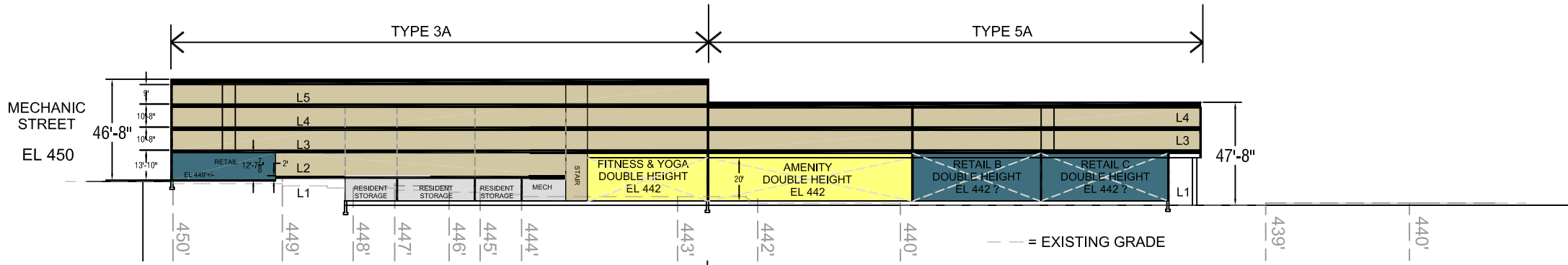


P4: 33,480 GSF
108 SPACES

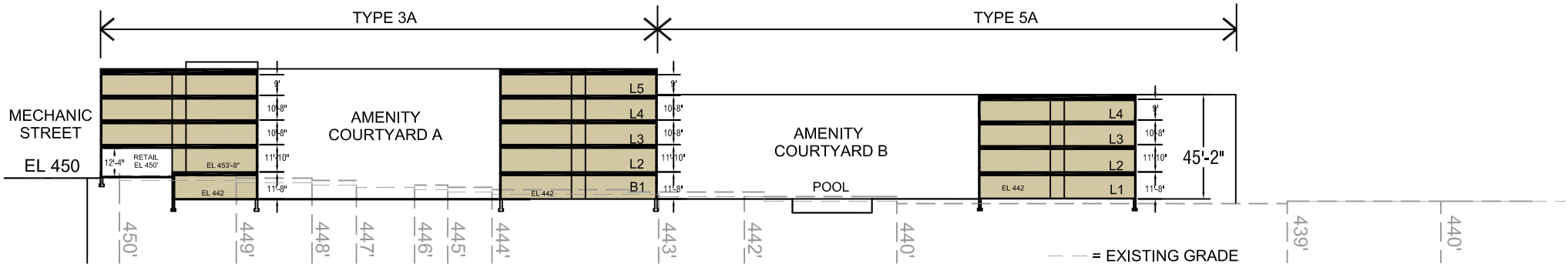


CONCEPT PLAN
3.14.22

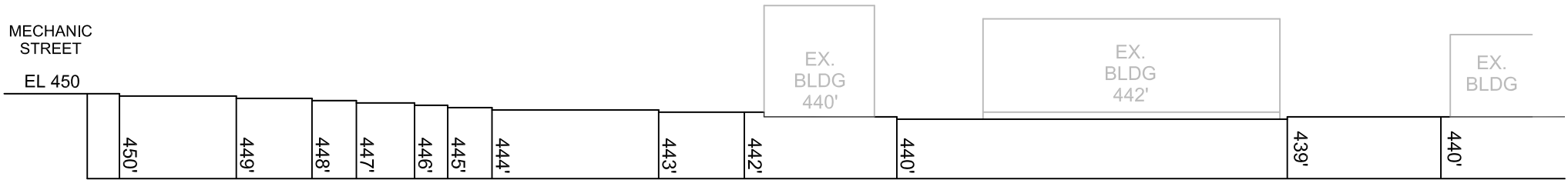




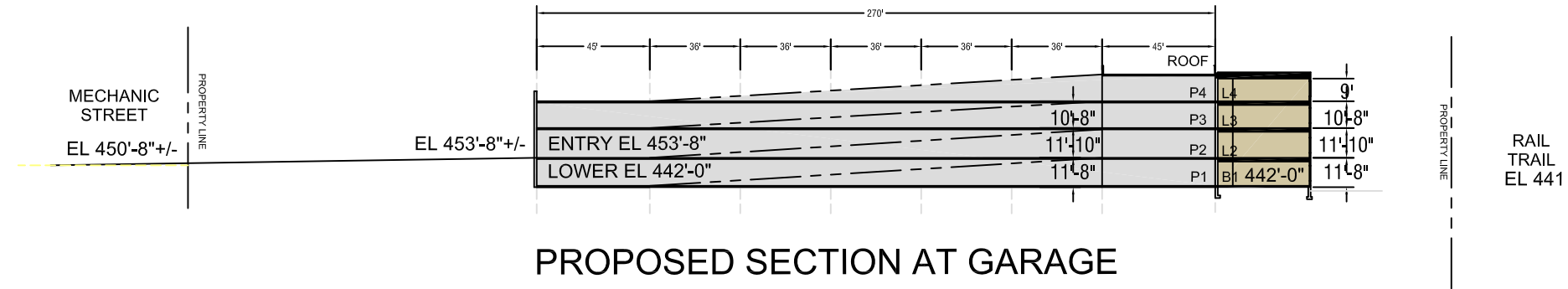
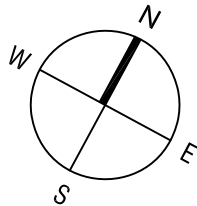
A-A PROPOSED SECTION AT LINCOLN STREET @ RETAIL/AMENITY



B-B PROPOSED SECTION AT COURTYARDS



EXISTING SECTION AT LINCOLN STREET



PROPOSED SECTION AT GARAGE

CONCEPT PLAN
3.14.22



AUTOMATIC TRAFFIC RECORDER COUNT DATA



Location : Lincoln Street
 Location : East of Mechanic Street
 City/State: Marlborough, MA

92990001

3/23/2022	EB,		Hour Totals		WB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		4		51		8		72		
12:15		5		37		5		84		
12:30		2		43		7		78		
12:45		1	12	46	3	74	23	308	35	485
1:00		1		35	4	80				
1:15		0		35	5	60				
1:30		2		37	6	72				
1:45		1	4	41	4	62	19	274	23	422
2:00		0		58	3	69				
2:15		1		56	2	89				
2:30		1		72	0	75				
2:45		1	3	71	4	99	9	332	12	589
3:00		0		55	1	94				
3:15		0		67	1	81				
3:30		3		68	3	89				
3:45		1	4	72	5	117	10	381	14	643
4:00		4		65	5	102				
4:15		3		74	6	99				
4:30		5		69	8	115				
4:45		8	20	74	10	111	29	427	49	709
5:00		12		61	26	93				
5:15		15		96	32	103				
5:30		28		75	32	106				
5:45		38	93	88	51	101	141	403	234	723
6:00		45		65	41	110				
6:15		43		58	64	85				
6:30		56		45	75	101				
6:45		49	193	58	66	102	246	398	439	624
7:00		72		75	75	93				
7:15		53		45	96	89				
7:30		58		65	113	83				
7:45		69	252	47	101	94	385	359	637	591
8:00		52		43	96	76				
8:15		43		47	83	67				
8:30		51		40	71	79				
8:45		56	202	35	73	61	323	283	525	448
9:00		38		31	71	54				
9:15		40		41	50	43				
9:30		34		23	56	51				
9:45		51	163	26	61	45	238	193	401	314
10:00		35		16	63	37				
10:15		31		13	69	26				
10:30		40		17	63	28				
10:45		48	154	18	62	17	257	108	411	172
11:00		33		11	68	18				
11:15		29		10	58	19				
11:30		50		9	61	16				
11:45		35	147	4	82	10	269	63	416	97
Total	1247	2288			1949	3529			3196	5817
Percent	35.3%	64.7%			35.6%	64.4%			35.5%	64.5%

Location : Lincoln Street
 Location : East of Mechanic Street
 City/State: Marlborough, MA

92990001

3/24/2022	EB,		Hour Totals		WB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	5	49			12	82				
12:15	3	51			4	73				
12:30	0	41			3	70				
12:45	1	36	9	177	4	77	23	302	32	479
1:00	5	39			3	67				
1:15	0	47			1	56				
1:30	1	44			0	70				
1:45	2	34	8	164	1	82	5	275	13	439
2:00	0	38			3	73				
2:15	2	59			2	83				
2:30	1	36			1	89				
2:45	1	63	4	196	2	99	8	344	12	540
3:00	1	61			1	96				
3:15	0	42			2	93				
3:30	1	65			1	90				
3:45	2	58	4	226	7	98	11	377	15	603
4:00	5	74			3	87				
4:15	3	63			5	109				
4:30	6	71			5	100				
4:45	5	43	19	251	8	104	21	400	40	651
5:00	2	67			18	101				
5:15	24	67			14	106				
5:30	18	72			30	76				
5:45	24	60	68	266	27	88	89	371	157	637
6:00	20	75			37	95				
6:15	30	53			51	85				
6:30	34	53			53	91				
6:45	39	53	123	234	63	79	204	350	327	584
7:00	39	60			59	81				
7:15	48	44			80	59				
7:30	56	44			103	77				
7:45	62	44	205	192	88	65	330	282	535	474
8:00	42	45			89	56				
8:15	47	30			72	61				
8:30	39	28			68	68				
8:45	37	27	165	130	66	62	295	247	460	377
9:00	40	29			70	47				
9:15	41	18			51	57				
9:30	32	18			59	41				
9:45	28	20	141	85	54	40	234	185	375	270
10:00	41	15			50	37				
10:15	35	7			56	27				
10:30	31	10			60	30				
10:45	52	11	159	43	63	39	229	133	388	176
11:00	40	3			72	15				
11:15	43	4			62	16				
11:30	50	10			80	8				
11:45	54	5	187	22	80	10	294	49	481	71
Total	1092	1986			1743	3315			2835	5301
Percent	35.5%	64.5%			34.5%	65.5%			34.8%	65.2%
Grand Total	2339	4274			3692	6844			6031	11118
Percent	35.4%	64.6%			35.0%	65.0%			35.2%	64.8%
ADT	ADT: 8,574		AADT: 8,574							

92990002

3/23/2022	SB,		Hour Totals		NB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	3	18			3	41				
12:15	0	20			2	34				
12:30	0	28			2	42				
12:45	1	29	4	95	0	27	7	144	11	239
1:00	0	17			3	44				
1:15	0	20			1	34				
1:30	0	24			2	43				
1:45	1	14	1	75	2	31	8	152	9	227
2:00	0	26			2	31				
2:15	0	22			1	42				
2:30	0	46			0	49				
2:45	0	36	0	130	1	51	4	173	4	303
3:00	1	29			0	61				
3:15	0	24			1	45				
3:30	1	31			1	60				
3:45	0	39	2	123	1	59	3	225	5	348
4:00	2	34			1	73				
4:15	1	36			2	52				
4:30	2	31			3	73				
4:45	1	39	6	140	4	63	10	261	16	401
5:00	5	48			3	63				
5:15	13	44			8	61				
5:30	15	35			4	71				
5:45	13	30	46	157	17	60	32	255	78	412
6:00	19	25			20	59				
6:15	25	20			18	58				
6:30	35	26			25	39				
6:45	27	29	106	100	15	54	78	210	184	310
7:00	36	34			18	40				
7:15	30	21			23	36				
7:30	25	17			32	49				
7:45	40	16	131	88	33	36	106	161	237	249
8:00	28	23			39	38				
8:15	36	16			36	28				
8:30	42	18			32	32				
8:45	50	16	156	73	42	27	149	125	305	198
9:00	21	13			23	26				
9:15	27	12			32	21				
9:30	18	10			25	19				
9:45	19	8	85	43	41	17	121	83	206	126
10:00	35	5			33	10				
10:15	20	3			33	9				
10:30	19	2			39	15				
10:45	18	2	92	12	29	9	134	43	226	55
11:00	22	7			38	10				
11:15	19	4			28	9				
11:30	22	1			21	10				
11:45	18	1	81	13	32	3	119	32	200	45
Total	710	1049			771	1864			1481	2913
Percent	40.4%	59.6%			29.3%	70.7%			33.7%	66.3%

Location : Mechanic Street
 Location : North of Lincoln Street
 City/State: Marlborough, MA

92990002

3/24/2022	SB,		Hour Totals		NB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	14			3	33				
12:15	2	21			2	35				
12:30	1	19			0	46				
12:45	0	18	3	72	0	33	5	147	8	219
1:00	2	11			1	44				
1:15	0	19			2	30				
1:30	0	20			1	40				
1:45	2	12	4	62	1	45	5	159	9	221
2:00	0	17			1	42				
2:15	1	19			3	46				
2:30	2	22			0	34				
2:45	0	34	3	92	0	58	4	180	7	272
3:00	1	25			0	45				
3:15	1	18			0	58				
3:30	1	36			0	53				
3:45	0	18	3	97	2	63	2	219	5	316
4:00	1	24			0	49				
4:15	0	17			1	68				
4:30	2	20			2	79				
4:45	0	29	3	90	5	65	8	261	11	351
5:00	3	22			3	64				
5:15	13	28			6	73				
5:30	10	37			6	45				
5:45	8	16	34	103	8	62	23	244	57	347
6:00	12	28			8	58				
6:15	12	24			11	56				
6:30	22	34			15	49				
6:45	26	32	72	118	20	52	54	215	126	333
7:00	29	24			23	37				
7:15	26	18			25	31				
7:30	23	10			34	26				
7:45	29	10	107	62	34	29	116	123	223	185
8:00	15	8			34	31				
8:15	20	11			30	29				
8:30	26	7			26	35				
8:45	29	7	90	33	44	36	134	131	224	164
9:00	18	4			35	31				
9:15	22	9			22	19				
9:30	13	5			31	31				
9:45	16	4	69	22	32	18	120	99	189	121
10:00	24	7			25	9				
10:15	23	5			30	15				
10:30	20	5			34	12				
10:45	20	3	87	20	40	9	129	45	216	65
11:00	18	4			25	5				
11:15	17	1			46	8				
11:30	22	4			36	6				
11:45	20	1	77	10	41	4	148	23	225	33
Total	552	781			748	1846			1300	2627
Percent	41.4%	58.6%			28.8%	71.2%			33.1%	66.9%
Grand Total	1262	1830			1519	3710			2781	5540
Percent	40.8%	59.2%			29.0%	71.0%			33.4%	66.6%
ADT	ADT: 4,394		AADT: 4,394							

92990002

3/21/2022	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,
12:00 AM	*	*	*	*	4	7	3	5	*	*	*	*	*	*	4	6
1:00	*	*	*	*	1	8	4	5	*	*	*	*	*	*	2	6
2:00	*	*	*	*	0	4	3	4	*	*	*	*	*	*	2	4
3:00	*	*	*	*	2	3	3	2	*	*	*	*	*	*	2	2
4:00	*	*	*	*	6	10	3	8	*	*	*	*	*	*	4	9
5:00	*	*	*	*	46	32	34	23	*	*	*	*	*	*	40	28
6:00	*	*	*	*	106	78	72	54	*	*	*	*	*	*	89	66
7:00	*	*	*	*	131	106	107	116	*	*	*	*	*	*	119	111
8:00	*	*	*	*	156	149	90	134	*	*	*	*	*	*	123	142
9:00	*	*	*	*	85	121	69	120	*	*	*	*	*	*	77	120
10:00	*	*	*	*	92	134	87	129	*	*	*	*	*	*	90	132
11:00	*	*	*	*	81	119	77	148	*	*	*	*	*	*	79	134
12:00 PM	*	*	*	*	95	144	72	147	*	*	*	*	*	*	84	146
1:00	*	*	*	*	75	152	62	159	*	*	*	*	*	*	68	156
2:00	*	*	*	*	130	173	92	180	*	*	*	*	*	*	111	176
3:00	*	*	*	*	123	225	97	219	*	*	*	*	*	*	110	222
4:00	*	*	*	*	140	261	90	261	*	*	*	*	*	*	115	261
5:00	*	*	*	*	157	255	103	244	*	*	*	*	*	*	130	250
6:00	*	*	*	*	100	210	118	215	*	*	*	*	*	*	109	212
7:00	*	*	*	*	88	161	62	123	*	*	*	*	*	*	75	142
8:00	*	*	*	*	73	125	33	131	*	*	*	*	*	*	53	128
9:00	*	*	*	*	43	83	22	99	*	*	*	*	*	*	32	91
10:00	*	*	*	*	12	43	20	45	*	*	*	*	*	*	16	44
11:00	*	*	*	*	13	32	10	23	*	*	*	*	*	*	12	28
Total Day	0	0	0	0	1759	2635	1333	2594	0	0	0	0	0	0	1546	2616
	0		0		4394		3927		0		0		0		4162	
AM Peak Volume					8:00 156	8:00 149	7:00 107	11:00 148							8:00 123	8:00 142
PM Peak Volume					5:00 157	4:00 261	6:00 118	4:00 261							5:00 130	4:00 261
Comb Total ADT	0 ADT: 4,394		0 AADT: 4,394		4394		3927		0		0		0		4162	

TURNING MOVEMENT COUNT DATA



Accurate Counts

978-664-2565

N/S Street : Mechanic Street
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Cloudy

File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
Page No : 1

Groups Printed- Cars - Trucks

	Mechanic St From North			Lincoln St From East			Mechanic St From South			Lincoln St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	24	23	6	1	72	11	6	12	5	2	48	12	222
07:15 AM	13	25	4	8	84	7	9	12	4	5	50	8	229
07:30 AM	13	23	5	4	100	13	14	27	0	3	48	13	263
07:45 AM	25	33	3	2	85	15	11	26	1	4	54	13	272
Total	75	104	18	15	341	46	40	77	10	14	200	46	986
08:00 AM	16	23	2	4	79	12	11	17	0	1	29	8	202
08:15 AM	19	25	3	4	72	14	14	10	2	7	33	5	208
08:30 AM	16	26	3	0	61	4	6	24	3	4	36	10	193
08:45 AM	25	34	5	6	62	8	11	20	3	3	33	8	218
Total	76	108	13	14	274	38	42	71	8	15	131	31	821
Grand Total	151	212	31	29	615	84	82	148	18	29	331	77	1807
Apprch %	38.3	53.8	7.9	4	84.5	11.5	33.1	59.7	7.3	6.6	75.7	17.6	
Total %	8.4	11.7	1.7	1.6	34	4.6	4.5	8.2	1	1.6	18.3	4.3	
Cars	150	211	31	29	611	81	80	146	17	27	328	75	1786
% Cars	99.3	99.5	100	100	99.3	96.4	97.6	98.6	94.4	93.1	99.1	97.4	98.8
Trucks	1	1	0	0	4	3	2	2	1	2	3	2	21
% Trucks	0.7	0.5	0	0	0.7	3.6	2.4	1.4	5.6	6.9	0.9	2.6	1.2

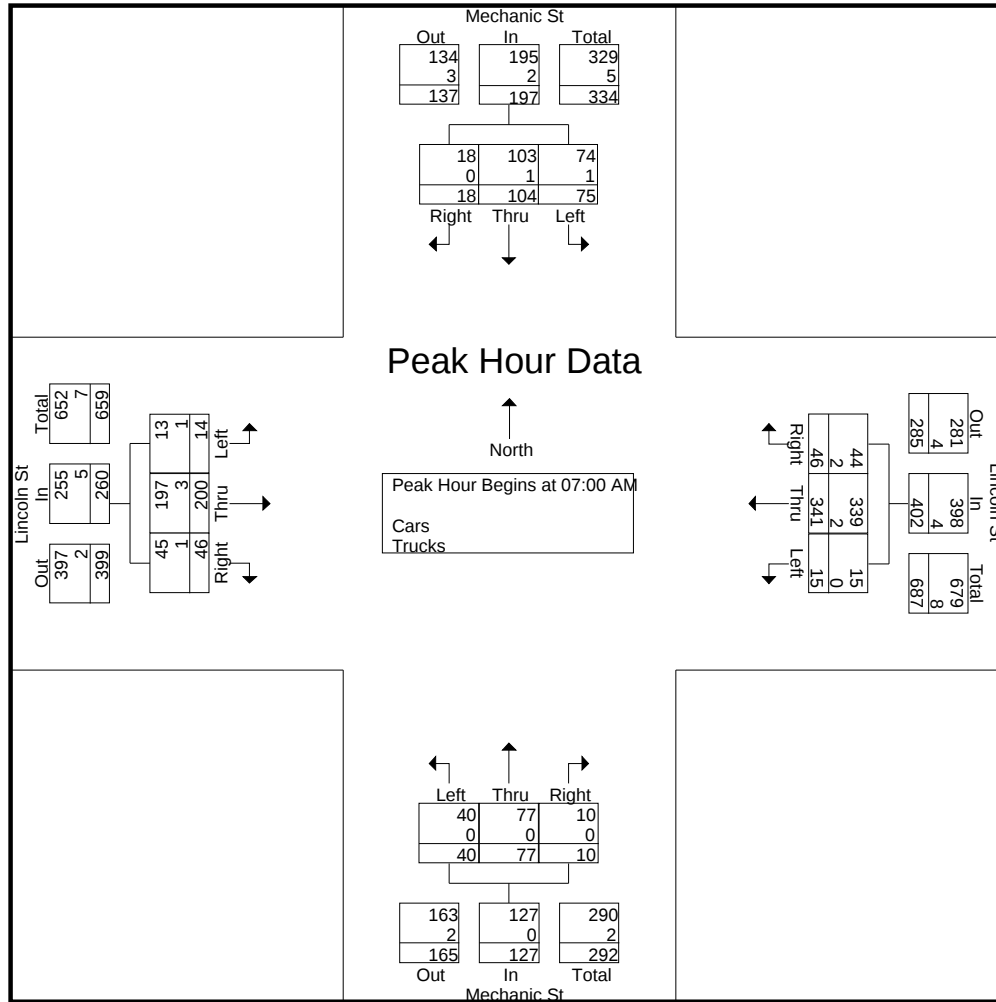
	Mechanic St From North				Lincoln St From East				Mechanic St From South				Lincoln St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	24	23	6	53	1	72	11	84	6	12	5	23	2	48	12	62	222
07:15 AM	13	25	4	42	8	84	7	99	9	12	4	25	5	50	8	63	229
07:30 AM	13	23	5	41	4	100	13	117	14	27	0	41	3	48	13	64	263
07:45 AM	25	33	3	61	2	85	15	102	11	26	1	38	4	54	13	71	272
Total Volume	75	104	18	197	15	341	46	402	40	77	10	127	14	200	46	260	986
% App. Total	38.1	52.8	9.1		3.7	84.8	11.4		31.5	60.6	7.9		5.4	76.9	17.7		
PHF	.750	.788	.750	.807	.469	.853	.767	.859	.714	.713	.500	.774	.700	.926	.885	.915	.906
Cars	74	103	18	195	15	339	44	398	40	77	10	127	13	197	45	255	975
% Cars	98.7	99.0	100	99.0	100	99.4	95.7	99.0	100	100	100	100	92.9	98.5	97.8	98.1	98.9
Trucks	1	1	0	2	0	2	2	4	0	0	0	0	1	3	1	5	11
% Trucks	1.3	1.0	0	1.0	0	0.6	4.3	1.0	0	0	0	0	7.1	1.5	2.2	1.9	1.1

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Lincoln Street
 City/State : Marlborough, MA
 Weather : Cloudy

File Name : 92990001
 Site Code : 92990001
 Start Date : 3/30/2022
 Page No : 2



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

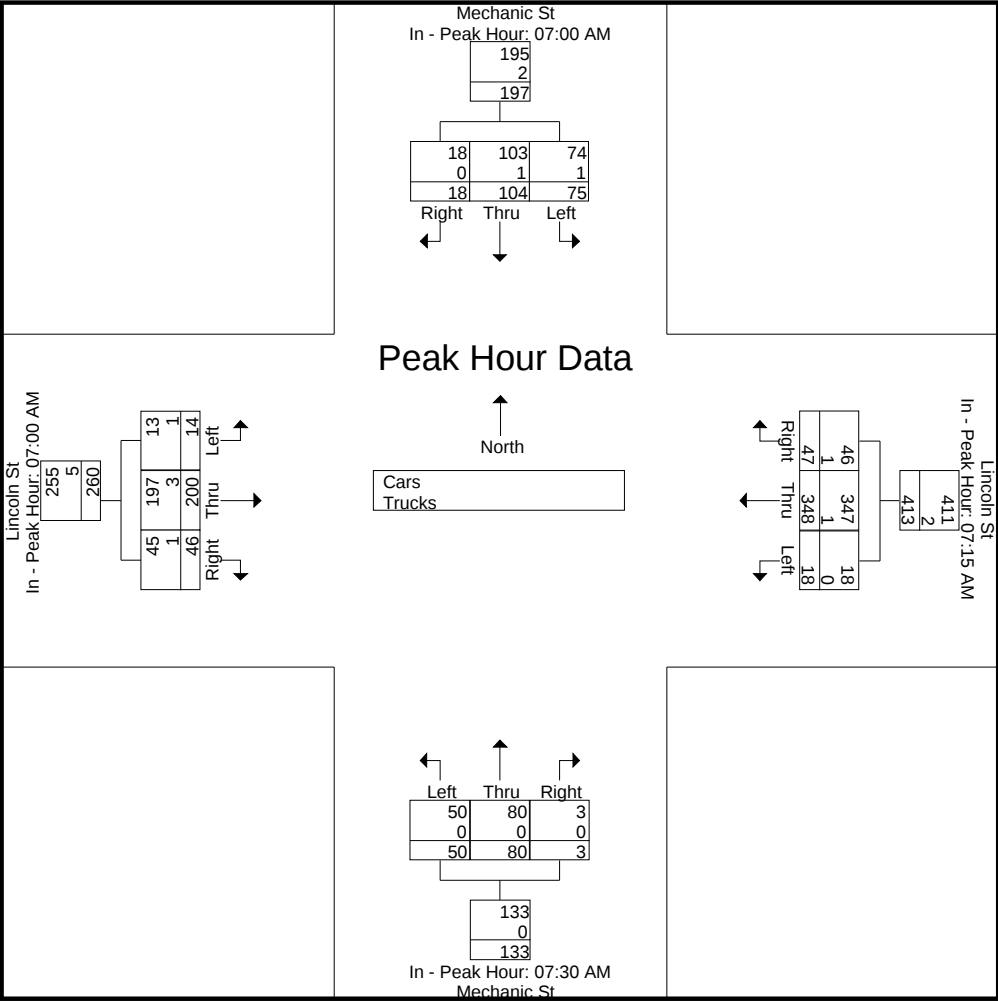
	07:00 AM				07:15 AM				07:30 AM				07:00 AM			
+0 mins.	24	23	6	53	8	84	7	99	14	27	0	41	2	48	12	62
+15 mins.	13	25	4	42	4	100	13	117	11	26	1	38	5	50	8	63
+30 mins.	13	23	5	41	2	85	15	102	11	17	0	28	3	48	13	64
+45 mins.	25	33	3	61	4	79	12	95	14	10	2	26	4	54	13	71
Total Volume	75	104	18	197	18	348	47	413	50	80	3	133	14	200	46	260
% App. Total	38.1	52.8	9.1		4.4	84.3	11.4		37.6	60.2	2.3		5.4	76.9	17.7	
PHF	.750	.788	.750	.807	.563	.870	.783	.882	.893	.741	.375	.811	.700	.926	.885	.915
Cars	74	103	18	195	18	347	46	411	50	80	3	133	13	197	45	255
% Cars	98.7	99	100	99	100	99.7	97.9	99.5	100	100	100	100	92.9	98.5	97.8	98.1
Trucks	1	1	0	2	0	1	1	2	0	0	0	0	1	3	1	5
% Trucks	1.3	1	0	1	0	0.3	2.1	0.5	0	0	0	0	7.1	1.5	2.2	1.9

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Lincoln Street
 City/State : Marlborough, MA
 Weather : Cloudy

File Name : 92990001
 Site Code : 92990001
 Start Date : 3/30/2022
 Page No : 3



Accurate Counts

978-664-2565

N/S Street : Mechanic Street
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Cloudy

File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
Page No : 4

Groups Printed- Cars

	Mechanic St From North			Lincoln St From East			Mechanic St From South			Lincoln St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	23	23	6	1	71	10	6	12	5	2	47	12	218
07:15 AM	13	24	4	8	83	7	9	12	4	5	50	7	226
07:30 AM	13	23	5	4	100	12	14	27	0	2	46	13	259
07:45 AM	25	33	3	2	85	15	11	26	1	4	54	13	272
Total	74	103	18	15	339	44	40	77	10	13	197	45	975
08:00 AM	16	23	2	4	79	12	11	17	0	1	29	8	202
08:15 AM	19	25	3	4	71	14	14	10	2	7	33	5	207
08:30 AM	16	26	3	0	61	4	6	23	2	3	36	9	189
08:45 AM	25	34	5	6	61	7	9	19	3	3	33	8	213
Total	76	108	13	14	272	37	40	69	7	14	131	30	811
Grand Total	150	211	31	29	611	81	80	146	17	27	328	75	1786
Apprch %	38.3	53.8	7.9	4	84.7	11.2	32.9	60.1	7	6.3	76.3	17.4	
Total %	8.4	11.8	1.7	1.6	34.2	4.5	4.5	8.2	1	1.5	18.4	4.2	

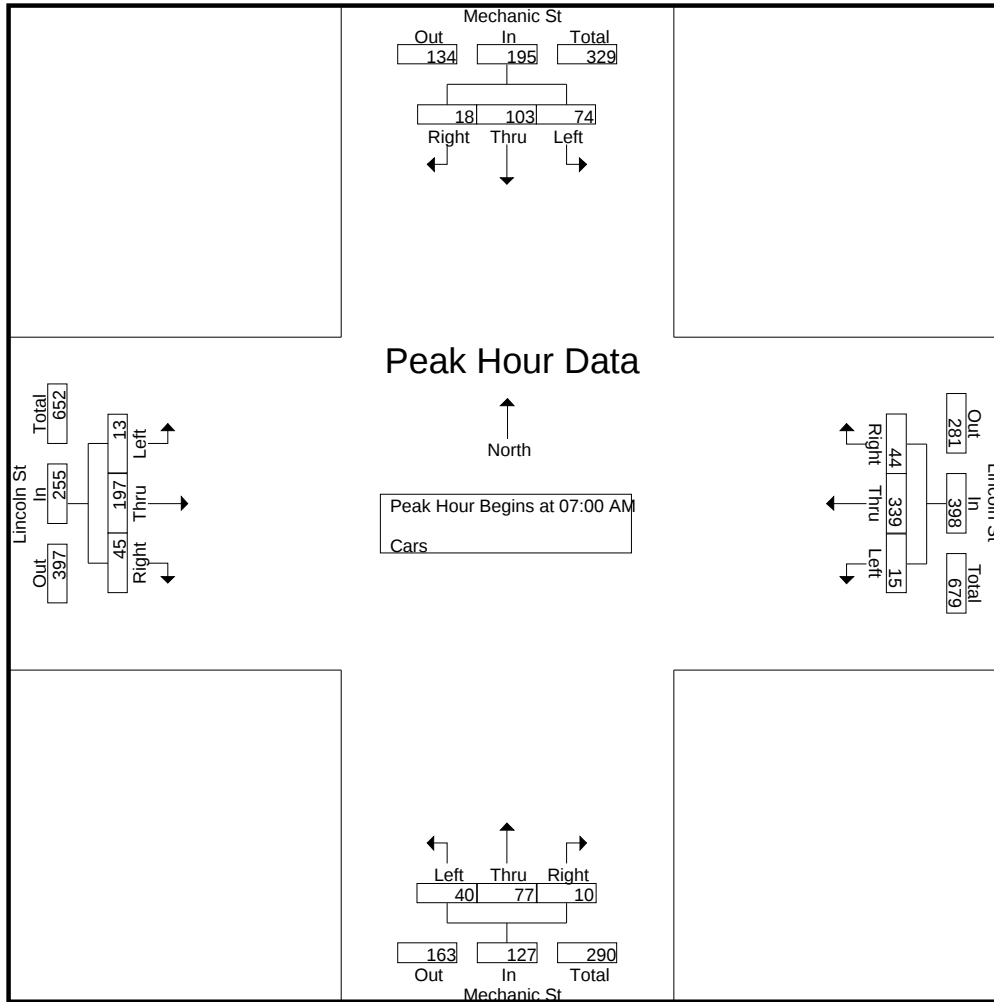
	Mechanic St From North				Lincoln St From East				Mechanic St From South				Lincoln St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	23	23	6	52	1	71	10	82	6	12	5	23	2	47	12	61	218
07:15 AM	13	24	4	41	8	83	7	98	9	12	4	25	5	50	7	62	226
07:30 AM	13	23	5	41	4	100	12	116	14	27	0	41	2	46	13	61	259
07:45 AM	25	33	3	61	2	85	15	102	11	26	1	38	4	54	13	71	272
Total Volume	74	103	18	195	15	339	44	398	40	77	10	127	13	197	45	255	975
% App. Total	37.9	52.8	9.2		3.8	85.2	11.1		31.5	60.6	7.9		5.1	77.3	17.6		
PHF	.740	.780	.750	.799	.469	.848	.733	.858	.714	.713	.500	.774	.650	.912	.865	.898	.896

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Lincoln Street
 City/State : Marlborough, MA
 Weather : Cloudy

File Name : 92990001
 Site Code : 92990001
 Start Date : 3/30/2022
 Page No : 5

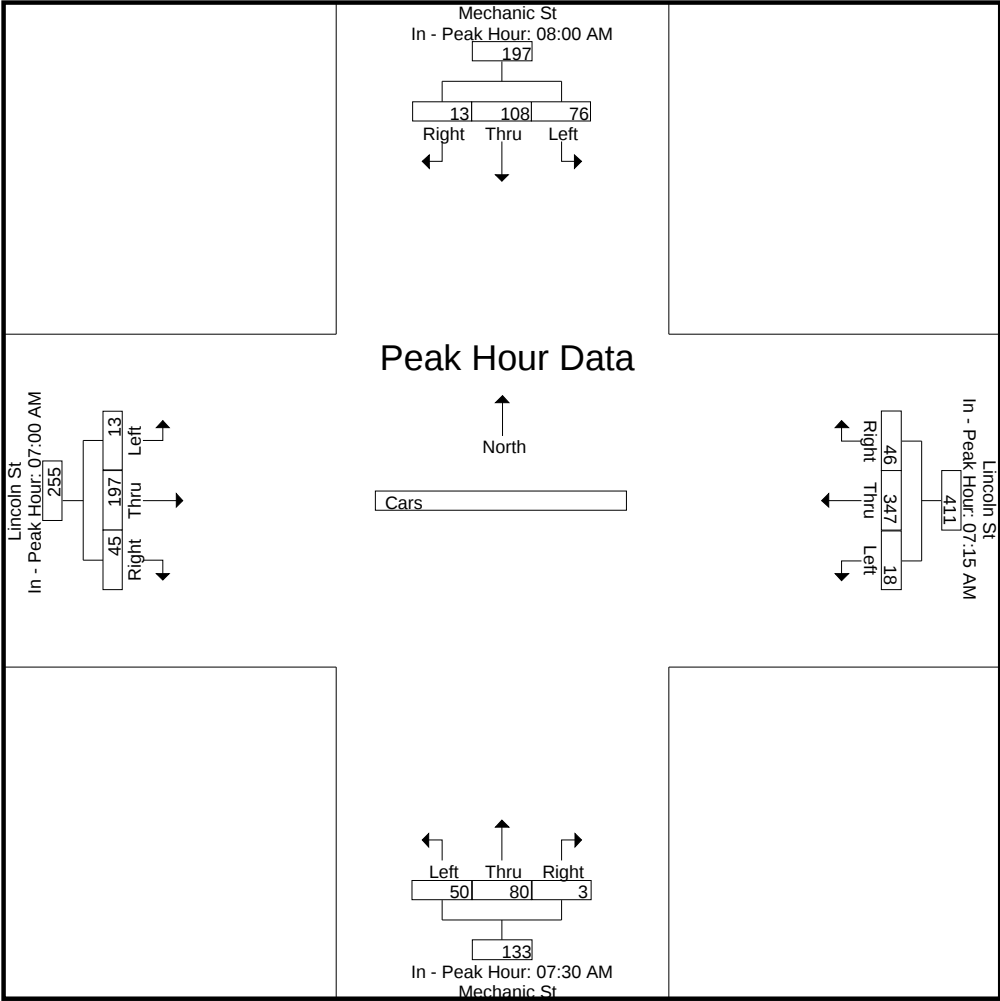


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	08:00 AM				07:15 AM				07:30 AM				07:00 AM			
+0 mins.	16	23	2	41	8	83	7	98	14	27	0	41	2	47	12	61
+15 mins.	19	25	3	47	4	100	12	116	11	26	1	38	5	50	7	62
+30 mins.	16	26	3	45	2	85	15	102	11	17	0	28	2	46	13	61
+45 mins.	25	34	5	64	4	79	12	95	14	10	2	26	4	54	13	71
Total Volume	76	108	13	197	18	347	46	411	50	80	3	133	13	197	45	255
% App. Total	38.6	54.8	6.6		4.4	84.4	11.2		37.6	60.2	2.3		5.1	77.3	17.6	
PHF	.760	.794	.650	.770	.563	.868	.767	.886	.893	.741	.375	.811	.650	.912	.865	.898

N/S Street : Mechanic Street
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Cloudy

File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Mechanic Street
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Cloudy

File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
Page No : 7

Groups Printed- Trucks

	Mechanic St From North			Lincoln St From East			Mechanic St From South			Lincoln St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	1	0	0	0	1	1	0	0	0	0	1	0	4
07:15 AM	0	1	0	0	1	0	0	0	0	0	0	1	3
07:30 AM	0	0	0	0	0	1	0	0	0	1	2	0	4
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	1	0	0	2	2	0	0	0	1	3	1	11
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	1	1	1	0	1	4
08:45 AM	0	0	0	0	1	1	2	1	0	0	0	0	5
Total	0	0	0	0	2	1	2	2	1	1	0	1	10
Grand Total	1	1	0	0	4	3	2	2	1	2	3	2	21
Apprch %	50	50	0	0	57.1	42.9	40	40	20	28.6	42.9	28.6	
Total %	4.8	4.8	0	0	19	14.3	9.5	9.5	4.8	9.5	14.3	9.5	

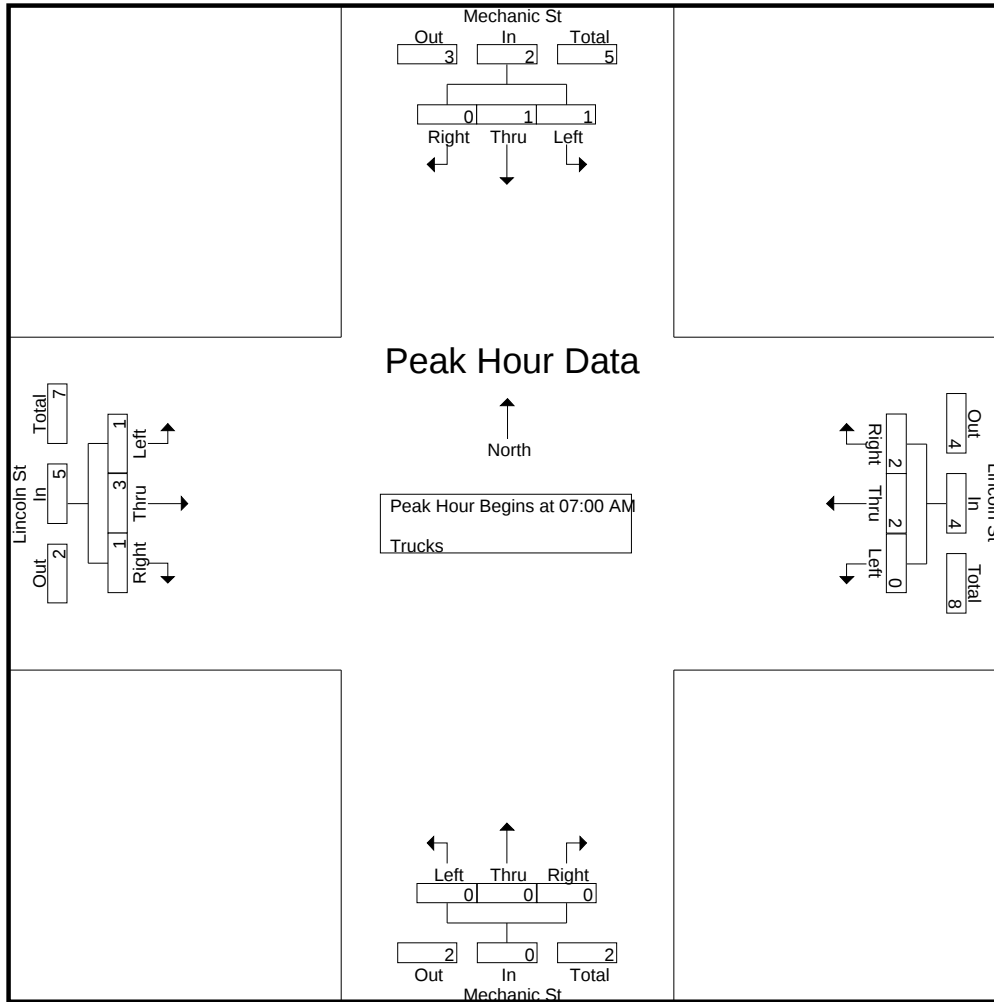
	Mechanic St From North				Lincoln St From East				Mechanic St From South				Lincoln St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	1	0	0	1	0	1	1	2	0	0	0	0	0	1	0	1	4
07:15 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	1	1	3
07:30 AM	0	0	0	0	0	0	1	1	0	0	0	0	1	2	0	3	4
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	1	0	2	0	2	2	4	0	0	0	0	1	3	1	5	11
% App. Total	50	50	0		0	50	50		0	0	0		20	60	20		
PHF	.250	.250	.000	.500	.000	.500	.500	.500	.000	.000	.000	.000	.250	.375	.250	.417	.688

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Lincoln Street
 City/State : Marlborough, MA
 Weather : Cloudy

File Name : 92990001
 Site Code : 92990001
 Start Date : 3/30/2022
 Page No : 8

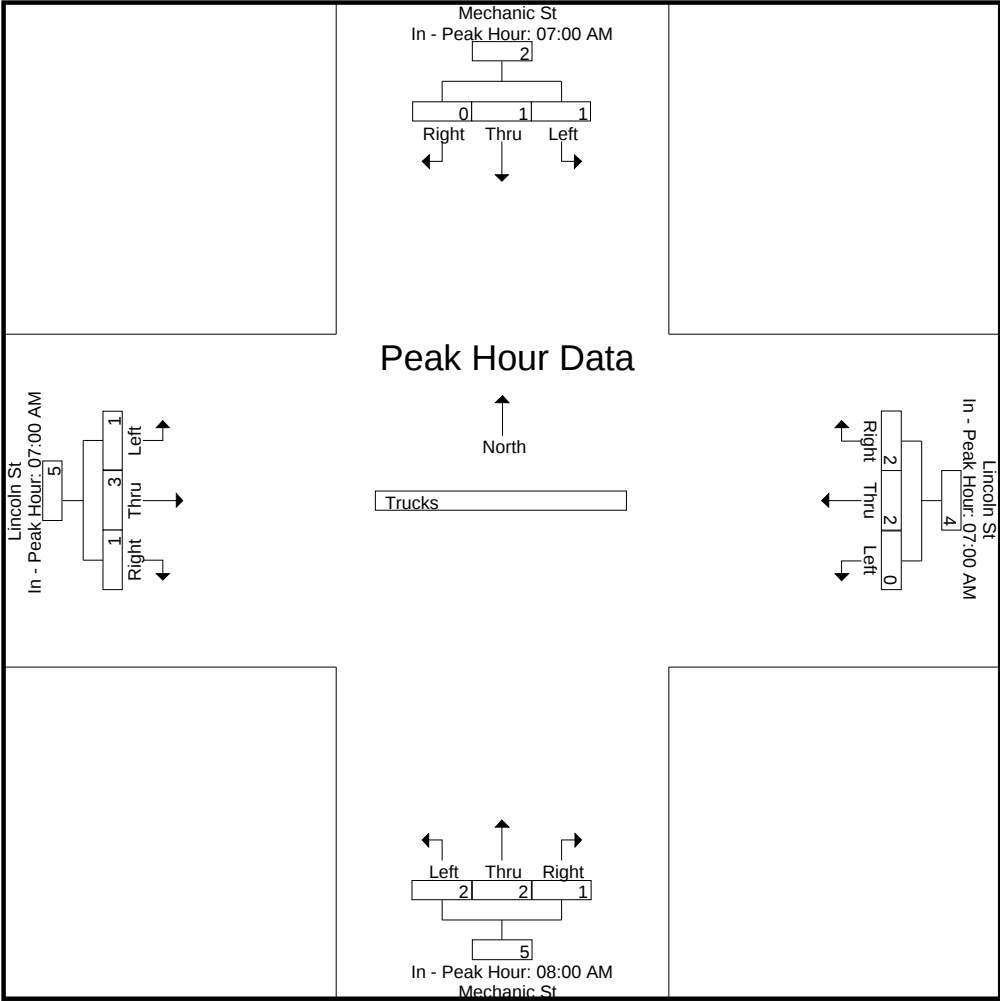


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				08:00 AM				07:00 AM			
+0 mins.	1	0	0	1	0	1	1	2	0	0	0	0	0	1	0	1
+15 mins.	0	1	0	1	0	1	0	1	0	0	0	0	0	0	1	1
+30 mins.	0	0	0	0	0	0	1	1	0	1	1	2	1	2	0	3
+45 mins.	0	0	0	0	0	0	0	0	2	1	0	3	0	0	0	0
Total Volume	1	1	0	2	0	2	2	4	2	2	1	5	1	3	1	5
% App. Total	50	50	0		0	50	50		40	40	20		20	60	20	
PHF	.250	.250	.000	.500	.000	.500	.500	.500	.250	.500	.250	.417	.250	.375	.250	.417

N/S Street : Mechanic Street
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Cloudy

File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
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978-664-2565

File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
Page No : 10

	Mechanic St From North				Lincoln St From East				Mechanic St From South				Lincoln St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	3	0	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	4	7	0	7
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	4	0	0	0	5	10	0	10
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	1	2
08:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	2	1	3
Grand Total	0	0	0	2	0	1	0	0	0	0	0	5	0	0	0	5	12	1	13
Apprch %	0	0	0		0	100	0		0	0	0		0	0	0				
Total %	0	0	0		0	100	0		0	0	0		0	0	0		92.3	7.7	

[illegible]

978-664-2565

File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
Page No : 11

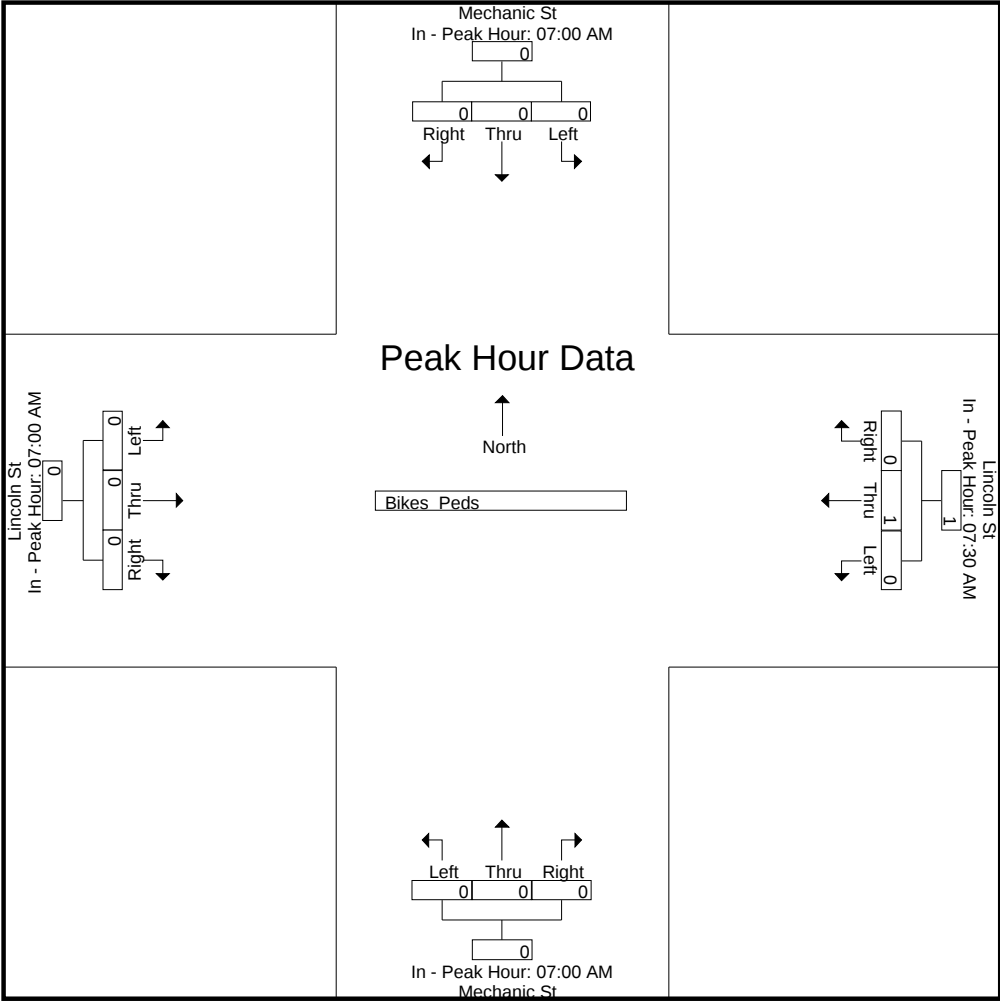


Peak Hour Begins at 07:30 AM
Bikes Peds

Peak Hour for Each Approach Begins at:																
	07:00 AM				07:30 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+45 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	
% App. Total	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	

N/S Street : Mechanic Street
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Cloudy

File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
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File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
Page No : 1

	Mechanic St From North			Lincoln St From East			Mechanic St From South			Lincoln St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	12	27	7	4	88	18	21	39	4	3	56	16	295
04:15 PM	14	31	3	6	79	17	23	38	4	6	51	19	291
04:30 PM	15	26	5	4	92	11	22	48	0	4	48	16	291
04:45 PM	33	29	4	6	92	21	22	35	2	3	49	15	311
Total	74	113	19	20	351	67	88	160	10	16	204	66	1188
05:00 PM	26	31	2	5	92	12	19	42	4	3	62	16	314
05:15 PM	24	28	9	4	79	20	21	49	5	1	55	31	326
05:30 PM	21	23	6	3	98	18	23	44	4	1	65	18	324
05:45 PM	20	21	2	7	95	14	21	47	3	3	58	21	312
Total	91	103	19	19	364	64	84	182	16	8	240	86	1276
Grand Total	165	216	38	39	715	131	172	342	26	24	444	152	2464
Apprch %	39.4	51.6	9.1	4.4	80.8	14.8	31.9	63.3	4.8	3.9	71.6	24.5	
Total %	6.7	8.8	1.5	1.6	29	5.3	7	13.9	1.1	1	18	6.2	
Cars	165	215	38	38	712	131	172	340	26	24	443	152	2456
% Cars	100	99.5	100	97.4	99.6	100	100	99.4	100	100	99.8	100	99.7
Trucks	0	1	0	1	3	0	0	2	0	0	1	0	8
% Trucks	0	0.5	0	2.6	0.4	0	0	0.6	0	0	0.2	0	0.3

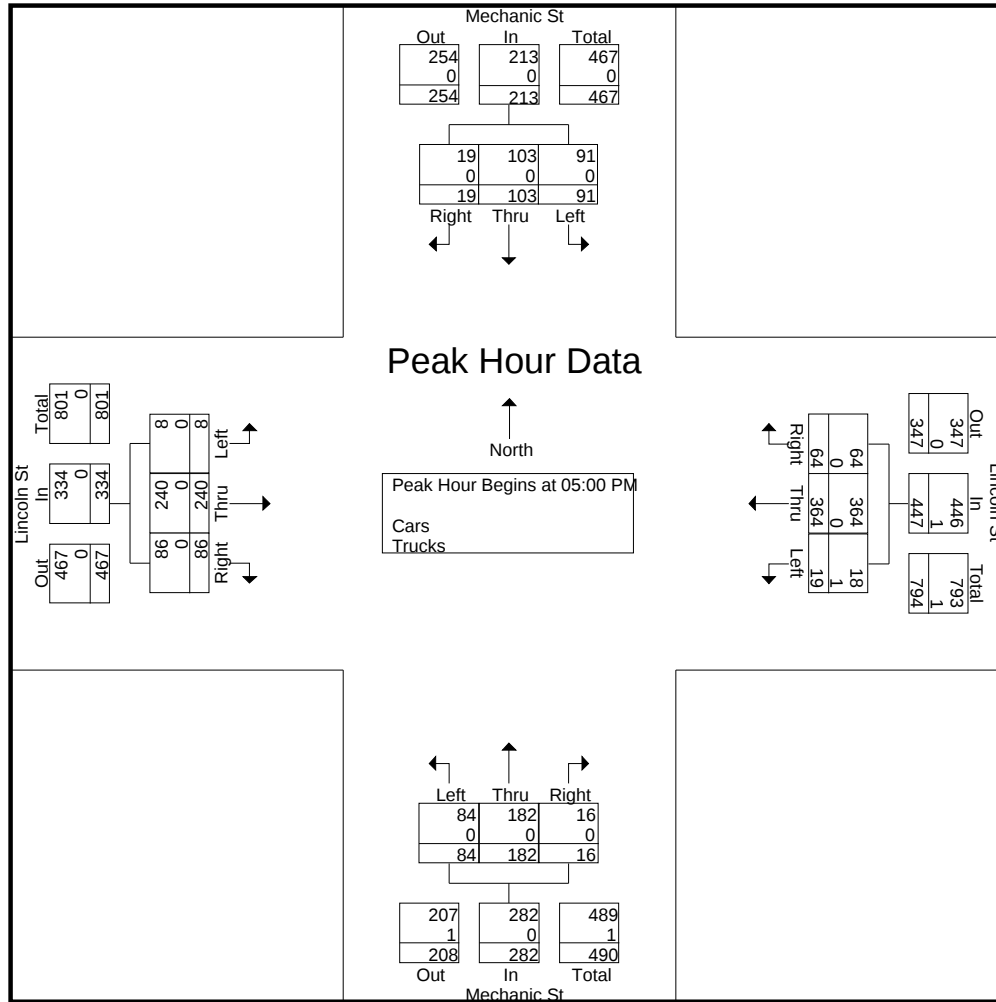
[illegible]

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Lincoln Street
 City/State : Marlborough, MA
 Weather : Cloudy

File Name : 92990001
 Site Code : 92990001
 Start Date : 3/30/2022
 Page No : 2



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

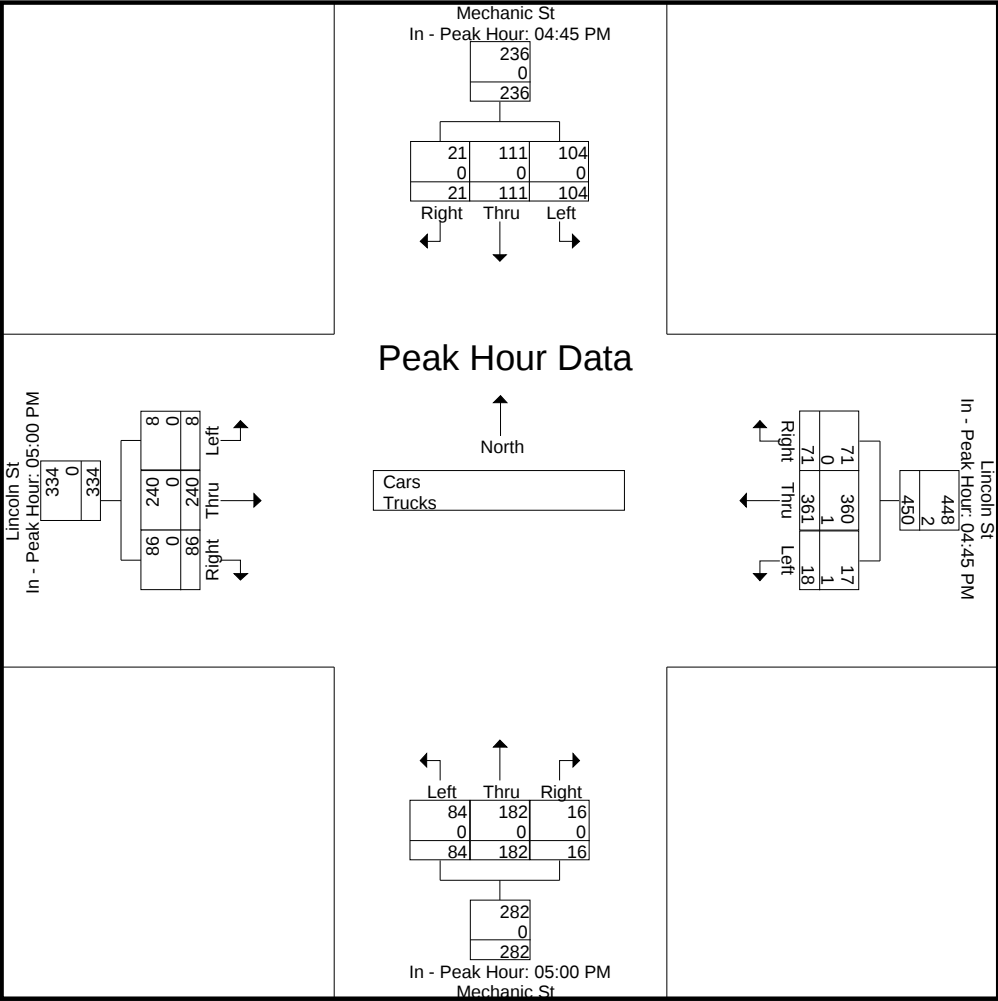
	04:45 PM				04:45 PM				05:00 PM				05:00 PM			
+0 mins.	33	29	4	66	6	92	21	119	19	42	4	65	3	62	16	81
+15 mins.	26	31	2	59	5	92	12	109	21	49	5	75	1	55	31	87
+30 mins.	24	28	9	61	4	79	20	103	23	44	4	71	1	65	18	84
+45 mins.	21	23	6	50	3	98	18	119	21	47	3	71	3	58	21	82
Total Volume	104	111	21	236	18	361	71	450	84	182	16	282	8	240	86	334
% App. Total	44.1	47	8.9		4	80.2	15.8		29.8	64.5	5.7		2.4	71.9	25.7	
PHF	.788	.895	.583	.894	.750	.921	.845	.945	.913	.929	.800	.940	.667	.923	.694	.960
Cars	104	111	21	236	17	360	71	448	84	182	16	282	8	240	86	334
% Cars	100	100	100	100	94.4	99.7	100	99.6	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	5.6	0.3	0	0.4	0	0	0	0	0	0	0	0

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Lincoln Street
 City/State : Marlborough, MA
 Weather : Cloudy

File Name : 92990001
 Site Code : 92990001
 Start Date : 3/30/2022
 Page No : 3



Accurate Counts

978-664-2565

N/S Street : Mechanic Street
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Cloudy

File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
Page No : 4

Groups Printed- Cars

	Mechanic St From North			Lincoln St From East			Mechanic St From South			Lincoln St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	12	26	7	4	88	18	21	38	4	3	55	16	292
04:15 PM	14	31	3	6	77	17	23	37	4	6	51	19	288
04:30 PM	15	26	5	4	92	11	22	48	0	4	48	16	291
04:45 PM	33	29	4	6	91	21	22	35	2	3	49	15	310
Total	74	112	19	20	348	67	88	158	10	16	203	66	1181
05:00 PM	26	31	2	5	92	12	19	42	4	3	62	16	314
05:15 PM	24	28	9	3	79	20	21	49	5	1	55	31	325
05:30 PM	21	23	6	3	98	18	23	44	4	1	65	18	324
05:45 PM	20	21	2	7	95	14	21	47	3	3	58	21	312
Total	91	103	19	18	364	64	84	182	16	8	240	86	1275
Grand Total	165	215	38	38	712	131	172	340	26	24	443	152	2456
Apprch %	39.5	51.4	9.1	4.3	80.8	14.9	32	63.2	4.8	3.9	71.6	24.6	
Total %	6.7	8.8	1.5	1.5	29	5.3	7	13.8	1.1	1	18	6.2	

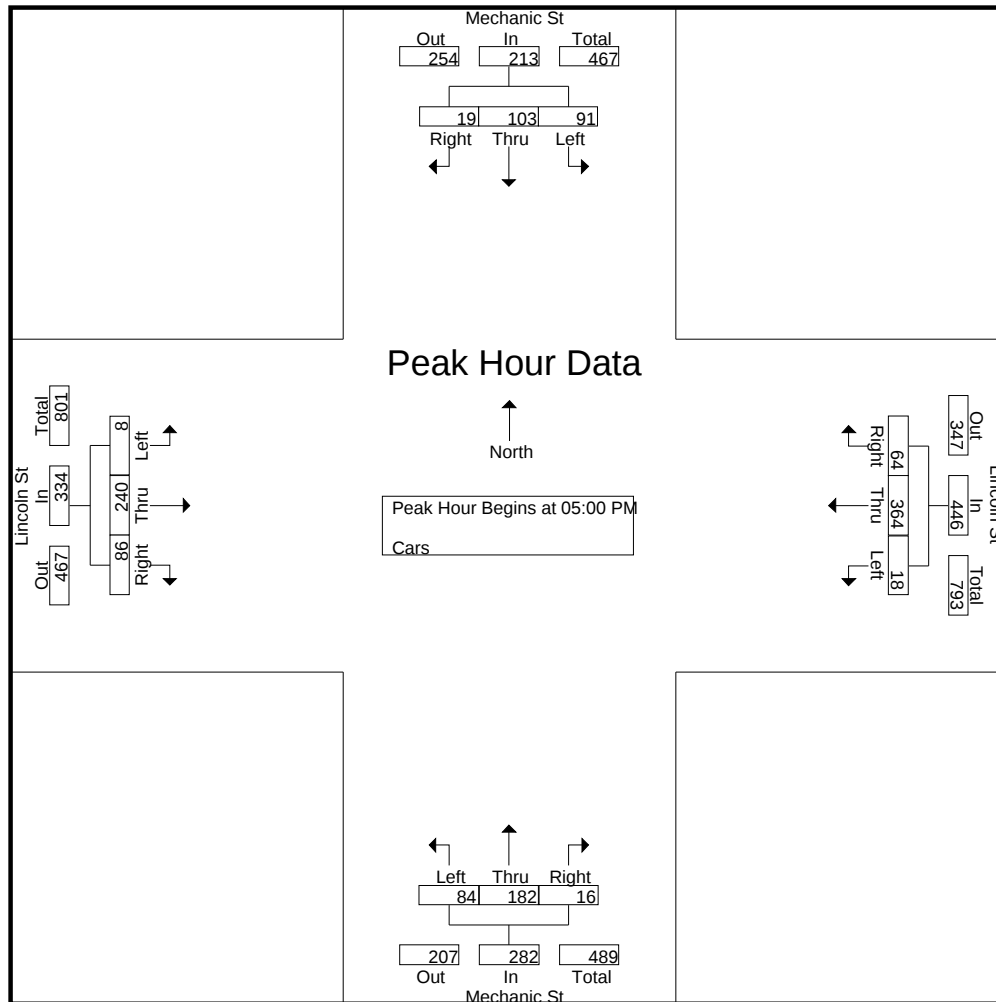
	Mechanic St From North				Lincoln St From East				Mechanic St From South				Lincoln St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	26	31	2	59	5	92	12	109	19	42	4	65	3	62	16	81	314
05:15 PM	24	28	9	61	3	79	20	102	21	49	5	75	1	55	31	87	325
05:30 PM	21	23	6	50	3	98	18	119	23	44	4	71	1	65	18	84	324
05:45 PM	20	21	2	43	7	95	14	116	21	47	3	71	3	58	21	82	312
Total Volume	91	103	19	213	18	364	64	446	84	182	16	282	8	240	86	334	1275
% App. Total	42.7	48.4	8.9		4	81.6	14.3		29.8	64.5	5.7		2.4	71.9	25.7		
PHF	.875	.831	.528	.873	.643	.929	.800	.937	.913	.929	.800	.940	.667	.923	.694	.960	.981

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Lincoln Street
 City/State : Marlborough, MA
 Weather : Cloudy

File Name : 92990001
 Site Code : 92990001
 Start Date : 3/30/2022
 Page No : 5

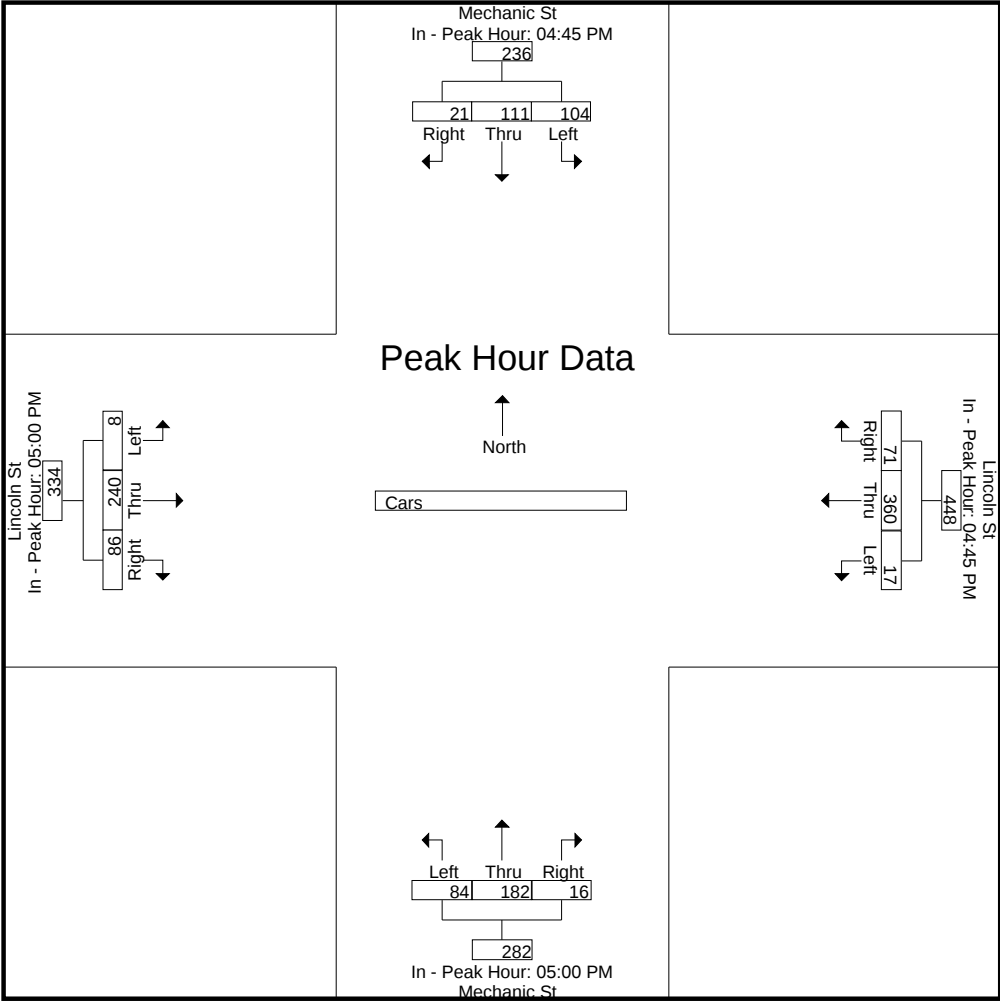


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				05:00 PM				05:00 PM			
+0 mins.	33	29	4	66	6	91	21	118	19	42	4	65	3	62	16	81
+15 mins.	26	31	2	59	5	92	12	109	21	49	5	75	1	55	31	87
+30 mins.	24	28	9	61	3	79	20	102	23	44	4	71	1	65	18	84
+45 mins.	21	23	6	50	3	98	18	119	21	47	3	71	3	58	21	82
Total Volume	104	111	21	236	17	360	71	448	84	182	16	282	8	240	86	334
% App. Total	44.1	47	8.9		3.8	80.4	15.8		29.8	64.5	5.7		2.4	71.9	25.7	
PHF	.788	.895	.583	.894	.708	.918	.845	.941	.913	.929	.800	.940	.667	.923	.694	.960

N/S Street : Mechanic Street
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Cloudy

File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Mechanic Street
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Cloudy

File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
Page No : 7

Groups Printed- Trucks

	Mechanic St From North			Lincoln St From East			Mechanic St From South			Lincoln St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	1	0	0	0	0	0	1	0	0	1	0	3
04:15 PM	0	0	0	0	2	0	0	1	0	0	0	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	1	0	0	3	0	0	2	0	0	1	0	7
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	0	1
Grand Total	0	1	0	1	3	0	0	2	0	0	1	0	8
Apprch %	0	100	0	25	75	0	0	100	0	0	100	0	
Total %	0	12.5	0	12.5	37.5	0	0	25	0	0	12.5	0	

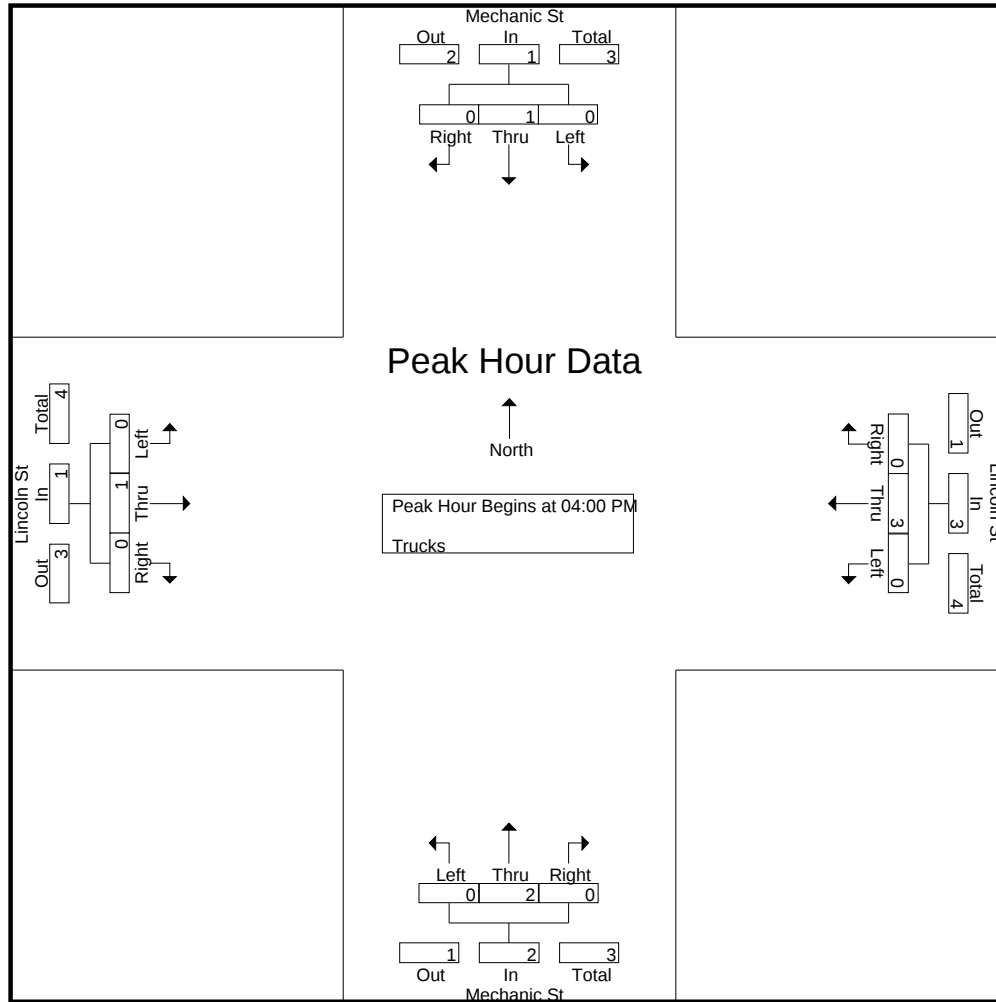
	Mechanic St From North				Lincoln St From East				Mechanic St From South				Lincoln St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	1	0	1	3
04:15 PM	0	0	0	0	0	2	0	2	0	1	0	1	0	0	0	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	1	0	3	0	3	0	2	0	2	0	1	0	1	7
% App. Total	0	100	0		0	100	0		0	100	0		0	100	0		
PHF	.000	.250	.000	.250	.000	.375	.000	.375	.000	.500	.000	.500	.000	.250	.000	.250	.583

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Lincoln Street
 City/State : Marlborough, MA
 Weather : Cloudy

File Name : 92990001
 Site Code : 92990001
 Start Date : 3/30/2022
 Page No : 8

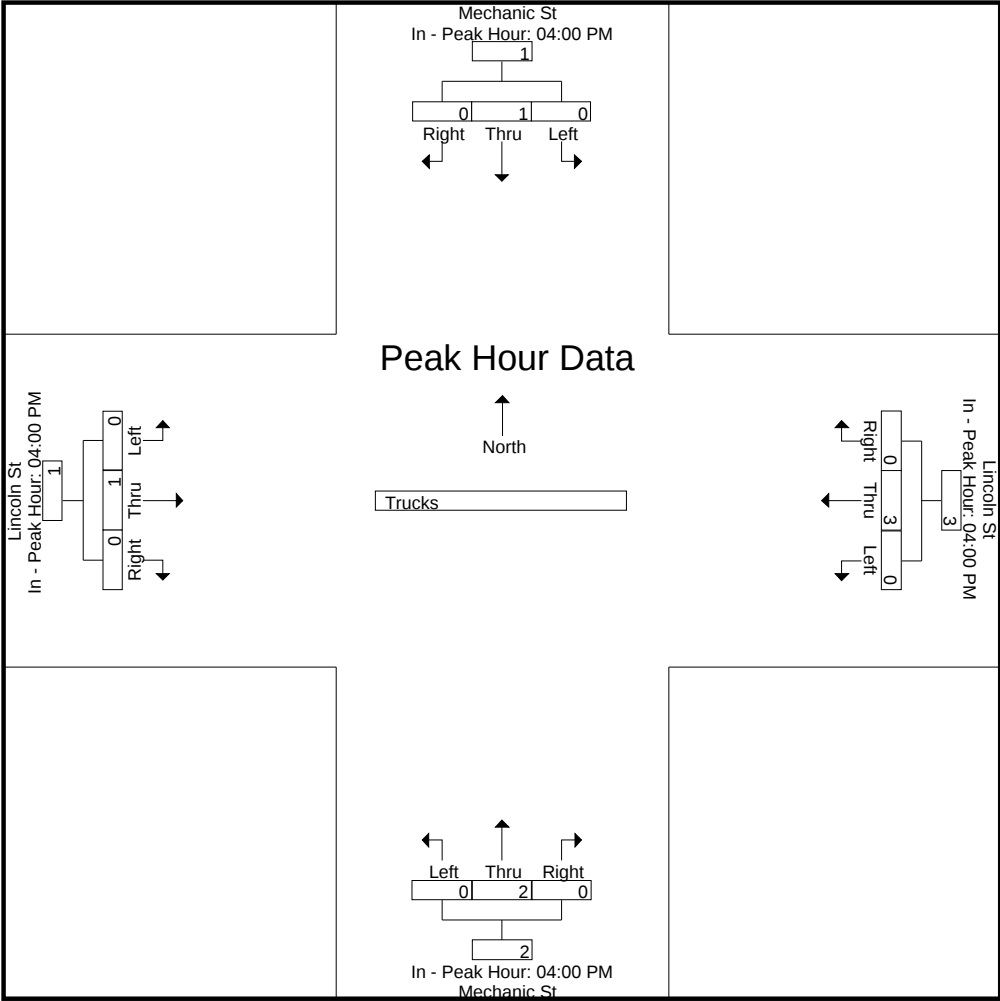


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	1	0	1	0	0	0	0	0	1	0	1	0	1	0	1
+15 mins.	0	0	0	0	0	2	0	2	0	1	0	1	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	3	0	3	0	2	0	2	0	1	0	1
% App. Total	0	100	0		0	100	0		0	100	0		0	100	0	
PHF	.000	.250	.000	.250	.000	.375	.000	.375	.000	.500	.000	.500	.000	.250	.000	.250

N/S Street : Mechanic Street
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Cloudy

File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Mechanic Street
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Cloudy

File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
Page No : 10

Groups Printed- Bikes Peds

	Mechanic St From North				Lincoln St From East				Mechanic St From South				Lincoln St From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	0	4
04:15 PM	0	1	0	3	0	0	0	2	0	0	0	4	0	0	0	0	9	1	10
04:30 PM	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	3	0	3
04:45 PM	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	1	4	0	4
Total	0	1	0	3	0	0	0	6	0	0	0	10	0	0	0	1	20	1	21
05:00 PM	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	2	6	0	6
05:15 PM	0	0	0	1	0	0	0	3	0	0	0	6	0	0	0	1	11	0	11
05:30 PM	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	1	3	1	4
05:45 PM	0	2	0	1	0	1	0	0	0	0	0	3	0	1	0	3	7	4	11
Total	0	3	0	5	0	1	0	4	0	0	0	11	0	1	0	7	27	5	32
Grand Total	0	4	0	8	0	1	0	10	0	0	0	21	0	1	0	8	47	6	53
Apprch %	0	100	0		0	100	0		0	0	0		0	100	0				
Total %	0	66.7	0		0	16.7	0		0	0	0		0	16.7	0		88.7	11.3	

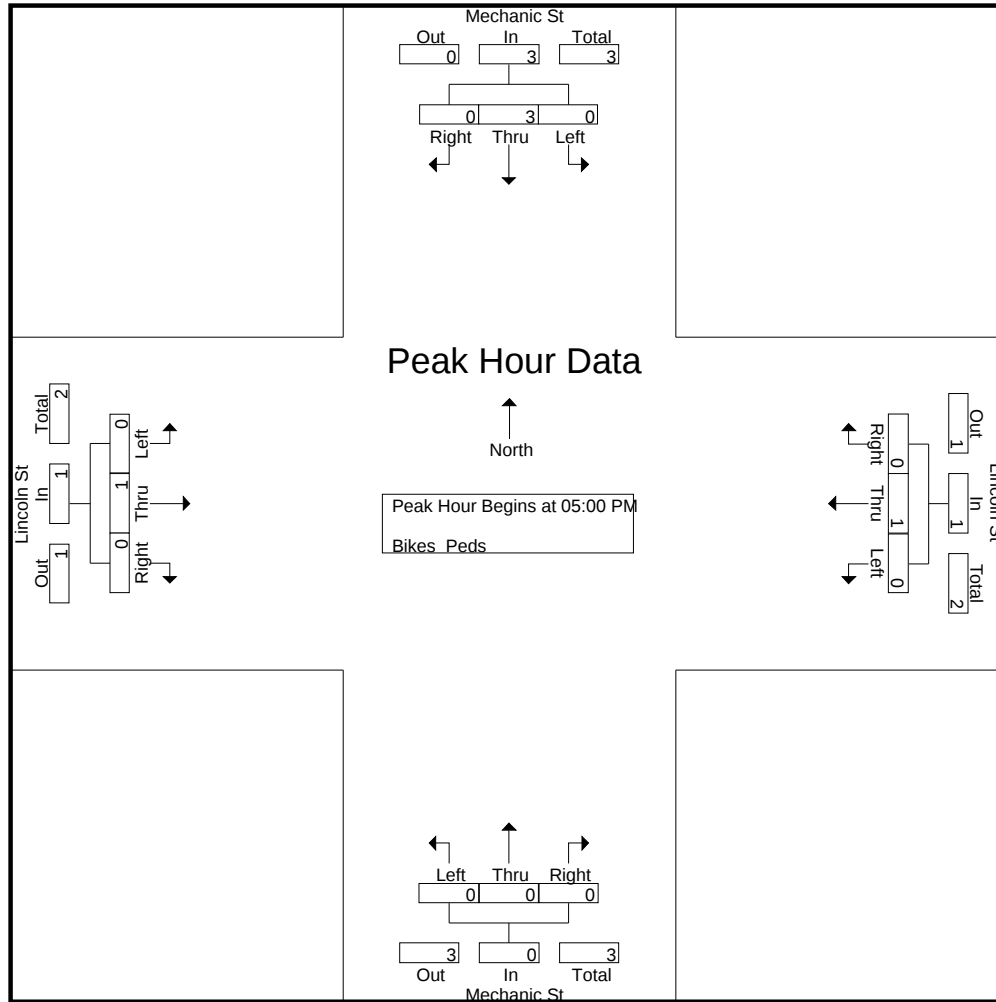
	Mechanic St From North				Lincoln St From East				Mechanic St From South				Lincoln St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	2	0	2	0	1	0	1	0	0	0	0	0	1	0	1	4
Total Volume	0	3	0	3	0	1	0	1	0	0	0	0	0	1	0	1	5
% App. Total	0	100	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.375	.000	.375	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.313

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Lincoln Street
 City/State : Marlborough, MA
 Weather : Cloudy

File Name : 92990001
 Site Code : 92990001
 Start Date : 3/30/2022
 Page No : 11

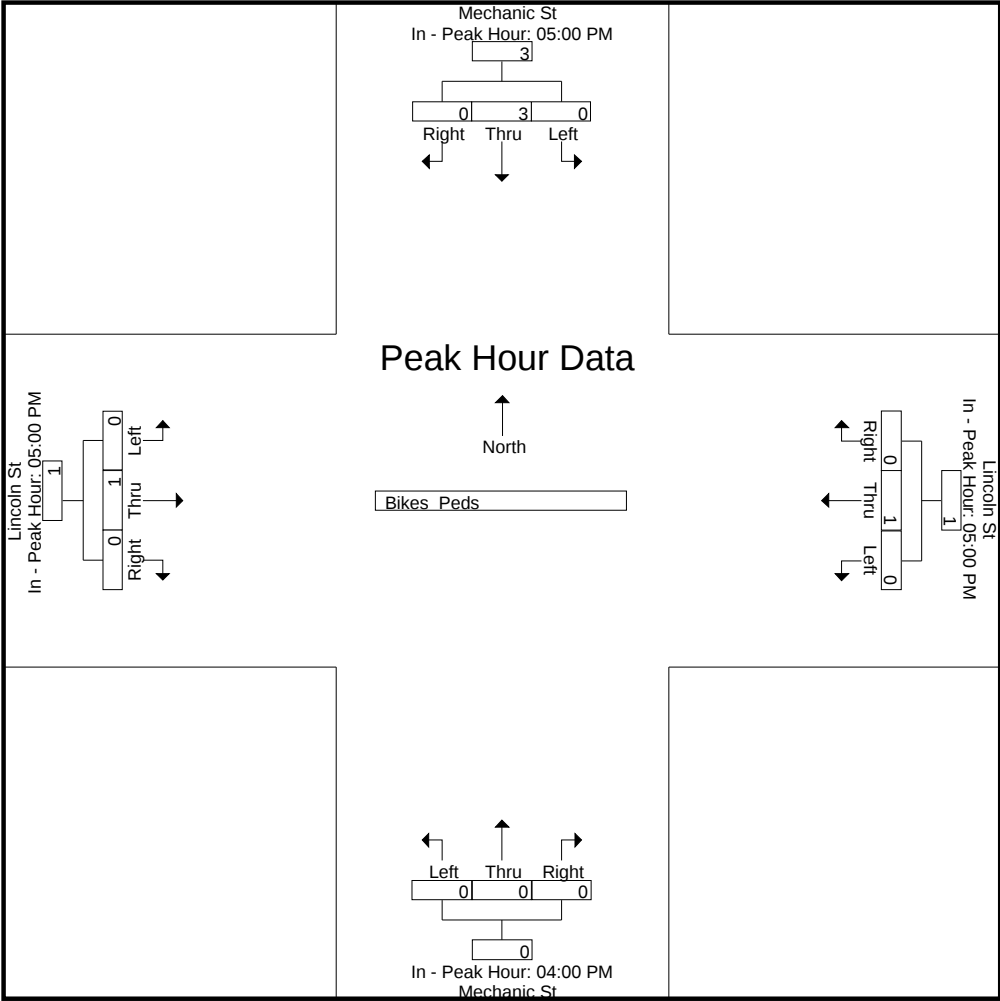


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				04:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	2	0	2	0	1	0	1	0	0	0	0	0	1	0	1
Total Volume	0	3	0	3	0	1	0	1	0	0	0	0	0	1	0	1
% App. Total	0	100	0		0	100	0		0	0	0		0	100	0	
PHF	.000	.375	.000	.375	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250

N/S Street : Mechanic Street
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Cloudy

File Name : 92990001
Site Code : 92990001
Start Date : 3/30/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Highland St / Cashman St
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
Page No : 1

Groups Printed- Cars - Trucks

	Highland St From North			Lincoln St From East			Cashman St From South			Lincoln St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	1	5	11	1	62	1	5	1	1	3	66	4	161
07:15 AM	5	4	5	0	93	4	7	1	4	5	52	3	183
07:30 AM	5	7	6	0	101	4	6	3	2	3	55	3	195
07:45 AM	9	5	6	0	93	4	8	5	4	4	75	4	217
Total	20	21	28	1	349	13	26	10	11	15	248	14	756
08:00 AM	4	3	4	0	88	9	3	4	1	5	50	4	175
08:15 AM	2	4	0	0	77	3	2	5	2	5	47	1	148
08:30 AM	5	2	4	0	61	1	7	3	2	2	54	2	143
08:45 AM	5	5	7	1	62	5	5	2	1	5	47	4	149
Total	16	14	15	1	288	18	17	14	6	17	198	11	615
Grand Total	36	35	43	2	637	31	43	24	17	32	446	25	1371
Apprch %	31.6	30.7	37.7	0.3	95.1	4.6	51.2	28.6	20.2	6.4	88.7	5	
Total %	2.6	2.6	3.1	0.1	46.5	2.3	3.1	1.8	1.2	2.3	32.5	1.8	
Cars	36	35	41	2	631	31	42	21	16	32	435	23	1345
% Cars	100	100	95.3	100	99.1	100	97.7	87.5	94.1	100	97.5	92	98.1
Trucks	0	0	2	0	6	0	1	3	1	0	11	2	26
% Trucks	0	0	4.7	0	0.9	0	2.3	12.5	5.9	0	2.5	8	1.9

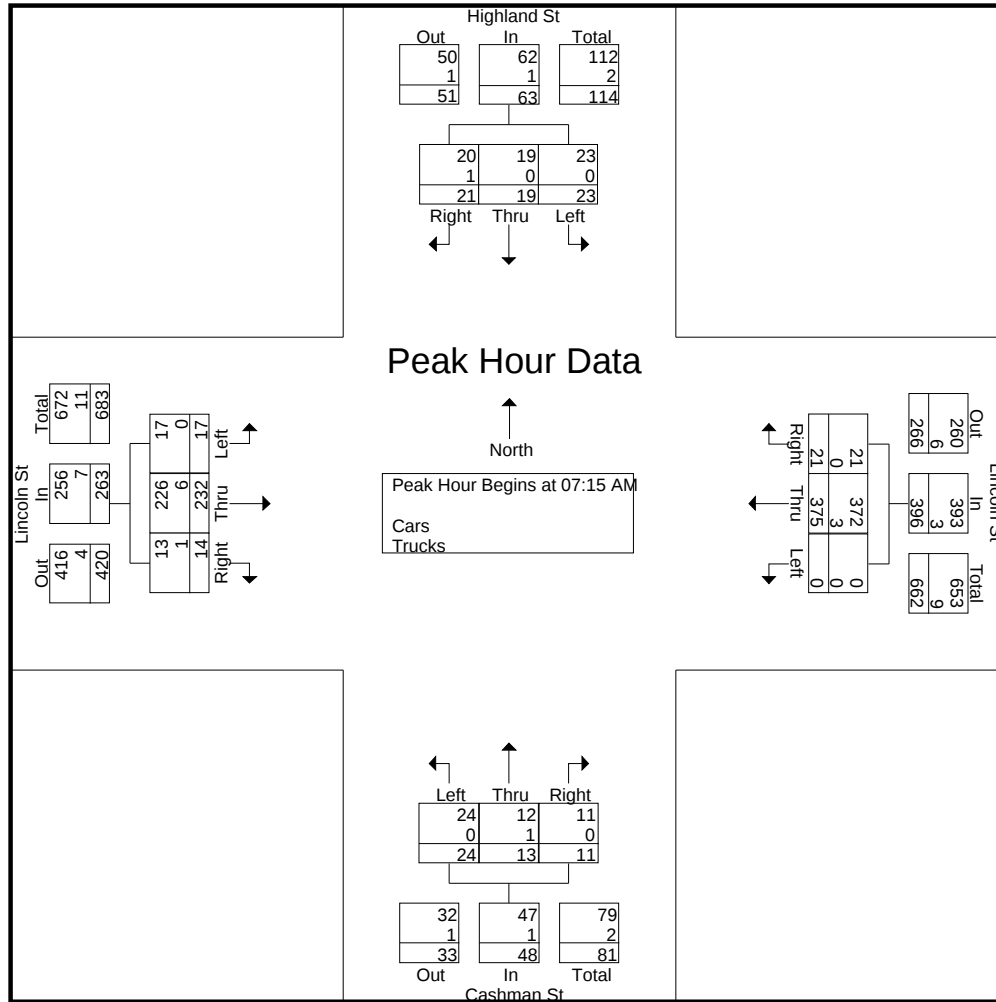
	Highland St From North				Lincoln St From East				Cashman St From South				Lincoln St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	5	4	5	14	0	93	4	97	7	1	4	12	5	52	3	60	183
07:30 AM	5	7	6	18	0	101	4	105	6	3	2	11	3	55	3	61	195
07:45 AM	9	5	6	20	0	93	4	97	8	5	4	17	4	75	4	83	217
08:00 AM	4	3	4	11	0	88	9	97	3	4	1	8	5	50	4	59	175
Total Volume	23	19	21	63	0	375	21	396	24	13	11	48	17	232	14	263	770
% App. Total	36.5	30.2	33.3		0	94.7	5.3		50	27.1	22.9		6.5	88.2	5.3		
PHF	.639	.679	.875	.788	.000	.928	.583	.943	.750	.650	.688	.706	.850	.773	.875	.792	.887
Cars	23	19	20	62	0	372	21	393	24	12	11	47	17	226	13	256	758
% Cars	100	100	95.2	98.4	0	99.2	100	99.2	100	92.3	100	97.9	100	97.4	92.9	97.3	98.4
Trucks	0	0	1	1	0	3	0	3	0	1	0	1	0	6	1	7	12
% Trucks	0	0	4.8	1.6	0	0.8	0	0.8	0	7.7	0	2.1	0	2.6	7.1	2.7	1.6

Accurate Counts

978-664-2565

N/S Street : Highland St / Cashman St
 E/W Street : Lincoln Street
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990002
 Site Code : 92990002
 Start Date : 3/23/2022
 Page No : 2

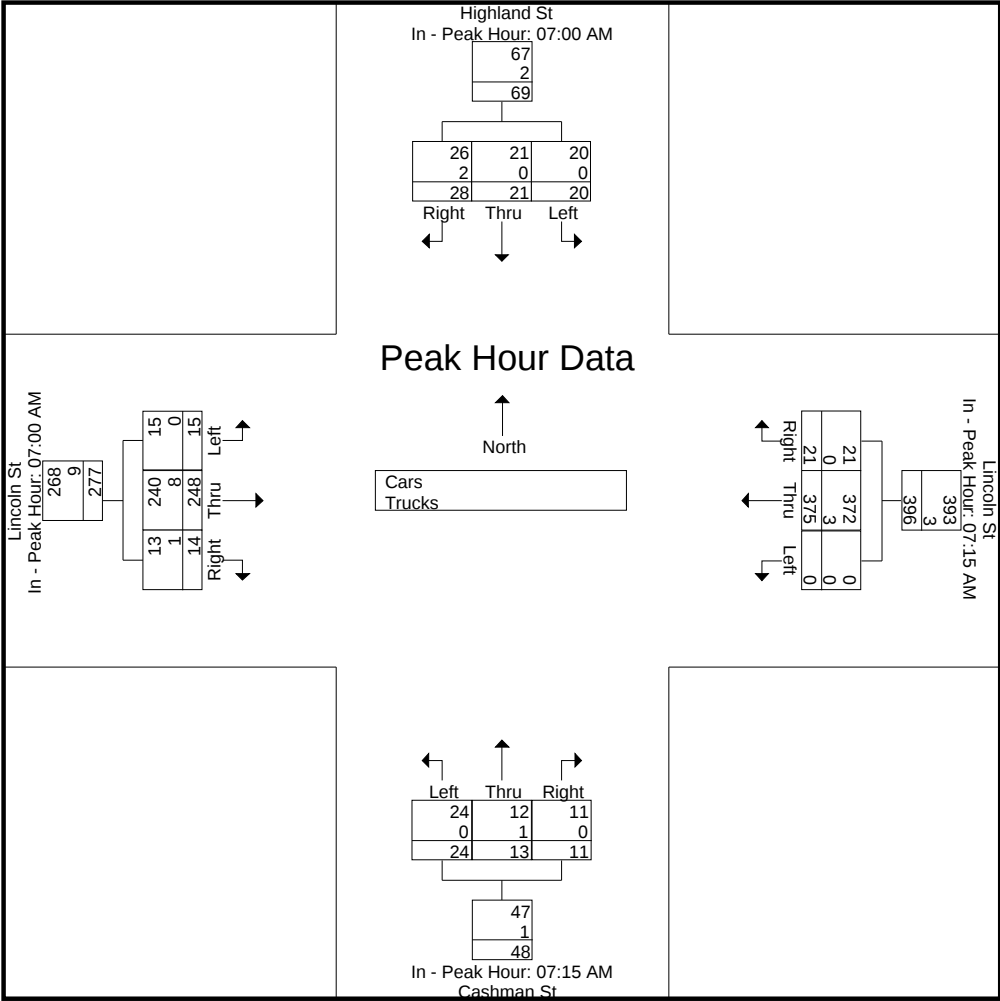


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				07:15 AM				07:00 AM			
+0 mins.	1	5	11	17	0	93	4	97	7	1	4	12	3	66	4	73
+15 mins.	5	4	5	14	0	101	4	105	6	3	2	11	5	52	3	60
+30 mins.	5	7	6	18	0	93	4	97	8	5	4	17	3	55	3	61
+45 mins.	9	5	6	20	0	88	9	97	3	4	1	8	4	75	4	83
Total Volume	20	21	28	69	0	375	21	396	24	13	11	48	15	248	14	277
% App. Total	29	30.4	40.6		0	94.7	5.3		50	27.1	22.9		5.4	89.5	5.1	
PHF	.556	.750	.636	.863	.000	.928	.583	.943	.750	.650	.688	.706	.750	.827	.875	.834
Cars	20	21	26	67	0	372	21	393	24	12	11	47	15	240	13	268
% Cars	100	100	92.9	97.1	0	99.2	100	99.2	100	92.3	100	97.9	100	96.8	92.9	96.8
Trucks	0	0	2	2	0	3	0	3	0	1	0	1	0	8	1	9
% Trucks	0	0	7.1	2.9	0	0.8	0	0.8	0	7.7	0	2.1	0	3.2	7.1	3.2

N/S Street : Highland St / Cashman St
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Highland St / Cashman St

E/W Street : Lincoln Street

City/State : Marlborough, MA

Weather : Clear

File Name : 92990002

Site Code : 92990002

Start Date : 3/23/2022

Page No : 4

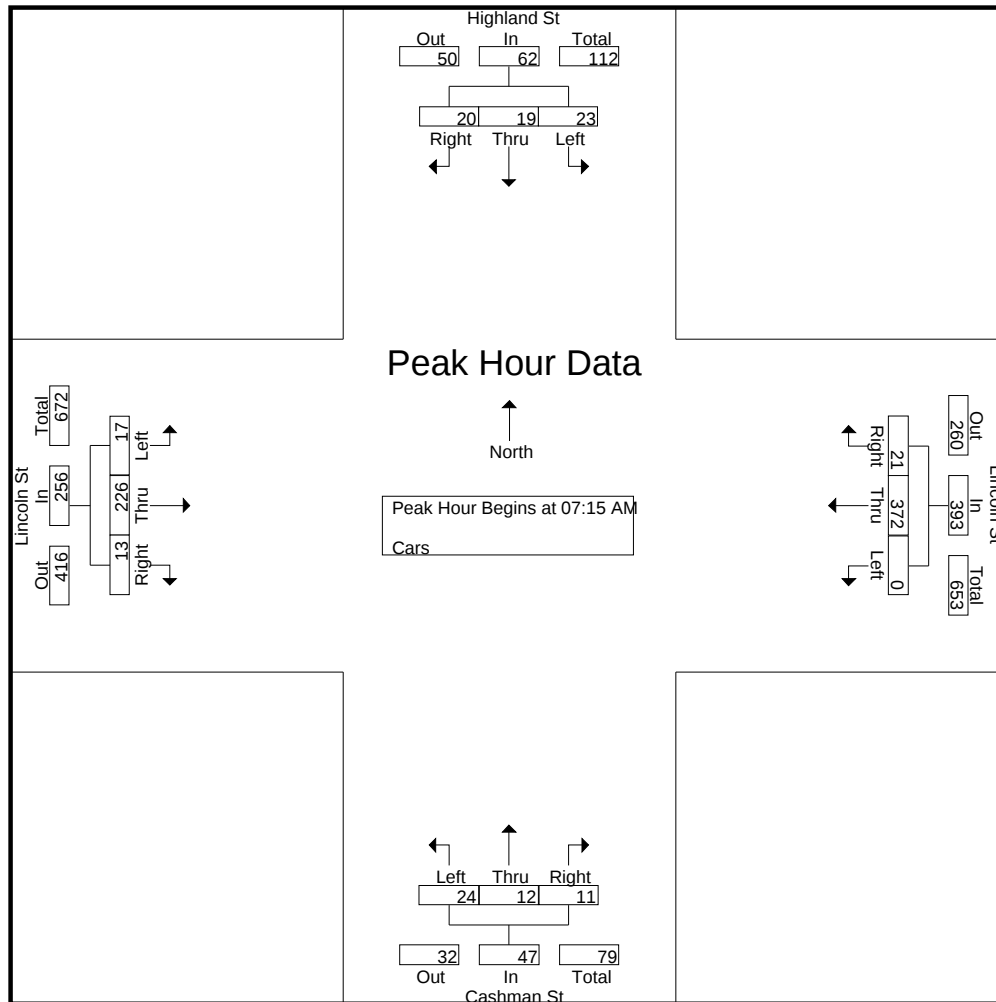
Groups Printed- Cars

	Highland St From North			Lincoln St From East			Cashman St From South			Lincoln St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	1	5	10	1	62	1	5	1	1	3	64	4	158
07:15 AM	5	4	5	0	92	4	7	1	4	5	49	3	179
07:30 AM	5	7	5	0	100	4	6	2	2	3	53	2	189
07:45 AM	9	5	6	0	92	4	8	5	4	4	74	4	215
Total	20	21	26	1	346	13	26	9	11	15	240	13	741
08:00 AM	4	3	4	0	88	9	3	4	1	5	50	4	175
08:15 AM	2	4	0	0	74	3	2	5	2	5	46	1	144
08:30 AM	5	2	4	0	61	1	7	2	1	2	53	1	139
08:45 AM	5	5	7	1	62	5	4	1	1	5	46	4	146
Total	16	14	15	1	285	18	16	12	5	17	195	10	604
Grand Total	36	35	41	2	631	31	42	21	16	32	435	23	1345
Apprch %	32.1	31.2	36.6	0.3	95	4.7	53.2	26.6	20.3	6.5	88.8	4.7	
Total %	2.7	2.6	3	0.1	46.9	2.3	3.1	1.6	1.2	2.4	32.3	1.7	

	Highland St From North				Lincoln St From East				Cashman St From South				Lincoln St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	5	4	5	14	0	92	4	96	7	1	4	12	5	49	3	57	179
07:30 AM	5	7	5	17	0	100	4	104	6	2	2	10	3	53	2	58	189
07:45 AM	9	5	6	20	0	92	4	96	8	5	4	17	4	74	4	82	215
08:00 AM	4	3	4	11	0	88	9	97	3	4	1	8	5	50	4	59	175
Total Volume	23	19	20	62	0	372	21	393	24	12	11	47	17	226	13	256	758
% App. Total	37.1	30.6	32.3		0	94.7	5.3		51.1	25.5	23.4		6.6	88.3	5.1		
PHF	.639	.679	.833	.775	.000	.930	.583	.945	.750	.600	.688	.691	.850	.764	.813	.780	.881

N/S Street : Highland St / Cashman St
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
Page No : 5

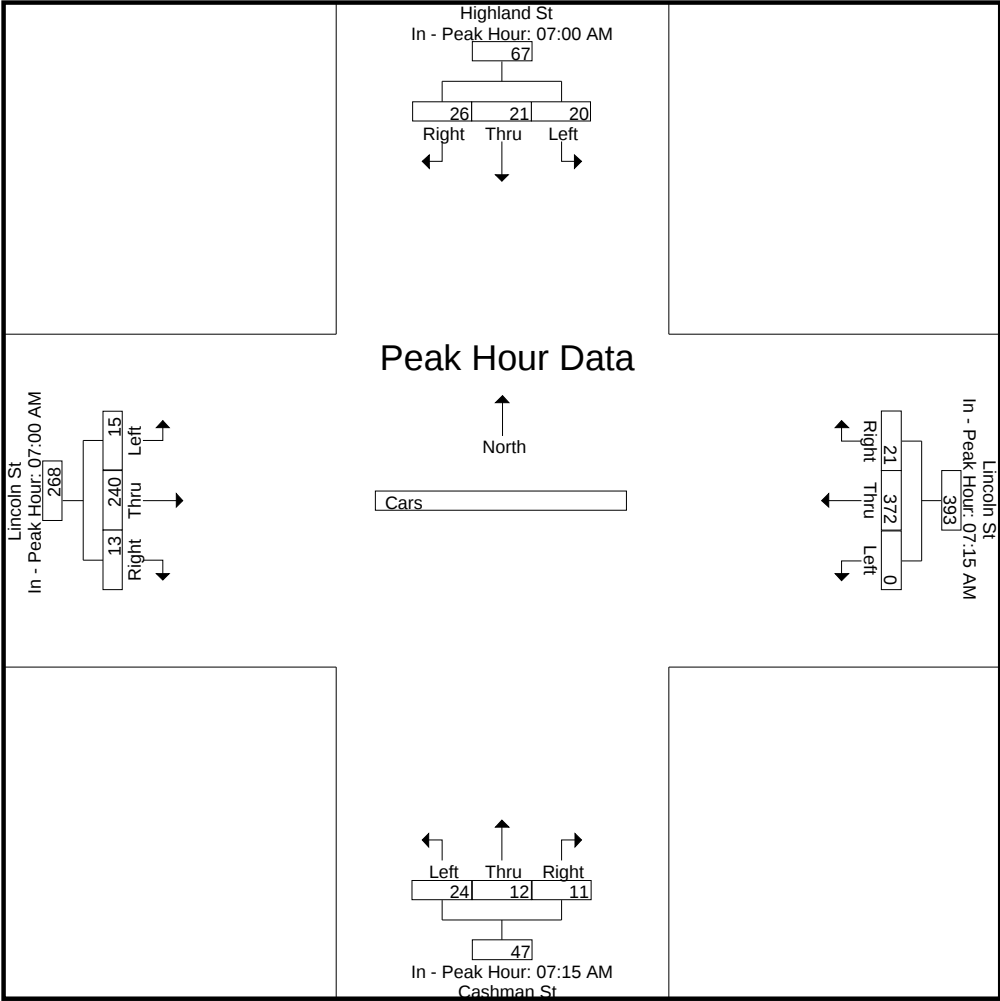


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				07:15 AM				07:00 AM			
+0 mins.	1	5	10	16	0	92	4	96	7	1	4	12	3	64	4	71
+15 mins.	5	4	5	14	0	100	4	104	6	2	2	10	5	49	3	57
+30 mins.	5	7	5	17	0	92	4	96	8	5	4	17	3	53	2	58
+45 mins.	9	5	6	20	0	88	9	97	3	4	1	8	4	74	4	82
Total Volume	20	21	26	67	0	372	21	393	24	12	11	47	15	240	13	268
% App. Total	29.9	31.3	38.8		0	94.7	5.3		51.1	25.5	23.4		5.6	89.6	4.9	
PHF	.556	.750	.650	.838	.000	.930	.583	.945	.750	.600	.688	.691	.750	.811	.813	.817

N/S Street : Highland St / Cashman St
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Highland St / Cashman St

E/W Street : Lincoln Street

City/State : Marlborough, MA

Weather : Clear

File Name : 92990002

Site Code : 92990002

Start Date : 3/23/2022

Page No : 7

Groups Printed- Trucks

	Highland St From North			Lincoln St From East			Cashman St From South			Lincoln St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	1	0	0	0	0	0	0	0	2	0	3
07:15 AM	0	0	0	0	1	0	0	0	0	0	3	0	4
07:30 AM	0	0	1	0	1	0	0	1	0	0	2	1	6
07:45 AM	0	0	0	0	1	0	0	0	0	0	1	0	2
Total	0	0	2	0	3	0	0	1	0	0	8	1	15
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	3	0	0	0	0	0	1	0	4
08:30 AM	0	0	0	0	0	0	0	1	1	0	1	1	4
08:45 AM	0	0	0	0	0	0	1	1	0	0	1	0	3
Total	0	0	0	0	3	0	1	2	1	0	3	1	11
Grand Total	0	0	2	0	6	0	1	3	1	0	11	2	26
Apprch %	0	0	100	0	100	0	20	60	20	0	84.6	15.4	
Total %	0	0	7.7	0	23.1	0	3.8	11.5	3.8	0	42.3	7.7	

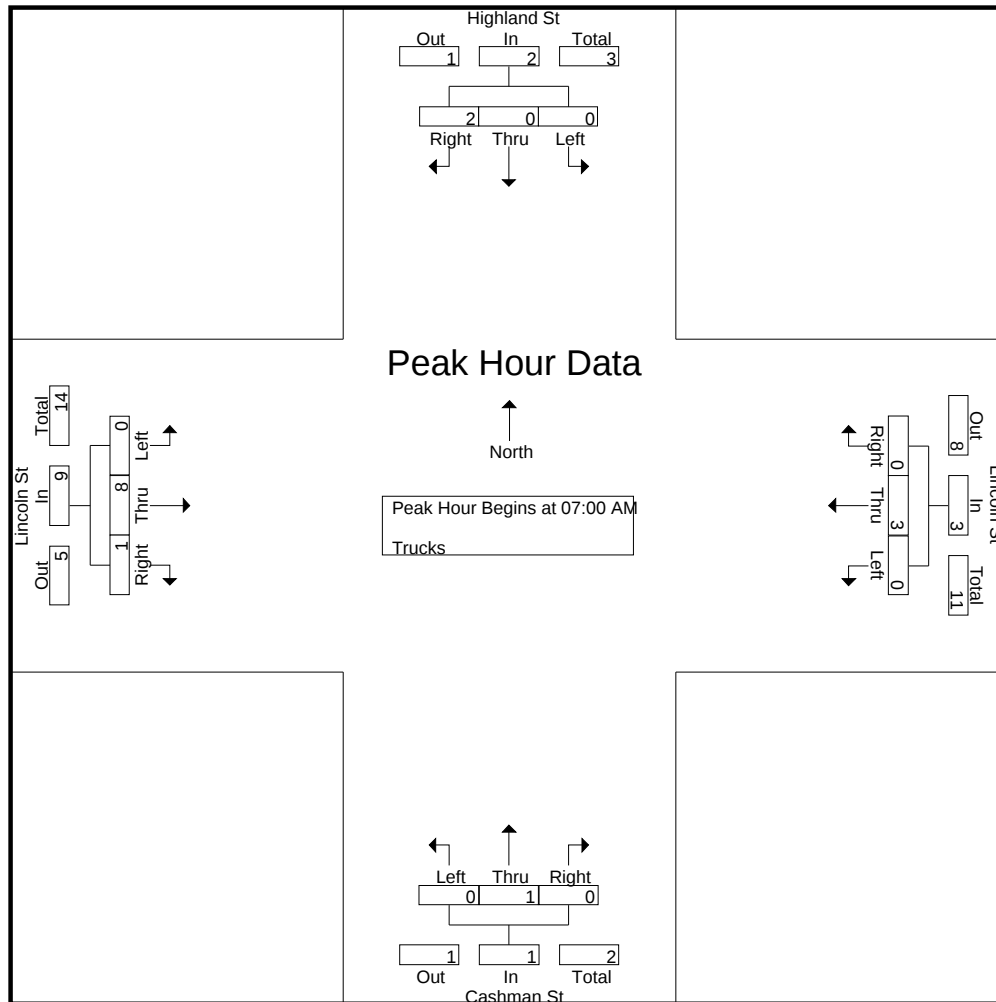
	Highland St From North				Lincoln St From East				Cashman St From South				Lincoln St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	2	0	2	3
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	3	4
07:30 AM	0	0	1	1	0	1	0	1	0	1	0	1	0	2	1	3	6
07:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
Total Volume	0	0	2	2	0	3	0	3	0	1	0	1	0	8	1	9	15
% App. Total	0	0	100		0	100	0		0	100	0		0	88.9	11.1		
PHF	.000	.000	.500	.500	.000	.750	.000	.750	.000	.250	.000	.250	.000	.667	.250	.750	.625

Accurate Counts

978-664-2565

N/S Street : Highland St / Cashman St
 E/W Street : Lincoln Street
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990002
 Site Code : 92990002
 Start Date : 3/23/2022
 Page No : 8

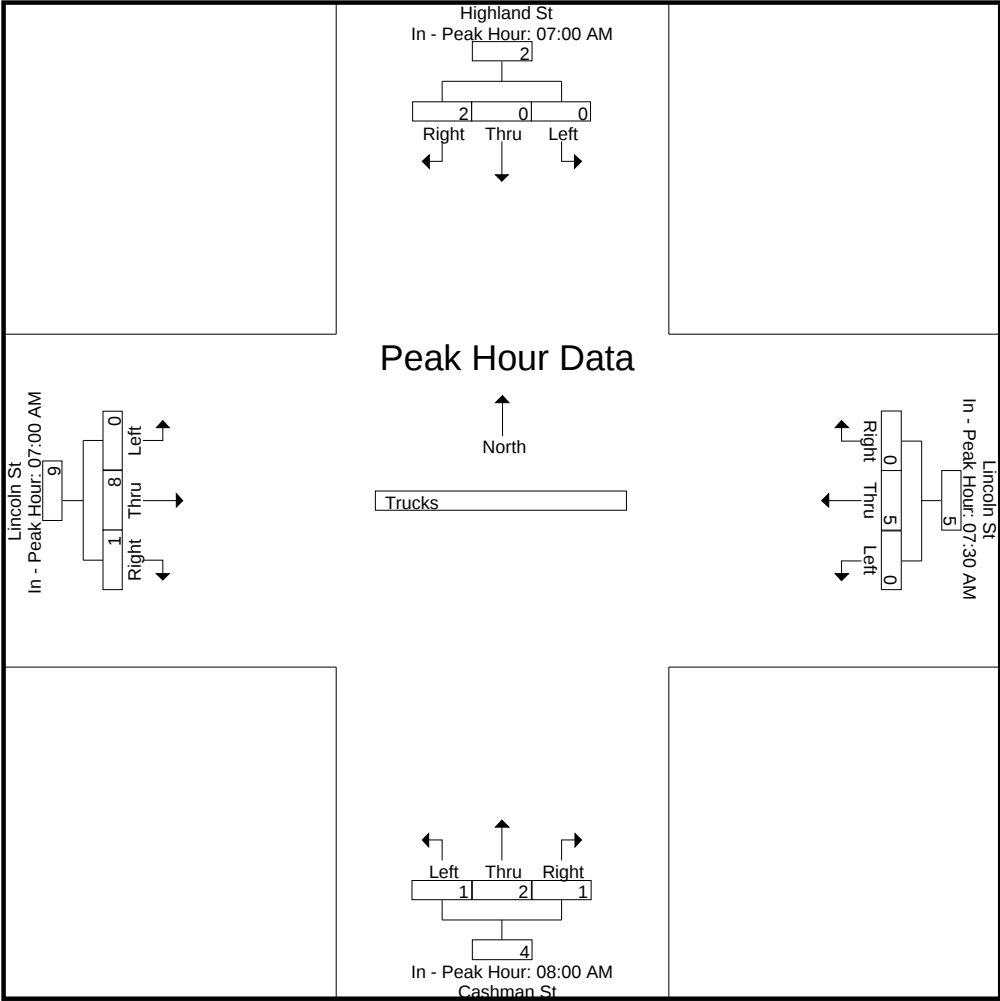


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM				07:30 AM				08:00 AM				07:00 AM			
+0 mins.	0	0	1	1	0	1	0	1	0	0	0	0	0	2	0	2
+15 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	3
+30 mins.	0	0	1	1	0	0	0	0	0	1	1	2	0	2	1	3
+45 mins.	0	0	0	0	0	3	0	3	1	1	0	2	0	1	0	1
Total Volume	0	0	2	2	0	5	0	5	1	2	1	4	0	8	1	9
% App. Total	0	0	100		0	100	0		25	50	25		0	88.9	11.1	
PHF	.000	.000	.500	.500	.000	.417	.000	.417	.250	.500	.250	.500	.000	.667	.250	.750

N/S Street : Highland St / Cashman St
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Highland St / Cashman St

E/W Street : Lincoln Street

City/State : Marlborough, MA

Weather : Clear

File Name : 92990002

Site Code : 92990002

Start Date : 3/23/2022

Page No : 10

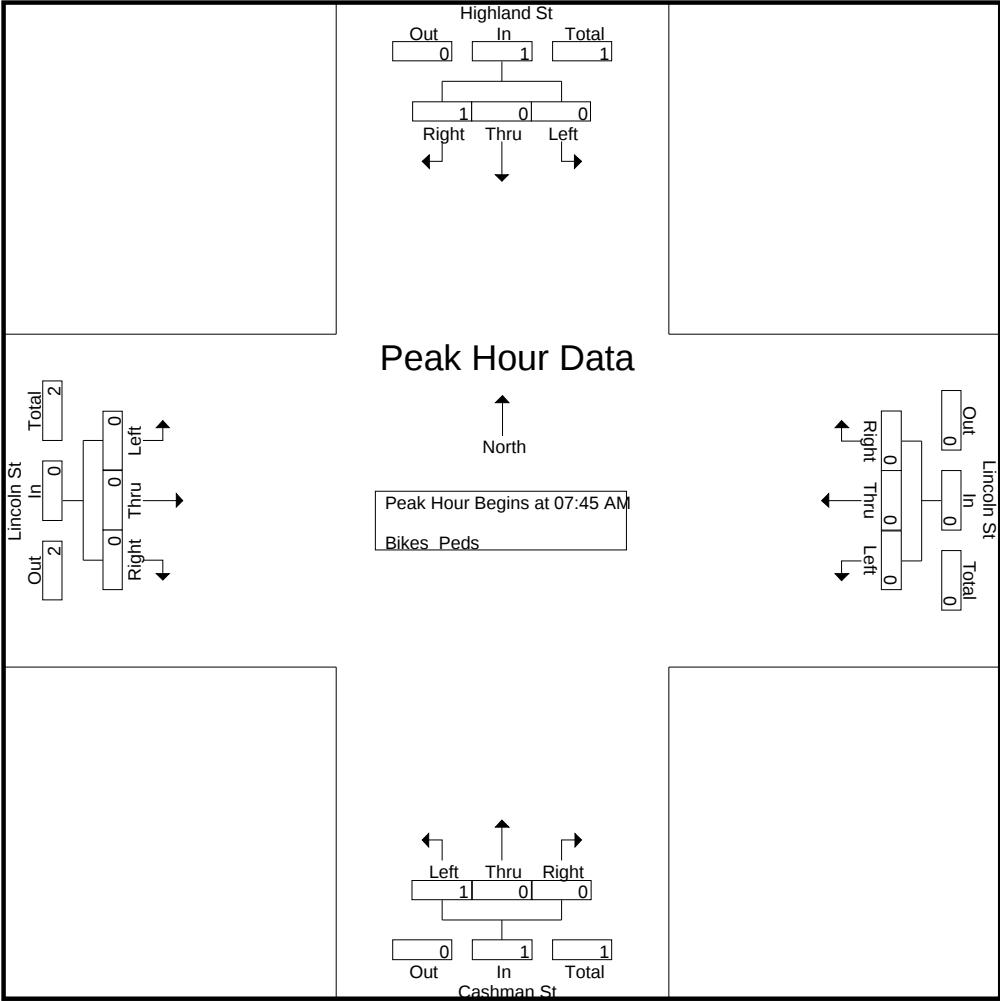
Groups Printed- Bikes Peds

	Highland St From North				Lincoln St From East				Cashman St From South				Lincoln St From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
07:30 AM	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	1	5	0	5
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	1	0	0	0	4	1	0	0	3	8	1	9
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0	2
08:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
08:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3	3	1	4
08:45 AM	0	0	0	5	0	0	0	0	0	0	0	2	0	0	0	1	8	0	8
Total	0	0	1	5	0	0	0	0	1	0	0	3	0	0	0	5	13	2	15
Grand Total	0	0	1	5	0	0	0	1	1	0	0	7	1	0	0	8	21	3	24
Apprch %	0	0	100		0	0	0		100	0	0		100	0	0				
Total %	0	0	33.3		0	0	0		33.3	0	0		33.3	0	0		87.5	12.5	

	Highland St From North				Lincoln St From East				Cashman St From South				Lincoln St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
Total Volume	0	0	1	1	0	0	0	0	1	0	0	1	0	0	0	0	2
% App. Total	0	0	100		0	0	0		100	0	0		0	0	0		
PHF	.000	.000	.250	.250	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.500

N/S Street : Highland St / Cashman St
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
Page No : 11

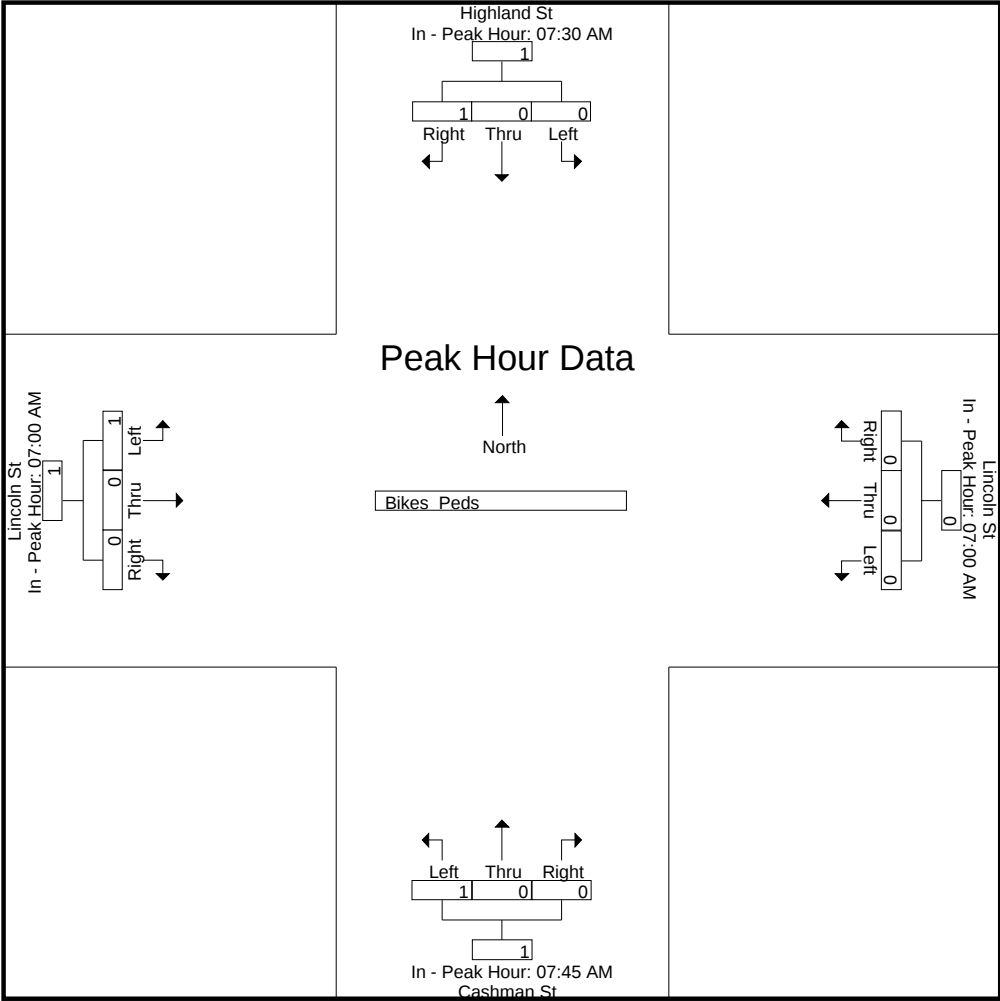


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

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

N/S Street : Highland St / Cashman St
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
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Accurate Counts

978-664-2565

N/S Street : Highland St / Cashman St
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
Page No : 1

Groups Printed- Cars - Trucks

	Highland St From North			Lincoln St From East			Cashman St From South			Lincoln St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	1	7	7	1	91	7	5	9	4	5	64	4	205
04:15 PM	1	5	5	1	94	1	4	3	4	4	74	6	202
04:30 PM	6	6	4	0	102	2	6	4	6	4	53	7	200
04:45 PM	1	3	10	0	103	2	6	4	5	3	68	6	211
Total	9	21	26	2	390	12	21	20	19	16	259	23	818
05:00 PM	2	3	5	0	85	5	5	5	6	4	54	6	180
05:15 PM	2	4	7	0	93	5	7	6	5	4	88	5	226
05:30 PM	6	2	6	1	95	5	3	6	4	6	72	7	213
05:45 PM	4	3	6	1	101	4	8	3	6	7	77	10	230
Total	14	12	24	2	374	19	23	20	21	21	291	28	849
Grand Total	23	33	50	4	764	31	44	40	40	37	550	51	1667
Apprch %	21.7	31.1	47.2	0.5	95.6	3.9	35.5	32.3	32.3	5.8	86.2	8	
Total %	1.4	2	3	0.2	45.8	1.9	2.6	2.4	2.4	2.2	33	3.1	
Cars	23	33	49	4	759	31	44	39	40	36	548	51	1657
% Cars	100	100	98	100	99.3	100	100	97.5	100	97.3	99.6	100	99.4
Trucks	0	0	1	0	5	0	0	1	0	1	2	0	10
% Trucks	0	0	2	0	0.7	0	0	2.5	0	2.7	0.4	0	0.6

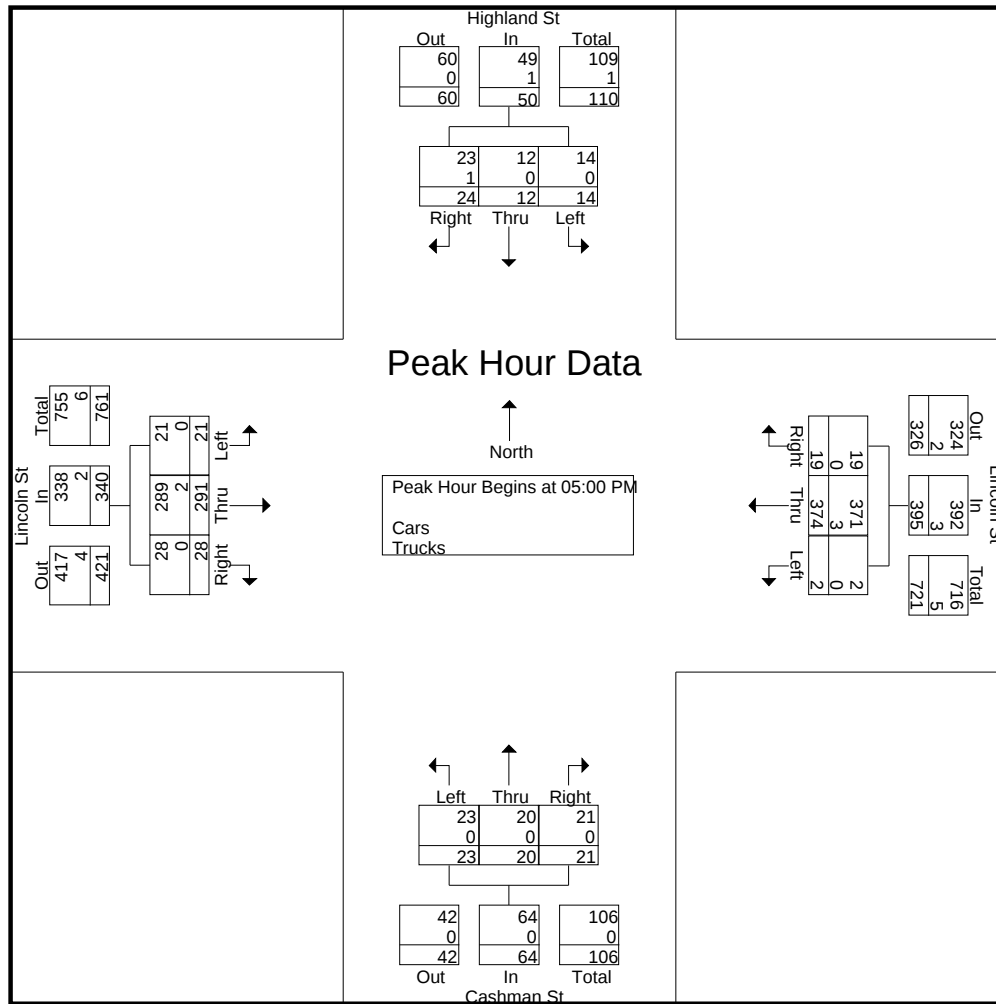
	Highland St From North				Lincoln St From East				Cashman St From South				Lincoln St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	2	3	5	10	0	85	5	90	5	5	6	16	4	54	6	64	180
05:15 PM	2	4	7	13	0	93	5	98	7	6	5	18	4	88	5	97	226
05:30 PM	6	2	6	14	1	95	5	101	3	6	4	13	6	72	7	85	213
05:45 PM	4	3	6	13	1	101	4	106	8	3	6	17	7	77	10	94	230
Total Volume	14	12	24	50	2	374	19	395	23	20	21	64	21	291	28	340	849
% App. Total	28	24	48		0.5	94.7	4.8		35.9	31.2	32.8		6.2	85.6	8.2		
PHF	.583	.750	.857	.893	.500	.926	.950	.932	.719	.833	.875	.889	.750	.827	.700	.876	.923
Cars	14	12	23	49	2	371	19	392	23	20	21	64	21	289	28	338	843
% Cars	100	100	95.8	98.0	100	99.2	100	99.2	100	100	100	100	100	99.3	100	99.4	99.3
Trucks	0	0	1	1	0	3	0	3	0	0	0	0	0	2	0	2	6
% Trucks	0	0	4.2	2.0	0	0.8	0	0.8	0	0	0	0	0	0.7	0	0.6	0.7

Accurate Counts

978-664-2565

N/S Street : Highland St / Cashman St
 E/W Street : Lincoln Street
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990002
 Site Code : 92990002
 Start Date : 3/23/2022
 Page No : 2

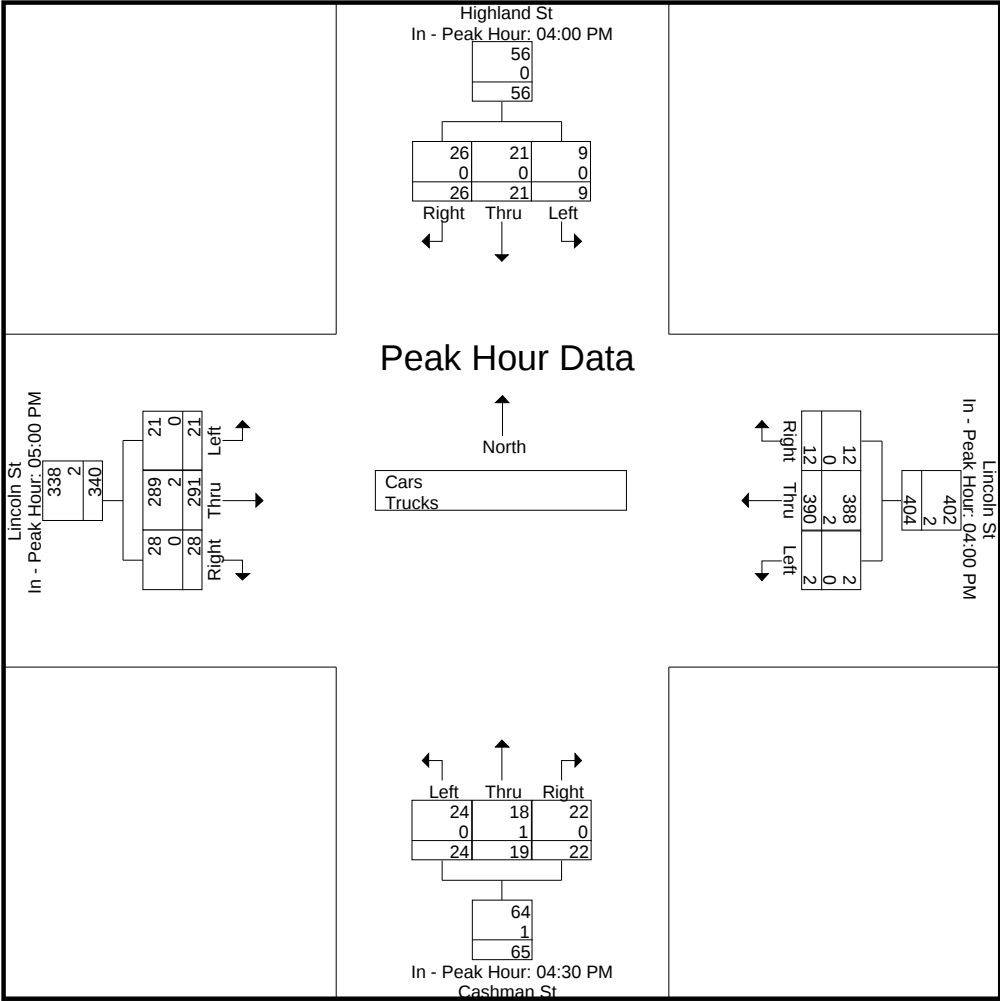


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:30 PM				05:00 PM			
+0 mins.	1	7	7	15	1	91	7	99	6	4	6	16	4	54	6	64
+15 mins.	1	5	5	11	1	94	1	96	6	4	5	15	4	88	5	97
+30 mins.	6	6	4	16	0	102	2	104	5	5	6	16	6	72	7	85
+45 mins.	1	3	10	14	0	103	2	105	7	6	5	18	7	77	10	94
Total Volume	9	21	26	56	2	390	12	404	24	19	22	65	21	291	28	340
% App. Total	16.1	37.5	46.4		0.5	96.5	3		36.9	29.2	33.8		6.2	85.6	8.2	
PHF	.375	.750	.650	.875	.500	.947	.429	.962	.857	.792	.917	.903	.750	.827	.700	.876
Cars	9	21	26	56	2	388	12	402	24	18	22	64	21	289	28	338
% Cars	100	100	100	100	100	99.5	100	99.5	100	94.7	100	98.5	100	99.3	100	99.4
Trucks	0	0	0	0	0	2	0	2	0	1	0	1	0	2	0	2
% Trucks	0	0	0	0	0	0.5	0	0.5	0	5.3	0	1.5	0	0.7	0	0.6

N/S Street : Highland St / Cashman St
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Highland St / Cashman St

E/W Street : Lincoln Street

City/State : Marlborough, MA

Weather : Clear

File Name : 92990002

Site Code : 92990002

Start Date : 3/23/2022

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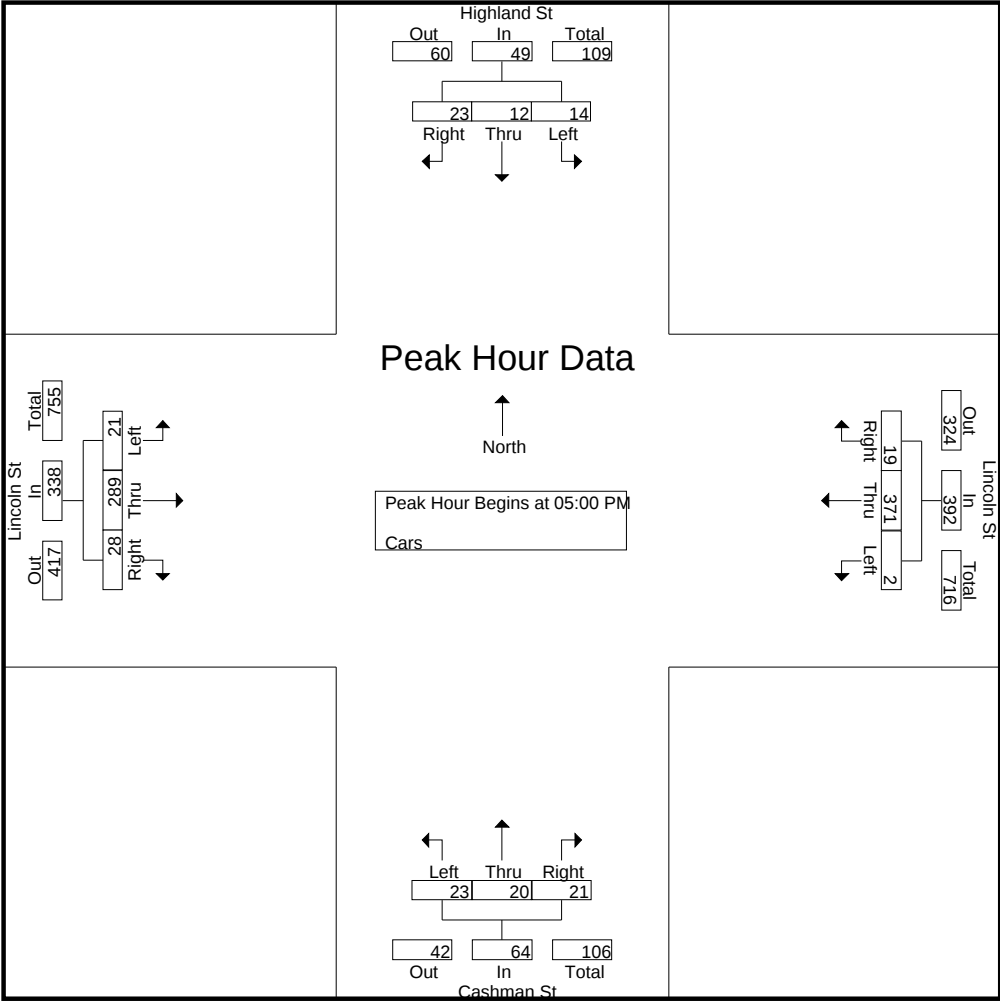
Groups Printed- Cars

	Highland St From North			Lincoln St From East			Cashman St From South			Lincoln St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	1	7	7	1	91	7	5	9	4	4	64	4	204
04:15 PM	1	5	5	1	92	1	4	3	4	4	74	6	200
04:30 PM	6	6	4	0	102	2	6	3	6	4	53	7	199
04:45 PM	1	3	10	0	103	2	6	4	5	3	68	6	211
Total	9	21	26	2	388	12	21	19	19	15	259	23	814
05:00 PM	2	3	4	0	85	5	5	5	6	4	54	6	179
05:15 PM	2	4	7	0	91	5	7	6	5	4	88	5	224
05:30 PM	6	2	6	1	94	5	3	6	4	6	71	7	211
05:45 PM	4	3	6	1	101	4	8	3	6	7	76	10	229
Total	14	12	23	2	371	19	23	20	21	21	289	28	843
Grand Total	23	33	49	4	759	31	44	39	40	36	548	51	1657
Apprch %	21.9	31.4	46.7	0.5	95.6	3.9	35.8	31.7	32.5	5.7	86.3	8	
Total %	1.4	2	3	0.2	45.8	1.9	2.7	2.4	2.4	2.2	33.1	3.1	

	Highland St From North				Lincoln St From East				Cashman St From South				Lincoln St From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	2	3	4	9	0	85	5	90	5	5	6	16	4	54	6	64	179
05:15 PM	2	4	7	13	0	91	5	96	7	6	5	18	4	88	5	97	224
05:30 PM	6	2	6	14	1	94	5	100	3	6	4	13	6	71	7	84	211
05:45 PM	4	3	6	13	1	101	4	106	8	3	6	17	7	76	10	93	229
Total Volume	14	12	23	49	2	371	19	392	23	20	21	64	21	289	28	338	843
% App. Total	28.6	24.5	46.9		0.5	94.6	4.8		35.9	31.2	32.8		6.2	85.5	8.3		
PHF	.583	.750	.821	.875	.500	.918	.950	.925	.719	.833	.875	.889	.750	.821	.700	.871	.920

N/S Street : Highland St / Cashman St
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
Page No : 5

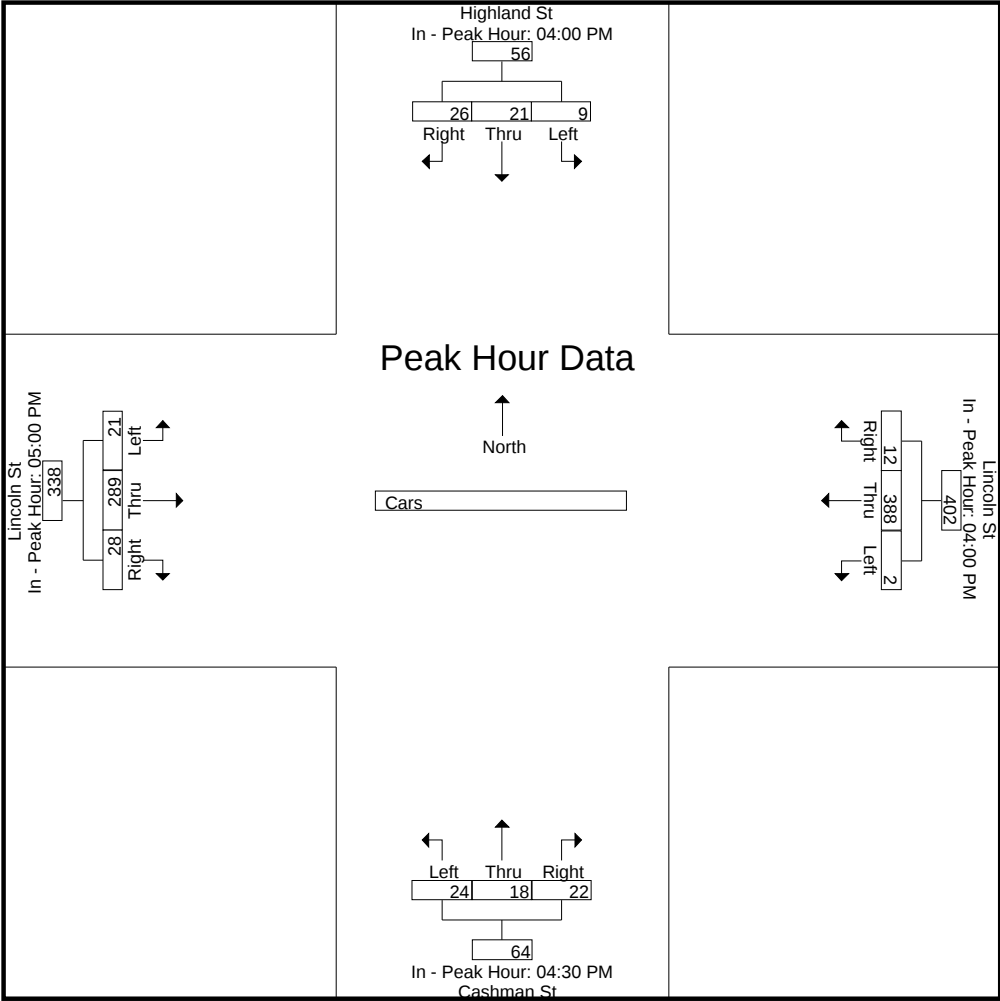


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:30 PM				05:00 PM			
+0 mins.	1	7	7	15	1	91	7	99	6	3	6	15	4	54	6	64
+15 mins.	1	5	5	11	1	92	1	94	6	4	5	15	4	88	5	97
+30 mins.	6	6	4	16	0	102	2	104	5	5	6	16	6	71	7	84
+45 mins.	1	3	10	14	0	103	2	105	7	6	5	18	7	76	10	93
Total Volume	9	21	26	56	2	388	12	402	24	18	22	64	21	289	28	338
% App. Total	16.1	37.5	46.4		0.5	96.5	3		37.5	28.1	34.4		6.2	85.5	8.3	
PHF	.375	.750	.650	.875	.500	.942	.429	.957	.857	.750	.917	.889	.750	.821	.700	.871

N/S Street : Highland St / Cashman St
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
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Accurate Counts

978-664-2565

N/S Street : Highland St / Cashman St

E/W Street : Lincoln Street

City/State : Marlborough, MA

Weather : Clear

File Name : 92990002

Site Code : 92990002

Start Date : 3/23/2022

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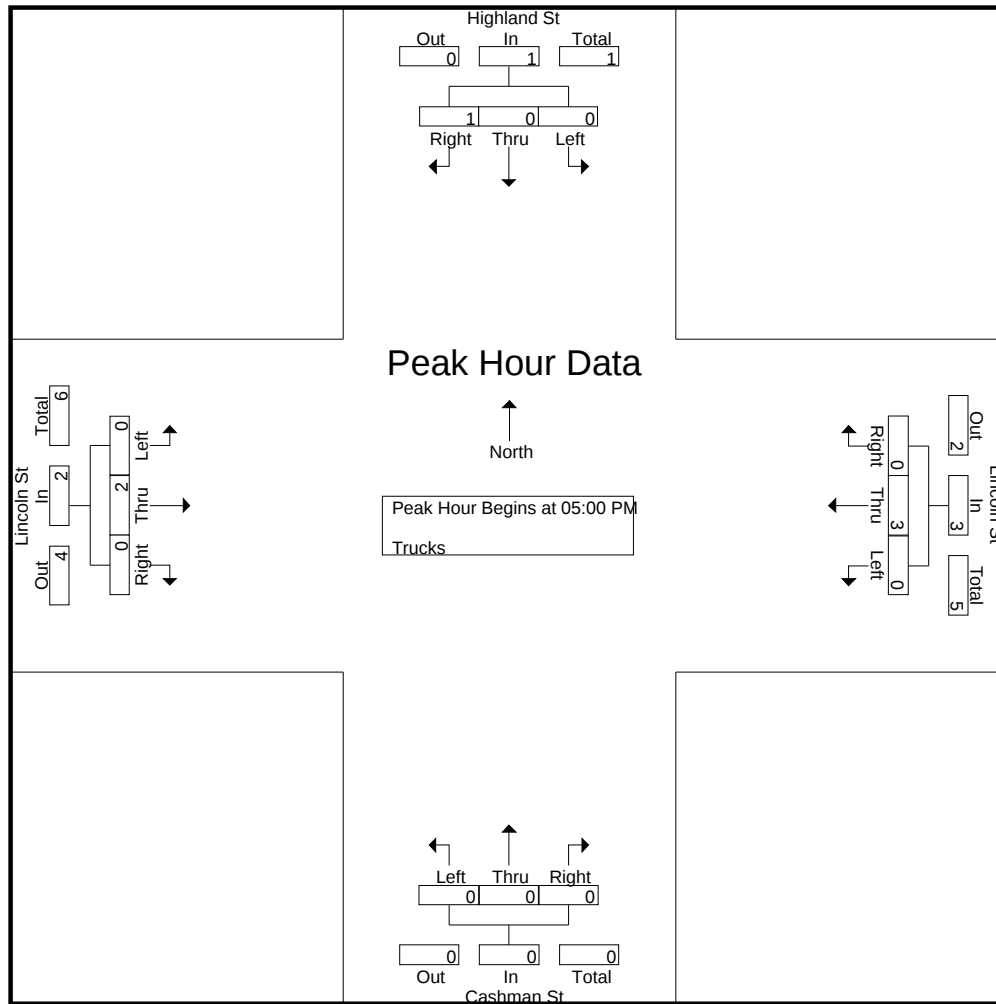
Groups Printed- Trucks

	Highland St From North			Lincoln St From East			Cashman St From South			Lincoln St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
04:15 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	2	0	0	1	0	1	0	0	4
05:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	1	0	3	0	0	0	0	0	2	0	6
Grand Total	0	0	1	0	5	0	0	1	0	1	2	0	10
Apprch %	0	0	100	0	100	0	0	100	0	33.3	66.7	0	
Total %	0	0	10	0	50	0	0	10	0	10	20	0	

	Highland St From North				Lincoln St From East				Cashman St From South				Lincoln St From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	1	1	0	3	0	3	0	0	0	0	0	2	0	2	6
% App. Total	0	0	100		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.250	.250	.000	.375	.000	.375	.000	.000	.000	.000	.000	.500	.000	.500	.750

N/S Street : Highland St / Cashman St
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
Page No : 8

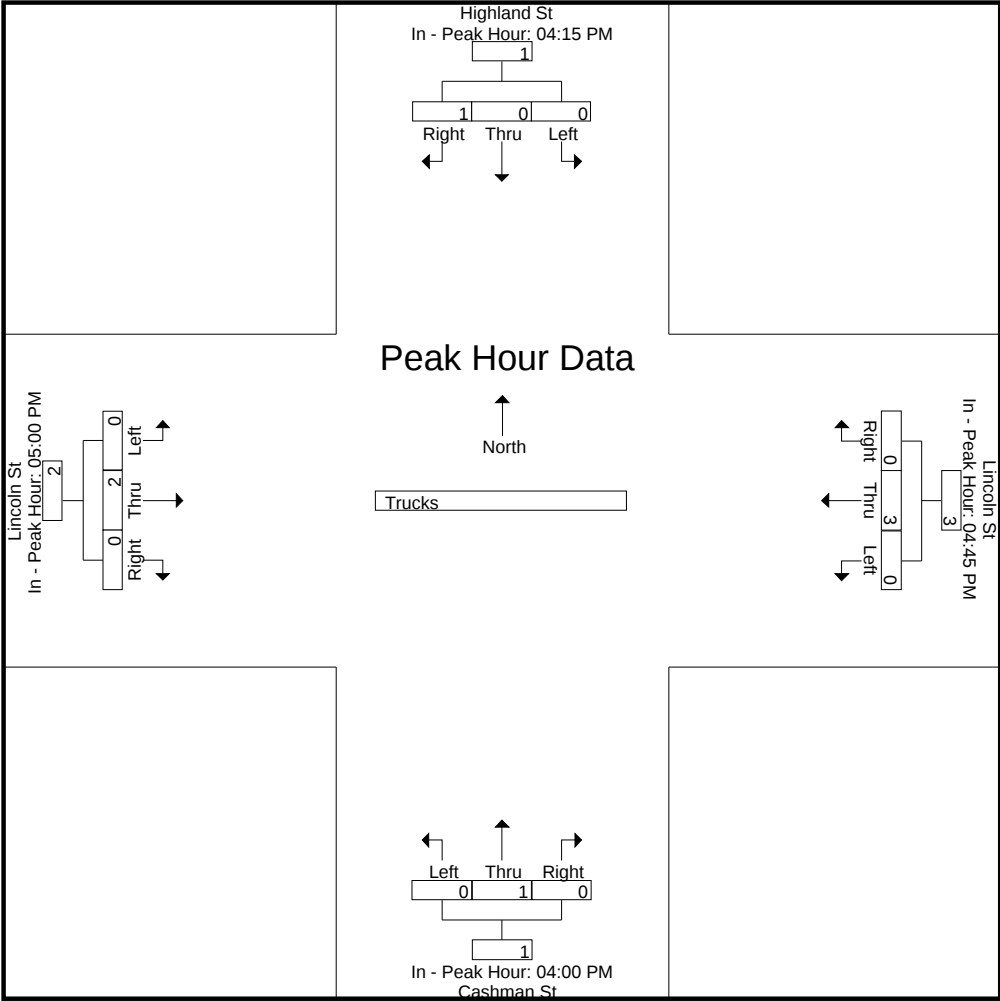


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:45 PM				04:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	2	0	2	0	1	0	1	0	1	0	1
+45 mins.	0	0	1	1	0	1	0	1	0	0	0	0	0	1	0	1
Total Volume	0	0	1	1	0	3	0	3	0	1	0	1	0	2	0	2
% App. Total	0	0	100		0	100	0		0	100	0		0	100	0	
PHF	.000	.000	.250	.250	.000	.375	.000	.375	.000	.250	.000	.250	.000	.500	.000	.500

N/S Street : Highland St / Cashman St
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
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File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
Page No : 10

	Highland St From North				Lincoln St From East				Cashman St From South				Lincoln St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	2	3	3	6
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	5	0	5
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	7	7	1	8
04:45 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2	4	0	4
Total	0	2	1	3	0	0	0	0	0	1	0	1	0	0	0	15	19	4	23
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	6	8	0	8
05:15 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	5	8	0	8
05:30 PM	0	0	1	2	0	0	0	0	0	1	0	0	2	0	0	5	7	4	11
05:45 PM	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	4	7	0	7
Total	0	0	1	7	0	0	0	1	0	1	0	2	2	0	0	20	30	4	34
Grand Total	0	2	2	10	0	0	0	1	0	2	0	3	2	0	0	35	49	8	57
Apprch %	0	50	50		0	0	0		0	100	0		100	0	0				
Total %	0	25	25		0	0	0		0	25	0		25	0	0		86	14	

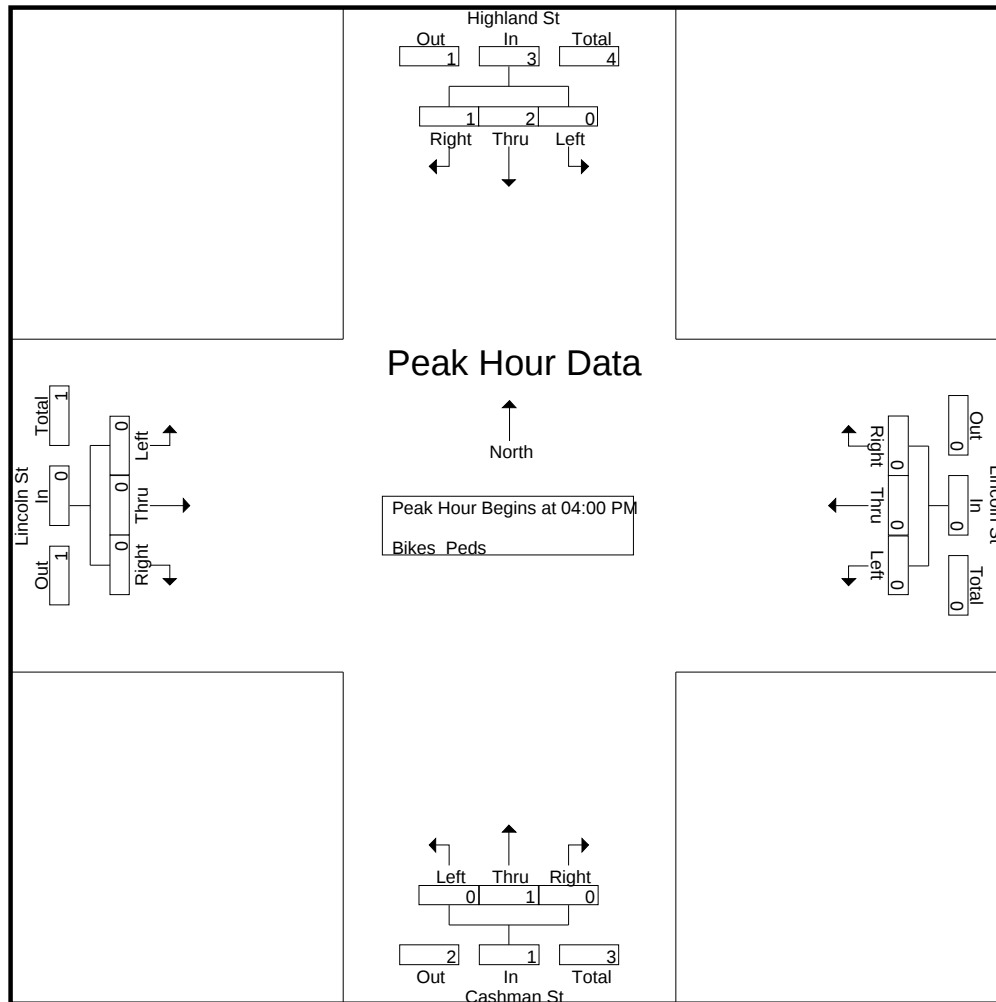
	Highland St From North				Lincoln St From East				Cashman St From South				Lincoln St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	1	3	0	0	0	0	0	1	0	1	0	0	0	0	4
% App. Total	0	66.7	33.3		0	0	0		0	100	0		0	0	0		
PHF	.000	.250	.250	.250	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.333

Accurate Counts

978-664-2565

N/S Street : Highland St / Cashman St
 E/W Street : Lincoln Street
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990002
 Site Code : 92990002
 Start Date : 3/23/2022
 Page No : 11

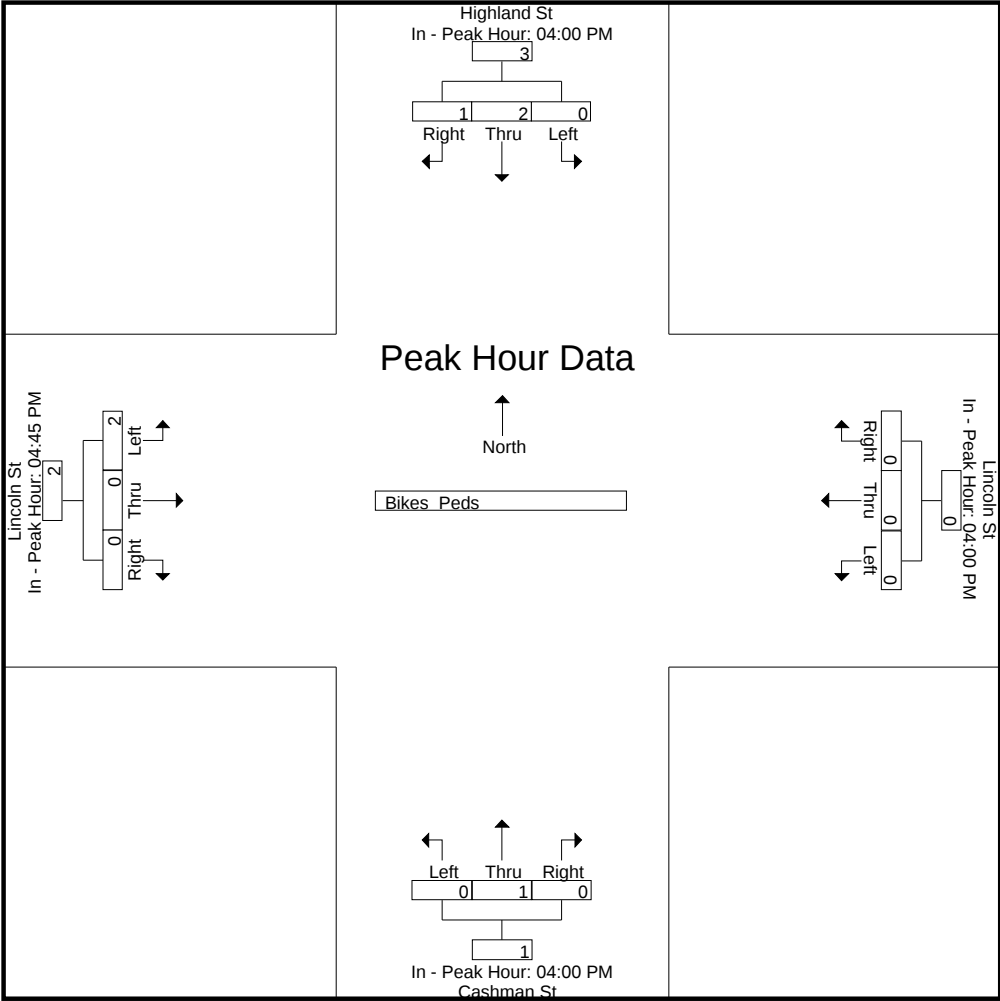


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:45 PM			
+0 mins.	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
Total Volume	0	2	1	3	0	0	0	0	0	1	0	1	2	0	0	2
% App. Total	0	66.7	33.3		0	0	0		0	100	0		100	0	0	
PHF	.000	.250	.250	.250	.000	.000	.000	.000	.000	.250	.000	.250	.250	.000	.000	.250

N/S Street : Highland St / Cashman St
E/W Street : Lincoln Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990002
Site Code : 92990002
Start Date : 3/23/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 1

Groups Printed- Cars - Trucks

	Mechanic St From North		Mechanic St From South		Hastings St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	43	0	1	18	0	3	65
07:15 AM	50	1	1	22	0	1	75
07:30 AM	45	0	2	32	0	0	79
07:45 AM	47	2	0	34	2	1	86
Total	185	3	4	106	2	5	305
08:00 AM	36	2	0	37	1	1	77
08:15 AM	49	3	1	38	2	2	95
08:30 AM	53	0	2	30	1	3	89
08:45 AM	60	2	1	44	1	1	109
Total	198	7	4	149	5	7	370
Grand Total	383	10	8	255	7	12	675
Apprch %	97.5	2.5	3	97	36.8	63.2	
Total %	56.7	1.5	1.2	37.8	1	1.8	
Cars	380	9	8	250	7	12	666
% Cars	99.2	90	100	98	100	100	98.7
Trucks	3	1	0	5	0	0	9
% Trucks	0.8	10	0	2	0	0	1.3

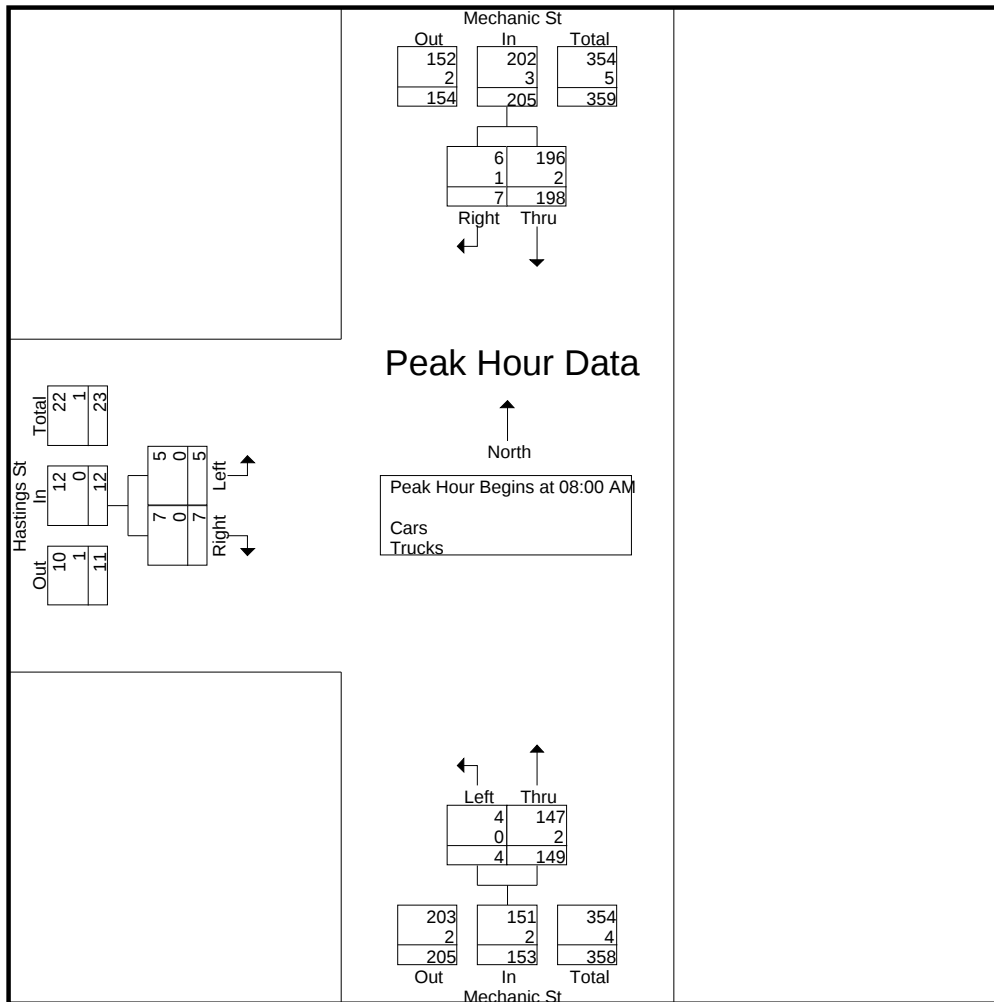
	Mechanic St From North			Mechanic St From South			Hastings St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	36	2	38	0	37	37	1	1	2	77
08:15 AM	49	3	52	1	38	39	2	2	4	95
08:30 AM	53	0	53	2	30	32	1	3	4	89
08:45 AM	60	2	62	1	44	45	1	1	2	109
Total Volume	198	7	205	4	149	153	5	7	12	370
% App. Total	96.6	3.4		2.6	97.4		41.7	58.3		
PHF	.825	.583	.827	.500	.847	.850	.625	.583	.750	.849
Cars	196	6	202	4	147	151	5	7	12	365
% Cars	99.0	85.7	98.5	100	98.7	98.7	100	100	100	98.6
Trucks	2	1	3	0	2	2	0	0	0	5
% Trucks	1.0	14.3	1.5	0	1.3	1.3	0	0	0	1.4

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Hastings Street
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990003
 Site Code : 92990003
 Start Date : 3/23/2022
 Page No : 2

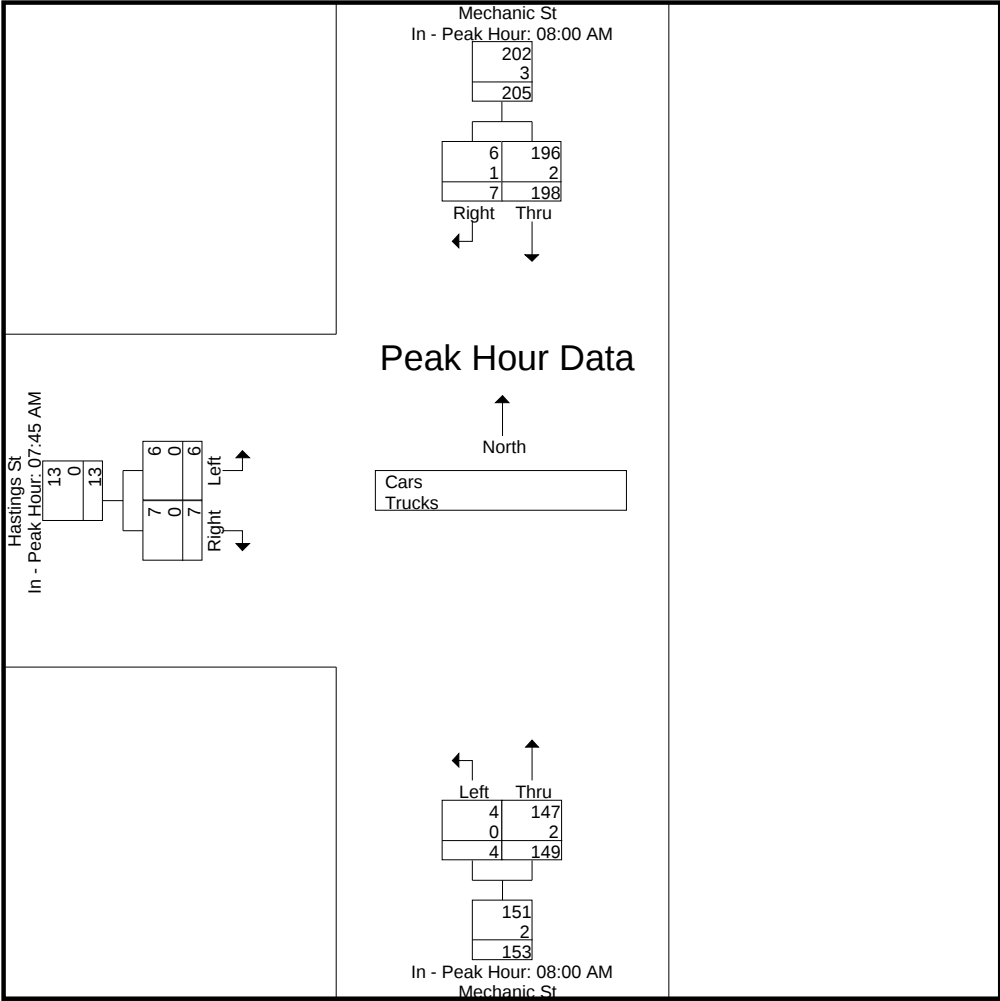


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	08:00 AM			08:00 AM			07:45 AM		
+0 mins.	36	2	38	0	37	37	2	1	3
+15 mins.	49	3	52	1	38	39	1	1	2
+30 mins.	53	0	53	2	30	32	2	2	4
+45 mins.	60	2	62	1	44	45	1	3	4
Total Volume	198	7	205	4	149	153	6	7	13
% App. Total	96.6	3.4		2.6	97.4		46.2	53.8	
PHF	.825	.583	.827	.500	.847	.850	.750	.583	.813
Cars	196	6	202	4	147	151	6	7	13
% Cars	99	85.7	98.5	100	98.7	98.7	100	100	100
Trucks	2	1	3	0	2	2	0	0	0
% Trucks	1	14.3	1.5	0	1.3	1.3	0	0	0

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 4

Groups Printed- Cars

	Mechanic St From North		Mechanic St From South		Hastings St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	42	0	1	17	0	3	63
07:15 AM	50	1	1	22	0	1	75
07:30 AM	45	0	2	31	0	0	78
07:45 AM	47	2	0	33	2	1	85
Total	184	3	4	103	2	5	301
08:00 AM	36	1	0	37	1	1	76
08:15 AM	49	3	1	38	2	2	95
08:30 AM	52	0	2	28	1	3	86
08:45 AM	59	2	1	44	1	1	108
Total	196	6	4	147	5	7	365
Grand Total	380	9	8	250	7	12	666
Apprch %	97.7	2.3	3.1	96.9	36.8	63.2	
Total %	57.1	1.4	1.2	37.5	1.1	1.8	

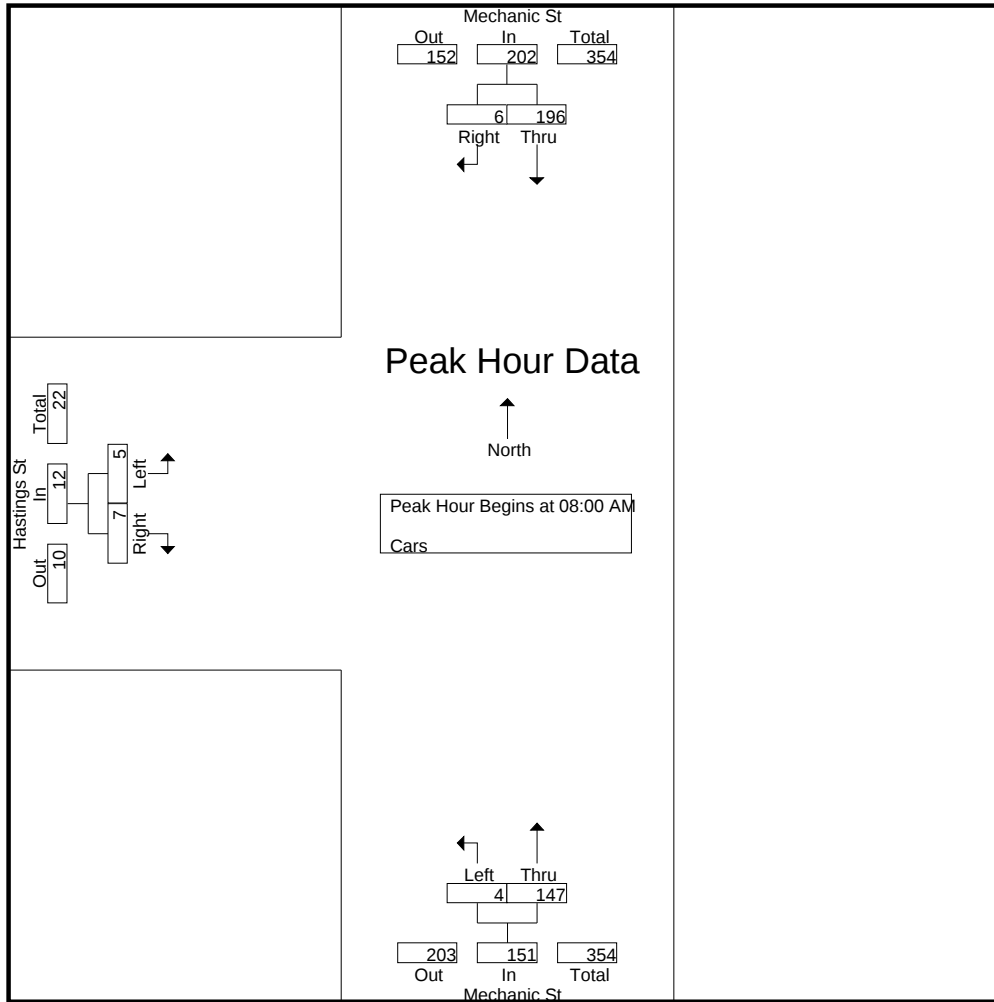
	Mechanic St From North			Mechanic St From South			Hastings St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	36	1	37	0	37	37	1	1	2	76
08:15 AM	49	3	52	1	38	39	2	2	4	95
08:30 AM	52	0	52	2	28	30	1	3	4	86
08:45 AM	59	2	61	1	44	45	1	1	2	108
Total Volume	196	6	202	4	147	151	5	7	12	365
% App. Total	97	3		2.6	97.4		41.7	58.3		
PHF	.831	.500	.828	.500	.835	.839	.625	.583	.750	.845

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Hastings Street
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990003
 Site Code : 92990003
 Start Date : 3/23/2022
 Page No : 5

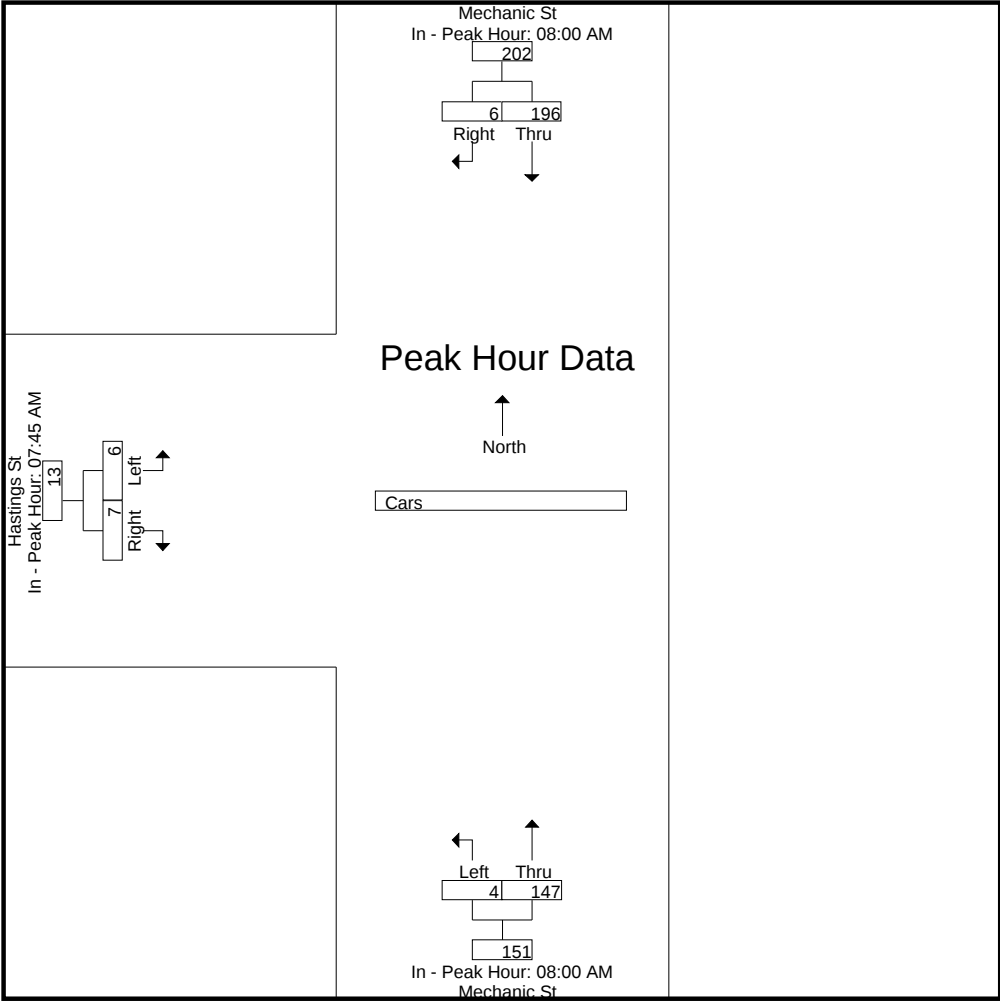


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	08:00 AM			08:00 AM			07:45 AM		
+0 mins.	36	1	37	0	37	37	2	1	3
+15 mins.	49	3	52	1	38	39	1	1	2
+30 mins.	52	0	52	2	28	30	2	2	4
+45 mins.	59	2	61	1	44	45	1	3	4
Total Volume	196	6	202	4	147	151	6	7	13
% App. Total	97	3		2.6	97.4		46.2	53.8	
PHF	.831	.500	.828	.500	.835	.839	.750	.583	.813

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 7

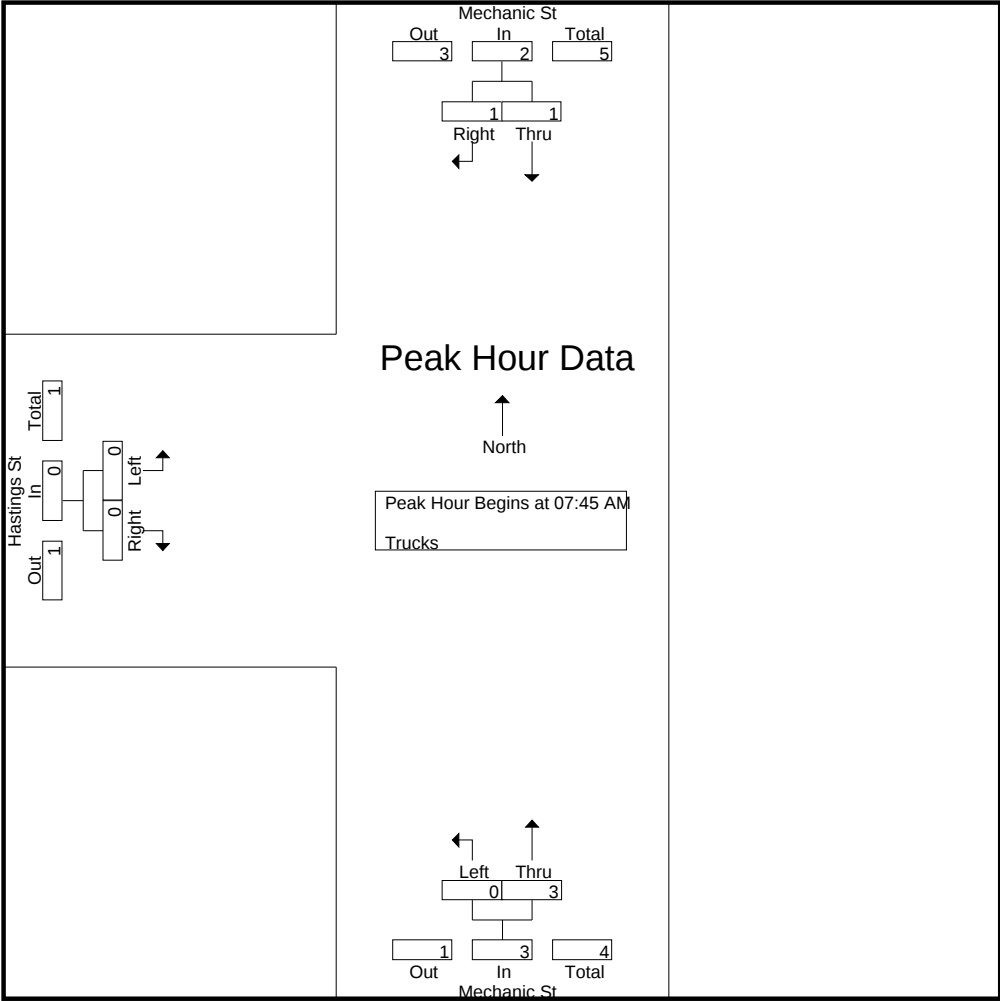
Groups Printed- Trucks

	Mechanic St From North		Mechanic St From South		Hastings St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00 AM	1	0	0	1	0	0	2
07:15 AM	0	0	0	0	0	0	0
07:30 AM	0	0	0	1	0	0	1
07:45 AM	0	0	0	1	0	0	1
Total	1	0	0	3	0	0	4
08:00 AM	0	1	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0
08:30 AM	1	0	0	2	0	0	3
08:45 AM	1	0	0	0	0	0	1
Total	2	1	0	2	0	0	5
Grand Total	3	1	0	5	0	0	9
Apprch %	75	25	0	100	0	0	
Total %	33.3	11.1	0	55.6	0	0	

	Mechanic St From North			Mechanic St From South			Hastings St 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 07:45 AM										
07:45 AM	0	0	0	0	1	1	0	0	0	1
08:00 AM	0	1	1	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	1	0	1	0	2	2	0	0	0	3
Total Volume	1	1	2	0	3	3	0	0	0	5
% App. Total	50	50		0	100		0	0		
PHF	.250	.250	.500	.000	.375	.375	.000	.000	.000	.417

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 8

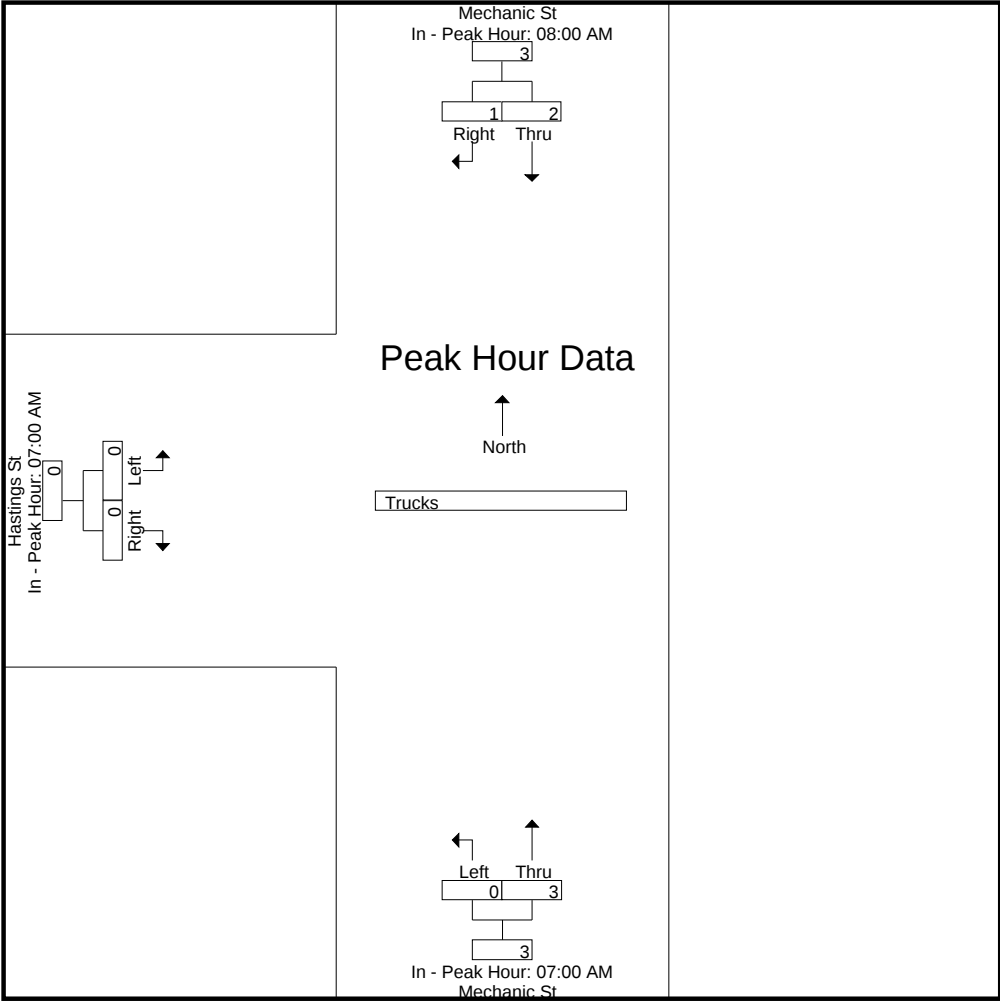


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	1	1	0	1	1	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	1	0	1	0	1	1	0	0	0
+45 mins.	1	0	1	0	1	1	0	0	0
Total Volume	2	1	3	0	3	3	0	0	0
% App. Total	66.7	33.3		0	100		0	0	
PHF	.500	.250	.750	.000	.750	.750	.000	.000	.000

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
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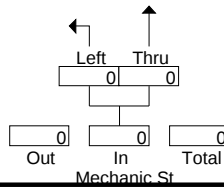
978-664-2565

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 10

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978-664-2565

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 11

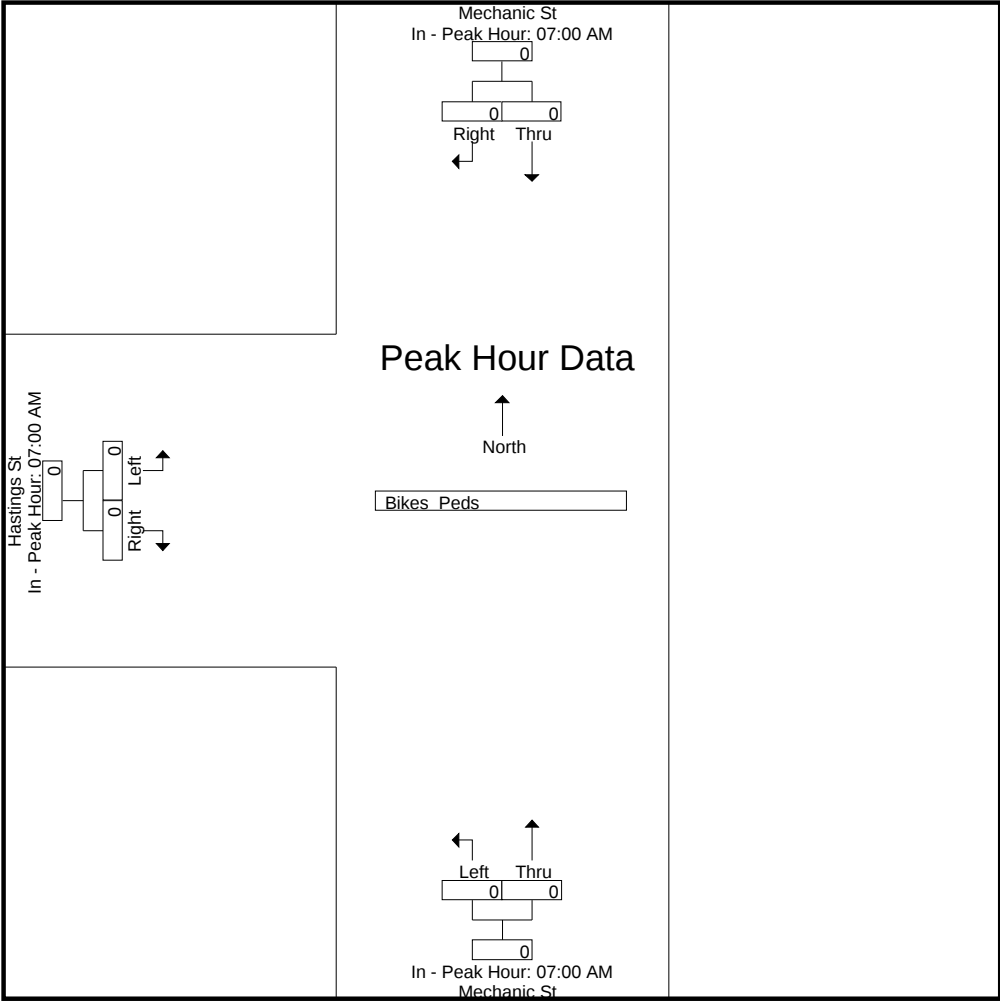


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

Peak Hour for Each Approach Begins at:									
	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHE	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 1

Groups Printed- Cars - Trucks

	Mechanic St From North		Mechanic St From South		Hastings St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	48	0	2	75	1	2	128
04:15 PM	56	0	2	52	2	1	113
04:30 PM	54	1	1	71	2	1	130
04:45 PM	56	1	2	65	0	1	125
Total	214	2	7	263	5	5	496
05:00 PM	63	2	2	62	4	3	136
05:15 PM	67	2	2	60	2	0	133
05:30 PM	57	1	1	69	3	3	134
05:45 PM	51	0	1	61	1	0	114
Total	238	5	6	252	10	6	517
Grand Total	452	7	13	515	15	11	1013
Apprch %	98.5	1.5	2.5	97.5	57.7	42.3	
Total %	44.6	0.7	1.3	50.8	1.5	1.1	
Cars	450	7	13	509	15	11	1005
% Cars	99.6	100	100	98.8	100	100	99.2
Trucks	2	0	0	6	0	0	8
% Trucks	0.4	0	0	1.2	0	0	0.8

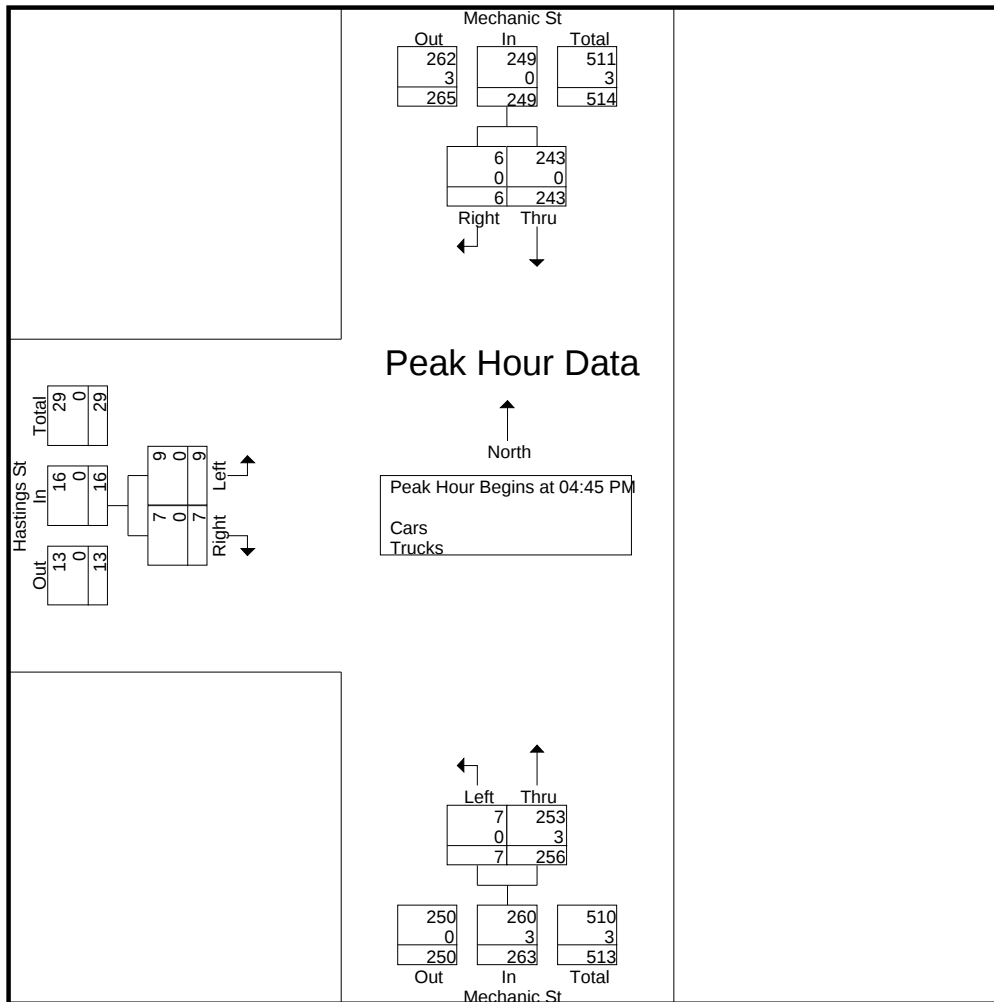
	Mechanic St From North			Mechanic St From South			Hastings St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	56	1	57	2	65	67	0	1	1	125
05:00 PM	63	2	65	2	62	64	4	3	7	136
05:15 PM	67	2	69	2	60	62	2	0	2	133
05:30 PM	57	1	58	1	69	70	3	3	6	134
Total Volume	243	6	249	7	256	263	9	7	16	528
% App. Total	97.6	2.4		2.7	97.3		56.2	43.8		
PHF	.907	.750	.902	.875	.928	.939	.563	.583	.571	.971
Cars	243	6	249	7	253	260	9	7	16	525
% Cars	100	100	100	100	98.8	98.9	100	100	100	99.4
Trucks	0	0	0	0	3	3	0	0	0	3
% Trucks	0	0	0	0	1.2	1.1	0	0	0	0.6

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Hastings Street
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990003
 Site Code : 92990003
 Start Date : 3/23/2022
 Page No : 2



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

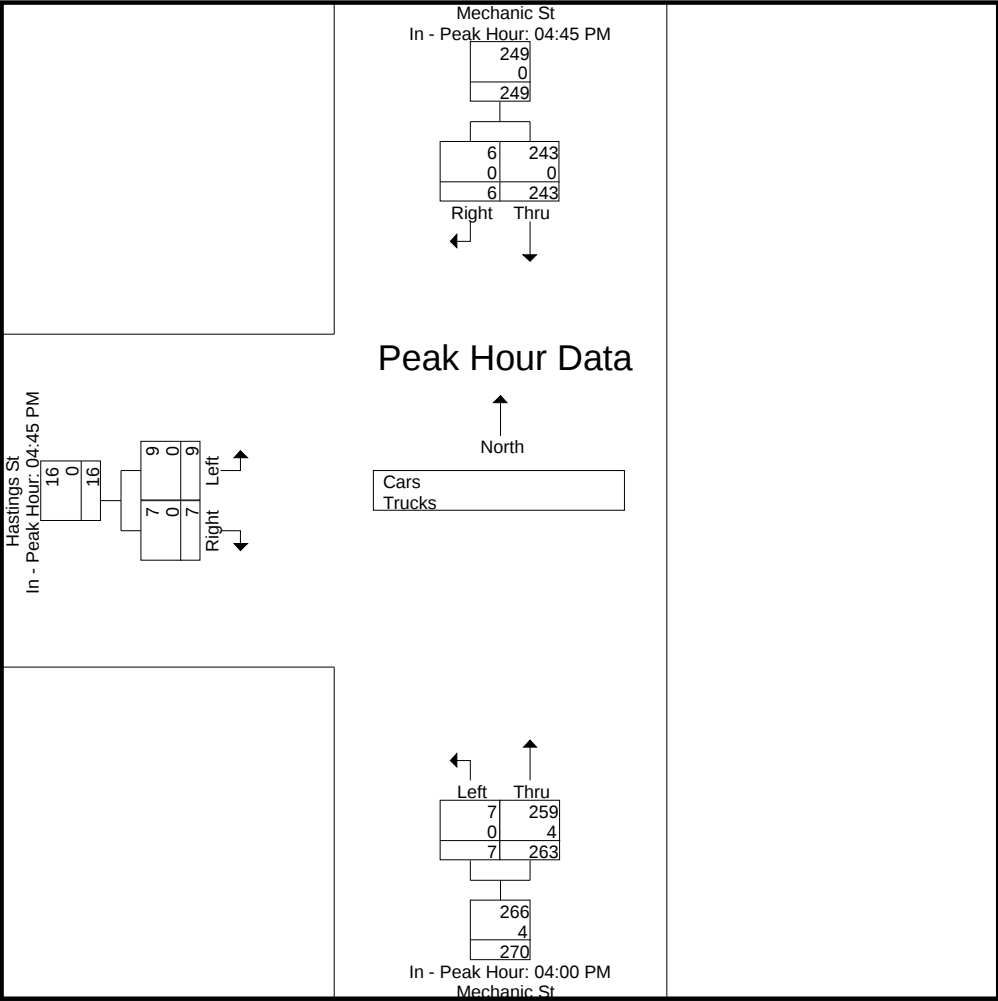
	04:45 PM			04:00 PM			04:45 PM		
+0 mins.	56	1	57	2	75	77	0	1	1
+15 mins.	63	2	65	2	52	54	4	3	7
+30 mins.	67	2	69	1	71	72	2	0	2
+45 mins.	57	1	58	2	65	67	3	3	6
Total Volume	243	6	249	7	263	270	9	7	16
% App. Total	97.6	2.4		2.6	97.4		56.2	43.8	
PHF	.907	.750	.902	.875	.877	.877	.563	.583	.571
Cars	243	6	249	7	259	266	9	7	16
% Cars	100	100	100	100	98.5	98.5	100	100	100
Trucks	0	0	0	0	4	4	0	0	0
% Trucks	0	0	0	0	1.5	1.5	0	0	0

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Hastings Street
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990003
 Site Code : 92990003
 Start Date : 3/23/2022
 Page No : 3



Accurate Counts

978-664-2565

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 4

Groups Printed- Cars

	Mechanic St From North		Mechanic St From South		Hastings St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	47	0	2	74	1	2	126
04:15 PM	56	0	2	51	2	1	112
04:30 PM	54	1	1	70	2	1	129
04:45 PM	56	1	2	64	0	1	124
Total	213	2	7	259	5	5	491
05:00 PM	63	2	2	62	4	3	136
05:15 PM	67	2	2	60	2	0	133
05:30 PM	57	1	1	67	3	3	132
05:45 PM	50	0	1	61	1	0	113
Total	237	5	6	250	10	6	514
Grand Total	450	7	13	509	15	11	1005
Apprch %	98.5	1.5	2.5	97.5	57.7	42.3	
Total %	44.8	0.7	1.3	50.6	1.5	1.1	

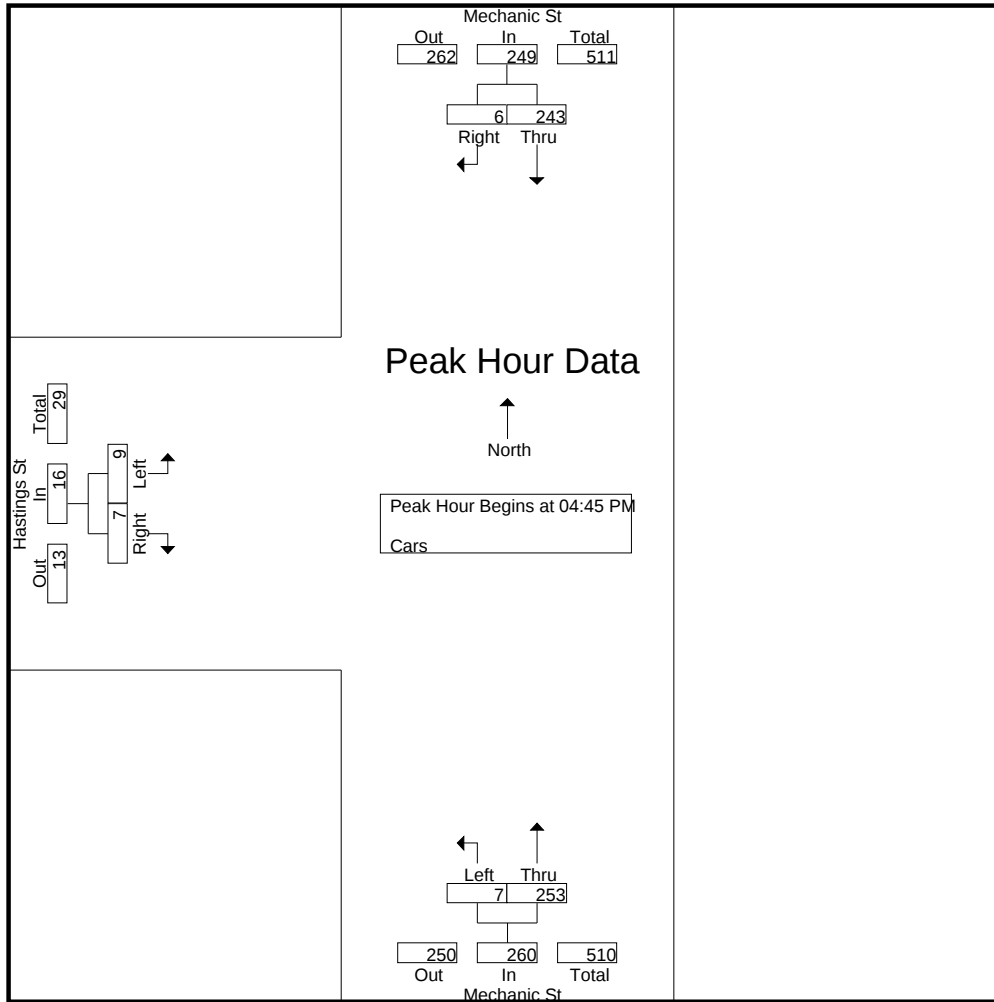
	Mechanic St From North			Mechanic St From South			Hastings St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	56	1	57	2	64	66	0	1	1	124
05:00 PM	63	2	65	2	62	64	4	3	7	136
05:15 PM	67	2	69	2	60	62	2	0	2	133
05:30 PM	57	1	58	1	67	68	3	3	6	132
Total Volume	243	6	249	7	253	260	9	7	16	525
% App. Total	97.6	2.4		2.7	97.3		56.2	43.8		
PHF	.907	.750	.902	.875	.944	.956	.563	.583	.571	.965

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Hastings Street
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990003
 Site Code : 92990003
 Start Date : 3/23/2022
 Page No : 5

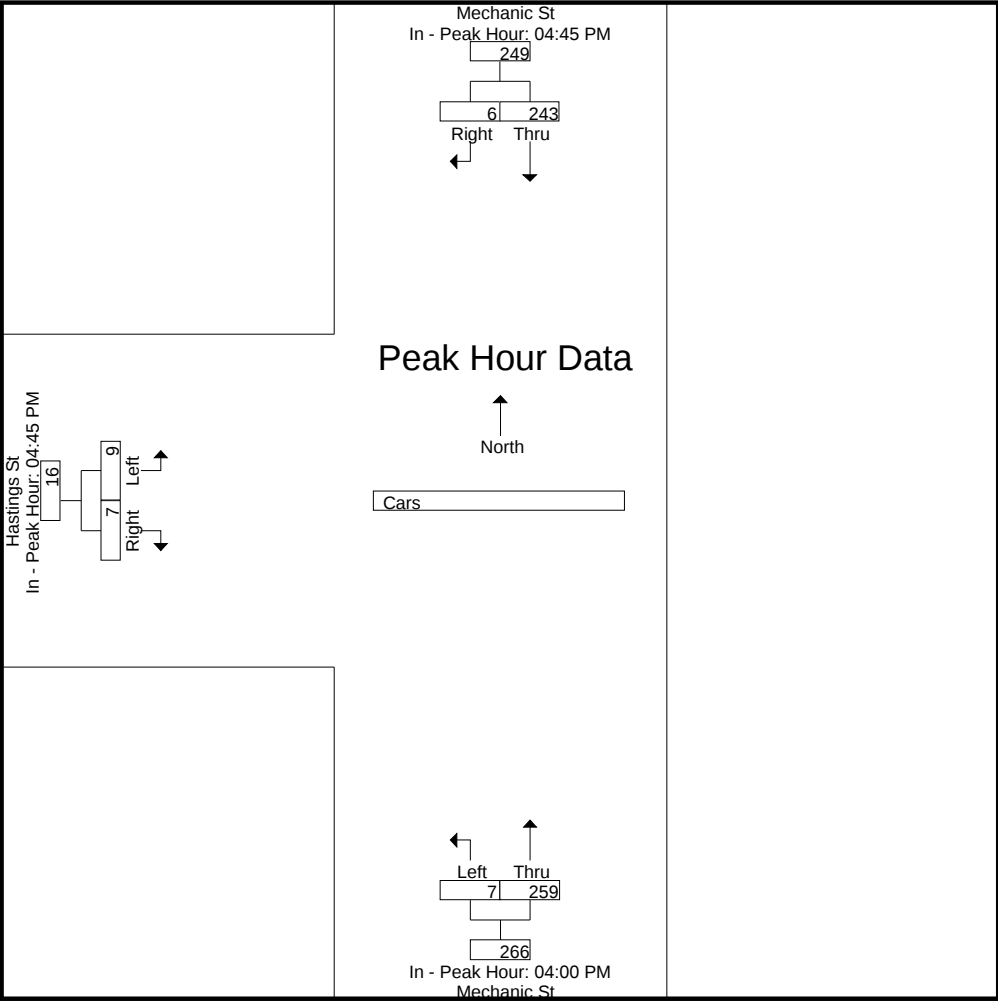


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM			04:00 PM			04:45 PM		
+0 mins.	56	1	57	2	74	76	0	1	1
+15 mins.	63	2	65	2	51	53	4	3	7
+30 mins.	67	2	69	1	70	71	2	0	2
+45 mins.	57	1	58	2	64	66	3	3	6
Total Volume	243	6	249	7	259	266	9	7	16
% App. Total	97.6	2.4		2.6	97.4		56.2	43.8	
PHF	.907	.750	.902	.875	.875	.875	.563	.583	.571

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 7

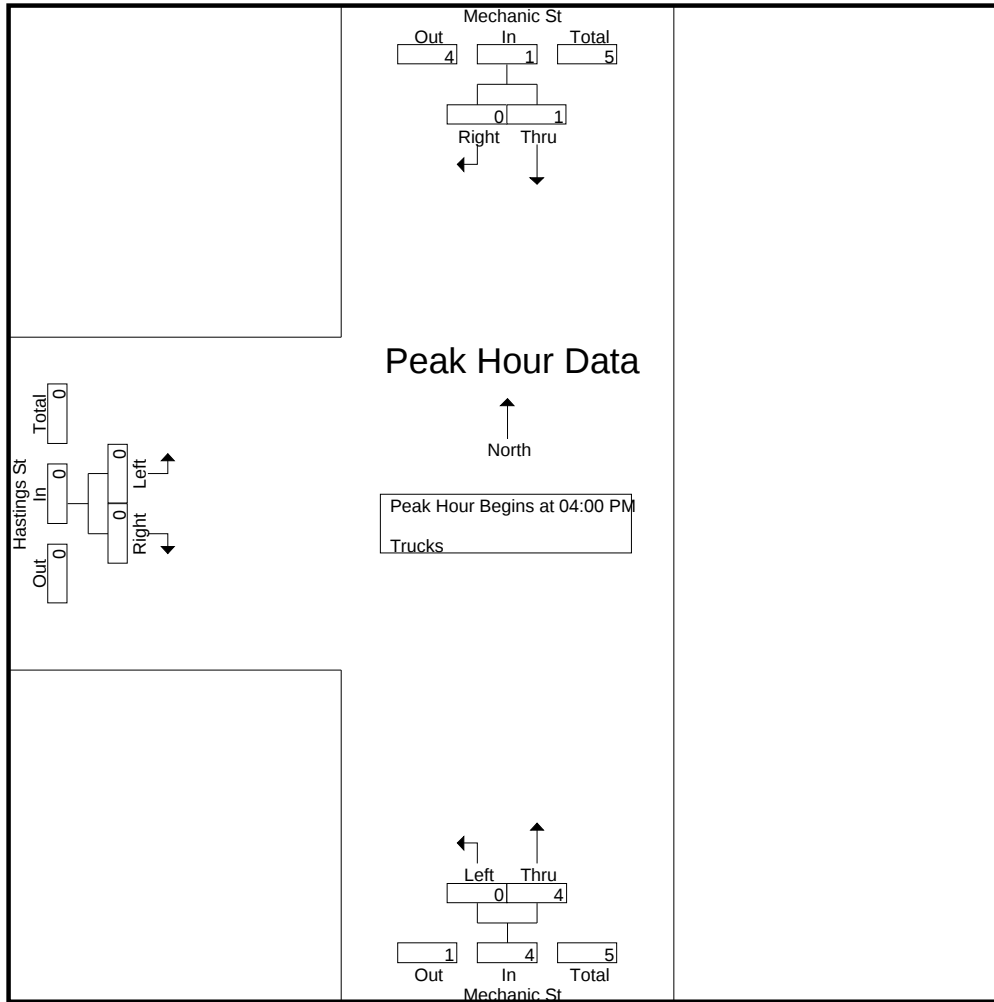
Groups Printed- Trucks

	Mechanic St From North		Mechanic St From South		Hastings St From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
04:00 PM	1	0	0	1	0	0	2
04:15 PM	0	0	0	1	0	0	1
04:30 PM	0	0	0	1	0	0	1
04:45 PM	0	0	0	1	0	0	1
Total	1	0	0	4	0	0	5
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	0	2	0	0	2
05:45 PM	1	0	0	0	0	0	1
Total	1	0	0	2	0	0	3
Grand Total	2	0	0	6	0	0	8
Apprch %	100	0	0	100	0	0	
Total %	25	0	0	75	0	0	

	Mechanic St From North			Mechanic St From South			Hastings St 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 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	1	0	1	0	1	1	0	0	0	2
04:15 PM	0	0	0	0	1	1	0	0	0	1
04:30 PM	0	0	0	0	1	1	0	0	0	1
04:45 PM	0	0	0	0	1	1	0	0	0	1
Total Volume	1	0	1	0	4	4	0	0	0	5
% App. Total	100	0		0	100		0	0		
PHF	.250	.000	.250	.000	1.00	1.00	.000	.000	.000	.625

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 8

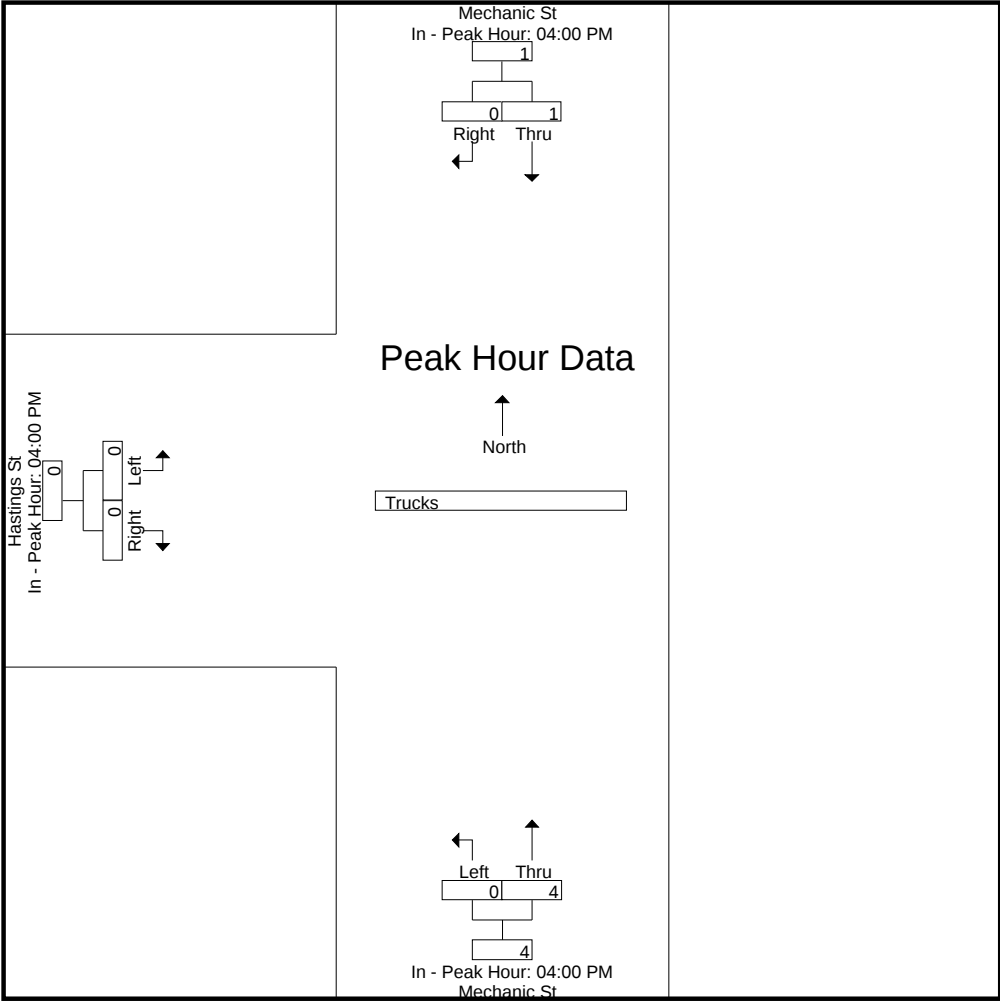


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	1	0	1	0	1	1	0	0	0
+15 mins.	0	0	0	0	1	1	0	0	0
+30 mins.	0	0	0	0	1	1	0	0	0
+45 mins.	0	0	0	0	1	1	0	0	0
Total Volume	1	0	1	0	4	4	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.250	.000	.250	.000	1.000	1.000	.000	.000	.000

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
Page No : 10

Groups Printed- Bikes Peds

	Mechanic St From North			Mechanic St From South			Hastings St 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	2	0	0	1	0	0	1	4	0	4
04:30 PM	0	0	0	0	0	0	0	0	1	1	0	1
04:45 PM	0	0	0	0	0	0	0	0	1	1	0	1
Total	0	0	2	0	0	1	0	0	3	6	0	6
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	1	0	0	0	0	0	1	1
05:45 PM	0	0	1	0	0	0	1	0	0	1	1	2
Total	0	0	1	0	1	0	1	0	0	1	2	3
Grand Total	0	0	3	0	1	1	1	0	3	7	2	9
Apprch %	0	0		0	100		100	0				
Total %	0	0		0	50		50	0		77.8	22.2	

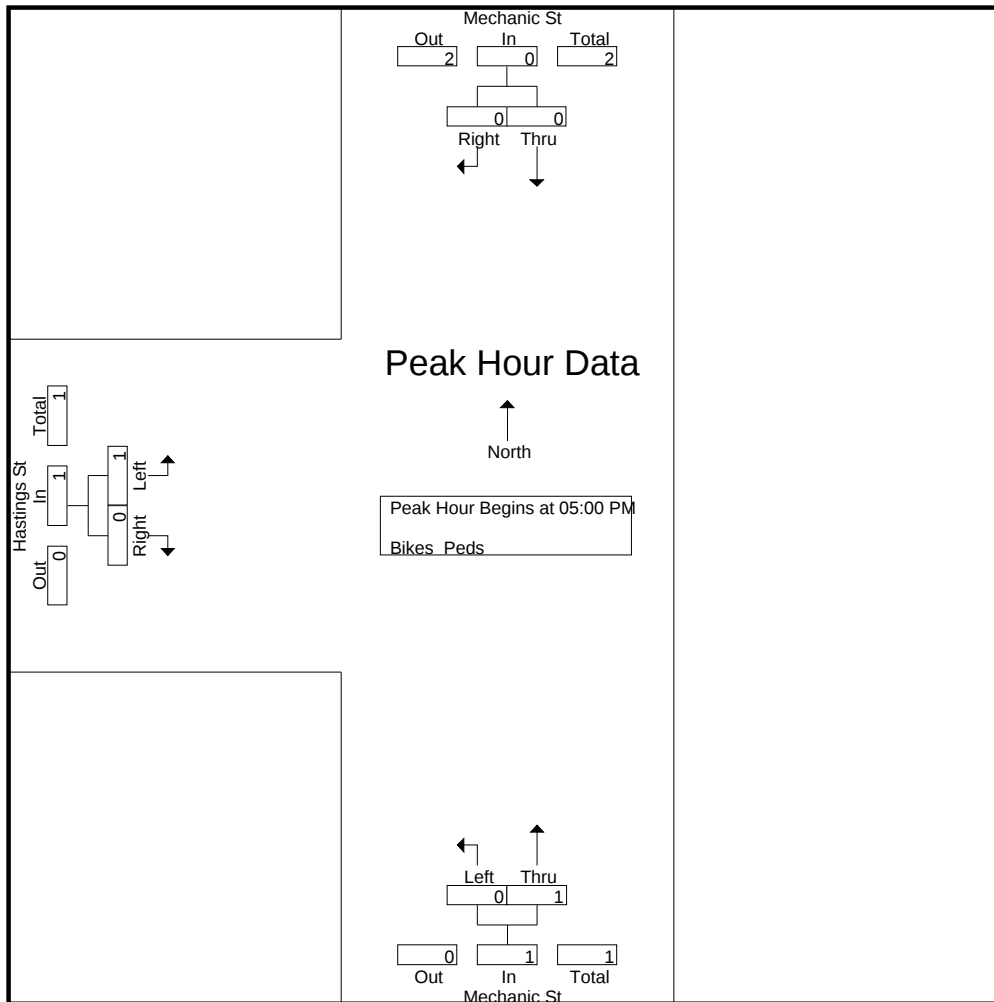
	Mechanic St From North			Mechanic St From South			Hastings St From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	1	1	0	0	0	1
05:45 PM	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	1	1	1	0	1	2
% App. Total	0	0		0	100		100	0		
PHF	.000	.000	.000	.000	.250	.250	.250	.000	.250	.500

Accurate Counts

978-664-2565

N/S Street : Mechanic Street
 E/W Street : Hastings Street
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990003
 Site Code : 92990003
 Start Date : 3/23/2022
 Page No : 11

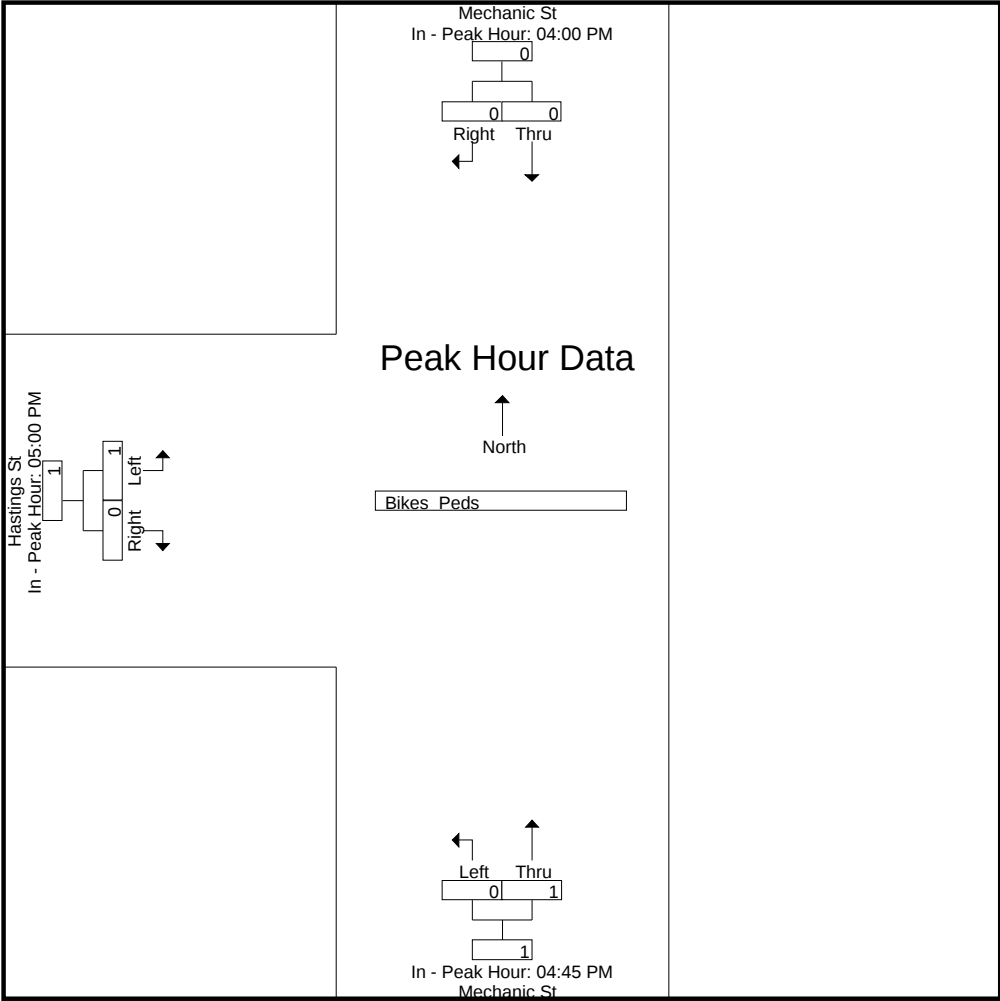


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:00 PM			04:45 PM			05:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	1	1	1	0	1
Total Volume	0	0	0	0	1	1	1	0	1
% App. Total	0	0		0	100		100	0	
PHF	.000	.000	.000	.000	.250	.250	.250	.000	.250

N/S Street : Mechanic Street
E/W Street : Hastings Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990003
Site Code : 92990003
Start Date : 3/23/2022
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Accurate Counts

978-664-2565

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
Page No : 1

Groups Printed- Cars - Trucks

	Mechanic St From North			Main St From East			Granger Blvd From South			West Main St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	9	23	0	3	29	5	46	8	1	2	16	0	142
07:15 AM	12	30	0	3	32	4	81	19	3	2	27	0	213
07:30 AM	8	25	0	4	26	16	82	18	1	4	29	0	213
07:45 AM	8	31	0	4	30	9	69	20	3	1	37	0	212
Total	37	109	0	14	117	34	278	65	8	9	109	0	780
08:00 AM	11	17	0	1	39	20	76	19	4	3	36	1	227
08:15 AM	14	23	0	0	17	8	77	29	2	2	37	0	209
08:30 AM	10	24	0	4	38	13	69	17	3	3	52	0	233
08:45 AM	9	25	0	5	38	14	66	33	3	2	45	0	240
Total	44	89	0	10	132	55	288	98	12	10	170	1	909
Grand Total	81	198	0	24	249	89	566	163	20	19	279	1	1689
Apprch %	29	71	0	6.6	68.8	24.6	75.6	21.8	2.7	6.4	93.3	0.3	
Total %	4.8	11.7	0	1.4	14.7	5.3	33.5	9.7	1.2	1.1	16.5	0.1	
Cars	81	195	0	24	245	89	534	162	19	17	274	1	1641
% Cars	100	98.5	0	100	98.4	100	94.3	99.4	95	89.5	98.2	100	97.2
Trucks	0	3	0	0	4	0	32	1	1	2	5	0	48
% Trucks	0	1.5	0	0	1.6	0	5.7	0.6	5	10.5	1.8	0	2.8

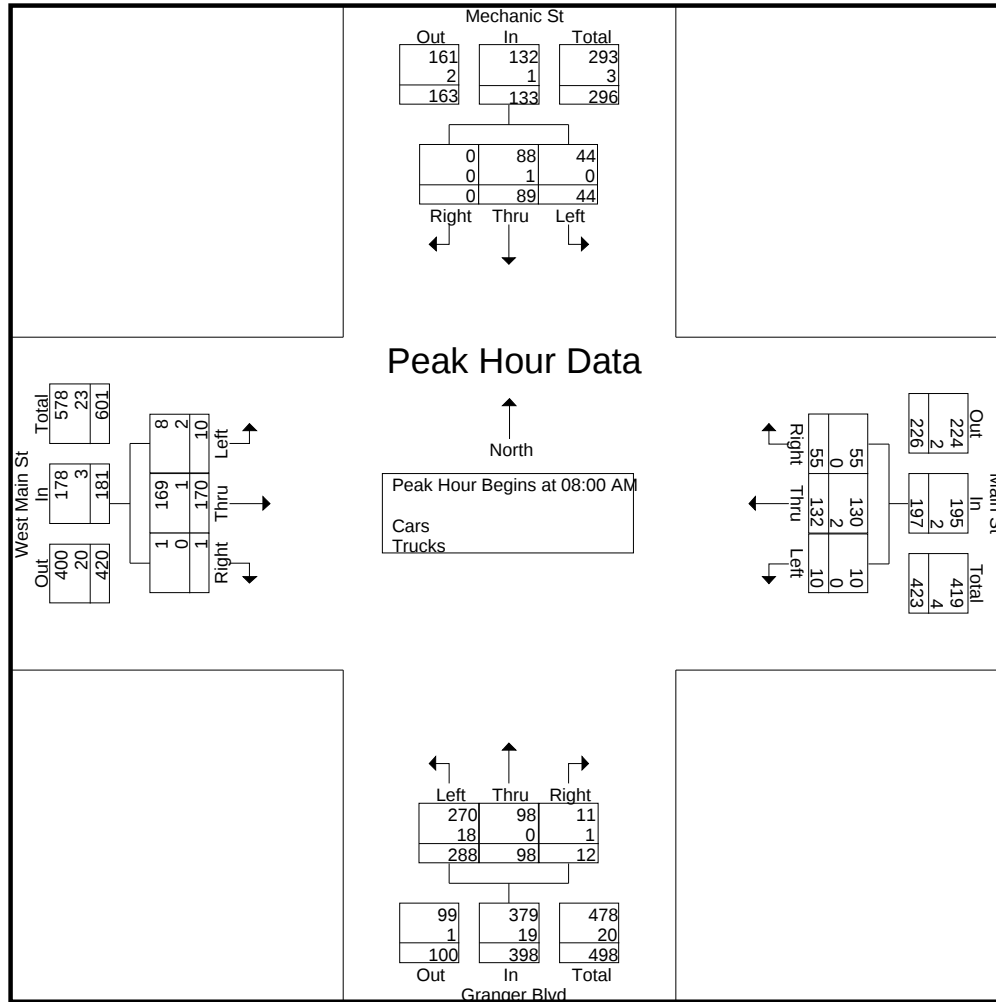
	Mechanic St From North				Main St From East				Granger Blvd From South				West Main St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	11	17	0	28	1	39	20	60	76	19	4	99	3	36	1	40	227
08:15 AM	14	23	0	37	0	17	8	25	77	29	2	108	2	37	0	39	209
08:30 AM	10	24	0	34	4	38	13	55	69	17	3	89	3	52	0	55	233
08:45 AM	9	25	0	34	5	38	14	57	66	33	3	102	2	45	0	47	240
Total Volume	44	89	0	133	10	132	55	197	288	98	12	398	10	170	1	181	909
% App. Total	33.1	66.9	0		5.1	67	27.9		72.4	24.6	3		5.5	93.9	0.6		
PHF	.786	.890	.000	.899	.500	.846	.688	.821	.935	.742	.750	.921	.833	.817	.250	.823	.947
Cars	44	88	0	132	10	130	55	195	270	98	11	379	8	169	1	178	884
% Cars	100	98.9	0	99.2	100	98.5	100	99.0	93.8	100	91.7	95.2	80.0	99.4	100	98.3	97.2
Trucks	0	1	0	1	0	2	0	2	18	0	1	19	2	1	0	3	25
% Trucks	0	1.1	0	0.8	0	1.5	0	1.0	6.3	0	8.3	4.8	20.0	0.6	0	1.7	2.8

Accurate Counts

978-664-2565

N/S Street : Mechanic St / Granger Blvd
 E/W Street : Main St / West Main St
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990004
 Site Code : 92990004
 Start Date : 3/23/2022
 Page No : 2

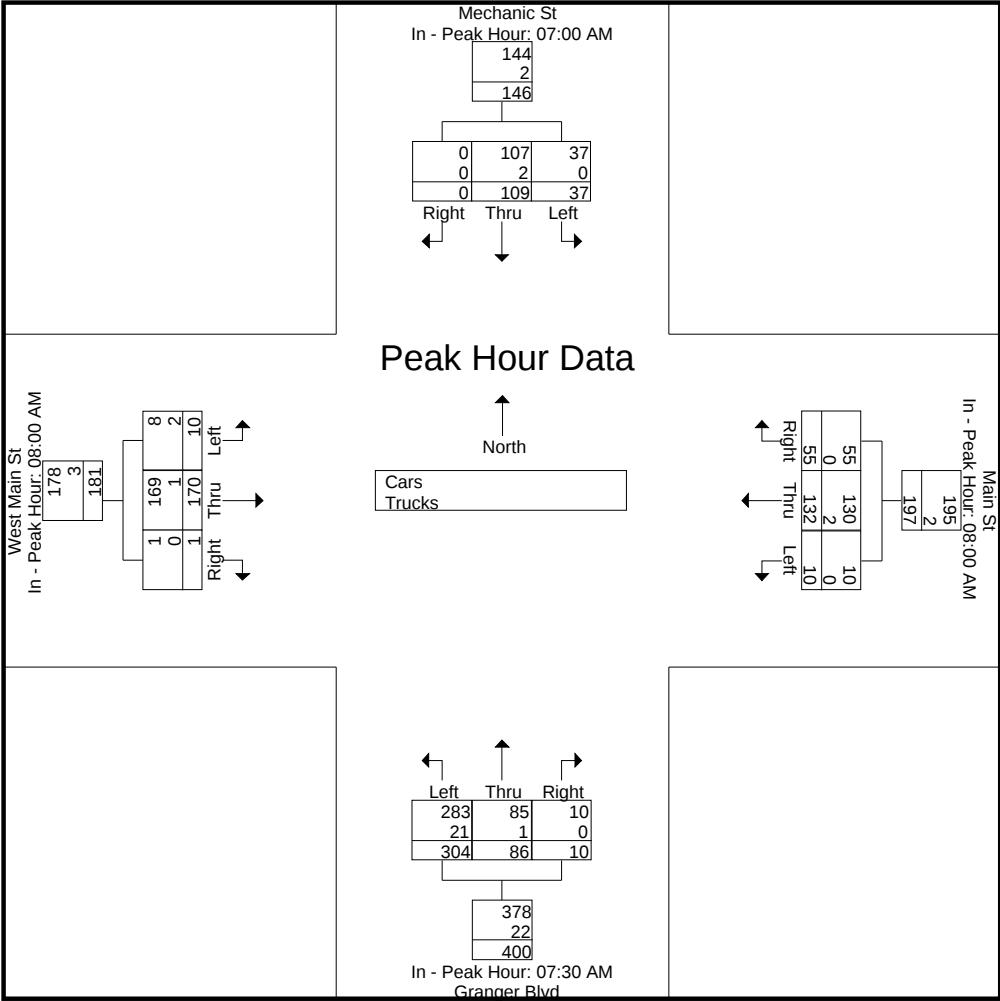


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM				08:00 AM				07:30 AM				08:00 AM			
+0 mins.	9	23	0	32	1	39	20	60	82	18	1	101	3	36	1	40
+15 mins.	12	30	0	42	0	17	8	25	69	20	3	92	2	37	0	39
+30 mins.	8	25	0	33	4	38	13	55	76	19	4	99	3	52	0	55
+45 mins.	8	31	0	39	5	38	14	57	77	29	2	108	2	45	0	47
Total Volume	37	109	0	146	10	132	55	197	304	86	10	400	10	170	1	181
% App. Total	25.3	74.7	0		5.1	67	27.9		76	21.5	2.5		5.5	93.9	0.6	
PHF	.771	.879	.000	.869	.500	.846	.688	.821	.927	.741	.625	.926	.833	.817	.250	.823
Cars	37	107	0	144	10	130	55	195	283	85	10	378	8	169	1	178
% Cars	100	98.2	0	98.6	100	98.5	100	99	93.1	98.8	100	94.5	80	99.4	100	98.3
Trucks	0	2	0	2	0	2	0	2	21	1	0	22	2	1	0	3
% Trucks	0	1.8	0	1.4	0	1.5	0	1	6.9	1.2	0	5.5	20	0.6	0	1.7

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Mechanic St / Granger Blvd

E/W Street : Main St / West Main St

City/State : Marlborough, MA

Weather : Clear

File Name : 92990004

Site Code : 92990004

Start Date : 3/23/2022

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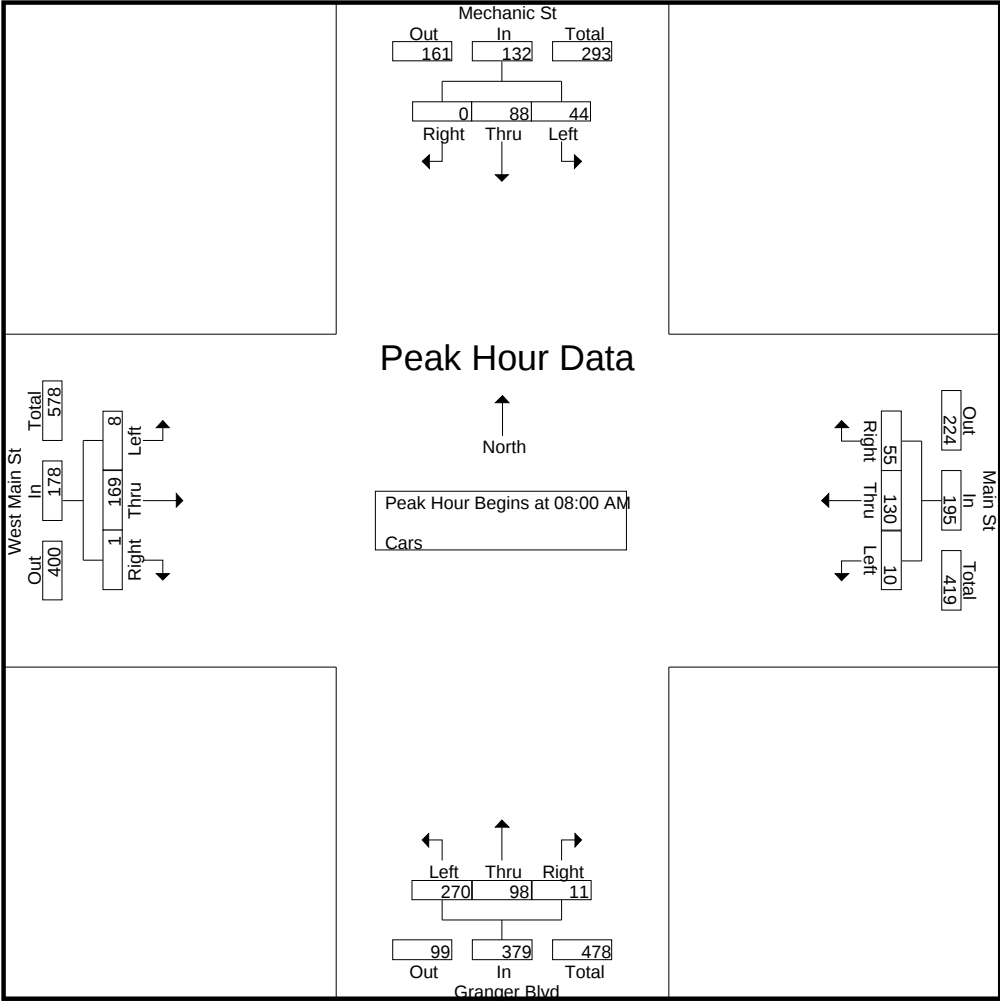
Groups Printed- Cars

	Mechanic St From North			Main St From East			Granger Blvd From South			West Main St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	9	22	0	3	29	5	44	8	1	2	15	0	138
07:15 AM	12	30	0	3	30	4	80	19	3	2	27	0	210
07:30 AM	8	24	0	4	26	16	74	18	1	4	26	0	201
07:45 AM	8	31	0	4	30	9	66	19	3	1	37	0	208
Total	37	107	0	14	115	34	264	64	8	9	105	0	757
08:00 AM	11	17	0	1	38	20	71	19	4	3	36	1	221
08:15 AM	14	23	0	0	17	8	72	29	2	2	36	0	203
08:30 AM	10	23	0	4	37	13	66	17	2	1	52	0	225
08:45 AM	9	25	0	5	38	14	61	33	3	2	45	0	235
Total	44	88	0	10	130	55	270	98	11	8	169	1	884
Grand Total	81	195	0	24	245	89	534	162	19	17	274	1	1641
Apprch %	29.3	70.7	0	6.7	68.4	24.9	74.7	22.7	2.7	5.8	93.8	0.3	
Total %	4.9	11.9	0	1.5	14.9	5.4	32.5	9.9	1.2	1	16.7	0.1	

	Mechanic St From North				Main St From East				Granger Blvd From South				West Main St From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. 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	11	17	0	28	1	38	20	59	71	19	4	94	3	36	1	40	221
08:15 AM	14	23	0	37	0	17	8	25	72	29	2	103	2	36	0	38	203
08:30 AM	10	23	0	33	4	37	13	54	66	17	2	85	1	52	0	53	225
08:45 AM	9	25	0	34	5	38	14	57	61	33	3	97	2	45	0	47	235
Total Volume	44	88	0	132	10	130	55	195	270	98	11	379	8	169	1	178	884
% App. Total	33.3	66.7	0		5.1	66.7	28.2		71.2	25.9	2.9		4.5	94.9	0.6		
PHF	.786	.880	.000	.892	.500	.855	.688	.826	.938	.742	.688	.920	.667	.813	.250	.840	.940

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
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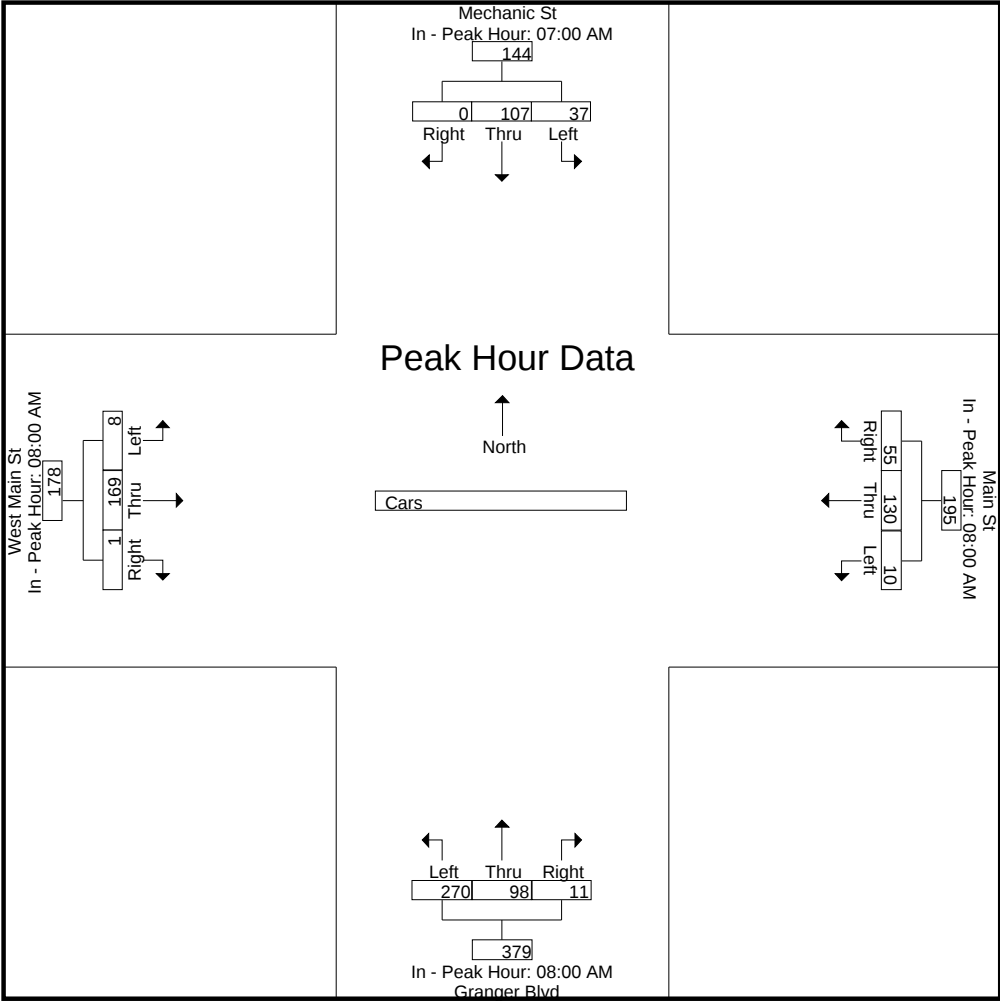


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	9	22	0	31	1	38	20	59	71	19	4	94	3	36	1	40
+15 mins.	12	30	0	42	0	17	8	25	72	29	2	103	2	36	0	38
+30 mins.	8	24	0	32	4	37	13	54	66	17	2	85	1	52	0	53
+45 mins.	8	31	0	39	5	38	14	57	61	33	3	97	2	45	0	47
Total Volume	37	107	0	144	10	130	55	195	270	98	11	379	8	169	1	178
% App. Total	25.7	74.3	0		5.1	66.7	28.2		71.2	25.9	2.9		4.5	94.9	0.6	
PHF	.771	.863	.000	.857	.500	.855	.688	.826	.938	.742	.688	.920	.667	.813	.250	.840

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
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Accurate Counts

978-664-2565

N/S Street : Mechanic St / Granger Blvd

E/W Street : Main St / West Main St

City/State : Marlborough, MA

Weather : Clear

File Name : 92990004

Site Code : 92990004

Start Date : 3/23/2022

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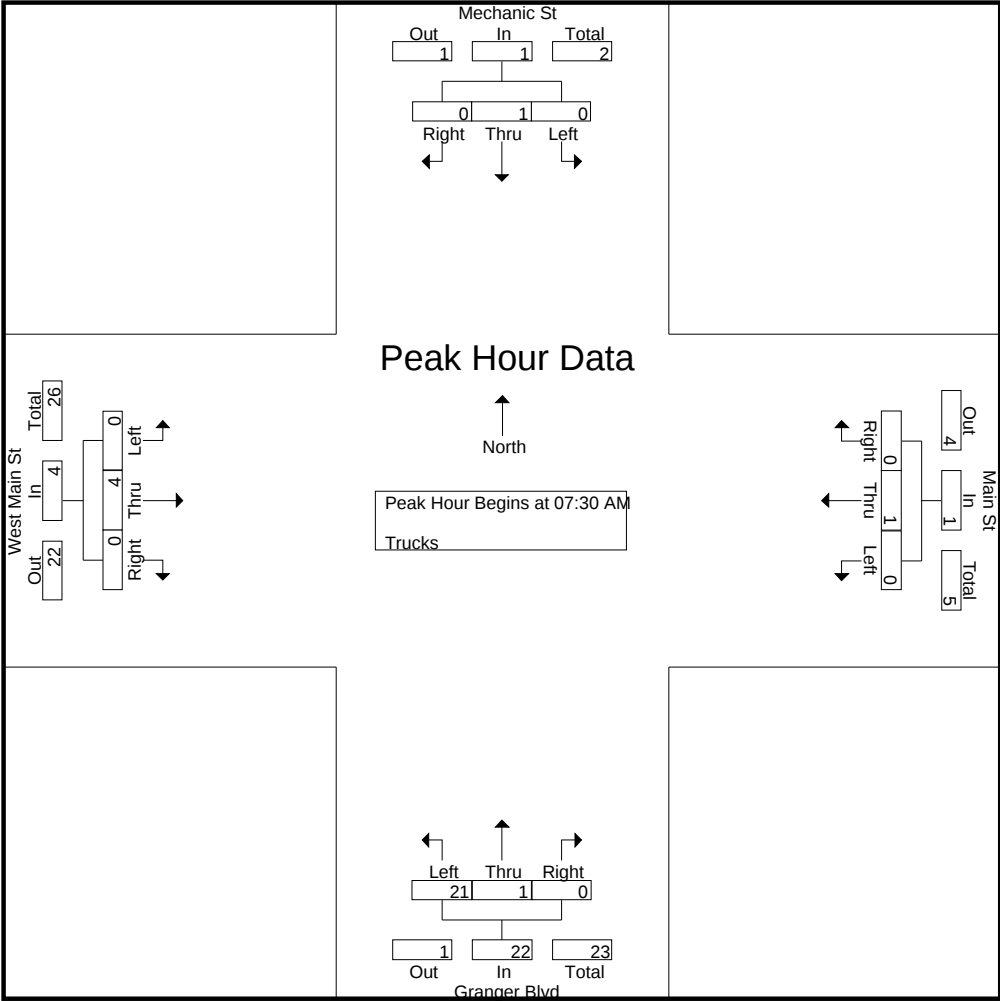
Groups Printed- Trucks

	Mechanic St From North			Main St From East			Granger Blvd From South			West Main St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	1	0	0	0	0	2	0	0	0	1	0	4
07:15 AM	0	0	0	0	2	0	1	0	0	0	0	0	3
07:30 AM	0	1	0	0	0	0	8	0	0	0	3	0	12
07:45 AM	0	0	0	0	0	0	3	1	0	0	0	0	4
Total	0	2	0	0	2	0	14	1	0	0	4	0	23
08:00 AM	0	0	0	0	1	0	5	0	0	0	0	0	6
08:15 AM	0	0	0	0	0	0	5	0	0	0	1	0	6
08:30 AM	0	1	0	0	1	0	3	0	1	2	0	0	8
08:45 AM	0	0	0	0	0	0	5	0	0	0	0	0	5
Total	0	1	0	0	2	0	18	0	1	2	1	0	25
Grand Total	0	3	0	0	4	0	32	1	1	2	5	0	48
Apprch %	0	100	0	0	100	0	94.1	2.9	2.9	28.6	71.4	0	
Total %	0	6.2	0	0	8.3	0	66.7	2.1	2.1	4.2	10.4	0	

	Mechanic St From North				Main St From East				Granger Blvd From South				West Main St From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	1	0	1	0	0	0	0	8	0	0	8	0	3	0	3	12
07:45 AM	0	0	0	0	0	0	0	0	3	1	0	4	0	0	0	0	4
08:00 AM	0	0	0	0	0	1	0	1	5	0	0	5	0	0	0	0	6
08:15 AM	0	0	0	0	0	0	0	0	5	0	0	5	0	1	0	1	6
Total Volume	0	1	0	1	0	1	0	1	21	1	0	22	0	4	0	4	28
% App. Total	0	100	0		0	100	0		95.5	4.5	0		0	100	0		
PHF	.000	.250	.000	.250	.000	.250	.000	.250	.656	.250	.000	.688	.000	.333	.000	.333	.583

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
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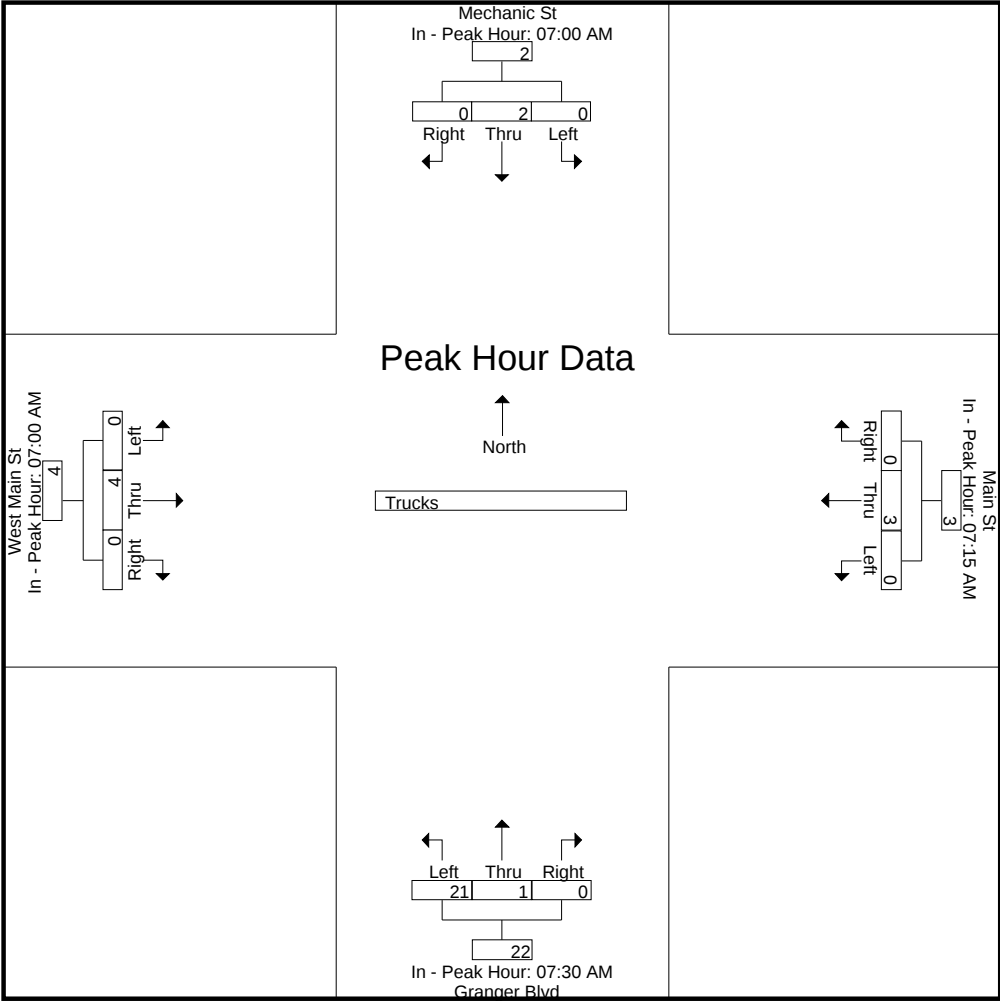


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				07:30 AM				07:00 AM			
+0 mins.	0	1	0	1	0	2	0	2	8	0	0	8	0	1	0	1
+15 mins.	0	0	0	0	0	0	0	0	3	1	0	4	0	0	0	0
+30 mins.	0	1	0	1	0	0	0	0	5	0	0	5	0	3	0	3
+45 mins.	0	0	0	0	0	1	0	1	5	0	0	5	0	0	0	0
Total Volume	0	2	0	2	0	3	0	3	21	1	0	22	0	4	0	4
% App. Total	0	100	0		0	100	0		95.5	4.5	0		0	100	0	
PHF	.000	.500	.000	.500	.000	.375	.000	.375	.656	.250	.000	.688	.000	.333	.000	.333

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
Page No : 9



978-664-2565

File Name : 92990004

Site Code : 92990004

Start Date : 3/23/2022

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Groups Printed- Bikes Peds
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	Mechanic St From North				Main St From East				Granger Blvd From South				West Main St From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	2
Grand Total	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	2	1	3
Apprch %	0	0	0		0	100	0		0	0	0		0	0	0				
Total %	0	0	0		0	100	0		0	0	0		0	0	0		66.7	33.3	

[illegible]

978-664-2565

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
Page No : 11



North

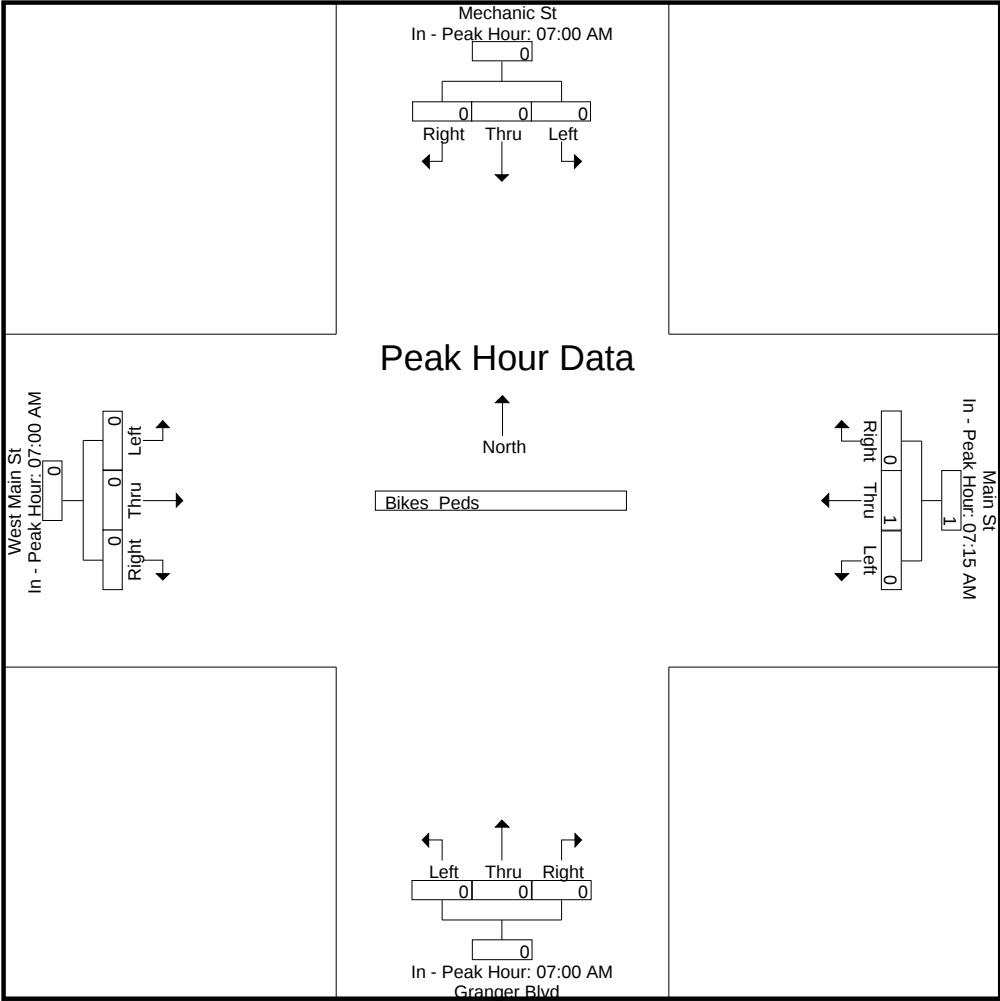
Peak Hour Begins at 07:15 AM

	Bikes	Peds
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11	1	1
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93	1	1
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95	1	1
96	1	1
97	1	1
98	1	1
99	1	1
100	1	1

Peak Hour for Each Approach Begins at:																
	07:00 AM				07:15 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+45 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	
% App. Total	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
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Accurate Counts

978-664-2565

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
Page No : 1

Groups Printed- Cars - Trucks

	Mechanic St From North			Main St From East			Granger Blvd From South			West Main St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	25	21	0	7	31	46	92	50	7	4	57	0	340
04:15 PM	13	14	0	1	36	23	85	42	2	2	59	0	277
04:30 PM	16	19	0	6	36	23	102	49	7	5	50	1	314
04:45 PM	18	22	0	7	30	35	94	44	2	3	39	1	295
Total	72	76	0	21	133	127	373	185	18	14	205	2	1226
05:00 PM	19	29	0	2	45	25	90	46	5	2	48	0	311
05:15 PM	28	29	0	7	44	27	84	45	8	1	54	2	329
05:30 PM	14	23	0	5	37	34	80	42	3	2	57	0	297
05:45 PM	11	22	0	0	36	27	105	40	4	4	46	1	296
Total	72	103	0	14	162	113	359	173	20	9	205	3	1233
Grand Total	144	179	0	35	295	240	732	358	38	23	410	5	2459
Apprch %	44.6	55.4	0	6.1	51.8	42.1	64.9	31.7	3.4	5.3	93.6	1.1	
Total %	5.9	7.3	0	1.4	12	9.8	29.8	14.6	1.5	0.9	16.7	0.2	
Cars	144	178	0	35	294	240	719	355	38	23	410	5	2441
% Cars	100	99.4	0	100	99.7	100	98.2	99.2	100	100	100	100	99.3
Trucks	0	1	0	0	1	0	13	3	0	0	0	0	18
% Trucks	0	0.6	0	0	0.3	0	1.8	0.8	0	0	0	0	0.7

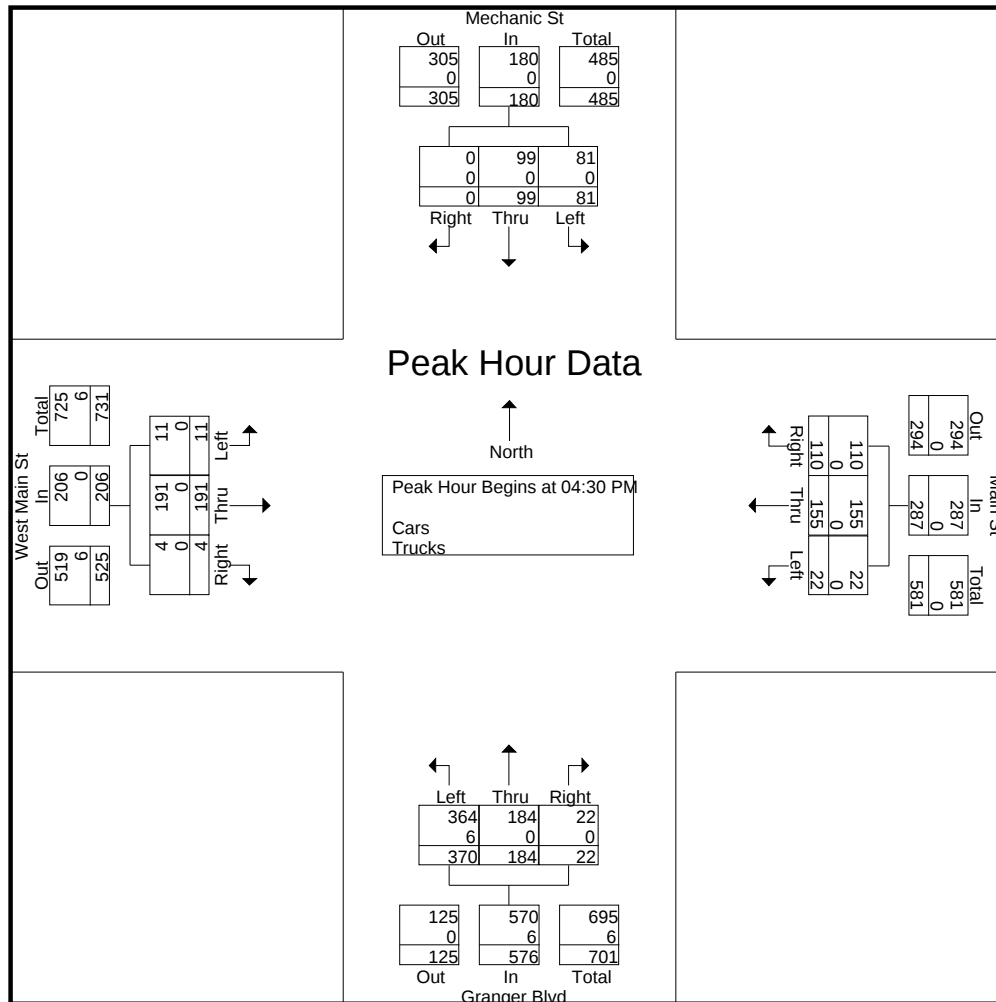
	Mechanic St From North				Main St From East				Granger Blvd From South				West Main St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	16	19	0	35	6	36	23	65	102	49	7	158	5	50	1	56	314
04:45 PM	18	22	0	40	7	30	35	72	94	44	2	140	3	39	1	43	295
05:00 PM	19	29	0	48	2	45	25	72	90	46	5	141	2	48	0	50	311
05:15 PM	28	29	0	57	7	44	27	78	84	45	8	137	1	54	2	57	329
Total Volume	81	99	0	180	22	155	110	287	370	184	22	576	11	191	4	206	1249
% App. Total	45	55	0		7.7	54	38.3		64.2	31.9	3.8		5.3	92.7	1.9		
PHF	.723	.853	.000	.789	.786	.861	.786	.920	.907	.939	.688	.911	.550	.884	.500	.904	.949
Cars	81	99	0	180	22	155	110	287	364	184	22	570	11	191	4	206	1243
% Cars	100	100	0	100	100	100	100	100	98.4	100	100	99.0	100	100	100	100	99.5
Trucks	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	6
% Trucks	0	0	0	0	0	0	0	0	1.6	0	0	1.0	0	0	0	0	0.5

Accurate Counts

978-664-2565

N/S Street : Mechanic St / Granger Blvd
 E/W Street : Main St / West Main St
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990004
 Site Code : 92990004
 Start Date : 3/23/2022
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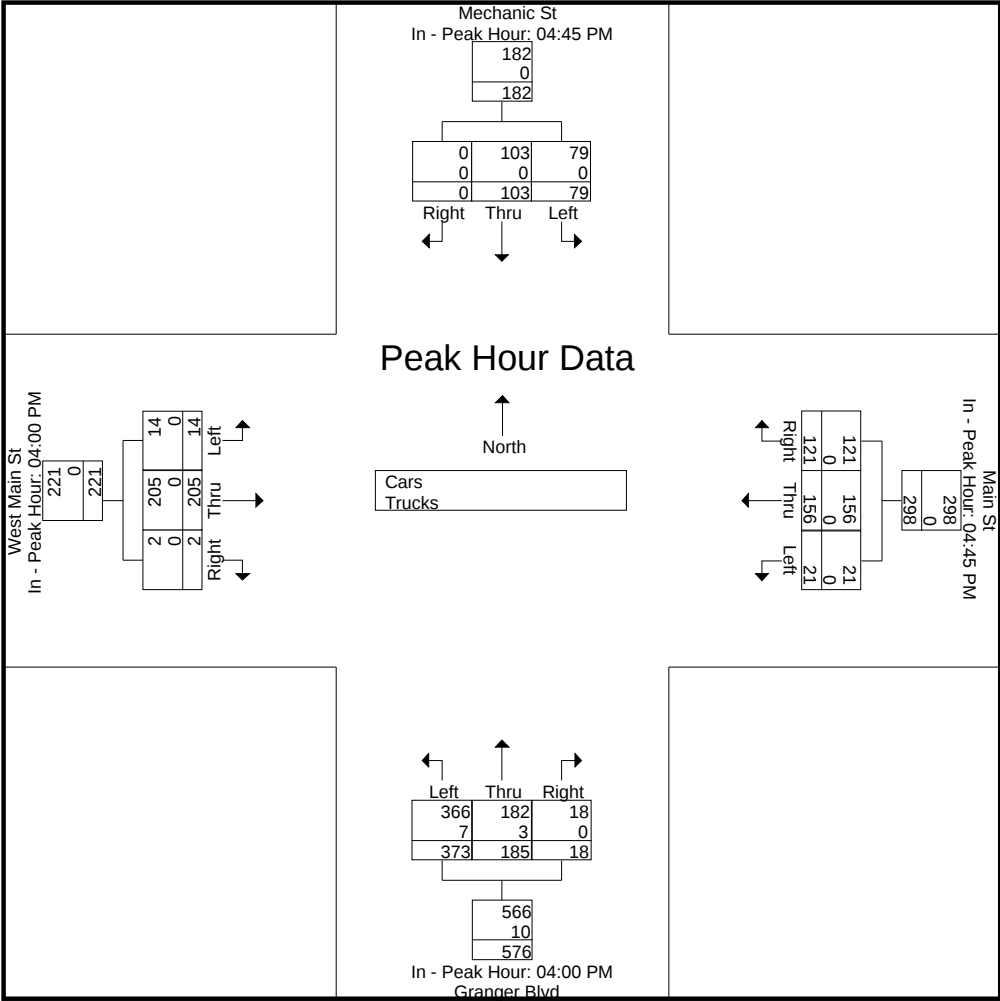


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:00 PM				04:00 PM			
+0 mins.	18	22	0	40	7	30	35	72	92	50	7	149	4	57	0	61
+15 mins.	19	29	0	48	2	45	25	72	85	42	2	129	2	59	0	61
+30 mins.	28	29	0	57	7	44	27	78	102	49	7	158	5	50	1	56
+45 mins.	14	23	0	37	5	37	34	76	94	44	2	140	3	39	1	43
Total Volume	79	103	0	182	21	156	121	298	373	185	18	576	14	205	2	221
% App. Total	43.4	56.6	0		7	52.3	40.6		64.8	32.1	3.1		6.3	92.8	0.9	
PHF	.705	.888	.000	.798	.750	.867	.864	.955	.914	.925	.643	.911	.700	.869	.500	.906
Cars	79	103	0	182	21	156	121	298	366	182	18	566	14	205	2	221
% Cars	100	100	0	100	100	100	100	100	98.1	98.4	100	98.3	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	7	3	0	10	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	1.9	1.6	0	1.7	0	0	0	0

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
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Accurate Counts

978-664-2565

N/S Street : Mechanic St / Granger Blvd

E/W Street : Main St / West Main St

City/State : Marlborough, MA

Weather : Clear

File Name : 92990004

Site Code : 92990004

Start Date : 3/23/2022

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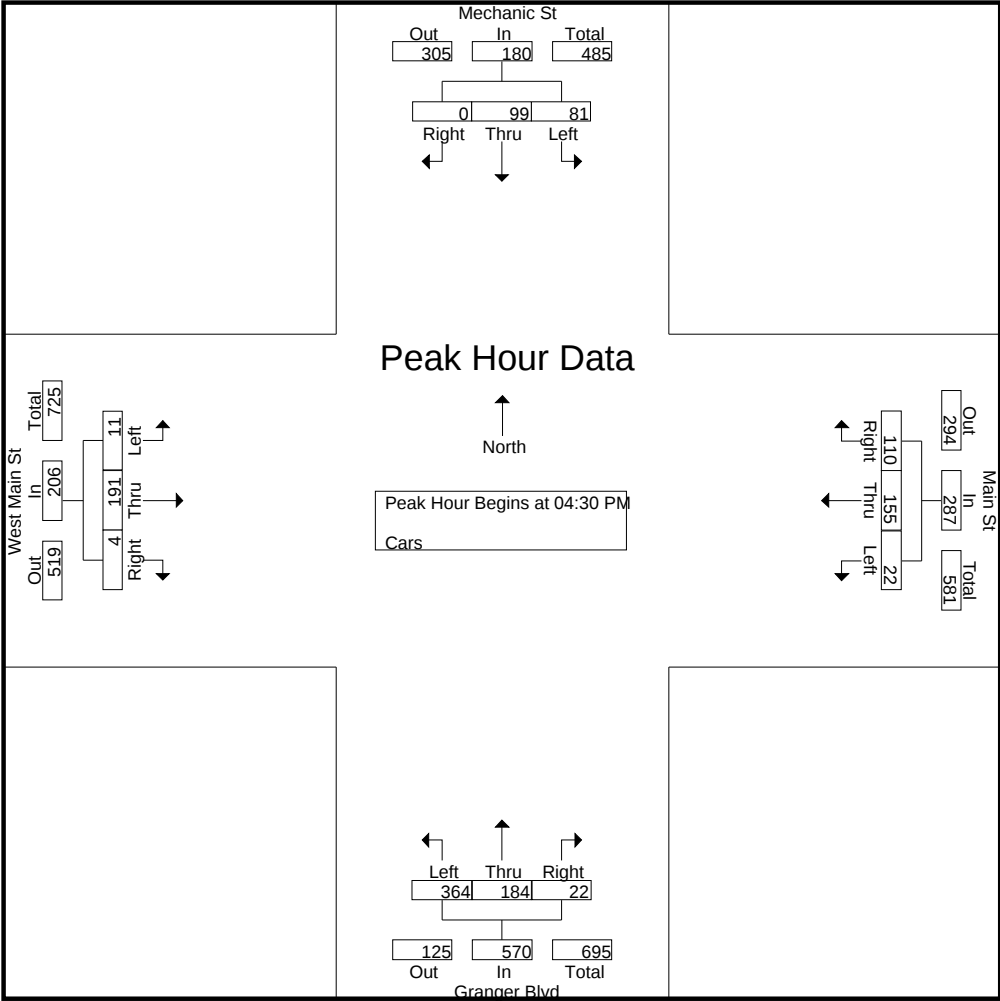
Groups Printed- Cars

	Mechanic St From North			Main St From East			Granger Blvd From South			West Main St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	25	20	0	7	31	46	89	48	7	4	57	0	334
04:15 PM	13	14	0	1	36	23	81	41	2	2	59	0	272
04:30 PM	16	19	0	6	36	23	102	49	7	5	50	1	314
04:45 PM	18	22	0	7	30	35	94	44	2	3	39	1	295
Total	72	75	0	21	133	127	366	182	18	14	205	2	1215
05:00 PM	19	29	0	2	45	25	88	46	5	2	48	0	309
05:15 PM	28	29	0	7	44	27	80	45	8	1	54	2	325
05:30 PM	14	23	0	5	37	34	80	42	3	2	57	0	297
05:45 PM	11	22	0	0	35	27	105	40	4	4	46	1	295
Total	72	103	0	14	161	113	353	173	20	9	205	3	1226
Grand Total	144	178	0	35	294	240	719	355	38	23	410	5	2441
Apprch %	44.7	55.3	0	6.2	51.7	42.2	64.7	31.9	3.4	5.3	93.6	1.1	
Total %	5.9	7.3	0	1.4	12	9.8	29.5	14.5	1.6	0.9	16.8	0.2	

	Mechanic St From North				Main St From East				Granger Blvd From South				West Main St From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	16	19	0	35	6	36	23	65	102	49	7	158	5	50	1	56	314
04:45 PM	18	22	0	40	7	30	35	72	94	44	2	140	3	39	1	43	295
05:00 PM	19	29	0	48	2	45	25	72	88	46	5	139	2	48	0	50	309
05:15 PM	28	29	0	57	7	44	27	78	80	45	8	133	1	54	2	57	325
Total Volume	81	99	0	180	22	155	110	287	364	184	22	570	11	191	4	206	1243
% App. Total	45	55	0		7.7	54	38.3		63.9	32.3	3.9		5.3	92.7	1.9		
PHF	.723	.853	.000	.789	.786	.861	.786	.920	.892	.939	.688	.902	.550	.884	.500	.904	.956

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
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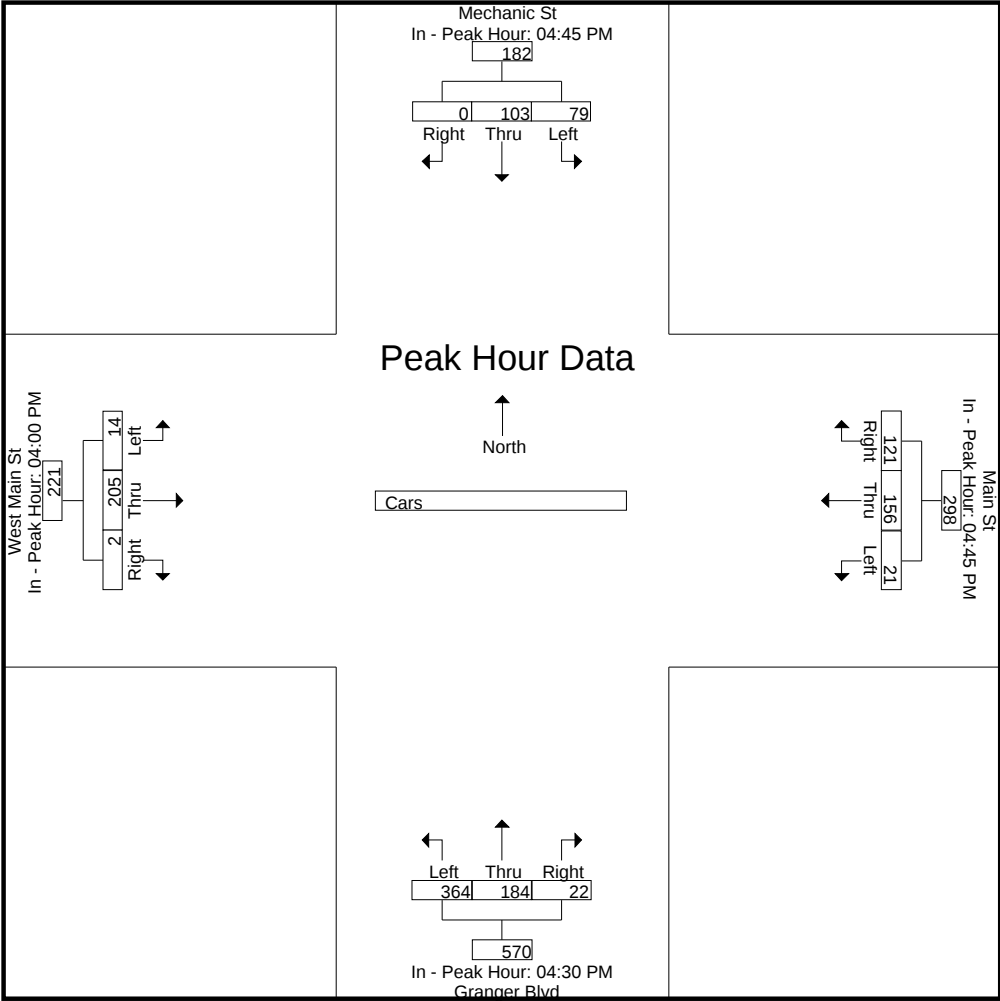


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:30 PM				04:00 PM			
+0 mins.	18	22	0	40	7	30	35	72	102	49	7	158	4	57	0	61
+15 mins.	19	29	0	48	2	45	25	72	94	44	2	140	2	59	0	61
+30 mins.	28	29	0	57	7	44	27	78	88	46	5	139	5	50	1	56
+45 mins.	14	23	0	37	5	37	34	76	80	45	8	133	3	39	1	43
Total Volume	79	103	0	182	21	156	121	298	364	184	22	570	14	205	2	221
% App. Total	43.4	56.6	0		7	52.3	40.6		63.9	32.3	3.9		6.3	92.8	0.9	
PHF	.705	.888	.000	.798	.750	.867	.864	.955	.892	.939	.688	.902	.700	.869	.500	.906

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
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Accurate Counts

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N/S Street : Mechanic St / Granger Blvd

E/W Street : Main St / West Main St

City/State : Marlborough, MA

Weather : Clear

File Name : 92990004

Site Code : 92990004

Start Date : 3/23/2022

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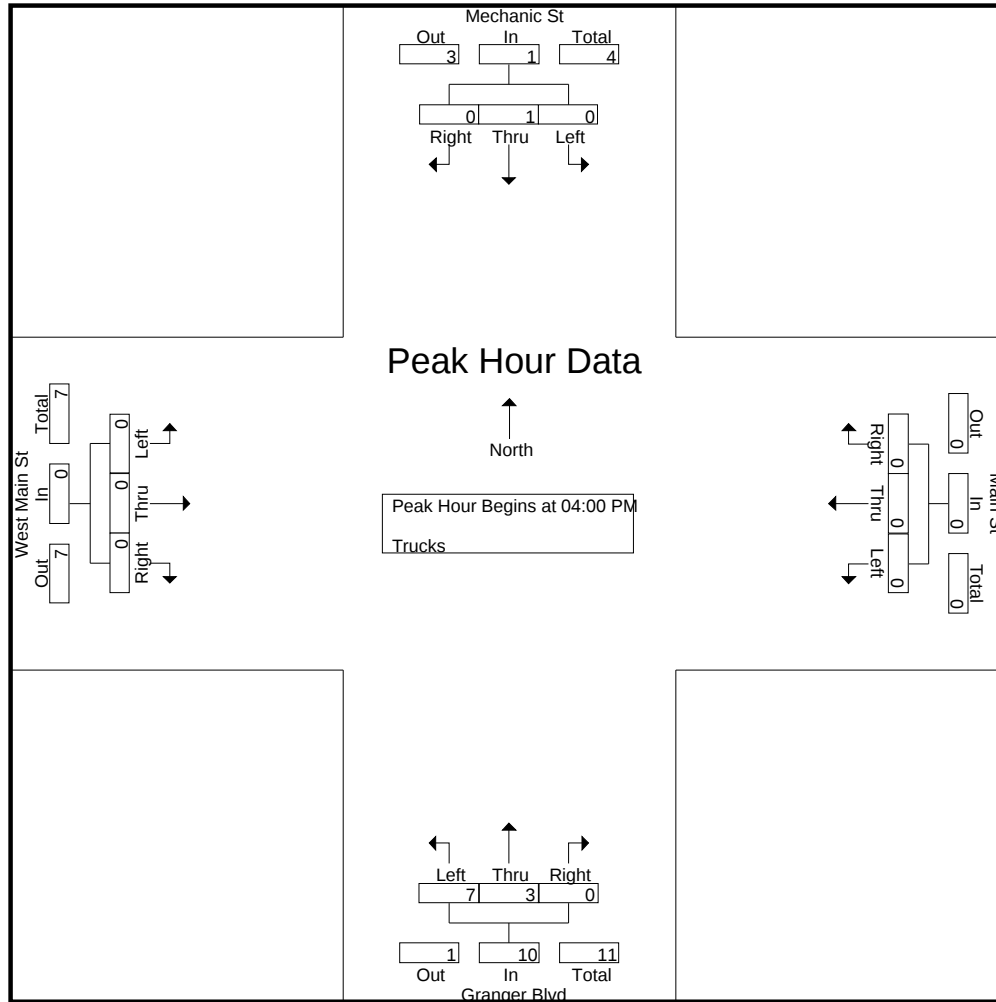
Groups Printed- Trucks

	Mechanic St From North			Main St From East			Granger Blvd From South			West Main St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	0	1	0	0	0	0	3	2	0	0	0	0	6
04:15 PM	0	0	0	0	0	0	4	1	0	0	0	0	5
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	7	3	0	0	0	0	11
05:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	4	0	0	0	0	0	4
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	0	0	0	1	0	6	0	0	0	0	0	7
Grand Total	0	1	0	0	1	0	13	3	0	0	0	0	18
Apprch %	0	100	0	0	100	0	81.2	18.8	0	0	0	0	
Total %	0	5.6	0	0	5.6	0	72.2	16.7	0	0	0	0	

	Mechanic St From North				Main St From East				Granger Blvd From South				West Main St From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	1	0	1	0	0	0	0	3	2	0	5	0	0	0	0	6
04:15 PM	0	0	0	0	0	0	0	0	4	1	0	5	0	0	0	0	5
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	7	3	0	10	0	0	0	0	11
% App. Total	0	100	0		0	0	0		70	30	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.438	.375	.000	.500	.000	.000	.000	.000	.458

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
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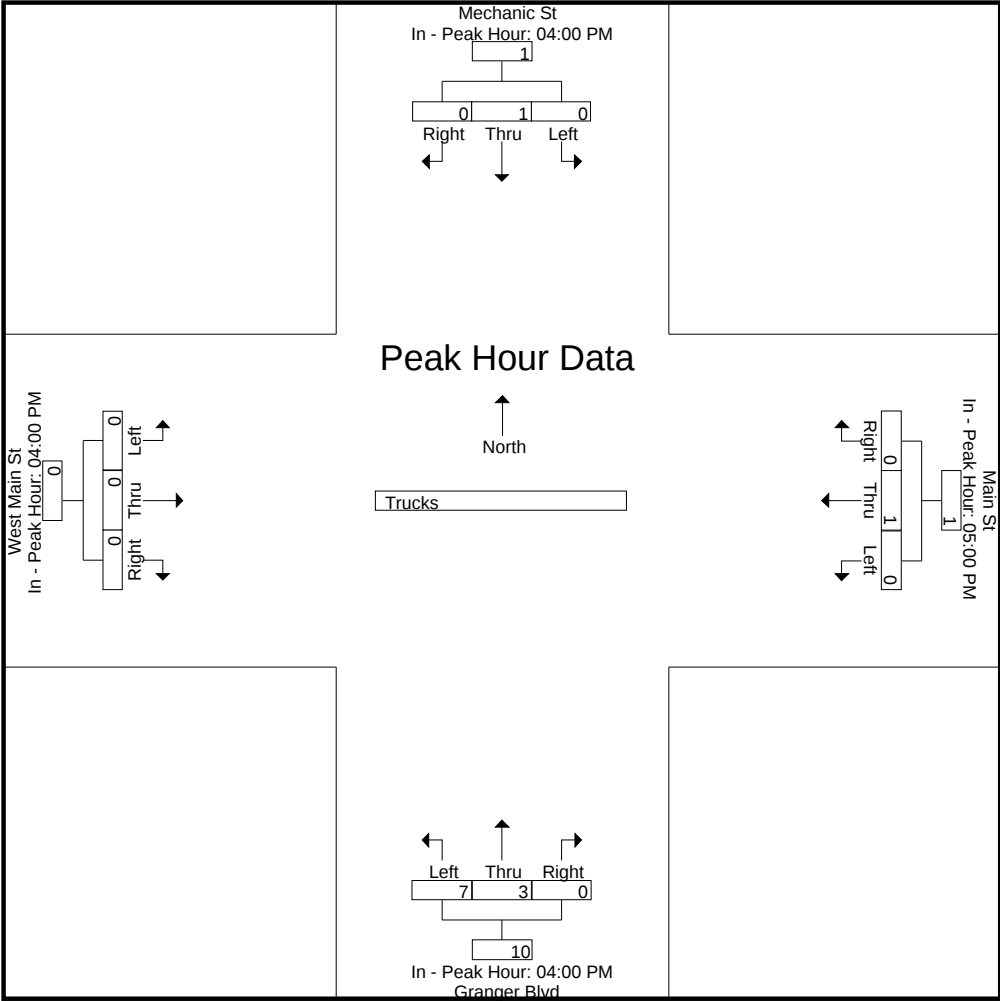


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	1	0	1	0	0	0	0	3	2	0	5	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	4	1	0	5	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	1	0	1	7	3	0	10	0	0	0	0
% App. Total	0	100	0		0	100	0		70	30	0		0	0	0	
PHF	.000	.250	.000	.250	.000	.250	.000	.250	.438	.375	.000	.500	.000	.000	.000	.000

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Mechanic St / Granger Blvd

E/W Street : Main St / West Main St

City/State : Marlborough, MA

Weather : Clear

File Name : 92990004

Site Code : 92990004

Start Date : 3/23/2022

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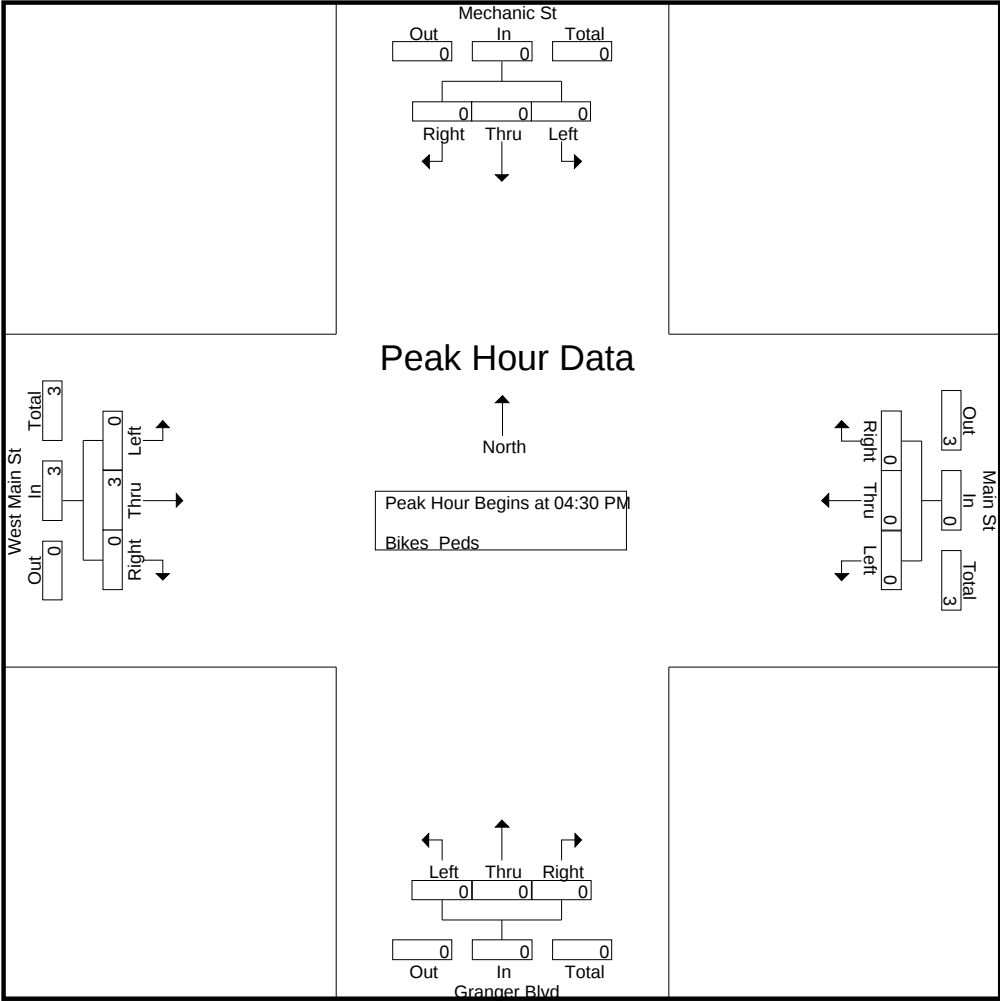
Groups Printed- Bikes Peds

	Mechanic St From North				Main St From East				Granger Blvd From South				West Main St From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2
04:30 PM	0	0	0	0	0	0	0	1	0	0	0	4	0	1	0	0	5	1	6
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
Total	0	0	0	1	0	0	0	1	0	0	0	6	0	1	0	0	8	1	9
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
05:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2
05:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	2	4	2	6
Grand Total	0	0	0	1	0	0	0	3	0	0	0	6	0	3	0	2	12	3	15
Apprch %	0	0	0		0	0	0		0	0	0		0	100	0				
Total %	0	0	0		0	0	0		0	0	0		0	100	0		80	20	

	Mechanic St From North				Main St From East				Granger Blvd From South				West Main St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	3
% App. Total	0	0	0		0	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.750	.000	.750	.750

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
Page No : 11

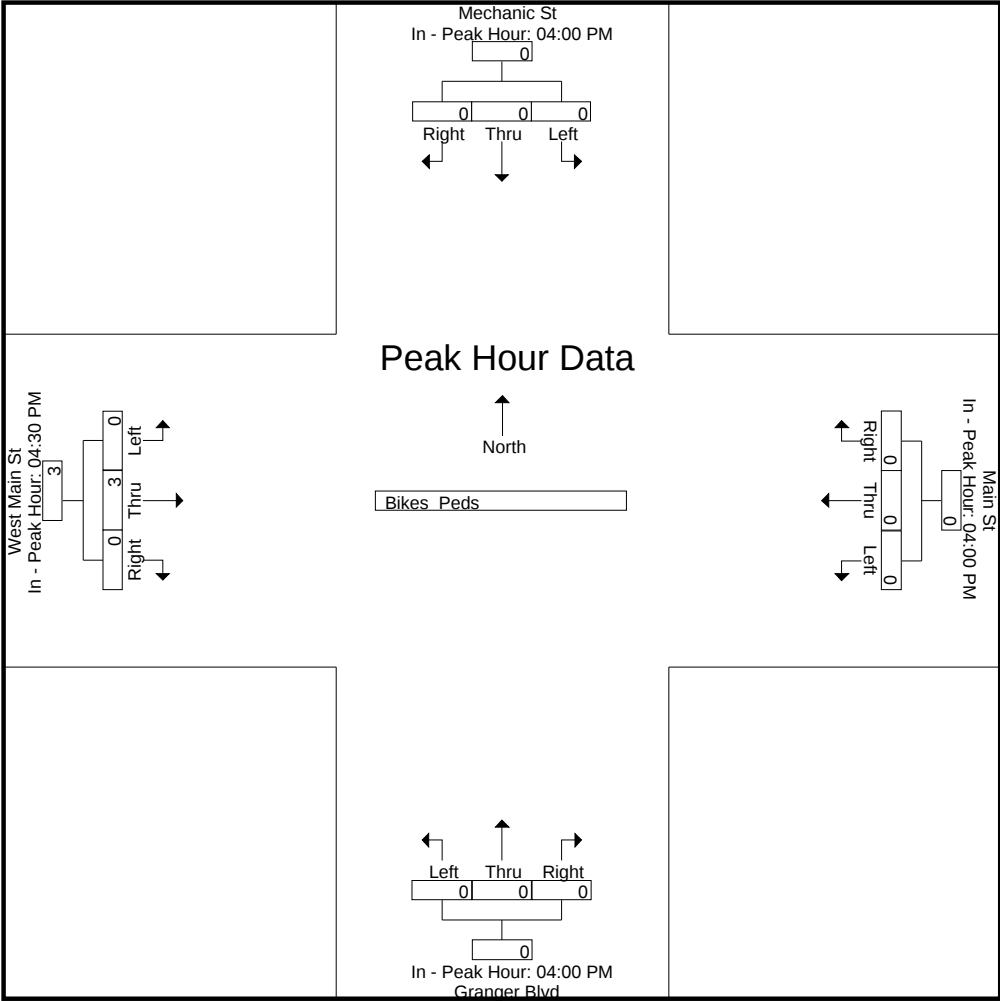


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:30 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
% App. Total	0	0	0		0	0	0		0	0	0		0	100	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.750	.000	.750

N/S Street : Mechanic St / Granger Blvd
E/W Street : Main St / West Main St
City/State : Marlborough, MA
Weather : Clear

File Name : 92990004
Site Code : 92990004
Start Date : 3/23/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Bates Ave / Granger Blvd

E/W Street : West Main Street

City/State : Marlborough, MA

Weather : Clear

File Name : 92990005

Site Code : 92990005

Start Date : 3/23/2022

Page No : 1

Groups Printed- Cars - Trucks

	Bates Ave From North			W Main St From East			Granger Blvd From South			West Main St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	0	0	0	75	0	0	0	0	0	17	83	175
07:15 AM	0	0	5	0	115	0	0	0	0	0	30	101	251
07:30 AM	0	1	7	0	104	0	0	0	0	0	33	95	240
07:45 AM	0	0	5	0	97	0	0	0	0	0	40	126	268
Total	0	1	17	0	391	0	0	0	0	0	120	405	934
08:00 AM	0	0	8	0	114	0	0	0	0	0	40	121	283
08:15 AM	0	0	4	0	95	0	0	0	0	0	40	91	230
08:30 AM	0	0	2	0	107	0	0	0	0	0	57	100	266
08:45 AM	0	0	13	0	104	0	0	0	0	0	47	107	271
Total	0	0	27	0	420	0	0	0	0	0	184	419	1050
Grand Total	0	1	44	0	811	0	0	0	0	0	304	824	1984
Apprch %	0	2.2	97.8	0	100	0	0	0	0	0	27	73	
Total %	0	0.1	2.2	0	40.9	0	0	0	0	0	15.3	41.5	
Cars	0	1	44	0	777	0	0	0	0	0	298	781	1901
% Cars	0	100	100	0	95.8	0	0	0	0	0	98	94.8	95.8
Trucks	0	0	0	0	34	0	0	0	0	0	6	43	83
% Trucks	0	0	0	0	4.2	0	0	0	0	0	2	5.2	4.2

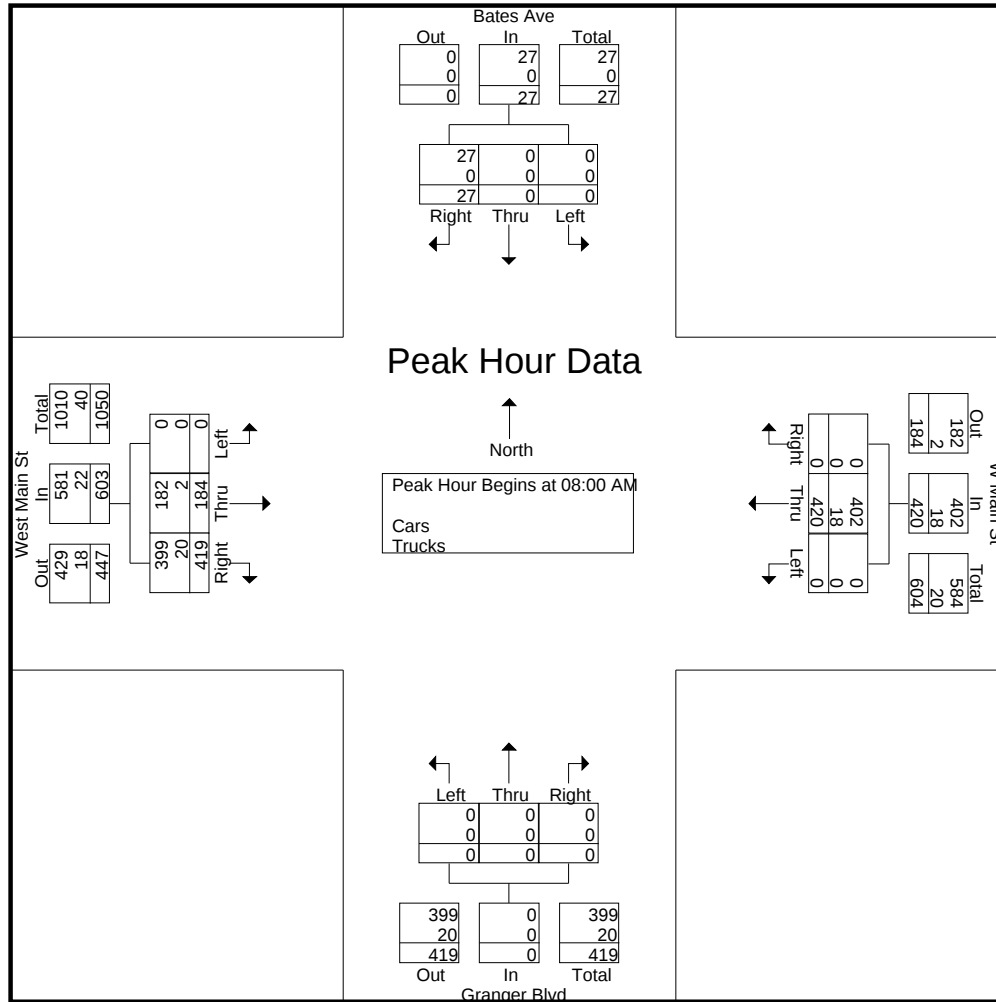
	Bates Ave From North				W Main St From East				Granger Blvd From South				West Main St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	8	8	0	114	0	114	0	0	0	0	0	40	121	161	283
08:15 AM	0	0	4	4	0	95	0	95	0	0	0	0	0	40	91	131	230
08:30 AM	0	0	2	2	0	107	0	107	0	0	0	0	0	57	100	157	266
08:45 AM	0	0	13	13	0	104	0	104	0	0	0	0	0	47	107	154	271
Total Volume	0	0	27	27	0	420	0	420	0	0	0	0	0	184	419	603	1050
% App. Total	0	0	100		0	100	0		0	0	0		0	30.5	69.5		
PHF	.000	.000	.519	.519	.000	.921	.000	.921	.000	.000	.000	.000	.000	.807	.866	.936	.928
Cars	0	0	27	27	0	402	0	402	0	0	0	0	0	182	399	581	1010
% Cars	0	0	100	100	0	95.7	0	95.7	0	0	0	0	0	98.9	95.2	96.4	96.2
Trucks	0	0	0	0	0	18	0	18	0	0	0	0	0	2	20	22	40
% Trucks	0	0	0	0	0	4.3	0	4.3	0	0	0	0	0	1.1	4.8	3.6	3.8

Accurate Counts

978-664-2565

N/S Street : Bates Ave / Granger Blvd
 E/W Street : West Main Street
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990005
 Site Code : 92990005
 Start Date : 3/23/2022
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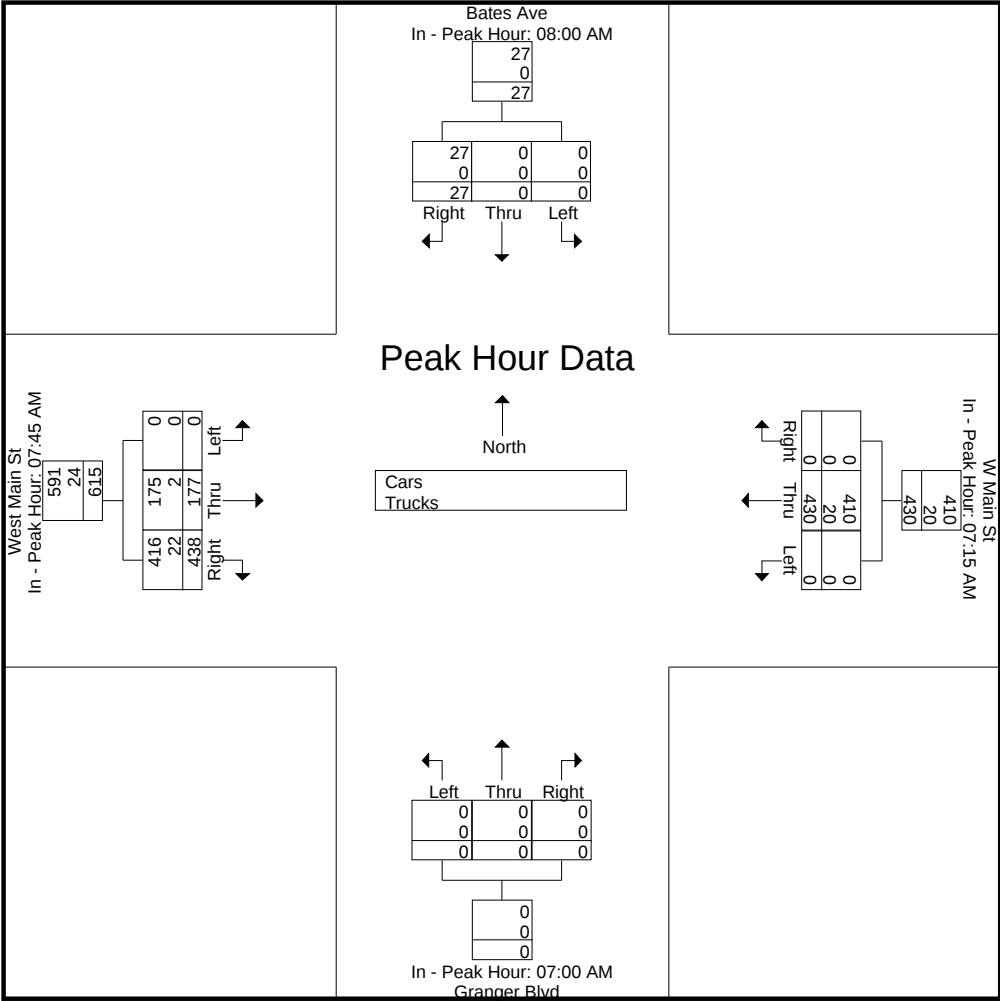


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	08:00 AM				07:15 AM				07:00 AM				07:45 AM			
+0 mins.	0	0	8	8	0	115	0	115	0	0	0	0	0	40	126	166
+15 mins.	0	0	4	4	0	104	0	104	0	0	0	0	0	40	121	161
+30 mins.	0	0	2	2	0	97	0	97	0	0	0	0	0	40	91	131
+45 mins.	0	0	13	13	0	114	0	114	0	0	0	0	0	57	100	157
Total Volume	0	0	27	27	0	430	0	430	0	0	0	0	0	177	438	615
% App. Total	0	0	100		0	100	0		0	0	0		0	28.8	71.2	
PHF	.000	.000	.519	.519	.000	.935	.000	.935	.000	.000	.000	.000	.000	.776	.869	.926
Cars	0	0	27	27	0	410	0	410	0	0	0	0	0	175	416	591
% Cars	0	0	100	100	0	95.3	0	95.3	0	0	0	0	0	98.9	95	96.1
Trucks	0	0	0	0	0	20	0	20	0	0	0	0	0	2	22	24
% Trucks	0	0	0	0	0	4.7	0	4.7	0	0	0	0	0	1.1	5	3.9

N/S Street : Bates Ave / Granger Blvd
E/W Street : West Main Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990005
Site Code : 92990005
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Bates Ave / Granger Blvd
E/W Street : West Main Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990005
Site Code : 92990005
Start Date : 3/23/2022
Page No : 4

Groups Printed- Cars

	Bates Ave From North			W Main St From East			Granger Blvd From South			West Main St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	0	0	0	73	0	0	0	0	0	16	74	163
07:15 AM	0	0	5	0	113	0	0	0	0	0	30	96	244
07:30 AM	0	1	7	0	95	0	0	0	0	0	30	92	225
07:45 AM	0	0	5	0	94	0	0	0	0	0	40	120	259
Total	0	1	17	0	375	0	0	0	0	0	116	382	891
08:00 AM	0	0	8	0	108	0	0	0	0	0	40	117	273
08:15 AM	0	0	4	0	91	0	0	0	0	0	40	90	225
08:30 AM	0	0	2	0	103	0	0	0	0	0	55	89	249
08:45 AM	0	0	13	0	100	0	0	0	0	0	47	103	263
Total	0	0	27	0	402	0	0	0	0	0	182	399	1010
Grand Total	0	1	44	0	777	0	0	0	0	0	298	781	1901
Apprch %	0	2.2	97.8	0	100	0	0	0	0	0	27.6	72.4	
Total %	0	0.1	2.3	0	40.9	0	0	0	0	0	15.7	41.1	

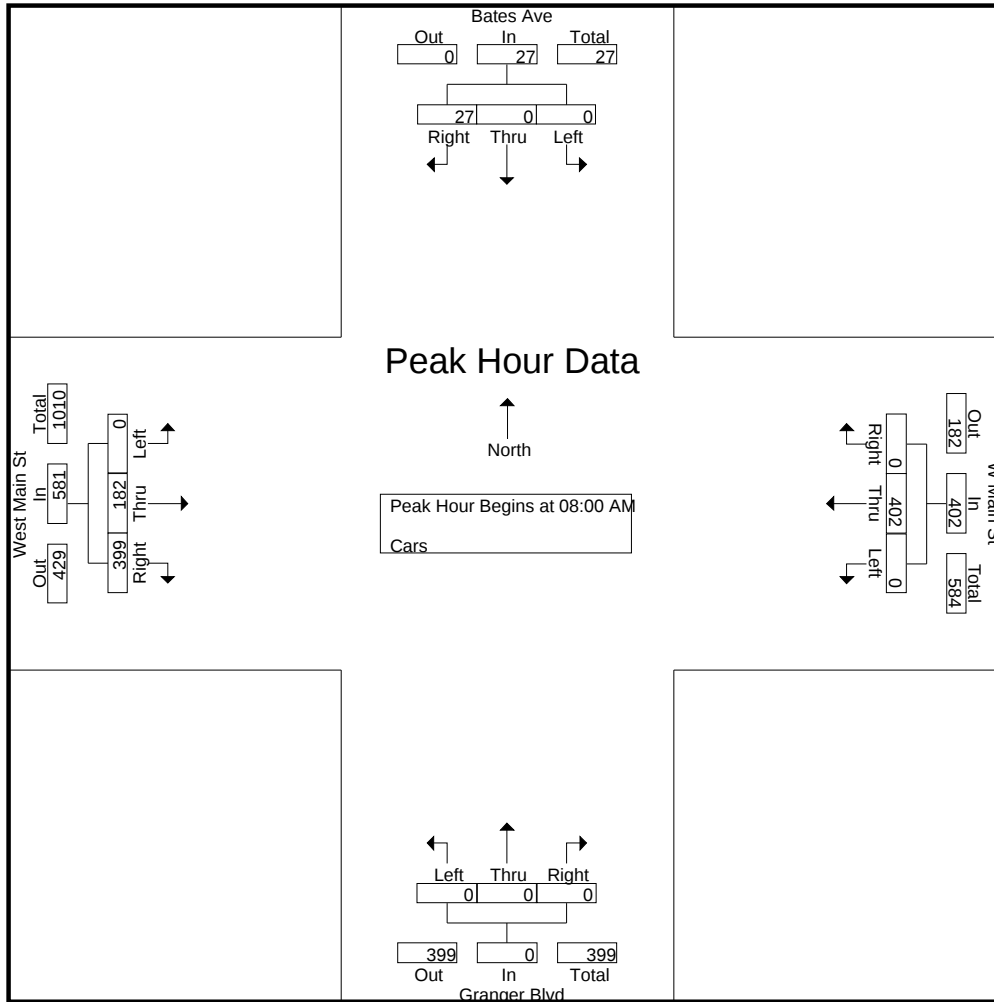
	Bates Ave From North				W Main St From East				Granger Blvd From South				West Main St From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	8	8	0	108	0	108	0	0	0	0	0	40	117	157	273
08:15 AM	0	0	4	4	0	91	0	91	0	0	0	0	0	40	90	130	225
08:30 AM	0	0	2	2	0	103	0	103	0	0	0	0	0	55	89	144	249
08:45 AM	0	0	13	13	0	100	0	100	0	0	0	0	0	47	103	150	263
Total Volume	0	0	27	27	0	402	0	402	0	0	0	0	0	182	399	581	1010
% App. Total	0	0	100		0	100	0		0	0	0		0	31.3	68.7		
PHF	.000	.000	.519	.519	.000	.931	.000	.931	.000	.000	.000	.000	.000	.827	.853	.925	.925

Accurate Counts

978-664-2565

N/S Street : Bates Ave / Granger Blvd
 E/W Street : West Main Street
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990005
 Site Code : 92990005
 Start Date : 3/23/2022
 Page No : 5

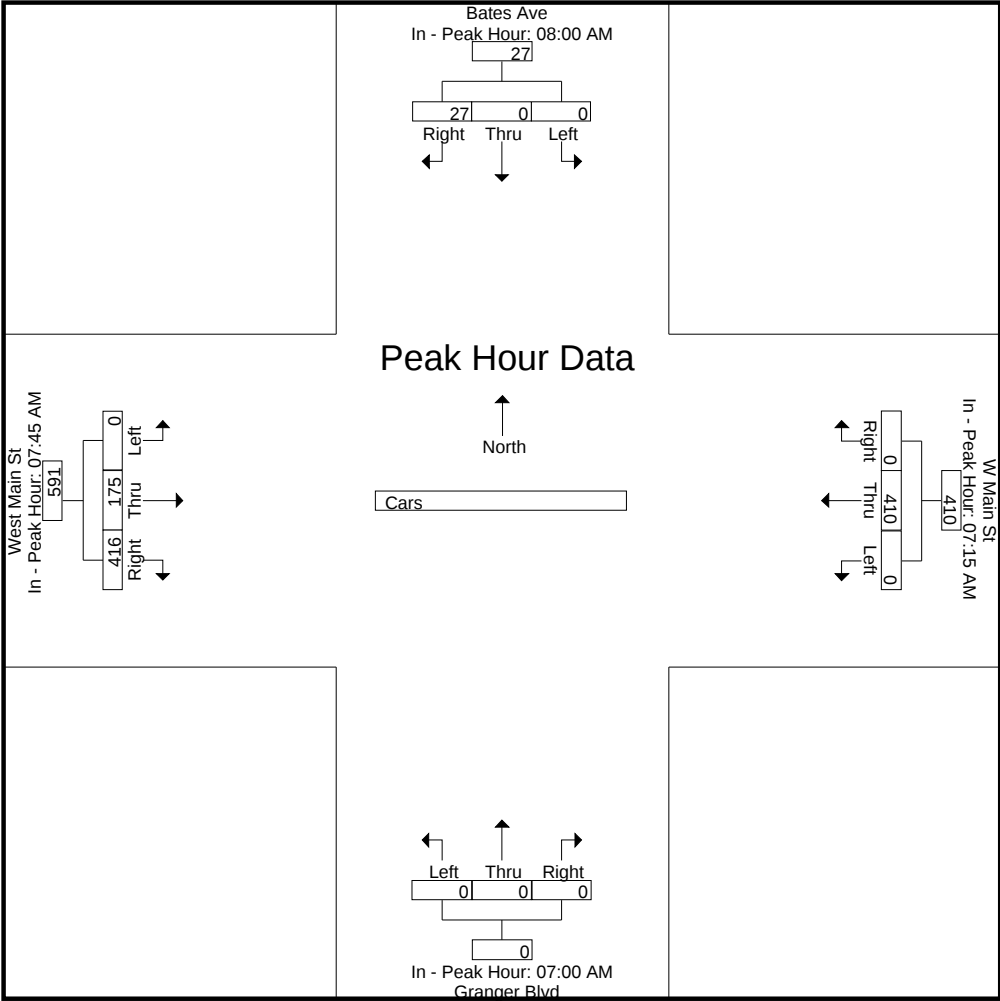


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	08:00 AM				07:15 AM				07:00 AM				07:45 AM			
+0 mins.	0	0	8	8	0	113	0	113	0	0	0	0	0	40	120	160
+15 mins.	0	0	4	4	0	95	0	95	0	0	0	0	0	40	117	157
+30 mins.	0	0	2	2	0	94	0	94	0	0	0	0	0	40	90	130
+45 mins.	0	0	13	13	0	108	0	108	0	0	0	0	0	55	89	144
Total Volume	0	0	27	27	0	410	0	410	0	0	0	0	0	175	416	591
% App. Total	0	0	100		0	100	0		0	0	0		0	29.6	70.4	
PHF	.000	.000	.519	.519	.000	.907	.000	.907	.000	.000	.000	.000	.000	.795	.867	.923

N/S Street : Bates Ave / Granger Blvd
E/W Street : West Main Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990005
Site Code : 92990005
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Bates Ave / Granger Blvd

E/W Street : West Main Street

City/State : Marlborough, MA

Weather : Clear

File Name : 92990005

Site Code : 92990005

Start Date : 3/23/2022

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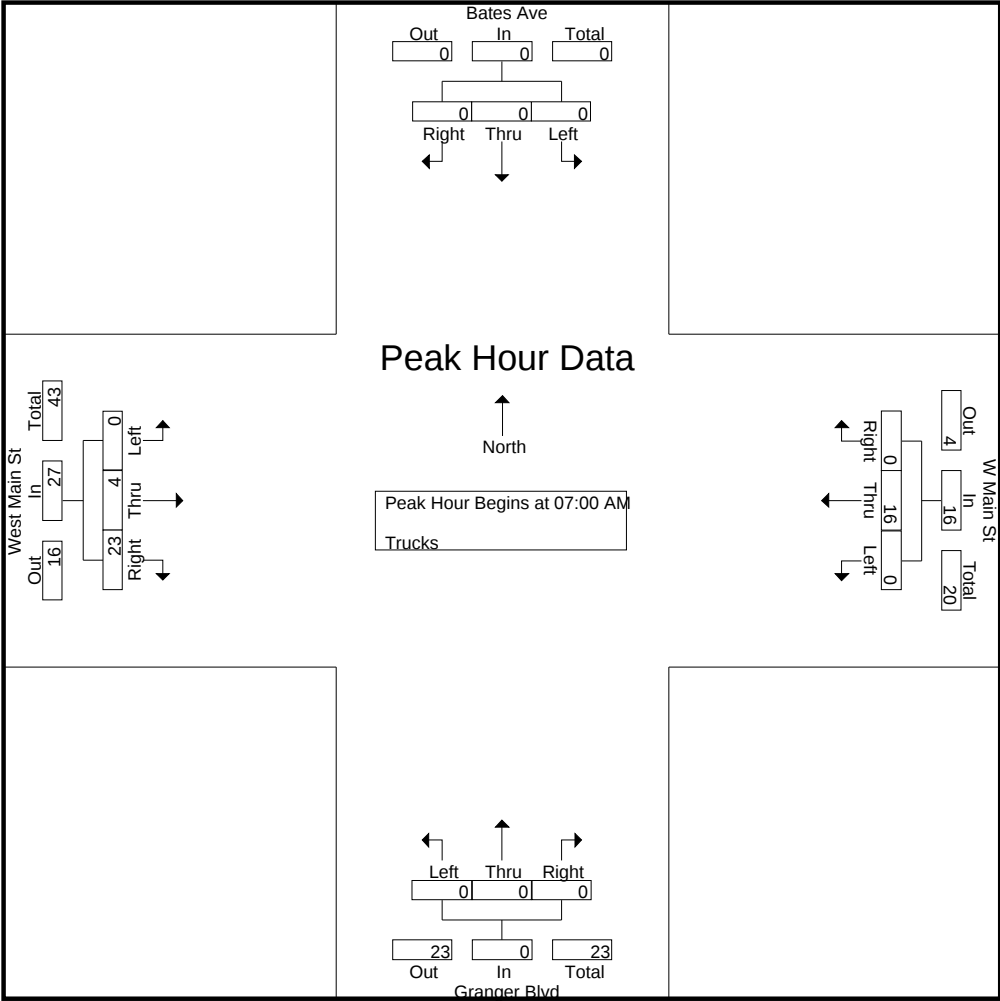
Groups Printed- Trucks

	Bates Ave From North			W Main St From East			Granger Blvd From South			West Main St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	0	0	0	2	0	0	0	0	0	1	9	12
07:15 AM	0	0	0	0	2	0	0	0	0	0	0	5	7
07:30 AM	0	0	0	0	9	0	0	0	0	0	3	3	15
07:45 AM	0	0	0	0	3	0	0	0	0	0	0	6	9
Total	0	0	0	0	16	0	0	0	0	0	4	23	43
08:00 AM	0	0	0	0	6	0	0	0	0	0	0	4	10
08:15 AM	0	0	0	0	4	0	0	0	0	0	0	1	5
08:30 AM	0	0	0	0	4	0	0	0	0	0	2	11	17
08:45 AM	0	0	0	0	4	0	0	0	0	0	0	4	8
Total	0	0	0	0	18	0	0	0	0	0	2	20	40
Grand Total	0	0	0	0	34	0	0	0	0	0	6	43	83
Apprch %	0	0	0	0	100	0	0	0	0	0	12.2	87.8	
Total %	0	0	0	0	41	0	0	0	0	0	7.2	51.8	

	Bates Ave From North				W Main St From East				Granger Blvd From South				West Main St From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. 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	2	0	2	0	0	0	0	0	1	9	10	12
07:15 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	5	5	7
07:30 AM	0	0	0	0	0	9	0	9	0	0	0	0	0	3	3	6	15
07:45 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	0	6	6	9
Total Volume	0	0	0	0	0	16	0	16	0	0	0	0	0	4	23	27	43
% App. Total	0	0	0		0	100	0		0	0	0		0	14.8	85.2		
PHF	.000	.000	.000	.000	.000	.444	.000	.444	.000	.000	.000	.000	.000	.333	.639	.675	.717

N/S Street : Bates Ave / Granger Blvd
E/W Street : West Main Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990005
Site Code : 92990005
Start Date : 3/23/2022
Page No : 8

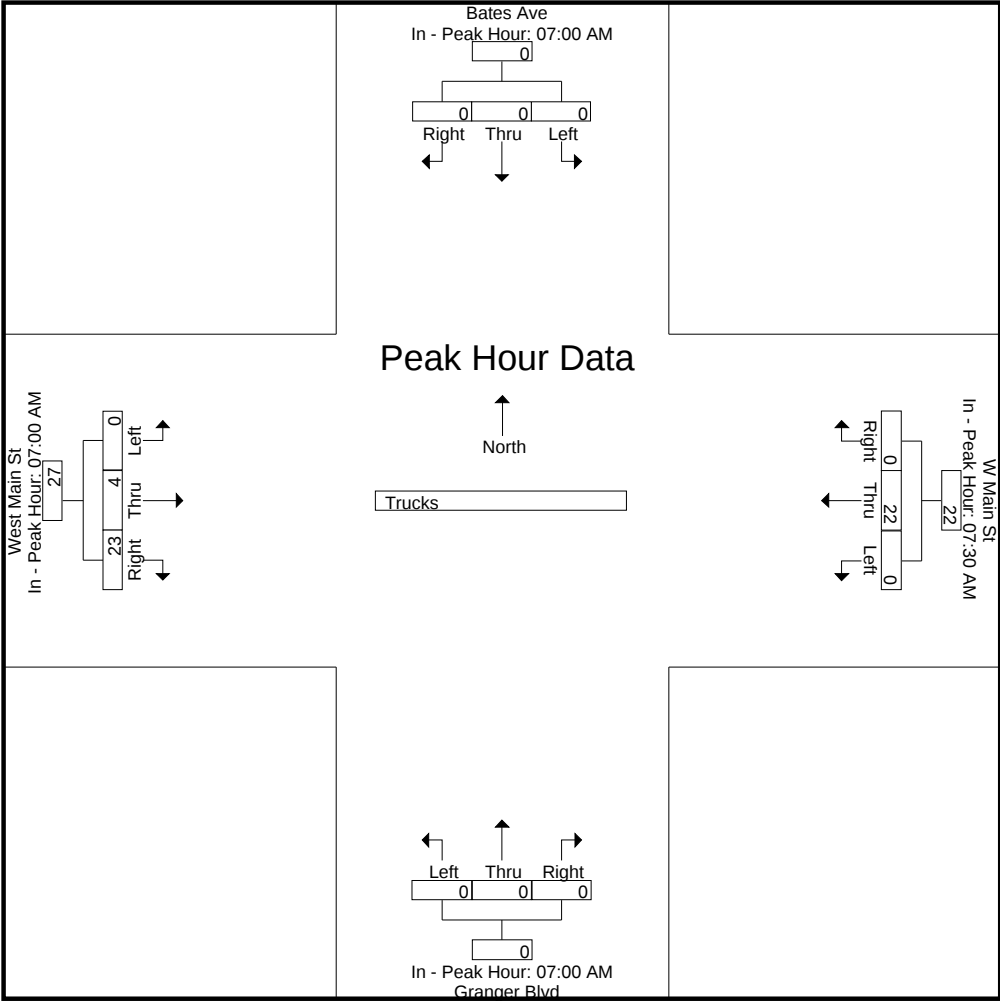


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:30 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	9	0	9	0	0	0	0	0	1	9	10
+15 mins.	0	0	0	0	0	3	0	3	0	0	0	0	0	0	5	5
+30 mins.	0	0	0	0	0	6	0	6	0	0	0	0	0	3	3	6
+45 mins.	0	0	0	0	0	4	0	4	0	0	0	0	0	0	6	6
Total Volume	0	0	0	0	0	22	0	22	0	0	0	0	0	4	23	27
% App. Total	0	0	0		0	100	0		0	0	0		0	14.8	85.2	
PHF	.000	.000	.000	.000	.000	.611	.000	.611	.000	.000	.000	.000	.000	.333	.639	.675

N/S Street : Bates Ave / Granger Blvd
E/W Street : West Main Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990005
Site Code : 92990005
Start Date : 3/23/2022
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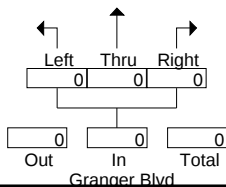
Page No : 10

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978-664-2565

Weather : Clear

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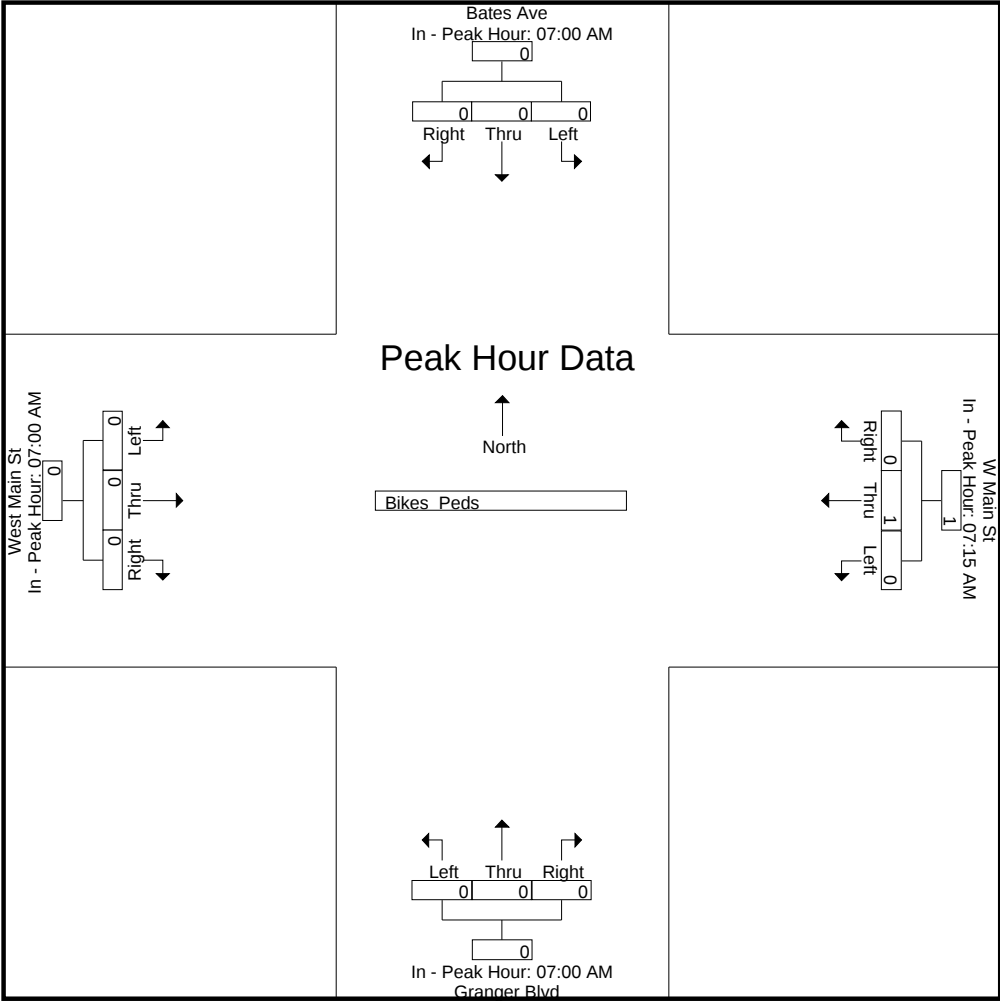


Peak Hour for Each Approach Begins at:

Earliest Approach Begins at:																
	07:00 AM				07:15 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Bates Ave / Granger Blvd
E/W Street : West Main Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990005
Site Code : 92990005
Start Date : 3/23/2022
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Bates Ave / Granger Blvd

E/W Street : West Main Street

City/State : Marlborough, MA

Weather : Clear

File Name : 92990005

Site Code : 92990005

Start Date : 3/23/2022

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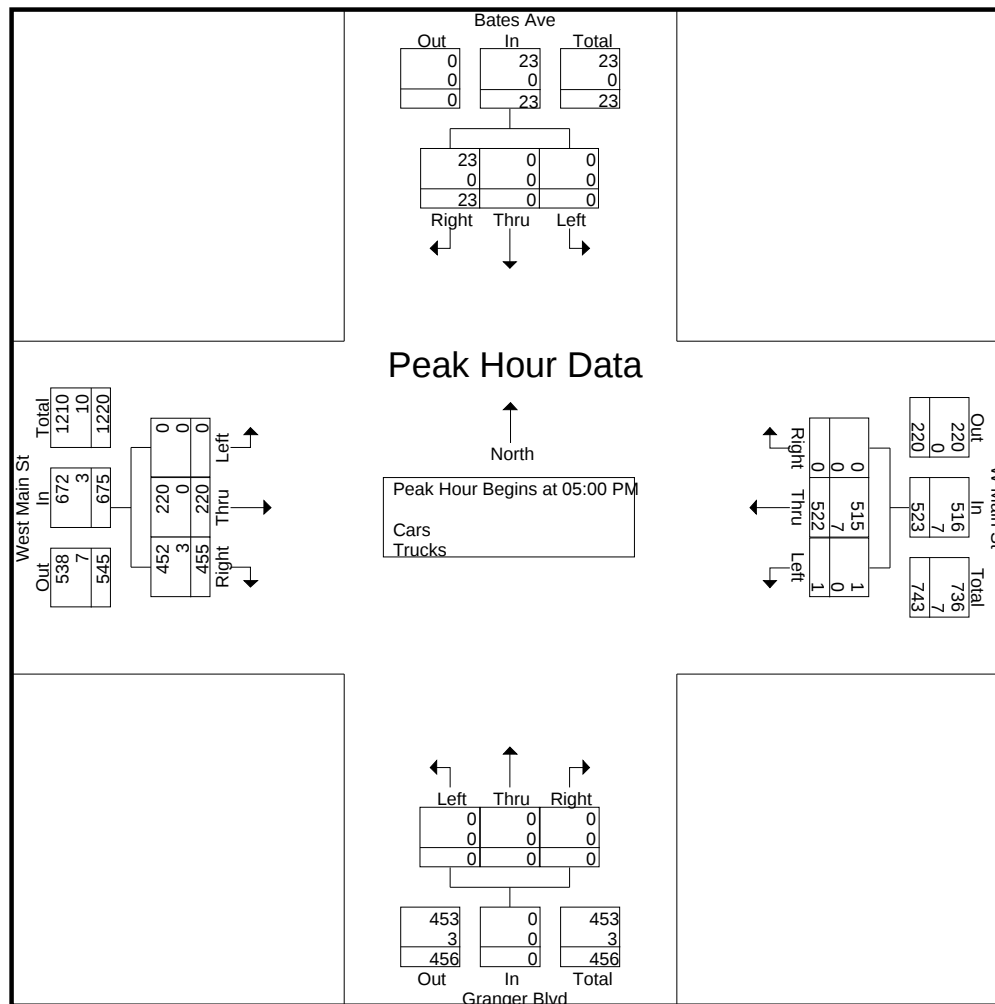
Groups Printed- Cars - Trucks

	Bates Ave From North			W Main St From East			Granger Blvd From South			West Main St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	0	0	4	0	127	0	0	0	0	0	62	78	271
04:15 PM	0	0	3	0	122	0	0	0	0	0	66	108	299
04:30 PM	0	0	11	0	131	0	0	0	0	0	50	91	283
04:45 PM	0	0	8	1	121	0	0	0	0	0	45	94	269
Total	0	0	26	1	501	0	0	0	0	0	223	371	1122
05:00 PM	0	0	6	0	138	0	0	0	0	0	48	102	294
05:15 PM	0	0	4	1	128	0	0	0	0	0	57	132	322
05:30 PM	0	0	3	0	116	0	0	0	0	0	60	109	288
05:45 PM	0	0	10	0	140	0	0	0	0	0	55	112	317
Total	0	0	23	1	522	0	0	0	0	0	220	455	1221
Grand Total	0	0	49	2	1023	0	0	0	0	0	443	826	2343
Apprch %	0	0	100	0.2	99.8	0	0	0	0	0	34.9	65.1	
Total %	0	0	2.1	0.1	43.7	0	0	0	0	0	18.9	35.3	
Cars	0	0	49	2	1009	0	0	0	0	0	443	818	2321
% Cars	0	0	100	100	98.6	0	0	0	0	0	100	99	99.1
Trucks	0	0	0	0	14	0	0	0	0	0	0	8	22
% Trucks	0	0	0	0	1.4	0	0	0	0	0	0	1	0.9

	Bates Ave From North				W Main St From East				Granger Blvd From South				West Main St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	6	6	0	138	0	138	0	0	0	0	0	48	102	150	294
05:15 PM	0	0	4	4	1	128	0	129	0	0	0	0	0	57	132	189	322
05:30 PM	0	0	3	3	0	116	0	116	0	0	0	0	0	60	109	169	288
05:45 PM	0	0	10	10	0	140	0	140	0	0	0	0	0	55	112	167	317
Total Volume	0	0	23	23	1	522	0	523	0	0	0	0	0	220	455	675	1221
% App. Total	0	0	100		0.2	99.8	0		0	0	0		0	32.6	67.4		
PHF	.000	.000	.575	.575	.250	.932	.000	.934	.000	.000	.000	.000	.000	.917	.862	.893	.948
Cars	0	0	23	23	1	515	0	516	0	0	0	0	0	220	452	672	1211
% Cars	0	0	100	100	100	98.7	0	98.7	0	0	0	0	0	100	99.3	99.6	99.2
Trucks	0	0	0	0	0	7	0	7	0	0	0	0	0	0	3	3	10
% Trucks	0	0	0	0	0	1.3	0	1.3	0	0	0	0	0	0	0.7	0.4	0.8

978-664-2565

File Name : 92990005
Site Code : 92990005
Start Date : 3/23/2022
Page No : 2

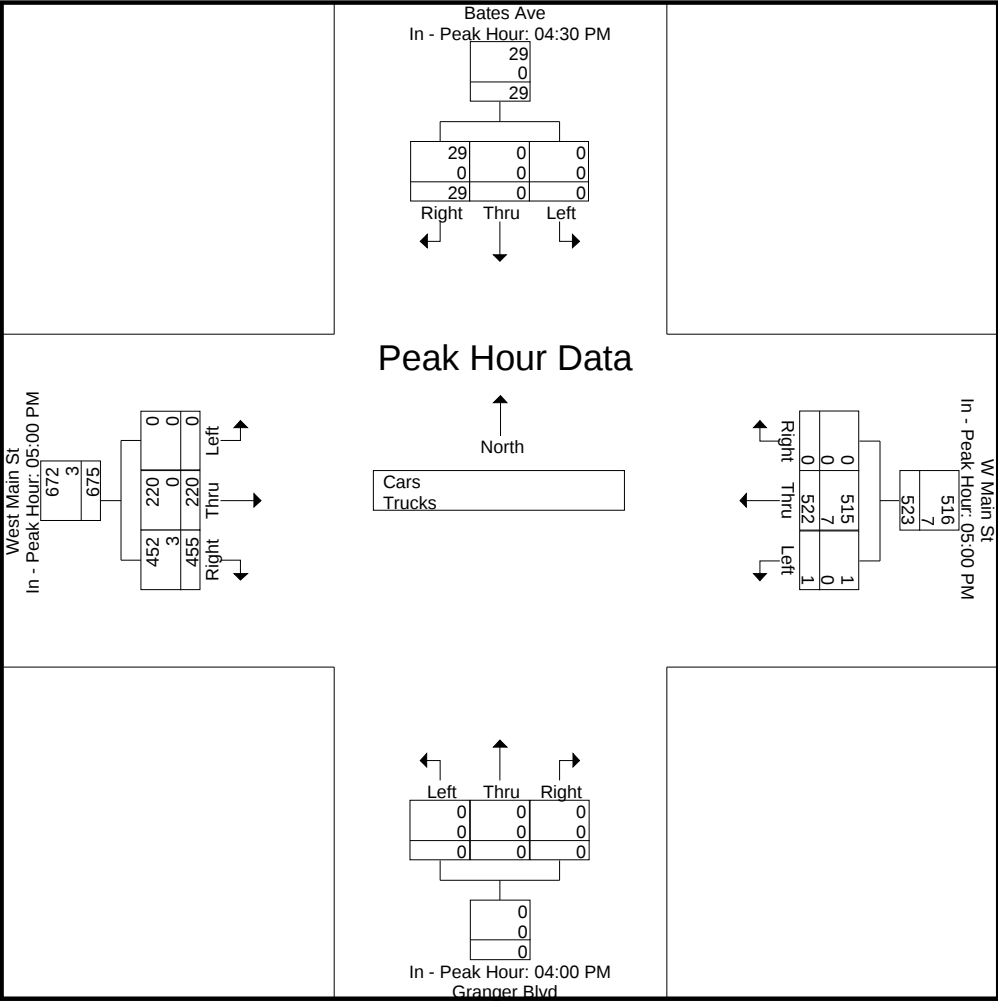


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

[illegible]

N/S Street : Bates Ave / Granger Blvd
E/W Street : West Main Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990005
Site Code : 92990005
Start Date : 3/23/2022
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Bates Ave / Granger Blvd
E/W Street : West Main Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990005
Site Code : 92990005
Start Date : 3/23/2022
Page No : 4

Groups Printed- Cars

	Bates Ave From North			W Main St From East			Granger Blvd From South			West Main St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	0	0	4	0	124	0	0	0	0	0	62	78	268
04:15 PM	0	0	3	0	118	0	0	0	0	0	66	107	294
04:30 PM	0	0	11	0	131	0	0	0	0	0	50	90	282
04:45 PM	0	0	8	1	121	0	0	0	0	0	45	91	266
Total	0	0	26	1	494	0	0	0	0	0	223	366	1110
05:00 PM	0	0	6	0	136	0	0	0	0	0	48	101	291
05:15 PM	0	0	4	1	124	0	0	0	0	0	57	132	318
05:30 PM	0	0	3	0	116	0	0	0	0	0	60	107	286
05:45 PM	0	0	10	0	139	0	0	0	0	0	55	112	316
Total	0	0	23	1	515	0	0	0	0	0	220	452	1211
Grand Total	0	0	49	2	1009	0	0	0	0	0	443	818	2321
Apprch %	0	0	100	0.2	99.8	0	0	0	0	0	35.1	64.9	
Total %	0	0	2.1	0.1	43.5	0	0	0	0	0	19.1	35.2	

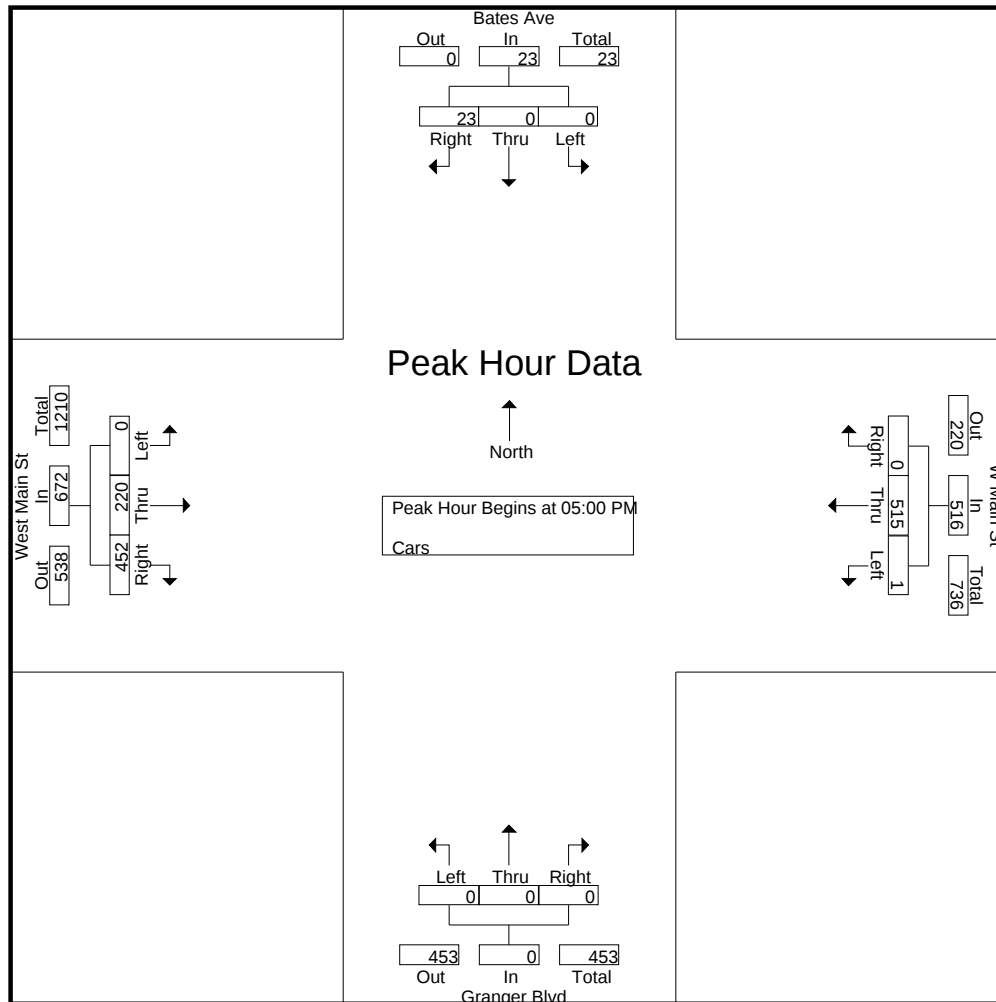
	Bates Ave From North				W Main St From East				Granger Blvd From South				West Main St From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	6	6	0	136	0	136	0	0	0	0	0	48	101	149	291
05:15 PM	0	0	4	4	1	124	0	125	0	0	0	0	0	57	132	189	318
05:30 PM	0	0	3	3	0	116	0	116	0	0	0	0	0	60	107	167	286
05:45 PM	0	0	10	10	0	139	0	139	0	0	0	0	0	55	112	167	316
Total Volume	0	0	23	23	1	515	0	516	0	0	0	0	0	220	452	672	1211
% App. Total	0	0	100		0.2	99.8	0		0	0	0		0	32.7	67.3		
PHF	.000	.000	.575	.575	.250	.926	.000	.928	.000	.000	.000	.000	.000	.917	.856	.889	.952

Accurate Counts

978-664-2565

N/S Street : Bates Ave / Granger Blvd
 E/W Street : West Main Street
 City/State : Marlborough, MA
 Weather : Clear

File Name : 92990005
 Site Code : 92990005
 Start Date : 3/23/2022
 Page No : 5

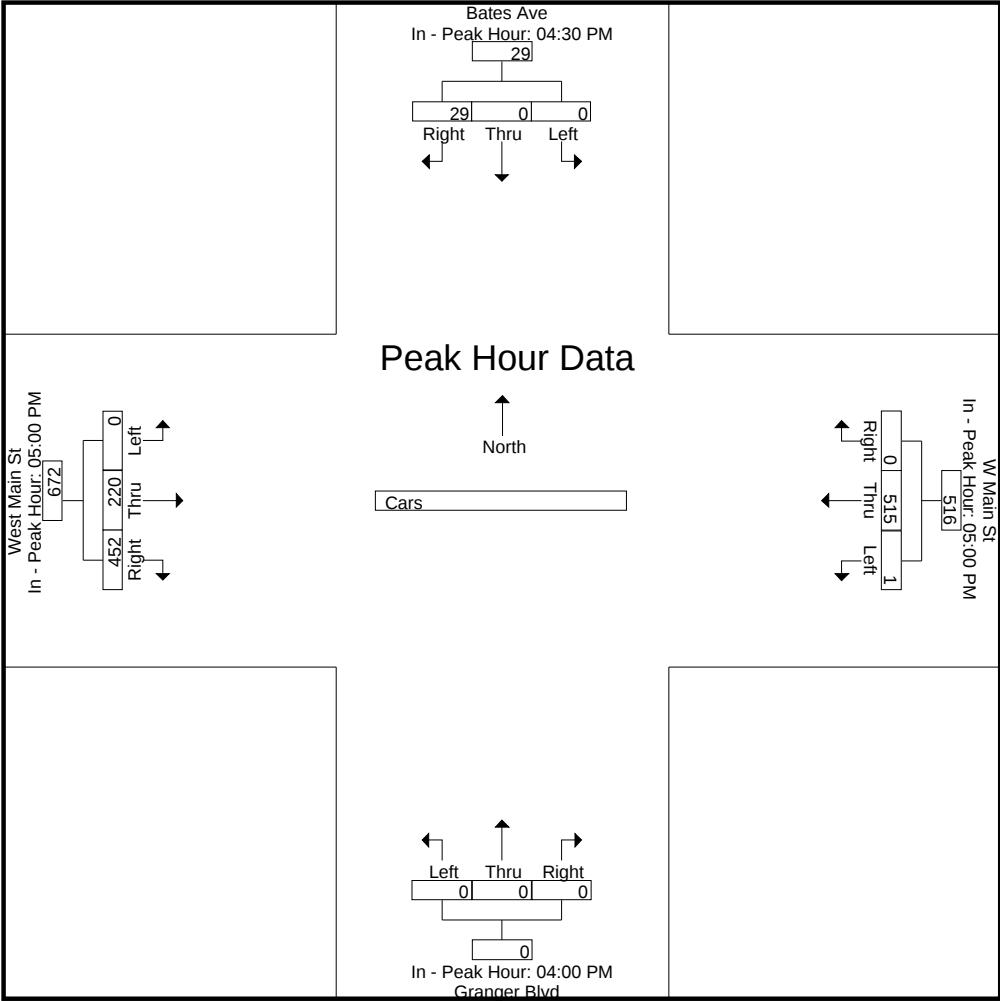


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:30 PM				05:00 PM				04:00 PM				05:00 PM			
+0 mins.	0	0	11	11	0	136	0	136	0	0	0	0	0	48	101	149
+15 mins.	0	0	8	8	1	124	0	125	0	0	0	0	0	57	132	189
+30 mins.	0	0	6	6	0	116	0	116	0	0	0	0	0	60	107	167
+45 mins.	0	0	4	4	0	139	0	139	0	0	0	0	0	55	112	167
Total Volume	0	0	29	29	1	515	0	516	0	0	0	0	0	220	452	672
% App. Total	0	0	100		0.2	99.8	0		0	0	0		0	32.7	67.3	
PHF	.000	.000	.659	.659	.250	.926	.000	.928	.000	.000	.000	.000	.000	.917	.856	.889

N/S Street : Bates Ave / Granger Blvd
E/W Street : West Main Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990005
Site Code : 92990005
Start Date : 3/23/2022
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Bates Ave / Granger Blvd

E/W Street : West Main Street

City/State : Marlborough, MA

Weather : Clear

File Name : 92990005

Site Code : 92990005

Start Date : 3/23/2022

Page No : 7

Groups Printed- Trucks

	Bates Ave From North			W Main St From East			Granger Blvd From South			West Main St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	0	0	0	0	3	0	0	0	0	0	0	0	3
04:15 PM	0	0	0	0	4	0	0	0	0	0	0	1	5
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	3	3
Total	0	0	0	0	7	0	0	0	0	0	0	5	12
05:00 PM	0	0	0	0	2	0	0	0	0	0	0	1	3
05:15 PM	0	0	0	0	4	0	0	0	0	0	0	0	4
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	2
05:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	0	0	0	7	0	0	0	0	0	0	3	10
Grand Total	0	0	0	0	14	0	0	0	0	0	0	8	22
Apprch %	0	0	0	0	100	0	0	0	0	0	0	100	
Total %	0	0	0	0	63.6	0	0	0	0	0	0	36.4	

	Bates Ave From North				W Main St From East				Granger Blvd From South				West Main St From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	3
04:15 PM	0	0	0	0	0	4	0	4	0	0	0	0	0	0	1	1	5
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3
Total Volume	0	0	0	0	0	7	0	7	0	0	0	0	0	0	5	5	12
% App. Total	0	0	0		0	100	0		0	0	0		0	0	100		
PHF	.000	.000	.000	.000	.000	.438	.000	.438	.000	.000	.000	.000	.000	.000	.417	.417	.600

978-664-2565

File Name : 92990005
Site Code : 92990005
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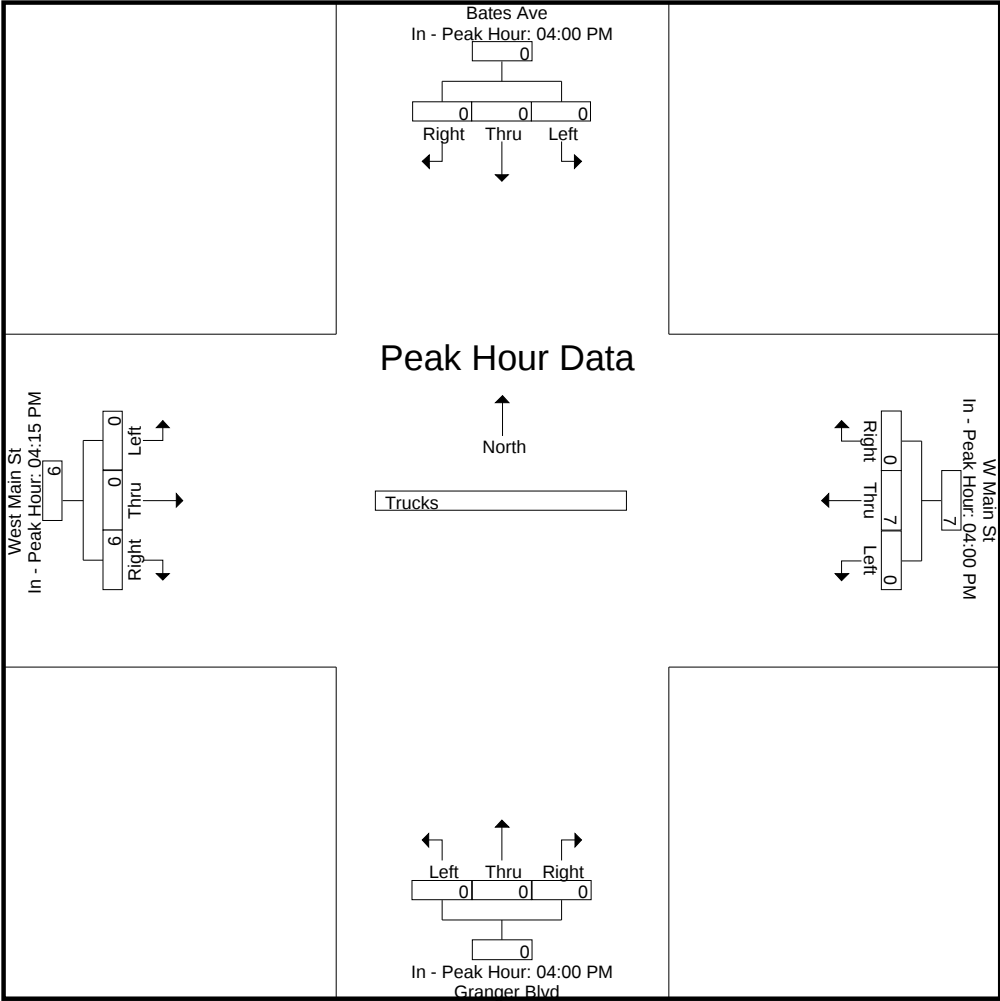
Peak Hour Begins at 04:00 PM
Trucks

Peak Hour for Each Approach Begins at:

[illegible]

N/S Street : Bates Ave / Granger Blvd
E/W Street : West Main Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990005
Site Code : 92990005
Start Date : 3/23/2022
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Accurate Counts

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N/S Street : Bates Ave / Granger Blvd

E/W Street : West Main Street

City/State : Marlborough, MA

Weather : Clear

File Name : 92990005

Site Code : 92990005

Start Date : 3/23/2022

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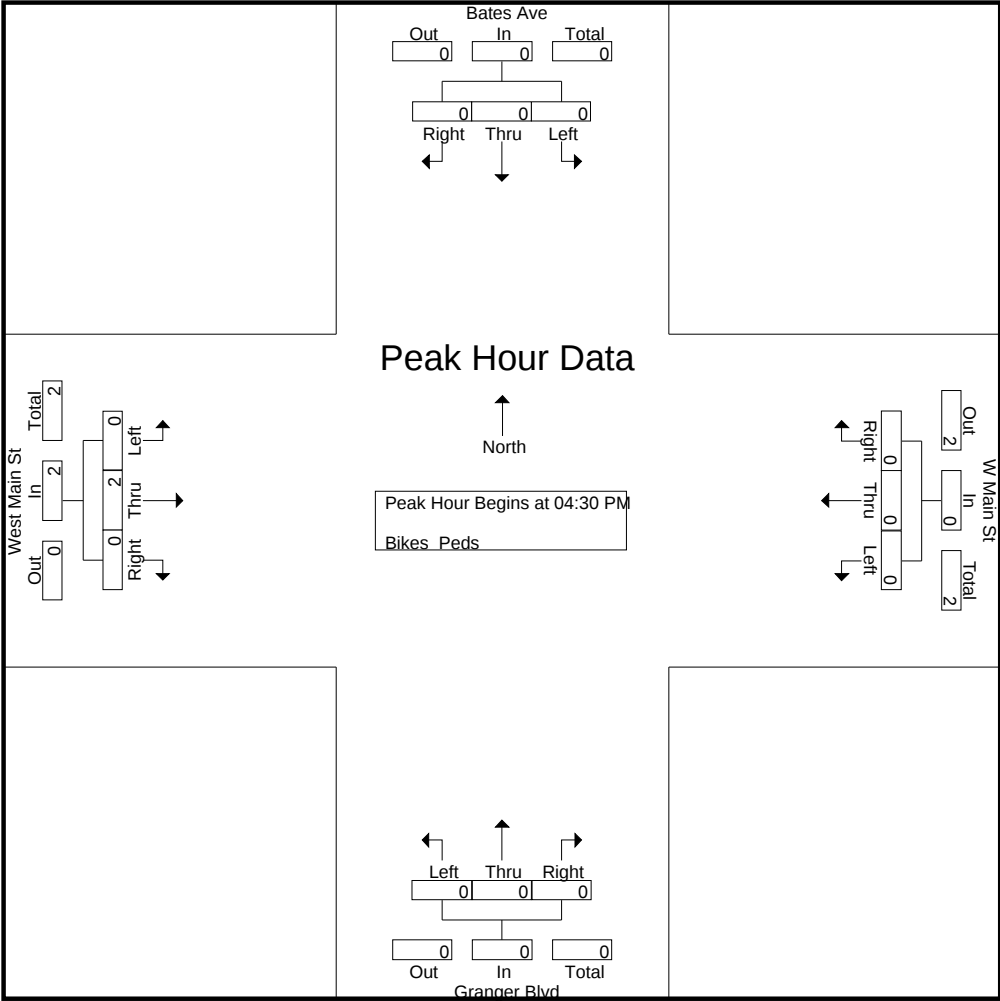
Groups Printed- Bikes Peds

	Bates Ave From North				W Main St From East				Granger Blvd From South				West Main St From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	1	5	1	6
04:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2	0	2
Total	0	0	0	1	0	0	0	1	0	0	0	6	0	1	0	1	9	1	10
05:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
05:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	3	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	0	0	1	0	0	0	0	0	1	0	2	5	1	6
Grand Total	0	0	0	3	0	0	0	2	0	0	0	6	0	2	0	3	14	2	16
Apprch %	0	0	0		0	0	0		0	0	0		0	100	0				
Total %	0	0	0		0	0	0		0	0	0		0	100	0		87.5	12.5	

	Bates Ave From North				W Main St From East				Granger Blvd From South				West Main St From West						
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total		
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 04:30 PM																			
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1		1	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1		1	
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2		2	
% App. Total	0	0	0		0	0	0		0	0	0		0	100	0				
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.500		.500	

N/S Street : Bates Ave / Granger Blvd
E/W Street : West Main Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990005
Site Code : 92990005
Start Date : 3/23/2022
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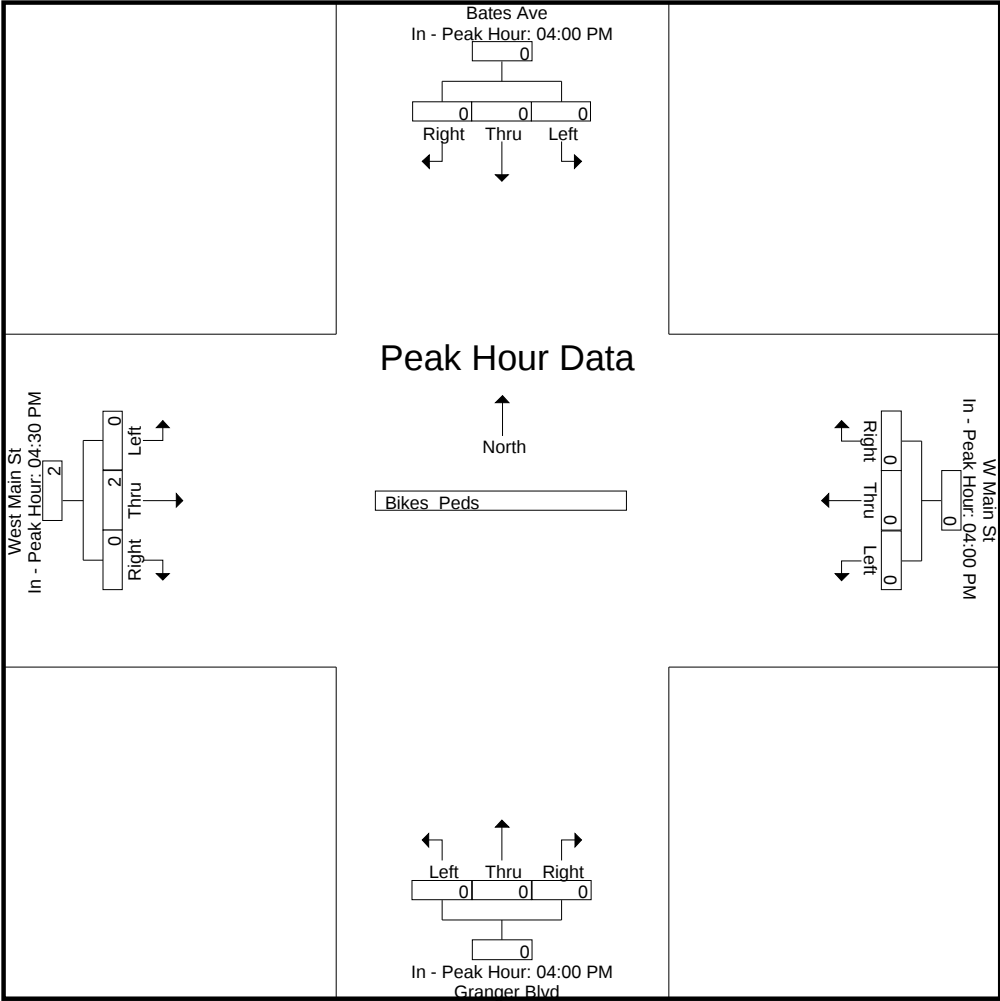


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

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

N/S Street : Bates Ave / Granger Blvd
E/W Street : West Main Street
City/State : Marlborough, MA
Weather : Clear

File Name : 92990005
Site Code : 92990005
Start Date : 3/23/2022
Page No : 12



SEASONAL ADJUSTMENT DATA



Massachusetts Highway Department

AET08: Monthly Hourly Volume for March 2019

Location ID: AET08
County: Worcester
Functional Class: 1
Location: MASSACHUSETTS TURNPIKE

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

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	QC Status
1	830	533	488	560	1180	3922	5522	6760	7222	5840	5627	5721	6445	6979	7818	8183	7914	7842	6946	6139	4439	3400	2717	2016	115043	Accepted
2	1146	708	581	552	707	1114	1427	2003	2405	2775	3320	3857	4268	4475	4842	5042	4970	4641	3857	2996	2467	2114	2294	1676	64237	Accepted
3	901	642	426	373	382	649	1240	1895	2634	4018	5194	6239	6608	6929	7071	7022	7231	6435	5873	4375	2882	1749	974	698	82440	Accepted
4	475	258	176	276	384	959	1481	1759	2423	3054	3783	3532	3418	3454	3915	4321	4478	4780	3659	2594	2098	1842	1383	949	55451	Accepted
5	663	501	451	575	1314	4571	6040	5914	6141	5815	4955	4659	5044	5297	6407	7084	7226	7340	6455	4457	2947	2296	2269	1370	99791	Accepted
6	722	442	407	532	1184	4422	5833	6309	6786	5696	5009	4496	4687	5275	6525	7326	7603	7104	6217	4336	2983	2337	1723	954	98908	Accepted
7	718	425	373	578	1209	4373	5967	6584	7200	5903	5062	4938	5291	5514	6744	7293	6972	7463	6721	4993	3420	2716	2305	1336	104098	Accepted
8	870	540	459	607	1172	3990	5615	6533	6714	5765	5481	5727	6608	6986	8034	8233	7601	7875	7148	6060	4188	3185	2651	1898	113940	Accepted
9	1272	734	556	490	687	1376	2150	3255	4463	5558	6272	7325	7015	7100	7269	7414	7345	6737	5745	4369	3683	3234	3075	2299	99423	Accepted
10	1278	768	0	625	549	679	1017	1446	1768	2236	3452	4158	4866	5767	6086	6191	6335	5904	5361	4478	3688	2927	2082	1376	73037	Accepted
11	823	505	420	547	1350	4236	5458	5764	6644	5779	5266	5081	5136	5545	6291	7128	7592	7578	6053	4376	2898	2333	1667	1151	99621	Accepted
12	699	435	435	558	1223	4570	5793	6282	6792	5940	5155	4936	5090	5281	6488	7264	7633	7733	5977	4478	3147	2380	1695	1151	101135	Accepted
13	695	479	382	557	1208	4466	5749	6347	7111	5862	5261	4997	5168	5469	6857	7556	7525	8003	6420	4373	3212	2559	1860	1103	103219	Accepted
14	702	551	438	552	1243	4398	5926	6401	7298	6403	5327	5262	5431	5874	6996	7959	8056	8109	6823	5067	3529	2838	2425	1504	109112	Accepted
15	938	606	475	658	1234	3936	5330	6626	7013	6281	5718	6050	6469	7077	8181	8075	7695	7971	7467	5666	4059	3217	2741	1994	115477	Accepted
16	1307	760	579	498	692	1251	2073	3145	4541	5914	7470	7979	7574	7282	7376	7603	7647	6941	5648	4392	3851	3201	2853	2033	102610	Accepted
17	1236	715	523	469	444	631	1095	1892	2860	4394	5877	6770	6863	7101	7266	7280	7395	7145	6470	5109	4347	3293	2278	1390	92843	Accepted
18	799	553	434	567	1373	4517	5850	6056	6873	6040	5516	5274	5389	5484	6595	7337	7581	7743	5981	4213	2847	2267	1961	1191	102441	Accepted
19	688	421	449	585	1235	4611	5834	6310	6936	6095	4999	4885	5165	5388	6715	7431	7798	7824	5954	4144	2987	2337	1765	1033	101589	Accepted
20	704	470	390	547	1256	4443	5702	6274	7016	5985	5344	4932	5403	5608	6735	7557	7940	8127	6499	4511	3250	2607	1827	1255	104382	Accepted
21	935	558	433	585	1287	4342	5814	6460	7200	6320	5392	5209	5588	5829	6856	7812	7793	7973	6280	4449	3509	2579	1970	1230	106403	Accepted
22	841	558	447	588	1137	3674	5103	6123	6686	5879	5437	5685	6183	6936	7053	7825	7470	7181	6920	5186	3840	2928	2448	1812	107940	Accepted
23	1146	693	496	500	562	1186	1830	3093	4483	5582	6380	7122	6986	7003	7117	7109	6966	6229	5314	4004	3478	3130	2761	1993	95163	Accepted
24	1301	736	498	410	410	652	1172	1690	2696	4389	5754	6785	6930	7272	7181	8041	7862	7365	6304	5066	4267	3210	2591	1425	94007	Accepted
25	840	496	426	564	1318	3965	6151	6508	6769	5919	5217	5051	4933	5226	6283	7191	6374	8104	6035	3831	2926	2333	1688	1156	99304	Accepted
26	825	466	421	580	1273	4583	5838	6289	6328	5855	4874	4905	4914	5349	6610	7467	7935	7960	6188	4265	3220	2512	1722	1196	101575	Accepted
27	952	475	411	586	1196	4535	5947	5980	6517	6194	5286	5108	5149	5581	6957	8028	7659	7585	6639	4678	3463	2720	2057	1511	105214	Accepted
28	870	461	476	601	1299	4484	6140	6142	6878	6011	5353	5179	5547	5991	7082	7646	7742	8184	6945	5252	3874	3051	2492	1408	109108	Accepted
29	835	592	483	602	1260	4012	5692	6560	7127	6333	5900	5854	6517	6919	7609	7899	7594	7378	7040	5628	4100	3171	3022	1977	114104	Accepted
30																										
31																										

99021.21 March ADT
102,416 2019 AADT
-0.03428 3.4% below

COVID ADJUSTMENT



Massachusetts Highway Department

AET08: Monthly Hourly Volume for March 2022

Location ID: AET08
County: Worcester
Functional Class: 1
Location: MASSACHUSETTS TURNPIKE

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

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	QC Status
1	670	402	369	492	986	3147	5380	6211	5836	4840	4209	4127	4178	4555	5680	6231	6926	6312	4582	3129	2142	1625	1378	1191	84598	Accepted
2	639	393	345	479	961	3045	5523	5972	5926	4105	4504	4248	4340	4551	5722	6525	6297	6406	4813	3388	2417	1926	1358	824	84707	Accepted
3	669	484	367	442	1010	3009	5388	5705	5818	4692	4341	4424	4695	4878	6212	5977	7130	7046	6053	4187	3025	2387	1854	1723	91516	Accepted
4	1276	605	454	524	1015	2907	4979	5372	5173	4973	4966	5287	5811	6344	7537	7588	7261	7233	6451	4592	3482	2712	2013	1455	100010	Accepted
5	927	608	513	448	570	1174	2022	2894	3992	5147	6263	6989	6841	6899	6880	6777	6714	5776	4914	3800	3202	2584	2084	1561	89579	Accepted
6	885	629	461	392	381	596	1134	1488	2204	3492	5058	6333	6475	6933	6814	6670	7003	6730	5201	3970	3038	2317	1511	1049	80764	Accepted
7	652	419	410	506	998	3131	5391	6182	5571	4873	4494	4156	4302	4571	5595	6447	6327	5839	4170	2732	2014	1650	1486	964	82880	Accepted
8	596	436	375	465	971	3131	5438	6075	5742	4960	4249	4141	4281	4641	5624	6165	6474	6564	4922	3356	2418	1775	1388	1083	85270	Accepted
9	687	384	363	499	1039	3087	5539	6473	5909	4758	4173	4070	4346	4800	5825	5353	5727	5151	4260	2559	2089	1637	1200	928	80856	Accepted
10	593	387	354	520	966	2939	5110	6056	5555	4982	4592	4486	4791	5240	6392	6687	7130	7010	5399	3769	2729	2110	1859	1279	90935	Accepted
11	783	540	451	521	1048	2926	4209	4848	5217	5070	5331	5560	5913	6595	7477	6940	7042	7613	6117	4750	3634	2862	2329	1730	99506	Accepted
12	1112	648	508	452	634	1037	1768	2549	3456	4214	4892	5380	5567	5306	5545	5544	5004	4198	3272	2533	2322	1789	2158	1320	71208	Accepted
13	830	562	0	485	515	642	1031	1480	2145	3391	4840	6183	6954	7197	7284	7128	6686	6576	5654	4664	3913	2775	1719	1216	83870	Accepted
14	778	511	392	510	1061	3087	5232	5570	5231	4992	4692	4462	4549	4742	5838	6278	6227	6161	4496	3266	2324	1781	1278	932	84390	Accepted
15	587	394	394	540	1063	3143	5502	6227	5969	4949	4653	4406	4553	4766	5894	6694	6922	6834	4697	3440	2335	1977	1419	987	88345	Accepted
16	710	431	396	531	1032	2977	5402	6103	6003	5098	4564	4545	4604	4876	6270	6867	7008	6924	5137	3536	2735	2127	1506	1196	90578	Accepted
17	816	442	418	496	995	3015	5352	6093	5783	5064	4701	4751	5001	5367	6300	6873	6998	6951	5133	3630	2688	2085	1547	1205	91704	Accepted
18	800	493	479	511	1042	2793	4716	5546	5503	5394	5320	5646	6024	6677	7099	7521	7646	7115	6461	4671	3636	2893	2156	1801	101943	Accepted
19	1140	686	537	484	585	1068	1659	2664	3629	4850	6091	6866	6759	6577	6366	6524	6383	5715	4645	3799	3028	2758	2391	1715	86919	Accepted
20	1087	651	536	387	433	656	1086	1622	2463	4100	5732	6915	7245	7207	7279	7475	7438	7016	6043	4953	4023	2607	1821	1289	90064	Accepted
21	743	531	450	515	1072	3170	5531	6100	5833	5182	4641	4623	4624	4737	6233	6455	6836	6387	4559	3203	2331	1865	1215	995	87831	Accepted
22	638	371	387	491	1051	3119	5691	6251	5842	4988	4461	4196	4295	4625	5798	6742	6778	6899	5434	3496	2448	1836	1320	1037	88194	Accepted
23	1061	702	405	569	1022	3109	5586	6090	5897	5178	4641	4597	4724	5069	6245	6776	7154	7129	4998	3292	2483	2018	1560	1106	91411	Accepted
24	614	423	366	481	1013	2640	4753	5590	5779	4482	4579	4590	4700	5023	6204	6809	7050	6940	4957	3550	2651	2071	1584	1308	88157	Accepted
25	768	468	418	531	1013	2903	4890	5847	5600	5114	5109	5280	5939	6351	7353	7209	7363	7420	6036	4445	3403	2652	2220	1478	99810	Accepted
26																										
27																										
28																										
29																										
30																										
31																										

2019 Average Count Data – Sta. AET08

March ADT: 99,021

2022 Average Count Data – Sta. AET08

March ADT: 88,602

COVID Adjustment

$$1 - \frac{99,021}{88,602} = 11.8\% \text{ below}$$

PUBLIC TRANSPORTATION SCHEDULES



ROUTE 7C: Inner City Marlborough MetroWest Regional Transportation Authority



Fare Information

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

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

Children under 12 years old may not ride unaccompanied.

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

Transfers / Connections

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

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

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

There is no service provided on the following holidays:

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

MWRTA Customer Service:

(508) 935-2222

Blandin Hub: 15 Blandin Ave.
Framingham, MA 01702

www.mwrtat.com



Follow Us: @mwrtat

Scan the QR code with your smartphone to be directed to the MWRTA Routes and Schedules



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



ROUTE 7C Weekday (Monday-Friday Service)

EastboundAMPM

Solomon Pond Mall (Bus Shelter)	~	8:04	9:50	11:36	1:10	~	2:48	4:27	6:05	7:45
Hannafords Plaza by AAA	~	8:16	10:02	11:46	1:22	~	3:00	4:39	6:17	7:55
Apex Entertainment (Bus Shelter)	~	8:19	10:05	11:49	1:24	~	3:03	4:42	6:20	7:57
Broad / Lincoln Sts.	~	8:26	10:12	11:55	1:30	1:30	3:09	4:48	6:26	8:03
Lincoln / Pleasant Sts.	~	8:28	10:14	11:57	~	1:32	3:11	4:51	6:29	8:05*
Marlborough Hospital*	~	8:31	10:17	12:00	~	1:35	3:14	4:54	6:32	~
South Bolton / Main Sts.	~	8:38	10:24	12:06	~	1:41	3:20	5:00	6:38	~
Post Road Shopping Center - Price Chopper	~	8:42	10:28	12:10	~	1:45	3:24	5:04	6:42	~
Target	~	8:54	10:40	12:18	~	1:55	3:34	5:14	6:50	~
Wayside Inn Store	~	8:57	10:43	12:20	~	1:58	3:37	5:17	6:53	~

WestboundAMPM

Post Road Shopping Center - Price Chopper	~	9:05	10:51	12:28	~	2:08	3:47	5:27	7:02	~
Main St. (Downtown Marlborough)	7:26	9:10	10:56	12:32	~	2:12	3:51	5:31	7:06	~
Newton / Weed Sts.	7:29	9:13	10:59	12:34	~	2:14	3:53	5:33	7:08	~
Marlborough Hospital*	7:34	9:18	11:05	12:38	~	2:18	3:57	5:37	7:12	~
Lincoln / Pleasant Sts.	7:38	9:22	11:09	12:42	~	2:21	4:00	5:40	7:15	~
Broad / Lincoln Sts.	7:40	9:24	11:11	12:44	~	2:23	4:02	5:42	7:17	~
Apex Entertainment (Bus Shelter)	7:47	9:30	11:17	12:50	~	2:29	4:08	5:48	7:26	~
Hannafords Plaza by AAA	7:49	9:33	11:20	12:53	~	2:32	4:11	5:51	7:29	~
Solomon Pond Mall (Bus Shelter)	7:59	9:45	11:32	1:05	~	2:44	4:23	6:02	7:42	~

Scheduled Times

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

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

* Continues as 7 to Blandin Hub with limited stops.

~Continues from the Route 7.

Transfers

Route 7C passengers can make the following transfers:
Route 7 & 15 at Newton / Weed Sts.

Route 7C services the Blandin Hub at 6:40 am and 12:25 pm going to Marlborough and at 2:30 pm and 8:45 pm from Marlborough.

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

7C

Saturday

ROUTE 7C: Inner City Marlborough



MetroWest Regional Transportation Authority

ROUTE 7C SATURDAY



Fare Information

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

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

Children under 12 years old may not ride unaccompanied.

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

Transfers / Connections

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

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

MWRTA Customer Service:

(508) 935-2222

Blandin Hub: 15 Blandin Ave.
Framingham, MA 01702

www.mwrtar.com



Follow Us: @mwrtar

Scan the QR code with your smartphone to be directed to the MWRTA Routes and Schedules



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



7C

There is no service provided on the following holidays:

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



ROUTE 7C Saturday Service



v 6.2021

Eastbound

AM

PM

Blandin Hub (15 Blandin Ave.)	8:00	~	~	~	~	~
Banana Lot	8:10	~	~	~	~	~
Framingham State University (McCarthy Center)	8:15	~	~	~	~	~
Stop & Shop (Temple St.)	8:20	~	~	~	~	~
Halstead Apartments*	8:30	~	~	~	~	~
Downtown Southborough	8:40	~	~	~	~	~
Solomon Pond Mall	~	9:28	11:05	12:44	2:25	4:05
Hannafords Plaza by AAA	~	9:40	11:16	12:56	2:37	4:17
Apex Entertainment (Bus Shelter)	~	9:43	11:19	12:59	2:40	4:20
Broad / Lincoln Sts.	~	9:48	11:24	1:04	2:45	4:25
Lincoln / Pleasant Sts.	~	9:50	11:26	1:06	2:47	4:27
Marlborough Hospital*	~	9:55	11:30	1:10	2:51	4:31
South Bolton / Main Sts.	~	10:00	11:35	1:15	2:56	4:35
Post Road Shopping Center - Price Chopper	~	10:04	11:39	1:19	3:00	4:39
Target	~	10:14	11:50	1:30	3:10	4:50
Wayside Inn Store	~	10:17	11:53	1:33	3:13	4:53

Westbound

AM

PM

Post Road Shopping Center - Price Chopper	~	10:27	12:03	1:45	3:23	5:03
Main St. (Downtown Marlborough)	8:55	10:30	12:07	1:49	3:27	5:07
Newton / Weed Sts.	8:57	10:33	12:09	1:51	3:29	~
Marlborough Hospital*	9:01	10:37	12:14	1:56	3:35	~
Lincoln / Pleasant Sts.	9:04	10:40	12:17	1:59	3:38	~
Broad / Lincoln Sts.	9:06	10:42	12:19	2:01	3:40	~
Apex Entertainment (Bus Shelter)	9:11	10:47	12:24	2:06	3:45	~
Hannafords Plaza by AAA	9:14	10:50	12:27	2:09	3:48	~
Solomon Pond Mall	9:24	11:02	12:39	2:21	4:00	~
Downtown Southborough	~	~	~	~	~	~
Halstead Apartments*	~	~	~	~	~	5:25
Stop & Shop (Temple St.)	~	~	~	~	~	5:29
Framingham State University (McCarthy Center)	~	~	~	~	~	5:34
Banana Lot	~	~	~	~	~	5:40
Blandin Hub (15 Blandin Ave.)	~	~	~	~	~	5:45

Scheduled Times

Scheduled times are only approximate; please wait for the MWRTA ten minutes in advance of scheduled times to assure not missing the bus.

For up to the minute bus information call the MWRTA at 508-935-2222 or visit www.mwrt.com for GPS tracking.

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

Banana Lot is the Northside Parking Lot at the Framingham Commuter Rail Station

*Stop may not be serviced due to snow and ice.

Transfers

Route 7C Saturday passengers can make transfers to the Route 7 Saturday at Newton / Weed Sts.

VEHICLE TRAVEL SPEED DATA



Location : Lincoln Street

92990001

Location : East of Mechanic Street

City/State: Marlborough, MA

Direction: EB,

3/23/2022	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	Total
12:00 AM	0	0	1	6	5	0	0	0	0	0	0	0	0	12
1:00	0	0	0	3	1	0	0	0	0	0	0	0	0	4
2:00	0	0	0	1	1	1	0	0	0	0	0	0	0	3
3:00	0	0	1	1	0	0	1	1	0	0	0	0	0	4
4:00	0	0	5	8	4	3	0	0	0	0	0	0	0	20
5:00	1	0	11	40	33	6	2	0	0	0	0	0	0	93
6:00	2	0	31	101	47	10	2	0	0	0	0	0	0	193
7:00	2	7	57	129	46	10	0	0	1	0	0	0	0	252
8:00	0	1	49	103	45	4	0	0	0	0	0	0	0	202
9:00	2	2	37	89	27	6	0	0	0	0	0	0	0	163
10:00	1	1	39	78	28	6	1	0	0	0	0	0	0	154
11:00	0	2	27	79	31	7	1	0	0	0	0	0	0	147
12:00 PM	1	4	48	87	35	2	0	0	0	0	0	0	0	177
1:00	0	6	46	64	27	4	1	0	0	0	0	0	0	148
2:00	0	4	55	150	43	2	3	0	0	0	0	0	0	257
3:00	3	9	77	121	44	6	2	0	0	0	0	0	0	262
4:00	2	10	77	162	30	1	0	0	0	0	0	0	0	282
5:00	0	16	91	156	49	7	1	0	0	0	0	0	0	320
6:00	2	19	53	107	38	6	1	0	0	0	0	0	0	226
7:00	0	4	69	110	45	4	0	0	0	0	0	0	0	232
8:00	0	3	44	85	32	1	0	0	0	0	0	0	0	165
9:00	0	4	25	59	30	1	2	0	0	0	0	0	0	121
10:00	0	2	19	31	9	2	1	0	0	0	0	0	0	64
11:00	0	1	5	11	16	1	0	0	0	0	0	0	0	34
Total	16	95	867	1781	666	90	18	1	1	0	0	0	0	3535

Percentile	15th	50th	85th	95th
Speed	24	27	31	34
Mean Speed (Average)	27.2			
10 MPH Pace Speed	20-29			
Number in Pace	2614			
Percent in Pace	73.9%			
Number > 30 MPH	776			
Percent > 30 MPH	22.0%			

92990001

3/24/2022	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	4	3	2	0	0	0	0	0	0	0	0	9
1:00	0	0	0	5	3	0	0	0	0	0	0	0	0	8
2:00	0	0	2	1	1	0	0	0	0	0	0	0	0	4
3:00	0	0	0	2	1	0	0	1	0	0	0	0	0	4
4:00	0	0	5	9	4	1	0	0	0	0	0	0	0	19
5:00	0	1	12	36	14	4	1	0	0	0	0	0	0	68
6:00	0	0	44	57	18	3	1	0	0	0	0	0	0	123
7:00	2	5	53	107	31	6	1	0	0	0	0	0	0	205
8:00	2	2	43	82	33	2	0	0	0	0	0	1	0	165
9:00	0	5	41	69	22	4	0	0	0	0	0	0	0	141
10:00	0	5	45	84	23	2	0	0	0	0	0	0	0	159
11:00	2	6	41	95	37	5	1	0	0	0	0	0	0	187
12:00 PM	1	3	34	89	42	8	0	0	0	0	0	0	0	177
1:00	0	4	48	91	19	1	1	0	0	0	0	0	0	164
2:00	2	11	51	101	30	0	1	0	0	0	0	0	0	196
3:00	3	9	52	104	47	9	2	0	0	0	0	0	0	226
4:00	0	2	53	138	50	7	1	0	0	0	0	0	0	251
5:00	2	6	70	137	43	6	2	0	0	0	0	0	0	266
6:00	2	11	54	121	40	5	1	0	0	0	0	0	0	234
7:00	0	5	48	100	30	9	0	0	0	0	0	0	0	192
8:00	0	5	31	63	22	8	1	0	0	0	0	0	0	130
9:00	1	1	14	49	16	3	1	0	0	0	0	0	0	85
10:00	0	3	8	24	6	2	0	0	0	0	0	0	0	43
11:00	0	0	5	15	1	0	1	0	0	0	0	0	0	22
Total	17	84	758	1582	535	85	15	1	0	0	0	1	0	3078
			Percentile	15th	50th	85th	95th							
			Speed	24	27	31	34							
			Mean Speed (Average)	27.2										
			10 MPH Pace Speed	20-29										
			Number in Pace	2310										
			Percent in Pace	75.0%										
			Number > 30 MPH	637										
			Percent > 30 MPH	20.7%										
Grand Total	33	179	1625	3363	1201	175	33	2	1	0	0	1	0	6613
Stats			Percentile	15th	50th	85th	95th							
			Speed	24	27	31	34							
			Mean Speed (Average)	27.2										
			10 MPH Pace Speed	20-29										
			Number in Pace	4924										
			Percent in Pace	74.5%										
			Number > 30 MPH	1413										
			Percent > 30 MPH	21.4%										

Location : Lincoln Street
 Location : East of Mechanic Street
 City/State: Marlborough, MA
 Direction: WB,

92990001

3/23/2022	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	3	11	5	4	0	0	0	0	0	0	0	0	23
1:00	0	1	6	6	4	0	0	1	1	0	0	0	0	19
2:00	0	0	2	4	2	0	0	1	0	0	0	0	0	9
3:00	0	1	0	5	3	1	0	0	0	0	0	0	0	10
4:00	0	1	13	5	8	1	1	0	0	0	0	0	0	29
5:00	16	17	41	38	25	4	0	0	0	0	0	0	0	141
6:00	45	51	60	59	27	4	0	0	0	0	0	0	0	246
7:00	104	112	73	63	22	6	3	2	0	0	0	0	0	385
8:00	64	62	88	75	23	11	0	0	0	0	0	0	0	323
9:00	48	51	51	63	21	3	0	0	0	1	0	0	0	238
10:00	35	48	71	77	22	4	0	0	0	0	0	0	0	257
11:00	50	49	76	54	38	2	0	0	0	0	0	0	0	269
12:00 PM	55	63	94	79	15	2	0	0	0	0	0	0	0	308
1:00	57	48	82	59	22	6	0	0	0	0	0	0	0	274
2:00	79	75	101	44	28	5	0	0	0	0	0	0	0	332
3:00	137	108	85	40	10	1	0	0	0	0	0	0	0	381
4:00	158	110	83	63	11	2	0	0	0	0	0	0	0	427
5:00	138	101	90	52	18	4	0	0	0	0	0	0	0	403
6:00	106	113	114	48	17	0	0	0	0	0	0	0	0	398
7:00	108	101	75	59	14	1	1	0	0	0	0	0	0	359
8:00	57	66	87	52	19	2	0	0	0	0	0	0	0	283
9:00	27	37	56	46	23	4	0	0	0	0	0	0	0	193
10:00	8	17	36	27	16	3	1	0	0	0	0	0	0	108
11:00	5	16	22	11	6	2	1	0	0	0	0	0	0	63
Total	1297	1251	1417	1034	398	68	7	4	1	1	0	0	0	5478

Percentile	15th	50th	85th	95th
Speed	13	21	28	32
Mean Speed (Average)	19.8			
10 MPH Pace Speed	15-24			
Number in Pace	2648			
Percent in Pace	48.3%			
Number > 30 MPH	479			
Percent > 30 MPH	8.7%			

92990001

3/24/2022	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	1	3	6	9	3	0	0	1	0	0	0	0	0	23
1:00	1	0	0	1	3	0	0	0	0	0	0	0	0	5
2:00	0	0	1	2	2	1	1	1	0	0	0	0	0	8
3:00	0	1	4	4	0	2	0	0	0	0	0	0	0	11
4:00	0	3	5	3	6	4	0	0	0	0	0	0	0	21
5:00	4	10	27	30	14	4	0	0	0	0	0	0	0	89
6:00	36	36	64	48	17	3	0	0	0	0	0	0	0	204
7:00	99	86	77	49	18	1	0	0	0	0	0	0	0	330
8:00	65	75	71	56	25	3	0	0	0	0	0	0	0	295
9:00	32	46	79	59	15	3	0	0	0	0	0	0	0	234
10:00	19	46	91	53	20	0	0	0	0	0	0	0	0	229
11:00	58	67	93	49	23	4	0	0	0	0	0	0	0	294
12:00 PM	51	75	83	61	29	3	0	0	0	0	0	0	0	302
1:00	51	66	87	49	20	2	0	0	0	0	0	0	0	275
2:00	111	77	75	64	15	2	0	0	0	0	0	0	0	344
3:00	125	113	87	41	11	0	0	0	0	0	0	0	0	377
4:00	132	105	99	49	14	1	0	0	0	0	0	0	0	400
5:00	124	112	77	39	17	2	0	0	0	0	0	0	0	371
6:00	101	82	102	52	13	0	0	0	0	0	0	0	0	350
7:00	69	62	75	54	18	4	0	0	0	0	0	0	0	282
8:00	43	48	74	58	24	0	0	0	0	0	0	0	0	247
9:00	26	30	54	54	20	0	0	0	1	0	0	0	0	185
10:00	14	26	37	33	19	4	0	0	0	0	0	0	0	133
11:00	2	9	9	13	14	1	1	0	0	0	0	0	0	49
Total	1164	1178	1377	930	360	44	2	2	1	0	0	0	0	5058
		Percentile		15th	50th	85th	95th							
		Speed		13	20	27	31							
		Mean Speed (Average)		19.7										
		10 MPH Pace Speed		15-24										
		Number in Pace		2535										
		Percent in Pace		50.1%										
		Number > 30 MPH		409										
		Percent > 30 MPH		8.1%										
Grand Total	2461	2429	2794	1964	758	112	9	6	2	1	0	0	0	10536
Stats		Percentile		15th	50th	85th	95th							
		Speed		13	21	28	31							
		Mean Speed (Average)		19.7										
		10 MPH Pace Speed		15-24										
		Number in Pace		5183										
		Percent in Pace		49.2%										
		Number > 30 MPH		888										
		Percent > 30 MPH		8.4%										

Location : Lincoln Street
 Location : East of Mechanic Street
 City/State: Marlborough, MA
 Direction: Combined

92990001

3/23/2022	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	3	12	11	9	0	0	0	0	0	0	0	0	35
1:00	0	1	6	9	5	0	0	1	1	0	0	0	0	23
2:00	0	0	2	5	3	1	0	1	0	0	0	0	0	12
3:00	0	1	1	6	3	1	1	1	0	0	0	0	0	14
4:00	0	1	18	13	12	4	1	0	0	0	0	0	0	49
5:00	17	17	52	78	58	10	2	0	0	0	0	0	0	234
6:00	47	51	91	160	74	14	2	0	0	0	0	0	0	439
7:00	106	119	130	192	68	16	3	2	1	0	0	0	0	637
8:00	64	63	137	178	68	15	0	0	0	0	0	0	0	525
9:00	50	53	88	152	48	9	0	0	0	1	0	0	0	401
10:00	36	49	110	155	50	10	1	0	0	0	0	0	0	411
11:00	50	51	103	133	69	9	1	0	0	0	0	0	0	416
12:00 PM	56	67	142	166	50	4	0	0	0	0	0	0	0	485
1:00	57	54	128	123	49	10	1	0	0	0	0	0	0	422
2:00	79	79	156	194	71	7	3	0	0	0	0	0	0	589
3:00	140	117	162	161	54	7	2	0	0	0	0	0	0	643
4:00	160	120	160	225	41	3	0	0	0	0	0	0	0	709
5:00	138	117	181	208	67	11	1	0	0	0	0	0	0	723
6:00	108	132	167	155	55	6	1	0	0	0	0	0	0	624
7:00	108	105	144	169	59	5	1	0	0	0	0	0	0	591
8:00	57	69	131	137	51	3	0	0	0	0	0	0	0	448
9:00	27	41	81	105	53	5	2	0	0	0	0	0	0	314
10:00	8	19	55	58	25	5	2	0	0	0	0	0	0	172
11:00	5	17	27	22	22	3	1	0	0	0	0	0	0	97
Total	1313	1346	2284	2815	1064	158	25	5	2	1	0	0	0	9013

Percentile	15th	50th	85th	95th
Speed	15	25	30	33
Mean Speed (Average)	22.7			
10 MPH Pace Speed	20-29			
Number in Pace	5070			
Percent in Pace	56.3%			
Number > 30 MPH	1255			
Percent > 30 MPH	13.9%			

92990001

3/24/2022	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	1	3	10	12	5	0	0	1	0	0	0	0	0	32
1:00	1	0	0	6	6	0	0	0	0	0	0	0	0	13
2:00	0	0	3	3	3	1	1	1	0	0	0	0	0	12
3:00	0	1	4	6	1	2	0	1	0	0	0	0	0	15
4:00	0	3	10	12	10	5	0	0	0	0	0	0	0	40
5:00	4	11	39	66	28	8	1	0	0	0	0	0	0	157
6:00	36	36	108	105	35	6	1	0	0	0	0	0	0	327
7:00	101	91	130	156	49	7	1	0	0	0	0	0	0	535
8:00	67	77	114	138	58	5	0	0	0	0	0	1	0	460
9:00	32	51	120	128	37	7	0	0	0	0	0	0	0	375
10:00	19	51	136	137	43	2	0	0	0	0	0	0	0	388
11:00	60	73	134	144	60	9	1	0	0	0	0	0	0	481
12:00 PM	52	78	117	150	71	11	0	0	0	0	0	0	0	479
1:00	51	70	135	140	39	3	1	0	0	0	0	0	0	439
2:00	113	88	126	165	45	2	1	0	0	0	0	0	0	540
3:00	128	122	139	145	58	9	2	0	0	0	0	0	0	603
4:00	132	107	152	187	64	8	1	0	0	0	0	0	0	651
5:00	126	118	147	176	60	8	2	0	0	0	0	0	0	637
6:00	103	93	156	173	53	5	1	0	0	0	0	0	0	584
7:00	69	67	123	154	48	13	0	0	0	0	0	0	0	474
8:00	43	53	105	121	46	8	1	0	0	0	0	0	0	377
9:00	27	31	68	103	36	3	1	0	1	0	0	0	0	270
10:00	14	29	45	57	25	6	0	0	0	0	0	0	0	176
11:00	2	9	14	28	15	1	2	0	0	0	0	0	0	71
Total	1181	1262	2135	2512	895	129	17	3	1	0	0	1	0	8136
Percentile				15th	50th	85th	95th							
Speed				15	24	30	32							
Mean Speed (Average)				22.5										
10 MPH Pace Speed				20-29										
Number in Pace				4622										
Percent in Pace				56.8%										
Number > 30 MPH				1046										
Percent > 30 MPH				12.9%										
Grand Total	2494	2608	4419	5327	1959	287	42	8	3	1	0	1	0	17149
Stats	Percentile			15th	50th	85th	95th							
Speed				15	24	30	33							
Mean Speed (Average)				22.6										
10 MPH Pace Speed				20-29										
Number in Pace				9692										
Percent in Pace				56.5%										
Number > 30 MPH				2301										
Percent > 30 MPH				13.4%										

Location : Mechanic Street
 Location : North of Lincoln Street
 City/State: Marlborough, MA
 Direction: SB,

92990002

3/23/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	1	0	0	1	2	0	0	0	0	0	4
1:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
4:00	0	0	0	0	0	0	0	0	3	2	0	1	0	0	6
5:00	0	0	0	0	0	1	4	10	14	10	6	0	1	0	46
6:00	0	0	0	5	3	4	17	23	28	17	6	3	0	0	106
7:00	0	0	1	3	3	5	28	31	40	15	4	1	0	0	131
8:00	0	0	3	2	6	8	35	32	46	15	5	3	1	0	156
9:00	0	0	0	0	3	7	14	18	20	16	6	1	0	0	85
10:00	0	0	1	2	2	10	12	18	27	16	3	1	0	0	92
11:00	0	0	1	2	0	5	14	28	19	10	2	0	0	0	81
12:00 PM	0	0	1	0	1	3	21	25	20	17	7	0	0	0	95
1:00	0	0	2	1	4	9	16	14	20	7	1	1	0	0	75
2:00	0	0	1	4	6	6	23	32	31	20	5	2	0	0	130
3:00	0	0	2	2	5	17	16	30	32	12	7	0	0	0	123
4:00	0	0	4	3	5	8	23	48	35	12	1	1	0	0	140
5:00	0	0	2	5	10	14	38	32	31	18	6	0	1	0	157
6:00	0	0	0	0	3	8	27	26	24	10	2	0	0	0	100
7:00	0	0	1	3	0	4	18	29	22	9	1	0	1	0	88
8:00	0	0	0	1	4	3	14	21	17	9	4	0	0	0	73
9:00	0	0	0	0	1	3	5	12	11	9	2	0	0	0	43
10:00	0	0	0	0	2	0	2	3	2	2	1	0	0	0	12
11:00	0	0	1	0	0	0	0	6	4	2	0	0	0	0	13
Total	0	0	20	33	59	115	328	439	449	229	69	14	4	0	1759

Percentile 15th 50th 85th 95th
 Speed 18 23 27 30
 Mean Speed (Average) 22.9
 10 MPH Pace Speed 18-27
 Number in Pace 1289
 Percent in Pace 73.3%
 Number > 24 MPH 765
 Percent > 24 MPH 43.5%

Location : Mechanic Street
 Location : North of Lincoln Street
 City/State: Marlborough, MA
 Direction: NB,

92990002

3/23/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	1	1	0	3	2	0	0	0	7
1:00	0	0	0	0	0	1	0	0	1	4	0	1	0	0	8
2:00	0	0	0	0	0	0	0	1	1	1	1	0	0	0	4
3:00	0	0	0	0	0	0	0	0	1	0	1	0	0	1	3
4:00	0	0	0	0	0	0	0	2	4	1	3	0	0	0	10
5:00	0	0	0	0	0	0	2	2	8	12	6	0	1	1	32
6:00	0	0	0	0	1	3	5	8	24	23	11	1	2	0	78
7:00	0	0	0	2	3	2	8	14	35	20	19	2	1	0	106
8:00	0	0	0	0	2	4	6	13	47	49	19	5	3	1	149
9:00	0	0	0	0	3	1	9	15	31	38	21	2	0	1	121
10:00	0	0	0	2	1	2	7	21	34	38	23	5	0	1	134
11:00	0	0	0	0	2	1	12	11	33	43	13	3	1	0	119
12:00 PM	0	0	0	0	2	2	10	15	35	47	29	3	0	1	144
1:00	0	0	0	0	3	8	5	23	51	45	13	3	0	1	152
2:00	0	0	0	2	2	6	16	31	57	32	22	3	2	0	173
3:00	0	0	3	1	5	3	16	37	85	60	13	1	1	0	225
4:00	0	0	0	0	0	0	18	46	104	65	24	3	0	1	261
5:00	0	0	0	1	2	9	16	30	73	72	41	11	0	0	255
6:00	0	0	0	0	3	2	17	27	74	60	19	6	2	0	210
7:00	0	0	0	0	0	2	23	31	49	34	16	5	1	0	161
8:00	0	0	0	0	2	4	8	17	41	30	14	4	4	1	125
9:00	0	0	0	0	2	1	4	10	24	23	12	5	2	0	83
10:00	0	0	0	0	0	2	4	6	10	9	6	4	1	1	43
11:00	0	0	0	0	0	0	0	4	12	8	5	2	1	0	32
Total	0	0	3	8	34	52	188	365	834	717	333	69	22	10	2635

Percentile	15th
Speed	22
Mean Speed (Average)	26.7
10 MPH Pace Speed	21-30
Number in Pace	2022
Percent in Pace	76.7%
Number > 24 MPH	1985
Percent > 24 MPH	75.3%

92990002

3/24/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	0	1	1	1	2	0	0	0	5
1:00	0	0	0	0	0	0	0	2	1	2	0	0	0	0	5
2:00	0	0	0	0	0	0	0	2	0	2	0	0	0	0	4
3:00	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
4:00	0	0	0	0	0	0	2	3	1	1	1	0	0	0	8
5:00	0	0	0	0	0	1	2	0	6	6	6	2	0	0	23
6:00	0	0	0	0	0	0	2	6	15	15	12	2	2	0	54
7:00	0	0	0	1	1	4	8	16	46	21	13	5	1	0	116
8:00	0	0	0	1	1	2	4	25	39	33	24	3	2	0	134
9:00	0	0	0	0	1	2	10	19	38	32	16	1	1	0	120
10:00	0	0	0	0	1	2	12	16	43	33	17	3	2	0	129
11:00	0	0	0	0	0	0	3	17	53	50	24	1	0	0	148
12:00 PM	0	0	0	1	0	2	16	26	41	36	20	4	0	1	147
1:00	0	0	0	0	1	2	10	24	56	37	22	5	2	0	159
2:00	0	0	0	0	3	10	18	34	44	43	24	4	0	0	180
3:00	0	0	1	2	1	6	17	42	64	53	25	5	2	1	219
4:00	0	0	0	1	6	9	21	51	80	59	27	4	1	2	261
5:00	0	0	0	1	0	3	21	35	71	75	28	9	1	0	244
6:00	0	0	0	0	1	1	9	42	80	62	18	2	0	0	215
7:00	0	0	0	0	2	0	7	22	46	27	14	4	1	0	123
8:00	0	0	1	0	0	4	7	17	56	31	9	4	2	0	131
9:00	0	0	0	0	3	1	9	15	29	24	14	2	2	0	99
10:00	0	0	0	0	0	0	5	11	9	11	8	0	1	0	45
11:00	0	0	0	0	0	0	3	5	4	7	3	1	0	0	23
Total	0	0	2	7	21	49	186	431	825	661	327	61	20	4	2594
Percentile				15th	50th	85th	95th								
Speed				22	26	30	32								
Mean Speed (Average)				26.3											
10 MPH Pace Speed				21-30											
Number in Pace				2021											
Percent in Pace				77.9%											
Number > 24 MPH				1898											
Percent > 24 MPH				73.2%											
Grand Total	0	0	5	15	55	101	374	796	1659	1378	660	130	42	14	5229
Stats				Percentile	15th	50th	85th	95th							
Speed				22	26	30	32								
Mean Speed (Average)				26.5											
10 MPH Pace Speed				21-30											
Number in Pace				4043											
Percent in Pace				77.3%											
Number > 24 MPH				3883											
Percent > 24 MPH				74.3%											

92990002

	Percentile	15th	50th	85th	95th
	Speed	20	25	30	32
Mean Speed (Average)		25.2			
10 MPH Pace Speed		20-29			
Number in Pace		3191			
Percent in Pace		72.6%			
Number > 24 MPH		2750			
Percent > 24 MPH		62.6%			

92990002

3/24/2022	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	1	0	1	2	2	2	0	0	0	8
1:00	0	0	0	0	0	0	0	3	2	3	1	0	0	0	9
2:00	0	0	0	0	0	0	1	2	1	3	0	0	0	0	7
3:00	0	0	0	0	0	0	0	1	3	1	0	0	0	0	5
4:00	0	0	0	0	0	1	2	3	2	2	1	0	0	0	11
5:00	0	0	0	0	0	2	8	10	15	11	7	4	0	0	57
6:00	0	0	0	0	2	2	14	31	34	24	15	2	2	0	126
7:00	0	0	1	5	6	11	30	45	72	30	15	6	2	0	223
8:00	0	0	0	4	6	11	16	51	58	43	29	4	2	0	224
9:00	0	0	0	1	4	7	17	40	55	43	19	2	1	0	189
10:00	0	0	0	4	7	10	23	35	67	46	19	3	2	0	216
11:00	0	0	1	0	5	6	16	35	79	57	25	1	0	0	225
12:00 PM	0	0	0	2	4	10	31	39	60	44	24	4	0	1	219
1:00	0	0	0	0	3	4	26	43	72	43	23	5	2	0	221
2:00	0	0	7	9	13	20	31	50	60	51	26	5	0	0	272
3:00	0	0	2	7	15	16	34	69	82	56	26	6	2	1	316
4:00	0	0	1	3	11	16	43	74	99	66	31	4	1	2	351
5:00	0	0	1	3	11	11	35	67	91	88	29	10	1	0	347
6:00	0	0	2	5	7	10	28	70	113	76	19	3	0	0	333
7:00	0	0	0	0	4	6	19	40	63	30	17	4	2	0	185
8:00	0	0	1	0	0	5	11	26	69	35	11	4	2	0	164
9:00	0	0	0	1	4	2	16	20	32	26	16	2	2	0	121
10:00	0	0	0	0	3	4	9	14	13	12	9	0	1	0	65
11:00	0	0	0	0	0	0	5	5	7	11	4	1	0	0	33
Total	0	0	16	44	105	155	415	774	1151	803	368	70	22	4	3927
Percentile				15th	50th	85th	95th								
Speed				20	25	30	32								
Mean Speed (Average)				24.9											
10 MPH Pace Speed				20-29											
Number in Pace				2853											
Percent in Pace				72.7%											
Number > 24 MPH				2418											
Percent > 24 MPH				61.6%											
Grand Total	0	0	39	85	198	322	931	1578	2434	1749	770	153	48	14	8321
Stats				Percentile	15th	50th	85th	95th							
Speed				20	25	30	32								
Mean Speed (Average)				25.1											
10 MPH Pace Speed				20-29											
Number in Pace				6044											
Percent in Pace				72.6%											
Number > 24 MPH				5168											
Percent > 24 MPH				62.1%											

MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING



INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Marlborough COUNT DATE : Mar-22

DISTRICT : 3 UNSIGNALIZED : ☒ SIGNALIZED : ☐

~ INTERSECTION DATA ~

MAJOR STREET : Mechanic Street

MINOR STREET(S) : Hasting Street

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	304	288	18			610

" K " FACTOR :

0.090

INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

6,778

TOTAL # OF CRASHES :

2

OF YEARS :

5

AVERAGE # OF CRASHES PER YEAR (A) :

0.40

CRASH RATE CALCULATION :

0.16

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

Comments : _____

Project Title & Date: 9299 - Marlborough

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Marlborough COUNT DATE : Mar-22

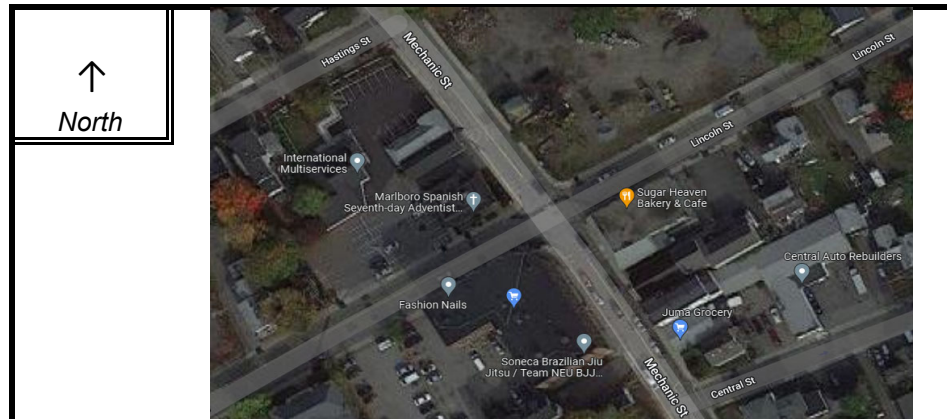
DISTRICT : 3 UNSIGNALIZED : ☒ SIGNALIZED : ☐

~ INTERSECTION DATA ~

MAJOR STREET : Mechanic Street

MINOR STREET(S) : Lincoln Street

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	333	289	386	519		1,527

" K " FACTOR : 0.090 INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME : 16,967

TOTAL # OF CRASHES : 33 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (A) : 6.60

CRASH RATE CALCULATION :

1.07

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

Comments : _____

Project Title & Date: 9299 - Marlborough

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Marlborough COUNT DATE : Mar-22

DISTRICT : 3 UNSIGNALIZED : ☒ SIGNALIZED : ☐

~ INTERSECTION DATA ~

MAJOR STREET : Lincoln Street

MINOR STREET(S) : Highland Street

Cashman Street

**INTERSECTION
DIAGRAM
(Label Approaches)**



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	74	58	392	456		980

" K " FACTOR :

0.090

INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

10,889

TOTAL # OF CRASHES :

11

OF YEARS :

5

AVERAGE # OF CRASHES PER YEAR (A) :

2.20

CRASH RATE CALCULATION :

0.55

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

Comments : _____

Project Title & Date: 9299 - Marlborough

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Marlborough COUNT DATE : Mar-22

DISTRICT : 3 UNSIGNALIZED : ☐ SIGNALIZED : ☒

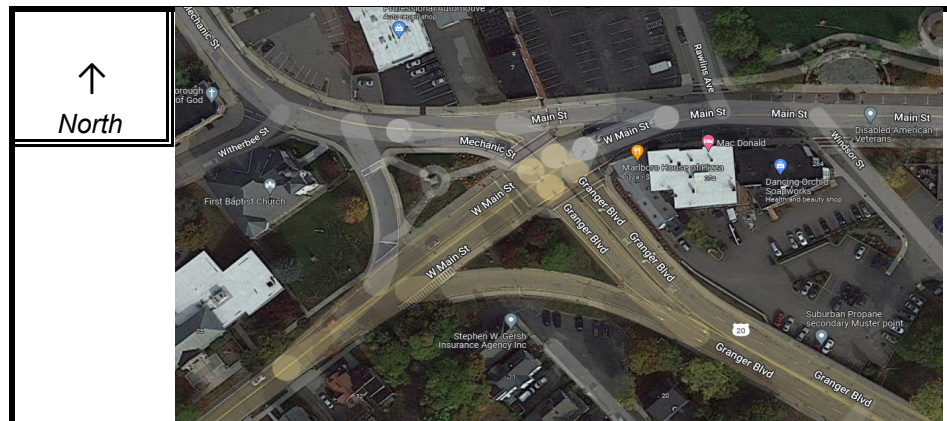
~ INTERSECTION DATA ~

MAJOR STREET : West Main Street Granger Boulevard

MINOR STREET(S) : Main Street

Mechanic Street

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	666	208	331	254		1,459

" K " FACTOR :

0.090

INTERSECTION ADT (V) = TOTAL DAILY
APPROACH VOLUME :

16,211

TOTAL # OF CRASHES :

22

OF
YEARS :

5

AVERAGE # OF
CRASHES PER YEAR (A) :

4.40

CRASH RATE CALCULATION :

0.74

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

Comments : _____

Project Title & Date: 9299 - Marlborough

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Marlborough COUNT DATE : Mar-22

DISTRICT : 3 UNSIGNALIZED : ☐ SIGNALIZED : ☒

~ INTERSECTION DATA ~

MAJOR STREET : West Main Street

MINOR STREET(S) : Bates Avenue

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :		27	780	607		1,414

" K " FACTOR :

0.090

INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

15,711

TOTAL # OF CRASHES :

2

OF YEARS :

5

AVERAGE # OF CRASHES PER YEAR (A) :

0.40

CRASH RATE CALCULATION :

0.07

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

Comments : _____

Project Title & Date: 9299 - Marlborough

GENERAL BACKGROUND TRAFFIC GROWTH



General Background Traffic Growth - Daily Traffic Volumes

CITY/TOWN	ROUTE/STREET	LOCATION	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Annual Growth Rate
Marlborough	Concord Road	north of Boston Post Road East								3,652	3,714	3,725	3,710	0.53%
Marlborough	Boston Post Road East	east of Concord Road								21,011	21,242	21,539	21,625	0.97%
Marlborough	Interstate 495	south of Route 20	93,974	88,287			84,259	86,324	92,263	91,415	91,141	92,235	92,788	0.55%
Marlborough	Interstate 495	north of Interstate 290	85,271	97,599			97,440	99,463	104,694	105,810	105,493	108,286	109,023	3.70%
Marlborough	Mechanic Street	north of Elm Street	1,687	1,692	1,716	1,736	1,745	1,799	1,840		2,322	2,329	2,320	1.09%
Marlborough	Elm Street	between Maplewood Avenue and Preston Street	6,000	5,986	6,066	6,137	6,164	6,355	6,160	6,542	6,653	5,854	5,831	-0.18%
Marlborough	Interstate 495	south of Route 290 EB to Route 495 SB Ramp	87,043	89,914			85,462	92,415	95,627	96,851	100,337	99,852	98,873	2.62%
Marlborough	Interstate 290	west of Route 290 EB to Route 495 SB Ramp	74,686	72,533		74,184	74,658	74,361	78,254	77,353	80,216	77,642	82,798	1.07%
														1.29%

TRIP-GENERATION CALCULATIONS



Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

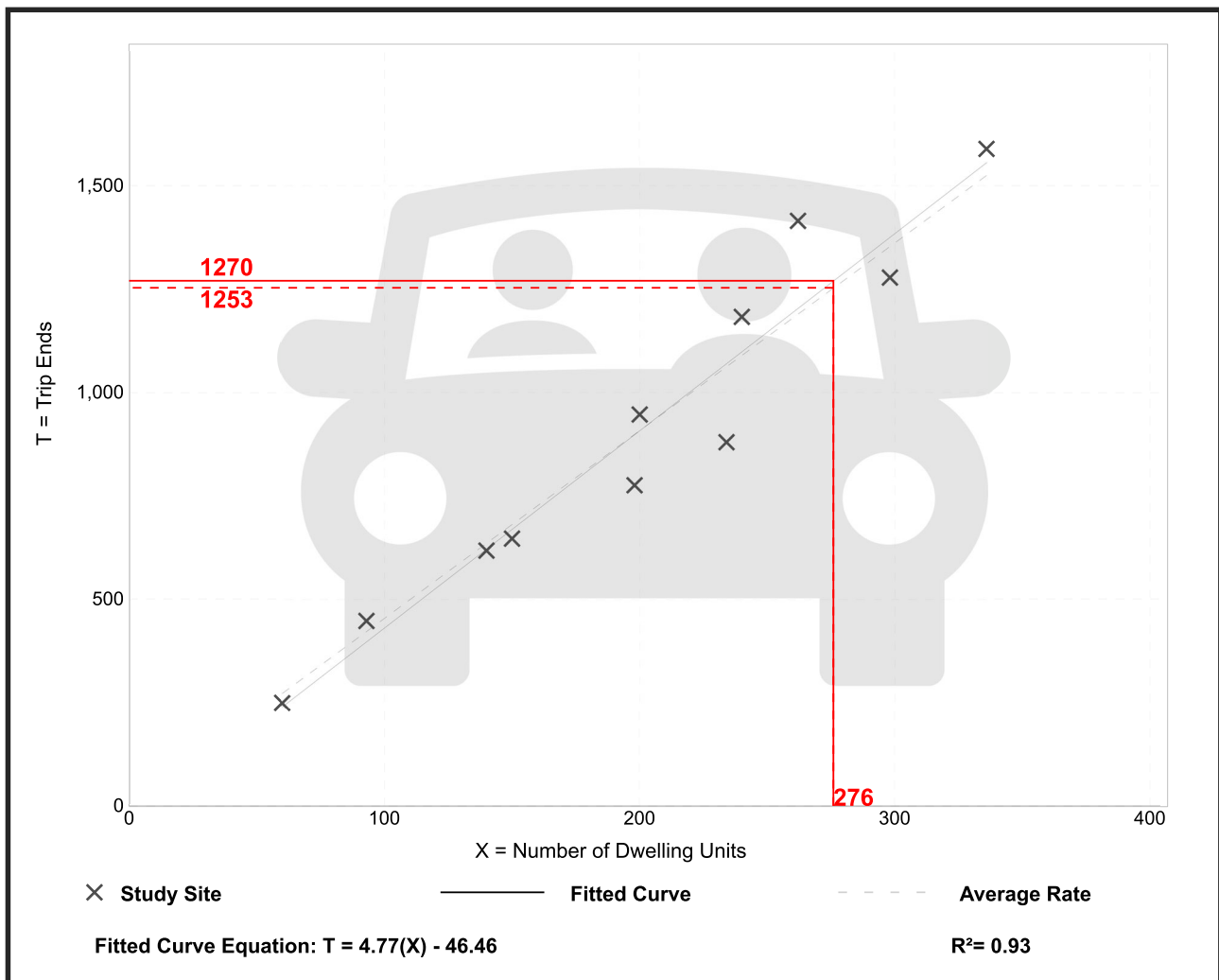
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 11
Avg. Num. of Dwelling Units: 201
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.54	3.76 - 5.40	0.51

Data Plot and Equation



Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 30

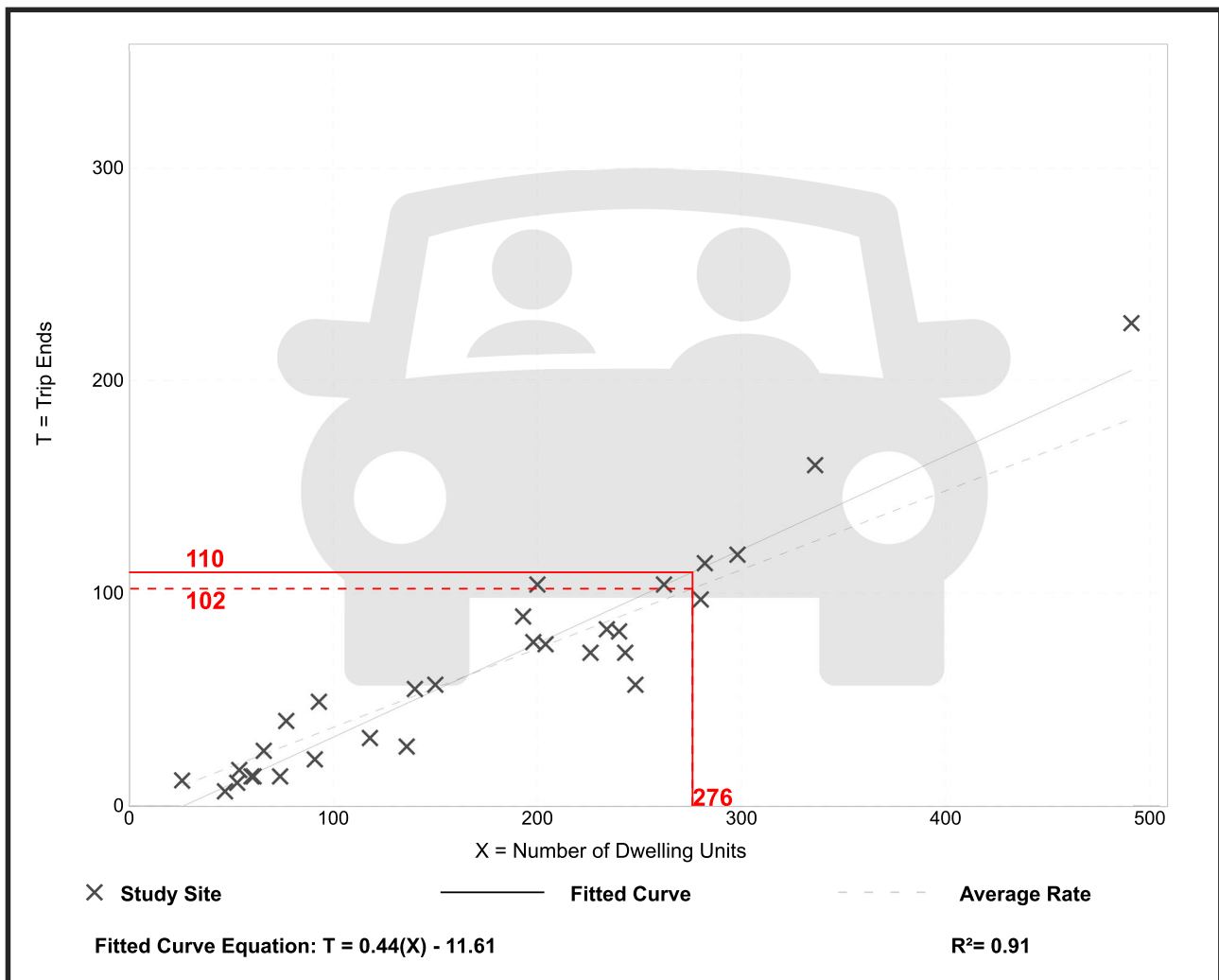
Avg. Num. of Dwelling Units: 173

Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.37	0.15 - 0.53	0.09

Data Plot and Equation



Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 31

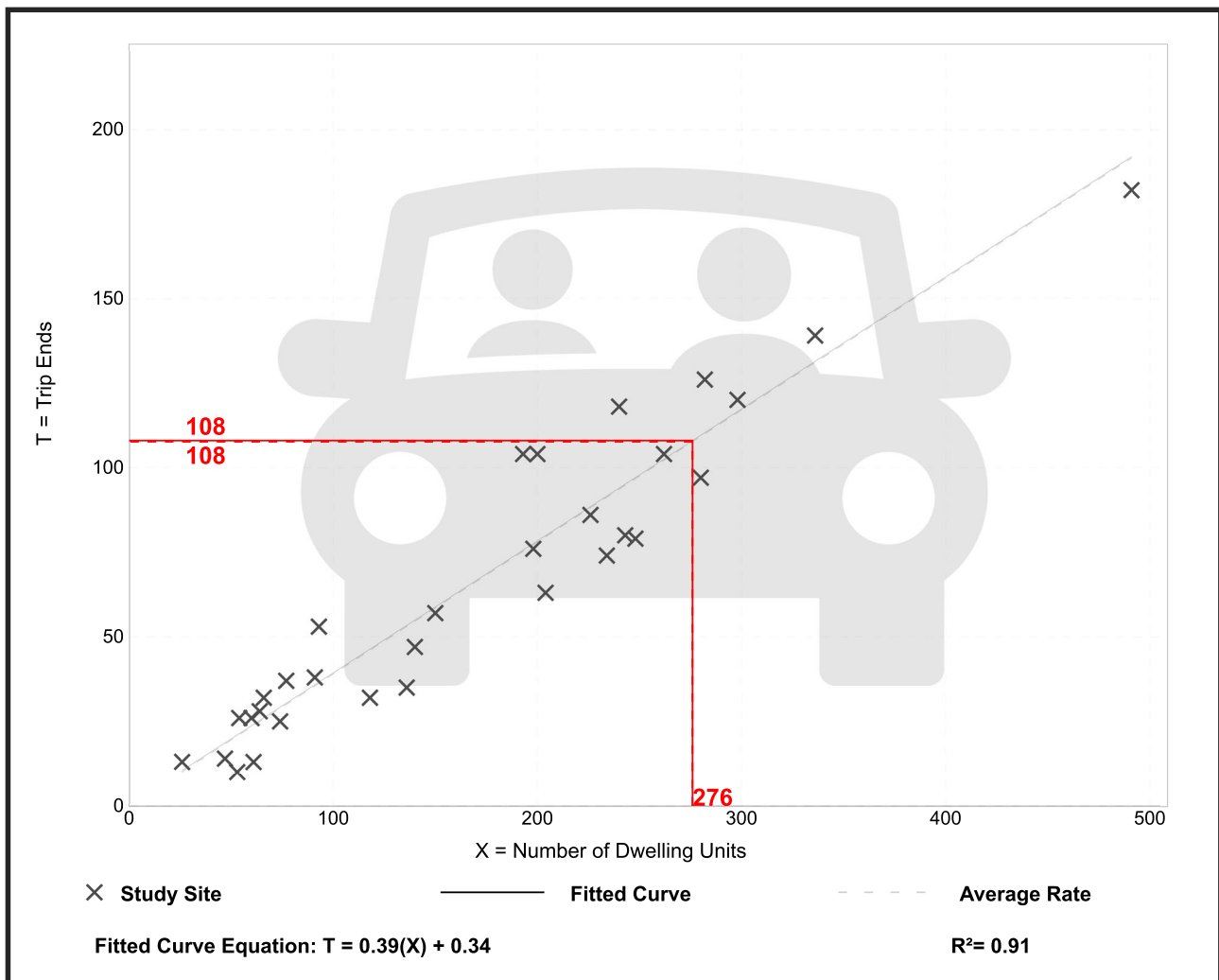
Avg. Num. of Dwelling Units: 169

Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.39	0.19 - 0.57	0.08

Data Plot and Equation



Strip Retail Plaza (<40k) (822)

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

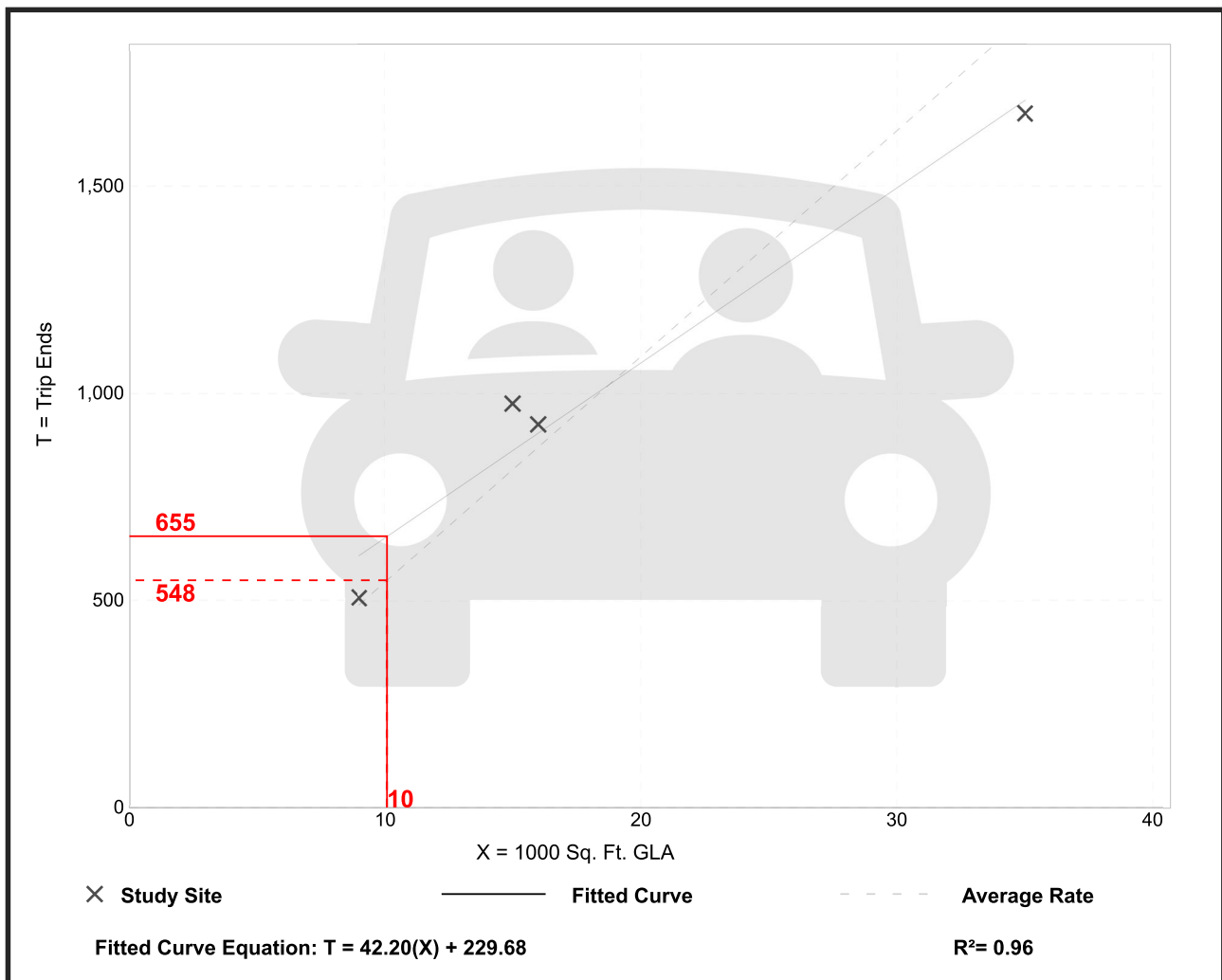
Setting/Location: General Urban/Suburban
Number of Studies: 4
Avg. 1000 Sq. Ft. GLA: 19
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
54.45	47.86 - 65.07	7.81

Data Plot and Equation

Caution – Small Sample Size



Strip Retail Plaza (<40k) (822)

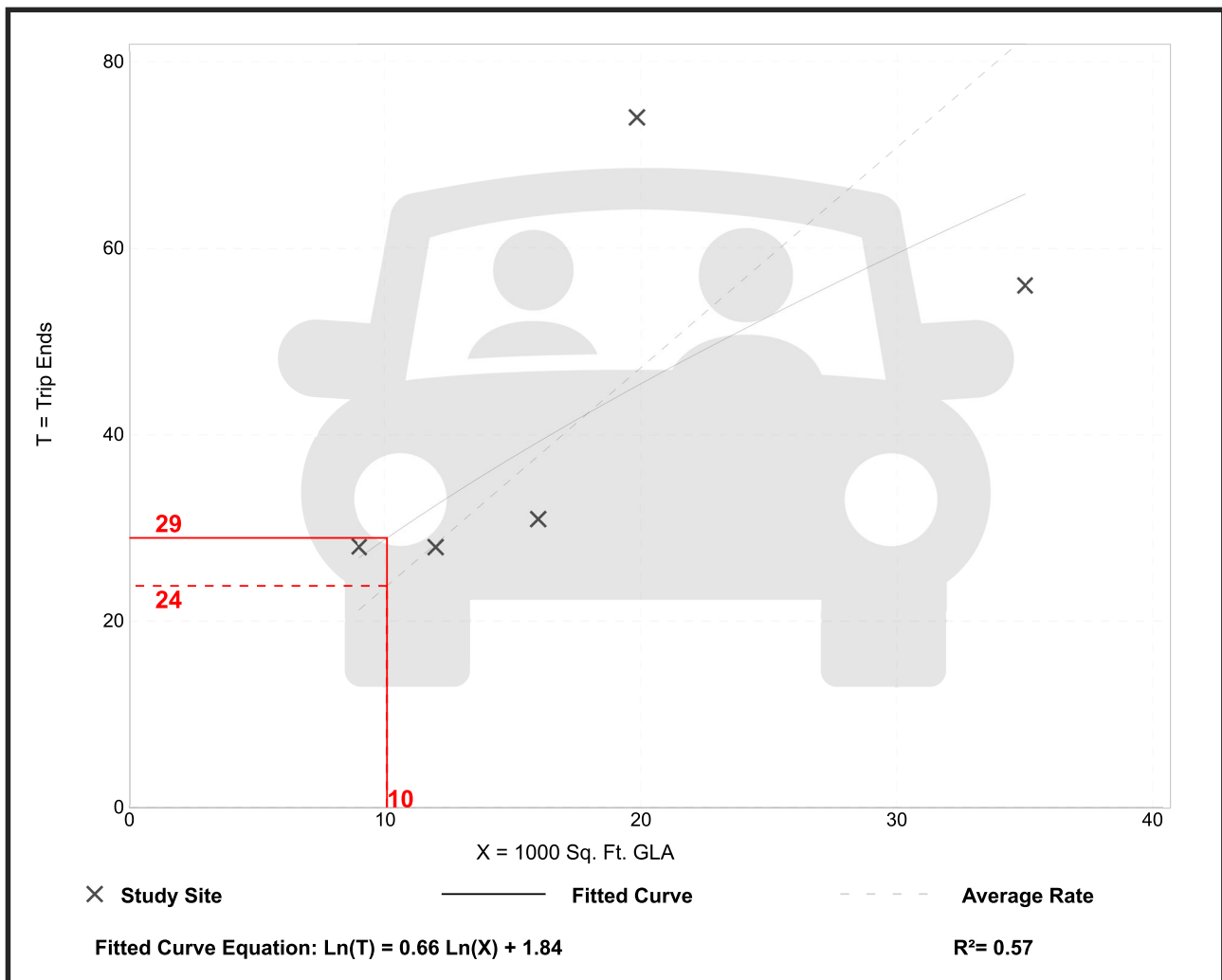
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 5
 Avg. 1000 Sq. Ft. GLA: 18
 Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
2.36	1.60 - 3.73	0.94

Data Plot and Equation

Caution – Small Sample Size



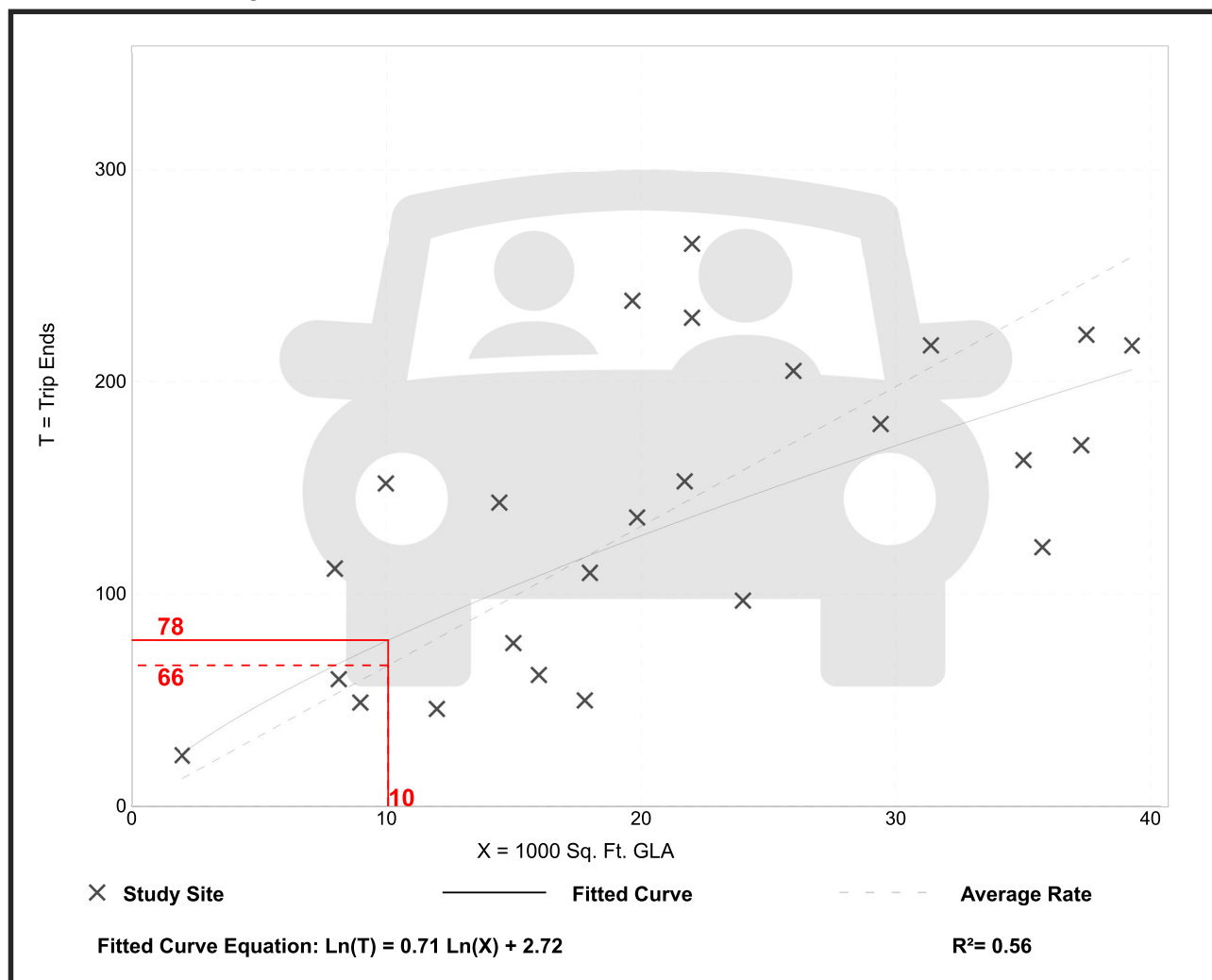
Strip Retail Plaza (<40k) (822)

Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 25
 Avg. 1000 Sq. Ft. GLA: 21
 Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
6.59	2.81 - 15.20	2.94

Data Plot and Equation



[illegible]

Source: ITE *Trip Generation Manual*, 11th Edition

[illegible]

JOURNEY-TO-WORK TRIP DISTRIBUTIONS



Proposed Mixed-Use Development
Marlborough, Massachusetts

Residence	Workplace	Number	Mechanic Street (North)		Lincoln Street (West)		West Main Street (Southwest)		Granger Boulevard (Southeast)		Main Street (East)		Lincoln Street (East)	
Marlborough city	Marlborough city	6,719	25%	1680		0	25%	1680	25%	1680	25%	1680		0
Marlborough city	Framingham town	1,463		0	25%	366	75%	1097		0		0		0
Marlborough city	Hudson town	1,182	50%	591		0		0		0		0	50%	591
Marlborough city	Boston city	1,169		0	75%	877		0		0		0	25%	292
Marlborough city	Waltham city	844		0	75%	633		0		0		0	25%	211
Marlborough city	Sudbury town	756		0		0		0		0		0	100%	756
Marlborough city	Southborough town	717		0		0	50%	359	50%	359		0		0
Marlborough city	Worcester city	682		0	100%	682		0		0		0		0
Marlborough city	Cambridge city	608		0	75%	456		0		0		0	25%	152
Marlborough city	Natick town	571		0	50%	286	50%	286		0		0		0
Marlborough city	Newton city	460		0	50%	230		0		0	50%	230		0
Marlborough city	Westborough town	443		0	100%	443		0		0		0		0
Marlborough city	Northborough town	364		0	100%	364		0		0		0		0
Marlborough city	Ashland town	290		0	25%	73	75%	218		0		0		0
Marlborough city	Burlington town	277		0	50%	139		0		0		0	50%	139
Marlborough city	Needham town	263		0	50%	132		0		0	50%	132		0
Marlborough city	Chelmsford town	203		0	100%	203		0		0		0		0
Marlborough city	Lexington town	193		0	50%	97		0		0		0	50%	97
Marlborough city	Acton town	192		0	50%	96		0		0		0	50%	96
Marlborough city	Milford town	186		0	100%	186		0		0		0		0
Marlborough city	Maynard town	177		0		0		0		0		0	100%	177
Marlborough city	Watertown Town city	171		0	75%	128		0		0		0	25%	43
Marlborough city	Hopkinton town	170		0	50%	85	50%	85		0		0		0
Marlborough city	Weston town	160		0	100%	160		0		0		0		0
Marlborough city	Wayland town	156		0	100%	156		0		0		0		0
Marlborough city	Wilmington town	156		0	100%	156		0		0		0		0
Marlborough city	Littleton town	152		0	75%	114		0		0		0	25%	38
Marlborough city	Concord town	141		0	75%	106		0		0		0	25%	35
Marlborough city	Somerville city	133		0	25%	33		0		0		0	75%	100
Marlborough city	Wellesley town	132		0		0	50%	66		0		0	50%	66
Marlborough city	Woburn city	130		0	75%	98		0		0		0	25%	33
Marlborough city	Shrewsbury town	127		0	100%	127		0		0		0		0
Marlborough city	Lowell city	111		0	75%	83		0		0		0	25%	28
Marlborough city	Bedford town	107		0	100%	107		0		0		0		0
Marlborough city	Medford city	103		0	75%	77		0		0		0	25%	26
Marlborough city	Dedham town	103		0	75%	77		0		0		0	25%	26
Marlborough city	Franklin Town city	94		0	100%	94		0		0		0		0
19,905			2,271		6,862		3,790		2,038		2,041		2,904	
			11.4%		34.5%		19.0%		10.2%		10.3%		14.6%	
<u>SAY</u>			11%		34%		19%		10%		10%		15%	

CAPACITY ANALYSIS WORKSHEETS

Mechanic Street at Hastings Street

Mechanic Street at Lincoln Street

Lincoln Street at Cashman Street and Highland Avenue

Main Street at West Main Street, Mechanic Street, and Granger Boulevard

West Main Street at Bates Avenue

Lincoln Street at the Project Site Driveway



Mechanic Street at Hastings Street



2022 Existing Weekday Morning
1: Mechanic Street & Hasting Street

04/06/2022

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	8	5	172	229	8
Future Vol, veh/h	6	8	5	172	229	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	85	85	83	83
Heavy Vehicles, %	0	0	0	1	2	14
Mvmt Flow	8	11	6	202	276	10

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	495	281	286	0	-	0
Stage 1	281	-	-	-	-	-
Stage 2	214	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	537	763	1288	-	-	-
Stage 1	771	-	-	-	-	-
Stage 2	826	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	534	763	1288	-	-	-
Mov Cap-2 Maneuver	534	-	-	-	-	-
Stage 1	767	-	-	-	-	-
Stage 2	826	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1288	-	645	-	-
HCM Lane V/C Ratio	0.005	-	0.029	-	-
HCM Control Delay (s)	7.8	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

2022 Existing Weekday Evening
1: Mechanic Street & Hasting Street

04/06/2022

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	8	8	296	281	7
Future Vol, veh/h	10	8	8	296	281	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	57	57	94	94	90	90
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	18	14	9	315	312	8

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	649	316	320
Stage 1	316	-	-
Stage 2	333	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	438	729	1251
Stage 1	744	-	-
Stage 2	731	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	434	729	1251
Mov Cap-2 Maneuver	434	-	-
Stage 1	737	-	-
Stage 2	731	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1251	-	529	-	-
HCM Lane V/C Ratio	0.007	-	0.06	-	-
HCM Control Delay (s)	7.9	0	12.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

2029 No Build Weekday Morning
1: Mechanic Street & Hasting Street

04/06/2022

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	9	6	191	254	9
Future Vol, veh/h	7	9	6	191	254	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	85	85	83	83
Heavy Vehicles, %	0	0	0	1	2	14
Mvmt Flow	9	12	7	225	306	11

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	551	312	317	0	-	0
Stage 1	312	-	-	-	-	-
Stage 2	239	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	499	733	1255	-	-	-
Stage 1	747	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	496	733	1255	-	-	-
Mov Cap-2 Maneuver	496	-	-	-	-	-
Stage 1	743	-	-	-	-	-
Stage 2	805	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1255	-	606	-	-
HCM Lane V/C Ratio	0.006	-	0.035	-	-
HCM Control Delay (s)	7.9	0	11.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

2029 No Build Weekday Evening
1: Mechanic Street & Hasting Street

04/06/2022

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	9	9	329	312	8
Future Vol, veh/h	11	9	9	329	312	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	57	57	94	94	90	90
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	19	16	10	350	347	9
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	722	352	356	0	-	0
Stage 1	352	-	-	-	-	-
Stage 2	370	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	397	696	1214	-	-	-
Stage 1	716	-	-	-	-	-
Stage 2	703	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	393	696	1214	-	-	-
Mov Cap-2 Maneuver	393	-	-	-	-	-
Stage 1	709	-	-	-	-	-
Stage 2	703	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.9	0.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1214	-	489	-	-	
HCM Lane V/C Ratio	0.008	-	0.072	-	-	
HCM Control Delay (s)	8	0	12.9	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

2029 Build Weekday Evening
1: Mechanic Street & Hasting Street/Project Driveway

04/06/2022

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	0	9	47	0	14	9	322	75	10	311	8
Future Vol, veh/h	11	0	9	47	0	14	9	322	75	10	311	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	57	92	57	92	92	92	94	94	92	92	90	90
Heavy Vehicles, %	0	2	0	2	2	2	0	1	2	2	0	0
Mvmt Flow	19	0	16	51	0	15	10	343	82	11	346	9
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	785	818	351	785	781	384	355	0	0	425	0	0
Stage 1	373	373	-	404	404	-	-	-	-	-	-	-
Stage 2	412	445	-	381	377	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.2	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	313	311	697	310	326	664	1215	-	-	1134	-	-
Stage 1	652	618	-	623	599	-	-	-	-	-	-	-
Stage 2	621	575	-	641	616	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	300	304	697	298	319	664	1215	-	-	1134	-	-
Mov Cap-2 Maneuver	300	304	-	298	319	-	-	-	-	-	-	-
Stage 1	645	611	-	616	592	-	-	-	-	-	-	-
Stage 2	600	569	-	619	609	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	14.8		18.1		0.2		0.2					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1215	-	-	403	341	1134	-	-				
HCM Lane V/C Ratio	0.008	-	-	0.087	0.194	0.01	-	-				
HCM Control Delay (s)	8	0	-	14.8	18.1	8.2	0	-				
HCM Lane LOS	A	A	-	B	C	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.3	0.7	0	-	-				

2029 Build Weekday Morning
1: Mechanic Street & Hasting Street/Project Driveway

04/06/2022

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	0	9	80	0	10	6	191	27	4	254	9
Future Vol, veh/h	7	0	9	80	0	10	6	191	27	4	254	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	92	75	92	92	92	85	85	92	92	83	83
Heavy Vehicles, %	0	2	0	2	2	2	0	1	2	2	2	14
Mvmt Flow	9	0	12	87	0	11	7	225	29	4	306	11

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	579	588	312	580	579	240	317	0	0	254	0	0
Stage 1	320	320	-	254	254	-	-	-	-	-	-	-
Stage 2	259	268	-	326	325	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.2	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	429	421	733	426	426	799	1255	-	-	1311	-	-
Stage 1	696	652	-	750	697	-	-	-	-	-	-	-
Stage 2	750	687	-	687	649	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	420	416	733	415	421	799	1255	-	-	1311	-	-
Mov Cap-2 Maneuver	420	416	-	415	421	-	-	-	-	-	-	-
Stage 1	691	649	-	745	692	-	-	-	-	-	-	-
Stage 2	735	682	-	673	646	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.8		15.6		0.2		0.1	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1255	-	-	553	438	1311	-
HCM Lane V/C Ratio	0.006	-	-	0.039	0.223	0.003	-
HCM Control Delay (s)	7.9	0	-	11.8	15.6	7.8	0
HCM Lane LOS	A	A	-	B	C	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	0.8	0	-

Mechanic Street at Lincoln Street



2022 Existing Weekday Morning
2: Mechanic Street & Lincoln Street

04/06/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	231	53	17	394	59	46	100	12	90	125	22
Future Volume (vph)	18	231	53	17	394	59	46	100	12	90	125	22
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976			0.983			0.990			0.988	
Flt Protected		0.997			0.998			0.986			0.981	
Satd. Flow (prot)	0	1928	0	0	1778	0	0	1978	0	0	1947	0
Flt Permitted		0.959			0.983			0.865			0.829	
Satd. Flow (perm)	0	1854	0	0	1751	0	0	1736	0	0	1645	0
Satd. Flow (RTOR)		15			10						7	
Adj. Flow (vph)	20	251	58	20	458	69	60	130	16	111	154	27
Lane Group Flow (vph)	0	329	0	0	547	0	0	206	0	0	292	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		10.0	15.0	
Total Split (s)	34.5	34.5		34.5	34.5		20.5	20.5		12.5	33.0	
Total Split (%)	42.3%	42.3%		42.3%	42.3%		25.2%	25.2%		15.3%	40.5%	
Maximum Green (s)	30.0	30.0		30.0	30.0		16.0	16.0		8.0	28.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-0.5			-0.5			-0.5			-0.5	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.39			0.70			0.35			0.51	
Control Delay		12.8			19.6			16.3			18.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		12.8			19.6			16.3			18.5	
Queue Length 50th (ft)		49			100			39			58	
Queue Length 95th (ft)		192			#385			108			161	
Internal Link Dist (ft)		328			1596			502			414	
Turn Bay Length (ft)												
Base Capacity (vph)		1254			1183			707			1059	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.26			0.46			0.29			0.28	
Intersection Summary												
Cycle Length: 81.5												

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	14.0
Total Split (s)	14.0
Total Split (%)	17%
Maximum Green (s)	12.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	10
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

2022 Existing Weekday Morning 2: Mechanic Street & Lincoln Street

04/06/2022

Actuated Cycle Length: 50.5

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: Mechanic Street & Lincoln Street

 Ø1	 Ø2	 Ø4	 Ø9
12.5 s	20.5 s	34.5 s	14 s
 Ø6	 Ø8		
33 s	34.5 s		

2022 Existing Weekday Morning
2: Mechanic Street & Lincoln Street

04/06/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	231	53	17	394	59	46	100	12	90	125	22
Future Volume (vph)	18	231	53	17	394	59	46	100	12	90	125	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	11	11	11	14	14	14	14	14	14
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.99			0.99	
Flt Protected		1.00			1.00			0.99			0.98	
Satd. Flow (prot)		1928			1778			1977			1946	
Flt Permitted		0.96			0.98			0.87			0.83	
Satd. Flow (perm)		1855			1751			1735			1645	
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.77	0.77	0.77	0.81	0.81	0.81
Adj. Flow (vph)	20	251	58	20	458	69	60	130	16	111	154	27
RTOR Reduction (vph)	0	8	0	0	6	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	321	0	0	541	0	0	206	0	0	287	0
Heavy Vehicles (%)	7%	2%	2%	0%	1%	4%	0%	0%	0%	1%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		21.9			21.9			16.8			16.8	
Effective Green, g (s)		22.4			22.4			17.3			17.3	
Actuated g/C Ratio		0.44			0.44			0.34			0.34	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		811			766			586			555	
v/s Ratio Prot												
v/s Ratio Perm		0.17			c0.31			0.12			c0.17	
v/c Ratio		0.40			0.71			0.35			0.52	
Uniform Delay, d1		9.8			11.7			12.7			13.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			3.0			0.4			0.8	
Delay (s)		10.1			14.7			13.1			14.4	
Level of Service		B			B			B			B	
Approach Delay (s)		10.1			14.7			13.1			14.4	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		13.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.68										
Actuated Cycle Length (s)		51.2			Sum of lost time (s)			14.5				
Intersection Capacity Utilization		55.2%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

2022 Existing Weekday Evening
2: Mechanic Street & Lincoln Street

04/06/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	277	99	22	421	76	97	218	18	124	140	25
Future Volume (vph)	10	277	99	22	421	76	97	218	18	124	140	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.965			0.980			0.993			0.988	
Flt Protected		0.999			0.998			0.986			0.979	
Satd. Flow (prot)	0	1954	0	0	1793	0	0	1984	0	0	1960	0
Flt Permitted		0.986			0.976			0.825			0.709	
Satd. Flow (perm)	0	1928	0	0	1753	0	0	1660	0	0	1420	0
Satd. Flow (RTOR)		24			12						7	
Adj. Flow (vph)	10	289	103	23	448	81	103	232	19	143	161	29
Lane Group Flow (vph)	0	402	0	0	552	0	0	354	0	0	333	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		10.0	15.0	
Total Split (s)	34.5	34.5		34.5	34.5		20.5	20.5		12.5	33.0	
Total Split (%)	42.3%	42.3%		42.3%	42.3%		25.2%	25.2%		15.3%	40.5%	
Maximum Green (s)	30.0	30.0		30.0	30.0		16.0	16.0		8.0	28.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-0.5			-0.5			-0.5			-0.5	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.49			0.75			0.53			0.58	
Control Delay		15.8			24.1			19.0			20.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		15.8			24.1			19.0			20.5	
Queue Length 50th (ft)		87			145			89			84	
Queue Length 95th (ft)		234			#424			234			219	
Internal Link Dist (ft)		328			1596			502			414	
Turn Bay Length (ft)												
Base Capacity (vph)		1080			977			671			752	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.37			0.56			0.53			0.44	
Intersection Summary												
Cycle Length: 81.5												

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	14.0
Total Split (s)	14.0
Total Split (%)	17%
Maximum Green (s)	12.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	10
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

2022 Existing Weekday Evening 2: Mechanic Street & Lincoln Street

04/06/2022

Actuated Cycle Length: 58.9

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: Mechanic Street & Lincoln Street

 Ø1	 Ø2	 Ø4	 Ø9
12.5 s	20.5 s	34.5 s	14 s
 Ø6	 Ø8		
33 s	34.5 s		

2022 Existing Weekday Evening
2: Mechanic Street & Lincoln Street

04/06/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	277	99	22	421	76	97	218	18	124	140	25
Future Volume (vph)	10	277	99	22	421	76	97	218	18	124	140	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	11	11	11	14	14	14	14	14	14
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.99			0.99	
Flt Protected		1.00			1.00			0.99			0.98	
Satd. Flow (prot)		1954			1793			1983			1961	
Flt Permitted		0.99			0.98			0.82			0.71	
Satd. Flow (perm)		1928			1754			1660			1419	
Peak-hour factor, PHF	0.96	0.96	0.96	0.94	0.94	0.94	0.94	0.94	0.94	0.87	0.87	0.87
Adj. Flow (vph)	10	289	103	23	448	81	103	232	19	143	161	29
RTOR Reduction (vph)	0	14	0	0	7	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	388	0	0	545	0	0	354	0	0	329	0
Heavy Vehicles (%)	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		23.9			23.9			23.3			23.3	
Effective Green, g (s)		24.4			24.4			23.8			23.8	
Actuated g/C Ratio		0.41			0.41			0.40			0.40	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		785			714			659			563	
v/s Ratio Prot												
v/s Ratio Perm		0.20			0.31			0.21			0.23	
v/c Ratio		0.49			0.76			0.54			0.58	
Uniform Delay, d1		13.2			15.3			13.8			14.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.5			4.8			0.8			1.5	
Delay (s)		13.7			20.1			14.7			15.7	
Level of Service		B			C			B			B	
Approach Delay (s)		13.7			20.1			14.7			15.7	
Approach LOS		B			C			B			B	
Intersection Summary												
HCM 2000 Control Delay		16.5			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		59.9			Sum of lost time (s)			14.5				
Intersection Capacity Utilization		68.6%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

2029 No Build Weekday Morning
2: Mechanic Street & Lincoln Street

04/06/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	257	59	19	438	65	51	111	13	100	139	24
Future Volume (vph)	21	257	59	19	438	65	51	111	13	100	139	24
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976			0.983			0.990			0.988	
Flt Protected		0.997			0.998			0.986			0.981	
Satd. Flow (prot)	0	1927	0	0	1778	0	0	1978	0	0	1947	0
Flt Permitted		0.953			0.982			0.843			0.798	
Satd. Flow (perm)	0	1842	0	0	1750	0	0	1691	0	0	1583	0
Satd. Flow (RTOR)		15			10						7	
Adj. Flow (vph)	23	279	64	22	509	76	66	144	17	123	172	30
Lane Group Flow (vph)	0	366	0	0	607	0	0	227	0	0	325	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		10.0	15.0	
Total Split (s)	34.5	34.5		34.5	34.5		20.5	20.5		12.5	33.0	
Total Split (%)	42.3%	42.3%		42.3%	42.3%		25.2%	25.2%		15.3%	40.5%	
Maximum Green (s)	30.0	30.0		30.0	30.0		16.0	16.0		8.0	28.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-0.5			-0.5			-0.5			-0.5	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.41			0.73			0.40			0.60	
Control Delay		13.4			21.3			18.2			22.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		13.4			21.3			18.2			22.0	
Queue Length 50th (ft)		63			133			58			88	
Queue Length 95th (ft)		218			#454			119			183	
Internal Link Dist (ft)		328			1596			502			414	
Turn Bay Length (ft)												
Base Capacity (vph)		1069			1014			628			871	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.34			0.60			0.36			0.37	
Intersection Summary												
Cycle Length: 81.5												

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	14.0
Total Split (s)	14.0
Total Split (%)	17%
Maximum Green (s)	12.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	10
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

2029 No Build Weekday Morning 2: Mechanic Street & Lincoln Street

04/06/2022

Actuated Cycle Length: 56.7

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: Mechanic Street & Lincoln Street

 Ø1	 Ø2	 Ø4	 Ø9
12.5 s	20.5 s	34.5 s	14 s
 Ø6	 Ø8		
33 s	34.5 s		

2029 No Build Weekday Morning
2: Mechanic Street & Lincoln Street

04/06/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	21	257	59	19	438	65	51	111	13	100	139	24
Future Volume (vph)	21	257	59	19	438	65	51	111	13	100	139	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	11	11	11	14	14	14	14	14	14
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.99			0.99	
Flt Protected		1.00			1.00			0.99			0.98	
Satd. Flow (prot)		1928			1779			1977			1947	
Flt Permitted		0.95			0.98			0.84			0.80	
Satd. Flow (perm)		1843			1749			1690			1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.77	0.77	0.77	0.81	0.81	0.81
Adj. Flow (vph)	23	279	64	22	509	76	66	144	17	123	172	30
RTOR Reduction (vph)	0	8	0	0	5	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	358	0	0	602	0	0	227	0	0	320	0
Heavy Vehicles (%)	7%	2%	2%	0%	1%	4%	0%	0%	0%	1%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		26.4			26.4			18.7			18.7	
Effective Green, g (s)		26.9			26.9			19.2			19.2	
Actuated g/C Ratio		0.47			0.47			0.33			0.33	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		857			813			561			525	
v/s Ratio Prot												
v/s Ratio Perm		0.19			0.34			0.13			0.20	
v/c Ratio		0.42			0.74			0.40			0.61	
Uniform Delay, d1		10.3			12.6			14.9			16.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			3.6			0.5			2.1	
Delay (s)		10.6			16.2			15.4			18.3	
Level of Service		B			B			B			B	
Approach Delay (s)		10.6			16.2			15.4			18.3	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	57.8	Sum of lost time (s)	14.5
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

2029 No Build Weekday Evening
2: Mechanic Street & Lincoln Street

04/06/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	307	110	24	467	84	108	242	20	138	155	28
Future Volume (vph)	12	307	110	24	467	84	108	242	20	138	155	28
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.965			0.980			0.993			0.988	
Flt Protected		0.999			0.998			0.986			0.979	
Satd. Flow (prot)	0	1954	0	0	1793	0	0	1984	0	0	1960	0
Flt Permitted		0.980			0.973			0.797			0.662	
Satd. Flow (perm)	0	1917	0	0	1748	0	0	1604	0	0	1326	0
Satd. Flow (RTOR)		24			12						7	
Adj. Flow (vph)	13	320	115	26	497	89	115	257	21	159	178	32
Lane Group Flow (vph)	0	448	0	0	612	0	0	393	0	0	369	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		10.0	15.0	
Total Split (s)	34.5	34.5		34.5	34.5		20.5	20.5		12.5	33.0	
Total Split (%)	42.3%	42.3%		42.3%	42.3%		25.2%	25.2%		15.3%	40.5%	
Maximum Green (s)	30.0	30.0		30.0	30.0		16.0	16.0		8.0	28.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-0.5			-0.5			-0.5			-0.5	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.53			0.80			0.61			0.69	
Control Delay		16.9			27.2			21.9			26.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		16.9			27.2			21.9			26.0	
Queue Length 50th (ft)		118			198			118			113	
Queue Length 95th (ft)		268			#498			270			#285	
Internal Link Dist (ft)		328			1596			502			414	
Turn Bay Length (ft)												
Base Capacity (vph)		953			864			642			622	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.47			0.71			0.61			0.59	
Intersection Summary												
Cycle Length: 81.5												

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	14.0
Total Split (s)	14.0
Total Split (%)	17%
Maximum Green (s)	12.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	10
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

2029 No Build Weekday Evening 2: Mechanic Street & Lincoln Street

04/06/2022

Actuated Cycle Length: 64.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: Mechanic Street & Lincoln Street

 Ø1	 Ø2	 Ø4	 Ø9
12.5 s	20.5 s	34.5 s	14 s
 Ø6	 Ø8		
33 s	34.5 s		

2029 No Build Weekday Evening
2: Mechanic Street & Lincoln Street

04/06/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	307	110	24	467	84	108	242	20	138	155	28
Future Volume (vph)	12	307	110	24	467	84	108	242	20	138	155	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	11	11	11	14	14	14	14	14	14
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.99			0.99	
Flt Protected		1.00			1.00			0.99			0.98	
Satd. Flow (prot)		1954			1793			1983			1961	
Flt Permitted		0.98			0.97			0.80			0.66	
Satd. Flow (perm)		1918			1748			1603			1327	
Peak-hour factor, PHF	0.96	0.96	0.96	0.94	0.94	0.94	0.94	0.94	0.94	0.87	0.87	0.87
Adj. Flow (vph)	12	320	115	26	497	89	115	257	21	159	178	32
RTOR Reduction (vph)	0	14	0	0	7	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	434	0	0	605	0	0	393	0	0	365	0
Heavy Vehicles (%)	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		27.7			27.7			25.4			25.4	
Effective Green, g (s)		28.2			28.2			25.9			25.9	
Actuated g/C Ratio		0.43			0.43			0.39			0.39	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		819			746			629			520	
v/s Ratio Prot												
v/s Ratio Perm		0.23			0.35			0.25			0.27	
v/c Ratio		0.53			0.81			0.62			0.70	
Uniform Delay, d1		14.0			16.6			16.1			16.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.7			6.7			1.9			4.3	
Delay (s)		14.7			23.3			18.1			21.1	
Level of Service		B			C			B			C	
Approach Delay (s)		14.7			23.3			18.1			21.1	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay		19.6			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		66.0			Sum of lost time (s)			14.5				
Intersection Capacity Utilization		74.8%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

2029 Build Weekday Morning
2: Mechanic Street & Lincoln Street

04/06/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	259	59	22	439	69	51	124	17	113	175	55
Future Volume (vph)	31	259	59	22	439	69	51	124	17	113	175	55
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.977			0.982			0.988			0.978	
Flt Protected		0.996			0.998			0.987			0.984	
Satd. Flow (prot)	0	1925	0	0	1776	0	0	1976	0	0	1934	0
Flt Permitted		0.932			0.976			0.826			0.803	
Satd. Flow (perm)	0	1801	0	0	1737	0	0	1654	0	0	1578	0
Satd. Flow (RTOR)		14			11						13	
Adj. Flow (vph)	34	282	64	26	510	80	66	161	22	140	216	68
Lane Group Flow (vph)	0	380	0	0	616	0	0	249	0	0	424	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		10.0	15.0	
Total Split (s)	34.5	34.5		34.5	34.5		20.5	20.5		12.5	33.0	
Total Split (%)	42.3%	42.3%		42.3%	42.3%		25.2%	25.2%		15.3%	40.5%	
Maximum Green (s)	30.0	30.0		30.0	30.0		16.0	16.0		8.0	28.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-0.5			-0.5			-0.5			-0.5	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.47			0.79			0.39			0.68	
Control Delay		16.1			26.3			17.7			24.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		16.1			26.3			17.7			24.1	
Queue Length 50th (ft)		94			192			66			126	
Queue Length 95th (ft)		230			#467			131			248	
Internal Link Dist (ft)		328			796			502			414	
Turn Bay Length (ft)												
Base Capacity (vph)		899			865			643			750	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.42			0.71			0.39			0.57	
Intersection Summary												
Cycle Length: 81.5												

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	14.0
Total Split (s)	14.0
Total Split (%)	17%
Maximum Green (s)	12.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	10
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

2029 Build Weekday Morning 2: Mechanic Street & Lincoln Street

04/06/2022

Actuated Cycle Length: 64

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: Mechanic Street & Lincoln Street

 Ø1	 Ø2	 Ø4	 Ø9
12.5 s	20.5 s	34.5 s	14 s
 Ø6	 Ø8		
33 s	34.5 s		

2029 Build Weekday Morning
2: Mechanic Street & Lincoln Street

04/06/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	259	59	22	439	69	51	124	17	113	175	55
Future Volume (vph)	31	259	59	22	439	69	51	124	17	113	175	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	11	11	11	14	14	14	14	14	14
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.99			0.98	
Flt Protected		1.00			1.00			0.99			0.98	
Satd. Flow (prot)		1925			1777			1976			1934	
Flt Permitted		0.93			0.98			0.83			0.80	
Satd. Flow (perm)		1802			1738			1655			1579	
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.77	0.77	0.77	0.81	0.81	0.81
Adj. Flow (vph)	34	282	64	26	510	80	66	161	22	140	216	68
RTOR Reduction (vph)	0	8	0	0	6	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	372	0	0	610	0	0	249	0	0	416	0
Heavy Vehicles (%)	7%	2%	2%	0%	1%	4%	0%	0%	0%	1%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		28.2			28.2			24.3			24.3	
Effective Green, g (s)		28.7			28.7			24.8			24.8	
Actuated g/C Ratio		0.44			0.44			0.38			0.38	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		790			762			627			598	
v/s Ratio Prot												
v/s Ratio Perm		0.21			0.35			0.15			0.26	
v/c Ratio		0.47			0.80			0.40			0.70	
Uniform Delay, d1		13.0			15.9			14.8			17.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.4			6.0			0.4			3.5	
Delay (s)		13.4			21.9			15.3			20.6	
Level of Service		B			C			B			C	
Approach Delay (s)		13.4			21.9			15.3			20.6	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay		18.7			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		65.4			Sum of lost time (s)			14.5				
Intersection Capacity Utilization		66.3%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

2029 Build Weekday Evening
2: Mechanic Street & Lincoln Street

04/06/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	309	110	31	469	94	108	275	27	144	178	45
Future Volume (vph)	37	309	110	31	469	94	108	275	27	144	178	45
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.979			0.991			0.983	
Flt Protected		0.996			0.997			0.987			0.981	
Satd. Flow (prot)	0	1952	0	0	1788	0	0	1982	0	0	1954	0
Flt Permitted		0.927			0.962			0.792			0.652	
Satd. Flow (perm)	0	1817	0	0	1725	0	0	1591	0	0	1299	0
Satd. Flow (RTOR)		22			13						10	
Adj. Flow (vph)	39	322	115	33	499	100	115	293	29	166	205	52
Lane Group Flow (vph)	0	476	0	0	632	0	0	437	0	0	423	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		15.0	15.0		10.0	15.0	
Total Split (s)	34.5	34.5		34.5	34.5		20.5	20.5		12.5	33.0	
Total Split (%)	42.3%	42.3%		42.3%	42.3%		25.2%	25.2%		15.3%	40.5%	
Maximum Green (s)	30.0	30.0		30.0	30.0		16.0	16.0		8.0	28.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-0.5			-0.5			-0.5			-0.5	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.60			0.84			0.66			0.77	
Control Delay		19.2			31.2			23.7			30.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		19.2			31.2			23.7			30.4	
Queue Length 50th (ft)		131			210			136			138	
Queue Length 95th (ft)		300			#527			#340			#354	
Internal Link Dist (ft)		328			796			502			414	
Turn Bay Length (ft)												
Base Capacity (vph)		820			773			665			554	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.58			0.82			0.66			0.76	
Intersection Summary												
Cycle Length: 81.5												

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	14.0
Total Split (s)	14.0
Total Split (%)	17%
Maximum Green (s)	12.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	5.0
Pedestrian Calls (#/hr)	10
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

2029 Build Weekday Evening 2: Mechanic Street & Lincoln Street

04/06/2022

Actuated Cycle Length: 69.2

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: Mechanic Street & Lincoln Street

 Ø1	 Ø2	 Ø4	 Ø9
12.5 s	20.5 s	34.5 s	14 s
 Ø6	 Ø8		
33 s	34.5 s		

2029 Build Weekday Evening
2: Mechanic Street & Lincoln Street

04/06/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	309	110	31	469	94	108	275	27	144	178	45
Future Volume (vph)	37	309	110	31	469	94	108	275	27	144	178	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	11	11	11	14	14	14	14	14	14
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.99			0.98	
Flt Protected		1.00			1.00			0.99			0.98	
Satd. Flow (prot)		1953			1788			1982			1955	
Flt Permitted		0.93			0.96			0.79			0.65	
Satd. Flow (perm)		1817			1725			1591			1300	
Peak-hour factor, PHF	0.96	0.96	0.96	0.94	0.94	0.94	0.94	0.94	0.94	0.87	0.87	0.87
Adj. Flow (vph)	39	322	115	33	499	100	115	293	29	166	205	52
RTOR Reduction (vph)	0	13	0	0	8	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	463	0	0	624	0	0	437	0	0	417	0
Heavy Vehicles (%)	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		29.3			29.3			28.4			28.4	
Effective Green, g (s)		29.8			29.8			28.9			28.9	
Actuated g/C Ratio		0.42			0.42			0.41			0.41	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		765			727			650			531	
v/s Ratio Prot												
v/s Ratio Perm		0.26			c0.36			0.27			c0.32	
v/c Ratio		0.61			0.86			0.67			0.79	
Uniform Delay, d1		15.9			18.5			17.0			18.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.4			9.9			2.7			7.5	
Delay (s)		17.2			28.5			19.8			25.7	
Level of Service		B			C			B			C	
Approach Delay (s)		17.2			28.5			19.8			25.7	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay		23.2			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		70.7			Sum of lost time (s)			14.5				
Intersection Capacity Utilization		76.6%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

Lincoln Street at Cashman Street and Highland Avenue



2022 Existing Weekday Morning
3: Cashman Street/Highland Street & Lincoln Street

04/06/2022

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	268	16	0	434	24	28	15	13	27	22	24
Future Vol, veh/h	20	268	16	0	434	24	28	15	13	27	22	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	94	94	94	71	71	71	79	79	79
Heavy Vehicles, %	0	3	7	0	1	0	0	8	0	0	0	5
Mvmt Flow	25	339	20	0	462	26	39	21	18	34	28	30
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	488	0	0	359	0	0	903	887	349	894	884	475
Stage 1	-	-	-	-	-	-	399	399	-	475	475	-
Stage 2	-	-	-	-	-	-	504	488	-	419	409	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.58	6.2	7.1	6.5	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.58	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.58	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4.072	3.3	3.5	4	3.345
Pot Cap-1 Maneuver	1086	-	-	1211	-	-	260	277	699	264	286	584
Stage 1	-	-	-	-	-	-	631	592	-	574	561	-
Stage 2	-	-	-	-	-	-	554	540	-	616	600	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1086	-	-	1211	-	-	223	269	699	236	278	584
Mov Cap-2 Maneuver	-	-	-	-	-	-	223	269	-	236	278	-
Stage 1	-	-	-	-	-	-	613	575	-	557	561	-
Stage 2	-	-	-	-	-	-	499	540	-	561	583	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0			22.8			21.4		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	280	1086	-	-	1211	-	-	311				
HCM Lane V/C Ratio	0.282	0.023	-	-	-	-	-	0.297				
HCM Control Delay (s)	22.8	8.4	0	-	0	-	-	21.4				
HCM Lane LOS	C	A	A	-	A	-	-	C				
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0	-	-	1.2				

2022 Existing Weekday Evening
3: Cashman Street/Highland Street & Lincoln Street

04/06/2022

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	24	336	32	2	432	22	27	23	24	16	14	28
Future Vol, veh/h	24	336	32	2	432	22	27	23	24	16	14	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	93	93	93	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	27	382	36	2	465	24	30	26	27	18	16	31
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	489	0	0	418	0	0	959	947	400	962	953	477
Stage 1	-	-	-	-	-	-	454	454	-	481	481	-
Stage 2	-	-	-	-	-	-	505	493	-	481	472	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.336
Pot Cap-1 Maneuver	1085	-	-	1152	-	-	239	263	654	237	261	584
Stage 1	-	-	-	-	-	-	589	573	-	570	557	-
Stage 2	-	-	-	-	-	-	553	550	-	570	562	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1085	-	-	1152	-	-	210	254	654	204	252	584
Mov Cap-2 Maneuver	-	-	-	-	-	-	210	254	-	204	252	-
Stage 1	-	-	-	-	-	-	570	554	-	551	556	-
Stage 2	-	-	-	-	-	-	507	549	-	504	543	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0			22.4			19.2		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	289	1085	-	-	1152	-	-	319				
HCM Lane V/C Ratio	0.288	0.025	-	-	0.002	-	-	0.204				
HCM Control Delay (s)	22.4	8.4	0	-	8.1	0	-	19.2				
HCM Lane LOS	C	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	1.2	0.1	-	-	0	-	-	0.8				

2029 No Build Weekday Morning
3: Cashman Street/Highland Street & Lincoln Street

04/06/2022

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	298	18	0	482	27	31	17	14	30	24	27
Future Vol, veh/h	22	298	18	0	482	27	31	17	14	30	24	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	94	94	94	71	71	71	79	79	79
Heavy Vehicles, %	0	3	7	0	1	0	0	8	0	0	0	5
Mvmt Flow	28	377	23	0	513	29	44	24	20	38	30	34
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	542	0	0	400	0	0	1005	987	389	995	984	528
Stage 1	-	-	-	-	-	-	445	445	-	528	528	-
Stage 2	-	-	-	-	-	-	560	542	-	467	456	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.58	6.2	7.1	6.5	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.58	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.58	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4.072	3.3	3.5	4	3.345
Pot Cap-1 Maneuver	1037	-	-	1170	-	-	222	242	664	226	250	544
Stage 1	-	-	-	-	-	-	596	565	-	538	531	-
Stage 2	-	-	-	-	-	-	516	510	-	580	572	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1037	-	-	1170	-	-	183	234	664	197	241	544
Mov Cap-2 Maneuver	-	-	-	-	-	-	183	234	-	197	241	-
Stage 1	-	-	-	-	-	-	575	545	-	519	531	-
Stage 2	-	-	-	-	-	-	456	510	-	519	552	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0			28.9			26.4		
HCM LOS							D			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	236	1037	-	-	1170	-	-	269				
HCM Lane V/C Ratio	0.37	0.027	-	-	-	-	-	0.381				
HCM Control Delay (s)	28.9	8.6	0	-	0	-	-	26.4				
HCM Lane LOS	D	A	A	-	A	-	-	D				
HCM 95th %tile Q(veh)	1.6	0.1	-	-	0	-	-	1.7				

2029 No Build Weekday Evening
3: Cashman Street/Highland Street & Lincoln Street

04/06/2022

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	27	373	36	2	479	24	30	26	27	18	16	31
Future Vol, veh/h	27	373	36	2	479	24	30	26	27	18	16	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	93	93	93	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	31	424	41	2	515	26	34	29	30	20	18	35
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	541	0	0	465	0	0	1066	1052	445	1068	1059	528
Stage 1	-	-	-	-	-	-	507	507	-	532	532	-
Stage 2	-	-	-	-	-	-	559	545	-	536	527	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.336
Pot Cap-1 Maneuver	1038	-	-	1107	-	-	202	228	617	201	226	546
Stage 1	-	-	-	-	-	-	552	543	-	535	529	-
Stage 2	-	-	-	-	-	-	517	522	-	532	532	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1038	-	-	1107	-	-	171	218	617	166	216	546
Mov Cap-2 Maneuver	-	-	-	-	-	-	171	218	-	166	216	-
Stage 1	-	-	-	-	-	-	529	521	-	513	527	-
Stage 2	-	-	-	-	-	-	466	520	-	458	510	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0			28.4			23		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	245	1038	-	-	1107	-	-	272				
HCM Lane V/C Ratio	0.381	0.03	-	-	0.002	-	-	0.269				
HCM Control Delay (s)	28.4	8.6	0	-	8.3	0	-	23				
HCM Lane LOS	D	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	1.7	0.1	-	-	0	-	-	1.1				

2029 Build Weekday Morning
3: Cashman Street/Highland Street & Lincoln Street

04/06/2022

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	312	18	0	488	27	31	17	14	30	24	27
Future Vol, veh/h	22	312	18	0	488	27	31	17	14	30	24	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	94	94	94	71	71	71	79	79	79
Heavy Vehicles, %	0	3	7	0	1	0	0	8	0	0	0	5
Mvmt Flow	28	395	23	0	519	29	44	24	20	38	30	34

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	548	0	0	418	0	0	1029	1011	407	1019	1008	534
Stage 1	-	-	-	-	-	-	463	463	-	534	534	-
Stage 2	-	-	-	-	-	-	566	548	-	485	474	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.58	6.2	7.1	6.5	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.58	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.58	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4.072	3.3	3.5	4	3.345
Pot Cap-1 Maneuver	1032	-	-	1152	-	-	214	234	648	217	242	540
Stage 1	-	-	-	-	-	-	583	554	-	534	528	-
Stage 2	-	-	-	-	-	-	513	507	-	567	561	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1032	-	-	1152	-	-	176	226	648	188	234	540
Mov Cap-2 Maneuver	-	-	-	-	-	-	176	226	-	188	234	-
Stage 1	-	-	-	-	-	-	563	535	-	515	528	-
Stage 2	-	-	-	-	-	-	453	507	-	507	541	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0	30.4	27.6
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	227	1032	-	-	1152	-	-	260
HCM Lane V/C Ratio	0.385	0.027	-	-	-	-	-	0.394
HCM Control Delay (s)	30.4	8.6	0	-	0	-	-	27.6
HCM Lane LOS	D	A	A	-	A	-	-	D
HCM 95th %tile Q(veh)	1.7	0.1	-	-	0	-	-	1.8

2029 Build Weekday Evening
3: Cashman Street/Highland Street & Lincoln Street

04/06/2022

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	27	382	36	2	492	24	30	26	27	18	16	31
Future Vol, veh/h	27	382	36	2	492	24	30	26	27	18	16	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	93	93	93	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	4
Mvmt Flow	31	434	41	2	529	26	34	29	30	20	18	35
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	555	0	0	475	0	0	1090	1076	455	1092	1083	542
Stage 1	-	-	-	-	-	-	517	517	-	546	546	-
Stage 2	-	-	-	-	-	-	573	559	-	546	537	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.336
Pot Cap-1 Maneuver	1026	-	-	1098	-	-	194	221	609	194	219	537
Stage 1	-	-	-	-	-	-	545	537	-	526	521	-
Stage 2	-	-	-	-	-	-	508	514	-	526	526	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1026	-	-	1098	-	-	164	211	609	159	209	537
Mov Cap-2 Maneuver	-	-	-	-	-	-	164	211	-	159	209	-
Stage 1	-	-	-	-	-	-	523	515	-	504	519	-
Stage 2	-	-	-	-	-	-	457	512	-	452	504	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0			29.7			23.9		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	237	1026	-	-	1098	-	-	263				
HCM Lane V/C Ratio	0.393	0.03	-	-	0.002	-	-	0.278				
HCM Control Delay (s)	29.7	8.6	0	-	8.3	0	-	23.9				
HCM Lane LOS	D	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	1.8	0.1	-	-	0	-	-	1.1				

Main Street at West Main Street, Mechanic Street, and Granger Boulevard



2022 Existing Weekday Morning

4: Granger Boulevard/Mechanic Street & West Main Street/Main Street

04/06/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	200	0	12	153	0	333	113	14	51	103	0
Future Volume (vph)	13	200	0	12	153	0	333	113	14	51	103	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt								0.984				
Flt Protected		0.997		0.950			0.950				0.984	
Satd. Flow (prot)	0	2101	0	1745	1739	0	1646	1805	0	0	2105	0
Flt Permitted		0.974		0.319			0.511				0.849	
Satd. Flow (perm)	0	2053	0	586	1739	0	885	1805	0	0	1816	0
Satd. Flow (RTOR)								6				
Adj. Flow (vph)	16	244	0	15	187	0	362	123	15	57	114	0
Lane Group Flow (vph)	0	260	0	15	187	0	362	138	0	0	171	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Total Split (s)	25.0	25.0		20.0	45.0		20.0	45.0		25.0	25.0	
Total Split (%)	22.9%	22.9%		18.3%	41.3%		18.3%	41.3%		22.9%	22.9%	
Maximum Green (s)	20.0	20.0		15.0	40.0		15.0	40.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.53		0.05	0.41		0.52	0.14			0.44	
Control Delay		27.9		19.7	23.0		15.3	10.5			28.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		27.9		19.7	23.0		15.3	10.5			28.2	
Queue Length 50th (ft)		70		4	49		49	15			46	
Queue Length 95th (ft)		212		19	133		#280	95			163	
Internal Link Dist (ft)		444			419			368			502	
Turn Bay Length (ft)				80								
Base Capacity (vph)		761		515	1259		708	1309			673	
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		0.34		0.03	0.15		0.51	0.11			0.25	
Intersection Summary												
Cycle Length: 109												

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	17%
Maximum Green (s)	17.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	9.0
Flash Dont Walk (s)	8.0
Pedestrian Calls (#/hr)	1
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Actuated Cycle Length: 61.6

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Granger Boulevard/Mechanic Street & West Main Street/Main Street

 Ø2	 Ø3	 Ø4	 Ø9
45 s	20 s	25 s	19 s
 Ø5	 Ø6	 Ø8	
20 s	25 s	45 s	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔			↔	
Traffic Volume (vph)	13	200	0	12	153	0	333	113	14	51	103	0
Future Volume (vph)	13	200	0	12	153	0	333	113	14	51	103	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	11	10	16	11	11	11	16	16	16
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Frt		1.00		1.00	1.00		1.00	0.98			1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)		2101		1745	1739		1646	1805			2104	
Flt Permitted		0.97		0.32	1.00		0.51	1.00			0.85	
Satd. Flow (perm)		2053		586	1739		886	1805			1816	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	16	244	0	15	187	0	362	123	15	57	114	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	260	0	15	187	0	362	135	0	0	171	0
Heavy Vehicles (%)	20%	1%	0%	0%	2%	0%	6%	0%	1%	0%	1%	0%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.6		19.5	19.5		33.2	33.2			12.5	
Effective Green, g (s)		14.6		20.5	20.5		34.2	34.2			13.5	
Actuated g/C Ratio		0.22		0.31	0.31		0.51	0.51			0.20	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		448		212	533		643	924			367	
v/s Ratio Prot				0.00	c0.11		c0.14	0.07				
v/s Ratio Perm		c0.13		0.02			c0.15				0.09	
v/c Ratio		0.58		0.07	0.35		0.56	0.15			0.47	
Uniform Delay, d1		23.4		17.4	18.0		11.0	8.6			23.5	
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		1.9		0.1	0.4		1.1	0.1			0.9	
Delay (s)		25.3		17.5	18.4		12.1	8.7			24.4	
Level of Service		C		B	B		B	A			C	
Approach Delay (s)		25.3			18.3			11.2			24.4	
Approach LOS		C			B			B			C	

Intersection Summary

HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	66.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

2022 Existing Weekday Evening

4: Granger Boulevard/Mechanic Street & West Main Street/Main Street

04/06/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	240	0	25	179	0	428	213	25	94	114	0
Future Volume (vph)	14	240	0	25	179	0	428	213	25	94	114	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt								0.984				
Flt Protected		0.997		0.950			0.950				0.978	
Satd. Flow (prot)	0	2147	0	1745	1773	0	1711	1807	0	0	2106	0
Flt Permitted		0.976		0.265			0.519				0.732	
Satd. Flow (perm)	0	2102	0	487	1773	0	935	1807	0	0	1576	0
Satd. Flow (RTOR)								6				
Adj. Flow (vph)	16	267	0	27	195	0	470	234	27	119	144	0
Lane Group Flow (vph)	0	283	0	27	195	0	470	261	0	0	263	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Total Split (s)	25.0	25.0		20.0	45.0		20.0	45.0		25.0	25.0	
Total Split (%)	22.9%	22.9%		18.3%	41.3%		18.3%	41.3%		22.9%	22.9%	
Maximum Green (s)	20.0	20.0		15.0	40.0		15.0	40.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.60		0.10	0.39		0.66	0.26			0.63	
Control Delay		33.5		20.6	23.8		20.3	12.4			34.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		33.5		20.6	23.8		20.3	12.4			34.7	
Queue Length 50th (ft)		98		8	66		83	38			84	
Queue Length 95th (ft)		259		31	154		#498	179			#233	
Internal Link Dist (ft)		444			419			368			502	
Turn Bay Length (ft)				80								
Base Capacity (vph)		656		450	1080		712	1104			492	
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		0.43		0.06	0.18		0.66	0.24			0.53	
Intersection Summary												
Cycle Length: 109												

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	17%
Maximum Green (s)	17.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	9.0
Flash Dont Walk (s)	8.0
Pedestrian Calls (#/hr)	1
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Actuated Cycle Length: 71.3

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Granger Boulevard/Mechanic Street & West Main Street/Main Street

 Ø2	 Ø3	 Ø4	 Ø9
45 s	20 s	25 s	19 s
 Ø5	 Ø6	 Ø8	
20 s	25 s	45 s	

2022 Existing Weekday Evening

4: Granger Boulevard/Mechanic Street & West Main Street/Main Street

04/06/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕			↕	
Traffic Volume (vph)	14	240	0	25	179	0	428	213	25	94	114	0
Future Volume (vph)	14	240	0	25	179	0	428	213	25	94	114	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	11	10	16	11	11	11	16	16	16
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Frt		1.00		1.00	1.00		1.00	0.98			1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)		2147		1745	1773		1711	1808			2106	
Flt Permitted		0.98		0.26	1.00		0.52	1.00			0.73	
Satd. Flow (perm)		2101		486	1773		935	1808			1577	
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.91	0.91	0.91	0.79	0.79	0.79
Adj. Flow (vph)	16	267	0	27	195	0	470	234	27	119	144	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	283	0	27	195	0	470	258	0	0	263	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		14.9		22.2	22.2		39.2	39.2			18.3	
Effective Green, g (s)		15.9		23.2	23.2		40.2	40.2			19.3	
Actuated g/C Ratio		0.21		0.31	0.31		0.53	0.53			0.25	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		440		203	542		668	958			401	
v/s Ratio Prot				0.01	c0.11		c0.16	0.14				
v/s Ratio Perm		c0.13		0.03			c0.22				0.17	
v/c Ratio		0.64		0.13	0.36		0.70	0.27			0.66	
Uniform Delay, d1		27.4		20.0	20.5		13.0	9.8			25.3	
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		3.2		0.3	0.4		3.4	0.2			3.8	
Delay (s)		30.6		20.3	20.9		16.4	9.9			29.1	
Level of Service		C		C	C		B	A			C	
Approach Delay (s)		30.6			20.8			14.1			29.1	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			20.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			75.8			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			69.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

2029 No Build Weekday Morning

4: Granger Boulevard/Mechanic Street & West Main Street/Main Street

04/06/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	222	0	13	170	0	370	126	16	57	114	0
Future Volume (vph)	14	222	0	13	170	0	370	126	16	57	114	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt								0.983				
Flt Protected		0.997		0.950			0.950				0.984	
Satd. Flow (prot)	0	2102	0	1745	1739	0	1646	1803	0	0	2105	0
Flt Permitted		0.974		0.297			0.489				0.841	
Satd. Flow (perm)	0	2054	0	545	1739	0	847	1803	0	0	1799	0
Satd. Flow (RTOR)								7				
Adj. Flow (vph)	17	271	0	16	207	0	402	137	17	63	127	0
Lane Group Flow (vph)	0	288	0	16	207	0	402	154	0	0	190	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Total Split (s)	25.0	25.0		20.0	45.0		20.0	45.0		25.0	25.0	
Total Split (%)	22.9%	22.9%		18.3%	41.3%		18.3%	41.3%		22.9%	22.9%	
Maximum Green (s)	20.0	20.0		15.0	40.0		15.0	40.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.56		0.06	0.44		0.59	0.15			0.49	
Control Delay		28.7		19.7	23.4		17.4	10.7			29.5	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		28.7		19.7	23.4		17.4	10.7			29.5	
Queue Length 50th (ft)		80		4	56		62	19			54	
Queue Length 95th (ft)		234		20	147		#368	105			181	
Internal Link Dist (ft)		444			419			368			502	
Turn Bay Length (ft)				80								
Base Capacity (vph)		727		495	1202		685	1249			637	
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		0.40		0.03	0.17		0.59	0.12			0.30	
Intersection Summary												
Cycle Length: 109												

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	17%
Maximum Green (s)	17.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	9.0
Flash Dont Walk (s)	8.0
Pedestrian Calls (#/hr)	1
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Actuated Cycle Length: 63.7

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Granger Boulevard/Mechanic Street & West Main Street/Main Street

 Ø2	 Ø3	 Ø4	 Ø9
45 s	20 s	25 s	19 s
 Ø5	 Ø6	 Ø8	
20 s	25 s	45 s	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔			↔	
Traffic Volume (vph)	14	222	0	13	170	0	370	126	16	57	114	0
Future Volume (vph)	14	222	0	13	170	0	370	126	16	57	114	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	11	10	16	11	11	11	16	16	16
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Frt		1.00		1.00	1.00		1.00	0.98			1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)		2102		1745	1739		1646	1804			2104	
Flt Permitted		0.97		0.30	1.00		0.49	1.00			0.84	
Satd. Flow (perm)		2054		546	1739		847	1804			1800	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	17	271	0	16	207	0	402	137	17	63	127	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	288	0	16	207	0	402	151	0	0	190	0
Heavy Vehicles (%)	20%	1%	0%	0%	2%	0%	6%	0%	1%	0%	1%	0%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		14.8		20.7	20.7		34.2	34.2			13.1	
Effective Green, g (s)		15.8		21.7	21.7		35.2	35.2			14.1	
Actuated g/C Ratio		0.23		0.31	0.31		0.51	0.51			0.20	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		470		204	546		630	920			367	
v/s Ratio Prot				0.00	c0.12		c0.16	0.08				
v/s Ratio Perm		c0.14		0.02			c0.17				0.11	
v/c Ratio		0.61		0.08	0.38		0.64	0.16			0.52	
Uniform Delay, d1		23.9		17.8	18.4		11.9	9.0			24.4	
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		2.4		0.2	0.4		2.1	0.1			1.2	
Delay (s)		26.2		17.9	18.8		14.1	9.1			25.7	
Level of Service		C		B	B		B	A			C	
Approach Delay (s)		26.2			18.8			12.7			25.7	
Approach LOS		C			B			B			C	

Intersection Summary

HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	69.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

2029 No Build Weekday Evening

4: Granger Boulevard/Mechanic Street & West Main Street/Main Street

04/06/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	266	0	28	199	0	475	236	28	104	127	0
Future Volume (vph)	16	266	0	28	199	0	475	236	28	104	127	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt								0.984				
Flt Protected		0.997		0.950			0.950				0.978	
Satd. Flow (prot)	0	2147	0	1745	1773	0	1711	1807	0	0	2106	0
Flt Permitted		0.974		0.240			0.510				0.720	
Satd. Flow (perm)	0	2097	0	441	1773	0	918	1807	0	0	1550	0
Satd. Flow (RTOR)								6				
Adj. Flow (vph)	18	296	0	30	216	0	522	259	31	132	161	0
Lane Group Flow (vph)	0	314	0	30	216	0	522	290	0	0	293	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Total Split (s)	25.0	25.0		20.0	45.0		20.0	45.0		25.0	25.0	
Total Split (%)	22.9%	22.9%		18.3%	41.3%		18.3%	41.3%		22.9%	22.9%	
Maximum Green (s)	20.0	20.0		15.0	40.0		15.0	40.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.65		0.12	0.42		0.75	0.28			0.66	
Control Delay		35.2		20.6	24.5		24.3	13.0			36.1	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		35.2		20.6	24.5		24.3	13.0			36.1	
Queue Length 50th (ft)		110		9	73		106	48			101	
Queue Length 95th (ft)		#296		34	170		#581	201			#279	
Internal Link Dist (ft)		444			419			368			502	
Turn Bay Length (ft)				80								
Base Capacity (vph)		608		422	1004		693	1026			449	
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		0.52		0.07	0.22		0.75	0.28			0.65	
Intersection Summary												
Cycle Length: 109												

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	17%
Maximum Green (s)	17.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	9.0
Flash Dont Walk (s)	8.0
Pedestrian Calls (#/hr)	1
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Actuated Cycle Length: 75.1

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Granger Boulevard/Mechanic Street & West Main Street/Main Street

 Ø2	 Ø3	 Ø4	 Ø9
45 s	20 s	25 s	19 s
 Ø5	 Ø6	 Ø8	
20 s	25 s	45 s	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔			↔	
Traffic Volume (vph)	16	266	0	28	199	0	475	236	28	104	127	0
Future Volume (vph)	16	266	0	28	199	0	475	236	28	104	127	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	11	10	16	11	11	11	16	16	16
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Frt		1.00		1.00	1.00		1.00	0.98			1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)		2147		1745	1773		1711	1807			2106	
Flt Permitted		0.97		0.24	1.00		0.51	1.00			0.72	
Satd. Flow (perm)		2098		441	1773		918	1807			1551	
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.91	0.91	0.91	0.79	0.79	0.79
Adj. Flow (vph)	18	296	0	30	216	0	522	259	31	132	161	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	314	0	30	216	0	522	287	0	0	293	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.4		23.9	23.9		41.4	41.4			20.8	
Effective Green, g (s)		17.4		24.9	24.9		42.4	42.4			21.8	
Actuated g/C Ratio		0.22		0.31	0.31		0.53	0.53			0.27	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		457		194	553		652	960			423	
v/s Ratio Prot				0.01	c0.12		c0.17	0.16				
v/s Ratio Perm		c0.15		0.04			c0.26				0.19	
v/c Ratio		0.69		0.15	0.39		0.80	0.30			0.69	
Uniform Delay, d1		28.7		21.0	21.5		14.4	10.4			26.0	
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		4.3		0.4	0.5		7.0	0.2			4.9	
Delay (s)		33.0		21.4	22.0		21.4	10.6			30.9	
Level of Service		C		C	C		C	B			C	
Approach Delay (s)		33.0			21.9			17.5			30.9	
Approach LOS		C			C			B			C	

Intersection Summary

HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	79.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

2029 Build Weekday Morning

4: Granger Boulevard/Mechanic Street & West Main Street/Main Street

04/06/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔			↔	
Traffic Volume (vph)	22	222	0	13	170	0	370	131	16	66	125	0
Future Volume (vph)	22	222	0	13	170	0	370	131	16	66	125	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt								0.984				
Flt Protected		0.995		0.950			0.950				0.983	
Satd. Flow (prot)	0	2086	0	1745	1739	0	1646	1805	0	0	2103	0
Flt Permitted		0.957		0.306			0.476				0.831	
Satd. Flow (perm)	0	2006	0	562	1739	0	825	1805	0	0	1778	0
Satd. Flow (RTOR)								6				
Adj. Flow (vph)	27	271	0	16	207	0	402	142	17	73	139	0
Lane Group Flow (vph)	0	298	0	16	207	0	402	159	0	0	212	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Total Split (s)	25.0	25.0		20.0	45.0		20.0	45.0		25.0	25.0	
Total Split (%)	22.9%	22.9%		18.3%	41.3%		18.3%	41.3%		22.9%	22.9%	
Maximum Green (s)	20.0	20.0		15.0	40.0		15.0	40.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.58		0.05	0.42		0.60	0.16			0.53	
Control Delay		29.3		19.8	23.3		18.0	11.0			30.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		29.3		19.8	23.3		18.0	11.0			30.7	
Queue Length 50th (ft)		87		4	58		66	21			63	
Queue Length 95th (ft)		244		20	147		#374	109			201	
Internal Link Dist (ft)		444			419			368			502	
Turn Bay Length (ft)				80								
Base Capacity (vph)		688		483	1165		669	1211			610	
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		0.43		0.03	0.18		0.60	0.13			0.35	
Intersection Summary												
Cycle Length: 109												

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	17%
Maximum Green (s)	17.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	9.0
Flash Dont Walk (s)	8.0
Pedestrian Calls (#/hr)	1
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Actuated Cycle Length: 65.3

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Granger Boulevard/Mechanic Street & West Main Street/Main Street

 Ø2	 Ø3	 Ø4	 Ø9
45 s	20 s	25 s	19 s
 Ø5	 Ø6	 Ø8	
20 s	25 s	45 s	

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	222	0	13	170	0	370	131	16	66	125	0
Future Volume (vph)	22	222	0	13	170	0	370	131	16	66	125	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	11	10	16	11	11	11	16	16	16
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Frt		1.00		1.00	1.00		1.00	0.98			1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)		2087		1745	1739		1646	1805			2103	
Flt Permitted		0.96		0.31	1.00		0.48	1.00			0.83	
Satd. Flow (perm)		2006		563	1739		825	1805			1778	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	27	271	0	16	207	0	402	142	17	73	139	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	298	0	16	207	0	402	156	0	0	212	0
Heavy Vehicles (%)	20%	1%	0%	0%	2%	0%	6%	0%	1%	0%	1%	0%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		15.7		21.6	21.6		34.9	34.9			13.9	
Effective Green, g (s)		16.7		22.6	22.6		35.9	35.9			14.9	
Actuated g/C Ratio		0.24		0.32	0.32		0.51	0.51			0.21	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		473		211	555		616	916			374	
v/s Ratio Prot				0.00	c0.12		c0.16	0.09				
v/s Ratio Perm		c0.15		0.02			c0.17				0.12	
v/c Ratio		0.63		0.08	0.37		0.65	0.17			0.57	
Uniform Delay, d1		24.2		18.0	18.6		12.5	9.4			25.0	
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		2.7		0.2	0.4		2.5	0.1			2.0	
Delay (s)		27.0		18.1	19.0		15.0	9.5			27.0	
Level of Service		C		B	B		B	A			C	
Approach Delay (s)		27.0			18.9			13.4			27.0	
Approach LOS		C			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			19.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			70.7			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			65.9%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

2029 Build Weekday Evening

4: Granger Boulevard/Mechanic Street & West Main Street/Main Street

04/06/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	266	0	28	199	0	475	248	28	111	136	0
Future Volume (vph)	35	266	0	28	199	0	475	248	28	111	136	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt								0.985				
Flt Protected		0.994		0.950			0.950				0.978	
Satd. Flow (prot)	0	2140	0	1745	1773	0	1711	1809	0	0	2106	0
Flt Permitted		0.939		0.268			0.500				0.714	
Satd. Flow (perm)	0	2022	0	492	1773	0	900	1809	0	0	1537	0
Satd. Flow (RTOR)								6				
Adj. Flow (vph)	39	296	0	30	216	0	522	273	31	141	172	0
Lane Group Flow (vph)	0	335	0	30	216	0	522	304	0	0	313	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Total Split (s)	25.0	25.0		20.0	45.0		20.0	45.0		25.0	25.0	
Total Split (%)	22.9%	22.9%		18.3%	41.3%		18.3%	41.3%		22.9%	22.9%	
Maximum Green (s)	20.0	20.0		15.0	40.0		15.0	40.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-1.0		-1.0	-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.67		0.11	0.40		0.78	0.30			0.72	
Control Delay		36.0		20.4	23.9		26.1	13.5			39.6	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		36.0		20.4	23.9		26.1	13.5			39.6	
Queue Length 50th (ft)		120		9	73		120	57			117	
Queue Length 95th (ft)		#349		34	170		#584	211			#309	
Internal Link Dist (ft)		444			419			368			502	
Turn Bay Length (ft)				80								
Base Capacity (vph)		572		422	979		672	1002			435	
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		0.59		0.07	0.22		0.78	0.30			0.72	
Intersection Summary												
Cycle Length: 109												

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	17%
Maximum Green (s)	17.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	9.0
Flash Dont Walk (s)	8.0
Pedestrian Calls (#/hr)	1
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Actuated Cycle Length: 76.5

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: Granger Boulevard/Mechanic Street & West Main Street/Main Street

 Ø2	 Ø3	 Ø4	 Ø9
45 s	20 s	25 s	19 s
 Ø5	 Ø6	 Ø8	
20 s	25 s	45 s	

2029 Build Weekday Evening

4: Granger Boulevard/Mechanic Street & West Main Street/Main Street

04/06/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕			↕	
Traffic Volume (vph)	35	266	0	28	199	0	475	248	28	111	136	0
Future Volume (vph)	35	266	0	28	199	0	475	248	28	111	136	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	11	10	16	11	11	11	16	16	16
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Frt		1.00		1.00	1.00		1.00	0.98			1.00	
Flt Protected		0.99		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)		2141		1745	1773		1711	1809			2106	
Flt Permitted		0.94		0.27	1.00		0.50	1.00			0.71	
Satd. Flow (perm)		2022		492	1773		900	1809			1537	
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.91	0.91	0.91	0.79	0.79	0.79
Adj. Flow (vph)	39	296	0	30	216	0	522	273	31	141	172	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	335	0	30	216	0	522	301	0	0	313	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		17.9		25.4	25.4		41.3	41.3			20.8	
Effective Green, g (s)		18.9		26.4	26.4		42.3	42.3			21.8	
Actuated g/C Ratio		0.23		0.33	0.33		0.52	0.52			0.27	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		470		213	576		633	942			412	
v/s Ratio Prot				0.01	c0.12		c0.17	0.17				
v/s Ratio Perm		c0.17		0.04			c0.26				0.20	
v/c Ratio		0.71		0.14	0.38		0.82	0.32			0.76	
Uniform Delay, d1		28.7		20.7	21.1		15.7	11.2			27.3	
Progression Factor		1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2		5.1		0.3	0.4		8.6	0.2			7.9	
Delay (s)		33.7		21.0	21.5		24.3	11.4			35.1	
Level of Service		C		C	C		C	B			D	
Approach Delay (s)		33.7			21.4			19.5			35.1	
Approach LOS		C			C			B			D	
Intersection Summary												
HCM 2000 Control Delay			25.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			81.2			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			79.4%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

West Main Street at Bates Avenue



2022 Existing Weekday Morning
5: West Main Street & Bates Avenue

04/06/2022

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↗
Traffic Vol, veh/h	0	213	486	0	0	31
Future Vol, veh/h	0	213	486	0	0	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	92	92	52	52
Heavy Vehicles, %	2	0	4	0	0	0
Mvmt Flow	0	227	528	0	0	60
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	528
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	0	0	554
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	554
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		12.3		
HCM LOS				B		
Minor Lane/Major Mvmt	EBT	WBT	SBLn1			
Capacity (veh/h)	-	-	554			
HCM Lane V/C Ratio	-	-	0.108			
HCM Control Delay (s)	-	-	12.3			
HCM Lane LOS	-	-	B			
HCM 95th %tile Q(veh)	-	-	0.4			

2022 Existing Weekday Evening
5: West Main Street & Bates Avenue

04/06/2022

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↗
Traffic Vol, veh/h	0	254	607	0	0	27
Future Vol, veh/h	0	254	607	0	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	93	93	58	58
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	0	285	653	0	0	47
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	653
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	0	-	-	0	0	471
Stage 1	0	-	-	0	0	-
Stage 2	0	-	-	0	0	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	-	471
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		SB	
HCM Control Delay, s	0		0		13.5	
HCM LOS					B	
Minor Lane/Major Mvmt	EBT		WBT		SBLn1	
Capacity (veh/h)	-		-		471	
HCM Lane V/C Ratio	-		-		0.099	
HCM Control Delay (s)	-		-		13.5	
HCM Lane LOS	-		-		B	
HCM 95th %tile Q(veh)	-		-		0.3	

2029 No Build Weekday Morning
5: West Main Street & Bates Avenue

04/06/2022

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	236	540	0	0	34
Future Vol, veh/h	0	236	540	0	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	92	92	52	52
Heavy Vehicles, %	2	0	4	0	0	0
Mvmt Flow	0	251	587	0	0	65

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 587
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.2
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.3
Pot Cap-1 Maneuver	0	-	- 0 0 513
Stage 1	0	-	- 0 0 -
Stage 2	0	-	- 0 0 -
Platoon blocked, %	-	-	
Mov Cap-1 Maneuver	-	-	- - 513
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	513
HCM Lane V/C Ratio	-	-	0.127
HCM Control Delay (s)	-	-	13
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.4

2029 No Build Weekday Evening
5: West Main Street & Bates Avenue

04/06/2022

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	282	674	0	0	30
Future Vol, veh/h	0	282	674	0	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	93	93	58	58
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	0	317	725	0	0	52

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 725
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.2
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.3
Pot Cap-1 Maneuver	0	-	- 0 0 428
Stage 1	0	-	- 0 0 -
Stage 2	0	-	- 0 0 -
Platoon blocked, %	-	-	
Mov Cap-1 Maneuver	-	-	- - 428
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.6
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	428
HCM Lane V/C Ratio	-	-	0.121
HCM Control Delay (s)	-	-	14.6
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.4

2029 Build Weekday Morning
5: West Main Street & Bates Avenue

04/06/2022

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	244	540	0	0	53
Future Vol, veh/h	0	244	540	0	0	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	92	92	52	52
Heavy Vehicles, %	2	0	4	0	0	0
Mvmt Flow	0	260	587	0	0	102

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 587
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.2
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.3
Pot Cap-1 Maneuver	0	-	- 0 0 513
Stage 1	0	-	- 0 0 -
Stage 2	0	-	- 0 0 -
Platoon blocked, %	-	-	
Mov Cap-1 Maneuver	-	-	- - 513
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	513
HCM Lane V/C Ratio	-	-	0.199
HCM Control Delay (s)	-	-	13.7
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.7

2029 Build Weekday Evening
5: West Main Street & Bates Avenue

04/06/2022

Intersection

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	301	674	0	0	44
Future Vol, veh/h	0	301	674	0	0	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	93	93	58	58
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	0	338	725	0	0	76

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 725
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.2
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.3
Pot Cap-1 Maneuver	0	-	- 0 0 428
Stage 1	0	-	- 0 0 -
Stage 2	0	-	- 0 0 -
Platoon blocked, %	-	-	
Mov Cap-1 Maneuver	-	-	- - 428
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	15.2
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	428
HCM Lane V/C Ratio	-	-	0.177
HCM Control Delay (s)	-	-	15.2
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	0.6

Lincoln Street at Project Site Driveway



2029 Build Weekday Morning
6: Lincoln Street & Project Driveway

04/06/2022

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	351	544	2	1	4
Future Vol, veh/h	6	351	544	2	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	79	92	92	92	92
Heavy Vehicles, %	2	3	1	2	2	2
Mvmt Flow	7	444	591	2	1	4
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	593	0	-	0	1050	592
Stage 1	-	-	-	-	592	-
Stage 2	-	-	-	-	458	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	983	-	-	-	252	506
Stage 1	-	-	-	-	553	-
Stage 2	-	-	-	-	637	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	983	-	-	-	250	506
Mov Cap-2 Maneuver	-	-	-	-	250	-
Stage 1	-	-	-	-	548	-
Stage 2	-	-	-	-	637	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		13.7		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	983	-	-	-	420	
HCM Lane V/C Ratio	0.007	-	-	-	0.013	
HCM Control Delay (s)	8.7	0	-	-	13.7	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0	

2029 Build Weekday Evening
6: Lincoln Street & Project Driveway

04/06/2022

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	435	549	4	10	10
Future Vol, veh/h	16	435	549	4	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	88	93	92	92	92
Heavy Vehicles, %	2	1	1	2	2	2
Mvmt Flow	17	494	590	4	11	11
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	594	0	-	0	1120	592
Stage 1	-	-	-	-	592	-
Stage 2	-	-	-	-	528	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	982	-	-	-	228	506
Stage 1	-	-	-	-	553	-
Stage 2	-	-	-	-	592	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	982	-	-	-	223	506
Mov Cap-2 Maneuver	-	-	-	-	223	-
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	592	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		17.5		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	982	-	-	-	310	
HCM Lane V/C Ratio	0.018	-	-	-	0.07	
HCM Control Delay (s)	8.7	0	-	-	17.5	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	