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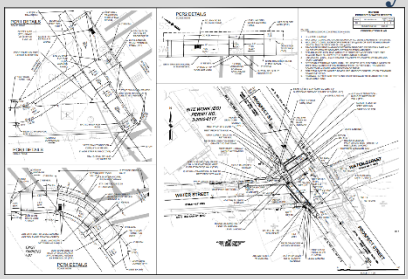
Quality

Traffic Impact and Access Study

Retail/Bank Expansion
225 Shrewsbury Street
Worcester, Massachusetts

Accuracy



Prepared for:

Lundgren Equity Partners
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Jun 13 2024

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Actual Submittal Date 6/10/2024

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May 31, 2024

Integrity

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Traffic Impact and Access Study

To:	Mr. Tyler Alten Lundgren Equity Partners 163 Washington Street Auburn, MA 01501	Reg:	Retail/Bank Expansion 225 Shrewsbury Street Worcester, Massachusetts
		Date:	May 31, 2024
From:	Shaun Kelly, Sr. Project Manager Patrick Bradley, Traffic Engineer	Project #:	24022

INTRODUCTION

Chappell Engineering Associates, LLC (CEA) has conducted this Traffic Impact and Access Study for the proposed expansion of the retail and bank space located at 225 Shrewsbury Street in Worcester, Massachusetts. The site currently contains the Shrewsbury Street Marketplace and a vacant building formerly used to store ambulances and is located on the south side of Shrewsbury Street abutting Casco Street and Albany Street. Access to the site is currently provided via a right-in/right-out only driveway on Shrewsbury Street, an exit-only driveway on Casco Street, and a full access/egress driveway on Albany Street.

As proposed, the former ambulance storage building will be razed and replaced with an approximately 15,375 square foot building addition consisting of 9,500 square feet of retail space and a 5,100 square foot new DCU bank with drive-through lanes. A 775 square foot hallway is proposed between the existing DCU bank building and the proposed retail space to provide access to/from Casco Street from the parking area. The existing 5,100 square foot bank will be retrofitted with a new retail use. Parking will be shared with the Shrewsbury Street Marketplace. Access to the site will be maintained via the Shrewsbury Street driveway, which will be modified to provide larger turning radii and will continue to be a right-in/right-out only driveway. The Casco Street driveway will be relocated closer to Albany Street and will serve as an exit-only driveway for the DCU bank drive-through. The Albany Street driveway will be relocated closer to the site's western property line and will maintain full access/egress from the site. The location of the site with respect to the area roadway network is shown on Figure 1.

Figure 1
Site Location Map

The site was approved in 2022 for a residential apartment building. At the time, the former ambulance storage building was proposed to be razed and replaced with a seven-story, 218-unit apartment building with parking underneath at ground level. The existing Shrewsbury Street Marketplace was proposed to remain and share parking with the new apartment building.

This report has been prepared to assess the safety of the proposed site driveways, estimate the increase in traffic as a result of site expansion, compare that increase to the traffic previously approved for the apartment building, and evaluate the impacts of this traffic on the adjacent streets. As this report shows, ample sight distances exist at the site driveway locations to allow for safe operation, exceeding minimum requirements. It is recommended that sightlines at the driveways be kept clear of any obstructions such as landscaping or signs.

The retail expansion project will add between 26 and 116 peak hour vehicle trips (total vehicles entering and exiting the site) to the existing site traffic generation. When compared with the prior approved apartment development, the current project will actually generate less traffic during the critical weekday peak commuter hours and slightly more traffic during the Saturday peak hour. A substantial portion of retail traffic comes from the existing traffic passing by the site today (referred to as pass-by trips) and is therefore not new to the area. Without taking any credit for pass-by trips, traffic-volume increases on the surrounding streets are expected in the range of 10 to 53 additional vehicles during peak hours. These increases represent, on average, approximately one additional vehicle every one to six minutes. Smaller increases are expected during all other times of the day.

The site driveways are expected to operate at acceptable levels with vehicle queues of one vehicle. Traffic was occasionally observed making illegal movements at the Shrewsbury Street and Casco Street site driveways. It is recommended that improvements be made to increase driver awareness of the turn restrictions. The Shrewsbury Street and Casco Street intersection is expected to operate at acceptable levels of service under Build traffic conditions.

Queue studies conducted at the existing DCU Bank drive-through lanes show that maximum observed queues currently impede on-site circulation. The proposed drive-through lanes can easily accommodate the observed maximum queues and on-site circulation will be significantly improved as a result.

EXISTING CONDITIONS

Study Area

Evaluation of the traffic impacts associated with the proposed site redevelopment requires an evaluation of existing and projected traffic volumes, the volume of traffic expected to be generated by the project, and the impact that this traffic will have on the adjacent streets and nearby intersections. In preparing this study, the following intersections were analyzed and evaluated:

- Shrewsbury Street at Casco Street
- Shrewsbury Street at Oleum Court/Site driveway
- Casco Street at site driveway
- Albany Street at site driveway

As documented in this report, the development is expected to have a negligible effect on traffic operations beyond this study area. The study area roadways and intersection are described below:

Shrewsbury Street is under local jurisdiction and is a four-lane, urban principle arterial roadway (U3). Direction of travel is separated by a raised median. One-hour on-street parking and sidewalks are provided along both sides of the roadway and exclusive left-turn lanes are provided at major intersection locations. Shrewsbury Street provides connections between Worcester and Interstate I-290 to the southwest and Shrewsbury and Route 9 to the northeast. The posted speed limit along Shrewsbury Street is 30 miles per hour (mph) within the study area. Pavement and parking markings are generally in good condition. Land uses along Shrewsbury Street include primarily retail and commercial uses.

Casco Street is a local two-lane roadway (U7) with sidewalks on both sides of the roadway. There are no pavement markings or a posted speed limit and one-hour parking is allowed on both sides of the roadway. Casco Street provides connections between Shrewsbury Street and Albany Street and the pavement is generally in fair condition. Land use along Casco Street is exclusively commercial.

Albany Street is a local two-lane roadway (U7). There are no pavement markings or a posted speed limit and parking is allowed on both sides of the roadway. Albany Street generally parallels Shrewsbury Street and provides access to mostly commercial and industrial uses with the closest connections to Shrewsbury Street from the site via Casco Street and Fantasia Drive, which provides a signalized intersection with Shrewsbury Street.

Oleum Court is a local two-lane roadway with no sidewalks along either side of the road, and pavement is generally in poor condition. Oleum Court is approximately 230 feet long and provides a connection between Shrewsbury Street and Verdi Road/East Park Terrace. There are no pavement markings except for a stop line and crosswalk at its intersection with Shrewsbury Street. There is no posted speed limit. Land use along Oleum Court is predominantly commercial.

Shrewsbury Street meets Oleum Court and the Shrewsbury Street Marketplace driveway to form a four-way offset unsignalized intersection. The site driveway northbound approach is offset to the east from Oleum Court and operates as a right in/right out only driveway, with left-turns and through movements prohibited via the median break that is provided for Oleum Court. The Oleum Court southbound approach operates under STOP control and consists of a single shared use lane. The Shrewsbury Street westbound approach operates freely and consists of a through lane and a shared through/right-turn lane, while the eastbound approach consists of a dedicated left turn lane, a through lane and a shared through/right-turn lane. Turning movements are prohibited for

westbound traffic on Shrewsbury Street via the median break that serves Oleum Court. A painted crosswalk is provided across Oleum Court. On-street parking is provided along both sides of Shrewsbury Street at this intersection. Illumination is provided via overhead streetlights, which are provided on both sides of Shrewsbury Street at this intersection.

The site driveway meets Casco Street to form a three-way unsignalized intersection. The Casco Street northbound and southbound approaches consist of a through lane in each direction while the site driveway eastbound approach provides a wide exit-only approach and is primarily used by DCU bank customers who use the bank drive-through. Although there are no stop signs, this approach operates under stop control. In addition, there are no entering sign restrictions along Casco Street but there is a "DO NOT ENTER" sign posted over the driveway on the bank drive-through canopy.

The Shrewsbury Street Marketplace rear driveway meets Albany Street to form a three-way unsignalized intersection. The Albany Street eastbound and westbound approaches consist of a general-purpose lane. The site driveway southbound approach provides a single approach lane. Although there are no stop signs, the site driveway operates under stop control.

Traffic Volumes

Base traffic conditions within the study area were developed by conducting automatic traffic recorder (ATR) counts on Shrewsbury Street adjacent to the site to collect weekday daily traffic volumes and by conducting manual turning movement and vehicle classification counts (TMCs) at the study area intersections. The ATR data were collected in June 2018 while the TMC data are composed of counts performed in July 2023 as well as newer counts performed in March and April 2024. All count data are provided in the Appendix. The TMCs were performed during the weekday AM peak period (7:00 to 9:00 AM), the weekday PM peak period (4:00 to 6:00 PM), and the Saturday midday peak period (11:00 AM to 2:00 PM) to collect peak hour data during times when both the adjacent street volumes are highest, and the development generates the greatest volume of traffic. The July 2023 TMC data were collected for 12 consecutive hours at the Shrewsbury Street Marketplace driveway, encompassing both the AM and PM peak periods. The count data indicates that the weekday AM peak hour typically occurs from 7:30 to 8:30 AM, the weekday PM peak hour occurs from 4:15 to 5:15 PM, and the Saturday Midday peak hour occurs from 11:00 AM to 12:00 PM.

To determine if the count data needed to be adjusted to represent annual average month conditions consistent with state guidelines for traffic impact assessment, historical traffic volume data were obtained from Massachusetts Department of Transportation (MassDOT). The closest permanent count station to the project site is located on Interstate 290 north of the Route 9 interchange (Station No. 3333). Based on this information, traffic during the month of March is approximately one percent below annual average-month conditions while April and July were both above annual average-month conditions (three percent and two percent above, respectively). Traffic during the month of June represents the annual average-month conditions. Accordingly, the March data were

upwardly adjusted by one percent while the remaining counts were not adjusted to represent a conservative (above annual average-month) condition. The MassDOT seasonal adjustment data are provided in the Appendix.

The MassDOT *Traffic and Safety Engineering 25% Design Submission Guidelines* were updated on May 31, 2022. These new directives note that traffic volume data collected after March 1, 2022, are no longer subject to any adjustments to represent pre-pandemic traffic volume conditions, except in areas where land use is predominantly office. Therefore, since the TMC data were collected in July 2023 and in March/April 2024 and land use in the area is predominantly residential and commercial, COVID adjustments do not need to be applied to the data. The 2023 TMC data was adjusted to the present year 2024 to reflect existing conditions based on traffic growth rates described in the *Traffic Growth* section of this report. The 2024 Existing peak hour traffic flow networks are shown graphically on Figure 2.

The ATR data were obtained in 2018 (pre-COVID) and were thus adjusted to the present year 2024 to reflect existing conditions based on traffic growth rates described in the *Traffic Growth* section of this report. The daily and peak hour traffic flows are summarized in Table 1.

Table 1
Existing Traffic Volume Summary

Location	Daily Volume [a]	Peak Hour Volume [b]		K-Factor [c]	Directional Distribution [d]
Shrewsbury Street Adjacent to the Site	30,216	AM:	1,938	6.4%	61% SB
		PM:	2,449	8.1%	52% SB
		Sat:	1,853		61% NB

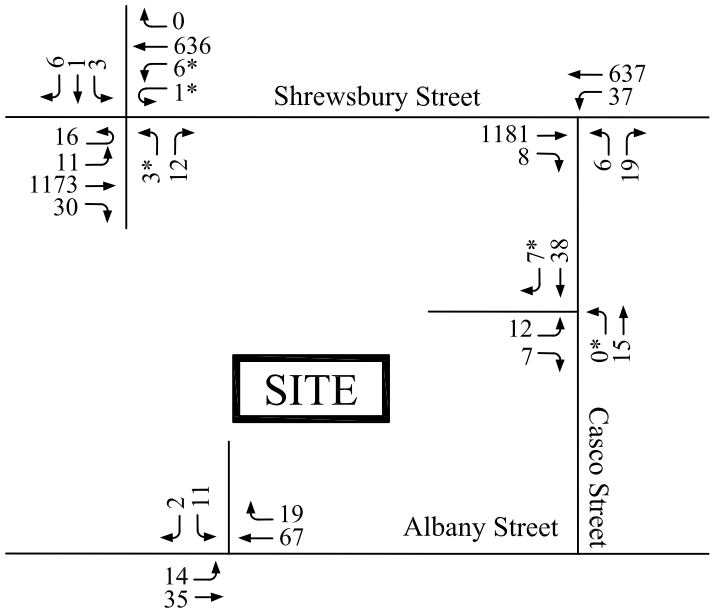
[a] In vehicles per day.
[b] In vehicles per hour.
[c] Percentage of daily traffic occurring during the peak hour.
[d] SB = southbound, NB = northbound.

Crash Data

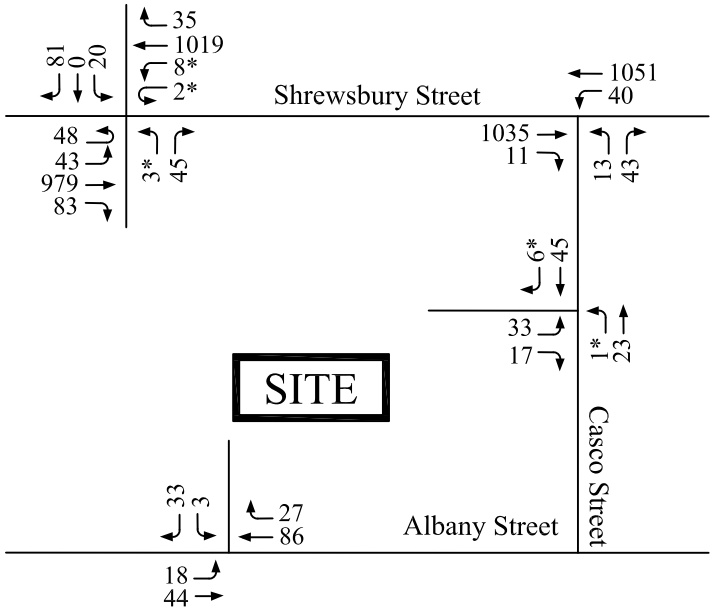
Crash data for the study intersections were obtained from MassDOT for the period between 2015 and 2019, the latest five years of available data excluding 2020 which was impacted by COVID conditions. A summary of the MassDOT crash data is provided in Table 2. In addition to the summary, crash occurrence should also be compared to the volume of traffic through a particular intersection to determine any significance. Accordingly, an crash rate was calculated for the intersection and compared with the statewide and district-wide (District 3) averages. An intersection crash rate is a measure of the frequency of crashes compared to the volume of traffic through an intersection and is presented in accidents per million entering vehicles (acc/mev). For

Figure 2
2024 Existing
Peak Hour Traffic Volumes

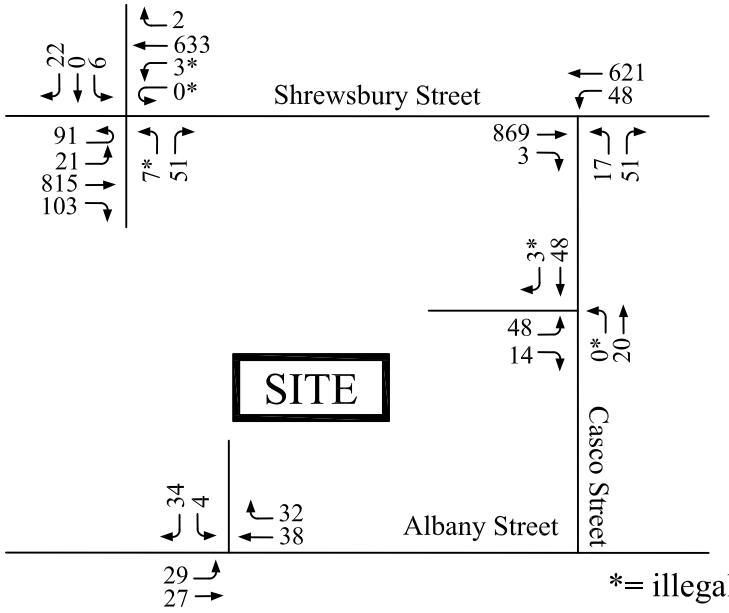
Weekday AM Peak Hour



Weekday PM Peak Hour



Saturday Midday Peak Hour



NOT TO SCALE

*= illegal movement

unsignalized intersections, the statewide average crash rate is 0.57 acc/mev and the district-wide crash rate is 0.61 acc/mev. A comparison of the calculated crash rate to the statewide and district-wide averages can be used to establish the significance of crash occurrence and whether or not potential safety problems exist. The crash rate worksheets are provided in the Appendix.

Table 2
Crash Summary

	Number of Crashes			Severity [a]			Crash Type [b]						% During
Location	Total	Avg./ Year	Crash Rate [c]	PD	PI	NR	CM	RE	HO	SS	Ped	Other	Wet/Icy Conditions
Shrewsbury Street at Casco Street	16	3.2	0.31	7	6	3	11	3	1	1	0	0	13%
Shrewsbury Street at Site Driveway	22	4.4	0.39	9	9	4	10	5	0	4	0	3	9%
Casco Street at Site Driveway	0	0.0	0.00	0	0	0	0	0	0	0	0	0	0%
Albany Street at Site Driveway	0	0.0	0.00	0	0	0	0	0	0	0	0	0	0%

Source: MassDOT Traffic Operations Safety Management System – 2015 through 2019 data.
[a] PD = property damage only; PI = personal injury; NR = not reported/unknown.
[b] CM = cross movement/angle; RE = rear end; HO = head on; SS = side-swipe; Ped = pedestrian.
[c] Measured in accidents per million entering vehicles.

As shown in Table 2, the intersection of Shrewsbury Street and Casco Street experienced 16 crashes over the five-year period, averaging just over three crashes per year. Of the 16 total collisions, seven resulted in property damage only and six involved non-fatal injuries. The severity of the remaining three crashes was not reported. There were 11 angle type collisions (69 percent), 3 rear-end type collisions (19 percent), one sideswipe type collision (six percent) and one head-on vehicle type collision (six percent). Of the 16 total crashes, two (12.5%) occurred during wet or icy roadway conditions. The calculated crash rate of 0.31 acc/mev is lower than both the statewide and district wide averages for unsignalized intersections.

At the Shrewsbury Street, Oleum Court and site driveway intersection, there were a total of 22 reported crashes over the five-year period, averaging just over four crashes per year. Of the 22 total collisions, nine resulted in property damage only and nine involved non-fatal injuries. The

severity of the remaining four crashes was not reported. There were 10 angle type collisions (45 percent), 5 rear-end type collisions (23 percent), four sideswipe type collisions (18 percent), one head-on vehicle type collision (five percent), one front to rear type collision (five percent). The remaining crash types were not reported. Of the 22 total crashes, two (nine percent) occurred during wet or icy roadway conditions. The calculated crash rate of 0.39 acc/mev is lower than both the statewide and district wide averages for unsignalized intersections.

There were no reported crashes at the site driveway intersections with Casco Street or Albany Street over the five-year analysis period. It should be noted that none of the study area intersections are listed as top crash locations in the MassDOT database of Highway Safety Improvement Program (HSIP) eligible clusters.

Vehicle Speeds

Speed measurements were conducted along Shrewsbury Street adjacent to the site by measuring the elapsed time for vehicles traveling a short, pre-measured distance between two checkpoints. The travel time was recorded using automatic traffic recorders and the speed is derived by dividing the elapsed time into the measured distance between checkpoints. The results of the speed measurements are summarized in Table 3.

Table 3
Observed Travel Speeds [a]

Location/Direction	Posted Speed Limit	Average Speed	85th Percentile Speed [b]
Shrewsbury Street Adjacent to the Site:			
Eastbound	30	32	38
Westbound	30	31	38

[a] In miles per hour (mph).
[b] Speed at, or below which 85 percent of all observed vehicles travel.

As shown, the average speeds along Shrewsbury Street adjacent to the site driveway were slightly above the posted speed limit. The 85th percentile speeds were recorded to be 8 mph higher than the posted speed limit of 30 miles per hour (mph) in both directions. These speeds were accordingly used in the calculation of minimum sight distance requirements, as described below.

Sight Distance

To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the site driveway intersections to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO).[1] AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. The MassDOT and the Executive Office of Energy and Environmental Affairs (EEA) require the use of AASHTO sight distance standards when preparing traffic impact assessments and studies, as stated in their guidelines for traffic impact assessments.

Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. Stopping sight distance is measured from an eye height of 3.5 feet to an object height of 2 feet above street level, equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level. The use of an object height equal to the driver eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied.

SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. However, the ISD must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."* Accordingly, ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

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

The available intersection sight distances at the Shrewsbury Street driveway location were measured and compared to minimum requirements as established by AASHTO based on the observed speeds and are shown in Table 4. Although no posted speed limit was identified on Casco Street or Albany Street within the study area, a design speed of 30 mph was assumed. Sight lines from the Casco Street driveway extend to the ends of the roadway to the intersections with Shrewsbury Street and with Albany Street. Therefore, the sightline measurements are based on a turning speed of 15 mph as these movements can be seen from the site driveway approach.

Table 4
Sight Distance Summary

	Sight Distance (feet)		
Location/Direction	Measured	Minimum Required (SSD)[a]	Desirable (ISD)[b]
Shrewsbury Street at Site Driveway:			
West of intersection (right-turns out only)	400+	280	335
Casco Street at Bank Exit Driveway:			
North of intersection	325[c]	80	170
South of intersection	90[c]	80	170
Albany Street at Full Access Driveway:			
East of intersection	500+	200	335
West of intersection	500+	200	335

[a] Values based on AASHTO SSD requirements for the observed 85th percentile travel speed of 38 mph on Shrewsbury Street, a turning speed of 15 mph on Casco Street, and an assumed design speed of 30 mph on Albany Street.
[b] Values based on AASHTO ISD requirements for posted speed limit of 30 mph on Shrewsbury Street, a turning speed of 15 mph on Casco Street, and an assumed design speed of 30 mph on Albany Street.
[c] Values based on distances to adjacent intersections.

As shown in Table 4, ample sight distances exist at the proposed site driveway locations to allow for safe operation, exceeding minimum requirements. It is recommended that any proposed landscaping or signs in the vicinity of the site driveways be kept low (maximum 2 feet in height from street level), or set back outside the sight triangles (as defined by AASHTO) so as not to impede the available sight distances.

Public Transportation

Worcester is serviced by the Worcester Regional Transit Authority (WRTA). WRTA Bus Route 15 (Shrewsbury Center via Shrewsbury Street and Route 9) provides local bus service and travels in front of the site along Shrewsbury Street. The route services facilities including Cristoforo Colombo Park, East View Apartments, UMass Medical Center, White City Plaza, Shrewsbury Towers, Shrewsbury Town Hall, Shrewsbury Senior Center, Shrewsbury center, and Union Station. This route typically operates from 5:50 AM to 9:10 PM on weekdays and 9:50 AM to 5:50 PM on Saturdays at approximately one-hour headways. At Union Station in Worcester, connections can be made to Greyhound and Peter Pan Bus Lines, Amtrak, and the MBTA commuter rail service. There is also a 500-space parking garage located behind Union Station. Current maps and schedules can be found on the WRTA website at www.therta.com.

Existing Pedestrian and Bicycle Accommodation

A sidewalk is provided along both sides of Shrewsbury Street and Casco Street within the study area. There are some sections of sidewalks along Albany Street, but they do not extend through the study area. Bicycle accommodations are not provided along the roadways within the study area. A crosswalk is provided across the Casco Street approach to Shrewsbury Street and a defined sidewalk across the site driveway approach to Shrewsbury Street.

FUTURE CONDITIONS

Traffic Growth

Future traffic conditions were projected to the year 2031, representing a 7-year design horizon consistent with state requirements for traffic impact analysis. To project traffic conditions within this design horizon, two components of traffic growth were considered. First, an annual average traffic growth rate was determined to account for general population growth and smaller development projects (i.e. residential subdivisions) that may impact traffic in the site vicinity. Based on historical traffic volume information from a MassDOT count station on Shrewsbury Street south of Route 9 (Station No. 3979), traffic volumes have increased an average of 0.79 percent per year based on the latest years of available data. To provide a conservative assessment, a one percent per year growth rate was used to bring the 2024 Existing volumes to 2031 (7-year growth) before the planned development volumes were added.

Second, any planned or approved specific developments in the area that would generate a significant volume of traffic on study area roadways within the next seven years were included. Based on discussions with the City of Worcester, the following developments were included:

- *224 Shrewsbury Street* – construction of a new five-story multifamily residential building consisting of 73 units with parking underneath. The traffic to be generated by this project was taken from the traffic study[2] prepared for the project. The distribution of that traffic on the study area roadways is provided in the Appendix.

- *393-397 Shrewsbury Street* – construction of a new building consisting of 2,400 square feet of ground floor commercial space with 24 residential units located above. Of the 24 units, there will be eight one-bedroom units and 16 two-bedroom units. The traffic to be generated by this project was taken from the traffic study[3] prepared for the project. The distribution of that traffic on the study area roadways is provided in the Appendix.

No-Build Conditions

The 2031 No-Build networks were accordingly developed by applying a compounded 1.0 percent annual growth rate (7.2 percent over seven years) to the existing adjacent street volumes and by assuming construction of the above-referenced development projects. The 2031 No-Build peak-hour traffic-flow networks are shown on Figure 3.

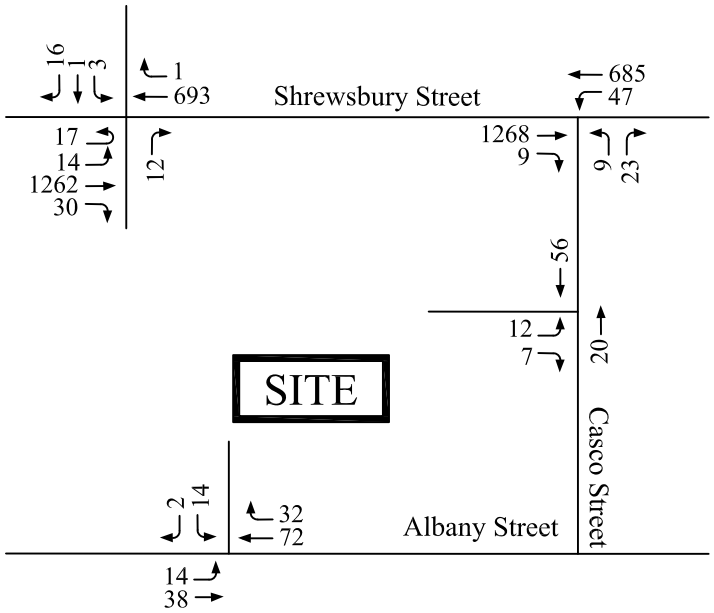
Trip Generation

The traffic to be generated by the retail expansion project was estimated using the Institute of Transportation Engineering (ITE) *Trip Generation Manual*.[4] As proposed, the existing vacant ambulance warehouse will be razed and replaced with a new 15,375 sf mixed use building. The existing DCU bank on site will be moved to part of this new building, with the old space being retrofitted with a new retail use. Accordingly, Land Use Code 822 (Strip Retail Plaza - less than 40,000 sf) and LUC 912 (Drive-In Bank) were used in estimating the traffic generation characteristics of the project, as shown in Table 5. Higher square footages than what are proposed were used in the calculation for the new bank and retail spaces to provide a conservative trip generation estimate. The trip generation calculations are provided in the Appendix.

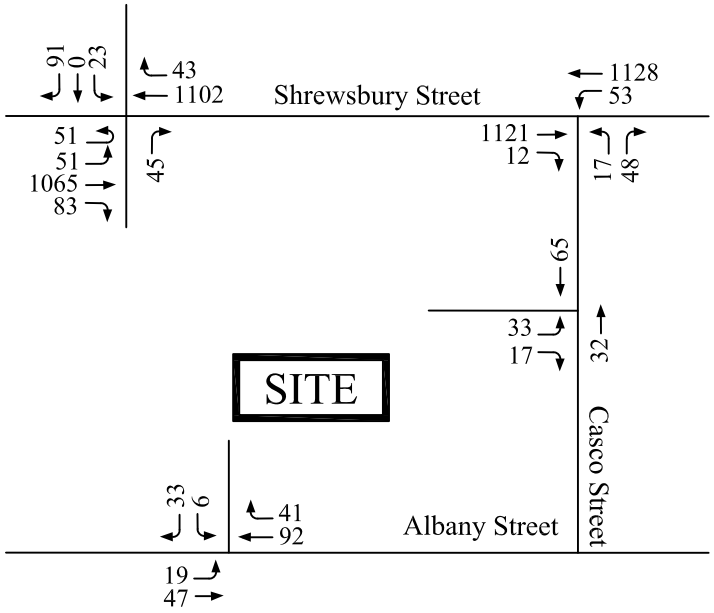
[2] *Traffic Impact Assessment, Proposed Apartment Building, 224 Shrewsbury Street, Worcester, MA;* prepared for Highpoint Engineering, Inc; prepared by Chappell Engineering Associates, LLC, Inc; August 7, 2023
[3] *Traffic Impact Assessment, Proposed Mixed-Use Development, 393-397 Shrewsbury Street, Worcester, MA;* prepared for Wei Dong Wilson Wang; prepared by Kimley-Horn and Associates, Inc; June 2023
[4] *Trip Generation Manual, 11th Edition;* Institute of Transportation Engineers; Washington, DC; 2021.

Figure 3
2031 No Build
Peak Hour Traffic Volumes

Weekday AM Peak Hour



Weekday PM Peak Hour



Saturday Midday Peak Hour

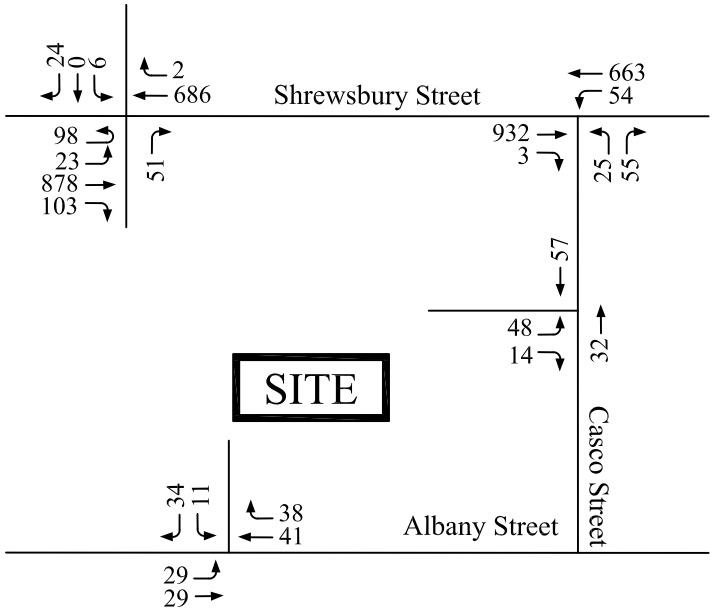


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Table 5
Trip Generation Summary

Time Period	Proposed Bank [a]	Existing Bank [b]	Additional Bank Trips [c]	Proposed Retail Space [d]	Existing Retail Space [e]	Additional Retail Trips [f]	**Total Additional Trips** [g]
Weekday Daily	570	510	60	1,743	1,104	639	**699**
Weekday AM Peak							
Enter	33	30	3	40	28	12	**15**
Exit	24	21	3	27	19	8	**11**
Total	57	51	6	67	47	20	**26**
Weekday PM Peak							
Enter	60	54	6	97	66	31	**37**
Exit	60	53	7	96	65	31	**38**
Total	120	107	13	193	131	62	**75**
Saturday Daily	490	440	50	3,070	1,770	1,300	**1,350**
Sat. Midday Peak							
Enter	77	68	9	120	69	51	**60**
Exit	73	66	7	116	67	49	**56**
Total	150	134	16	236	136	100	**116**

[a] ITE Land Use Code 912 (Drive-In Bank) trip rates applied to 5,700 square feet.
[b] ITE Land Use Code 912 (Drive-In Bank) trip rates applied to 5,100 square feet.
[c] Difference between proposed bank trips and existing bank trips.
[d] ITE Land Use Code 822 (Strip Retail Plaza) trip rates applied to 35,872 square feet.
[e] ITE Land Use Code 822 (Strip Retail Plaza) trip rates applied to 20,712 square feet.
[f] Difference between proposed retail trips and existing retail trips.
[g] Total of additional bank trips and additional retail trips.

As shown, the proposed retail and bank expansion development will generate 699 additional trips (350 in and 349 out) on a weekday daily basis, of which 26 trips (15 in and 11 out) will occur during the weekday AM peak hour and 75 trips (37 in and 38 out) will occur during the weekday PM peak hour. On a typical Saturday, the expansion project is expected to generate 1,350 additional trips (675 in and 675 out) of which 116 trips (60 in and 56 out) will occur during the Saturday midday peak hour.

It is important to note that a substantial portion of retail traffic comes from the existing traffic passing by the site today (referred to as pass-by traffic) and is therefore not new to the area. Based on projections from the ITE *Trip Generation Manual,* pass-by traffic can account for 31 to 40 percent of the total traffic generated by retail establishments, depending on the time period. For the purpose of this report, no adjustments for pass-by traffic were made to present a conservative analytical framework.

The site was approved in 2022 for a seven-story, 218-unit apartment building in place of the vacant ambulance warehouse. Accordingly, a comparison was made between the trip generation of the previously approved apartment building and the currently proposed retail and bank expansion development to determine the difference in site traffic generation between the two uses. Table 6 summarizes this comparison based on methodology as used in the 2022 approved traffic study[5].

Table 6
Trip Generation Comparison

Time Period	Proposed Retail/Bank Expansion [a]	Approved Multifamily Housing [b]	**Change in Site Trips**
Weekday Daily	699	990	**-291**
Weekday AM Peak Hour			
Enter	15	19	**-4**
Exit	11	65	**-54**
Total	26	84	**-58**
Weekday PM Peak Hour			
Enter	37	52	**-15**
Exit	38	33	**+5**
Total	75	85	**-10**
Saturday Daily	1,350	994	**+356**
Sat. Midday Peak Hour			
Enter	60	45	**+15**
Exit	56	43	**+13**
Total	116	88	**+28**

[a] From Table 5.
[b] From *Traffic Impact and Access Study, Proposed Apartment Building, 225 Shrewsbury Street, Worcester, MA;* prepared for Highpoint Engineering, Inc.; prepared by Ron Müller & Associates; August 7, 2022. Saturday volumes from ITE Land Use Code 221 (Multifamily Housing - Midrise) based on 218 dwelling units.

As shown, the proposed retail and bank expansion project will generate less traffic than the formerly approved apartment building on a weekday daily and peak hour basis. During the critical commuter peak hours, the currently proposed project will generate between 10 and 58 fewer trips than the previously approved apartment building. Since retail developments generate the majority of their traffic on a Saturday, the current project will generate 28 trips more during the Saturday peak hour than the prior approved apartment building.

[5] *Traffic Impact and Access Study, Proposed Apartment Building, 225 Shrewsbury Street, Worcester, MA;* prepared for Highpoint Engineering, Inc.; prepared by Ron Müller & Associates; August 7, 2022.

Trip Distribution

The distribution of retail and bank traffic on the area roadways is based on the roadway network, surrounding population densities, and existing travel patterns observed within the study area. Shrewsbury Street is a divided roadway with turn restrictions in place at the main driveway intersection with Shrewsbury Street (no left turns into or out of the site). There are no turn restrictions for traffic entering/exiting Casco Street and there are several options for cars to access Shrewsbury Street from Albany Street (via Fantasia Drive, Lyon Street, and South Hill Street). The overall distribution of traffic is expected to be 50 percent to/from Shrewsbury Street west and 45 percent to/from Shrewsbury Street east, with the remaining 5 percent to/from Albany Street west. However, due to the turn restrictions at the Shrewsbury Street driveway, entering traffic from the east would use Casco Street and Albany Street to turn into the site. Of the 45 percent of traffic exiting the site and destined to the east, 30 percent would use the Shrewsbury Street driveway, 10 percent would use the Casco Street driveway, and 5 percent would use the Albany Street driveway. Of the 50 percent of traffic exiting the site and destined to the west, 30 percent would access Shrewsbury Street via Casco Street (15% from the Casco Street driveway and 15% from the Albany Street driveway), and the remaining 20 percent would use the Albany Street driveway and head west to access Shrewsbury Street via Fantasia Drive, Lyon Street, or South Hill Street.

The distribution of bank traffic would follow the same overall distribution but would use different driveways. Due to the nature of the drive-in bank, most customers would utilize the drive-up tellers rather than going inside the bank. It was estimated that 80% of bank traffic would use the drive-up teller and therefore use the Casco Street driveway. The remaining bank traffic would use the other driveways, with a distribution as described above.

Build Conditions

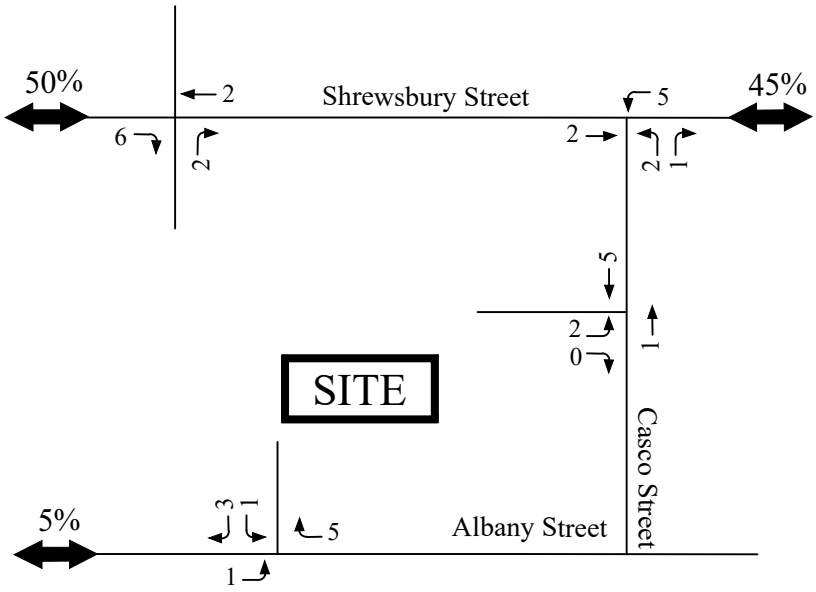
Based on the above traffic generation and distribution estimates, the traffic volumes generated by the project were assigned to the roadway network as shown on Figures 4 and 5 and were added to the 2031 No-Build traffic volumes to develop the 2031 Build traffic volumes. The 2031 Build traffic volume networks are graphically depicted on Figure 6.

Traffic Increases

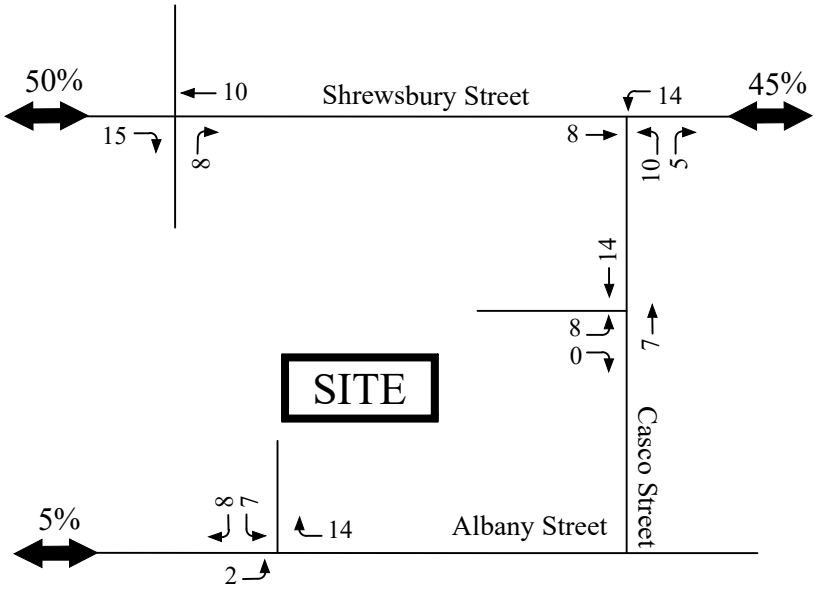
The proposed project will result in increases in traffic on the study area roadways. Without taking any credit for pass-by trips, traffic-volume increases on Shrewsbury Street are expected in the range of 10 to 53 additional vehicles during peak hours. These increases represent, on average, approximately one additional vehicle every one to six minutes. Traffic increases on Casco Street are expected in the range of 12 to 55 additional vehicles during peak hours, representing one additional vehicle every one to five minutes. Traffic increases on Albany Street are expected in the range of 8 to 37 additional vehicles during peak hours, representing one additional vehicle

Figure 4
Site Generated Traffic - Retail
Peak Hour Traffic Volumes

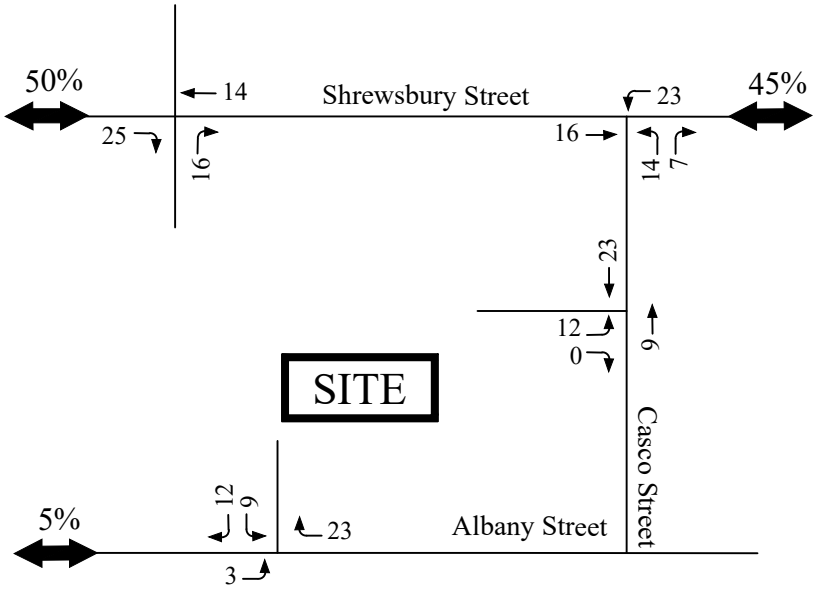
Weekday AM Peak Hour



Weekday PM Peak Hour



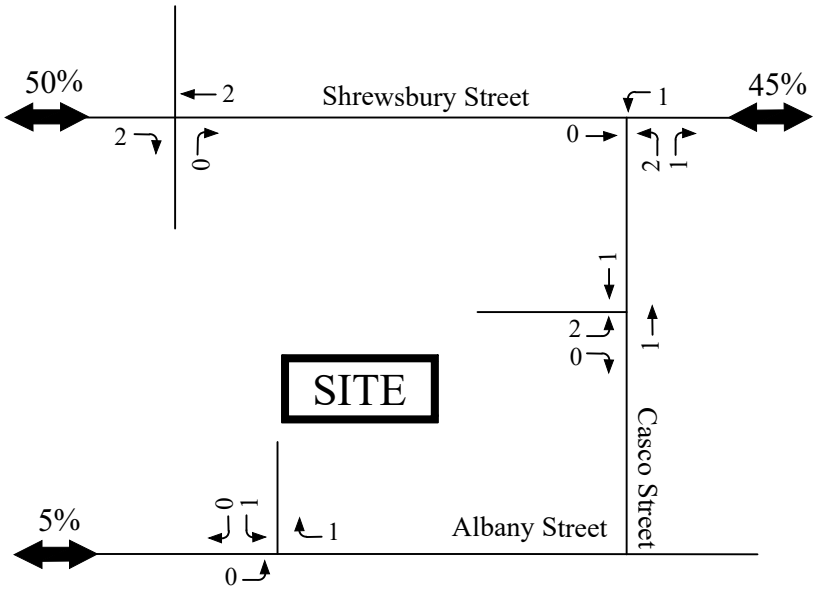
Saturday Midday Peak Hour



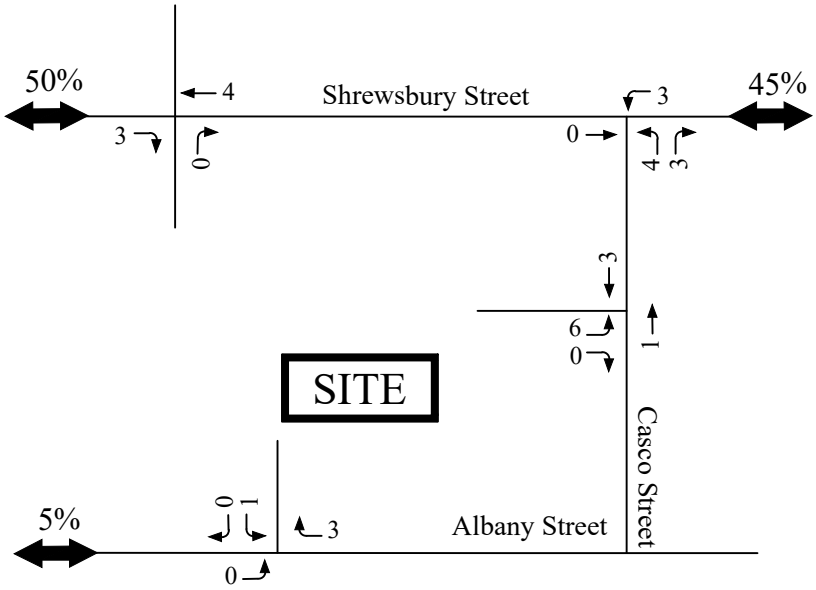
NOT TO SCALE

Figure 5
Site Generated Traffic - Bank
Peak Hour Traffic Volumes

Weekday AM Peak Hour



Weekday PM Peak Hour



Saturday Midday Peak Hour

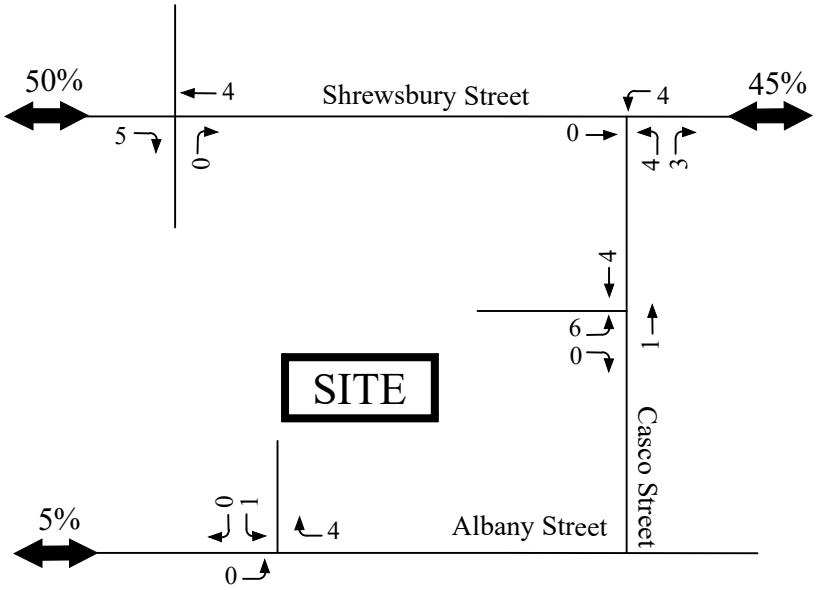


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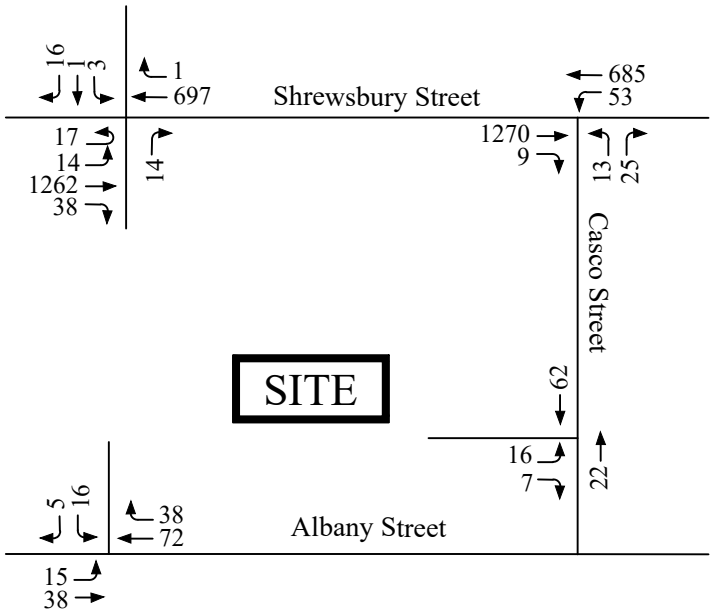
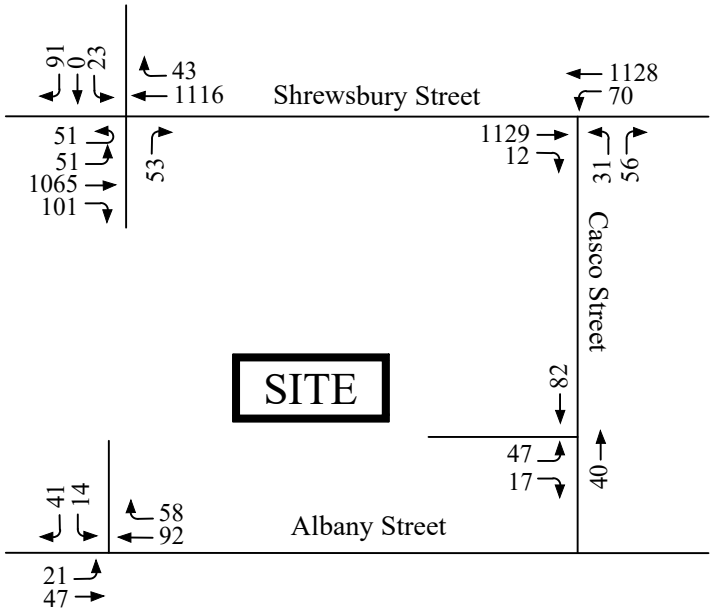
Figure 6
2031 Build
Peak Hour Traffic Volumes

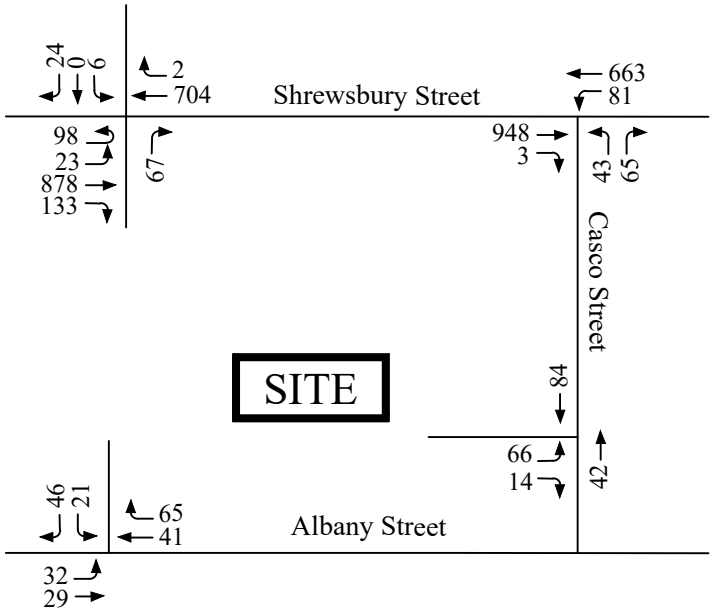
Weekday AM Peak Hour



Weekday PM Peak Hour



Saturday Midday Peak Hour



NOT TO SCALE

every one and a half to seven and a half minutes. Smaller increases are expected during all other times of the day.

Site Access, Drive-Through Queuing, and On-Site Circulation

Access to the site is proposed via driveways on Shrewsbury Street, Albany Street, and Casco Street. The Casco Street site driveway, which currently only allows exiting traffic for the DCU bank drive-through, is proposed to be closed and moved closer to Albany Street. The driveway will continue to operate as an exit-only driveway and is proposed to be 12 feet wide with a pedestrian crosswalk connecting the existing sidewalk. The existing Albany Street driveway will be closed and moved near the southwest corner of the parcel. The driveway is proposed to be a two-way, 24-foot-wide driveway. The Shrewsbury Street driveway will be modified to provide a larger turning radius and will continue to be a right-in/right-out only driveway. Further turn restriction postings are proposed at this driveway, including a painted RIGHT TURN ONLY arrow and an additional NO LEFT TURN sign on the property. All driveways will be fitted with STOP lines and signs (R1-1). A DO NOT ENTER (R5-1) sign facing the public street will be added to the Casco Street driveway.

There are two 10-foot-wide lanes proposed to access the drive through area approximately 41 feet north of Albany Street adjacent to the driveway. The northernmost lane tapers into two 12-foot-wide lanes, which will be used to access the drive-up teller and ATM respectively. The southern lane provides an Exit Only Lane to the Casco Street driveway. DO NOT BLOCK INTERSECTION pavement striping will be placed at the start of the drive through lanes to prevent traffic queueing at the Albany Street driveway from blocking access to the drive through and vice versa. Additionally, a crosswalk is proposed across the two drive through lanes and the escape lane approximately 60 feet from the teller window/ATM. After the drive through lanes, a large queueing area is proposed where all three lanes will be able to maneuver and merge toward the Casco Street driveway.

The drive-in bank offers one teller window and one ATM lane. Based on the latest site plan, each drive-through lane will be able to accommodate approximately five vehicles in queue before the lanes merge, after which an additional two cars can be stored for a total of 12 vehicles. To estimate the expected queues in the drive-up teller window, drive-through queue studies performed by Ron Müller & Associates and conducted at eight existing bank locations throughout Massachusetts were reviewed. A summary of these queue studies is provided in the Appendix. Based on a total of 15 data points, the average of all maximum queues in the teller window lane was found to be two vehicles and the maximum queue observed at any one bank was four vehicles. At ATM lanes, the average of all maximum queues in the ATM lanes was found to be three vehicles and the maximum queue observed at any one bank was five vehicles. Given that a total of 5 queueing spaces are provided in each lane and an additional two vehicles can be accommodated before impacting on-site circulation, the proposed drive-through lanes can easily accommodate the anticipated maximum queues.

Drive-through queue studies were also conducted at the existing DCU Bank on Friday May 17 and Saturday May 18, 2024 to establish current queuing conditions within the drive-through lanes. These studies were performed during peak banking hours as defined in the ITE *Trip Generation Manual.* The results of these studies, which are provided in the Appendix, show that both the existing teller lane and the existing ATM lane experienced a maximum queue of 5 vehicles. The existing drive-through lanes provide vehicle queue storage for only 3 vehicles, so on-site circulation is currently impeded when queues exceed this storage capacity. The proposed drive-through lanes at the relocated bank can easily accommodate these existing queues and on-site circulations will be significantly improved as a result.

The parking lot will be reconfigured to better facilitate the flow of traffic on site. The general layout of the parking lot will remain the same with two main parking areas separated by a parking island. The island will be extended to encompass the entire frontage of the existing and proposed building, except for a 20-foot-wide drive aisle that will provide vehicular access between the two parking areas, accompanied by STOP lines and signs. An additional 5-foot-wide striped pedestrian walkway is proposed south of this cut through to allow for safe pedestrian access. A 570 square foot hallway is proposed between the existing DCU bank building and the proposed retail space to provide access to/from Casco Street from the parking area. A landscape buffer will be added at the southern edge of the proposed DCU bank and will connect to the center parking lot island. This will separate the drive-through lanes from the rest of the parking area, allowing for maximum queuing in these areas without impacting any parking and provide screening to hide the queueing vehicles. A "Drive Through Right Turn" sign will be added to the Shrewsbury Street entrance to direct traffic to the proper path toward the bank drive through lanes.

CAPACITY ANALYSIS

Level-of-service (LOS) analyses were conducted at the study area intersections under existing and projected volume conditions to determine the effect that the additional site-generated traffic will have on traffic operations. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual*[6] (HCM) and is described in the Appendix. For unsignalized intersections, the 95th percentile queue represents the length of queue of the critical minor-street movement that is not expected to be exceeded 95 percent of the time during the analysis period (typically one hour). The queue length is a function of the capacity of the movement and the movement's degree of saturation. The level-of-service and queue results are presented in Table 7 and are discussed below. All analysis worksheets are provided in the Appendix.

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

Table 7
Level-of-Service Analysis Summary

Location/Peak Hour	2024 Existing				2031 No-Build				2031 Build			
Movement	v/c[a]	Del.[b]	LOS[c]	Queue[d]	v/c	Del.	LOS	Queue	v/c	Del.	LOS	Queue
Shrewsbury Street at 225 Driveway/Oleum Court												
Weekday AM Peak												
EB Left	0.046	10.9	B	25	0.057	11.4	B	25	0.057	11.4	B	25
NB Right	0.046	14.2	B	25	0.054	15.0	C	25	0.059	15.1	C	25
SB All	0.048	16.5	C	25	0.080	14.9	B	25	0.080	14.9	B	25
Weekday PM Peak												
EB Left	0.265	18.9	C	25	0.339	22.6	B	25	0.345	23.1	C	50
NB Right	0.141	13.6	B	25	0.169	14.5	B	25	0.180	14.7	B	25
SB All	0.410	25.3	D	50	0.554	36.2	E	75	0.568	37.8	E	75
Saturday Midday Peak												
EB Left	0.201	12.5	B	25	0.237	13.6	B	25	0.240	13.8	B	25
NB Right	0.120	12.8	B	25	0.145	13.5	B	25	0.170	13.9	B	25
SB All	0.103	14.3	B	25	0.120	15.3	C	25	0.122	15.5	C	25
Shrewsbury Street at Casco Street												
Weekday AM Peak												
NB All	0.158	19.3	C	25	0.263	24.9	C	25	0.300	26.4	D	50
WB Left	0.072	12.2	B	25	0.106	13.2	B	25	0.112	13.2	B	25
Weekday PM Peak												
NB All	0.196	17.8	C	25	0.301	22.5	C	50	0.397	27.1	D	50
WB Left	0.064	10.9	B	25	0.104	11.7	B	25	0.121	11.8	B	25
Saturday Midday Peak												
NB All	0.207	16.6	C	25	0.335	21.8	C	50	0.433	26.1	D	50
WB Left	0.079	10.7	B	25	0.114	11.3	B	25	0.144	11.6	B	25

[a] Volume-to-capacity ratio.
[b] Average control delay (sec./vehicle).
[c] Level of service.
[d] 95th percentile queue in feet, assuming 25 feet/vehicle.

Table 7 (Cont.)
Level-of-Service Analysis Summary

Location/Peak Hour	2024 Existing				2031 No-Build				2031 Build			
Movement	v/c[a]	Del.[b]	LOS[c]	Queue[d]	v/c	Del.	LOS	Queue	v/c	Del.	LOS	Queue
Casco Street at Bank Drive Through												
Weekday AM Peak												
EB Left	0.016	8.9	A	0	0.018	9.0	A	25	0.022	9.1	A	25
EB Right	0.009	8.5	A	0	0.009	8.6	A	0	0.009	8.7	A	0
Weekday PM Peak												
EB Left	0.048	9.1	A	25	0.058	9.4	A	25	0.075	9.6	A	25
EB Right	0.023	8.6	A	25	0.023	8.8	A	25	0.024	8.8	A	25
Saturday Midday Peak												
EB Left	0.063	9.3	A	25	0.075	9.6	A	25	0.097	9.9	A	25
EB Right	0.017	8.7	A	25	0.017	8.8	A	25	0.018	8.9	A	25
Albany Street at Site Driveway												
Weekday AM Peak												
EB Left	0.011	7.4	A	0	0.012	7.5	A	0	0.012	7.5	A	0
SB All	0.024	9.4	A	25	0.034	9.6	A	25	0.039	9.5	A	25
Weekday PM Peak												
EB Left	0.019	7.5	A	25	0.022	7.6	A	25	0.023	7.6	A	25
SB All	0.057	9.2	A	25	0.079	9.6	A	25	0.097	9.9	A	25
Saturday Midday Peak												
EB Left	0.026	7.5	A	25	0.028	7.5	A	25	0.030	7.6	A	25
SB All	0.050	8.9	A	25	0.079	9.4	A	25	0.097	9.6	A	25

[a] Volume-to-capacity ratio.
[b] Average control delay (sec./vehicle).
[c] Level of service.
[d] 95th percentile queue in feet, assuming 25 feet/vehicle.

As shown in Table 7, the Shrewsbury Street site driveway currently operates at LOS B or better and is expected to continue to operate at acceptable levels (LOS B to C) under both the future No-Build and Build conditions. Under all analyzed conditions and time periods, 95th percentile vehicle queues are not expected to exceed one vehicle.

The intersection of Casco Street and Shrewsbury Street currently operates at LOS C for all Casco Street traffic and LOS B for left turning vehicles from Shrewsbury Street. Traffic will continue to operate at acceptable levels of service under future No-Build and Build conditions. The addition of site traffic will increase delays by less than 5 seconds per vehicle and traffic exiting Casco Street will continue to operate at acceptable levels (LOS D). Vehicle platooning along Shrewsbury Street from upstream traffic signals creates gaps in the traffic flow. Actual delays for vehicles turning

from Casco Street onto Shrewsbury Street are therefore expected to be better than modeled. Vehicles also have the option to utilize the traffic signals at the intersections of Fantasia Drive at Shrewsbury Street and South Hill Street at Shrewsbury Street to avoid any delays on Casco Street.

The DCU Bank driveway and the Albany Street driveway currently operate at LOS A during all peak hours and are expected to continue to operate at desirable levels under both the future No-Build and Build conditions. Under all analyzed conditions and time periods, vehicle queues are expected at one vehicle.

TRANSPORTATION DEMAND MANAGEMENT MEASURES

The neighborhood of the project site is transit oriented in nature. Union Station is approximately 0.8 miles away providing train and bus services. There are also several WRTA stops near the site. Within walking distance, there are various destinations, including restaurants, retail stores, personal services and other various businesses. Downtown Worcester and Plantation Street, both of which are major employer hubs, are also within walking distance. The proponent is committed to implementing a number of Transportation Demand Management (TDM) measures to take advantage of the area's transportation options, in an effort to minimize dependency on automobile use and to promote healthy living.

Pedestrian Linkages – Casco Street will have pedestrian improvements as a part of this redevelopment. New sidewalk sections are proposed to connect the existing sidewalk at the former bank driveway. Additionally, a crosswalk with accompanying ADA compliant pedestrian curb ramps is proposed across the new bank drive through exit at the southeast corner of the property. A 775 square foot hallway is proposed between the existing and proposed buildings on site to allow for pedestrians on Casco Street to access the main site. This will also allow for a connection between the parking lot and the All Systems Go Esports Bar. The sidewalk along the frontage of the businesses on site will have an ADA compliant pedestrian crossing across the proposed bank drive through connecting to Albany Street. This will allow for any future proposed sidewalks on Albany Street to be connected to the site.

Bicycle Accommodations – A bicycle rack is proposed near the Shrewsbury Street driveway and will allow up to six bikes to park at once.

Electric Vehicle Charging Stations – To encourage cleaner modes of transportation, the proponent will install electric vehicle charging stations within the parking areas. Six spaces will be EV ready upon completion of the project with an additional 19 spaces designated as EV Future use.

TRAFFIC SIGNAL WARRANT ANALYSIS

A traffic signal warrant analysis was conducted to determine if signal control could be warranted at the intersection of Shrewsbury Street and Oleum Court/the Shrewsbury Street Marketplace driveway. Consistent with the Manual on Uniform Traffic Control Devices (MUTCD)[7], the volume-based signal warrants are based on the total volume of Shrewsbury Street traffic (both directions) and the higher of the two minor-street approaches. Based on the TMC traffic data that was collected, Oleum Court (with the addition of proposed site generated traffic from the 224 residential development) generates more traffic than the Shrewsbury Street Marketplace driveway even with the addition of the project generated traffic. The signal warrant analysis was therefore performed using Oleum Court as the minor street. The following volume-related warrants were evaluated:

- Warrant 1 – Eight Hour Vehicular Volume
  - Condition A – Minimum Vehicular Volume
  - Condition B – Interruption of Continuous Traffic
  - Combination of Conditions A and B
- Warrant 2 – Four-Hour Vehicular Volume; and
- Warrant 3 – One-Hour Vehicular Volume.

In accordance with the MUTCD, a traffic control signal may only be installed if at least one of the signal warrants is met. However, a number of factors are involved in determining if signal control should be installed, including intersection operations, safety, and engineering judgment. It is only in very rare circumstances that a traffic control signal is installed on the basis of the four-hour or peak hour warrants alone. Normally, at least one of the eight-hour warrants (Warrant 1, Condition A or B) should be met before signal control is considered. The four-hour and peak-hour volume warrants are applied only in unusual cases such as driveways serving large office/industrial complexes, manufacturing plants, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short period of time. These warrants do not apply to the intersection in question. In addition, the combination of Conditions A and B under Warrant 1 should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. Table 8 summarizes the results of the signal warrant analysis and the detailed analysis is provided in the Appendix.

[7]*Manual on Uniform Traffic Control Devices*; Federal Highway Administration; Washington, DC; December 2009; revised May 2012.

Table 8
Traffic Signal Warrant Analysis Summary

Intersection	Warrant 1 A	Warrant 1 B	Warrant 1 Combo	Warrant No. 2	Warrant No. 3	**Signal Recommended?**
Shrewsbury Street at Oleum Court/Shrewsbury Street Marketplace driveway	No	No	No	No	No	**No**

As shown in Table 8, the volumes exiting Oleum Court do not meet Warrant 1A, which MassDOT primarily uses as a basis for justifying installation of a new traffic signal. In addition, the volumes do not meet Warrant 1B or the combination of Warrant 1A and 1B.

Signal warrant analyses were also performed using the Shrewsbury Street Marketplace driveway volumes. These analyses show that the driveway volumes also do not meet any of the volume-based signal warrants.

Given the crash history experienced at the intersection of Shrewsbury Street and Oleum Court as shown in Table 2, Warrant 7, Crash Experience was also reviewed. This warrant is intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal. The need for a traffic control signal should only be considered if all of the following are met:

1. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency; and

2. Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage; and

3. For each of any 8 hours of an average day, the vehicles per hour (vph) given in both of the 80 percent columns of Condition A, or the vph in both of the 80 percent columns of Condition B exists on the major-street and the higher-volume minor-street approach, respectively, to the intersection.

Based on a review of the crash data as well as the volumes under the 80 percent columns of Warrant 1 Conditions A and B, the intersection does not meet the criteria of Warrant 7. Less than five crashes have occurred per year (which is below the minimum crash frequency threshold) of which only 45 percent of accidents (10 out of 22) were angle type collisions that could potentially be avoided through signal control.

CONCLUSIONS

Existing and future conditions at the study area intersections have been described and analyzed with respect to traffic operations and the impact of the apartment building project. Conclusions of this effort and recommendations are presented below.

- The site currently contains the Shrewsbury Street Marketplace and a vacant warehouse building that was formerly used to store ambulances. As proposed, the former ambulance storage building will be razed and replaced with an approximately 15,370 square foot building addition consisting of 9,100 square feet of retail space and a 5,700 square foot new DCU bank with drive-through lanes. A 570 square foot hallway is proposed between the existing DCU bank building and the proposed retail space to provide access to/from Casco Street from the parking area. The existing 5,100 square foot bank will be retrofitted for retail use.

- Existing access to the site is provided via driveways on Shrewsbury Street, Casco Street, and Albany Street. As part of the project, the Shrewsbury Street driveway will be modified to provide larger turning radii but will continue to be a right-in/right-out only driveway. The Casco Street site driveway is proposed to be closed and moved closer to Albany Street. The driveway will continue to operate as an exit-only driveway for the relocated bank. The existing Albany Street driveway will be closed and moved to the southwest corner of the parcel and allow full access/egress.

- The calculated crash rates at the study intersections, including the existing site driveways, are well below statewide and district-wide averages for unsignalized intersections and no trend in crash occurrence is apparent.

- Ample sight distances exist at the proposed site driveway locations to allow for safe operation, exceeding minimum requirements. It is recommended that any proposed landscaping or signs in the vicinity of the site driveways be kept low or set back outside the sight triangles so as not to impede the available sight distances.

- Future traffic conditions were projected to the year 2031, representing a 7-year design horizon consistent with state requirements for traffic impact analysis. Future No-Build conditions were developed by applying an annual traffic growth rate to the existing adjacent street volumes along with adding the traffic generated by other approved projects.

- As a result of the expansion project, the site is expected to generate 26 additional trips (15 in and 11 out) during the weekday AM peak hour and 75 additional trips (37 in and 38 out) during the weekday PM peak hour. During the Saturday peak hour, the project is expected to add 116 trips (60 in and 56 out).

- The site was approved in 2022 for a seven-story, 218-unit apartment building in place of the vacant ambulance warehouse. A trip generation comparison shows that the currently proposed

retail expansion project generates between 10 and 58 fewer trips than the previously approved apartment building. Since retail developments generate the majority of their traffic on a Saturday, the current project will generate 28 trips more during the Saturday peak hour than the prior approved apartment building.

- A substantial portion of retail traffic comes from the existing traffic passing by the site today (referred to as pass-by trips) and is therefore not new to the area. Without taking any credit for pass-by trips, traffic-volume increases on the surrounding streets are expected in the range of 10 to 53 additional vehicles during peak hours. These increases represent, on average, approximately one additional vehicle every one to six minutes. Smaller increases are expected during all other times of the day.

- Queue studies conducted at the existing DCU Bank drive-through lanes show a maximum of 5 vehicles in queue at both the teller and ATM lanes. As the existing drive-through lanes can accommodate only 3 vehicles in queue, on-site circulation is currently impeded when queues exceed this storage capacity.

- The proposed bank will also provide one drive-through teller lane and one drive-through ATM lane, each accommodating five vehicles in queue before the lanes merge, after which an additional two cars can be stored for a total of 12 vehicles. Based on the queue observations at the existing drive-through lanes, as well as several studies completed at similar drive-in banks in Massachusetts, the proposed drive-through lanes can easily accommodate the observed maximum queues and on-site circulation will be significantly improved as a result.

- Traffic was occasionally observed making illegal movements at the Shrewsbury Street and Casco Street site driveways. Proposed improvements include an additional NO LEFT TURN sign and a RIGHT TURN ONLY pavement arrow.

- The site driveways are expected to operate at acceptable levels during the peak hours with vehicle queues of one vehicle.

- The Shrewsbury Street and Casco Street intersection currently operates at acceptable levels of service and delays. Slight increases are expected during the No-Build and Build conditions with minimal increases in delay (less than 5 seconds per vehicle) expected with the inclusion of site traffic.

- Based on the review of both the traffic volumes and motor vehicle crash criteria, the intersection of Shrewsbury Street and the Site driveway does not currently meet and is not projected to meet any of the required thresholds to justify installation of a traffic signal at this location.

APPENDIX

Traffic Count Data
Seasonal/Historical Adjustment Data and Bus Schedule
Crash Rate and Trip Generation Worksheets
Drive Through Queue Studies
Capacity Analysis Methodology and Worksheets
Traffic Signal Warrant Analysis

Traffic Count Data

Accurate Counts

978-664-2565

Location : Shrewsbury Street
Location : West of Casco Street
City/State: Worcester, MA

18010VL1

Start	6/13/2018	WB		Hour Totals		EB		Hour Totals		Combined Totals	
Time	Wed	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		37	212			41	182				
12:15		28	231			37	180				
12:30		28	227			27	168				
12:45		25	229	118	899	17	161	122	691	240	1590
01:00		11	233			22	178				
01:15		19	203			18	188				
01:30		15	200			15	202				
01:45		11	216	56	852	23	185	78	753	134	1605
02:00		11	200			6	235				
02:15		14	244			16	219				
02:30		16	280			9	199				
02:45		17	216	58	940	11	203	42	856	100	1796
03:00		9	220			7	202				
03:15		17	246			6	258				
03:30		9	252			11	207				
03:45		16	232	51	950	11	231	35	898	86	1848
04:00		21	201			9	205				
04:15		33	237			15	261				
04:30		42	231			22	243				
04:45		57	220	153	889	15	265	61	974	214	1863
05:00		51	252			22	236				
05:15		75	236			21	244				
05:30		138	234			24	257				
05:45		138	215	402	937	38	214	105	951	507	1888
06:00		133	222			53	196				
06:15		194	186			69	181				
06:30		249	179			88	174				
06:45		273	183	849	770	99	160	309	711	1158	1481
07:00		221	167			131	171				
07:15		242	163			160	128				
07:30		253	138			176	131				
07:45		289	126	1005	594	205	145	672	575	1677	1169
08:00		254	137			165	121				
08:15		232	132			174	109				
08:30		241	123			135	109				
08:45		251	128	978	520	141	101	615	440	1593	960
09:00		215	107			136	105				
09:15		211	132			138	100				
09:30		190	89			134	123				
09:45		211	127	827	455	130	96	538	424	1365	879
10:00		228	95			129	89				
10:15		184	67			164	81				
10:30		206	72			154	64				
10:45		196	80	814	314	140	59	587	293	1401	607
11:00		233	57			143	68				
11:15		218	47			156	70				
11:30		239	42			163	68				
11:45		217	45	907	191	166	50	628	256	1535	447
Total		6218	8311			3792	7822			10010	16133
Percent		42.8%	57.2%			32.7%	67.3%			38.3%	61.7%

Accurate Counts

978-664-2565

Location : Shrewsbury Street
Location : West of Casco Street
City/State: Worcester, MA

18010VL1

Start Time	6/14/2018 Thu	WB Morning	WB Afternoon	Hour Totals Morning	Hour Totals Afternoon	EB Morning	EB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		24	217			31	204				
12:15		36	212			31	183				
12:30		30	246			27	187				
12:45		21	255	111	930	23	158	112	732	223	1662
01:00		15	238			18	160				
01:15		16	253			23	193				
01:30		22	238			8	198				
01:45		20	220	73	949	19	195	68	746	141	1695
02:00		19	227			15	216				
02:15		12	269			18	188				
02:30		19	252			15	193				
02:45		19	220	69	968	13	241	61	838	130	1806
03:00		10	218			8	223				
03:15		12	244			12	205				
03:30		17	240			9	262				
03:45		18	241	57	943	12	237	41	927	98	1870
04:00		18	208			13	231				
04:15		33	204			14	244				
04:30		37	202			7	272				
04:45		58	244	146	858	17	256	51	1003	197	1861
05:00		42	247			26	264				
05:15		68	229			27	232				
05:30		128	220			27	275				
05:45		131	239	369	935	40	217	120	988	489	1923
06:00		131	189			59	189				
06:15		182	185			66	184				
06:30		232	208			85	224				
06:45		276	179	821	761	111	151	321	748	1142	1509
07:00		234	177			130	150				
07:15		229	159			144	160				
07:30		273	154			157	178				
07:45		250	169	986	659	172	148	603	636	1589	1295
08:00		223	159			169	151				
08:15		240	154			138	134				
08:30		247	128			151	132				
08:45		224	139	934	580	148	99	606	516	1540	1096
09:00		257	138			145	109				
09:15		238	128			137	115				
09:30		230	114			130	113				
09:45		216	103	941	483	152	100	564	437	1505	920
10:00		196	82			150	92				
10:15		220	100			155	87				
10:30		222	102			153	94				
10:45		202	124	840	408	158	72	616	345	1456	753
11:00		222	66			159	76				
11:15		179	52			165	82				
11:30		232	57			172	76				
11:45		238	38	871	213	193	56	689	290	1560	503
Total		6218	8687			3852	8206			10070	16893
Percent		41.7%	58.3%			31.9%	68.1%			37.3%	62.7%
Grand Total		12436	16998			7644	16028			20080	33026
Percent		42.3%	57.7%			32.3%	67.7%			37.8%	62.2%
ADT		ADT 26,553		AADT 26,553							

Accurate Counts

978-664-2565

Location : Shrewsbury Street
Location : West of Casco Street
City/State: Worcester, MA

18010VL1

Start	6/11/2018		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 AM	*	*	*	*	118	122	111	112	*	*	*	*	*	*	114	117
01:00	*	*	*	*	56	78	73	68	*	*	*	*	*	*	64	73
02:00	*	*	*	*	58	42	69	61	*	*	*	*	*	*	64	52
03:00	*	*	*	*	51	35	57	41	*	*	*	*	*	*	54	38
04:00	*	*	*	*	153	61	146	51	*	*	*	*	*	*	150	56
05:00	*	*	*	*	402	105	369	120	*	*	*	*	*	*	386	112
06:00	*	*	*	*	849	309	821	321	*	*	*	*	*	*	835	315
07:00	*	*	*	*	**1005**	**672**	**986**	603	*	*	*	*	*	*	**996**	638
08:00	*	*	*	*	978	615	934	606	*	*	*	*	*	*	956	610
09:00	*	*	*	*	827	538	941	564	*	*	*	*	*	*	884	551
10:00	*	*	*	*	814	587	840	616	*	*	*	*	*	*	827	602
11:00	*	*	*	*	907	628	871	**689**	*	*	*	*	*	*	889	**658**
12:00 PM	*	*	*	*	899	691	930	732	*	*	*	*	*	*	914	712
01:00	*	*	*	*	852	753	949	746	*	*	*	*	*	*	900	750
02:00	*	*	*	*	940	856	**968**	838	*	*	*	*	*	*	**954**	847
03:00	*	*	*	*	**950**	898	943	927	*	*	*	*	*	*	946	912
04:00	*	*	*	*	889	**974**	858	**1003**	*	*	*	*	*	*	874	**988**
05:00	*	*	*	*	937	951	935	988	*	*	*	*	*	*	936	970
06:00	*	*	*	*	770	711	761	748	*	*	*	*	*	*	766	730
07:00	*	*	*	*	594	575	659	636	*	*	*	*	*	*	626	606
08:00	*	*	*	*	520	440	580	516	*	*	*	*	*	*	550	478
09:00	*	*	*	*	455	424	483	437	*	*	*	*	*	*	469	430
10:00	*	*	*	*	314	293	408	345	*	*	*	*	*	*	361	319
11:00	*	*	*	*	191	256	213	290	*	*	*	*	*	*	202	273
Lane	0	0	0	0	14529	11614	14905	12058	0	0	0	0	0	0	14717	11837
Day	0		0		26143		26963		0		0		0		26554	
AM Peak	-	-	-	-	07:00	07:00	07:00	11:00	-	-	-	-	-	-	07:00	11:00
Vol.	-	-	-	-	1005	672	986	689	-	-	-	-	-	-	996	658
PM Peak	-	-	-	-	15:00	16:00	14:00	16:00	-	-	-	-	-	-	14:00	16:00
Vol.	-	-	-	-	950	974	968	1003	-	-	-	-	-	-	954	988

Comb. Total	0	0	26143	26963	0	0	0	26554

ADT ADT 26,553 AADT 26,553

Accurate Counts

978-664-2565

Location : Shrewsbury Street
Location : West of Casco Street
City/State: Worcester, MA

18010SP1

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
06/13/18	1	2	5	16	33	39	12	6	4	0	0	0	0	0	118
01:00	1	1	2	5	24	19	3	1	0	0	0	0	0	0	56
02:00	2	2	1	4	19	18	11	1	0	0	0	0	0	0	58
03:00	0	0	2	4	17	16	8	4	0	0	0	0	0	0	51
04:00	1	0	2	5	31	68	34	10	2	0	0	0	0	0	153
05:00	8	1	2	22	94	128	113	33	1	0	0	0	0	0	402
06:00	20	2	14	54	287	322	115	31	3	1	0	0	0	0	849
07:00	32	10	24	147	369	319	92	10	2	0	0	0	0	0	1005
08:00	52	20	83	204	378	185	44	12	0	0	0	0	0	0	978
09:00	34	30	126	246	228	123	37	2	0	0	1	0	0	0	827
10:00	51	46	108	203	268	117	17	4	0	0	0	0	0	0	814
11:00	40	44	120	254	282	129	29	8	1	0	0	0	0	0	907
12 PM	55	54	161	290	269	59	10	1	0	0	0	0	0	0	899
13:00	35	33	135	223	303	96	22	3	2	0	0	0	0	0	852
14:00	61	54	94	247	323	132	27	2	0	0	0	0	0	0	940
15:00	63	48	149	240	296	130	21	1	1	1	0	0	0	0	950
16:00	47	35	91	222	273	176	40	3	1	1	0	0	0	0	889
17:00	59	32	118	219	292	177	34	6	0	0	0	0	0	0	937
18:00	29	34	83	194	253	137	37	3	0	0	0	0	0	0	770
19:00	20	26	63	134	205	106	33	5	2	0	0	0	0	0	594
20:00	20	21	52	126	170	94	31	5	1	0	0	0	0	0	520
21:00	19	24	42	115	155	73	25	1	1	0	0	0	0	0	455
22:00	14	8	14	28	107	94	40	8	0	0	1	0	0	0	314
23:00	4	4	4	14	66	53	28	12	5	0	1	0	0	0	191
Total	668	531	1495	3216	4742	2810	863	172	26	3	3	0	0	0	14529

Daily

15th Percentile :	23 MPH
50th Percentile :	31 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH
Mean Speed(Average) :	31 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	7958
Percent in Pace :	54.8%
Number of Vehicles > 35 MPH :	3877
Percent of Vehicles > 35 MPH :	26.7%

Accurate Counts

978-664-2565

Location : Shrewsbury Street
Location : West of Casco Street
City/State: Worcester, MA

18010SP1

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
06/14/18	1	0	4	11	28	49	15	2	0	0	1	0	0	0	111
01:00	0	0	2	4	25	28	12	1	1	0	0	0	0	0	73
02:00	1	1	1	6	19	25	7	8	1	0	0	0	0	0	69
03:00	1	0	0	4	23	16	9	2	2	0	0	0	0	0	57
04:00	3	0	2	4	19	51	45	20	2	0	0	0	0	0	146
05:00	7	1	4	13	73	139	101	21	8	1	1	0	0	0	369
06:00	13	1	7	33	250	351	136	21	9	0	0	0	0	0	821
07:00	51	33	48	193	371	206	65	19	0	0	0	0	0	0	986
08:00	40	14	31	224	320	251	49	4	1	0	0	0	0	0	934
09:00	44	30	102	285	317	127	29	5	2	0	0	0	0	0	941
10:00	45	33	82	214	302	124	31	7	1	1	0	0	0	0	840
11:00	53	44	123	285	241	103	15	6	1	0	0	0	0	0	871
12 PM	56	62	182	341	205	73	10	1	0	0	0	0	0	0	930
13:00	71	35	148	329	253	96	10	6	1	0	0	0	0	0	949
14:00	52	32	106	331	312	119	15	0	1	0	0	0	0	0	968
15:00	65	71	150	259	280	96	17	4	1	0	0	0	0	0	943
16:00	52	34	81	190	312	144	40	5	0	0	0	0	0	0	858
17:00	58	41	105	283	297	127	19	5	0	0	0	0	0	0	935
18:00	39	39	87	212	233	118	29	4	0	0	0	0	0	0	761
19:00	26	22	61	153	244	127	23	3	0	0	0	0	0	0	659
20:00	31	23	59	182	179	82	19	4	1	0	0	0	0	0	580
21:00	29	20	48	116	146	93	22	7	2	0	0	0	0	0	483
22:00	18	16	22	79	130	98	37	8	0	0	0	0	0	0	408
23:00	6	6	15	27	53	71	26	7	2	0	0	0	0	0	213
Total	762	558	1470	3778	4632	2714	781	170	36	2	2	0	0	0	14905

Daily

15th Percentile :	23 MPH
50th Percentile :	30 MPH
85th Percentile :	37 MPH
95th Percentile :	41 MPH
Mean Speed(Average) :	31 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	8410
Percent in Pace :	56.4%
Number of Vehicles > 35 MPH :	3705
Percent of Vehicles > 35 MPH :	24.9%

Grand Total	1430	1089	2965	6994	9374	5524	1644	342	62	5	5	0	0	0	29434

Overall

15th Percentile :	23 MPH
50th Percentile :	31 MPH
85th Percentile :	37 MPH
95th Percentile :	41 MPH
Mean Speed(Average) :	31 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	16368
Percent in Pace :	55.6%
Number of Vehicles > 35 MPH :	7582
Percent of Vehicles > 35 MPH :	25.8%

Accurate Counts

978-664-2565

Location : Shrewsbury Street
Location : West of Casco Street
City/State: Worcester, MA

18010SP1

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
06/13/18	2	2	2	9	45	35	17	9	0	1	0	0	0	0	122
01:00	0	0	2	11	21	29	11	3	0	0	1	0	0	0	78
02:00	2	0	0	5	13	17	4	1	0	0	0	0	0	0	42
03:00	0	0	2	3	11	10	7	2	0	0	0	0	0	0	35
04:00	0	0	0	5	26	18	11	1	0	0	0	0	0	0	61
05:00	0	1	0	11	27	35	20	9	2	0	0	0	0	0	105
06:00	5	8	6	25	85	95	68	13	3	1	0	0	0	0	309
07:00	15	14	17	67	228	212	96	18	5	0	0	0	0	0	672
08:00	17	9	25	69	207	209	57	16	4	2	0	0	0	0	615
09:00	14	16	22	103	208	134	36	4	1	0	0	0	0	0	538
10:00	18	27	39	129	218	119	34	2	0	1	0	0	0	0	587
11:00	18	36	39	168	223	114	25	5	0	0	0	0	0	0	628
12 PM	29	23	51	192	251	115	27	3	0	0	0	0	0	0	691
13:00	34	25	52	168	281	154	36	3	0	0	0	0	0	0	753
14:00	28	32	84	199	339	139	28	5	2	0	0	0	0	0	856
15:00	24	18	81	236	362	134	35	7	1	0	0	0	0	0	898
16:00	28	26	87	288	361	147	33	4	0	0	0	0	0	0	974
17:00	20	20	60	238	385	188	39	0	1	0	0	0	0	0	951
18:00	15	11	24	140	287	197	32	4	1	0	0	0	0	0	711
19:00	13	15	35	131	206	141	28	4	1	1	0	0	0	0	575
20:00	9	14	24	85	169	107	25	5	1	1	0	0	0	0	440
21:00	7	18	24	88	140	96	43	8	0	0	0	0	0	0	424
22:00	5	10	14	45	111	81	21	6	0	0	0	0	0	0	293
23:00	3	3	12	23	79	76	46	11	3	0	0	0	0	0	256
Total	306	328	702	2438	4283	2602	779	143	25	7	1	0	0	0	11614

Daily

15th Percentile :	25 MPH
50th Percentile :	32 MPH
85th Percentile :	38 MPH
95th Percentile :	42 MPH
Mean Speed(Average) :	32 MPH
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	6885
Percent in Pace :	59.3%
Number of Vehicles > 35 MPH :	3557
Percent of Vehicles > 35 MPH :	30.6%

Accurate Counts

978-664-2565

Location : Shrewsbury Street
Location : West of Casco Street
City/State: Worcester, MA

18010SP1

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
06/14/18	1	2	2	20	32	37	13	3	1	0	0	1	0	0	112
01:00	0	2	0	6	23	20	16	1	0	0	0	0	0	0	68
02:00	0	1	2	5	20	25	8	0	0	0	0	0	0	0	61
03:00	2	1	1	5	13	10	6	2	1	0	0	0	0	0	41
04:00	0	0	1	5	19	12	11	1	2	0	0	0	0	0	51
05:00	1	2	1	12	27	42	24	11	0	0	0	0	0	0	120
06:00	7	7	5	18	73	121	68	17	3	2	0	0	0	0	321
07:00	9	10	26	61	195	201	77	23	1	0	0	0	0	0	603
08:00	11	10	26	62	186	213	80	16	2	0	0	0	0	0	606
09:00	20	20	35	111	216	116	39	5	2	0	0	0	0	0	564
10:00	21	17	52	153	238	105	26	2	2	0	0	0	0	0	616
11:00	16	21	63	186	245	130	24	3	1	0	0	0	0	0	689
12 PM	25	35	92	200	246	116	16	2	0	0	0	0	0	0	732
13:00	15	23	74	231	250	122	29	1	1	0	0	0	0	0	746
14:00	26	31	66	274	288	119	31	3	0	0	0	0	0	0	838
15:00	43	30	64	254	344	147	41	2	2	0	0	0	0	0	927
16:00	51	38	123	303	351	119	14	4	0	0	0	0	0	0	1003
17:00	38	38	117	336	329	107	18	4	1	0	0	0	0	0	988
18:00	20	13	66	204	292	114	33	5	1	0	0	0	0	0	748
19:00	15	14	40	158	244	133	27	5	0	0	0	0	0	0	636
20:00	9	14	48	127	180	105	26	6	1	0	0	0	0	0	516
21:00	10	12	23	88	144	119	27	12	2	0	0	0	0	0	437
22:00	5	16	17	40	137	92	31	6	0	1	0	0	0	0	345
23:00	2	8	10	23	119	83	32	11	2	0	0	0	0	0	290
Total	347	365	954	2882	4211	2408	717	145	25	3	0	1	0	0	12058

Daily

15th Percentile :	25 MPH
50th Percentile :	31 MPH
85th Percentile :	38 MPH
95th Percentile :	42 MPH
Mean Speed(Average) :	32 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	7093
Percent in Pace :	58.8%
Number of Vehicles > 35 MPH :	3299
Percent of Vehicles > 35 MPH :	27.4%

Grand Total	653	693	1656	5320	8494	5010	1496	288	50	10	1	1	0	0	23672

Overall

15th Percentile :	25 MPH
50th Percentile :	32 MPH
85th Percentile :	38 MPH
95th Percentile :	42 MPH
Mean Speed(Average) :	32 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	13814
Percent in Pace :	58.4%
Number of Vehicles > 35 MPH :	6856
Percent of Vehicles > 35 MPH :	29.0%

Accurate Counts

978-664-2565

Location : Shrewsbury Street
Location : West of Casco Street
City/State: Worcester, MA

18010SP1

WB, EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
06/13/18	3	4	7	25	78	74	29	15	4	1	0	0	0	0	240
01:00	1	1	4	16	45	48	14	4	0	0	1	0	0	0	134
02:00	4	2	1	9	32	35	15	2	0	0	0	0	0	0	100
03:00	0	0	4	7	28	26	15	6	0	0	0	0	0	0	86
04:00	1	0	2	10	57	86	45	11	2	0	0	0	0	0	214
05:00	8	2	2	33	121	163	133	42	3	0	0	0	0	0	507
06:00	25	10	20	79	372	417	183	44	6	2	0	0	0	0	1158
07:00	47	24	41	214	597	531	188	28	7	0	0	0	0	0	1677
08:00	69	29	108	273	585	394	101	28	4	2	0	0	0	0	1593
09:00	48	46	148	349	436	257	73	6	1	0	1	0	0	0	1365
10:00	69	73	147	332	486	236	51	6	0	1	0	0	0	0	1401
11:00	58	80	159	422	505	243	54	13	1	0	0	0	0	0	1535
12 PM	84	77	212	482	520	174	37	4	0	0	0	0	0	0	1590
13:00	69	58	187	391	584	250	58	6	2	0	0	0	0	0	1605
14:00	89	86	178	446	662	271	55	7	2	0	0	0	0	0	1796
15:00	87	66	230	476	658	264	56	8	2	1	0	0	0	0	1848
16:00	75	61	178	510	634	323	73	7	1	1	0	0	0	0	1863
17:00	79	52	178	457	677	365	73	6	1	0	0	0	0	0	1888
18:00	44	45	107	334	540	334	69	7	1	0	0	0	0	0	1481
19:00	33	41	98	265	411	247	61	9	3	1	0	0	0	0	1169
20:00	29	35	76	211	339	201	56	10	2	1	0	0	0	0	960
21:00	26	42	66	203	295	169	68	9	1	0	0	0	0	0	879
22:00	19	18	28	73	218	175	61	14	0	0	1	0	0	0	607
23:00	7	7	16	37	145	129	74	23	8	0	1	0	0	0	447
Total	974	859	2197	5654	9025	5412	1642	315	51	10	4	0	0	0	26143

Daily

15th Percentile :	24 MPH
50th Percentile :	31 MPH
85th Percentile :	38 MPH
95th Percentile :	42 MPH
Mean Speed(Average) :	32 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	14679
Percent in Pace :	56.1%
Number of Vehicles > 35 MPH :	7434
Percent of Vehicles > 35 MPH :	28.4%

Accurate Counts

978-664-2565

Location : Shrewsbury Street
Location : West of Casco Street
City/State: Worcester, MA

18010SP1

WB, EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total
06/14/18	2	2	6	31	60	86	28	5	1	0	1	1	0	0	223
01:00	0	2	2	10	48	48	28	2	1	0	0	0	0	0	141
02:00	1	2	3	11	39	50	15	8	1	0	0	0	0	0	130
03:00	3	1	1	9	36	26	15	4	3	0	0	0	0	0	98
04:00	3	0	3	9	38	63	56	21	4	0	0	0	0	0	197
05:00	8	3	5	25	100	181	125	32	8	1	1	0	0	0	489
06:00	20	8	12	51	323	472	204	38	12	2	0	0	0	0	1142
07:00	60	43	74	254	566	407	142	42	1	0	0	0	0	0	1589
08:00	51	24	57	286	506	464	129	20	3	0	0	0	0	0	1540
09:00	64	50	137	396	533	243	68	10	4	0	0	0	0	0	1505
10:00	66	50	134	367	540	229	57	9	3	1	0	0	0	0	1456
11:00	69	65	186	471	486	233	39	9	2	0	0	0	0	0	1560
12 PM	81	97	274	541	451	189	26	3	0	0	0	0	0	0	1662
13:00	86	58	222	560	503	218	39	7	2	0	0	0	0	0	1695
14:00	78	63	172	605	600	238	46	3	1	0	0	0	0	0	1806
15:00	108	101	214	513	624	243	58	6	3	0	0	0	0	0	1870
16:00	103	72	204	493	663	263	54	9	0	0	0	0	0	0	1861
17:00	96	79	222	619	626	234	37	9	1	0	0	0	0	0	1923
18:00	59	52	153	416	525	232	62	9	1	0	0	0	0	0	1509
19:00	41	36	101	311	488	260	50	8	0	0	0	0	0	0	1295
20:00	40	37	107	309	359	187	45	10	2	0	0	0	0	0	1096
21:00	39	32	71	204	290	212	49	19	4	0	0	0	0	0	920
22:00	23	32	39	119	267	190	68	14	0	1	0	0	0	0	753
23:00	8	14	25	50	172	154	58	18	4	0	0	0	0	0	503
Total	1109	923	2424	6660	8843	5122	1498	315	61	5	2	1	0	0	26963

Daily

15th Percentile :	24 MPH
50th Percentile :	31 MPH
85th Percentile :	37 MPH
95th Percentile :	41 MPH
Mean Speed(Average) :	31 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	15503
Percent in Pace :	57.5%
Number of Vehicles > 35 MPH :	7004
Percent of Vehicles > 35 MPH :	26.0%

Grand Total	2083	1782	4621	12314	17868	10534	3140	630	112	15	6	1	0	0	53106

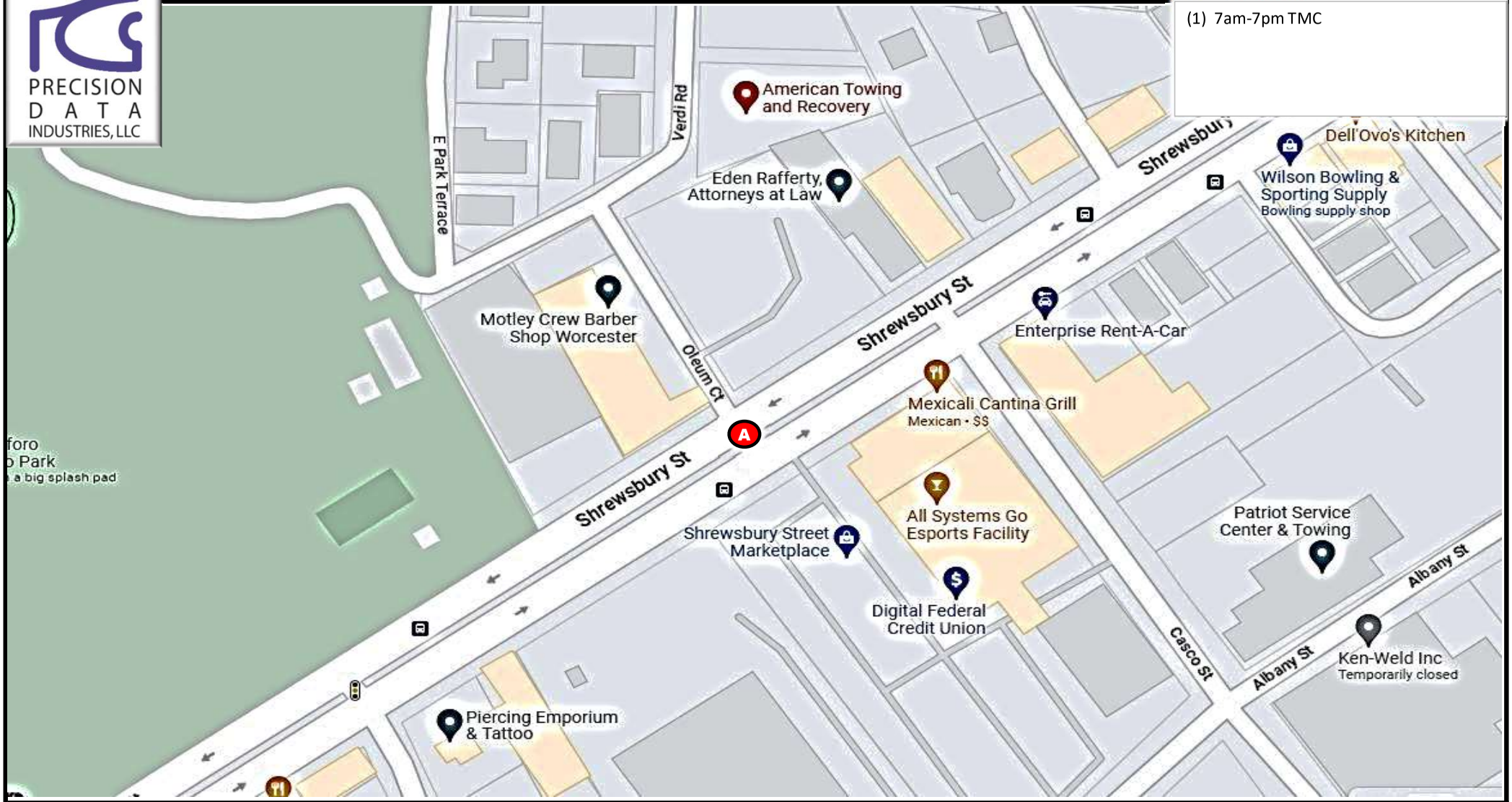
Overall

15th Percentile :	24 MPH
50th Percentile :	31 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH
Mean Speed(Average) :	31 MPH
10 MPH Pace Speed :	26-35 MPH
Number in Pace :	30182
Percent in Pace :	56.8%
Number of Vehicles > 35 MPH :	14438
Percent of Vehicles > 35 MPH :	27.2%

Location Map: 239467 Worcester

Precision Data Industries, LLC 157 Washington Street, Suite 2, Hudson, MA 01749 ph: 508-875-0100 email: datarequests@pdillc.com

(1) 7am-7pm TMC



Client:	Engineer:	Site Code:	Date:	PDI Job #	City, State:
P. Bradley	Chappell	22114	Thurs 7/6/2023	239467	Worcester

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars and Heavy Vehicles (Combined)

	Oleum Street					Shrewsbury Street					Shrewsbury Street Marketplace Driveway					Shrewsbury Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	105	2	0	107	2	0	0	0	2	10	215	2	2	229	338
7:15 AM	0	0	1	0	1	0	126	1	0	127	4	0	0	0	4	10	264	3	6	283	415
7:30 AM	0	0	1	0	1	0	147	2	0	149	6	0	0	0	6	4	265	0	1	270	426
7:45 AM	4	0	0	0	4	0	153	1	0	154	2	0	0	0	2	6	284	5	7	302	462
Total	4	0	2	0	6	0	531	6	0	537	14	0	0	0	14	30	1028	10	16	1084	1641
8:00 AM	1	1	0	0	2	0	133	3	0	136	2	0	2	0	4	5	257	3	6	271	413
8:15 AM	1	0	2	0	3	0	156	0	1	157	2	0	1	0	3	15	240	3	2	260	423
8:30 AM	2	0	1	0	3	2	120	0	0	122	6	0	0	0	6	15	259	13	5	292	423
8:45 AM	7	0	1	0	8	6	143	0	0	149	9	0	0	0	9	9	259	15	7	290	456
Total	11	1	4	0	16	8	552	3	1	564	19	0	3	0	22	44	1015	34	20	1113	1715
9:00 AM	13	1	4	0	18	5	127	2	0	134	11	0	0	0	11	13	215	11	7	246	409
9:15 AM	2	0	1	0	3	1	144	1	0	146	5	0	0	0	5	12	216	6	7	241	395
9:30 AM	6	0	0	0	6	1	140	1	0	142	13	0	0	0	13	15	212	5	3	235	396
9:45 AM	5	0	2	0	7	5	133	1	0	139	10	0	0	0	10	16	197	12	8	233	389
Total	26	1	7	0	34	12	544	5	0	561	39	0	0	0	39	56	840	34	25	955	1589
10:00 AM	4	1	1	0	6	2	140	2	0	144	12	0	1	0	13	18	221	8	8	255	418
10:15 AM	11	0	1	0	12	1	121	3	0	125	10	0	1	0	11	17	213	3	8	241	389
10:30 AM	3	0	1	0	4	4	139	1	0	144	14	0	1	0	15	13	189	3	11	216	379
10:45 AM	6	0	3	0	9	0	161	2	0	163	13	0	0	0	13	15	219	9	11	254	439
Total	24	1	6	0	31	7	561	8	0	576	49	0	3	0	52	63	842	23	38	966	1625
11:00 AM	8	0	2	0	10	3	138	1	1	143	13	0	1	0	14	19	162	7	10	198	365
11:15 AM	3	0	1	0	4	3	156	3	0	162	13	0	0	0	13	15	186	4	13	218	397
11:30 AM	7	0	0	0	7	6	160	2	0	168	14	0	0	0	14	17	188	4	5	214	403
11:45 AM	8	0	2	0	10	1	165	1	0	167	5	0	2	0	7	14	186	11	14	225	409
Total	26	0	5	0	31	13	619	7	1	640	45	0	3	0	48	65	722	26	42	855	1574
12:00 PM	12	0	3	0	15	4	181	1	0	186	13	1	1	0	15	21	212	10	5	248	464
12:15 PM	12	0	3	0	15	4	179	1	0	184	13	2	2	0	17	32	233	16	10	291	507
12:30 PM	8	0	1	0	9	4	159	1	0	164	18	0	0	0	18	24	212	9	12	257	448
12:45 PM	12	0	4	0	16	7	145	0	0	152	12	0	2	0	14	14	197	8	10	229	411
Total	44	0	11	0	55	19	664	3	0	686	56	3	5	0	64	91	854	43	37	1025	1830
1:00 PM	11	0	4	0	15	3	163	0	0	166	11	0	0	0	11	15	217	9	8	249	441
1:15 PM	6	1	2	0	9	6	160	1	1	168	11	0	0	0	11	13	215	11	13	252	440
1:30 PM	10	0	1	0	11	7	167	1	0	175	19	0	0	0	19	19	220	7	13	259	464
1:45 PM	12	0	3	0	15	4	178	1	0	183	12	0	0	0	12	20	226	12	16	274	484
Total	39	1	10	0	50	20	668	3	1	692	53	0	0	0	53	67	878	39	50	1034	1829
2:00 PM	10	0	2	0	12	3	174	2	0	179	11	0	2	0	13	20	243	8	11	282	486
2:15 PM	12	0	3	0	15	7	194	2	0	203	13	0	0	0	13	22	276	7	16	321	552
2:30 PM	10	0	0	0	10	5	218	1	0	224	10	0	0	0	10	15	250	9	9	283	527
2:45 PM	10	0	4	0	14	5	206	0	0	211	15	0	1	0	16	25	210	7	11	253	494
Total	42	0	9	0	51	20	792	5	0	817	49	0	3	0	52	82	979	31	47	1139	2059
3:00 PM	12	0	2	0	14	5	211	2	0	218	14	0	0	0	14	18	226	10	6	260	506
3:15 PM	18	1	5	0	24	3	228	6	0	237	12	0	0	0	12	22	216	14	8	260	533
3:30 PM	16	0	3	0	19	2	253	1	0	256	13	0	0	0	13	24	246	9	12	291	579
3:45 PM	12	1	1	0	14	6	177	2	0	185	13	0	0	0	13	14	228	13	9	264	476
Total	58	2	11	0	71	16	869	11	0	896	52	0	0	0	52	78	916	46	35	1075	2094
4:00 PM	6	0	4	0	10	8	227	3	0	238	8	0	0	6	14	26	221	10	14	271	533
4:15 PM	11	0	5	0	16	7	240	2	0	249	23	0	0	0	23	18	204	13	10	245	533
4:30 PM	25	0	5	0	30	11	257	0	1	269	9	0	1	1	11	21	237	12	7	277	587
4:45 PM	22	0	2	0	24	13	252	4	0	269	8	0	0	0	8	21	226	13	11	271	572
Total	64	0	16	0	80	39	976	9	1	1025	48	0	1	7	56	86	888	48	42	1064	2225
5:00 PM	17	0	7	0	24	6	248	2	0	256	18	0	1	0	19	19	219	11	17	266	565
5:15 PM	16	0	6	0	22	5	252	2	1	260	10	0	1	0	11	22	233	7	13	275	568
5:30 PM	15	0	5	0	20	4	226	2	0	232	9	0	0	0	9	20	222	11	10	263	524
5:45 PM	14	0	3	0	17	4	223	0	0	227	7	0	1	0	8	23	193	4	11	231	483
Total	62	0	21	0	83	19	949	6	1	975	44	0	3	0	47	84	867	33	51	1035	2140
6:00 PM	8	0	1	0	9	4	213	2	0	219	9	0	1	0	10	28	189	6	13	236	474
6:15 PM	16	0	2	0	18	2	183	0	0	185	11	0	1	0	12	12	203	7	9	231	446
6:30 PM	8	0	4	0	12	1	183	0	0	184	10	0	0	0	10	18	243	11	4	276	482
6:45 PM	12	0	2	0	14	3	162	1	0	166	13	0	0	0	13	19	232	9	17	277	470
Total	44	0	9	0	53	10	741	3	0	754	43	0	2	0	45	77	867	33	43	1020	1872
Grand Total	444	6	111	0	561	183	8466	69	5	8723	511	3	23	7	544	823	10696	400	446	12365	22193
Approach %	79.1	1.1	19.8	0.0		2.1	97.1	0.8	0.1		93.9	0.6	4.2	1.3		6.7	86.5	3.2	3.6		
Total %	2.0	0.0	0.5	0.0	2.5	0.8	38.1	0.3	0.0	39.3	2.3	0.0	0.1	0.0	2.5	3.7	48.2	1.8	2.0	55.7	

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars and Heavy Vehicles (Combined)

	Oleum Street					Shrewsbury Street					Shrewsbury Street Marketplace Driveway					Shrewsbury Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
Exiting Leg Total					586					11323					905					9379	22193
Cars	437	6	111	0	554	179	8264	69	5	8517	508	2	21	7	538	816	10408	396	441	12061	21670
% Cars	98.4	100.0	100.0	0.0	98.8	97.8	97.6	100.0	100.0	97.6	99.4	66.7	91.3	100.0	98.9	99.1	97.3	99.0	98.9	97.5	97.6
Exiting Leg Total					577					11032					898					9163	21670
Heavy Vehicles	7	0	0	0	7	4	202	0	0	206	3	1	2	0	6	7	288	4	5	304	523
% Heavy Vehicles	1.6	0.0	0.0	0.0	1.2	2.2	2.4	0.0	0.0	2.4	0.6	33.3	8.7	0.0	1.1	0.9	2.7	1.0	1.1	2.5	2.4
Exiting Leg Total					9					291					7					216	523

AM Peak Hour Analysis from 07:00 AM to 10:00 AM begins at:

7:30 AM	Oleum Street					Shrewsbury Street					Shrewsbury Street Marketplace Driveway					Shrewsbury Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:30 AM	0	0	1	0	1	0	147	2	0	149	6	0	0	0	6	4	265	0	1	270	426
7:45 AM	4	0	0	0	4	0	153	1	0	154	2	0	0	0	2	6	284	5	7	302	462
8:00 AM	1	1	0	0	2	0	133	3	0	136	2	0	2	0	4	5	257	3	6	271	413
8:15 AM	1	0	2	0	3	0	156	0	1	157	2	0	1	0	3	15	240	3	2	260	423
Total Volume	6	1	3	0	10	0	589	6	1	596	12	0	3	0	15	30	1046	11	16	1103	1724
% Approach Total	60.0	10.0	30.0	0.0		0.0	98.8	1.0	0.2		80.0	0.0	20.0	0.0		2.7	94.8	1.0	1.5		
PHF	0.375	0.250	0.375	0.000	0.625	0.000	0.944	0.500	0.250	0.949	0.500	0.000	0.375	0.000	0.625	0.500	0.921	0.550	0.571	0.913	0.933
Cars	5	1	3	0	9	0	565	6	1	572	12	0	3	0	15	30	1013	10	16	1069	1665
Cars %	83.3	100.0	100.0	0.0	90.0	0.0	95.9	100.0	100.0	96.0	100.0	0.0	100.0	0.0	100.0	100.0	96.8	90.9	100.0	96.9	96.6
Heavy Vehicles	1	0	0	0	1	0	24	0	0	24	0	0	0	0	0	0	33	1	0	34	59
Heavy Vehicles %	16.7	0.0	0.0	0.0	10.0	0.0	4.1	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	9.1	0.0	3.1	3.4
Cars Enter Leg	5	1	3	0	9	0	565	6	1	572	12	0	3	0	15	30	1013	10	16	1069	1665
Heavy Enter Leg	1	0	0	0	1	0	24	0	0	24	0	0	0	0	0	0	33	1	0	34	59
Total Entering Leg	6	1	3	0	10	0	589	6	1	596	12	0	3	0	15	30	1046	11	16	1103	1724
Cars Exiting Leg					10					1029					37					589	1665
Heavy Exiting Leg					1					33					0					25	59
Total Exiting Leg					11					1062					37					614	1724

MidDay Peak Hour Analysis from 10:00 AM to 2:00 PM begins at:

1:45 PM	Oleum Street					Shrewsbury Street					Shrewsbury Street Marketplace Driveway					Shrewsbury Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
1:45 PM	12	0	3	0	15	4	178	1	0	183	12	0	0	0	12	20	226	12	16	274	484
2:00 PM	10	0	2	0	12	3	174	2	0	179	11	0	2	0	13	20	243	8	11	282	486
2:15 PM	12	0	3	0	15	7	194	2	0	203	13	0	0	0	13	22	276	7	16	321	552
2:30 PM	10	0	0	0	10	5	218	1	0	224	10	0	0	0	10	15	250	9	9	283	527
Total Volume	44	0	8	0	52	19	764	6	0	789	46	0	2	0	48	77	995	36	52	1160	2049
% Approach Total	84.6	0.0	15.4	0.0		2.4	96.8	0.8	0.0		95.8	0.0	4.2	0.0		6.6	85.8	3.1	4.5		
PHF	0.917	0.000	0.667	0.000	0.867	0.679	0.876	0.750	0.000	0.881	0.885	0.000	0.250	0.000	0.923	0.875	0.901	0.750	0.813	0.903	0.928
Cars	43	0	8	0	51	19	743	6	0	768	46	0	2	0	48	76	969	35	52	1132	1999
Cars %	97.7	0.0	100.0	0.0	98.1	100.0	97.3	100.0	0.0	97.3	100.0	0.0	100.0	0.0	100.0	98.7	97.4	97.2	100.0	97.6	97.6
Heavy Vehicles	1	0	0	0	1	0	21	0	0	21	0	0	0	0	0	1	26	1	0	28	50
Heavy Vehicles %	2.3	0.0	0.0	0.0	1.9	0.0	2.7	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	1.3	2.6	2.8	0.0	2.4	2.4
Cars Enter Leg	43	0	8	0	51	19	743	6	0	768	46	0	2	0	48	76	969	35	52	1132	1999
Heavy Enter Leg	1	0	0	0	1	0	21	0	0	21	0	0	0	0	0	1	26	1	0	28	50
Total Entering Leg	44	0	8	0	52	19	764	6	0	789	46	0	2	0	48	77	995	36	52	1160	2049
Cars Exiting Leg					54					1023					82					840	1999
Heavy Exiting Leg					1					26					1					22	50
Total Exiting Leg					55					1049					83					862	2049

PM Peak Hour Analysis from 2:00 PM to 07:00 PM begins at:

4:30 PM	Oleum Street					Shrewsbury Street					Shrewsbury Street Marketplace Driveway					Shrewsbury Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:30 PM	25	0	5	0	30	11	257	0	1	269	9	0	1	1	11	21	237	12	7	277	587
4:45 PM	22	0	2	0	24	13	252	4	0	269	8	0	0	0	8	21	226	13	11	271	572
5:00 PM	17	0	7	0	24	6	248	2	0	256	18	0	1	0	19	19	219	11	17	266	565
5:15 PM	16	0	6	0	22	5	252	2	1	260	10	0	1	0	11	22	233	7	13	275	568
Total Volume	80	0	20	0	100	35	1009	8	2	1054	45	0	3	1	49	83	915	43	48	1089	2292
% Approach Total	80.0	0.0	20.0	0.0		3.3	95.7	0.8	0.2		91.8	0.0	6.1	2.0		7.6	84.0	3.9	4.4		
PHF	0.800	0.000	0.714	0.000	0.833	0.673	0.982	0.500	0.500	0.980	0.625	0.000	0.750	0.250	0.645	0.943	0.965	0.827	0.706	0.983	0.976
Cars	80	0	20	0	100	35	1002	8	2	1047	45	0	3	1	49	82	904	43	47	1076	2272

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class:

Cars and Heavy Vehicles (Combined)

	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
Cars %	100.0	0.0	100.0	0.0	100.0	100.0	99.3	100.0	100.0	99.3	100.0	0.0	100.0	100.0	100.0	98.8	98.8	100.0	97.9	98.8	99.1
Heavy Vehicles	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	1	11	0	1	13	20
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	1.2	1.2	0.0	2.1	1.2	0.9
Cars Enter Leg	80	0	20	0	100	35	1002	8	2	1047	45	0	3	1	49	82	904	43	47	1076	2272
Heavy Enter Leg	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	1	11	0	1	13	20
Total Entering Leg	80	0	20	0	100	35	1009	8	2	1054	45	0	3	1	49	83	915	43	48	1089	2292
Cars Exiting Leg					78					971					91					1132	2272
Heavy Exiting Leg					0					11					1					8	20
Total Exiting Leg					78					982					92					1140	2292

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars

	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	94	2	0	96	2	0	0	0	2	10	208	2	2	222	320
7:15 AM	0	0	1	0	1	0	126	1	0	127	4	0	0	0	4	10	256	3	6	275	407
7:30 AM	0	0	1	0	1	0	140	2	0	142	6	0	0	0	6	4	258	0	1	263	412
7:45 AM	4	0	0	0	4	0	147	1	0	148	2	0	0	0	2	6	274	4	7	291	445
Total	4	0	2	0	6	0	507	6	0	513	14	0	0	0	14	30	996	9	16	1051	1584
8:00 AM	0	1	0	0	1	0	127	3	0	130	2	0	2	0	4	5	249	3	6	263	398
8:15 AM	1	0	2	0	3	0	151	0	1	152	2	0	1	0	3	15	232	3	2	252	410
8:30 AM	2	0	1	0	3	2	113	0	0	115	6	0	0	0	6	15	246	12	5	278	402
8:45 AM	6	0	1	0	7	6	138	0	0	144	9	0	0	0	9	9	251	15	7	282	442
Total	9	1	4	0	14	8	529	3	1	541	19	0	3	0	22	44	978	33	20	1075	1652
9:00 AM	13	1	4	0	18	5	123	2	0	130	11	0	0	0	11	13	209	11	7	240	399
9:15 AM	2	0	1	0	3	1	142	1	0	144	5	0	0	0	5	12	211	6	7	236	388
9:30 AM	6	0	0	0	6	1	136	1	0	138	13	0	0	0	13	15	203	5	3	226	383
9:45 AM	5	0	2	0	7	5	128	1	0	134	9	0	0	0	9	14	188	12	8	222	372
Total	26	1	7	0	34	12	529	5	0	546	38	0	0	0	38	54	811	34	25	924	1542
10:00 AM	4	1	1	0	6	2	134	2	0	138	11	0	0	0	11	17	217	7	8	249	404
10:15 AM	10	0	1	0	11	1	119	3	0	123	10	0	1	0	11	16	205	3	8	232	377
10:30 AM	3	0	1	0	4	4	134	1	0	139	14	0	0	0	14	13	181	3	11	208	365
10:45 AM	6	0	3	0	9	0	155	2	0	157	13	0	0	0	13	15	213	9	11	248	427
Total	23	1	6	0	30	7	542	8	0	557	48	0	1	0	49	61	816	22	38	937	1573
11:00 AM	8	0	2	0	10	3	131	1	1	136	13	0	1	0	14	19	158	7	9	193	353
11:15 AM	3	0	1	0	4	3	152	3	0	158	13	0	0	0	13	15	177	4	12	208	383
11:30 AM	7	0	0	0	7	6	151	2	0	159	14	0	0	0	14	17	183	4	5	209	389
11:45 AM	8	0	2	0	10	1	158	1	0	160	5	0	2	0	7	14	181	11	14	220	397
Total	26	0	5	0	31	13	592	7	1	613	45	0	3	0	48	65	699	26	40	830	1522
12:00 PM	12	0	3	0	15	4	175	1	0	180	13	1	1	0	15	21	200	10	5	236	446
12:15 PM	12	0	3	0	15	4	177	1	0	182	12	1	2	0	15	32	221	16	10	279	491
12:30 PM	8	0	1	0	9	4	151	1	0	156	18	0	0	0	18	24	210	9	12	255	438
12:45 PM	12	0	4	0	16	7	145	0	0	152	12	0	2	0	14	14	189	8	10	221	403
Total	44	0	11	0	55	19	648	3	0	670	55	2	5	0	62	91	820	43	37	991	1778
1:00 PM	9	0	4	0	13	2	153	0	0	155	11	0	0	0	11	15	212	9	8	244	423
1:15 PM	6	1	2	0	9	6	160	1	1	168	11	0	0	0	11	13	209	11	12	245	433
1:30 PM	10	0	1	0	11	7	162	1	0	170	19	0	0	0	19	19	213	7	13	252	452
1:45 PM	12	0	3	0	15	4	173	1	0	178	12	0	0	0	12	20	220	12	16	268	473
Total	37	1	10	0	48	19	648	3	1	671	53	0	0	0	53	67	854	39	49	1009	1781
2:00 PM	9	0	2	0	11	3	169	2	0	174	11	0	2	0	13	19	236	7	11	273	471
2:15 PM	12	0	3	0	15	7	187	2	0	196	13	0	0	0	13	22	268	7	16	313	537
2:30 PM	10	0	0	0	10	5	214	1	0	220	10	0	0	0	10	15	245	9	9	278	518
2:45 PM	10	0	4	0	14	5	203	0	0	208	15	0	1	0	16	25	207	7	11	250	488
Total	41	0	9	0	50	20	773	5	0	798	49	0	3	0	52	81	956	30	47	1114	2014
3:00 PM	12	0	2	0	14	4	208	2	0	214	14	0	0	0	14	18	218	10	6	252	494
3:15 PM	18	1	5	0	24	3	220	6	0	229	12	0	0	0	12	21	208	14	8	251	516
3:30 PM	16	0	3	0	19	1	252	1	0	254	13	0	0	0	13	24	237	9	12	282	568
3:45 PM	11	1	1	0	13	5	177	2	0	184	13	0	0	0	13	14	221	13	8	256	466
Total	57	2	11	0	70	13	857	11	0	881	52	0	0	0	52	77	884	46	34	1041	2044
4:00 PM	6	0	4	0	10	8	225	3	0	236	8	0	0	6	14	26	215	10	14	265	525
4:15 PM	11	0	5	0	16	7	234	2	0	243	23	0	0	0	23	18	203	13	10	244	526
4:30 PM	25	0	5	0	30	11	256	0	1	268	9	0	1	1	11	21	232	12	7	272	581
4:45 PM	22	0	2	0	24	13	249	4	0	266	8	0	0	0	8	20	223	13	11	267	565
Total	64	0	16	0	80	39	964	9	1	1013	48	0	1	7	56	85	873	48	42	1048	2197
5:00 PM	17	0	7	0	24	6	245	2	0	253	18	0	1	0	19	19	219	11	16	265	561
5:15 PM	16	0	6	0	22	5	252	2	1	260	10	0	1	0	11	22	230	7	13	272	565
5:30 PM	15	0	5	0	20	4	223	2	0	229	9	0	0	0	9	20	222	11	10	263	521
5:45 PM	14	0	3	0	17	4	221	0	0	225	7	0	1	0	8	23	190	4	11	228	478
Total	62	0	21	0	83	19	941	6	1	967	44	0	3	0	47	84	861	33	50	1028	2125
6:00 PM	8	0	1	0	9	4	212	2	0	218	9	0	1	0	10	28	185	6	13	232	469
6:15 PM	16	0	2	0	18	2	180	0	0	182	11	0	1	0	12	12	202	7	9	230	442
6:30 PM	8	0	4	0	12	1	180	0	0	181	10	0	0	0	10	18	242	11	4	275	478
6:45 PM	12	0	2	0	14	3	162	1	0	166	13	0	0	0	13	19	231	9	17	276	469
Total	44	0	9	0	53	10	734	3	0	747	43	0	2	0	45	77	860	33	43	1013	1858
Grand Total	437	6	111	0	554	179	8264	69	5	8517	508	2	21	7	538	816	10408	396	441	12061	21670
Approach %	78.9	1.1	20.0	0.0		2.1	97.0	0.8	0.1		94.4	0.4	3.9	1.3		6.8	86.3	3.3	3.7		

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars

	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
Total %	2.0	0.0	0.5	0.0	2.6	0.8	38.1	0.3	0.0	39.3	2.3	0.0	0.1	0.0	2.5	3.8	48.0	1.8	2.0	55.7	
Exiting Leg Total					577					11032					898					9163	21670

AM Peak Hour Analysis from 07:00 AM to 10:00 AM begins at:

7:30 AM	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:30 AM	0	0	1	0	1	0	140	2	0	142	6	0	0	0	6	4	258	0	1	263	412
7:45 AM	4	0	0	0	4	0	147	1	0	148	2	0	0	0	2	6	274	4	7	291	445
8:00 AM	0	1	0	0	1	0	127	3	0	130	2	0	2	0	4	5	249	3	6	263	398
8:15 AM	1	0	2	0	3	0	151	0	1	152	2	0	1	0	3	15	232	3	2	252	410
Total Volume	5	1	3	0	9	0	565	6	1	572	12	0	3	0	15	30	1013	10	16	1069	1665
% Approach Total	55.6	11.1	33.3	0.0		0.0	98.8	1.0	0.2		80.0	0.0	20.0	0.0		2.8	94.8	0.9	1.5		
PHF	0.313	0.250	0.375	0.000	0.563	0.000	0.935	0.500	0.250	0.941	0.500	0.000	0.375	0.000	0.625	0.500	0.924	0.625	0.571	0.918	0.935
Entering Leg	5	1	3	0	9	0	565	6	1	572	12	0	3	0	15	30	1013	10	16	1069	1665
Exiting Leg					10					1029					37					589	1665
Total					19					1601					52					1658	3330

MidDay Peak Hour Analysis from 10:00 AM to 2:00 PM begins at:

1:45 PM	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
1:45 PM	12	0	3	0	15	4	173	1	0	178	12	0	0	0	12	20	220	12	16	268	473
2:00 PM	9	0	2	0	11	3	169	2	0	174	11	0	2	0	13	19	236	7	11	273	471
2:15 PM	12	0	3	0	15	7	187	2	0	196	13	0	0	0	13	22	268	7	16	313	537
2:30 PM	10	0	0	0	10	5	214	1	0	220	10	0	0	0	10	15	245	9	9	278	518
Total Volume	43	0	8	0	51	19	743	6	0	768	46	0	2	0	48	76	969	35	52	1132	1999
% Approach Total	84.3	0.0	15.7	0.0		2.5	96.7	0.8	0.0		95.8	0.0	4.2	0.0		6.7	85.6	3.1	4.6		
PHF	0.896	0.000	0.667	0.000	0.850	0.679	0.868	0.750	0.000	0.873	0.885	0.000	0.250	0.000	0.923	0.864	0.904	0.729	0.813	0.904	0.931
Entering Leg	43	0	8	0	51	19	743	6	0	768	46	0	2	0	48	76	969	35	52	1132	1999
Exiting Leg					54					1023					82					840	1999
Total					105					1791					130					1972	3998

PM Peak Hour Analysis from 2:00 PM to 07:00 PM begins at:

4:30 PM	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:30 PM	25	0	5	0	30	11	256	0	1	268	9	0	1	1	11	21	232	12	7	272	581
4:45 PM	22	0	2	0	24	13	249	4	0	266	8	0	0	0	8	20	223	13	11	267	565
5:00 PM	17	0	7	0	24	6	245	2	0	253	18	0	1	0	19	19	219	11	16	265	561
5:15 PM	16	0	6	0	22	5	252	2	1	260	10	0	1	0	11	22	230	7	13	272	565
Total Volume	80	0	20	0	100	35	1002	8	2	1047	45	0	3	1	49	82	904	43	47	1076	2272
% Approach Total	80.0	0.0	20.0	0.0		3.3	95.7	0.8	0.2		91.8	0.0	6.1	2.0		7.6	84.0	4.0	4.4		
PHF	0.800	0.000	0.714	0.000	0.833	0.673	0.979	0.500	0.500	0.977	0.625	0.000	0.750	0.250	0.645	0.932	0.974	0.827	0.734	0.989	0.978
Entering Leg	80	0	20	0	100	35	1002	8	2	1047	45	0	3	1	49	82	904	43	47	1076	2272
Exiting Leg					78					971					91					1132	2272
Total					178					2018					140					2208	4544

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Oleum Street					Shrewsbury Street					Shrewsbury Street Marketplace Driveway					Shrewsbury Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	7	0	0	7	18
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	8
7:30 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	7	0	0	7	14
7:45 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	10	1	0	11	17
Total	0	0	0	0	0	0	24	0	0	24	0	0	0	0	0	0	32	1	0	33	57
8:00 AM	1	0	0	0	1	0	6	0	0	6	0	0	0	0	0	0	8	0	0	8	15
8:15 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	8	0	0	8	13
8:30 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	13	1	0	14	21
8:45 AM	1	0	0	0	1	0	5	0	0	5	0	0	0	0	0	0	8	0	0	8	14
Total	2	0	0	0	2	0	23	0	0	23	0	0	0	0	0	0	37	1	0	38	63
9:00 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	10
9:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	7
9:30 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	9	0	0	9	13
9:45 AM	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	2	9	0	0	11	17
Total	0	0	0	0	0	0	15	0	0	15	1	0	0	0	1	2	29	0	0	31	47
10:00 AM	0	0	0	0	0	0	6	0	0	6	1	0	1	0	2	1	4	1	0	6	14
10:15 AM	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	1	8	0	0	9	12
10:30 AM	0	0	0	0	0	0	5	0	0	5	0	0	1	0	1	0	8	0	0	8	14
10:45 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	6	0	0	6	12
Total	1	0	0	0	1	0	19	0	0	19	1	0	2	0	3	2	26	1	0	29	52
11:00 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	4	0	1	5	12
11:15 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	9	0	1	10	14
11:30 AM	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	5	0	0	5	14
11:45 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	12
Total	0	0	0	0	0	0	27	0	0	27	0	0	0	0	0	0	23	0	2	25	52
12:00 PM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	12	0	0	12	18
12:15 PM	0	0	0	0	0	0	2	0	0	2	1	1	0	0	2	0	12	0	0	12	16
12:30 PM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	2	0	0	2	10
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	8
Total	0	0	0	0	0	0	16	0	0	16	1	1	0	0	2	0	34	0	0	34	52
1:00 PM	2	0	0	0	2	1	10	0	0	11	0	0	0	0	0	0	5	0	0	5	18
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	7	7
1:30 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	7	0	0	7	12
1:45 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	6	0	0	6	11
Total	2	0	0	0	2	1	20	0	0	21	0	0	0	0	0	0	24	0	1	25	48
2:00 PM	1	0	0	0	1	0	5	0	0	5	0	0	0	0	0	1	7	1	0	9	15
2:15 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	8	0	0	8	15
2:30 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	9
2:45 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	6
Total	1	0	0	0	1	0	19	0	0	19	0	0	0	0	0	1	23	1	0	25	45
3:00 PM	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	0	8	0	0	8	12
3:15 PM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	1	8	0	0	9	17
3:30 PM	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	9	0	0	9	11
3:45 PM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	7	0	1	8	10
Total	1	0	0	0	1	3	12	0	0	15	0	0	0	0	0	1	32	0	1	34	50
4:00 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	6	0	0	6	8
4:15 PM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	1	0	0	1	7
4:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	5	0	0	5	6
4:45 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	1	3	0	0	4	7
Total	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	1	15	0	0	16	28
5:00 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	1	1	4
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
5:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
5:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	5
Total	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	6	0	1	7	15
6:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	5
6:15 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4
6:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	7	0	0	7	14
Grand Total	7	0	0	0	7	4	202	0	0	206	3	1	2	0	6	7	288	4	5	304	523
Approach %	100.0	0.0	0.0	0.0		1.9	98.1	0.0	0.0		50.0	16.7	33.3	0.0		2.3	94.7	1.3	1.6		
Total %	1.3	0.0	0.0	0.0	1.3	0.8	38.6	0.0	0.0	39.4	0.6	0.2	0.4	0.0	1.1	1.3	55.1	0.8	1.0	58.1	

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
Exiting Leg Total					9					291					7					216	523
Buses	0	0	0	0	0	1	29	0	0	30	0	0	0	0	0	0	31	0	2	33	63
% Buses	0.0	0.0	0.0	0.0	0.0	25.0	14.4	0.0	0.0	14.6	0.0	0.0	0.0	0.0	0.0	0.0	10.8	0.0	40.0	10.9	12.0
Exiting Leg Total					1					31					0					31	63
Single-Unit Trucks	7	0	0	0	7	3	152	0	0	155	3	0	2	0	5	6	216	4	3	229	396
% Single-Unit	100.0	0.0	0.0	0.0	100.0	75.0	75.2	0.0	0.0	75.2	100.0	0.0	100.0	0.0	83.3	85.7	75.0	100.0	60.0	75.3	75.7
Exiting Leg Total					7					219					6					164	396
Articulated Trucks	0	0	0	0	0	0	21	0	0	21	0	1	0	0	1	1	41	0	0	42	64
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	10.4	0.0	0.0	10.2	0.0	100.0	0.0	0.0	16.7	14.3	14.2	0.0	0.0	13.8	12.2
Exiting Leg Total					1					41					1					21	64

AM Peak Hour Analysis from 07:00 AM to 10:00 AM begins at:

7:45 AM	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:45 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	10	1	0	11	17
8:00 AM	1	0	0	0	1	0	6	0	0	6	0	0	0	0	0	0	8	0	0	8	15
8:15 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	8	0	0	8	13
8:30 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	13	1	0	14	21
Total Volume	1	0	0	0	1	0	24	0	0	24	0	0	0	0	0	0	39	2	0	41	66
% Approach Total	100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	95.1	4.9	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.000	0.857	0.000	0.000	0.857	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.500	0.000	0.732	0.786
Buses	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	8
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	0.0	10.3	0.0	0.0	9.8	12.1
Single-Unit Trucks	1	0	0	0	1	0	19	0	0	19	0	0	0	0	0	0	25	2	0	27	47
Single-Unit %	100.0	0.0	0.0	0.0	100.0	0.0	79.2	0.0	0.0	79.2	0.0	0.0	0.0	0.0	0.0	0.0	64.1	100.0	0.0	65.9	71.2
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	10	0	0	10	11
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	25.6	0.0	0.0	24.4	16.7
Buses	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	8
Single-Unit Trucks	1	0	0	0	1	0	19	0	0	19	0	0	0	0	0	0	25	2	0	27	47
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	10	0	0	10	11
Total Entering Leg	1	0	0	0	1	0	24	0	0	24	0	0	0	0	0	0	39	2	0	41	66
Buses					0					4					0					4	8
Single-Unit Trucks					2					25					0					20	47
Articulated Trucks					0					10					0					1	11
Total Exiting Leg					2					39					0					25	66

MidDay Peak Hour Analysis from 10:00 AM to 2:00 PM begins at:

11:30 AM	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:30 AM	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	5	0	0	5	14
11:45 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	12
12:00 PM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	12	0	0	12	18
12:15 PM	0	0	0	0	0	0	2	0	0	2	1	1	0	0	2	0	12	0	0	12	16
Total Volume	0	0	0	0	0	0	24	0	0	24	1	1	0	0	2	0	34	0	0	34	60
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		50.0	50.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.667	0.000	0.000	0.667	0.250	0.250	0.000	0.000	0.250	0.000	0.708	0.000	0.000	0.708	0.833
Buses	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	2	0	0	2	7
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	20.8	0.0	0.0	20.8	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.0	0.0	5.9	11.7
Single-Unit Trucks	0	0	0	0	0	0	18	0	0	18	1	0	0	0	1	0	29	0	0	29	48
Single-Unit %	0.0	0.0	0.0	0.0	0.0	0.0	75.0	0.0	0.0	75.0	100.0	0.0	0.0	0.0	50.0	0.0	85.3	0.0	0.0	85.3	80.0
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	3	0	0	3	5
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0	4.2	0.0	100.0	0.0	0.0	50.0	0.0	8.8	0.0	0.0	8.8	8.3
Buses	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	2	0	0	2	7
Single-Unit Trucks	0	0	0	0	0	0	18	0	0	18	1	0	0	0	1	0	29	0	0	29	48
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	3	0	0	3	5
Total Entering Leg	0	0	0	0	0	0	24	0	0	24	1	1	0	0	2	0	34	0	0	34	60
Buses					0					2					0					5	7
Single-Unit Trucks					0					30					0					18	48
Articulated Trucks					1					3					0					1	5
Total Exiting Leg					1					35					0					24	60

PM Peak Hour Analysis from 2:00 PM to 07:00 PM begins at:

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Oleum Street					Shrewsbury Street					Shrewsbury Street Marketplace Driveway					Shrewsbury Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
3:00 PM	Oleum Street					Shrewsbury Street					Shrewsbury Street Marketplace Driveway					Shrewsbury Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
3:00 PM	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	0	8	0	0	8	12
3:15 PM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	1	8	0	0	9	17
3:30 PM	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	9	0	0	9	11
3:45 PM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	7	0	1	8	10
Total Volume	1	0	0	0	1	3	12	0	0	15	0	0	0	0	0	1	32	0	1	34	50
% Approach Total	100.0	0.0	0.0	0.0		20.0	80.0	0.0	0.0		0.0	0.0	0.0	0.0		2.9	94.1	0.0	2.9		
PHF	0.250	0.000	0.000	0.000	0.250	0.750	0.375	0.000	0.000	0.469	0.000	0.000	0.000	0.000	0.000	0.250	0.889	0.000	0.250	0.944	0.735
Buses	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	6	0	0	6	8
Buses %	0.0	0.0	0.0	0.0	0.0	33.3	8.3	0.0	0.0	13.3	0.0	0.0	0.0	0.0	0.0	0.0	18.8	0.0	0.0	17.6	16.0
Single-Unit Trucks	1	0	0	0	1	2	10	0	0	12	0	0	0	0	0	1	23	0	1	25	38
Single-Unit %	100.0	0.0	0.0	0.0	100.0	66.7	83.3	0.0	0.0	80.0	0.0	0.0	0.0	0.0	0.0	100.0	71.9	0.0	100.0	73.5	76.0
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	0.0	9.4	0.0	0.0	8.8	8.0
Buses	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	6	0	0	6	8
Single-Unit Trucks	1	0	0	0	1	2	10	0	0	12	0	0	0	0	0	1	23	0	1	25	38
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
Total Entering Leg	1	0	0	0	1	3	12	0	0	15	0	0	0	0	0	1	32	0	1	34	50
Buses					1					6					0					1	8
Single-Unit Trucks					2					23					1					12	38
Articulated Trucks					0					3					0					1	4
Total Exiting Leg					3					32					1					14	50

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Buses

	Oleum Street					Shrewsbury Street					Shrewsbury Street Marketplace Driveway					Shrewsbury Street					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	1	0	0	1	6
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Total	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	10
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
8:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
8:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Total	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
9:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
9:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
9:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	5	0	0	5	8
10:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
10:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
10:45 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
Total	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	6
11:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
11:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	1	2	5
12:00 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
12:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
1:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
2:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
3:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
3:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
Total	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	6	0	0	6	8
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
4:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	5
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	1	2
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Grand Total	0	0	0	0	0	1	29	0	0	30	0	0	0	0	0	0	31	0	2	33	63

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Buses

	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
Approach %	0.0	0.0	0.0	0.0		3.3	96.7	0.0	0.0		0.0	0.0	0.0	0.0		0.0	93.9	0.0	6.1		
Total %	0.0	0.0	0.0	0.0	0.0	1.6	46.0	0.0	0.0	47.6	0.0	0.0	0.0	0.0	0.0	0.0	49.2	0.0	3.2	52.4	
Exiting Leg Total					1					31					0					31	63

AM Peak Hour Analysis from 07:00 AM to 10:00 AM begins at:

7:00 AM	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	1	0	0	1	6
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Total Volume	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	10
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.300	0.000	0.000	0.300	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500	0.417
Entering Leg	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	10
Exiting Leg					0					4					0					6	10
Total					0					10					0					10	20

MidDay Peak Hour Analysis from 10:00 AM to 2:00 PM begins at:

10:15 AM	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
10:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
10:45 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
11:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Total Volume	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.000	0.750	0.583
Entering Leg	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
Exiting Leg					0					3					0					4	7
Total					0					7					0					7	14

PM Peak Hour Analysis from 2:00 PM to 07:00 PM begins at:

3:00 PM	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
3:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
3:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
Total Volume	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	6	0	0	6	8
% Approach Total	0.0	0.0	0.0	0.0		50.0	50.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500	0.667
Entering Leg	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	6	0	0	6	8
Exiting Leg					1					6					0					1	8
Total					1					8					0					7	16

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Single-Unit Trucks

	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	6	0	0	6	11
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7	7
7:30 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	12
7:45 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	7	1	0	8	13
Total	0	0	0	0	0	0	17	0	0	17	0	0	0	0	0	0	25	1	0	26	43
8:00 AM	1	0	0	0	1	0	6	0	0	6	0	0	0	0	0	0	1	0	0	1	8
8:15 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	6	0	0	6	9
8:30 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	11	1	0	12	17
8:45 AM	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	7	0	0	7	12
Total	2	0	0	0	2	0	18	0	0	18	0	0	0	0	0	0	25	1	0	26	46
9:00 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	7
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	4
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	5
9:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	7	0	0	9	10
Total	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	2	20	0	0	22	26
10:00 AM	0	0	0	0	0	0	4	0	0	4	1	0	1	0	2	1	4	1	0	6	12
10:15 AM	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	1	6	0	0	7	9
10:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	0	7	0	0	7	10
10:45 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	9
Total	1	0	0	0	1	0	11	0	0	11	1	0	2	0	3	2	22	1	0	25	40
11:00 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	3	0	1	4	10
11:15 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	8	0	0	8	11
11:30 AM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	5	0	0	5	13
11:45 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	5	0	0	5	10
Total	0	0	0	0	0	0	22	0	0	22	0	0	0	0	0	0	21	0	1	22	44
12:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	11	0	0	11	15
12:15 PM	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	8	0	0	8	10
12:30 PM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	2	0	0	2	10
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7	7
Total	0	0	0	0	0	0	13	0	0	13	1	0	0	0	1	0	28	0	0	28	42
1:00 PM	2	0	0	0	2	1	10	0	0	11	0	0	0	0	0	0	5	0	0	5	18
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	5	5
1:30 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
1:45 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	6	0	0	6	11
Total	2	0	0	0	2	1	19	0	0	20	0	0	0	0	0	0	18	0	1	19	41
2:00 PM	1	0	0	0	1	0	5	0	0	5	0	0	0	0	0	0	5	1	0	6	12
2:15 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	8	0	0	8	13
2:30 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
2:45 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
Total	1	0	0	0	1	0	17	0	0	17	0	0	0	0	0	0	18	1	0	19	37
3:00 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	8	0	0	8	11
3:15 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	1	5	0	0	6	13
3:30 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	7	0	0	7	8
3:45 PM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	3	0	1	4	6
Total	1	0	0	0	1	2	10	0	0	12	0	0	0	0	0	1	23	0	1	25	38
4:00 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
4:15 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	5
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
4:45 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	1	2	0	0	3	6
Total	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	1	8	0	0	9	19
5:00 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
Total	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	10
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
6:15 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4
6:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	10
Grand Total	7	0	0	0	7	3	152	0	0	155	3	0	2	0	5	6	216	4	3	229	396

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class:

Single-Unit Trucks

	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
Approach %	100.0	0.0	0.0	0.0		1.9	98.1	0.0	0.0		60.0	0.0	40.0	0.0		2.6	94.3	1.7	1.3		
Total %	1.8	0.0	0.0	0.0	1.8	0.8	38.4	0.0	0.0	39.1	0.8	0.0	0.5	0.0	1.3	1.5	54.5	1.0	0.8	57.8	
Exiting Leg Total					7					219					6					164	396

AM Peak Hour Analysis from 07:00 AM to 10:00 AM begins at:

7:45 AM	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:45 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	7	1	0	8	13
8:00 AM	1	0	0	0	1	0	6	0	0	6	0	0	0	0	0	0	1	0	0	1	8
8:15 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	6	0	0	6	9
8:30 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	11	1	0	12	17
Total Volume	1	0	0	0	1	0	19	0	0	19	0	0	0	0	0	0	25	2	0	27	47
% Approach Total	100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	92.6	7.4	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.000	0.792	0.000	0.000	0.792	0.000	0.000	0.000	0.000	0.000	0.000	0.568	0.500	0.000	0.563	0.691
Entering Leg	1	0	0	0	1	0	19	0	0	19	0	0	0	0	0	0	25	2	0	27	47
Exiting Leg					2					25					0					20	47
Total					3					44					0					47	94

MidDay Peak Hour Analysis from 10:00 AM to 2:00 PM begins at:

11:15 AM	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
11:15 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	8	0	0	8	11
11:30 AM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	5	0	0	5	13
11:45 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	5	0	0	5	10
12:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	11	0	0	11	15
Total Volume	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	0	29	0	0	29	49
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.000	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.659	0.000	0.000	0.659	0.817
Entering Leg	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	0	29	0	0	29	49
Exiting Leg					0					29					0					20	49
Total					0					49					0					49	98

PM Peak Hour Analysis from 2:00 PM to 07:00 PM begins at:

3:00 PM	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
3:00 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	8	0	0	8	11
3:15 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	1	5	0	0	6	13
3:30 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	7	0	0	7	8
3:45 PM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	3	0	1	4	6
Total Volume	1	0	0	0	1	2	10	0	0	12	0	0	0	0	0	1	23	0	1	25	38
% Approach Total	100.0	0.0	0.0	0.0		16.7	83.3	0.0	0.0		0.0	0.0	0.0	0.0		4.0	92.0	0.0	4.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.500	0.357	0.000	0.000	0.429	0.000	0.000	0.000	0.000	0.000	0.250	0.719	0.000	0.250	0.781	0.731
Entering Leg	1	0	0	0	1	2	10	0	0	12	0	0	0	0	0	1	23	0	1	25	38
Exiting Leg					2					23					1					12	38
Total					3					35					1					37	76

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Articulated Trucks

	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7	7
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
8:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	9	0	0	9	10
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
9:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
9:30 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
9:45 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	4
Total	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	4	0	0	4	13
10:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
10:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
10:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	6
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	3
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	4	0	0	4	5
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	4
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	2
2:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	3	0	0	4	5
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	4
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
6:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Grand Total	0	0	0	0	0	0	21	0	0	21	0	1	0	0	1	1	41	0	0	42	64

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class:

Articulated Trucks

	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		2.4	97.6	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	32.8	0.0	0.0	32.8	0.0	1.6	0.0	0.0	1.6	1.6	64.1	0.0	0.0	65.6	
Exiting Leg Total					1					41					1					21	64

AM Peak Hour Analysis from 07:00 AM to 10:00 AM begins at:

9:30 AM	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
9:30 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
9:45 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	4
10:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
10:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Total Volume	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	4	0	0	4	14
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.000	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.333	0.000	0.000	0.333	0.500
Entering Leg	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	4	0	0	4	14
Exiting Leg					0					4					0					10	14
Total					0					14					0					14	28

MidDay Peak Hour Analysis from 10:00 AM to 2:00 PM begins at:

10:00 AM	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
10:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
10:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
10:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	6
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500	0.500
Entering Leg	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	6
Exiting Leg					0					2					0					4	6
Total					0					6					0					6	12

PM Peak Hour Analysis from 2:00 PM to 07:00 PM begins at:

2:00 PM	Oleum Street from North					Shrewsbury Street from East					Shrewsbury Street Marketplace Driveway from South					Shrewsbury Street from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	2
2:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	3	0	0	4	5
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		25.0	75.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.250	0.750	0.000	0.000	0.500	0.625
Entering Leg	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	3	0	0	4	5
Exiting Leg					0					3					1					1	5
Total					0					4					1					5	10

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Bicycles (on Roadway and Crosswalks)

	Oleum Street							Shrewsbury Street							Shrewsbury Street Marketplace Driveway							Shrewsbury Street							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Total	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	1	3
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	1	2
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
10:45 AM	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	3
Total	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	2	0	0	0	0	2	6
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	1	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	1	2	3	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	2
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	2
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	5	0	1	0	0	0	0	1	6
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	2
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Grand Total	0	0	0	0	2	4	6	1	6	0	0	0	0	7	0	1	0	0	3	7	11	0	6	0	0	0	0	6	30

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Bicycles (on Roadway and Crosswalks)

	Oleum Street from North							Shrewsbury Street from East							Shrewsbury Street Marketplace Driveway from South							Shrewsbury Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
Approach %	0.0	0.0	0.0	0.0	33.3	66.7		14.3	85.7	0.0	0.0	0.0	0.0		0.0	9.1	0.0	0.0	27.3	63.6		0.0	100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	6.7	13.3	20.0	3.3	20.0	0.0	0.0	0.0	0.0	23.3	0.0	3.3	0.0	0.0	10.0	23.3	36.7	0.0	20.0	0.0	0.0	0.0	0.0	20.0	
Exiting Leg Total							8							6							10							6	30

AM Peak Hour Analysis from 07:00 AM to 10:00 AM begins at:

9:30 AM	Oleum Street from North							Shrewsbury Street from East							Shrewsbury Street Marketplace Driveway from South							Shrewsbury Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2	0	0	0	0	2	4
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	100.0		0.0	100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.500	0.000	0.500	0.000	0.000	0.000	0.000	0.500	1.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2	0	0	0	0	2	4
Exiting Leg							0							2							2							0	4
Total							0							2							4							2	8

MidDay Peak Hour Analysis from 10:00 AM to 2:00 PM begins at:

10:00 AM	Oleum Street from North							Shrewsbury Street from East							Shrewsbury Street Marketplace Driveway from South							Shrewsbury Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
10:45 AM	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	3
Total Volume	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	2	0	0	0	0	2	6
% Approach Total	0.0	0.0	0.0	0.0	50.0	50.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	50.0	50.0		0.0	100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.250	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.500	0.000	0.500	0.000	0.000	0.000	0.000	0.500	0.500
Entering Leg	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	2	0	0	0	0	2	6
Exiting Leg							2							2							2							0	6
Total							4							2							4							2	12

PM Peak Hour Analysis from 2:00 PM to 07:00 PM begins at:

2:00 PM	Oleum Street from North							Shrewsbury Street from East							Shrewsbury Street Marketplace Driveway from South							Shrewsbury Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	2
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	2
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	5	0	1	0	0	0	0	1	6
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	20.0	80.0		0.0	100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.500	0.625	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.750
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	5	0	1	0	0	0	0	1	6
Exiting Leg							0							1							5							0	6
Total							0							1							10							1	12

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Pedestrians

	Oleum Street (from North)							Shrewsbury Street (from East)							Shrewsbury Street Marketplace Driveway (from South)							Shrewsbury Street (from West)							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	3	0	0	0	0	0	0	0	4
Total	0	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	3	3	6	0	0	0	0	0	0	0	9
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	0	4
8:15 AM	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	3
8:30 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	0	0	0	0	6
Total	0	0	0	0	2	4	6	0	0	0	0	0	0	0	0	0	0	0	2	6	8	0	0	0	0	0	0	0	14
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	0	0	0	0	0	0	0	3
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	2
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	2	3	0	0	0	0	0	0	0	4
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	2	1	3	0	0	0	0	0	0	0	5
Total	0	0	0	0	0	0	0	0	0	0	0	1	2	3	0	0	0	0	4	7	11	0	0	0	0	0	0	0	14
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	2
10:15 AM	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	2	4	6	0	0	0	0	0	0	0	8
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	3
Total	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	2	9	11	0	0	0	0	1	0	1	14
11:00 AM	0	0	0	0	3	4	7	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	8
11:15 AM	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	4
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
Total	0	0	0	0	5	6	11	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	1	0	1	15
12:00 PM	0	0	0	0	2	4	6	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
12:15 PM	0	0	0	0	3	3	6	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	8
12:30 PM	0	0	0	0	4	3	7	0	0	0	0	3	0	3	0	0	0	0	2	0	2	0	0	0	0	0	0	0	12
12:45 PM	0	0	0	0	1	3	4	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	5
Total	0	0	0	0	10	13	23	0	0	0	0	3	2	5	0	0	0	0	3	1	4	0	0	0	0	0	0	0	32
1:00 PM	0	0	0	0	2	1	3	0	0	0	0	1	0	1	0	0	0	0	2	5	7	0	0	0	0	0	0	0	11
1:15 PM	0	0	0	0	4	3	7	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	10
1:30 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	5
1:45 PM	0	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	6
Total	0	0	0	0	8	7	15	0	0	0	0	1	0	1	0	0	0	0	9	7	16	0	0	0	0	0	0	0	32
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
2:15 PM	0	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	1	5	6	0	0	0	0	0	0	0	9
2:30 PM	0	0	0	0	9	1	10	0	0	0	0	0	0	0	0	0	0	0	4	1	5	0	0	0	0	0	0	0	15
2:45 PM	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	2	4	6	0	0	0	0	1	0	1	10
Total	0	0	0	0	14	2	16	0	0	0	0	0	0	0	0	0	0	0	7	11	18	0	0	0	0	1	0	1	35
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	3
3:15 PM	0	0	0	0	3	3	6	0	0	0	0	0	0	0	0	0	0	0	6	1	7	0	0	0	0	0	0	0	13
3:30 PM	0	0	0	0	1	0	1	0	0	0	0	1	0	1	0	0	0	0	3	0	3	0	0	0	0	0	0	0	5
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	0	0	0	0	0	0	0	3
Total	0	0	0	0	4	3	7	0	0	0	0	1	0	1	0	0	0	0	13	3	16	0	0	0	0	0	0	0	24
4:00 PM	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	3	1	4	0	0	0	0	0	0	0	6
4:15 PM	0	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	7
4:30 PM	0	0	0	0	0	2	2	0	0	0	0	0	1	1	0	0	0	0	1	1	2	0	0	0	0	0	0	0	5
4:45 PM	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	5	1	6	0	0	0	0	0	0	0	8
Total	0	0	0	0	4	6	10	0	0	0	0	0	1	1	0	0	0	0	12	3	15	0	0	0	0	0	0	0	26
5:00 PM	0	0	0	0	2	3	5	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	8
5:15 PM	0	0	0	0	4	2	6	0	0	0	0	1	0	1	0	0	0	0	1	1	2	0	0	0	0	0	0	0	9
5:30 PM	0	0	0	0	0	2	2	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	4
5:45 PM	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	3
Total	0	0	0	0	8	7	15	0	0	0	0	1	1	2	0	0	0	0	3	4	7	0	0	0	0	0	0	0	24
6:00 PM	0	0	0	0	7	6	13	0	0	0	0	0	0	0	0	0	0	0	3	2	5	0	0	0	0	0	0	0	18
6:15 PM	0	0	0	0	6	3	9	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	0	0	0	0	12
6:30 PM	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	2	3	5	0	0	0	0	0	0	0	7
6:45 PM	0	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	4
Total	0	0	0	0	15	12	27	0	0	0	0	0	0	0	0	0	0	0	8	6	14	0	0	0	0	0	0	0	41
Grand Total	0	0	0	0	73	62	135	0	0	0	0	7	6	13	0	0	0	0	66	63	129	0	0	0	0	3	0	3	280

PDI File #: **239467 A**
Location: **N: Oleum Street S: Shrewsbury Street Marketplace Driveway**
Location: **E: Shrewsbury Street W: Shrewsbury Street**
City, State: **Worcester, MA**
Client: **Chappell/ P. Bradley**
Site Code: **22114**
Count Date: **Thursday, July 6, 2023**
Start Time: **7:00 AM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Pedestrians

	Oleum Street from North							Shrewsbury Street from East							Shrewsbury Street Marketplace Driveway from South							Shrewsbury Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
Approach %	0	0	0	0	54.1	45.9		0	0	0	0	53.8	46.2		0	0	0	0	51.2	48.8		0	0	0	0	100	0		
Total %	0	0	0	0	26.1	22.1	48.2	0	0	0	0	2.5	2.14	4.64	0	0	0	0	23.6	22.5	46.1	0	0	0	0	1.07	0	1.07	
Exiting Leg Total							135							13							129							3	280

AM Peak Hour Analysis from 07:00 AM to 10:00 AM begins at:

9:30 AM	Oleum Street from North							Shrewsbury Street from East							Shrewsbury Street Marketplace Driveway from South							Shrewsbury Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	2	3	0	0	0	0	0	0	0	4
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	2	1	3	0	0	0	0	0	0	0	5
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	2
10:15 AM	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	2	4	6	0	0	0	0	0	0	0	8
Total Volume	0	0	0	0	2	0	2	0	0	0	0	1	2	3	0	0	0	0	5	8	13	0	0	0	0	1	0	1	19
% Approach Total	0.0	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0	33.3	66.7		0.0	0.0	0.0	0.0	38.5	61.5		0.0	0.0	0.0	0.0	100.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.250	0.375	0.000	0.000	0.000	0.000	0.625	0.500	0.542	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.594
Entering Leg	0	0	0	0	2	0	2	0	0	0	0	1	2	3	0	0	0	0	5	8	13	0	0	0	0	1	0	1	19
Exiting Leg							2							3							13							1	19
Total							4							6							26							2	38

MidDay Peak Hour Analysis from 10:00 AM to 2:00 PM begins at:

12:30 PM	Oleum Street from North							Shrewsbury Street from East							Shrewsbury Street Marketplace Driveway from South							Shrewsbury Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
12:30 PM	0	0	0	0	4	3	7	0	0	0	0	3	0	3	0	0	0	0	2	0	2	0	0	0	0	0	0	0	12
12:45 PM	0	0	0	0	1	3	4	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	5
1:00 PM	0	0	0	0	2	1	3	0	0	0	0	1	0	1	0	0	0	0	2	5	7	0	0	0	0	0	0	0	11
1:15 PM	0	0	0	0	4	3	7	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	10
Total Volume	0	0	0	0	11	10	21	0	0	0	0	4	0	4	0	0	0	0	8	5	13	0	0	0	0	0	0	0	38
% Approach Total	0.0	0.0	0.0	0.0	52.4	47.6		0.0	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0	61.5	38.5		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.688	0.833	0.750	0.000	0.000	0.000	0.000	0.333	0.000	0.333	0.000	0.000	0.000	0.000	0.667	0.250	0.464	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.792
Entering Leg	0	0	0	0	11	10	21	0	0	0	0	4	0	4	0	0	0	0	8	5	13	0	0	0	0	0	0	0	38
Exiting Leg							21							4							13							0	38
Total							42							8							26							0	76

PM Peak Hour Analysis from 2:00 PM to 07:00 PM begins at:

2:30 PM	Oleum Street from North							Shrewsbury Street from East							Shrewsbury Street Marketplace Driveway from South							Shrewsbury Street from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
2:30 PM	0	0	0	0	9	1	10	0	0	0	0	0	0	0	0	0	0	0	4	1	5	0	0	0	0	0	0	0	15
2:45 PM	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	2	4	6	0	0	0	0	1	0	1	10
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	3
3:15 PM	0	0	0	0	3	3	6	0	0	0	0	0	0	0	0	0	0	0	6	1	7	0	0	0	0	0	0	0	13
Total Volume	0	0	0	0	15	4	19	0	0	0	0	0	0	0	0	0	0	0	15	6	21	0	0	0	0	1	0	1	41
% Approach Total	0.0	0.0	0.0	0.0	78.9	21.1		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	71.4	28.6		0.0	0.0	0.0	0.0	100.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.417	0.333	0.475	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.375	0.750	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.683
Entering Leg	0	0	0	0	15	4	19	0	0	0	0	0	0	0	0	0	0	0	15	6	21	0	0	0	0	1	0	1	41
Exiting Leg							19							0							21							1	41
Total							38							0							42							2	82

Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Oleum-Shrewsbury St-Site Drwy Sat
Site Code : 24022
E-W Street:Shrewsbury St Start Date : 4/6/2024
N-S Street:Oleum Ct/Site Drwy Page No : 1

Groups Printed- Cars - Trucks

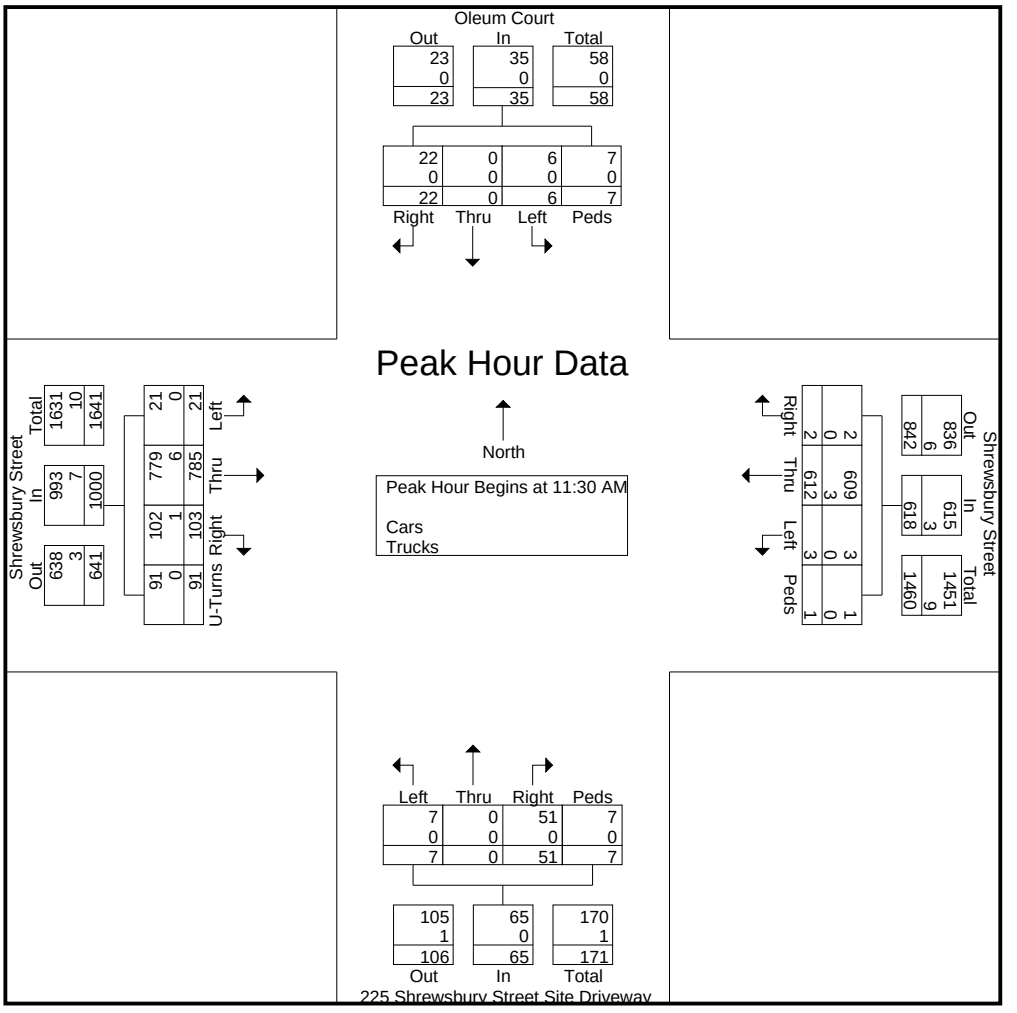
	Oleum Court From North					Shrewsbury Street From East					225 Shrewsbury Street Site Driveway From South					Shrewsbury Street From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
11:00 AM	0	0	5	2	7	0	160	1	0	161	1	0	20	4	25	3	194	20	18	235	428
11:15 AM	0	0	2	3	5	1	166	1	0	168	0	0	12	3	15	5	193	36	15	249	437
11:30 AM	2	0	3	1	6	1	170	1	0	172	2	0	15	3	20	6	174	29	10	219	417
11:45 AM	0	0	4	3	7	0	129	0	0	129	3	0	15	2	20	6	213	28	21	268	424
Total	2	0	14	9	25	2	625	3	0	630	6	0	62	12	80	20	774	113	64	971	1706
12:00 PM	1	0	4	3	8	1	149	1	1	152	1	0	14	1	16	4	190	20	31	245	421
12:15 PM	3	0	11	0	14	1	164	0	0	165	1	0	7	1	9	5	208	26	29	268	456
12:30 PM	1	0	2	2	5	2	163	1	0	166	1	0	19	3	23	2	177	27	14	220	414
12:45 PM	2	0	1	4	7	1	155	1	0	157	0	0	10	6	16	5	198	16	15	234	414
Total	7	0	18	9	34	5	631	3	1	640	3	0	50	11	64	16	773	89	89	967	1705
01:00 PM	2	0	5	0	7	1	149	0	0	150	0	0	11	1	12	2	187	23	14	226	395
01:15 PM	1	0	4	2	7	1	165	1	0	167	0	0	19	1	20	5	169	21	18	213	407
01:30 PM	3	0	6	4	13	1	138	1	0	140	0	0	9	7	16	2	221	16	22	261	430
01:45 PM	0	0	4	0	4	0	163	3	0	166	1	0	9	4	14	8	236	13	15	272	456
Total	6	0	19	6	31	3	615	5	0	623	1	0	48	13	62	17	813	73	69	972	1688
Grand Total	15	0	51	24	90	10	1871	11	1	1893	10	0	160	36	206	53	2360	275	222	2910	5099
Apprch %	16.7	0	56.7	26.7		0.5	98.8	0.6	0.1		4.9	0	77.7	17.5		1.8	81.1	9.5	7.6		
Total %	0.3	0	1	0.5	1.8	0.2	36.7	0.2	0	37.1	0.2	0	3.1	0.7	4	1	46.3	5.4	4.4	57.1	
Cars	15	0	51	24	90	10	1862	11	1	1884	10	0	160	36	206	53	2347	274	222	2896	5076
% Cars	100	0	100	100	100	100	99.5	100	100	99.5	100	0	100	100	100	100	99.4	99.6	100	99.5	99.5
Trucks	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	13	1	0	14	23
% Trucks	0	0	0	0	0	0	0.5	0	0	0.5	0	0	0	0	0	0	0.6	0.4	0	0.5	0.5

Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Oleum-Shrewsbury St-Site Drwy Sat
Site Code : 24022
E-W Street:Shrewsbury St Start Date : 4/6/2024
N-S Street:Oleum Ct/Site Drwy Page No : 2

	Oleum Court From North					Shrewsbury Street From East					225 Shrewsbury Street Site Driveway From South					Shrewsbury Street From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	U-Turns	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:30 AM																					
11:30 AM	2	0	3	1	6	**1**	**170**	**1**	0	**172**	2	0	**15**	**3**	**20**	**6**	174	**29**	10	219	417
11:45 AM	0	0	4	**3**	7	0	129	0	0	129	**3**	0	15	2	20	6	**213**	28	21	**268**	424
12:00 PM	1	0	4	3	8	1	149	1	**1**	152	1	0	14	1	16	4	190	20	**31**	245	421
12:15 PM	**3**	0	**11**	0	**14**	1	164	0	0	165	1	0	7	1	9	5	208	26	29	268	**456**
Total Volume	6	0	22	7	35	3	612	2	1	618	7	0	51	7	65	21	785	103	91	1000	1718
% App. Total	17.1	0	62.9	20		0.5	99	0.3	0.2		10.8	0	78.5	10.8		2.1	78.5	10.3	9.1		
PHF	.500	.000	.500	.583	.625	.750	.900	.500	.250	.898	.583	.000	.850	.583	.813	.875	.921	.888	.734	.933	.942
Cars	6	0	22	7	35	3	609	2	1	615	7	0	51	7	65	21	779	102	91	993	1708
% Cars	100	0	100	100	100	100	99.5	100	100	99.5	100	0	100	100	100	100	99.2	99.0	100	99.3	99.4
Trucks	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	6	1	0	7	10
% Trucks	0	0	0	0	0	0	0.5	0	0	0.5	0	0	0	0	0	0	0.8	1.0	0	0.7	0.6



Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Shrewsbury St at Casco St AM
Site Code : 24022
E-W Street:Shrewsbury St — Start Date : 3/27/2024
N-S Street:Casco St — Page No : 1

Groups Printed- Cars - Trucks

	Shrewsbury Street From East				Casco Street From South				Shrewsbury Street From West				
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	5	121	1	127	1	4	0	5	301	0	1	302	434
07:15 AM	9	143	3	155	1	4	0	5	249	3	1	253	413
07:30 AM	9	163	2	174	1	4	3	8	245	5	1	251	433
07:45 AM	12	164	0	176	1	4	0	5	311	1	1	313	494
Total	35	591	6	632	4	16	3	23	1106	9	4	1119	1774
08:00 AM	7	168	1	176	1	2	0	3	310	3	0	313	492
08:15 AM	10	162	0	172	3	7	0	10	280	3	1	284	466
08:30 AM	8	143	0	151	0	3	0	3	280	1	1	282	436
08:45 AM	8	148	3	159	1	5	0	6	266	2	1	269	434
Total	33	621	4	658	5	17	0	22	1136	9	3	1148	1828
Grand Total	68	1212	10	1290	9	33	3	45	2242	18	7	2267	3602
Apprch %	5.3	94	0.8		20	73.3	6.7		98.9	0.8	0.3		
Total %	1.9	33.6	0.3	35.8	0.2	0.9	0.1	1.2	62.2	0.5	0.2	62.9	
Cars	65	1179	10	1254	7	31	3	41	2184	15	7	2206	3501
% Cars	95.6	97.3	100	97.2	77.8	93.9	100	91.1	97.4	83.3	100	97.3	97.2
Trucks	3	33	0	36	2	2	0	4	58	3	0	61	101
% Trucks	4.4	2.7	0	2.8	22.2	6.1	0	8.9	2.6	16.7	0	2.7	2.8

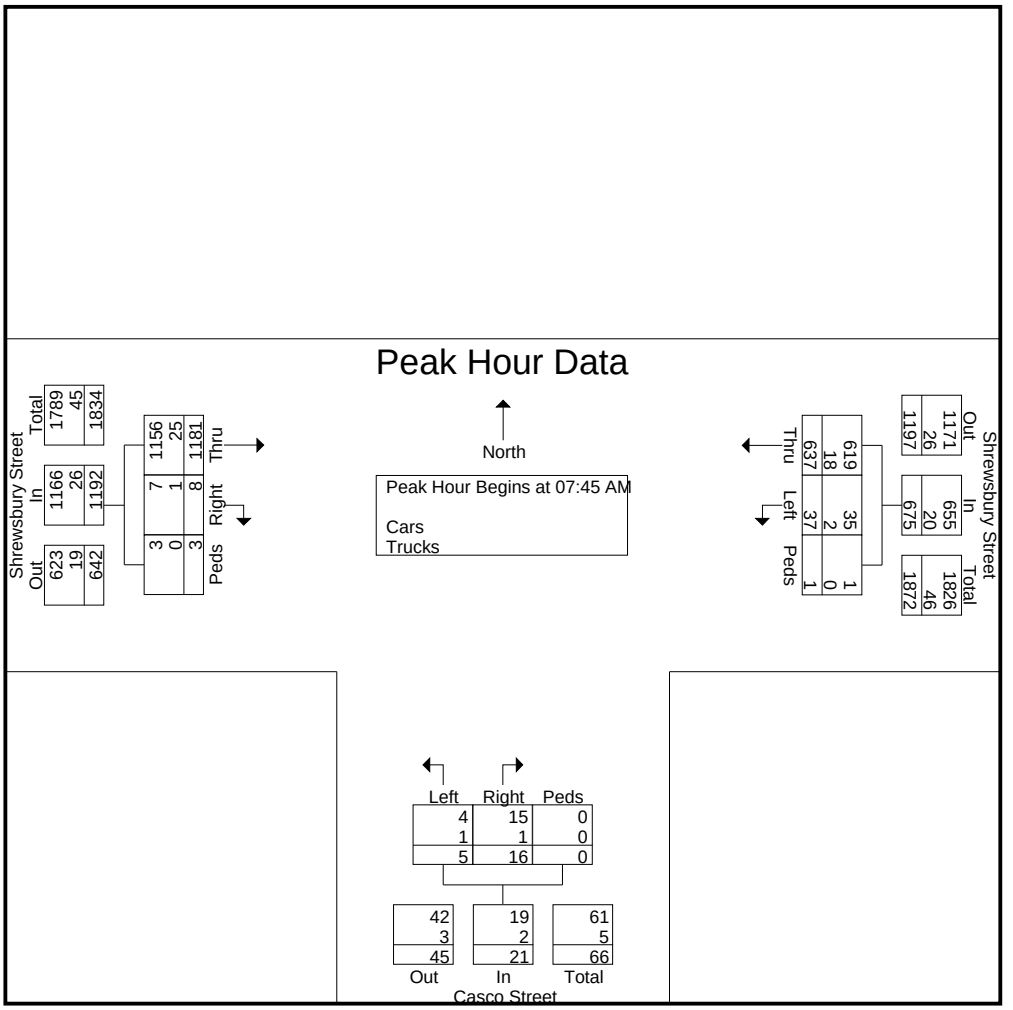
Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Shrewsbury St at Casco St AM
Site Code : 24022
Start Date : 3/27/2024
Page No : 2

E-W Street:Shrewsbury St
N-S Street:Casco St

	Shrewsbury Street From East				Casco Street From South				Shrewsbury Street From West				
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	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	**12**	164	0	**176**	1	4	0	5	**311**	1	**1**	**313**	**494**
08:00 AM	7	**168**	**1**	176	1	2	0	3	310	**3**	0	313	492
08:15 AM	10	162	0	172	**3**	**7**	0	**10**	280	3	1	284	466
08:30 AM	8	143	0	151	0	3	0	3	280	1	1	282	436
Total Volume	37	637	1	675	5	16	0	21	1181	8	3	1192	1888
% App. Total	5.5	94.4	0.1		23.8	76.2	0		99.1	0.7	0.3		
PHF	.771	.948	.250	.959	.417	.571	.000	.525	.949	.667	.750	.952	.955
Cars	35	619	1	655	4	15	0	19	1156	7	3	1166	1840
% Cars	94.6	97.2	100	97.0	80.0	93.8	0	90.5	97.9	87.5	100	97.8	97.5
Trucks	2	18	0	20	1	1	0	2	25	1	0	26	48
% Trucks	5.4	2.8	0	3.0	20.0	6.3	0	9.5	2.1	12.5	0	2.2	2.5



Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Shrewsbury St at Casco St PM
Site Code : 24022
E-W Street:Shrewsbury St
Start Date : 3/27/2024
N-S Street:Casco St
Page No : 1

Groups Printed- Cars - Trucks

	Shrewsbury Street From East				Casco Street From South				Shrewsbury Street From West				
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	14	250	0	264	0	10	1	11	230	12	2	244	519
04:15 PM	9	251	5	265	2	15	0	17	250	4	0	254	536
04:30 PM	14	263	2	279	5	9	0	14	269	1	4	274	567
04:45 PM	11	258	1	270	2	9	0	11	256	3	5	264	545
Total	48	1022	8	1078	9	43	1	53	1005	20	11	1036	2167
05:00 PM	5	249	1	255	4	10	0	14	260	3	5	268	537
05:15 PM	7	240	0	247	1	7	0	8	231	2	6	239	494
05:30 PM	5	227	4	236	0	12	0	12	252	5	4	261	509
05:45 PM	6	240	3	249	2	8	0	10	217	3	8	228	487
Total	23	956	8	987	7	37	0	44	960	13	23	996	2027
Grand Total	71	1978	16	2065	16	80	1	97	1965	33	34	2032	4194
Apprch %	3.4	95.8	0.8		16.5	82.5	1		96.7	1.6	1.7		
Total %	1.7	47.2	0.4	49.2	0.4	1.9	0	2.3	46.9	0.8	0.8	48.5	
Cars	71	1961	16	2048	14	75	1	90	1931	29	34	1994	4132
% Cars	100	99.1	100	99.2	87.5	93.8	100	92.8	98.3	87.9	100	98.1	98.5
Trucks	0	17	0	17	2	5	0	7	34	4	0	38	62
% Trucks	0	0.9	0	0.8	12.5	6.2	0	7.2	1.7	12.1	0	1.9	1.5

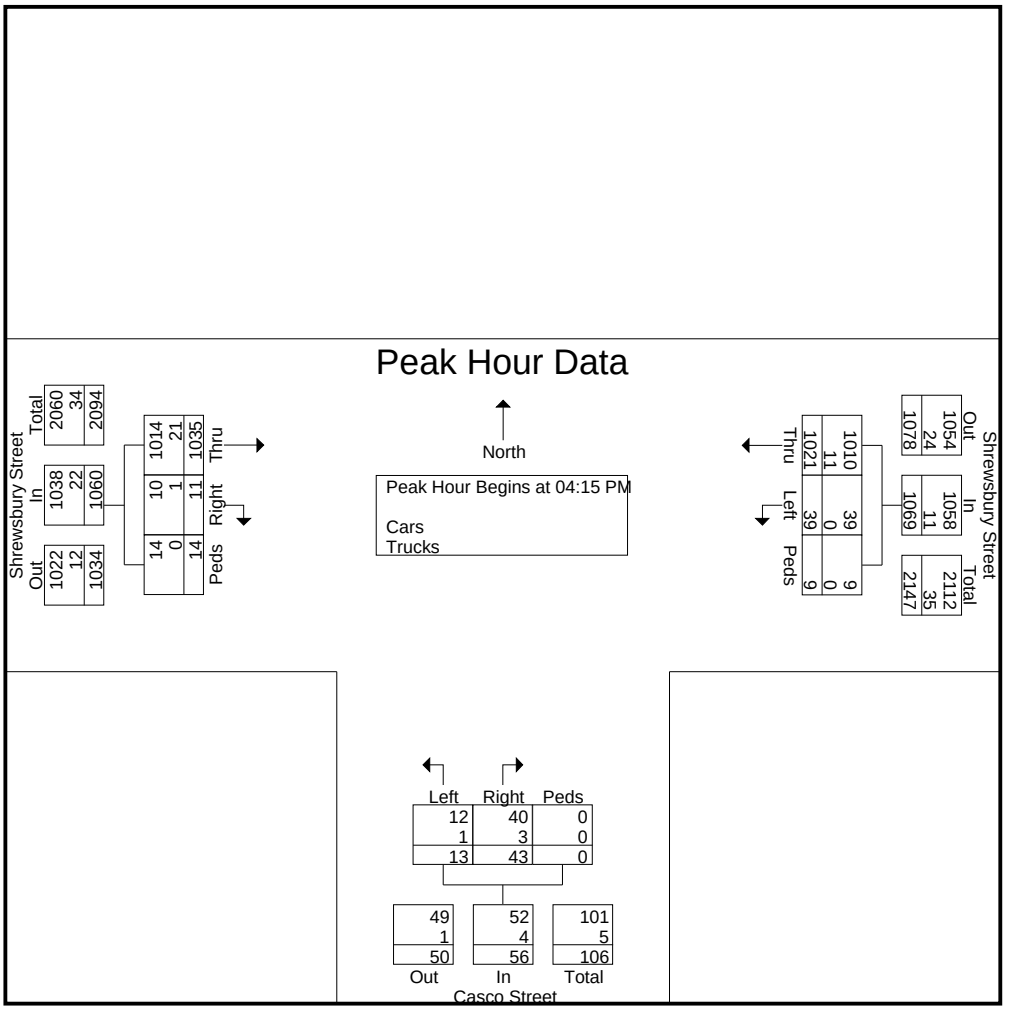
Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Shrewsbury St at Casco St PM
Site Code : 24022
Start Date : 3/27/2024
Page No : 2

E-W Street:Shrewsbury St
N-S Street:Casco St

	Shrewsbury Street From East				Casco Street From South				Shrewsbury Street From West				
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	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 04:15 PM													
04:15 PM	9	251	**5**	265	2	**15**	0	**17**	250	**4**	0	254	536
04:30 PM	**14**	**263**	2	**279**	**5**	9	0	14	**269**	1	4	**274**	**567**
04:45 PM	11	258	1	270	2	9	0	11	256	3	**5**	264	545
05:00 PM	5	249	1	255	4	10	0	14	260	3	5	268	537
Total Volume	39	1021	9	1069	13	43	0	56	1035	11	14	1060	2185
% App. Total	3.6	95.5	0.8		23.2	76.8	0		97.6	1	1.3		
PHF	.696	.971	.450	.958	.650	.717	.000	.824	.962	.688	.700	.967	.963
Cars	39	1010	9	1058	12	40	0	52	1014	10	14	1038	2148
% Cars	100	98.9	100	99.0	92.3	93.0	0	92.9	98.0	90.9	100	97.9	98.3
Trucks	0	11	0	11	1	3	0	4	21	1	0	22	37
% Trucks	0	1.1	0	1.0	7.7	7.0	0	7.1	2.0	9.1	0	2.1	1.7



Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Shrewsbury St at Casco St Sat
Site Code : 24022
E-W Street:Shrewsbury St — Start Date : 4/6/2024
N-S Street:Casco St — Page No : 1

Groups Printed- Cars - Trucks

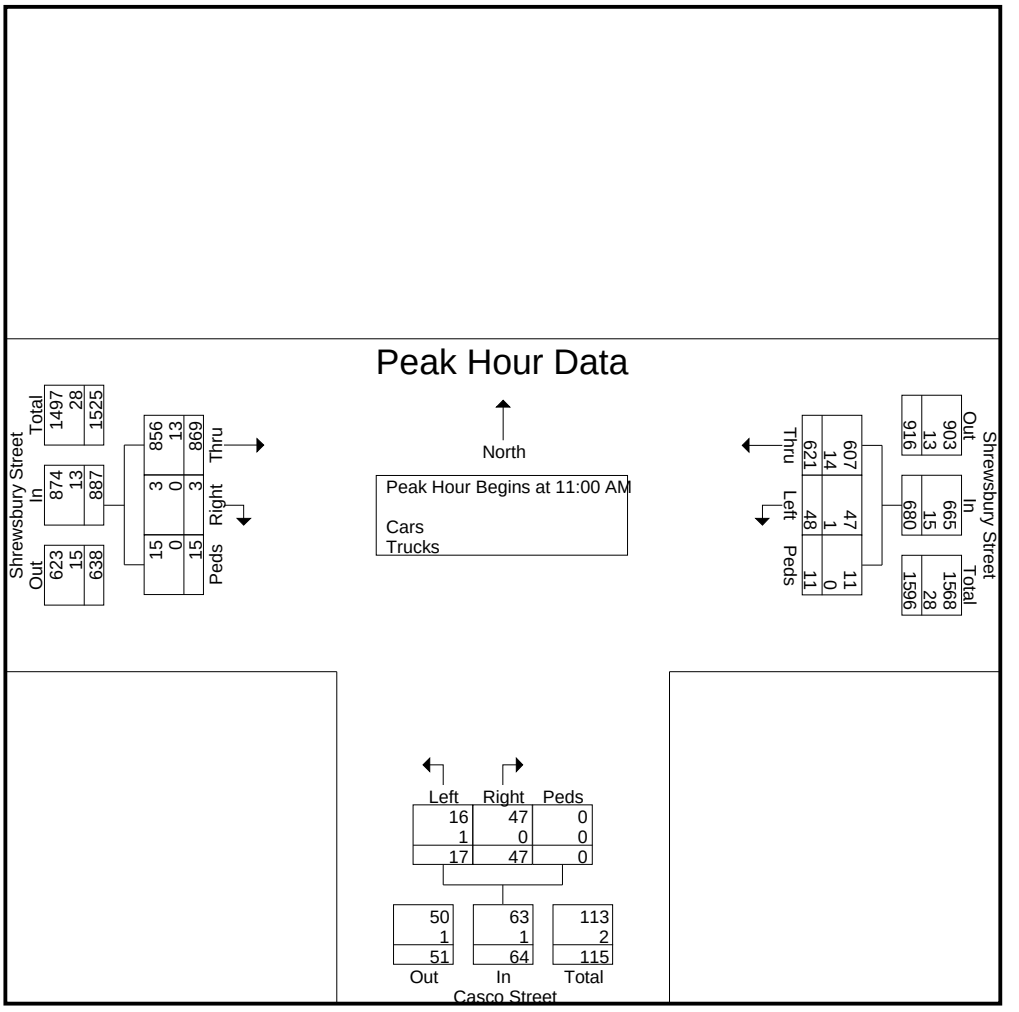
	Shrewsbury Street From East				Casco Street From South				Shrewsbury Street From West				
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
11:00 AM	17	160	4	181	3	10	0	13	217	2	6	225	419
11:15 AM	10	164	3	177	4	15	0	19	200	0	2	202	398
11:30 AM	15	173	4	192	5	8	0	13	199	1	5	205	410
11:45 AM	6	124	0	130	5	14	0	19	253	0	2	255	404
Total	48	621	11	680	17	47	0	64	869	3	15	887	1631
12:00 PM	5	138	1	144	7	13	0	20	211	0	1	212	376
12:15 PM	7	175	4	186	2	16	0	18	205	1	3	209	413
12:30 PM	9	167	5	181	2	8	0	10	198	1	0	199	390
12:45 PM	5	154	3	162	7	12	0	19	211	1	6	218	399
Total	26	634	13	673	18	49	0	67	825	3	10	838	1578
01:00 PM	12	144	2	158	5	6	0	11	215	1	0	216	385
01:15 PM	0	170	1	171	3	15	0	18	187	1	2	190	379
01:30 PM	7	144	3	154	4	3	0	7	240	2	7	249	410
01:45 PM	3	169	0	172	0	9	0	9	265	1	3	269	450
Total	22	627	6	655	12	33	0	45	907	5	12	924	1624
Grand Total	96	1882	30	2008	47	129	0	176	2601	11	37	2649	4833
Apprch %	4.8	93.7	1.5		26.7	73.3	0		98.2	0.4	1.4		
Total %	2	38.9	0.6	41.5	1	2.7	0	3.6	53.8	0.2	0.8	54.8	
Cars	95	1855	30	1980	46	128	0	174	2573	11	37	2621	4775
% Cars	99	98.6	100	98.6	97.9	99.2	0	98.9	98.9	100	100	98.9	98.8
Trucks	1	27	0	28	1	1	0	2	28	0	0	28	58
% Trucks	1	1.4	0	1.4	2.1	0.8	0	1.1	1.1	0	0	1.1	1.2

Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Shrewsbury St at Casco St Sat
Site Code : 24022
E-W Street:Shrewsbury St
Start Date : 4/6/2024
N-S Street:Casco St
Page No : 2

	Shrewsbury Street From East				Casco Street From South				Shrewsbury Street From West				
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:00 AM													
11:00 AM	**17**	160	**4**	181	3	10	0	13	217	**2**	**6**	225	**419**
11:15 AM	10	164	3	177	4	**15**	0	**19**	200	0	2	202	398
11:30 AM	15	**173**	4	**192**	**5**	8	0	13	199	1	5	205	410
11:45 AM	6	124	0	130	5	14	0	19	**253**	0	2	**255**	404
Total Volume	48	621	11	680	17	47	0	64	869	3	15	887	1631
% App. Total	7.1	91.3	1.6		26.6	73.4	0		98	0.3	1.7		
PHF	.706	.897	.688	.885	.850	.783	.000	.842	.859	.375	.625	.870	.973
Cars	47	607	11	665	16	47	0	63	856	3	15	874	1602
% Cars	97.9	97.7	100	97.8	94.1	100	0	98.4	98.5	100	100	98.5	98.2
Trucks	1	14	0	15	1	0	0	1	13	0	0	13	29
% Trucks	2.1	2.3	0	2.2	5.9	0	0	1.6	1.5	0	0	1.5	1.8



Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Casco at Site Drwy AM
Site Code : 24022
Start Date : 3/28/2024
Page No : 1

E-W Street:Site Drwy
N-S Street:Casco St

Groups Printed- Cars - Trucks

	Casco Street From North				Casco Street From South				225 Shrewsbury Street Site Driveway From West				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
07:00 AM	3	2	0	5	0	1	0	1	2	0	0	2	8
07:15 AM	5	0	0	5	0	3	0	3	5	0	0	5	13
07:30 AM	4	1	0	5	0	2	0	2	3	1	0	4	11
07:45 AM	6	3	0	9	0	1	0	1	3	2	0	5	15
Total	18	6	0	24	0	7	0	7	13	3	0	16	47
08:00 AM	8	2	0	10	0	5	0	5	1	4	0	5	20
08:15 AM	7	2	0	9	0	2	0	2	4	0	0	4	15
08:30 AM	10	2	0	12	0	5	0	5	3	1	0	4	21
08:45 AM	9	1	0	10	0	3	0	3	4	2	0	6	19
Total	34	7	0	41	0	15	0	15	12	7	0	19	75
Grand Total	52	13	0	65	0	22	0	22	25	10	0	35	122
Apprch %	80	20	0		0	100	0		71.4	28.6	0		
Total %	42.6	10.7	0	53.3	0	18	0	18	20.5	8.2	0	28.7	
Cars	51	13	0	64	0	17	0	17	25	10	0	35	116
% Cars	98.1	100	0	98.5	0	77.3	0	77.3	100	100	0	100	95.1
Trucks	1	0	0	1	0	5	0	5	0	0	0	0	6
% Trucks	1.9	0	0	1.5	0	22.7	0	22.7	0	0	0	0	4.9

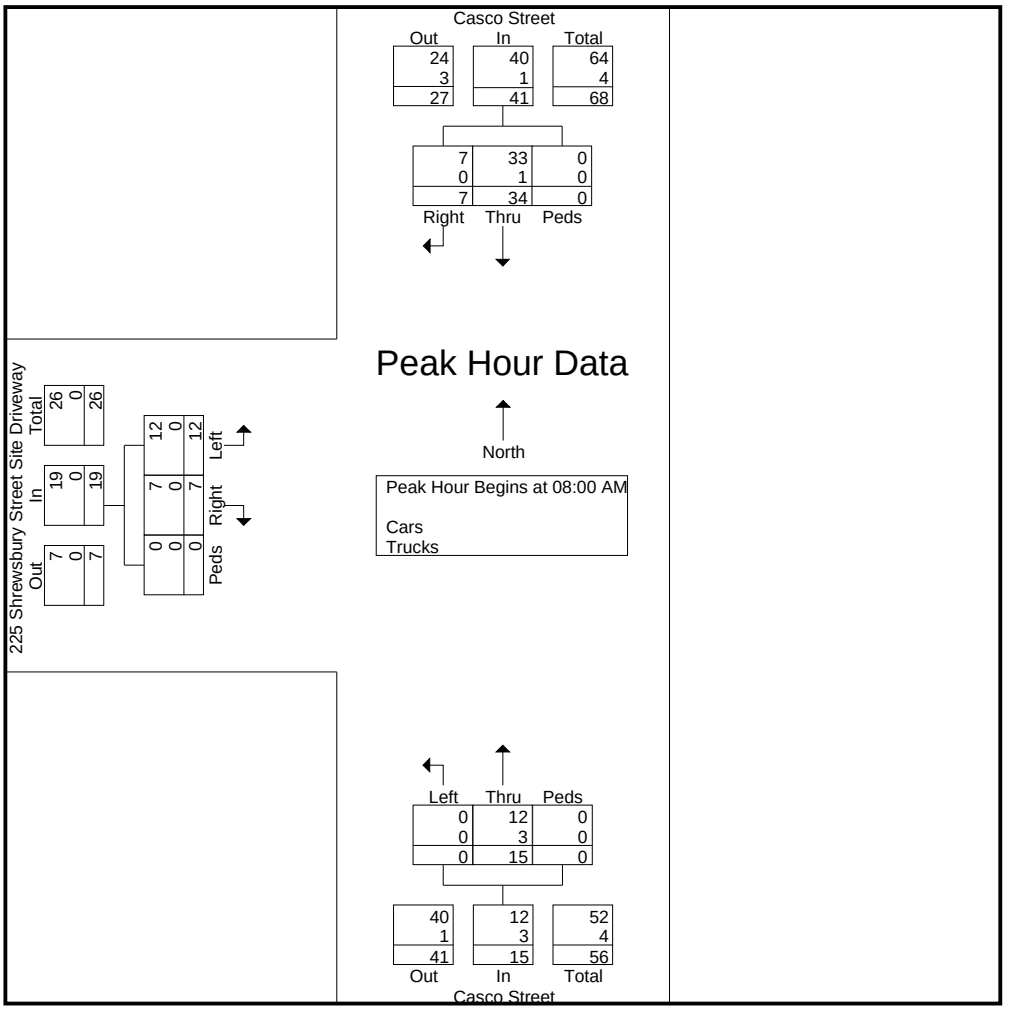
Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Casco at Site Drwy AM
Site Code : 24022
Start Date : 3/28/2024
Page No : 2

E-W Street:Site Drwy
N-S Street:Casco St

	Casco Street From North				Casco Street From South				225 Shrewsbury Street Site Driveway From West				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	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	8	**2**	0	10	0	**5**	0	**5**	1	**4**	0	5	20
08:15 AM	7	2	0	9	0	2	0	2	**4**	0	0	4	15
08:30 AM	**10**	2	0	**12**	0	5	0	5	3	1	0	4	**21**
08:45 AM	9	1	0	10	0	3	0	3	4	2	0	**6**	19
Total Volume	34	7	0	41	0	15	0	15	12	7	0	19	75
% App. Total	82.9	17.1	0		0	100	0		63.2	36.8	0		
PHF	.850	.875	.000	.854	.000	.750	.000	.750	.750	.438	.000	.792	.893
Cars	33	7	0	40	0	12	0	12	12	7	0	19	71
% Cars	97.1	100	0	97.6	0	80.0	0	80.0	100	100	0	100	94.7
Trucks	1	0	0	1	0	3	0	3	0	0	0	0	4
% Trucks	2.9	0	0	2.4	0	20.0	0	20.0	0	0	0	0	5.3



Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Casco at Site Drwy PM
Site Code : 24022
Start Date : 3/28/2024
Page No : 1

E-W Street:Site Drwy
N-S Street:Casco St

Groups Printed- Cars - Trucks

	Casco Street From North				Casco Street From South				225 Shrewsbury Street Site Driveway From West				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
04:00 PM	10	0	0	10	0	5	0	5	3	4	0	7	22
04:15 PM	12	3	0	15	0	6	0	6	11	4	0	15	36
04:30 PM	8	1	0	9	0	3	0	3	6	2	0	8	20
04:45 PM	12	2	0	14	1	3	0	4	9	8	0	17	35
Total	42	6	0	48	1	17	0	18	29	18	0	47	113
05:00 PM	13	0	0	13	0	5	0	5	7	3	0	10	28
05:15 PM	12	1	0	13	0	4	0	4	6	5	0	11	28
05:30 PM	8	1	0	9	0	3	0	3	8	2	0	10	22
05:45 PM	6	0	0	6	0	5	0	5	9	2	1	12	23
Total	39	2	0	41	0	17	0	17	30	12	1	43	101
Grand Total	81	8	0	89	1	34	0	35	59	30	1	90	214
Apprch %	91	9	0		2.9	97.1	0		65.6	33.3	1.1		
Total %	37.9	3.7	0	41.6	0.5	15.9	0	16.4	27.6	14	0.5	42.1	
Cars	81	7	0	88	1	34	0	35	59	30	1	90	213
% Cars	100	87.5	0	98.9	100	100	0	100	100	100	100	100	99.5
Trucks	0	1	0	1	0	0	0	0	0	0	0	0	1
% Trucks	0	12.5	0	1.1	0	0	0	0	0	0	0	0	0.5

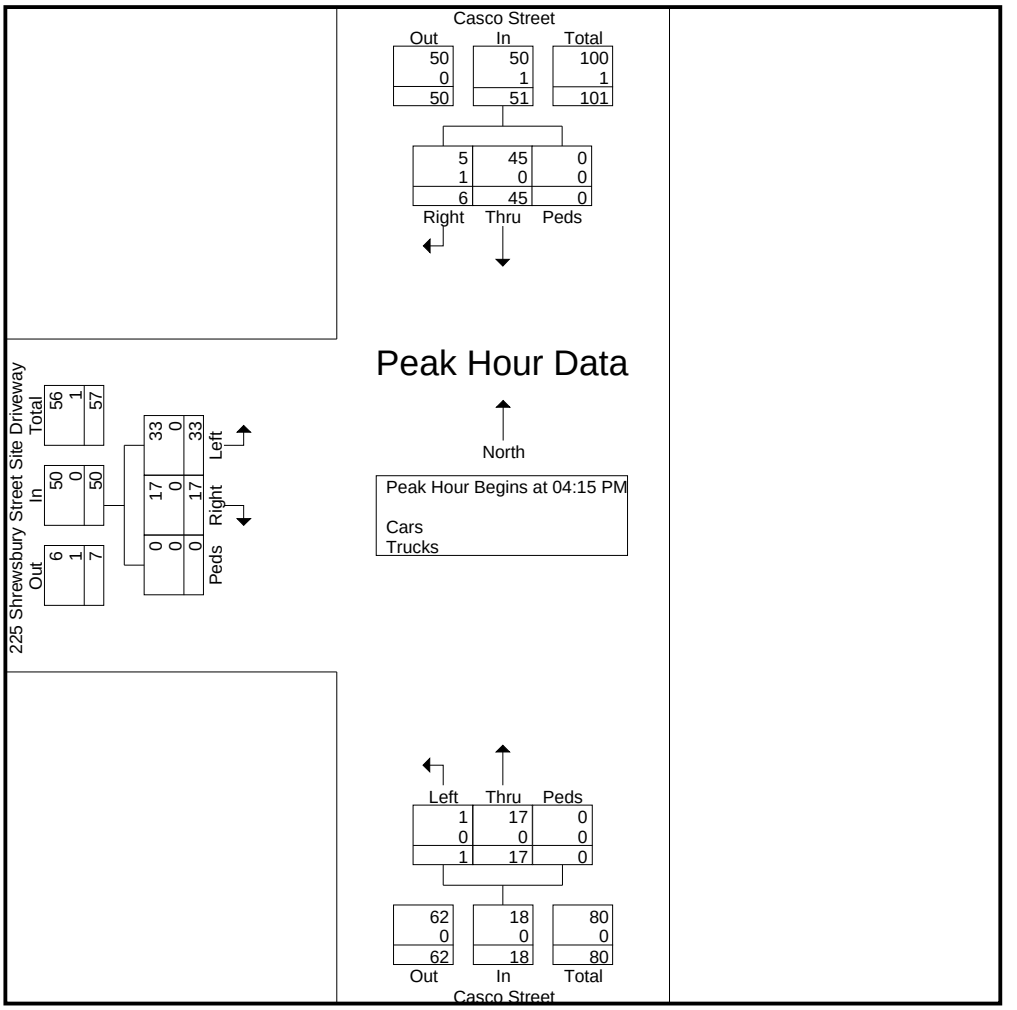
Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Casco at Site Drwy PM
Site Code : 24022
Start Date : 3/28/2024
Page No : 2

E-W Street:Site Drwy
N-S Street:Casco St

	Casco Street From North				Casco Street From South				225 Shrewsbury Street Site Driveway From West				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	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 04:15 PM													
04:15 PM	12	**3**	0	**15**	0	**6**	0	**6**	**11**	4	0	15	**36**
04:30 PM	8	1	0	9	0	3	0	3	6	2	0	8	20
04:45 PM	12	2	0	14	**1**	3	0	4	9	**8**	0	**17**	35
05:00 PM	**13**	0	0	13	0	5	0	5	7	3	0	10	28
Total Volume	45	6	0	51	1	17	0	18	33	17	0	50	119
% App. Total	88.2	11.8	0		5.6	94.4	0		66	34	0		
PHF	.865	.500	.000	.850	.250	.708	.000	.750	.750	.531	.000	.735	.826
Cars	45	5	0	50	1	17	0	18	33	17	0	50	118
% Cars	100	83.3	0	98.0	100	100	0	100	100	100	0	100	99.2
Trucks	0	1	0	1	0	0	0	0	0	0	0	0	1
% Trucks	0	16.7	0	2.0	0	0	0	0	0	0	0	0	0.8



Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Casco at Site Drwy Sat
Site Code : 24022
Start Date : 4/6/2024
Page No : 1

E-W Street:Site drwy
N-S Street:Casco st

Groups Printed- Cars - Trucks

	Casco Street From North				Casco Street From South				225 Shrewsbury Street Site Driveway From West				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
11:00 AM	13	0	0	13	0	3	0	3	9	7	0	16	32
11:15 AM	8	1	0	9	0	3	0	3	17	1	1	19	31
11:30 AM	10	2	0	12	0	6	0	6	11	4	1	16	34
11:45 AM	3	0	0	3	0	8	0	8	11	2	0	13	24
Total	34	3	0	37	0	20	0	20	48	14	2	64	121
12:00 PM	5	0	0	5	0	5	1	6	10	1	0	11	22
12:15 PM	7	1	0	8	0	5	0	5	9	8	0	17	30
12:30 PM	2	0	0	2	0	2	0	2	12	4	0	16	20
12:45 PM	13	0	0	13	0	3	0	3	12	4	0	16	32
Total	27	1	0	28	0	15	1	16	43	17	0	60	104
01:00 PM	2	0	0	2	0	6	0	6	11	4	0	15	23
01:15 PM	4	0	0	4	0	3	0	3	4	3	0	7	14
01:30 PM	5	0	0	5	0	3	0	3	10	1	0	11	19
01:45 PM	3	1	0	4	0	0	0	0	8	5	0	13	17
Total	14	1	0	15	0	12	0	12	33	13	0	46	73
Grand Total	75	5	0	80	0	47	1	48	124	44	2	170	298
Apprch %	93.8	6.2	0		0	97.9	2.1		72.9	25.9	1.2		
Total %	25.2	1.7	0	26.8	0	15.8	0.3	16.1	41.6	14.8	0.7	57	
Cars	75	5	0	80	0	47	1	48	124	44	2	170	298
% Cars	100	100	0	100	0	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0

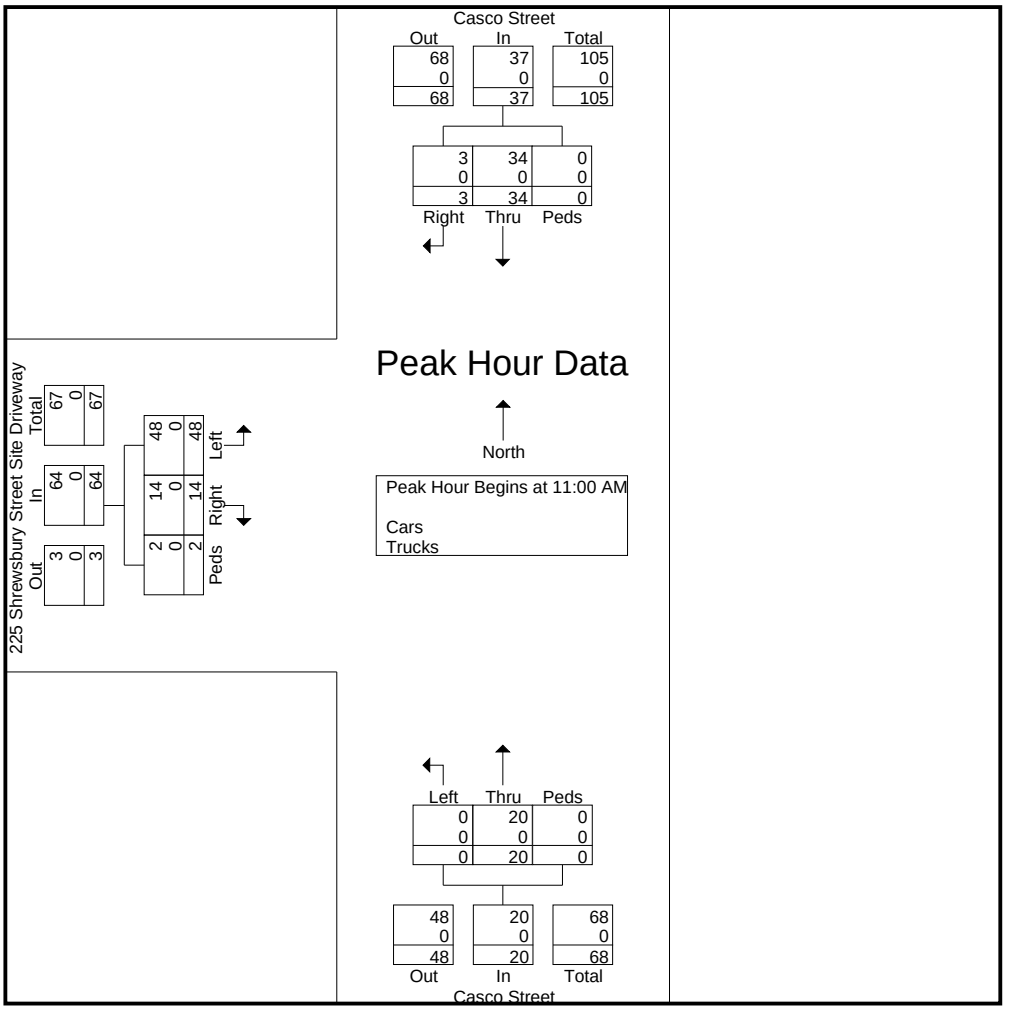
Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Casco at Site Drwy Sat
Site Code : 24022
Start Date : 4/6/2024
Page No : 2

E-W Street:Site drwy
N-S Street:Casco st

	Casco Street From North				Casco Street From South				225 Shrewsbury Street Site Driveway From West				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:00 AM													
11:00 AM	**13**	0	0	**13**	0	3	0	3	9	**7**	0	16	32
11:15 AM	8	1	0	9	0	3	0	3	**17**	1	**1**	**19**	31
11:30 AM	10	**2**	0	12	0	6	0	6	11	4	1	16	**34**
11:45 AM	3	0	0	3	0	**8**	0	**8**	11	2	0	13	24
Total Volume	34	3	0	37	0	20	0	20	48	14	2	64	121
% App. Total	91.9	8.1	0		0	100	0		75	21.9	3.1		
PHF	.654	.375	.000	.712	.000	.625	.000	.625	.706	.500	.500	.842	.890
Cars	34	3	0	37	0	20	0	20	48	14	2	64	121
% Cars	100	100	0	100	0	100	0	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0



Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Albany at Site Drwy AM
Site Code : 24022
Start Date : 3/27/2024
Page No : 1

E-W Street:Albany St
N-S Street:Site Drwy

Groups Printed- Cars - Trucks

	225 Shrewsbury Street Site Drwy From North				Albany Street From East				Albany Street From West				
Start Time	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	12	1	0	13	2	9	0	11	24
07:15 AM	0	2	0	2	13	2	0	15	2	4	0	6	23
07:30 AM	0	3	0	3	12	1	0	13	1	8	0	9	25
07:45 AM	1	2	0	3	13	7	0	20	2	13	0	15	38
Total	1	7	0	8	50	11	0	61	7	34	0	41	110
08:00 AM	0	2	0	2	21	5	0	26	1	9	0	10	38
08:15 AM	0	3	0	3	11	4	0	15	5	5	0	10	28
08:30 AM	1	4	0	5	22	3	0	25	6	8	0	14	44
08:45 AM	0	4	0	4	16	8	0	24	4	4	0	8	36
Total	1	13	0	14	70	20	0	90	16	26	0	42	146
Grand Total	2	20	0	22	120	31	0	151	23	60	0	83	256
Apprch %	9.1	90.9	0		79.5	20.5	0		27.7	72.3	0		
Total %	0.8	7.8	0	8.6	46.9	12.1	0	59	9	23.4	0	32.4	
Cars	2	20	0	22	117	31	0	148	23	54	0	77	247
% Cars	100	100	0	100	97.5	100	0	98	100	90	0	92.8	96.5
Trucks	0	0	0	0	3	0	0	3	0	6	0	6	9
% Trucks	0	0	0	0	2.5	0	0	2	0	10	0	7.2	3.5

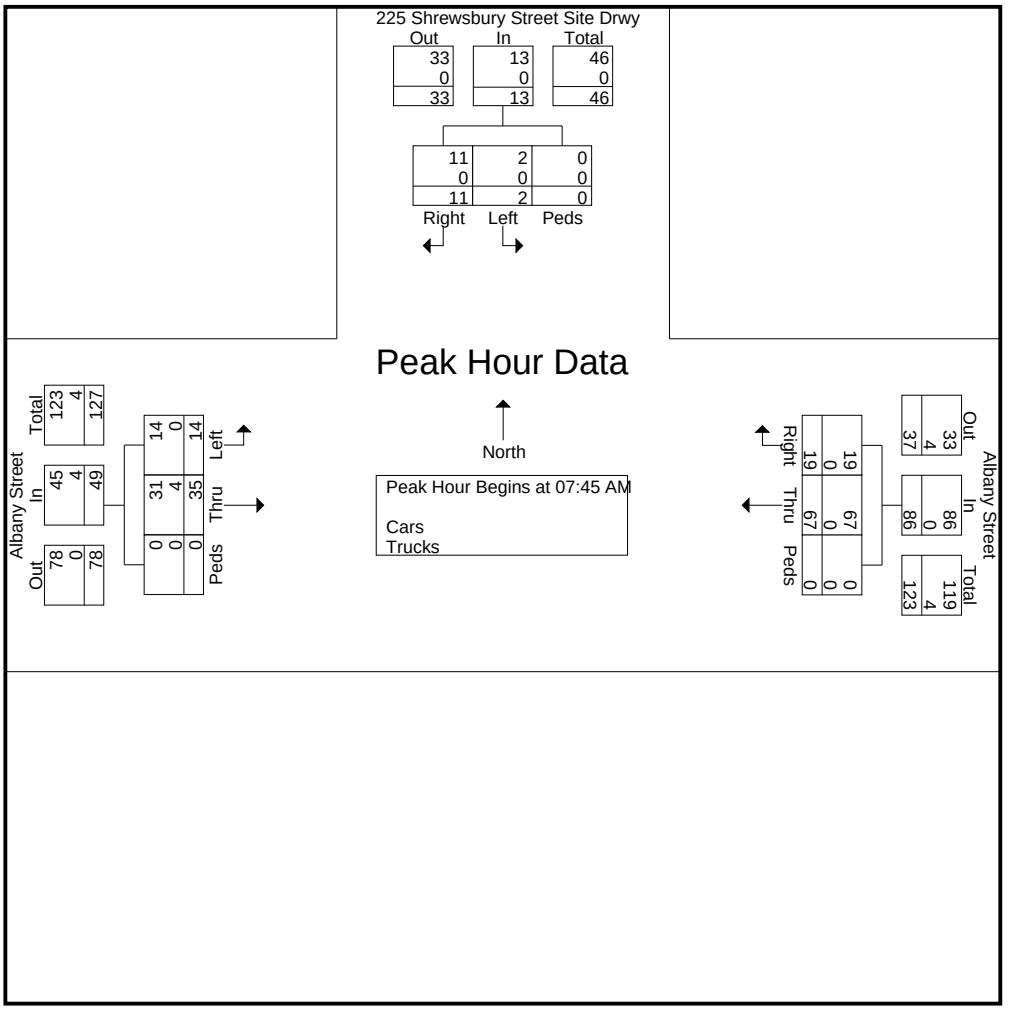
Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Albany at Site Drwy AM
Site Code : 24022
Start Date : 3/27/2024
Page No : 2

E-W Street:Albany St
N-S Street:Site Drwy

	225 Shrewsbury Street Site Drwy From North				Albany Street From East				Albany Street From West				
Start Time	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	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	**1**	2	0	3	13	**7**	0	20	2	**13**	0	**15**	38
08:00 AM	0	2	0	2	21	5	0	**26**	1	9	0	10	38
08:15 AM	0	3	0	3	11	4	0	15	5	5	0	10	28
08:30 AM	1	**4**	0	**5**	**22**	3	0	25	**6**	8	0	14	**44**
Total Volume	2	11	0	13	67	19	0	86	14	35	0	49	148
% App. Total	15.4	84.6	0		77.9	22.1	0		28.6	71.4	0		
PHF	.500	.688	.000	.650	.761	.679	.000	.827	.583	.673	.000	.817	.841
Cars	2	11	0	13	67	19	0	86	14	31	0	45	144
% Cars	100	100	0	100	100	100	0	100	100	88.6	0	91.8	97.3
Trucks	0	0	0	0	0	0	0	0	0	4	0	4	4
% Trucks	0	0	0	0	0	0	0	0	0	11.4	0	8.2	2.7



Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Albany at Site Drwy PM
Site Code : 24022
Start Date : 3/27/2024
Page No : 1

E-W Street:Albany St
N-S Street:Site Drwy

Groups Printed- Cars - Trucks

	225 Shrewsbury Street Site Driveway From North				Albany Street From East				Albany Street From West				
Start Time	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
04:00 PM	0	7	0	7	16	8	0	24	1	8	0	9	40
04:15 PM	0	13	0	13	21	6	0	27	6	18	0	24	64
04:30 PM	1	9	0	10	28	5	0	33	5	10	0	15	58
04:45 PM	2	4	0	6	21	8	0	29	6	8	0	14	49
Total	3	33	0	36	86	27	0	113	18	44	0	62	211
05:00 PM	0	6	0	6	15	0	0	15	3	9	0	12	33
05:15 PM	0	4	0	4	12	2	0	14	6	4	0	10	28
05:30 PM	1	10	0	11	14	8	0	22	3	6	0	9	42
05:45 PM	0	2	0	2	14	4	0	18	2	6	0	8	28
Total	1	22	0	23	55	14	0	69	14	25	0	39	131
Grand Total	4	55	0	59	141	41	0	182	32	69	0	101	342
Apprch %	6.8	93.2	0		77.5	22.5	0		31.7	68.3	0		
Total %	1.2	16.1	0	17.3	41.2	12	0	53.2	9.4	20.2	0	29.5	
Cars	3	55	0	58	139	41	0	180	32	68	0	100	338
% Cars	75	100	0	98.3	98.6	100	0	98.9	100	98.6	0	99	98.8
Trucks	1	0	0	1	2	0	0	2	0	1	0	1	4
% Trucks	25	0	0	1.7	1.4	0	0	1.1	0	1.4	0	1	1.2

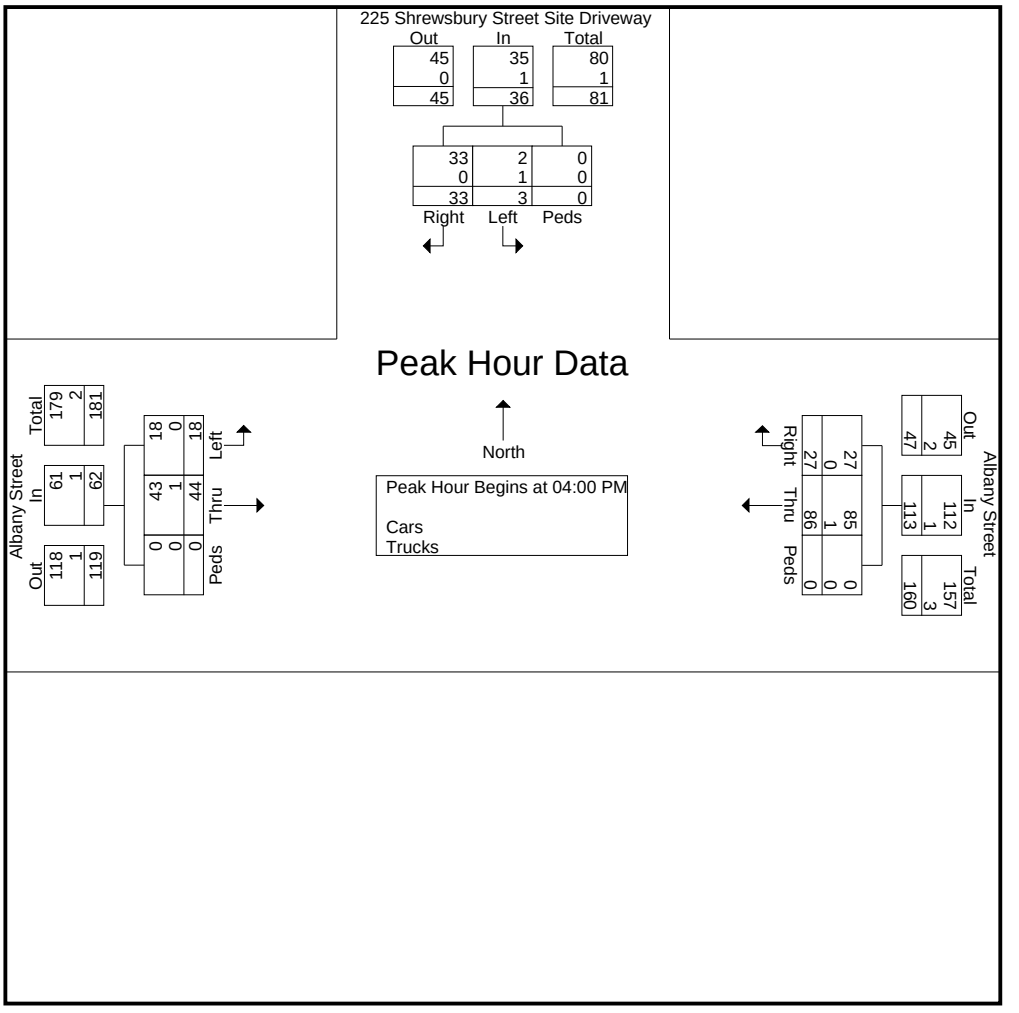
Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Albany at Site Drwy PM
Site Code : 24022
Start Date : 3/27/2024
Page No : 2

E-W Street:Albany St
N-S Street:Site Drwy

	225 Shrewsbury Street Site Driveway From North				Albany Street From East				Albany Street From West				
Start Time	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	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	7	0	7	16	**8**	0	24	1	8	0	9	40
04:15 PM	0	**13**	0	**13**	21	6	0	27	**6**	**18**	0	**24**	**64**
04:30 PM	1	9	0	10	**28**	5	0	**33**	5	10	0	15	58
04:45 PM	**2**	4	0	6	21	8	0	29	6	8	0	14	49
Total Volume	3	33	0	36	86	27	0	113	18	44	0	62	211
% App. Total	8.3	91.7	0		76.1	23.9	0		29	71	0		
PHF	.375	.635	.000	.692	.768	.844	.000	.856	.750	.611	.000	.646	.824
Cars	2	33	0	35	85	27	0	112	18	43	0	61	208
% Cars	66.7	100	0	97.2	98.8	100	0	99.1	100	97.7	0	98.4	98.6
Trucks	1	0	0	1	1	0	0	1	0	1	0	1	3
% Trucks	33.3	0	0	2.8	1.2	0	0	0.9	0	2.3	0	1.6	1.4



Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Albany at Site Drwy Sat
Site Code : 24022
Start Date : 4/6/2024
Page No : 1

E-W Street:Albany St
N-S Street:Site Drwy

Groups Printed- Cars - Trucks

	225 Shrewsbury Street Site Driveway From North				Albany Street From East				Albany Street From West				
Start Time	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
11:00 AM	1	6	0	7	14	11	0	25	10	9	0	19	51
11:15 AM	2	10	0	12	7	8	0	15	6	4	0	10	37
11:30 AM	0	7	0	7	9	11	0	20	8	8	0	16	43
11:45 AM	1	11	0	12	8	2	0	10	5	6	0	11	33
Total	4	34	0	38	38	32	0	70	29	27	0	56	164
12:00 PM	2	7	0	9	7	5	0	12	4	6	0	10	31
12:15 PM	3	12	0	15	12	8	0	20	5	3	0	8	43
12:30 PM	2	10	0	12	14	4	0	18	8	6	0	14	44
12:45 PM	1	8	0	9	4	7	0	11	4	4	0	8	28
Total	8	37	0	45	37	24	0	61	21	19	0	40	146
01:00 PM	2	10	0	12	7	13	0	20	3	6	0	9	41
01:15 PM	1	7	0	8	8	3	0	11	2	2	0	4	23
01:30 PM	0	10	0	10	3	4	0	7	4	3	0	7	24
01:45 PM	0	4	0	4	9	4	0	13	1	3	0	4	21
Total	3	31	0	34	27	24	0	51	10	14	0	24	109
Grand Total	15	102	0	117	102	80	0	182	60	60	0	120	419
Apprch %	12.8	87.2	0		56	44	0		50	50	0		
Total %	3.6	24.3	0	27.9	24.3	19.1	0	43.4	14.3	14.3	0	28.6	
Cars	14	102	0	116	100	80	0	180	60	57	0	117	413
% Cars	93.3	100	0	99.1	98	100	0	98.9	100	95	0	97.5	98.6
Trucks	1	0	0	1	2	0	0	2	0	3	0	3	6
% Trucks	6.7	0	0	0.9	2	0	0	1.1	0	5	0	2.5	1.4

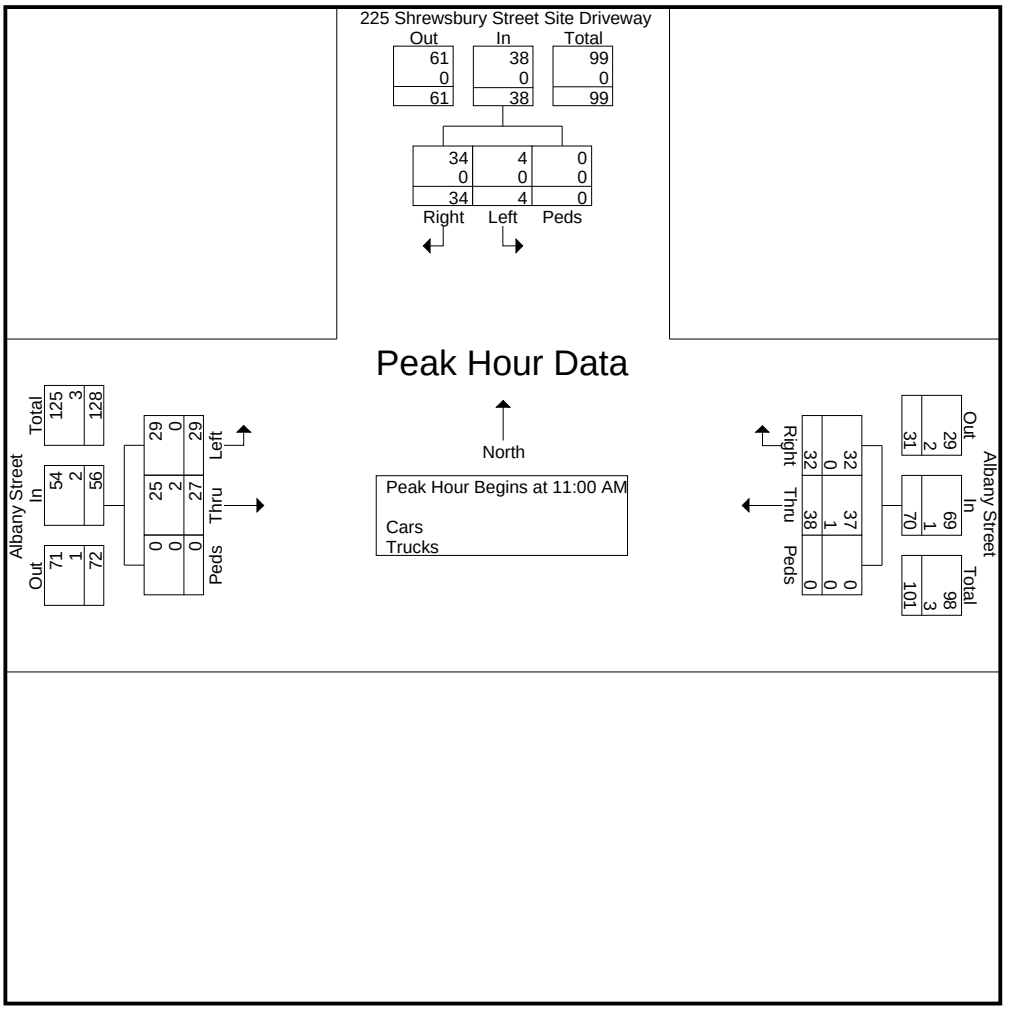
Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 Worcester Albany at Site Drwy Sat
Site Code : 24022
Start Date : 4/6/2024
Page No : 2

E-W Street:Albany St
N-S Street:Site Drwy

	225 Shrewsbury Street Site Driveway From North				Albany Street From East				Albany Street From West				
Start Time	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 11:00 AM													
11:00 AM	1	6	0	7	**14**	**11**	0	**25**	**10**	**9**	0	**19**	**51**
11:15 AM	**2**	10	0	**12**	7	8	0	15	6	4	0	10	37
11:30 AM	0	7	0	7	9	11	0	20	8	8	0	16	43
11:45 AM	1	**11**	0	12	8	2	0	10	5	6	0	11	33
Total Volume	4	34	0	38	38	32	0	70	29	27	0	56	164
% App. Total	10.5	89.5	0		54.3	45.7	0		51.8	48.2	0		
PHF	.500	.773	.000	.792	.679	.727	.000	.700	.725	.750	.000	.737	.804
Cars	4	34	0	38	37	32	0	69	29	25	0	54	161
% Cars	100	100	0	100	97.4	100	0	98.6	100	92.6	0	96.4	98.2
Trucks	0	0	0	0	1	0	0	1	0	2	0	2	3
% Trucks	0	0	0	0	2.6	0	0	1.4	0	7.4	0	3.6	1.8



Seasonal/Historical Adjustment Data and Bus Schedule

MassDOT Transportation Data Management System

STATION 3979 - Shrewsbury Street west of Daniels Street

YEAR #	YEAR	AADT
1	2009	20,221
2	2010	20,443
3	2011	
4	2012	
5	2013	
6	2014	22,291
7	2015	
8	2016	
9	2017	
10	2018	21,002

2014-2018 Annual Growth:

Year 6-7	
Year 6-8	
Year 6-9	
Year 6-10	-1.45%
Year 7-8	
Year 7-9	
Year 7-10	
Year 8-9	
Year 8-10	
Year 9-10	
Avg. Growth:	**-1.45%**

Traffic Growth Calculations

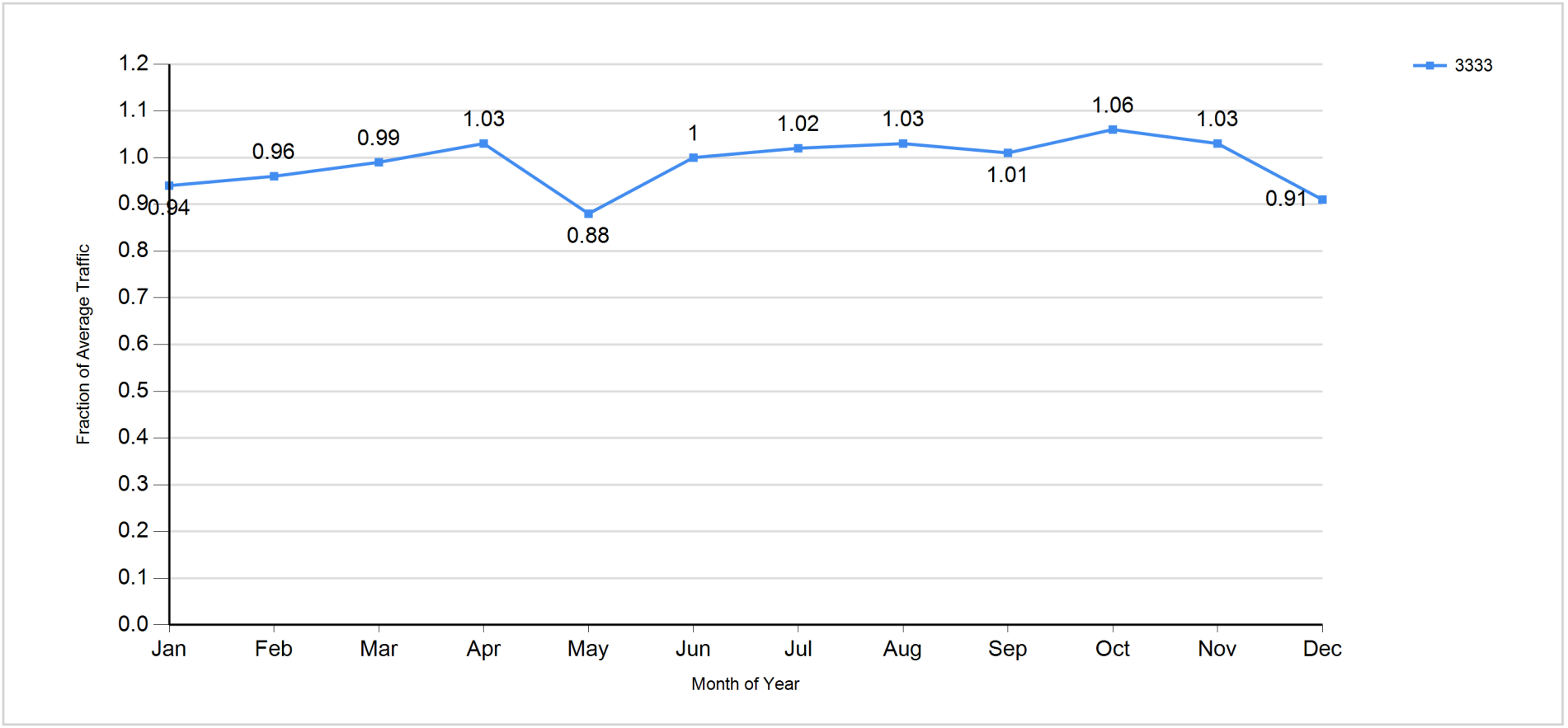
Year 1-2	1.10%	Year 2-3		Year 3-4	Year 4-5	Year 5-6
Year 1-3		Year 2-4		Year 3-5	Year 4-6	Year 5-7
Year 1-4		Year 2-5		Year 3-6	Year 4-7	Year 5-8
Year 1-5		Year 2-6	2.26%	Year 3-7	Year 4-8	Year 5-9
Year 1-6	2.05%	Year 2-7		Year 3-8	Year 4-9	Year 5-10
Year 1-7		Year 2-8		Year 3-9	Year 4-10	
Year 1-8		Year 2-9		Year 3-10		
Year 1-9		Year 2-10	0.34%			
Year 1-10	0.43%					

Year 6-7		Year 7-8		Year 8-9	Year 9-10
Year 6-8		Year 7-9		Year 8-10	
Year 6-9		Year 7-10			
Year 6-10	-1.45%				

2009-2018 Annual Average Traffic Growth Rate: **0.79%**

Massachusetts Highway Department

Traffic Pattern by Month for 1/1/2019 - 12/31/2019
Criteria: Location ID = 3333, From 1/1/1900 To 12/31/2049 12:00:00 AM



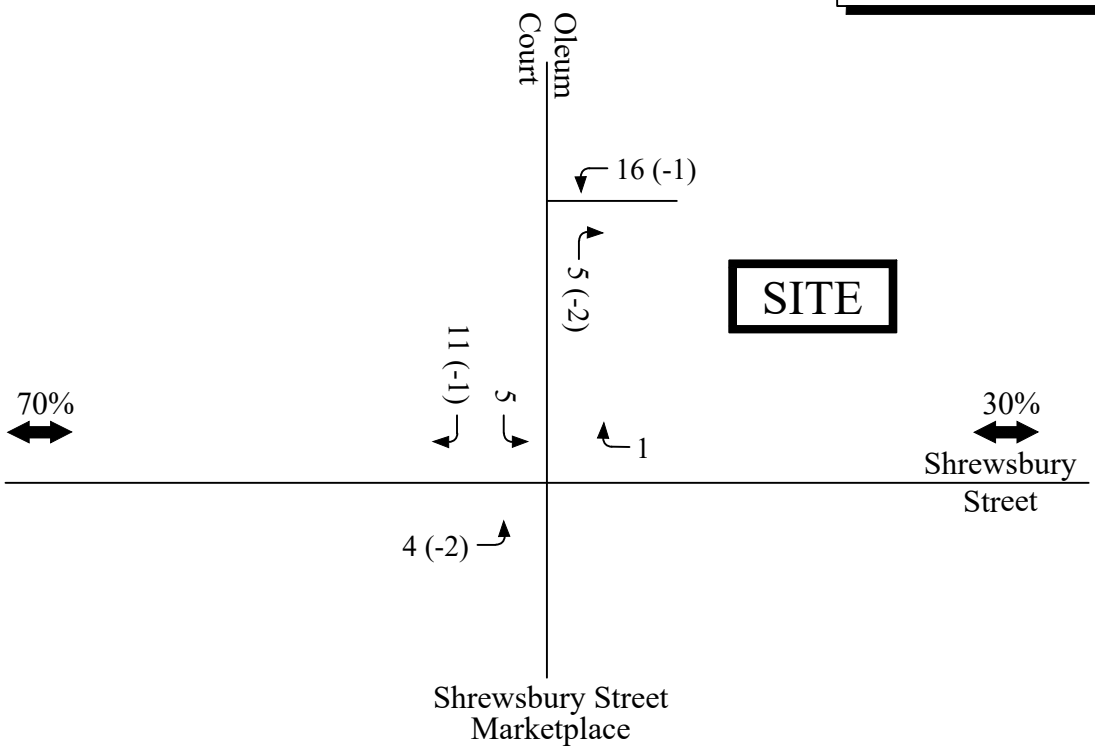
Massachusetts Highway Department

AADT Summary By Year for 1/1/2008 - 12/31/2019
Criteria: Location ID = 3979, From 1/1/1900 To 12/31/2049 12:00:00 AM

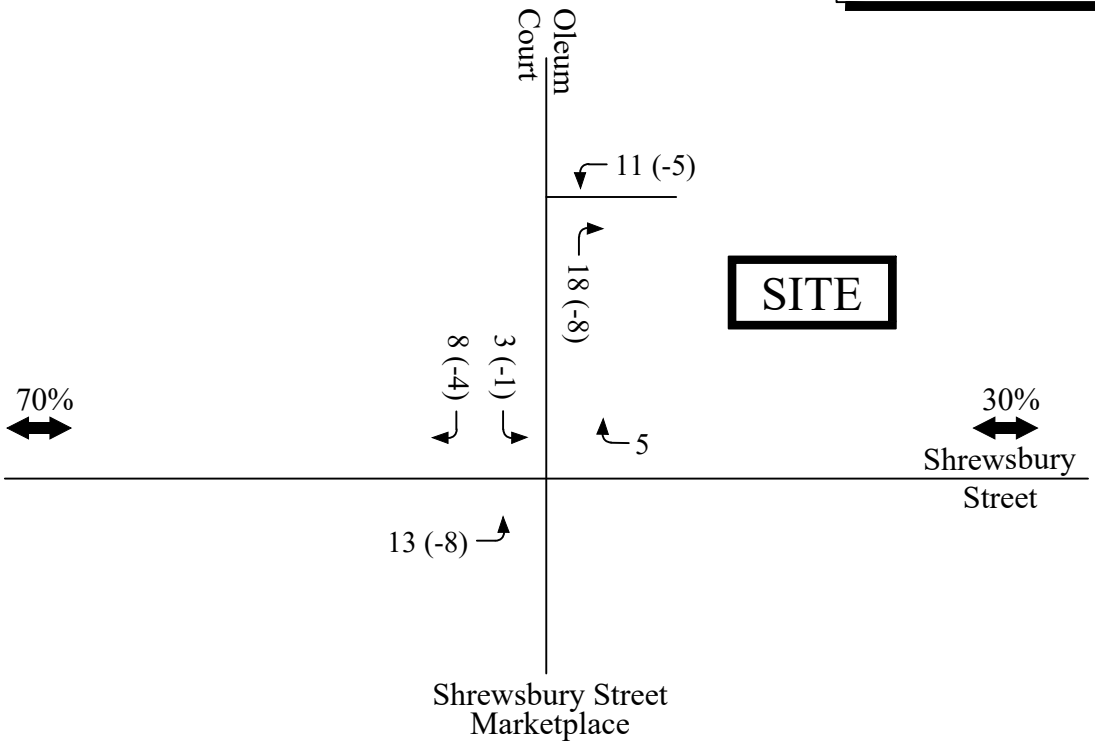
Community	Station	Station Information		2008	2009	2010	2014	2015	2016	2017	2018	2019
Worcester	3979	**Location**	SHREWSBURY STREET	20300	20221	20443	22291	22536	22829	23080	21002	21086
		Description		1	1	1	1	3	3	3	1	3
		FC	3	Actual	Actual	Actual	Actual	Grown	Grown	Grown	Actual	Grown

TG - 224 Shrewsbury Street
Peak Hour Traffic Volumes

Weekday AM Peak Hour



Weekday PM Peak Hour

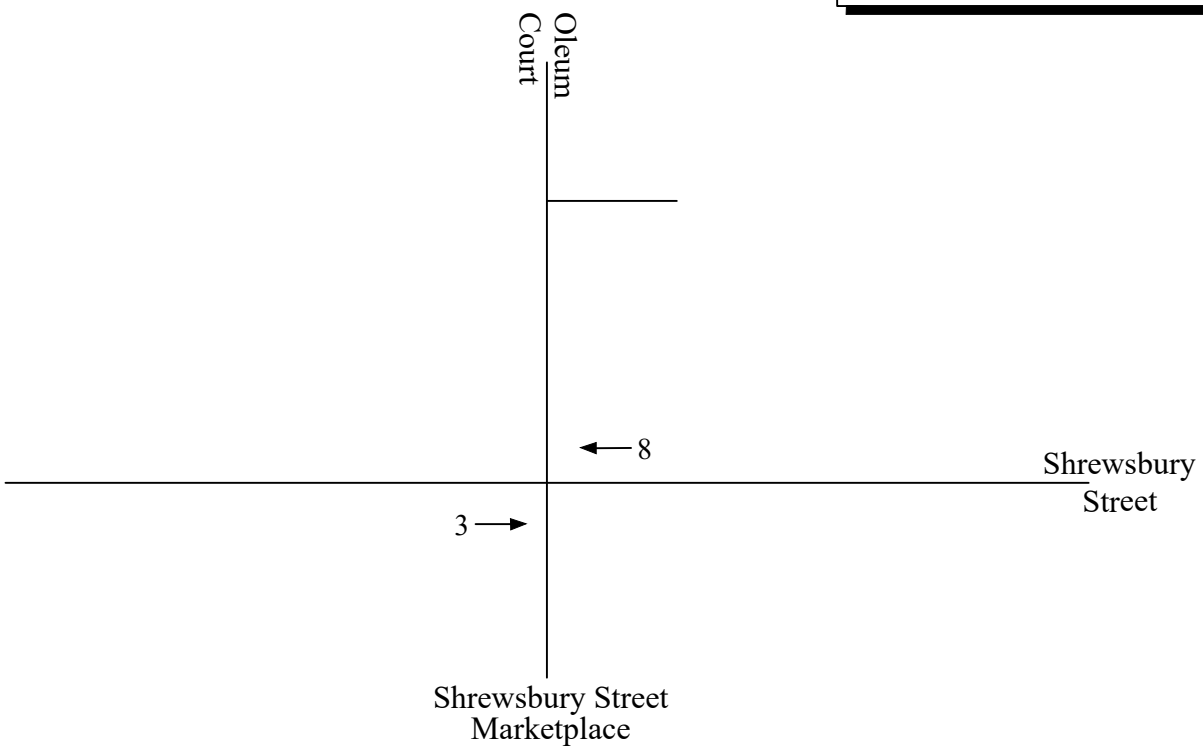


(XX) = Removed Existing Parking Lot Trips

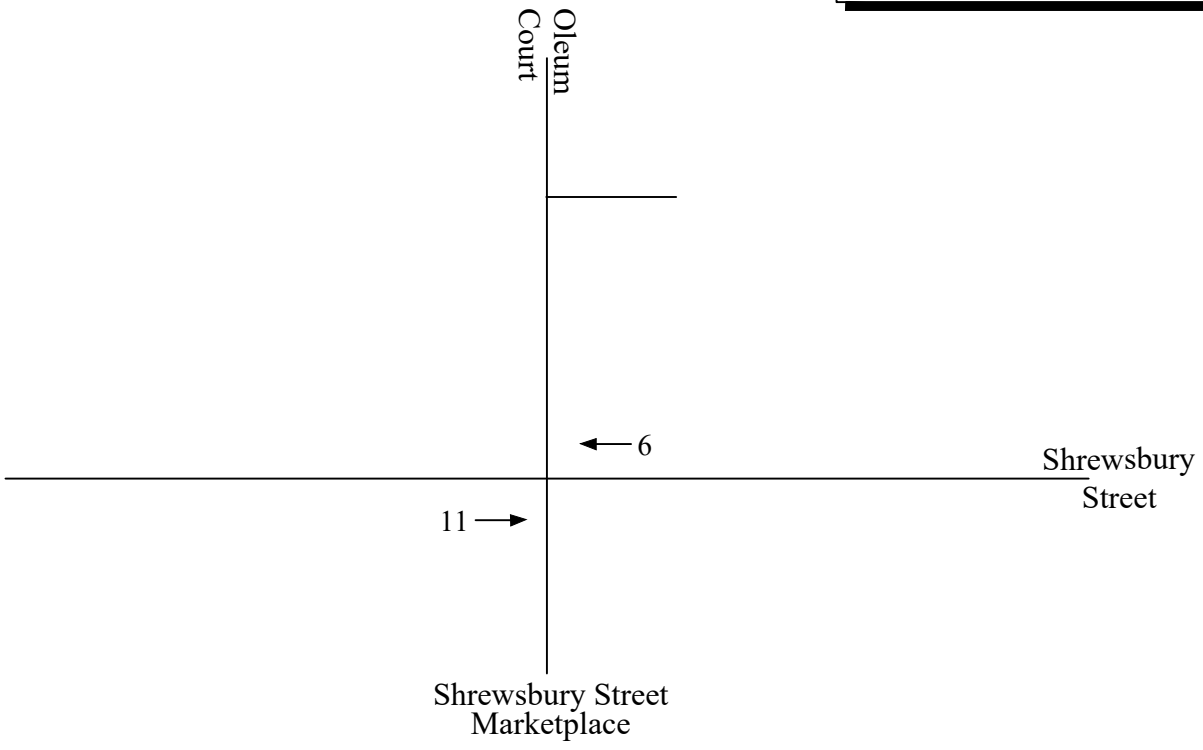
NOT TO SCALE

TG - 393-397 Shrewsbury Street
Peak Hour Traffic Volumes

Weekday AM Peak Hour



Weekday PM Peak Hour



NOT TO SCALE

Welcome aboard the WRTA!

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

WRTA FARE INFORMATION
Effective July 1, 2017

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

Valid ID Required for Senior/Disabled Fare

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

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

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

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

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

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

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

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

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

Weekday Service is provided on Veterans' Day.

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

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

Please…NO Smoking, Eating, Drinking or Music

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

OUTBOUND

WEEKDAYS

See the map for matching timepoint locations

1 BUS STARTS Union Station Hub	2 BUS Leaves UMass Medical Center	3 BUS Leaves Marketplace Shrewsbury	4 BUS Ends Julio Dr. Shrewsbury
550a	600a	608a	616a
650a	700a	708a	716a
750a	800a	808a	816a
850a	900a	908a	916a
950a	1000a	1010a	1021a
1100a	1110a	1120a	1131a
1210a	**1220p**	**1230p**	**1241p**
120p	**130p**	**140p**	**151p**
230p	**240p**	**250p**	**301p**
***340p**	**350p**	**411p***	
450p	**500p**	**510p**	**521p**
600p	**610p**	**620p**	**631p**
710p	**720p**	**728p**	**736p**
810p	**820p**	**828p**	**836p**

These trips end/start at Fairlawn Plaza.
****Lakeway Commons is By Request Only on outbound trips***

SATURDAYS

1 BUS STARTS Union Station Hub	2 BUS Leaves UMass Medical Center	3 BUS Leaves Marketplace Shrewsbury	4 BUS Ends Julio Dr. Shrewsbury
950a	959a	1007a	1016a
1050a	1059a	1107a	1116a
1150a	1159a	**1207p**	**1216p**
1250p	**1259p**	**107p**	**116p**
150p	**159p**	**207p**	**216p**
250p	**259p**	**307p**	**316p**
350p	**359p**	**407p**	**416p**
450p	**459p**	**507p**	**516p**

These trips end/start at Marketplace Shrewsbury.
****Lakeway Commons is By Request Only on outbound trips***

NO SUNDAY SERVICE

INBOUND

WEEKDAYS

See the map for matching timepoint locations

4 BUS STARTS Julio Dr. Shrewsbury	3 BUS Leaves Marketplace Shrewsbury	2 BUS Leaves UMass Medical Center	1 BUS ENDS Union Station Hub
620a	629a	638a	650a
720a	729a	738a	750a
820a	829a	838a	850a
920a	929a	938a	950a
1025a	1035a	1045a	1100a
1135a	1145a	1155a	**1210a**
1245p	**1255p**	**105p**	**120p**
155p	**205p**	**215p**	**230p**
305p	**315p**	**325p**	**340p**
	***415p**	**425p**	**450p**
525p	**535p**	**545p**	**600p**
635p	**645p**	**655p**	**710p**
740p	**749p**	**758p**	**810p**
840p	**849p**	**858p**	**910p**

SATURDAYS

4 BUS STARTS Julio Dr. Shrewsbury	3 BUS Leaves Marketplace Shrewsbury	2 BUS Leaves UMass Medical Center	1 BUS ENDS Union Station Hub
1020a	1029a	1038a	1050a
1120a	1129a	1138a	1150a
1220p	**1229p**	**1238p**	**1250p**
120p	**129p**	**138p**	**150p**
220p	**229p**	**238p**	**250p**
320p	**329p**	**338p**	**350p**
420p	**429p**	**438p**	**450p**
520p	**529p**	**538p**	**550p**

NO SUNDAY SERVICE

Route 15

UNION STATION HUB – SHREWSBURY CENTER via SHREWSBURY ST. & ROUTE 9

Revised: June 24, 2023

Worcester Regional Transit Authority

Serving:

Christoforo Columbo Park
East View Apartments
UMass Medical Center
White City Plaza
Lakeway Commons
Shrewsbury Town Hall
Shrewsbury Senior Center
Shrewsbury Center
Union Station
Marketplace Shrewsbury

Translation

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

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

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

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

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

15 UNION STATION HUB - Shrewsbury Center via Shrewsbury St & Route 9 15

Most Routes Serve:

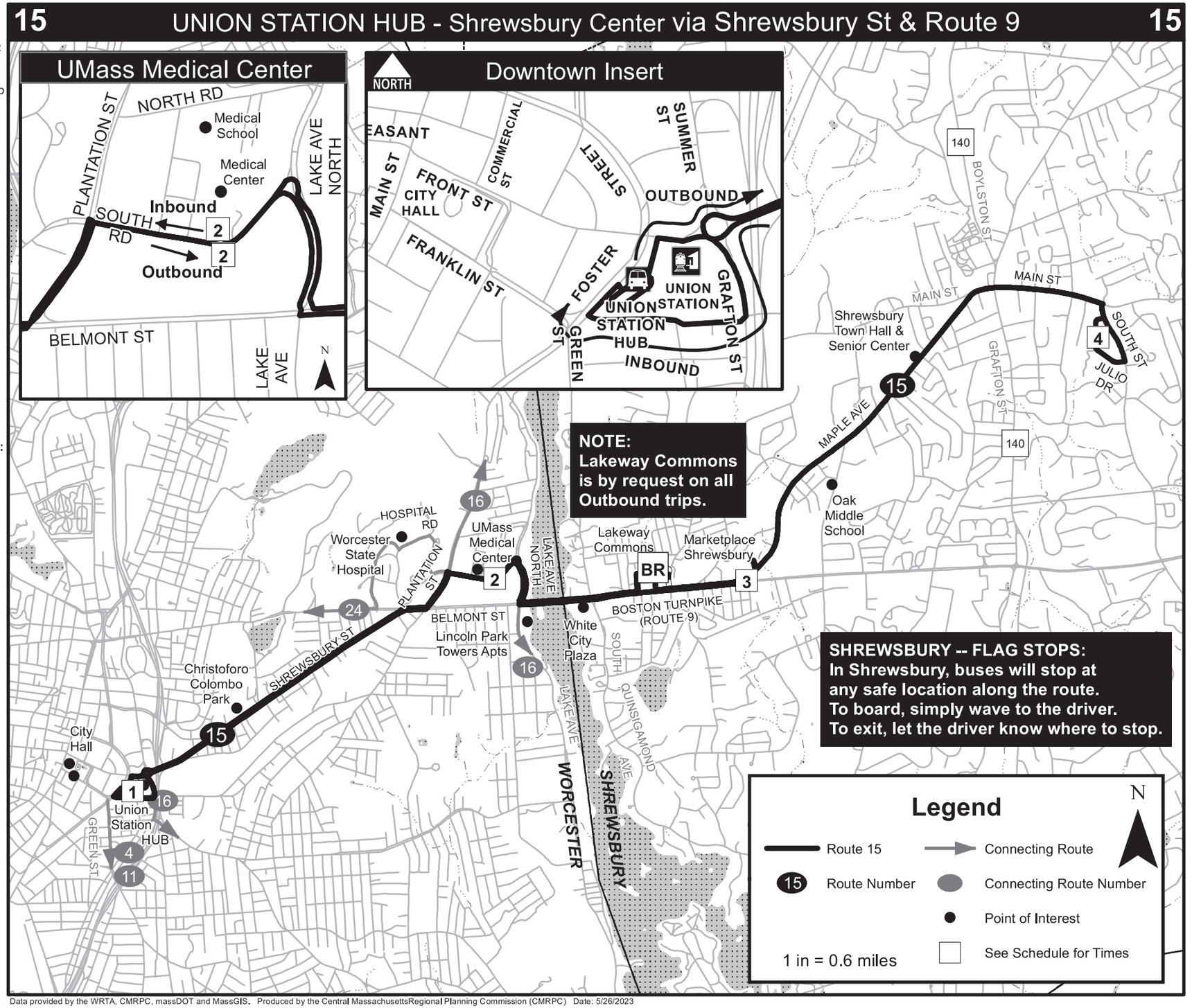
~ WRTA Customer Service Center/Hub
~ Union Station

Route 15 Serving:

~ Shrewsbury Street
~ Christoforo Columbo Park
~ UMass Medical Center
~ White City Plaza
~ Lakeway Commons
~ Marketplace Shrewsbury
~ Shrewsbury Town Hall
~ Shrewsbury Senior Center
~ Shrewsbury Center

Connecting Routes:

Route 16
Route 24/24A



Data provided by the WRTA, CMRPC, massDOT and MassGIS. Produced by the Central MassachusettsRegional Planning Commission (CMRPC) Date: 5/26/2023

Thank you for riding the

Crash Rate and Trip Generation Worksheets

Institute of Transportation Engineers (ITE); 11th Edition
Land Use Code (LUC) 822 - Strip Retail Plaza (less than 40,000 sf)

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Leasable Area
Independent Variable (X): 20.712 ksf

AVERAGE WEEKDAY DAILY
T = 42.20 * (X) + 229.68
T = 1,103.726
T = 1,104 vehicle trips
with 50% (552 vpd) entering and 50% (552 vpd) exiting.

WEEKDAY DAILY - Average Rate
T = 54.45 * (X)
T = 1127.77
T = 1,128 vehicle trips
with 564 vph entering and 564 vph exiting.

WEEKDAY AM PEAK HOUR OF ADJACENT STREET TRAFFIC
Ln T = 0.66 Ln (X) + 1.84
Ln T = 3.840
T = 46.53
T = 47 vehicle trips
with 60% (28 vph) entering and 40% (19 vph) exiting.

WEEKDAY AM PEAK HOUR - Average Rate
T = 2.36 * (X)
T = 48.88
T = 49 vehicle trips
with 29 vph entering and 20 vph exiting.

WEEKDAY PM PEAK HOUR OF ADJACENT STREET TRAFFIC
Ln T = 0.71 Ln (X) + 2.72
Ln T = 4.872
T = 130.58
T = 131 vehicle trips
with 50% (66 vph) entering and 50% (65 vph) exiting.

WEEKDAY PM PEAK HOUR - Average Rate
T = 6.59 * (X)
T = 136.49
T = 136 vehicle trips
with 68 vph entering and 68 vph exiting.

SATURDAY DAILY

$$\frac{\text{ITE LUC 821 Saturday Daily Trip Rate}}{\text{ITE LUC 821 Sat. Peak Hour Trip Rate}} = \frac{\text{ITE LUC 822 Saturday Daily Trip Rate}}{\text{ITE LUC 822 Sat. Peak Hour Trip Rate}}$$

$$\frac{81.07}{6.22} = \frac{(Y)}{6.57} \qquad Y = 85.632$$

T = 85.632 * (X)
T = 1773.61
T = 1770 vehicle trips
with 50% (885 vpd) entering and 50% (885 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR
T = 6.57 * (X)
T = 136.08
T = 136 vehicle trips
with 51% (69 vph) entering and 49% (67 vph) exiting.

Institute of Transportation Engineers (ITE); 11th Edition
Land Use Code (LUC) 822 - Strip Retail Plaza (less than 40,000 sf)

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Leasable Area
Independent Variable (X): 35.872 ksf

AVERAGE WEEKDAY DAILY
T = 42.20 * (X) + 229.68
T = 1,743.478
T = 1,743 vehicle trips
with 50% (872 vpd) entering and 50% (871 vpd) exiting.

WEEKDAY DAILY - Average Rate
T = 54.45 * (X)
T = 1953.23
T = 1,953 vehicle trips
with 977 vph entering and 976 vph exiting.

WEEKDAY AM PEAK HOUR OF ADJACENT STREET TRAFFIC
Ln T = 0.66 Ln (X) + 1.84
Ln T = 4.203
T = 66.89
T = 67 vehicle trips
with 60% (40 vph) entering and 40% (27 vph) exiting.

WEEKDAY AM PEAK HOUR - Average Rate
T = 2.36 * (X)
T = 84.66
T = 85 vehicle trips
with 51 vph entering and 34 vph exiting.

WEEKDAY PM PEAK HOUR OF ADJACENT STREET TRAFFIC
Ln T = 0.71 Ln (X) + 2.72
Ln T = 5.262
T = 192.87
T = 193 vehicle trips
with 50% (97 vph) entering and 50% (96 vph) exiting.

WEEKDAY PM PEAK HOUR - Average Rate
T = 6.59 * (X)
T = 236.40
T = 236 vehicle trips
with 118 vph entering and 118 vph exiting.

SATURDAY DAILY

$$\frac{\text{ITE LUC 821 Saturday Daily Trip Rate}}{\text{ITE LUC 821 Sat. Peak Hour Trip Rate}} = \frac{\text{ITE LUC 822 Saturday Daily Trip Rate}}{\text{ITE LUC 822 Sat. Peak Hour Trip Rate}}$$

$$\frac{81.07}{6.22} = \frac{(Y)}{6.57} \qquad Y = 85.632$$

T = 85.632 * (X)
T = 3071.7911
T = 3070 vehicle trips
with 50% (1535 vpd) entering and 50% (1535 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR
T = 6.57 * (X)
T = 235.68
T = 236 vehicle trips
with 51% (120 vph) entering and 49% (116 vph) exiting.

Institute of Transportation Engineers (ITE); 11th Edition
Land Use Code (LUC) 912 - Drive-In Bank

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area
Independent Variable (X): 5.100 ksf

AVERAGE WEEKDAY DAILY

T = 100.35 * (X)
T = 511.79
T = 510 vehicle trips
with 50% (255 vpd) entering and 50% (255 vpd) exiting.

WEEKDAY AM PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 9.95 * (X)
T = 50.75
T = 51 vehicle trips
with 58% (30 vph) entering and 42% (21 vph) exiting.

WEEKDAY PM PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 21.01 * (X)
T = 107.15
T = 107 vehicle trips
with 50% (54 vph) entering and 50% (53 vph) exiting.

SATURDAY DAILY

T = 86.48 * (X)
T = 441.05
T = 440 vehicle trips
with 50% (220 vpd) entering and 50% (220 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

T = 26.35 * (X)
T = 134.39
T = 134 vehicle trips
with 51% (68 vph) entering and 49% (66 vph) exiting.

Institute of Transportation Engineers (ITE); 11th Edition
Land Use Code (LUC) 912 - Drive-In Bank

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area
Independent Variable (X): 5.700 ksf

AVERAGE WEEKDAY DAILY

T = 100.35 * (X)
T = 572.00
T = 570 vehicle trips
with 50% (285 vpd) entering and 50% (285 vpd) exiting.

WEEKDAY AM PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 9.95 * (X)
T = 56.72
T = 57 vehicle trips
with 58% (33 vph) entering and 42% (24 vph) exiting.

WEEKDAY PM PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 21.01 * (X)
T = 119.76
T = 120 vehicle trips
with 50% (60 vph) entering and 50% (60 vph) exiting.

SATURDAY DAILY

T = 86.48 * (X)
T = 492.94
T = 490 vehicle trips
with 50% (245 vpd) entering and 50% (245 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

T = 26.35 * (X)
T = 150.20
T = 150 vehicle trips
with 51% (77 vph) entering and 49% (73 vph) exiting.

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Worcester COUNT DATE : Mar-24

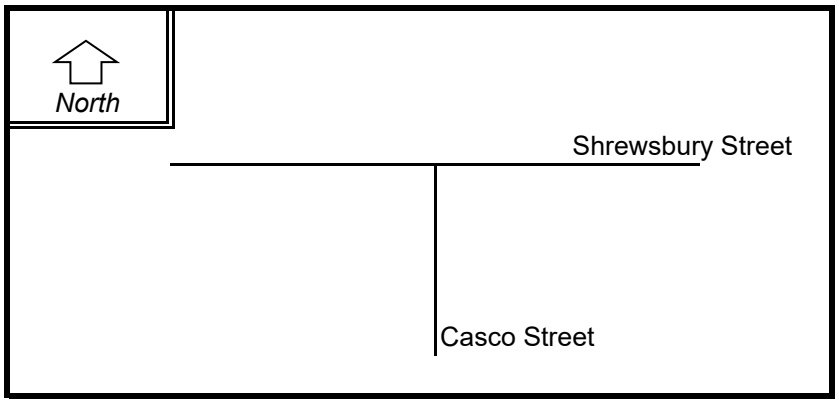
DISTRICT : 3 UNSIGNALIZED : x SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Shrewsbury Street

MINOR STREET(S) : Casco Street

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly
DIRECTION :	SB	WB	NB	EB		
PEAK HOURLY VOLUMES (PM) :		1,091	56	1,046		**2,193**

" K " FACTOR : **0.077** APPROACH VOLUME : **28,481**

TOTAL # OF CRASHES : 16 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **3.20**

CRASH RATE CALCULATION : **0.31** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : MassDOT Crash Portal 2015-2019

Project Title & Date: Retail and Bank Development 05-01-2024

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN: Worcester | COUNT DATE: Mar-24

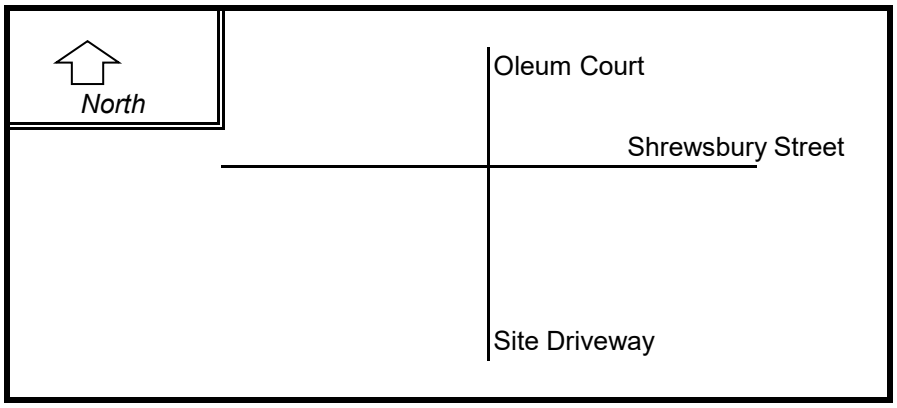
DISTRICT: 3 | UNSIGNALIZED: x | SIGNALIZED:

~ INTERSECTION DATA ~

MAJOR STREET: Shrewsbury Street

MINOR STREET(S): Site Driveway

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly
DIRECTION :	SB	WB	NB	EB		
PEAK HOURLY VOLUMES (PM) :	101	1,064	48	1,153		**2,366**

" K " FACTOR: **0.077** | APPROACH VOLUME: **30,727**

TOTAL # OF CRASHES :	22	# OF YEARS :	5	AVERAGE # OF CRASHES PER YEAR (**A**) :	**4.40**

CRASH RATE CALCULATION : **0.39**

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

Comments: MassDOT Crash Portal 2015-2019

Project Title & Date: Retail and Bank Development 05-01-2024

Drive Through Queue Analysis

Ron Müller & Associates
Traffic Engineering and Consulting Services

File Name : 24022 DCU DriveThru Lanes Fri
Site Code : 24022
Start Date : 5/17/2024

Summary Information:

11:55:00 AM - 2:01:00 PM	Lane 1: Teller	Lane 2: ATM
Total Vehicle Count:	24	35
Delayed Vehicle Count:	24	35
Through Vehicle Count:	0	0
Average Stopped Time:	592.75	197.000
Maximum Stopped Time:	1455	438
Min. Secs. for Delay:	0	0
Average Queue:	1.94	0.964
Queue Density:	2.15	1.808
Maximum Queue:	5	4
Delay in Vehicle Hour:	1.94	0.96
Total Delay:	14226	6895

Ron Müller & Associates

Traffic Engineering and Consulting Services

File Name : 24022 DCU DriveThru Lanes Sat
Site Code : 24022
Start Date : 5/18/2024
Page No : 1

Summary Information:

12:52:00 PM - 3:00:00 PM	Lane 1:Teller	Lane 2: ATM
Total Vehicle Count:	21	44
Delayed Vehicle Count:	21	44
Through Vehicle Count:	0	0
Average Stopped Time:	377.67	323.636
Maximum Stopped Time:	749	537
Min. Secs. for Delay:	0	0
Average Queue:	1.06	1.902
Queue Density:	1.54	2.191
Maximum Queue:	4	5
Delay in Vehicle Hour:	1.06	1.90
Total Delay:	7931	14240

Bank Drive-Through Queue and Parking Summary

Bank	Location	Time Period	Max. Queue in Teller Lane	Max. Queue in ATM Lane	Peak Parking Demand		
Institution for Savings	Rowley, MA	Friday 3 PM - 6 PM	2	2	18	3,100 sf	2 teller lanes, 1 ATM lane
Institution for Savings	Rowley, MA	Saturday 9 AM - 12 PM	2	4	9	3,100 sf	2 teller lanes, 1 ATM lane
Institution for Savings	Salisbury, MA	Friday 3 PM - 6 PM	1	1	9	3,620 sf	1 teller lane, 1 ATM lane
Institution for Savings	Salisbury, MA	Saturday 9 AM - 12 PM	4	3	14	3,620 sf	1 teller lane, 1 ATM lane
Institution for Savings	Topsfield, MA	Friday 3 PM - 6 PM	1	2	10	3,000 sf	1 teller lane, 1 ATM lane
Institution for Savings	Topsfield, MA	Saturday 9 AM - 12 PM	1	2	8	3,000 sf	1 teller lane, 1 ATM lane
Institution for Savings	Ipswich MA	Friday 3 PM - 6 PM	1	2	13	4,400 sf	1 teller lane, 1 ATM lane
Institution for Savings	Ipswich MA	Saturday 9 AM - 12 PM	1	1	15	4,400 sf	1 teller lane, 1 ATM lane
St. Mary's Credit Union	Hudson, MA	Friday 4 PM - 6 PM	3	5	NA	NA	2 teller lanes, 1 ATM lane
St. Mary's Credit Union	Hudson, MA	Saturday 9:30 AM to 12:30 PM	4	5	NA	NA	2 teller lanes, 1 ATM lane
St. Mary's Credit Union	Marlborough, MA	Friday 3 PM - 6 PM	3	3	NA	NA	2 teller lanes, 1 ATM lane
St. Mary's Credit Union	Marlborough, MA	Saturday 9:30 AM to 12:30 PM	3	2	NA	NA	2 teller lanes, 1 ATM lane
St. Mary's Credit Union	Northborough, MA	Friday 3 PM - 6 PM	2	2	NA	NA	1 teller lane, 1 ATM lane
St. Mary's Credit Union	Northborough, MA	Saturday 9:30 AM to 12:30 PM	4	3	NA	NA	1 teller lane, 1 ATM lane
Sovereign Bank	Norwell, MA	Friday 11 AM - 2 PM	4	2	NA	3,000 sf	1 teller lane, 1 ATM lane
		Maximum:	**4**	**5**	**18**		
		Average Max.:	**2**	**3**	**12**		

Capacity Analysis Methodology and Worksheets

General

A primary result of capacity analysis is the assignment of levels of service to traffic facilities under various traffic flow conditions. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM); Transportation Research Board; Washington, D.C.; 2010. The concept of level of service (LOS) 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 LOS A representing the best operating conditions and LOS F the worst. 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. A description of the operating condition under each level of service is provided below:

- LOS A describes conditions with little to no delay to motorists.
- LOS B represents a desirable level with relatively low delay to motorists.
- LOS C describes conditions with average delays to motorists.
- LOS D describes operations where the influence of congestion becomes more noticeable. Delays are still within an acceptable range.
- LOS E represents operating conditions with high delay values. This level is considered by many agencies to be the limit of acceptable delay.
- LOS F is considered to be unacceptable to most drivers with high delay values that often occur, when arrival flow rates exceed the capacity of the intersection.

Unsignalized Intersections

Levels of service for unsignalized intersections are calculated using the operational analysis methodology of the HCM. The procedure accounts for lane configuration on both the minor and major street approaches, conflicting traffic stream volumes, and the type of intersection control (STOP, YIELD, or all-way STOP control). The definition of level of service for unsignalized intersections is a function of average *control* delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The level-of-service criteria for unsignalized intersections are shown in Table A-1.

Signalized Intersections

Levels of service for signalized intersections are also calculated using the operational analysis methodology of the HCM. The methodology for signalized intersections assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometries on average *control* delay. Control delay includes queue move-up time and stopped delay. Table A-l summarizes the relationship between level of service and average control delay.

Table A-1
Level-of-Service Criteria for Intersections

Level of Service	Unsignalized Criteria Average Control Delay In Seconds Per Vehicle	Signalized Criteria Average Control Delay In Seconds Per Vehicle
A	≤ 10	≤ 10
B	10.1 to 15.0	10.1 to 20.0
C	15.1 to 25.0	20.1 to 35.0
D	25.1 to 35.0	35.1 to 55.0
E	35.1 to 50.0	55.1 to 80.0
F	>50	>80

For signalized intersections, this delay criterion may be applied in assigning level of service designations to individual lane groups, to individual intersection approaches, or to the entire intersection. For unsignalized intersections, this delay criterion may be applied in assigning level of service designations to individual lane groups or to individual intersection approaches.

Intersection	
Int Delay, s/veh	0.4

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEU	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations													
Traffic Vol, veh/h	0	0	12	3	1	6	16	11	1173	30	0	636	0
Future Vol, veh/h	0	0	12	3	1	6	16	11	1173	30	0	636	0
Conflicting Peds, #/hr	0	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	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	80	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	91	91	91	91	95	95	95
Heavy Vehicles, %	0	0	0	0	0	17	0	9	3	0	0	4	0
Mvmt Flow	0	0	19	5	2	10	18	12	1289	33	0	669	0

Major/Minor	Minor1			Minor2			Major1				Major2		
Conflicting Flow All	-	-	661	1374	2051	335	669	669	0	0	-	-	0
Stage 1	-	-	-	669	669	-	-	-	-	-	-	-	-
Stage 2	-	-	-	705	1382	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	7.24	6.4	4.28	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.47	2.5	2.29	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	410	106	56	619	548	871	-	-	0	-	-
Stage 1	0	0	-	418	459	-	-	-	-	-	0	-	-
Stage 2	0	0	-	398	213	-	-	-	-	-	0	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	-	410	97	53	619	641	641	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	217	148	-	-	-	-	-	-	-	-
Stage 1	-	-	-	398	459	-	-	-	-	-	-	-	-
Stage 2	-	-	-	362	203	-	-	-	-	-	-	-	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	14.2	16.5	0.2	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NEL	NET	NER	NBLn1	SBLn1	SWT	SWR
Capacity (veh/h)	641	-	-	410	330	-	-
HCM Lane V/C Ratio	0.046	-	-	0.046	0.048	-	-
HCM Control Delay (s)	10.9	-	-	14.2	16.5	-	-
HCM Lane LOS	B	-	-	B	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	6	19	1181	8	37	637
Future Vol, veh/h	6	19	1181	8	37	637
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	53	53	95	95	96	96
Heavy Vehicles, %	20	6	2	13	5	3
Mvmt Flow	11	36	1243	8	39	664

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1657	626	0	0	1251	0
Stage 1	1247	-	-	-	-	-
Stage 2	410	-	-	-	-	-
Critical Hdwy	7.2	7.02	-	-	4.2	-
Critical Hdwy Stg 1	6.2	-	-	-	-	-
Critical Hdwy Stg 2	6.2	-	-	-	-	-
Follow-up Hdwy	3.7	3.36	-	-	2.25	-
Pot Cap-1 Maneuver	74	417	-	-	536	-
Stage 1	202	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	69	417	-	-	536	-
Mov Cap-2 Maneuver	158	-	-	-	-	-
Stage 1	202	-	-	-	-	-
Stage 2	545	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	19.3	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	299	536	-
HCM Lane V/C Ratio	-	-	0.158	0.072	-
HCM Control Delay (s)	-	-	19.3	12.2	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.6	0.2	-

Intersection	
Int Delay, s/veh	2.4

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	0	15	38	0	12	7
Future Vol, veh/h	0	15	38	0	12	7
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	85	85	79	79
Heavy Vehicles, %	0	3	0	20	0	0
Mvmt Flow	0	20	45	0	15	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	45	0	-	0	65	45
Stage 1	-	-	-	-	45	-
Stage 2	-	-	-	-	20	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1576	-	-	-	946	1031
Stage 1	-	-	-	-	983	-
Stage 2	-	-	-	-	1008	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1576	-	-	-	946	1031
Mov Cap-2 Maneuver	-	-	-	-	946	-
Stage 1	-	-	-	-	983	-
Stage 2	-	-	-	-	1008	-

Approach	NB	SB	NE
HCM Control Delay, s	0	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	946	1031	1576	-	-	-
HCM Lane V/C Ratio	0.016	0.009	-	-	-	-
HCM Control Delay (s)	8.9	8.5	0	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	0	0	0	-	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	11	2	14	35	67	19
Future Vol, veh/h	11	2	14	35	67	19
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	65	65	82	82	83	83
Heavy Vehicles, %	0	0	0	11	0	0
Mvmt Flow	17	3	17	43	81	23

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	170	93	104	0	-	0
Stage 1	93	-	-	-	-	-
Stage 2	77	-	-	-	-	-
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	825	970	1500	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	951	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	815	970	1500	-	-	-
Mov Cap-2 Maneuver	815	-	-	-	-	-
Stage 1	925	-	-	-	-	-
Stage 2	951	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	9.4	2.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SWT	SWR
Capacity (veh/h)	1500	-	836	-	-
HCM Lane V/C Ratio	0.011	-	0.024	-	-
HCM Control Delay (s)	7.4	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEU	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations													
Traffic Vol, veh/h	0	0	45	20	0	81	48	43	978	83	0	1019	35
Future Vol, veh/h	0	0	45	20	0	81	48	43	978	83	0	1019	35
Conflicting Peds, #/hr	0	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	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	80	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	83	83	83	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0	2	0	1	1	0	1	0
Mvmt Flow	0	0	69	24	0	98	49	44	998	85	0	1040	36

Major/Minor	Minor1			Minor2			Major1				Major2		
Conflicting Flow All	-	-	542	1743	2327	538	1076	1076	0	0	-	-	0
Stage 1	-	-	-	1058	1058	-	-	-	-	-	-	-	-
Stage 2	-	-	-	685	1269	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	6.44	4.1	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.52	2.2	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	490	57	38	493	297	656	-	-	0	-	-
Stage 1	0	0	-	244	304	-	-	-	-	-	0	-	-
Stage 2	0	0	-	409	242	-	-	-	-	-	0	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	-	490	39	28	493	351	351	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	114	114	-	-	-	-	-	-	-	-
Stage 1	-	-	-	179	304	-	-	-	-	-	-	-	-
Stage 2	-	-	-	258	178	-	-	-	-	-	-	-	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	13.6	25.3	1.5	0
HCM LOS	B	D		

Minor Lane/Major Mvmt	NEL	NET	NER	NBLn1	SBLn1	SWT	SWR
Capacity (veh/h)	351	-	-	490	297	-	-
HCM Lane V/C Ratio	0.265	-	-	0.141	0.41	-	-
HCM Control Delay (s)	18.9	-	-	13.6	25.3	-	-
HCM Lane LOS	C	-	-	B	D	-	-
HCM 95th %tile Q(veh)	1	-	-	0.5	1.9	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	13	43	1035	11	40	1051
Future Vol, veh/h	13	43	1035	11	40	1051
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	97	97	96	96
Heavy Vehicles, %	8	7	2	9	0	1
Mvmt Flow	16	52	1067	11	42	1095

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1705	539	0	0	1078	0
Stage 1	1073	-	-	-	-	-
Stage 2	632	-	-	-	-	-
Critical Hdwy	6.96	7.04	-	-	4.1	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.37	-	-	2.2	-
Pot Cap-1 Maneuver	77	474	-	-	655	-
Stage 1	277	-	-	-	-	-
Stage 2	476	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	72	474	-	-	655	-
Mov Cap-2 Maneuver	187	-	-	-	-	-
Stage 1	277	-	-	-	-	-
Stage 2	446	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	17.8	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	349	655	-
HCM Lane V/C Ratio	-	-	0.196	0.064	-
HCM Control Delay (s)	-	-	17.8	10.9	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.7	0.2	-

Intersection	
Int Delay, s/veh	4

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	0	23	45	0	33	17
Future Vol, veh/h	0	23	45	0	33	17
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	85	85	74	74
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	31	53	0	45	23

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	53	0	-	0	84	53
Stage 1	-	-	-	-	53	-
Stage 2	-	-	-	-	31	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1566	-	-	-	923	1020
Stage 1	-	-	-	-	975	-
Stage 2	-	-	-	-	997	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1566	-	-	-	923	1020
Mov Cap-2 Maneuver	-	-	-	-	923	-
Stage 1	-	-	-	-	975	-
Stage 2	-	-	-	-	997	-

Approach	NB	SB	NE
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	923	1020	1566	-	-	-
HCM Lane V/C Ratio	0.048	0.023	-	-	-	-
HCM Control Delay (s)	9.1	8.6	0	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.1	0	-	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	3	33	18	44	86	27
Future Vol, veh/h	3	33	18	44	86	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	65	65	86	86
Heavy Vehicles, %	33	0	0	2	1	0
Mvmt Flow	4	48	28	68	100	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	240	116	131	0	-	0
Stage 1	116	-	-	-	-	-
Stage 2	124	-	-	-	-	-
Critical Hdwy	6.73	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	685	942	1467	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	671	942	1467	-	-	-
Mov Cap-2 Maneuver	671	-	-	-	-	-
Stage 1	820	-	-	-	-	-
Stage 2	830	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	9.2	2.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SWT	SWR
Capacity (veh/h)	1467	-	911	-	-
HCM Lane V/C Ratio	0.019	-	0.057	-	-
HCM Control Delay (s)	7.5	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEU	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations													
Traffic Vol, veh/h	0	0	51	6	0	22	91	21	815	103	0	633	2
Future Vol, veh/h	0	0	51	6	0	22	91	21	815	103	0	633	2
Conflicting Peds, #/hr	0	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	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	80	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	63	63	63	93	93	93	93	99	99	99
Heavy Vehicles, %	0	0	0	0	0	0	0	1	1	0	0	1	0
Mvmt Flow	0	0	63	10	0	35	98	23	876	111	0	639	2

Major/Minor	Minor1			Minor2			Major1				Major2		
Conflicting Flow All	-	-	494	1320	1869	321	641	641	0	0	-	-	0
Stage 1	-	-	-	640	640	-	-	-	-	-	-	-	-
Stage 2	-	-	-	680	1229	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	6.4	4.12	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.5	2.21	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	526	117	73	681	571	946	-	-	0	-	-
Stage 1	0	0	-	435	473	-	-	-	-	-	0	-	-
Stage 2	0	0	-	412	252	-	-	-	-	-	0	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	-	526	87	58	681	600	600	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	184	151	-	-	-	-	-	-	-	-
Stage 1	-	-	-	348	473	-	-	-	-	-	-	-	-
Stage 2	-	-	-	290	202	-	-	-	-	-	-	-	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	12.8	14.3	1.4	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NBLn1	SBLn1	SWT	SWR
Capacity (veh/h)	600	-	-	526	431	-	-
HCM Lane V/C Ratio	0.201	-	-	0.12	0.103	-	-
HCM Control Delay (s)	12.5	-	-	12.8	14.3	-	-
HCM Lane LOS	B	-	-	B	B	-	-
HCM 95th %tile Q(veh)	0.7	-	-	0.4	0.3	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	17	51	869	3	48	621
Future Vol, veh/h	17	51	869	3	48	621
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	87	87	89	89
Heavy Vehicles, %	6	0	2	0	2	2
Mvmt Flow	20	61	999	3	54	698

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1458	501	0	0	1002	0
Stage 1	1001	-	-	-	-	-
Stage 2	457	-	-	-	-	-
Critical Hdwy	6.92	6.9	-	-	4.14	-
Critical Hdwy Stg 1	5.92	-	-	-	-	-
Critical Hdwy Stg 2	5.92	-	-	-	-	-
Follow-up Hdwy	3.56	3.3	-	-	2.22	-
Pot Cap-1 Maneuver	116	521	-	-	687	-
Stage 1	307	-	-	-	-	-
Stage 2	593	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	107	521	-	-	687	-
Mov Cap-2 Maneuver	223	-	-	-	-	-
Stage 1	307	-	-	-	-	-
Stage 2	546	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	16.6	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	391	687	-
HCM Lane V/C Ratio	-	-	0.207	0.079	-
HCM Control Delay (s)	-	-	16.6	10.7	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.8	0.3	-

Intersection	
Int Delay, s/veh	3.9

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	0	20	48	0	48	14
Future Vol, veh/h	0	20	48	0	48	14
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	63	71	71	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	32	68	0	57	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	68	0	-	0	100	68
Stage 1	-	-	-	-	68	-
Stage 2	-	-	-	-	32	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1546	-	-	-	904	1001
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	996	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1546	-	-	-	904	1001
Mov Cap-2 Maneuver	-	-	-	-	904	-
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	996	-

Approach	NB	SB	NE
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	904	1001	1546	-	-	-
HCM Lane V/C Ratio	0.063	0.017	-	-	-	-
HCM Control Delay (s)	9.3	8.7	0	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.1	0	-	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	4	34	29	27	38	32
Future Vol, veh/h	4	34	29	27	38	32
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	79	79	74	74	70	70
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	5	43	39	36	54	46

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	191	77	100	0	-	0
Stage 1	77	-	-	-	-	-
Stage 2	114	-	-	-	-	-
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	803	990	1505	-	-	-
Stage 1	951	-	-	-	-	-
Stage 2	916	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	782	990	1505	-	-	-
Mov Cap-2 Maneuver	782	-	-	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	916	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	8.9	3.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SWT	SWR
Capacity (veh/h)	1505	-	963	-	-
HCM Lane V/C Ratio	0.026	-	0.05	-	-
HCM Control Delay (s)	7.5	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEU	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations													
Traffic Vol, veh/h	0	0	13	3	1	16	17	14	1262	33	0	695	1
Future Vol, veh/h	0	0	13	3	1	16	17	14	1262	33	0	695	1
Conflicting Peds, #/hr	0	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	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	80	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	91	91	91	91	95	95	95
Heavy Vehicles, %	0	0	0	0	0	17	0	9	3	0	0	4	0
Mvmt Flow	0	0	21	5	2	25	19	15	1387	36	0	732	1

Major/Minor	Minor1			Minor2			Major1				Major2		
Conflicting Flow All	-	-	712	1495	2224	367	733	733	0	0	-	-	0
Stage 1	-	-	-	733	733	-	-	-	-	-	-	-	-
Stage 2	-	-	-	762	1491	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	7.24	6.4	4.28	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.47	2.5	2.29	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	379	87	44	589	499	823	-	-	0	-	-
Stage 1	0	0	-	383	429	-	-	-	-	-	0	-	-
Stage 2	0	0	-	368	189	-	-	-	-	-	0	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	-	379	79	41	589	595	595	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	193	130	-	-	-	-	-	-	-	-
Stage 1	-	-	-	361	429	-	-	-	-	-	-	-	-
Stage 2	-	-	-	328	178	-	-	-	-	-	-	-	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	15	14.9	0.3	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NBLn1	SBLn1	SWT	SWR
Capacity (veh/h)	595	-	-	379	397	-	-
HCM Lane V/C Ratio	0.057	-	-	0.054	0.08	-	-
HCM Control Delay (s)	11.4	-	-	15	14.9	-	-
HCM Lane LOS	B	-	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.3	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	11	23	1269	9	50	685
Future Vol, veh/h	11	23	1269	9	50	685
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	53	53	95	95	96	96
Heavy Vehicles, %	20	6	2	13	5	3
Mvmt Flow	21	43	1336	9	52	714

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1802	673	0	0	1345	0
Stage 1	1341	-	-	-	-	-
Stage 2	461	-	-	-	-	-
Critical Hdwy	7.2	7.02	-	-	4.2	-
Critical Hdwy Stg 1	6.2	-	-	-	-	-
Critical Hdwy Stg 2	6.2	-	-	-	-	-
Follow-up Hdwy	3.7	3.36	-	-	2.25	-
Pot Cap-1 Maneuver	58	388	-	-	493	-
Stage 1	178	-	-	-	-	-
Stage 2	552	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	52	388	-	-	493	-
Mov Cap-2 Maneuver	137	-	-	-	-	-
Stage 1	178	-	-	-	-	-
Stage 2	494	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	24.9	0	0.9
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	244	493	-
HCM Lane V/C Ratio	-	-	0.263	0.106	-
HCM Control Delay (s)	-	-	24.9	13.2	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	1	0.4	-

Intersection	
Int Delay, s/veh	1.8

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	0	21	59	0	13	7
Future Vol, veh/h	0	21	59	0	13	7
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	85	85	79	79
Heavy Vehicles, %	0	3	0	20	0	0
Mvmt Flow	0	28	69	0	16	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	69	0	-	0	97	69
Stage 1	-	-	-	-	69	-
Stage 2	-	-	-	-	28	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1545	-	-	-	907	1000
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	1000	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1545	-	-	-	907	1000
Mov Cap-2 Maneuver	-	-	-	-	907	-
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	1000	-

Approach	NB	SB	NE
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	907	1000	1545	-	-	-
HCM Lane V/C Ratio	0.018	0.009	-	-	-	-
HCM Control Delay (s)	9	8.6	0	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	0.1	0	0	-	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	15	3	14	38	72	35
Future Vol, veh/h	15	3	14	38	72	35
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	65	65	82	82	83	83
Heavy Vehicles, %	0	0	0	11	0	0
Mvmt Flow	23	5	17	46	87	42

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	188	108	129	0	-	0
Stage 1	108	-	-	-	-	-
Stage 2	80	-	-	-	-	-
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	806	951	1469	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	948	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	796	951	1469	-	-	-
Mov Cap-2 Maneuver	796	-	-	-	-	-
Stage 1	910	-	-	-	-	-
Stage 2	948	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	9.6	2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SWT	SWR
Capacity (veh/h)	1469	-	818	-	-
HCM Lane V/C Ratio	0.012	-	0.034	-	-
HCM Control Delay (s)	7.5	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEU	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations													
Traffic Vol, veh/h	0	0	50	23	0	91	51	51	1065	90	0	1106	43
Future Vol, veh/h	0	0	50	23	0	91	51	51	1065	90	0	1106	43
Conflicting Peds, #/hr	0	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	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	80	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	83	83	83	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0	2	0	1	1	0	1	0
Mvmt Flow	0	0	77	28	0	110	52	52	1087	92	0	1129	44

Major/Minor	Minor1			Minor2			Major1				Major2		
Conflicting Flow All	-	-	590	1903	2538	587	1172	1173	0	0	-	-	0
Stage 1	-	-	-	1151	1151	-	-	-	-	-	-	-	-
Stage 2	-	-	-	752	1387	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	6.44	4.1	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.52	2.2	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	456	43	28	458	257	603	-	-	0	-	-
Stage 1	0	0	-	214	275	-	-	-	-	-	0	-	-
Stage 2	0	0	-	373	212	-	-	-	-	-	0	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	-	456	~ 26	19	458	307	307	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	88	92	-	-	-	-	-	-	-	-
Stage 1	-	-	-	141	275	-	-	-	-	-	-	-	-
Stage 2	-	-	-	205	140	-	-	-	-	-	-	-	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	14.5	36.2	1.8	0
HCM LOS	B	E		

Minor Lane/Major Mvmt	NEL	NET	NER	NBLn1	SBLn1	SWT	SWR
Capacity (veh/h)	307	-	-	456	248	-	-
HCM Lane V/C Ratio	0.339	-	-	0.169	0.554	-	-
HCM Control Delay (s)	22.6	-	-	14.5	36.2	-	-
HCM Lane LOS	C	-	-	B	E	-	-
HCM 95th %tile Q(veh)	1.5	-	-	0.6	3.1	-	-

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

Intersection	
Int Delay, s/veh	1.1

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	21	51	1126	12	60	1128
Future Vol, veh/h	21	51	1126	12	60	1128
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	97	97	96	96
Heavy Vehicles, %	8	7	2	9	0	1
Mvmt Flow	26	62	1161	12	63	1175

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1881	587	0	0	1173	0
Stage 1	1167	-	-	-	-	-
Stage 2	714	-	-	-	-	-
Critical Hdwy	6.96	7.04	-	-	4.1	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.37	-	-	2.2	-
Pot Cap-1 Maneuver	59	441	-	-	603	-
Stage 1	246	-	-	-	-	-
Stage 2	431	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	53	441	-	-	603	-
Mov Cap-2 Maneuver	160	-	-	-	-	-
Stage 1	246	-	-	-	-	-
Stage 2	386	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	22.5	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	292	603	-
HCM Lane V/C Ratio	-	-	0.301	0.104	-
HCM Control Delay (s)	-	-	22.5	11.7	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	1.2	0.3	-

Intersection	
Int Delay, s/veh	3.3

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	0	35	72	0	37	17
Future Vol, veh/h	0	35	72	0	37	17
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	85	85	74	74
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	47	85	0	50	23

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	85	0	-	0	132	85
Stage 1	-	-	-	-	85	-
Stage 2	-	-	-	-	47	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1524	-	-	-	867	980
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	981	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1524	-	-	-	867	980
Mov Cap-2 Maneuver	-	-	-	-	867	-
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	981	-

Approach	NB	SB	NE
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	867	980	1524	-	-	-
HCM Lane V/C Ratio	0.058	0.023	-	-	-	-
HCM Control Delay (s)	9.4	8.8	0	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.1	0	-	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	9	37	20	47	92	48
Future Vol, veh/h	9	37	20	47	92	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	65	65	86	86
Heavy Vehicles, %	33	0	0	2	1	0
Mvmt Flow	13	54	31	72	107	56

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	269	135	163	0	-	0
Stage 1	135	-	-	-	-	-
Stage 2	134	-	-	-	-	-
Critical Hdwy	6.73	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	659	919	1428	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	821	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	644	919	1428	-	-	-
Mov Cap-2 Maneuver	644	-	-	-	-	-
Stage 1	802	-	-	-	-	-
Stage 2	821	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	9.6	2.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SWT	SWR
Capacity (veh/h)	1428	-	848	-	-
HCM Lane V/C Ratio	0.022	-	0.079	-	-
HCM Control Delay (s)	7.6	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEU	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations													
Traffic Vol, veh/h	0	0	58	6	0	24	98	23	878	116	0	693	2
Future Vol, veh/h	0	0	58	6	0	24	98	23	878	116	0	693	2
Conflicting Peds, #/hr	0	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	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	80	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	63	63	63	93	93	93	93	99	99	99
Heavy Vehicles, %	0	0	0	0	0	0	0	1	1	0	0	1	0
Mvmt Flow	0	0	72	10	0	38	105	25	944	125	0	700	2

Major/Minor	Minor1			Minor2			Major1				Major2		
Conflicting Flow All	-	-	535	1433	2030	351	702	702	0	0	-	-	0
Stage 1	-	-	-	701	701	-	-	-	-	-	-	-	-
Stage 2	-	-	-	732	1329	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	6.4	4.12	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.5	2.21	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	495	96	58	651	522	898	-	-	0	-	-
Stage 1	0	0	-	400	444	-	-	-	-	-	0	-	-
Stage 2	0	0	-	383	226	-	-	-	-	-	0	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	-	495	67	44	651	549	549	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	156	129	-	-	-	-	-	-	-	-
Stage 1	-	-	-	305	444	-	-	-	-	-	-	-	-
Stage 2	-	-	-	250	172	-	-	-	-	-	-	-	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	13.5	15.3	1.5	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NEL	NET	NER	NBLn1	SBLn1	SWT	SWR
Capacity (veh/h)	549	-	-	495	398	-	-
HCM Lane V/C Ratio	0.237	-	-	0.145	0.12	-	-
HCM Control Delay (s)	13.6	-	-	13.5	15.3	-	-
HCM Lane LOS	B	-	-	B	C	-	-
HCM 95th %tile Q(veh)	0.9	-	-	0.5	0.4	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	32	58	939	3	65	663
Future Vol, veh/h	32	58	939	3	65	663
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	87	87	89	89
Heavy Vehicles, %	6	0	2	0	2	2
Mvmt Flow	38	69	1079	3	73	745

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1600	541	0	0	1082	0
Stage 1	1081	-	-	-	-	-
Stage 2	519	-	-	-	-	-
Critical Hdwy	6.92	6.9	-	-	4.14	-
Critical Hdwy Stg 1	5.92	-	-	-	-	-
Critical Hdwy Stg 2	5.92	-	-	-	-	-
Follow-up Hdwy	3.56	3.3	-	-	2.22	-
Pot Cap-1 Maneuver	93	491	-	-	640	-
Stage 1	278	-	-	-	-	-
Stage 2	551	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	82	491	-	-	640	-
Mov Cap-2 Maneuver	196	-	-	-	-	-
Stage 1	278	-	-	-	-	-
Stage 2	488	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	21.8	0	1
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	320	640	-
HCM Lane V/C Ratio	-	-	0.335	0.114	-
HCM Control Delay (s)	-	-	21.8	11.3	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	1.4	0.4	-

Intersection	
Int Delay, s/veh	3.2

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	0	37	68	0	53	14
Future Vol, veh/h	0	37	68	0	53	14
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	63	71	71	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	59	96	0	63	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	96	0	-	0	155	96
Stage 1	-	-	-	-	96	-
Stage 2	-	-	-	-	59	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1510	-	-	-	841	966
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	969	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1510	-	-	-	841	966
Mov Cap-2 Maneuver	-	-	-	-	841	-
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	969	-

Approach	NB	SB	NE
HCM Control Delay, s	0	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	841	966	1510	-	-	-
HCM Lane V/C Ratio	0.075	0.017	-	-	-	-
HCM Control Delay (s)	9.6	8.8	0	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.1	0	-	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	16	40	30	29	41	49
Future Vol, veh/h	16	40	30	29	41	49
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	79	79	74	74	70	70
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	20	51	41	39	59	70

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	215	94	129	0	-	0
Stage 1	94	-	-	-	-	-
Stage 2	121	-	-	-	-	-
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	778	968	1469	-	-	-
Stage 1	935	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	755	968	1469	-	-	-
Mov Cap-2 Maneuver	755	-	-	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	909	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	9.4	3.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SWT	SWR
Capacity (veh/h)	1469	-	896	-	-
HCM Lane V/C Ratio	0.028	-	0.079	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEU	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations													
Traffic Vol, veh/h	0	0	14	3	1	16	17	14	1262	38	0	697	1
Future Vol, veh/h	0	0	14	3	1	16	17	14	1262	38	0	697	1
Conflicting Peds, #/hr	0	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	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	80	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	91	91	91	91	95	95	95
Heavy Vehicles, %	0	0	0	0	0	17	0	9	3	0	0	4	0
Mvmt Flow	0	0	22	5	2	25	19	15	1387	42	0	734	1

Major/Minor	Minor1			Minor2			Major1				Major2		
Conflicting Flow All	-	-	715	1497	2232	368	735	735	0	0	-	-	0
Stage 1	-	-	-	735	735	-	-	-	-	-	-	-	-
Stage 2	-	-	-	762	1497	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	7.24	6.4	4.28	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.47	2.5	2.29	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	378	86	43	588	498	821	-	-	0	-	-
Stage 1	0	0	-	382	428	-	-	-	-	-	0	-	-
Stage 2	0	0	-	368	188	-	-	-	-	-	0	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	-	378	77	41	588	594	594	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	191	129	-	-	-	-	-	-	-	-
Stage 1	-	-	-	360	428	-	-	-	-	-	-	-	-
Stage 2	-	-	-	327	177	-	-	-	-	-	-	-	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	15.1	14.9	0.3	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NEL	NET	NER	NBLn1	SBLn1	SWT	SWR
Capacity (veh/h)	594	-	-	378	395	-	-
HCM Lane V/C Ratio	0.057	-	-	0.059	0.08	-	-
HCM Control Delay (s)	11.4	-	-	15.1	14.9	-	-
HCM Lane LOS	B	-	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.3	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	13	25	1270	9	53	685
Future Vol, veh/h	13	25	1270	9	53	685
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	53	53	95	95	96	96
Heavy Vehicles, %	20	6	2	13	5	3
Mvmt Flow	25	47	1337	9	55	714

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1809	673	0	0	1346	0
Stage 1	1342	-	-	-	-	-
Stage 2	467	-	-	-	-	-
Critical Hdwy	7.2	7.02	-	-	4.2	-
Critical Hdwy Stg 1	6.2	-	-	-	-	-
Critical Hdwy Stg 2	6.2	-	-	-	-	-
Follow-up Hdwy	3.7	3.36	-	-	2.25	-
Pot Cap-1 Maneuver	58	388	-	-	492	-
Stage 1	178	-	-	-	-	-
Stage 2	548	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	52	388	-	-	492	-
Mov Cap-2 Maneuver	137	-	-	-	-	-
Stage 1	178	-	-	-	-	-
Stage 2	487	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	26.4	0	1
HCM LOS	D		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	239	492	-
HCM Lane V/C Ratio	-	-	0.3	0.112	-
HCM Control Delay (s)	-	-	26.4	13.2	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	1.2	0.4	-

Intersection	
Int Delay, s/veh	2

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	0	22	62	0	16	7
Future Vol, veh/h	0	22	62	0	16	7
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	85	85	79	79
Heavy Vehicles, %	0	3	0	20	0	0
Mvmt Flow	0	29	73	0	20	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	73	0	-	0	102	73
Stage 1	-	-	-	-	73	-
Stage 2	-	-	-	-	29	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1540	-	-	-	901	995
Stage 1	-	-	-	-	955	-
Stage 2	-	-	-	-	999	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1540	-	-	-	901	995
Mov Cap-2 Maneuver	-	-	-	-	901	-
Stage 1	-	-	-	-	955	-
Stage 2	-	-	-	-	999	-

Approach	NB	SB	NE
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	901	995	1540	-	-	-
HCM Lane V/C Ratio	0.022	0.009	-	-	-	-
HCM Control Delay (s)	9.1	8.7	0	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	0.1	0	0	-	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	16	5	15	38	72	38
Future Vol, veh/h	16	5	15	38	72	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	65	65	82	82	83	83
Heavy Vehicles, %	0	0	0	11	0	0
Mvmt Flow	25	8	18	46	87	46

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	192	110	133	0	-	0
Stage 1	110	-	-	-	-	-
Stage 2	82	-	-	-	-	-
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	801	949	1464	-	-	-
Stage 1	920	-	-	-	-	-
Stage 2	946	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	791	949	1464	-	-	-
Mov Cap-2 Maneuver	791	-	-	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	946	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	9.5	2.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SWT	SWR
Capacity (veh/h)	1464	-	824	-	-
HCM Lane V/C Ratio	0.012	-	0.039	-	-
HCM Control Delay (s)	7.5	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEU	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations													
Traffic Vol, veh/h	0	0	53	23	0	91	51	51	1065	101	0	1116	43
Future Vol, veh/h	0	0	53	23	0	91	51	51	1065	101	0	1116	43
Conflicting Peds, #/hr	0	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	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	80	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	83	83	83	98	98	98	98	98	98	98
Heavy Vehicles, %	0	0	0	0	0	0	2	0	1	1	0	1	0
Mvmt Flow	0	0	82	28	0	110	52	52	1087	103	0	1139	44

Major/Minor	Minor1			Minor2			Major1				Major2		
Conflicting Flow All	-	-	595	1913	2559	592	1183	1183	0	0	-	-	0
Stage 1	-	-	-	1161	1161	-	-	-	-	-	-	-	-
Stage 2	-	-	-	752	1398	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	6.44	4.1	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.52	2.2	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	452	42	27	454	253	597	-	-	0	-	-
Stage 1	0	0	-	211	272	-	-	-	-	-	0	-	-
Stage 2	0	0	-	373	209	-	-	-	-	-	0	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	-	452	~ 25	18	454	302	302	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	85	90	-	-	-	-	-	-	-	-
Stage 1	-	-	-	138	272	-	-	-	-	-	-	-	-
Stage 2	-	-	-	200	137	-	-	-	-	-	-	-	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	14.7	37.8	1.9	0
HCM LOS	B	E		

Minor Lane/Major Mvmt	NEL	NET	NER	NBLn1	SBLn1	SWT	SWR
Capacity (veh/h)	302	-	-	452	242	-	-
HCM Lane V/C Ratio	0.345	-	-	0.18	0.568	-	-
HCM Control Delay (s)	23.1	-	-	14.7	37.8	-	-
HCM Lane LOS	C	-	-	B	E	-	-
HCM 95th %tile Q(veh)	1.5	-	-	0.7	3.2	-	-

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

Intersection	
Int Delay, s/veh	1.5

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	31	56	1129	12	70	1128
Future Vol, veh/h	31	56	1129	12	70	1128
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	97	97	96	96
Heavy Vehicles, %	8	7	2	9	0	1
Mvmt Flow	38	68	1164	12	73	1175

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1904	588	0	0	1176	0
Stage 1	1170	-	-	-	-	-
Stage 2	734	-	-	-	-	-
Critical Hdwy	6.96	7.04	-	-	4.1	-
Critical Hdwy Stg 1	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.96	-	-	-	-	-
Follow-up Hdwy	3.58	3.37	-	-	2.2	-
Pot Cap-1 Maneuver	56	440	-	-	601	-
Stage 1	245	-	-	-	-	-
Stage 2	420	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	49	440	-	-	601	-
Mov Cap-2 Maneuver	156	-	-	-	-	-
Stage 1	245	-	-	-	-	-
Stage 2	369	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	27.1	0	0.7
HCM LOS	D		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	267	601	-
HCM Lane V/C Ratio	-	-	0.397	0.121	-
HCM Control Delay (s)	-	-	27.1	11.8	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	1.8	0.4	-

Intersection	
Int Delay, s/veh	3.4

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	0	40	82	0	47	17
Future Vol, veh/h	0	40	82	0	47	17
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	85	85	74	74
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	53	96	0	64	23

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	96	0	-	0	149	96
Stage 1	-	-	-	-	96	-
Stage 2	-	-	-	-	53	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1510	-	-	-	848	966
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	975	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1510	-	-	-	848	966
Mov Cap-2 Maneuver	-	-	-	-	848	-
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	975	-

Approach	NB	SB	NE
HCM Control Delay, s	0	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	848	966	1510	-	-	-
HCM Lane V/C Ratio	0.075	0.024	-	-	-	-
HCM Control Delay (s)	9.6	8.8	0	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.1	0	-	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	14	41	21	47	92	58
Future Vol, veh/h	14	41	21	47	92	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	65	65	86	86
Heavy Vehicles, %	33	0	0	2	1	0
Mvmt Flow	20	59	32	72	107	67

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	277	141	174	0	-	0
Stage 1	141	-	-	-	-	-
Stage 2	136	-	-	-	-	-
Critical Hdwy	6.73	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	651	912	1415	-	-	-
Stage 1	815	-	-	-	-	-
Stage 2	820	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	635	912	1415	-	-	-
Mov Cap-2 Maneuver	635	-	-	-	-	-
Stage 1	795	-	-	-	-	-
Stage 2	820	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	9.9	2.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SWT	SWR
Capacity (veh/h)	1415	-	821	-	-
HCM Lane V/C Ratio	0.023	-	0.097	-	-
HCM Control Delay (s)	7.6	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEU	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations													
Traffic Vol, veh/h	0	0	67	6	0	24	98	23	878	133	0	704	2
Future Vol, veh/h	0	0	67	6	0	24	98	23	878	133	0	704	2
Conflicting Peds, #/hr	0	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	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	80	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	63	63	63	93	93	93	93	99	99	99
Heavy Vehicles, %	0	0	0	0	0	0	0	1	1	0	0	1	0
Mvmt Flow	0	0	83	10	0	38	105	25	944	143	0	711	2

Major/Minor	Minor1			Minor2			Major1				Major2		
Conflicting Flow All	-	-	544	1444	2059	357	713	713	0	0	-	-	0
Stage 1	-	-	-	712	712	-	-	-	-	-	-	-	-
Stage 2	-	-	-	732	1347	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	6.4	4.12	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.5	2.21	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	488	95	56	645	514	889	-	-	0	-	-
Stage 1	0	0	-	394	439	-	-	-	-	-	0	-	-
Stage 2	0	0	-	383	222	-	-	-	-	-	0	-	-
Platoon blocked, %									-	-		-	-
Mov Cap-1 Maneuver	-	-	488	64	43	645	541	541	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	151	126	-	-	-	-	-	-	-	-
Stage 1	-	-	-	299	439	-	-	-	-	-	-	-	-
Stage 2	-	-	-	242	168	-	-	-	-	-	-	-	-

Approach	NB	SB	NE	SW
HCM Control Delay, s	13.9	15.5	1.5	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NEL	NET	NER	NBLn1	SBLn1	SWT	SWR
Capacity (veh/h)	541	-	-	488	390	-	-
HCM Lane V/C Ratio	0.24	-	-	0.17	0.122	-	-
HCM Control Delay (s)	13.8	-	-	13.9	15.5	-	-
HCM Lane LOS	B	-	-	B	C	-	-
HCM 95th %tile Q(veh)	0.9	-	-	0.6	0.4	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	43	65	948	3	81	663
Future Vol, veh/h	43	65	948	3	81	663
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	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	87	87	89	89
Heavy Vehicles, %	6	0	2	0	2	2
Mvmt Flow	51	77	1090	3	91	745

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1647	547	0	0	1093	0
Stage 1	1092	-	-	-	-	-
Stage 2	555	-	-	-	-	-
Critical Hdwy	6.92	6.9	-	-	4.14	-
Critical Hdwy Stg 1	5.92	-	-	-	-	-
Critical Hdwy Stg 2	5.92	-	-	-	-	-
Follow-up Hdwy	3.56	3.3	-	-	2.22	-
Pot Cap-1 Maneuver	86	486	-	-	634	-
Stage 1	275	-	-	-	-	-
Stage 2	528	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	74	486	-	-	634	-
Mov Cap-2 Maneuver	187	-	-	-	-	-
Stage 1	275	-	-	-	-	-
Stage 2	452	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	26.1	0	1.3
HCM LOS	D		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	297	634	-
HCM Lane V/C Ratio	-	-	0.433	0.144	-
HCM Control Delay (s)	-	-	26.1	11.6	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	2.1	0.5	-

Intersection	
Int Delay, s/veh	3.3

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	0	42	84	0	66	14
Future Vol, veh/h	0	42	84	0	66	14
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	63	71	71	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	67	118	0	79	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	118	0	-	0	185	118
Stage 1	-	-	-	-	118	-
Stage 2	-	-	-	-	67	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1483	-	-	-	809	939
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	961	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1483	-	-	-	809	939
Mov Cap-2 Maneuver	-	-	-	-	809	-
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	961	-

Approach	NB	SB	NE
HCM Control Delay, s	0	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	809	939	1483	-	-	-
HCM Lane V/C Ratio	0.097	0.018	-	-	-	-
HCM Control Delay (s)	9.9	8.9	0	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	0.3	0.1	0	-	-	-

Intersection	
Int Delay, s/veh	3.6

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	21	46	32	29	41	65
Future Vol, veh/h	21	46	32	29	41	65
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	79	79	74	74	70	70
Heavy Vehicles, %	0	0	0	7	3	0
Mvmt Flow	27	58	43	39	59	93

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	231	106	152	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	125	-	-	-	-	-
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	762	954	1441	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	906	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	738	954	1441	-	-	-
Mov Cap-2 Maneuver	738	-	-	-	-	-
Stage 1	894	-	-	-	-	-
Stage 2	906	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	9.6	4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SWT	SWR
Capacity (veh/h)	1441	-	874	-	-
HCM Lane V/C Ratio	0.03	-	0.097	-	-
HCM Control Delay (s)	7.6	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Traffic Signal Warrant Analysis

Signal Warrant Analysis

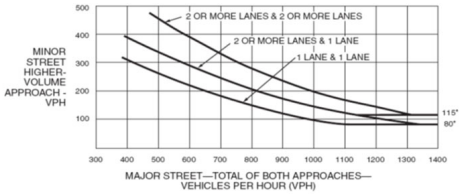
Minimum volume requirements from Manual on Uniform Traffic Control Devices, 2009 Edition

Location:	Shrewsbury Street at Oleum Court and 225 Shrewsbury Street	
Mainline:	2	through lane(s) per direction
Side Street:	1	approach lanes
Veh. Speed:	30	mph
Population:	No	< 10,000

	Mainline Minimum Volume	Side Street Minimum Volume
Warrant 1A (Minimum Vehicular Volume):	600	150
Warrant 1B (Interruption of Cont. Traffic):	900	75
Warrant 1 (Combination of A and B):	600	120
Warrant 2 (Four Hour Vehicular Vol.):	See Figure 4C-1	
Warrant 3 (Peak Hour Vehicular Vol.):	See Figure 4C-3	

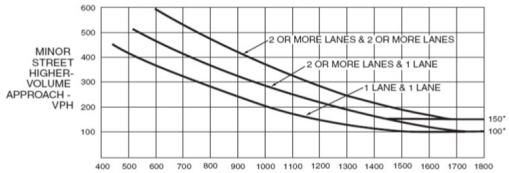
	Shrewsbury Street TMC Counts		Oleum Court TMC Count	225 Shrewsbury Street TMC Count	Oleum Court W/ Apartment TMC Count	225 Shrewsbury W/ Development Street TMC Count	Shrewsbury Street Total Avg. Mo.	Side Street Total Avg. Mo.	Warrant 1A	Warrant 1B	Warrant 1 Combo	Warrant 2	Warrant 3
Hour	EB	WB	SB	NB	SB	NB	x 1.00	x 1.00	Met?	Met?	Met?	Met?	Met?
7-8 AM	1084	537	6	14	12	15	1621	12	No	No	No	No	No
8-9 AM	1113	564	16	22	23	24	1677	23	No	No	No	No	No
9-10 AM	955	561	34	39	46	43	1516	46	No	No	No	No	No
10-11 AM	966	576	31	52	43	56	1542	43	No	No	No	No	No
11-12 PM	855	640	31	48	41	52	1495	41	No	No	No	No	No
12-1 PM	1025	686	55	64	68	68	1711	68	No	No	No	No	No
1-2 PM	1034	692	50	53	58	57	1726	58	No	No	No	No	No
2-3 PM	1139	817	51	52	62	56	1956	62	No	No	No	No	No
3-4 PM	1075	896	71	52	79	57	1971	79	No	Yes	No	No	No
4-5 PM	1064	1025	80	56	89	61	2089	89	No	Yes	No	Yes	No
5-6 PM	1035	975	83	47	95	52	2010	95	No	Yes	No	Yes	No
6-7 PM	1020	754	53	45	64	49	1774	64	No	No	No	No	No
								Warrant Met?	**No**	**No**	**No**	**No**	**No**

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume

Condition A—Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B—Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

[a] Basic minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
[d] May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000