MEMORANDUM

TO: Mr. Christopher M. York, P.E.
Millennium Engineering, Inc.
62 Elm Street
Salisbury, MA 01952

FROM: Scott W. Thornton, P.E. *and*
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DATE: October 21, 2021

RE: 9080

SUBJECT: Proposed Dispensary and Brewery Development – 191 Lafayette Road
Salisbury, Massachusetts

Vanasse & Associates, Inc. (VAI) has conducted a Traffic Impact Analysis (TIA) in order to determine the traffic impacts associated with the proposed development to be located at 191 Lafayette Road (Route 1) in Salisbury, Massachusetts. The purpose of this TIA is to review existing and future traffic conditions in the vicinity of the site, determine the traffic impact from the proposed Project at key intersections expected to experience increased traffic levels from the Project, and review the need for improvements to mitigate the Project's traffic impact. This assessment identifies existing conditions and reviews access requirements, circulation, and safety considerations. Since the Project site abuts a state highway, a Massachusetts Department of Transportation (MassDOT) curb cut permit application will be required.

PROJECT DESCRIPTION

The Project will entail the construction of a 6,166 square foot (sf) brewery and a 4,588 sf retail marijuana dispensary to be located at 191 Lafayette Road (Route 1) in Salisbury, Massachusetts. The Project site is bounded by residential properties to the north and west, commercial properties to the south, and Route 1 to the east. Access to the Project will be provided by a full-access driveway that intersects Route 1 approximately 160 feet south of Pine Street. Parking will be provided for 82 vehicles on site. At present the Project site includes residential buildings, garage space, and areas of open and wooded space. The existing buildings will be razed to accommodate the Project.

A marijuana cultivation facility ("the Facility") is located adjacent to the Project at 187 Lafayette Road. This site was recently constructed but is not yet occupied. Approximately 50 spaces are provided for the Facility, which has its own full-access driveway to Route 1. The two sites will have a connected parking lot and share parking facilities, with a total combined parking supply of 132 parking spaces between the two sites. Figure 1 depicts the Project site location in relation to the existing roadway network.

EXISTING CONDITIONS

A comprehensive field inventory of existing conditions on the study area roadways was conducted in September 2021. The field investigation consisted of an inventory of existing roadway geometrics; traffic volumes; and operating characteristics; as well as posted speed limits and land use information within the study area. The study area for the Project consisted of Route 1 at the following intersections:

Figure 1

Site Location Map

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- Route 1 at Pike Street/Collins Street (Route 286)
- Route 1 at Toll Road

The following describes the study area roadways and intersections at the study area intersections.

Roadway

Lafayette Road (Route 1)

Within the study area, Route 1 is a two-lane roadway under State jurisdiction that traverses the study area in a general north-south direction. Route 1 provides one 12-foot wide travel lane per direction separated by a double-yellow centerline with 5-foot shoulders. The posted speed limit along Route 1 is 40 and 45 miles per hour (mph), with land use consisting of residential and commercial properties.

Intersections

Lafayette Road at Collins Street and Pike Street (Route 1 at Route 286)

Route 1 intersects Route 286 from the north and south to form this four-way signalized intersection with each approach consisting of a single multi-purpose travel lane. This intersection is under jurisdictions of the State and the Town.

Toll Road at Route 1

Toll Road intersects Route 1 from the north and northwest to form this three-way signalized intersection with exclusive right-turn lanes on Route 1. This intersection is under jurisdiction of the State.

Existing Traffic Volumes

In order to determine existing traffic-volume demands and flow patterns within the study area, automatic traffic recorder (ATR) counts, manual turning movement counts (TMCs), and vehicle classification counts were completed in September 2021. The ATR counts were conducted on September 17th through 18th, 2021 (Friday through Saturday, inclusive) on Route 1 in the vicinity of the Project site in order to record weekday traffic conditions over an extended period with three-hour Saturday midday (11:00 AM to 2:00 PM) and two-hour weekday evening (4:00 to 6:00 PM) peak-period manual TMCs performed at the study intersections on September 16th and 18th, 2021.

Traffic-Volume Adjustments

In order to evaluate the potential for seasonal fluctuation of traffic volumes within the study area, traffic count data for MassDOT count station No. 5234 were reviewed. Based on a review of this data, it was determined that traffic volumes for the month of September are approximately 4.0 percent *above* average-month conditions. In order to be conservative, the raw traffic count data that forms the basis of this assessment was not adjusted downward.

In order to account for the reduction in traffic volumes caused by the COVID-19 travel restrictions, a review of historic traffic studies and traffic count data at MassDOT count station No. 5234 on Interstate-495 (I-495) was conducted. The 2019 traffic-volume data were expanded to 2021 by applying a background traffic growth rate of 1.0 percent per year (discussion follows) in order to allow for a comparison to 2021 data. Based on this comparison, the average daily traffic in September 2021 was found to be approximately 8

percent lower than the average daily traffic in September 2019. In addition, the COVID-19 adjustment factor of 3 percent from a recent traffic study[1] was used in order to provide an average adjustment factor to account for traffic-volume reductions in the area. Therefore, September 2021 counts were increased by an average factor of 1.06 to provide pre-COVID-19 operating conditions.

In order to account for changes in traffic pattern as a result of the Town ongoing sewer construction project (discussion follows), historic count data on Route 1 and Route 286 in the vicinity of the Route 1 at Route 286 intersection was reviewed and compared to September 2021 counts that was collected as part of the Project to account for pre- and post-construction traffic reductions. Based on this comparison a factor of 1.32 was applied to adjust the 2021 traffic counts. The 2021 Existing traffic volumes are summarized in Table 1, with the weekday evening and Saturday midday peak-hour traffic volumes graphically depicted on Figure 2.

Table 1
EXISTING ROADWAY TRAFFIC-VOLUME SUMMARY

Location/Peak Hour	AWT[a]	VPH[b]	K Factor[c]	Directional Distribution[d]
Route 1 in the vicinity of the Site Driveway:	7,680	--	--	--
Weekday Evening (4:15 – 5:15 PM)	--	721	9.3	51% SB
Saturday Midday (11:30 AM – 12:30 PM)	--	927	12.1	51% NB

[a]Average weekday traffic in vehicles per day adjusted upward 6 percent to account for COVID-19 travel reductions and 32 percent to account constructions on Route 1.
[b]Vehicles per hour.
[c]Percent of daily traffic occurring during the peak hour.
[d]Percent traveling in peak direction.
NB = northbound, SB= southbound.

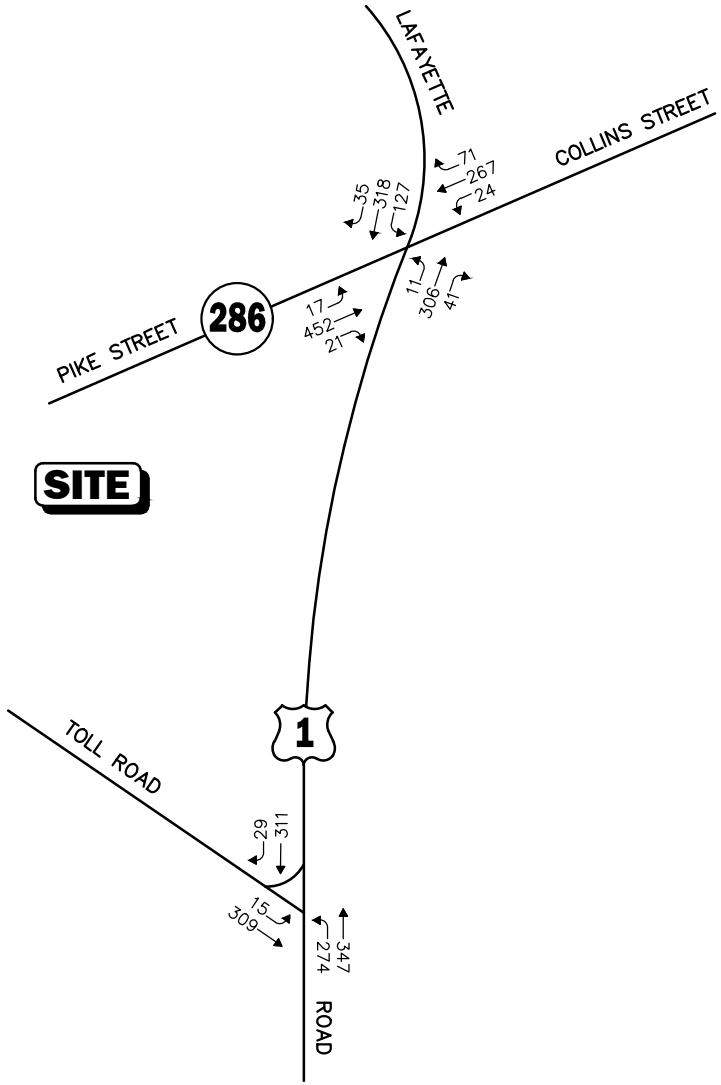
As can be seen in Table 1, Route 1 in the vicinity of the site driveway was found to accommodate approximately 7,680 vehicles on an average weekday (24-hour, two-way volume), with approximately 721 vehicles per hour (vph) during the weekday evening peak hour and 927 vph during the Saturday midday peak hour. A review of the peak-period traffic counts indicate that the weekday evening peak hour generally occurs between 4:15 and 5:15 PM with the Saturday midday peak hour generally occurring between 1:00 and 2:00 PM.

Motor Vehicle Crash Data

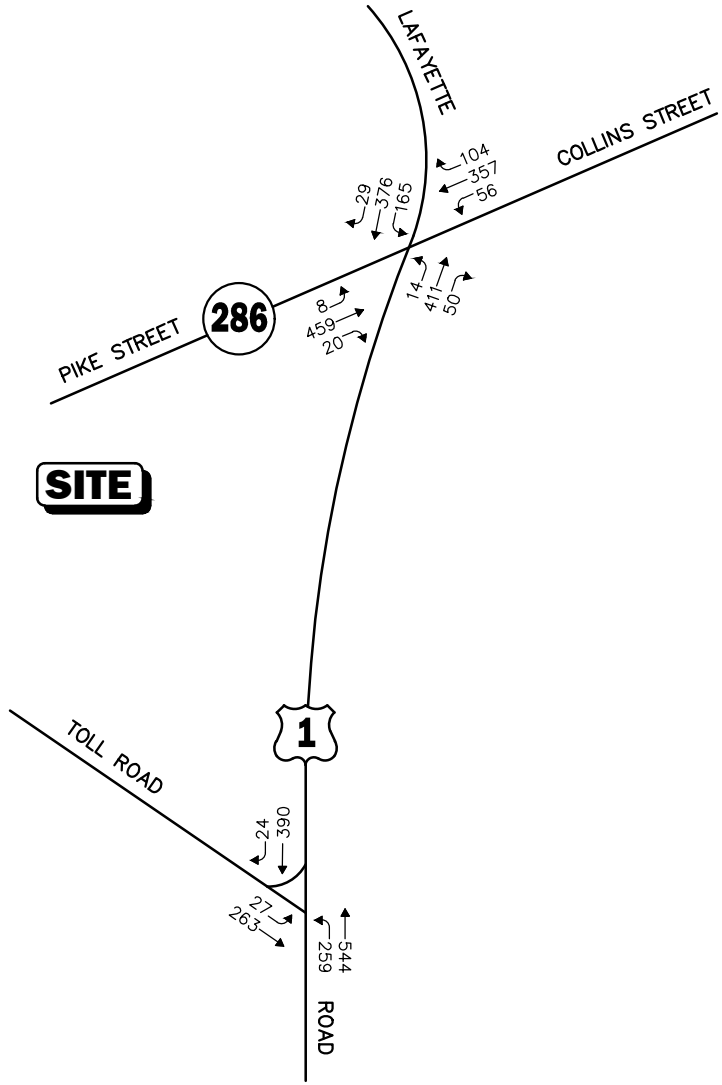
Motor vehicle crash information for the study area intersections was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2014 through 2018, inclusive) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized by intersection, type, severity, roadway and weather conditions, and day of occurrence, and presented in Table 2.

[1]*Traffic Assessment*, Proposed Residential Development, Forest Road Salisbury, Massachusetts; by Bayside Engineering; September 30, 2021.

WEEKDAY EVENING PEAK HOUR (4:15 - 5:15 PM)



SATURDAY MIDDAY PEAK HOUR (1:00 - 2:00 PM)



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

Figure 2

2021 Existing
Peak-Hour Traffic Volumes

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Table 2
MOTOR VEHICLE CRASH DATA SUMMARY[a]

	Route 1 at Route 286	Route 1 at Toll Road
Traffic Control Type[b]	U	TS
Year:		
2014	3	1
2015	3	1
2016	3	1
2017	5	1
2018	5	0
Total	19	4
Average	3.80	0.80
Rate[c]	0.47	0.13
MassDOT Crash Rate:[d]	0.57/0.57	0.78/0.73
Significant?[e]	No	No
Type:		
Angle	7	2
Rear-End	9	0
Head-On	2	0
Single Vehicle Crash	1	2
Unknown/Other	0	0
Total	19	4
Conditions:		
Clear	13	3
Cloudy	4	1
Rain	1	0
Snow/Ice	1	0
Total	19	4
Lighting:		
Daylight	18	2
Dawn/Dusk	0	1
Dark (Road Lit)	1	1
Dark (Road Unlit)	0	0
Total	19	4
Day of Week:		
Monday through Friday	12	4
Saturday	3	0
Sunday	4	0
Total	14	4
Severity:		
Property Damage Only	13	2
Non-fatal Injury	6	2
Total	19	4

[a]Source: MassDOT Safety Management/Traffic Operations Unit records, 2014 through 2018.
[b]Traffic Control Type: U = unsignalized; TS = traffic signal.
[c]Crash rate per million vehicles entering the intersection.
[d]Statewide/District crash rate.
[e]The intersection crash rate is significant if it is found to exceed the MassDOT crash rate for the MassDOT Highway Division District in which the Project is located (District 4).

As can be seen in Table 2, the study area intersections were found to have averaged approximately 4 or fewer reported motor vehicle crashes over the five-year review period, the majority of which occurred on a weekday, under clear weather conditions during daylight, and involved rear-end and angle-type collisions that resulted in property damage only. Both of the study intersections were found to have a motor vehicle crash rate *below* the MassDOT statewide and District average crash rates for a signalized or unsignalized intersection, as appropriate, for the MassDOT Highway Division District in which the intersections are located (District 4).

A review of the current MassDOT statewide High Crash Location Listing indicated that none of the study intersections are included on MassDOT's Highway Safety Improvement Program (HSIP) listing as a high crash location. It should be noted that a Road Safety Audit (RSA) was performed in August 2013 at the intersection of Route 1 at Route 286[2] and intended to identify potential safety improvements that can be evaluated and included as part of the design process for the MassDOT plan for future reconstruction of this intersection (discussion follows). In addition, no fatal motor vehicle crashes were reported to have occurred at the study area intersections over the five-year review period.

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

Vehicle Speed Measurements

Vehicle travel speed measurements were performed on Route 1 in the vicinity of the Project site in conjunction with the ATR counts. Table 3 summarizes the vehicle travel speed measurements.

Table 3
VEHICLE TRAVEL SPEED MEASUREMENTS

	Route 1	
	Northbound	Southbound
Mean Travel Speed (mph)	33	35
85th Percentile Speed (mph)	38	41
Posted Speed Limit (mph)	40	45

mph = miles per hour.

As can be seen in Table 3, the mean vehicle travel speed along Route 1 in the vicinity of the Project site was found to be 33 mph in the northbound direction and 35 mph traveling southbound. The measured 85th percentile vehicle travel speed, or the speed at which 85 percent of the observed vehicles traveled at or below, was found to be 38 mph in the northbound direction and 41 mph traveling southbound, which is below the posted speed limit along the northbound and southbound directions (40 and 45 mph, respectively). The 85th percentile speed is used as the basis of engineering design and in the evaluation of sight distances and is often used in establishing posted speed limits.

[2]Road Safety Audit, Route 1 at Route 286, Salisbury-Prepared by Howard/Stein-Hudson Associates, Inc, August 2013.

Sight Distance Evaluation

Sight distance measurements were performed at the proposed driveway to the new parking lot with Route 1 in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)[3] standards. In brief, stopping sight distance (SSD) is the minimum distance required for an approaching driver at a height of 3.5 feet to perceive and react accordingly to a stationary object 2 feet tall in its path. The values are based on a perception and reaction time of 2.5 seconds and braking distance required under wet, level pavements. Intersection sight distance (ISD) is based on the time required to perceive, react, and complete desired exiting maneuver from a driveway once the driver decides to execute the maneuver. Values for exiting sight distance represent the time to (1) turn left or right, in addition to accelerating to the operating speed of the roadway, without causing approaching vehicles to reduce speed by more than 10 mph; and (2) upon turning left, to clear the near half of the intersection without conflicting with the vehicles approaching from the left. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. Table 4 presents the measured sight distances at the proposed site driveway intersecting with Route 1.

Table 4
SIGHT DISTANCE MEASUREMENTS

Intersection/Sight Distance Measurement	Required Minimum (Feet)[a]	Measured (Feet)
191 Lafayette Road (Route 1) Site Driveway:		
Stopping Sight Distance:		
Looking to the north towards the driveway	360	500+
Looking to the south towards the driveway	360	500+
Intersection Sight Distance:		
Looking to the north from the driveway	430	500+
Looking to the south from the driveway	500	500+

[a]Recommended minimum values obtained from *A Policy on Geometric Design of Highways and Streets,* Fifth Edition; American Association of State Highway and Transportation Officials (AASHTO); 2011. Based on 45 mph approach speed on Route 1.

As can be seen in Table 4, the available lines of sight to and from the Project site driveway intersection with Route 1 will meet or exceed the recommended minimum sight distances to function in a safe (SSD) and efficient (ISD) manner based on a 45-mph approach speed, which is slightly above the measured 85th percentile vehicle travel speed (38/41 mph) and equal to maximum posted speed limit of 45 mph on Route 1.

FUTURE CONDITIONS

Future traffic growth is a function of the expected land development in the immediate area and the surrounding region. Several methods can be used to estimate this growth. A procedure frequently employed estimates an annual percentage increase in traffic growth and applies that percentage to all traffic

[3]*A Policy on Geometric Design of Highway and Streets,* 6th Edition; American Association of State Highway and Transportation Officials (AASHTO); 2011.

volumes under study. The drawback to such a procedure is that some turning volumes may actually grow at either a higher or a lower rate at particular intersections.

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

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

Specific Development by Others

The Town of Salisbury Planning Board was contacted in order to determine if there were any projects planned within the study area that would have an impact on future traffic volumes within the study area. Based on this consultation the following projects were identified:

Proposed Marijuana Cultivation Facility ("The Facility")

This development is located adjacent to the proposed Project and includes a marijuana cultivation facility with a two-story, 19,800 sf building and approximately 50 parking spaces. The traffic expected to be generated by this project were obtained from the traffic study prepared by VAI and assigned to the study area roadway network.[4]

Proposed Townhouse Units

This project entails construction of 56 townhouse units including 28 duplexes and two quadplexes located off Forest Road in Salisbury, Massachusetts. The traffic expected to be generated by this project were obtained from the traffic study prepared by Bayside Engineering and assigned to the study area roadway network.[5]

Proposed Residential Development

This project entails construction of nine single-family homes located at 9 Gerrish Road in Salisbury, Massachusetts. Traffic volumes associated with this project within the study area are expected to be relatively minor and would be reflected in the general background traffic growth rate (discussion follows).

Proposed Single Family Homes

This project includes construction of the three single-family homes located at 15 Forest Road. Traffic volumes associated with this project within the study area are expected to be relatively minor and would be reflected in the general background traffic growth rate.

No other developments were identified at this time that are expected to result in an increase in traffic within the study area beyond the general background traffic growth rate.

[4] *Traffic Assessment – Marijuana Cultivation Facility – 187 Lafayette Road Salisbury, Massachusetts;* VAI; May 7, 2020.

[5] *Traffic Assessment – Proposed Residential Development – Forest Road Salisbury, Massachusetts;* Bayside Engineering; September 30, 2020.

General Background Traffic Growth

Traffic-volume data compiled by MassDOT from permanent count stations were reviewed. This data indicated that traffic volumes are decreasing in the area by 0.82 percent per year. In order to be conservative a 1.0 percent per year compounded annual background traffic growth rate was used in order to account for future traffic growth and presently unforeseen development within the study area.

Roadway Improvement Projects

The MassDOT and Town of Salisbury were consulted in order to determine if there were any planned future roadway improvement projects expected to be complete by 2028 within the study area. Based on these discussions, the following projects and improvements were identified to be planned within the study area at this time:

Town of Salisbury - Route 1/Lafayette Road Sewer Project

This project includes installation of approximately 180 linear feet of the gravity sewer via horizontal directional drilling at the existing bridge above Smallpox Brook on Lafayette Road/Route 1. The project also includes the construction of three new sewer pump stations. Two submersible pumpstations are located on Bayberry Lane and Jak-Len Drive. The third pump station is a flooded suction, dry pit pump station at 63 Lafayette Road/Route 1. Currently, installation of the mainline sewer has been ongoing in the area south of the Salisbury Elementary School. The project is expected to be completed in September 2022.

MassDOT - Reconstruction of Route 1/Lafayette Road

The purpose of this project is the reconstruction of a section of Route 1/Lafayette Road in the Town of Salisbury. The project begins at Beach Road in Salisbury Square and extends northerly for approximately 2.42 miles to the New Hampshire state line. The proposed roadway shall provide two travel lanes, shoulders, sidewalks, curbing, and sidewalks with planting strips. In conjunction with this project, intersections of Route 1 and Toll Road as well as Route 1 and Route 286 will be reconstructed to function as a modern roundabout. In addition, a crosswalk is proposed south of Pine Street (approximately 150 feet north of the Project site driveway) for crossing Route 1. This Project is in the design phase and construction is expected to begin in the summer of 2023.

No-Build Traffic Volumes

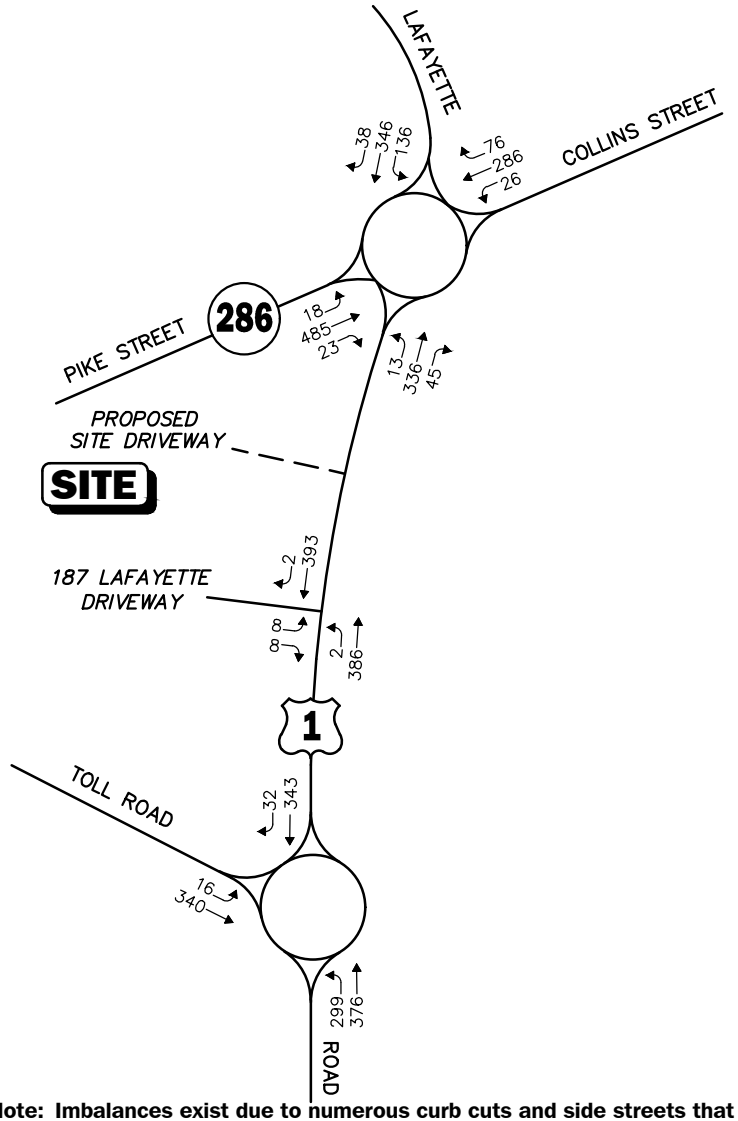
Traffic volumes in the study area were projected to the year 2028. The 2028 No-Build condition peak-hour traffic volumes were developed by applying the 1.0 percent per year compounded annual background traffic growth rate to the 2021 Existing peak-hour traffic volumes and then adding the peak-hour traffic volumes associated with the identified specific development projects by others. The resulting 2028 No-Build weekday morning and evening peak-hour traffic volumes are shown on Figure 3.

Project-Generated Traffic

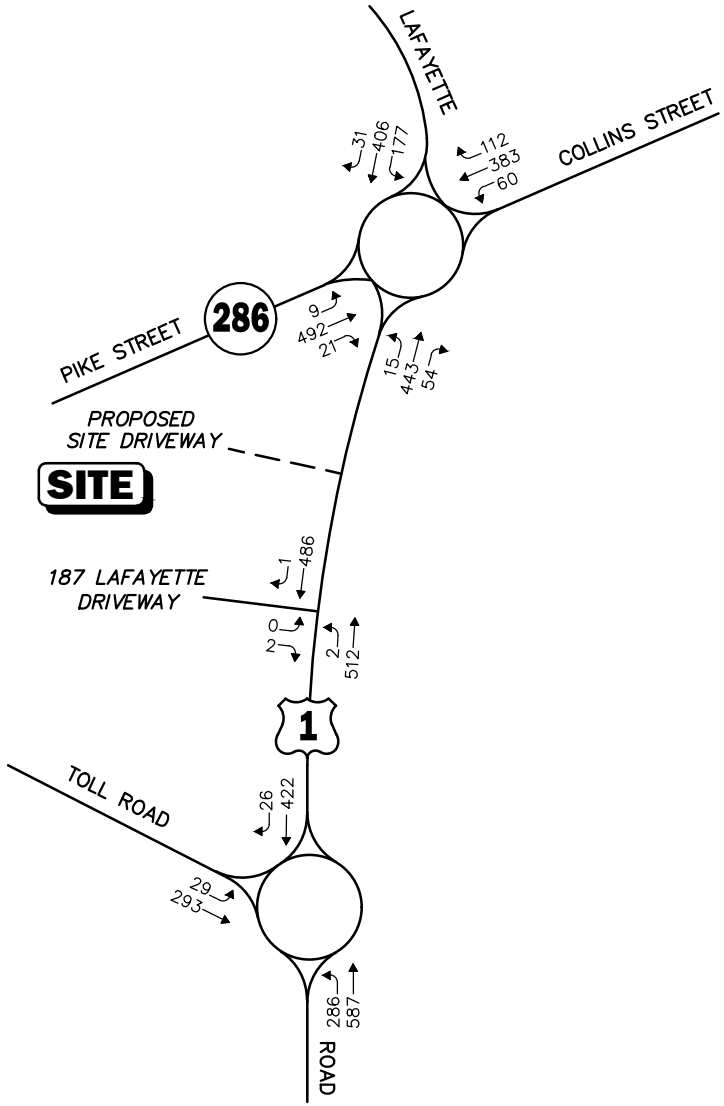
As proposed, the Project will entail the construction of a 6,166 sf brewery and a 4,588 sf marijuana dispensary. In order to develop the traffic characteristics of the proposed Project, the most recent trip-generation statistics published by Institute of Transportation Engineers (ITE)[6] for Land Use Code (LUC) 971, *Brewery Tap Room* and for LUC 882, *Marijuana Dispensary* were used. In order to provide a conservative (worst case) analysis scenario for the dispensary use, it was assumed that the weekday evening

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

WEEKDAY EVENING PEAK HOUR (4:15 - 5:15 PM)



SATURDAY MIDDAY PEAK HOUR (1:00 - 2:00 PM)



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

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Figure 3

2028 No-Build
Peak-Hour Traffic Volumes

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and Saturday midday peak hour of the Project (peak of the generator), will occur coincidental with the weekday evening and Saturday midday peak hour of Route 1.

Also, it should be noted that LUC 971 was recently added to the ITE 11th Edition and includes two study sites that were surveyed in Florida and Minnesota. The surveyed sites have similar gross floor area when compared to the Project and therefore calculated trips based on the ITE average rate indicates appropriate trip-generation estimates. Table 5 summarizes the anticipated traffic characteristics of the Project

Table 5
TRIP GENERATION SUMMARY

Time Period/Direction	Brewery Tap Room[a] (6,166 sf)	Dispensary[b] (4,588 sf)	Total Trips
Average Weekday Daily:			
Entering	190	484	674
Exiting	190	484	674
Total	380	968	1,348
Weekday Evening Peak Hour:			
Entering	36	55	91
Exiting	25	58	83
Total	61	113	174
Average Saturday Daily:			
Entering	376	594	970
Exiting	376	594	970
Total	752	1,188	1,940
Saturday Midday Peak Hour:			
Entering	79	66	145
Exiting	62	66	128
Total	141	132	273

[a]Based on ITE LUC 971, *Brewery Tap Room*.
[a]Based on ITE LUC 882, *Marijuana Dispensary*.

As can be seen in Table 5, the Project is predicted to generate approximately 1,348 vehicle trips on an average weekday (two-way volume, or 674vehicles entering and 674 exiting) and approximately 1,940 vehicle trips on a Saturday (also two-way volume, or 970 vehicles entering and 970 vehicles exiting), with 174 vehicle trips (91 vehicles entering and 83 exiting) expected during the weekday evening peak hour, and 273 vehicle trips (145 vehicles entering and 128 exiting) expected during the Saturday midday peak hour.

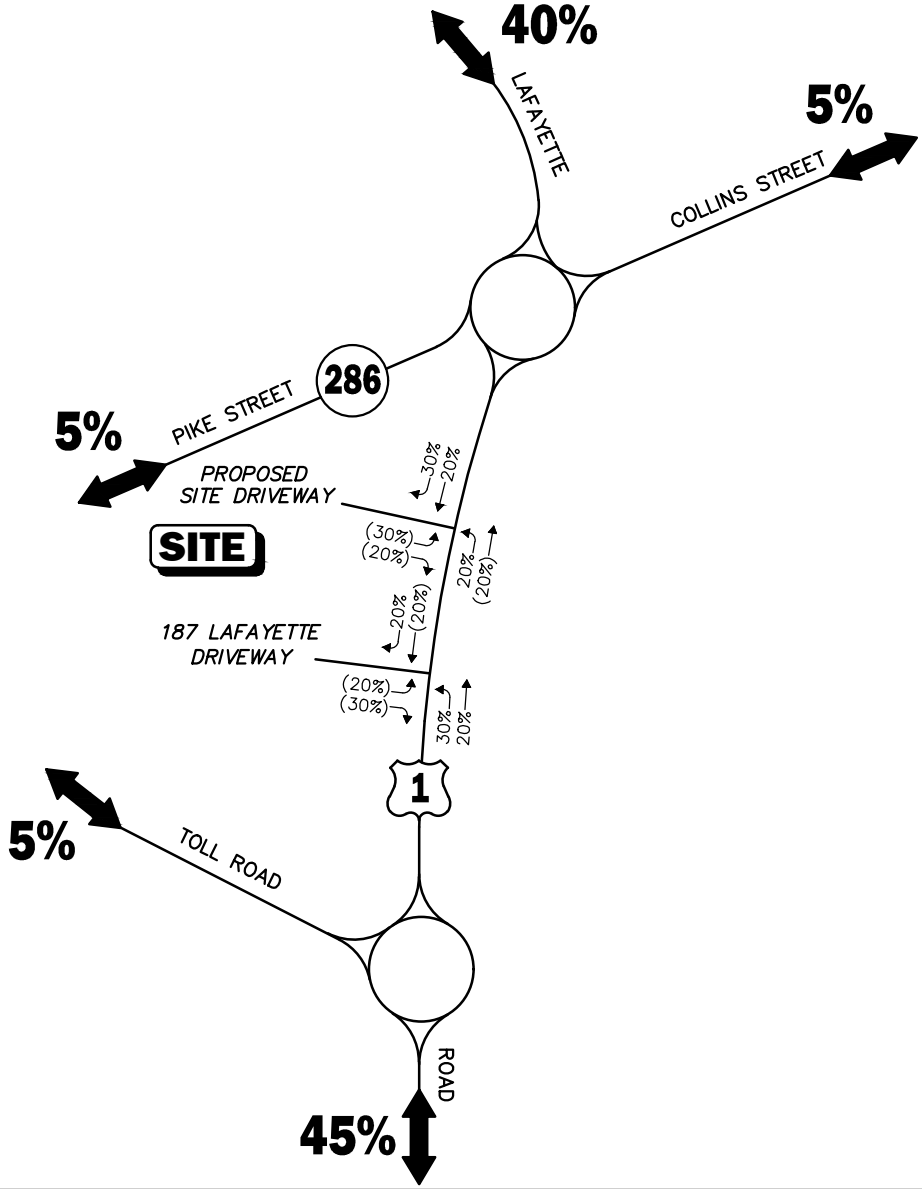

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Figure 4

Trip Distribution Map

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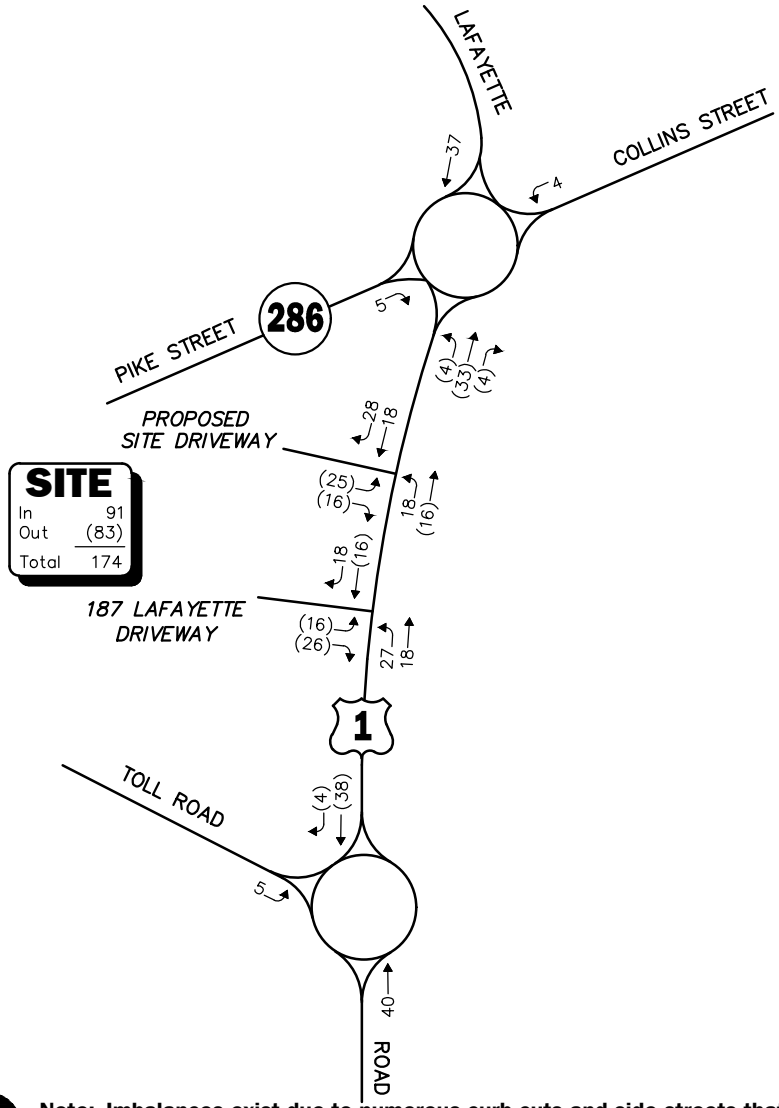
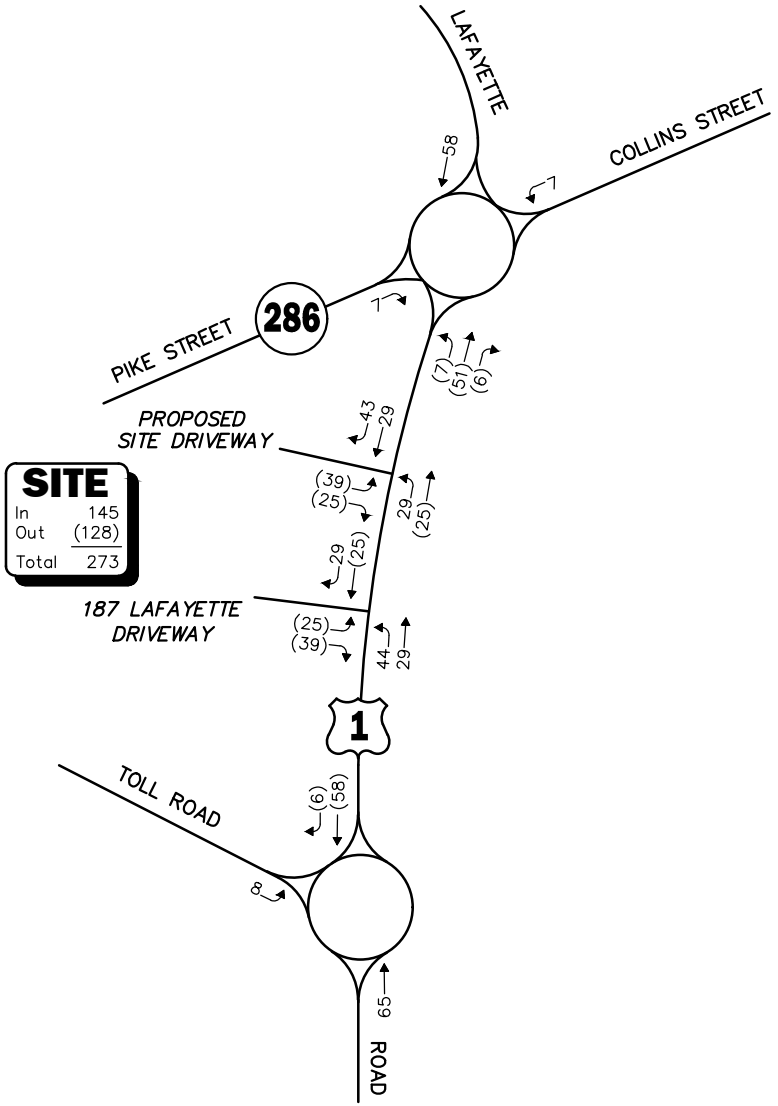
WEEKDAY EVENING PEAK HOUR (4:15 - 5:15 PM)



SATURDAY MIDDAY PEAK HOUR (1:00 - 2:00 PM)



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

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Figure 5

Project-Generated Peak-Hour Traffic Volumes

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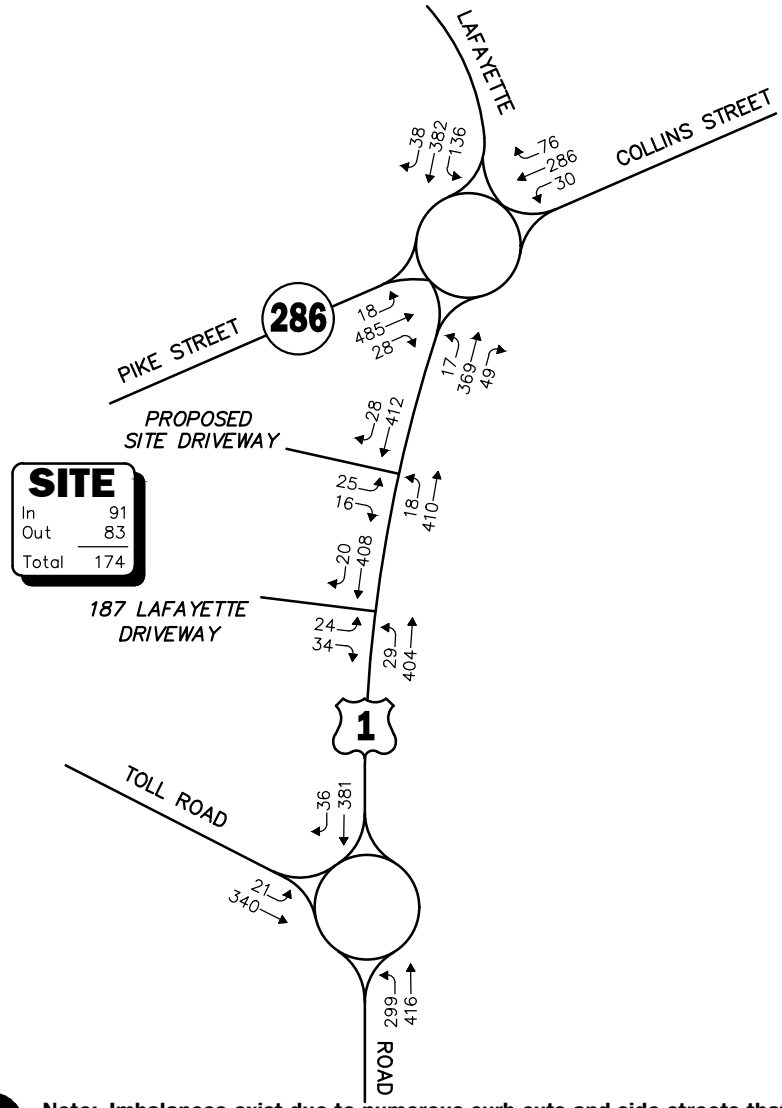
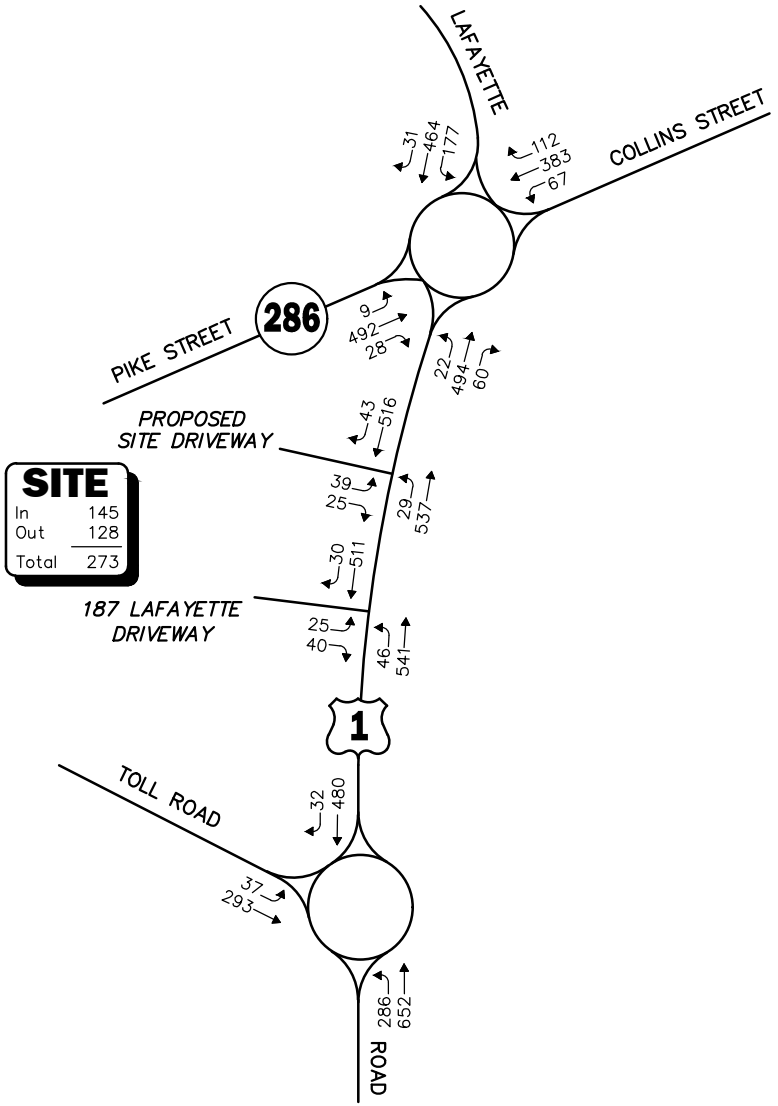
WEEKDAY EVENING PEAK HOUR (4:15 - 5:15 PM)



SATURDAY MIDDAY PEAK HOUR (1:00 - 2:00 PM)



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

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Figure 6

2028 Build
Peak-Hour Traffic Volumes

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Trip Distribution

The directional distribution of generated trips to and from the Project site was determined based on a review of existing traffic patterns within the study area. The anticipated distribution is shown on Figure 4. Traffic volumes expected to be generated by the Project were assigned onto the study area roadway network as shown on Figure 5 for the weekday evening and Saturday midday peak hours.

FUTURE TRAFFIC VOLUMES – BUILD CONDITION

The 2028 Build condition networks consist of the 2028 No-Build traffic volumes with the anticipated site-generated traffic added to them. The 2028 Build weekday evening and Saturday midday peak-hour traffic-volume networks are graphically depicted on Figure 6.

A summary of peak-hour projected traffic-volume increases external to the study area that is the subject of this assessment is shown in Table 6. These volumes are based on the expected increases from the Project.

Table 6
PEAK-HOUR TRAFFIC-VOLUME INCREASES[a]

Location/Peak Hour	2028 No-Build	2028 Build	Traffic-Volume Increase Over No-Build	Percent Increase Over No-Build
Route 1, north of Route 286:				
Weekday Evening	950	1,020	70	7.4
Saturday Midday	1,178	1,287	109	9.3
Route 286, east of Route 1:				
Weekday Evening	1,054	1,062	8	0.8
Saturday Midday	1,278	1,291	13	1.0
Route 286, west of Route 1:				
Weekday Evening	863	872	9	1.0
Saturday Midday	951	965	14	1.5
Toll Road, west of Route 1:				
Weekday Evening	687	696	9	1.3
Saturday Midday	634	648	14	2.2
Route 1, south of Toll Road:				
Weekday Evening	1,358	1,436	78	5.7
Saturday Midday	1,588	1,711	123	7.7

[a]Two-way traffic total.

As shown in Table 6, Project-related traffic-volume increases within of the study area relative to 2028 No-Build conditions are anticipated to range from 0.8 to 9.3 percent during the peak periods, with vehicle increases shown to range from 8 to 123 vehicles.

TRAFFIC OPERATIONS ANALYSIS

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

Methodology

Levels of Service

A primary result of capacity analyses is the assignment of level of service to traffic facilities under various traffic-flow conditions.[7] The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best operating conditions and LOS F representing congested or constrained operating conditions. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

Signalized Intersections

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

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

Levels of service for signalized intersections were calculated using the Percentile Delay Method implemented as a part of the Synchro™ 11 software as required by MassDOT. The Percentile Delay

[7]The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual 6th Edition;* Transportation Research Board; Washington, DC; 2016.

Method assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on "percentile" delay. Level-of-service designations are based on the criterion of percentile delay per vehicle and is a measure of: i) driver discomfort; ii) motorist frustration; and iii) fuel consumption; and includes a uniform delay based on percentile volumes using a Poisson arrival pattern, an initial queue move-up time, and a queue interaction delay that accounts for delays resulting from queues extending from adjacent intersections. Table 7 summarizes the relationship between level-of-service and percentile delay and uses the same numerical delay thresholds as the 2000 *Highway Capacity Manual (HCM)*[8] method. The tabulated percentile delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to entire intersections.

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

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

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

Unsignalized Intersections

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

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

[8]*Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2000.

The levels of service of unsignalized intersections are determined by application of a procedure described in the HCM 6th Edition.[9] Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the HCM 6th Edition. Table 8 summarizes the relationship between level of service and average control delay for two-way STOP-controlled and all-way STOP-controlled intersections.

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

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

[a]Source: *Highway Capacity Manual 6th Edition*; Transportation Research Board; Washington, DC; 2016; page 20-6.

Rotaries

The unsignalized capacity analysis is based on the procedures described in the *Traffic Signalized* and *Unsignalized Intersection Design and Research Aid* (*SIDRA*) *Intersection*.[10] The main features of the *SIDRA Intersection* method for unsignalized capacity estimation are the dependence of gap acceptance parameters on roadway geometry, entry lane flows, and the designation of traffic control on approach lanes.

The SIDRA analytical model calculates several components of delay. One of these, the average total delay component, produces level-of-service results based on the concepts described in the HCM. The delay ranges that define levels of service for roundabouts are shown in Table 9.

[9]*Highway Capacity Manual 6th Edition*; Transportation RESEARCH Board; Washington, DC; 2016.

[10]Traffic Signalized and Unsignalized Intersection Design and Research Aid, SIDRA Intersection 9.0 User Guide; Akcelik & Associates Pty Ltd; Greythorn, Victoria 3104, October 2020.

Table 9
LEVEL-OF-SERVICE CRITERIA FOR SIDRA: UNSIGNALIZED INTERSECTIONS[a]

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

[a]Source: *SIDRA Intersection 9.0 User Guide;* Akcelik & Associates Pty Ltd; Greythorn, Victoria 3104, October 2020.

ANALYSIS RESULTS

Level-of-service and vehicle queue analyses were conducted for 2021 Existing, 2028 No-Build, and 2028 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized in Table 12 and Table 13 with the detailed analysis results presented in the Appendix. The following is a summary of the level-of-service and delay analyses for the intersections within the study area.

Route 1 at Route 286

Under 2021 Existing conditions and prior to being reconstructed as a modern roundabout, the intersection was shown to operate at LOS C during weekday evening and LOS D during the Saturday midday peak hour. With the reconstruction of this intersection to function as a roundabout (Table 12), under 2028 No-Build conditions, the intersection is predicted to operate at overall LOS B during weekday evening and LOS C during Saturday midday peak hours. Under 2028 Build conditions, the intersection is predicted to operate at an overall LOS B during weekday evening and LOS D during Saturday midday peak hours with overall delay increases of up to 6.1 seconds over No-Build conditions.

Toll Road at Route 1

Prior to being reconstructed as a roundabout, the intersection was predicted to operate at LOS B during the peak hours under 2021 Existing conditions. With the reconstruction of this intersection to function as a roundabout, the improved intersection is predicted to operate at LOS B or better during the peak hours under 2028 No-Build and 2028 Build conditions.

Route 1 at Proposed Site Driveway

Under 2028 Build conditions, the critical movements at this intersection were shown to operate at LOS D or better with vehicle queuing of up to 1 vehicle during peak periods.

Route 1 at 187 Lafayette Road Driveway

Under 2021 Existing conditions, the adjacent facility located at 187 Lafayette Road is not occupied and the critical movements at this intersection had no demand during the weekday evening peak hour and therefore no results are presented. Under 2028 No-Build and Build conditions, after opening the critical movements were shown to operate at LOS C or better with vehicle queuing of up to 1 vehicle.

Table 10
SIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY

	2021 Existing				2028 No-Build				2028 Build			
Signalized Intersection/Peak Hour	V/C[a]	Delay[b]	LOS[c]	Queue[d] Avg/95th	V/C	Delay	LOS	Queue Avg/95th	V/C	Delay	LOS	Queue Avg/95th
Route 1 at Route 286:												
Weekday Evening:												
Route 286 EB LT/TH/RT	0.72	31.5	C	299/398								
Route 286 WB LT/TH/RT	0.63	28.2	C	218/278								
Route 1 NB LT/TH/RT	0.71	37.8	D	225/324								
Route 1 SB LT/TH/RT	0.84	32.7	C	320/544	This Intersection will be reconstructed as a roundabout							
Overall	**--**	**32.4**	**C**	**--**	See Table 12							
Saturday Midday:												
Route 286 EB LT/TH/RT	0.67	29.8	C	281/393								
Route 286 WB LT/TH/RT	0.97	58.5	E	365/540								
Route 1 NB LT/TH/RT	0.94	59.8	E	330/520								
Route 1 SB LT/TH/RT	0.96	49.5	D	383/591								
Overall	**--**	**49.6**	**D**	**--**								
Route 1 at Toll Road:												
Weekday Evening:												
Route 1 SB LT	0.66	24.0	C	104/164								
Route 1 SB RT	0.07	6.1	A	0/14								
Toll Road SEB LT/TH	0.21	8.5	A	30/62								
Route 1 NB TH	0.16	8.2	A	24/52								
Route 1 NB RT	0.37	2.5	A	0/39	This Intersection will be reconstructed as a roundabout							
Overall	**--**	**10.7**	**B**	**--**	See Table 12							
Saturday Midday:												
Route 1 SB LT	0.71	24.7	C	125/205								
Route 1 SB RT	0.05	6.2	A	0/13								
Toll Road SEB LT/TH	0.23	9.6	A	33/61								
Route 1 NB TH	0.16	9.2	A	25/55								
Route 1 NB RT	0.55	3.3	A	0/51								
Overall	**--**	**11.0**	**B**	**--**								

[a]Volume to capacity ratio.
[b]Average stopped delay per vehicle (in seconds).
[c]Level of service.
[d]Queue length in feet.
EB = eastbound; WB = westbound; NB = northbound; SB = southbound; SEB=southeast bound, LT = left-turning movements; TH = through movements; RT =right-turning movements.

Table 11
UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY

Unsignalized Intersection/ Peak Hour/Critical Movement	2021 Existing				2028 No-Build				2028 Build			
	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
Route 1 at Proposed Site Driveway												
Weekday Morning:												
Site Driveway EB LT/RT	--	--	--	--	--	--	--	--	41	16.6	C	0.4
Route 1 NB LT/TH	--	--	--	--	--	--	--	--	428	8.4	A	0.1
Weekday Evening:												
Site Driveway EB LT/RT	--	--	--	--	--	--	--	--	64	25.3	D	1.1
Route 1 NB LT/TH	--	--	--	--	--	--	--	--	566	8.8	A	0.1
Route 1 at 187 Lafayette Road Driveway												
Weekday Morning:												
Site Driveway EB LT/RT	--	--	--	--	16	13.7	B	0.1	58	15.5	C	0.5
Route 1 NB LT/TH	--	--	--	--	388	8.2	A	0.0	433	8.4	A	0.1
Weekday Evening:												
Site Driveway EB LT/RT	--	--	--	--	2	11.6	B	0.0	65	21.0	C	0.9
Route 1 NB LT/TH	--	--	--	--	514	8.5	A	0.0	587	8.8	A	0.2

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

Table 12
ROUNDABOUT LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

	2028 No-Build				2028 Build			
Rotary/Peak Hour/Movement	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th
Route 1 at Route 286:								
Weekday Evening:								
Route 1 NB	394	14.0	B	4	435	16.0	C	5
Route 286 WB	388	9.2	A	2	392	9.7	A	3
Route 1 SB	520	11.5	B	5	556	12.7	B	6
Route 286 EB	526	16.8	C	7	531	18.7	C	8
Overall	--	**13.1**	**B**	--	--	**14.5**	**B**	--
Saturday Midday:								
Route 1 NB	512	23.2	C	8	576	32.2	D	13
Route 286 WB	555	16.9	C	8	562	19.8	C	9
Route 1 SB	614	20.2	C	11	672	20.0	D	16
Route 286 EB	522	22.2	C	8	529	27.4	D	10
Overall	--	**20.5**	**C**	--	--	**26.6**	**D**	--
Route 1 at Toll Road:								
Weekday Evening:								
Route 1 NB	675	9.5	A	4	715	10.4	B	5
Route 1 SB	375	8.1	A	2	417	8.8	A	2
Toll Road SEB	356	8.4	A	2	361	8.9	A	2
Overall	--	**8.9**	**A**	--	--	**9.6**	**A**	--
Saturday Midday:								
Route 1 NB	873	15.1	C	9	938	18.6	C	12
Route 1 SB	448	9.3	A	3	512	10.7	B	4
Toll Road SEB	322	8.5	A	2	330	9.3	A	2
Overall	--	**12.2**	**B**	--	--	**14.6**	**B**	--

[a]Demand in vehicles per hour.
[b]Average control delay per vehicle (in seconds).
[c]Level of service.
[d]Queue length in vehicles.
EB = eastbound; WB = westbound; NB = northbound; SB = southbound; SEB = southeast bound.

PARKING

Dispensary

In order to determine the parking demands for the Project, parking demand data that was derived from the traffic-volume observations that were conducted at a recreational marijuana dispensary located in Millbury, Massachusetts. Table 13 summarizes the peak parking demand rates (per 1,000 sf) that were observed at Millbury dispensary.

Table 13
DISPENSARY PARKING CALCULATIONS

Land Use	(A) Mean Parking Demand (per 1000 sf)	(B) Required Parking Spaces (B=A*4.588)
Millbury Dispensary:[b]		
Weekday	4.05	19
Saturday	4.59	21

[a]Based on observations performed at Natures Remedy, 266 North Main Street, Millbury, Massachusetts, in July 2020; spaces per 1,000 sf.

As can be seen in Table 13, the observed mean parking demand on a weekday was observed to be 4.05 parking spaces per 1,000 sf. On a Saturday, the mean parking demand was observed to be 4.59 parking spaces per 1,000 sf.

Applying the mean observed weekday and Saturday parking demand (4.05 and 4.59 parking spaces per 1,000 sf) to the Project (4,588 sf) results in an average parking demand of 19 to 21 parking spaces, respectively.

Brewery

In order to determine the parking demands for the brewery, parking demand data was derived from ITE *Parking Generation Manual*[11] (PGM) for an available land use operating similar to the brewery use of the Project. The PGM does not have data available for the brewery use; therefore, LUC 932, *High-Turnover Restaurant* was used as some of the surveyed facilities within this land use contain lounge or bar areas for serving food or alcoholic drinks similar to the brewery.

[11] *Parking Generation Manual 5th Edition*; Institute of Transportation Engineers; January 2019.

Table 14
BREWERY/RESTAURANT PARKING CALCULATIONS[a]

Time Period	(A) Mean Parking Demand (per 1000 sf)	(B) Parking Spaces (B=A*6.166)
Weekday	9.44	58
Saturday	12.28	76

[a]Based on *ITE LUC 932, High-Turnover Restaurant* and 6,166 sf.

As can be seen in Table 14, the mean parking demand on a weekday was observed to be 9.44 parking spaces per 1,000 sf. On a Saturday, the mean parking demand was shown to be 12.28 parking spaces per 1,000 sf. Applying the mean weekday and Saturday parking demand (9.44 and 12.28 parking spaces per 1,000 sf) to the brewery use (6,166 sf) results in a parking demand of 58 to 76 parking spaces, respectively.

As it can be seen in Table 13 and Table 14, the maximum parking demand during these peak periods is expected to be 97 spaces during Saturday. The parking supply that is provided for the Project and the Facility (132 spaces) is sufficient to support the peak parking demand that occurs during this period.

CONCLUSIONS

VAI has completed a TIA in order to determine the potential impacts on the transportation infrastructure associated with the proposed project to be located at 191 Lafayette Road in Salisbury, Massachusetts. The following conclusions have been identified as they relate to the Project:

1. Using trip-generation statistics published by the ITE, the Project is expected to generate approximately 1,348 vehicle trips on an average weekday (two-way volume, or 674vehicles entering and 674 exiting) and approximately 1,940 vehicle trips on a Saturday (also two-way volume, or 970 vehicles entering and 970 vehicles exiting), with 174 vehicle trips (91 vehicles entering and 83 exiting) expected during the weekday evening peak hour, and 273 vehicle trips (145 vehicles entering and 128 exiting) expected during the Saturday midday peak hour;

2. Project-related traffic-volume increases external to the study area relative to 2028 No-Build conditions are anticipated to range from 0.8 to 9.3 percent during the peak periods, with vehicle increases shown to range from 8 to 123 vehicles ;

3. All movements at the Project and the Facility site driveway intersections with Route 1 are predicted to operate at a LOS D or better during the peak hours with vehicle queuing of up to 1 vehicle;

4. The parking supply that is provided for the Project and the Facility (132 spaces) is sufficient to support the peak parking demand; and

5. Lines of sight at the Project site driveway intersections with Route 1 were found to exceed the recommended minimum sight distances to function in a safe and efficient manner.

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

RECOMMENDATIONS

The following is recommended with respect to the site access:

- The site driveway intersection with Route 1 should be a minimum of 24 feet in width and support the turning and maneuvering requirements of delivery trucks and the largest anticipated responding emergency vehicle as defined by the Salisbury Fire Department.

- Drive aisles should be a minimum of 24 feet in width where perpendicular parking is proposed in order to allow for vehicle maneuvering.

- A STOP sign should be installed, and a STOP bar be marked at the site driveway intersection with Route 1.

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

➢ A traffic and parking management plan should be developed in consultation with the MassDOT and the Salisbury Police Department to accommodate the increased customer demand that may

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

occur during the initial opening period for adult use sales. The goal of the traffic and parking management plan will be to manage customer demands so as not to exceed the available parking within the project site with consideration of employee parking requirements. After the initial opening period, operations should be reviewed with MassDOT and the Police Chief on a periodic basis to determine if there is a need to continue the elements of the traffic and parking management plan.

With implementation of the above recommendation, safe and efficient access can be provided to the Project site and the Project can be accommodated within the confines of the existing transportation infrastructure with minimal impacts.

cc: File

APPENDIX

PROJECT SITE PLAN
AUTOMATIC TRAFFIC RECORDER COUNT DATA
MANUAL TURNING MOVEMENT COUNT DATA
SEASONAL AND COVID ADJUSTMENT DATA
VEHICLE TRAVEL SPEED DATA
CRASH DATA
PARKING OBSERVATION DATA
GENERAL BACKGROUND TRAFFIC GROWTH
BACKGROUND PROJECT NETWORKS
TRIP-GENERATION CALCULATIONS
CAPACITY ANALYSIS WORKSHEETS

PROJECT SITE PLAN

AUTOMATIC TRAFFIC RECORDER COUNT DATA

Location : Route 1 90800001
Location : Just North of South Driveway
City/State: Salisbury, MA

9/17/2021	SB,		Hour Totals		NB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	4	45			4	4				
12:15	4	49			0	4				
12:30	1	47			0	2				
12:45	3	53	12	194	1	0	5	10	17	204
1:00	2	44			2	0				
1:15	1	42			2	1				
1:30	1	35			1	0				
1:45	1	49	5	170	0	1	5	2	10	172
2:00	1	63			0	2				
2:15	1	57			0	3				
2:30	0	56			0	3				
2:45	2	65	4	241	1	28	1	36	5	277
3:00	1	54			1	67				
3:15	0	49			0	71				
3:30	1	55			2	69				
3:45	1	55	3	213	0	52	3	259	6	472
4:00	1	61			0	59				
4:15	2	54			6	80				
4:30	6	58			1	63				
4:45	4	56	13	229	11	60	18	262	31	491
5:00	6	51			6	71				
5:15	3	69			3	74				
5:30	7	54			7	63				
5:45	7	45	23	219	12	89	28	297	51	516
6:00	8	61			6	56				
6:15	20	45			19	56				
6:30	13	44			8	62				
6:45	26	34	67	184	19	42	52	216	119	400
7:00	13	45			6	41				
7:15	32	35			1	38				
7:30	21	33			1	40				
7:45	23	31	89	144	0	39	8	158	97	302
8:00	28	36			3	29				
8:15	18	27			2	22				
8:30	31	25			1	25				
8:45	21	23	98	111	0	11	6	87	104	198
9:00	28	20			1	17				
9:15	20	24			1	17				
9:30	29	14			1	18				
9:45	29	13	106	71	3	8	6	60	112	131
10:00	40	14			2	6				
10:15	34	13			1	12				
10:30	26	9			0	15				
10:45	42	6	142	42	0	6	3	39	145	81
11:00	38	6			0	9				
11:15	40	6			0	9				
11:30	31	4			3	5				
11:45	50	1	159	17	1	5	4	28	163	45
Total	721	1835			139	1454			860	3289
Percent	28.2%	71.8%			8.7%	91.3%			20.7%	79.3%

Location : Route 1 90800001
Location : Just North of South Driveway
City/State: Salisbury, MA

9/18/2021	SB,		Hour Totals		NB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	4	63			7	90				
12:15	4	46			1	125				
12:30	4	76			2	83				
12:45	1	78	13	263	3	81	13	379	26	642
1:00	1	85			0	81				
1:15	2	65			2	97				
1:30	1	72			2	78				
1:45	1	61	5	283	0	68	4	324	9	607
2:00	1	78			0	77				
2:15	0	79			5	73				
2:30	0	90			0	62				
2:45	1	75	2	322	0	76	5	288	7	610
3:00	0	60			1	75				
3:15	1	83			1	63				
3:30	1	67			0	63				
3:45	1	77	3	287	1	60	3	261	6	548
4:00	0	65			2	65				
4:15	0	72			0	70				
4:30	2	76			1	71				
4:45	2	63	4	276	4	59	7	265	11	541
5:00	3	56			4	65				
5:15	4	53			4	63				
5:30	5	64			5	62				
5:45	9	53	21	226	8	63	21	253	42	479
6:00	5	61			6	55				
6:15	11	63			12	43				
6:30	3	51			16	52				
6:45	9	49	28	224	19	49	53	199	81	423
7:00	13	39			22	44				
7:15	20	51			20	39				
7:30	17	33			17	42				
7:45	22	28	72	151	30	31	89	156	161	307
8:00	18	32			30	27				
8:15	26	30			47	19				
8:30	38	22			45	30				
8:45	30	11	112	95	35	19	157	95	269	190
9:00	31	25			56	23				
9:15	33	18			53	18				
9:30	42	18			67	19				
9:45	71	24	177	85	56	27	232	87	409	172
10:00	55	9			59	9				
10:15	58	14			67	12				
10:30	66	9			82	13				
10:45	74	7	253	39	81	4	289	38	542	77
11:00	49	5			90	8				
11:15	68	3			93	3				
11:30	71	3			76	5				
11:45	70	3	258	14	106	12	365	28	623	42
Total	948	2265			1238	2373			2186	4638
Percent	29.5%	70.5%			34.3%	65.7%			32.0%	68.0%
Grand Total	1669	4100			1377	3827			3046	7927
Percent	28.9%	71.1%			26.5%	73.5%			27.8%	72.2%
ADT		ADT: 5,486		AADT: 5,486						

MANUAL TURNING MOVEMENT COUNT DATA

Accurate Counts

978-664-2565

N/S Street : Route 1
E/W Street : Collins St / Pike St
City/State : Salisbury, MA
Weather : Clear

File Name : 90800001
Site Code : 90800001
Start Date : 9/16/2021
Page No : 1

Groups Printed- Cars - Trucks

	Route 1 From North			Collins St From East			Route 1 From South			Pike St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	16	57	5	6	51	13	3	61	11	2	64	1	290
04:15 PM	19	57	7	4	60	16	2	62	9	4	63	5	308
04:30 PM	26	56	11	5	48	8	1	60	10	2	96	4	327
04:45 PM	25	65	2	2	33	15	2	47	7	4	77	3	282
Total	86	235	25	17	192	52	8	230	37	12	300	13	1207
05:00 PM	21	49	5	6	50	12	3	50	3	2	87	3	291
05:15 PM	19	46	4	5	49	22	2	70	12	3	68	3	303
05:30 PM	32	45	3	3	49	20	1	41	6	3	80	2	285
05:45 PM	27	59	3	6	50	19	1	62	8	4	82	1	322
Total	99	199	15	20	198	73	7	223	29	12	317	9	1201
Grand Total	185	434	40	37	390	125	15	453	66	24	617	22	2408
Apprch %	28.1	65.9	6.1	6.7	70.7	22.6	2.8	84.8	12.4	3.6	93.1	3.3	
Total %	7.7	18	1.7	1.5	16.2	5.2	0.6	18.8	2.7	1	25.6	0.9	
Cars	185	434	40	36	390	124	15	453	66	24	615	22	2404
% Cars	100	100	100	97.3	100	99.2	100	100	100	100	99.7	100	99.8
Trucks	0	0	0	1	0	1	0	0	0	0	2	0	4
% Trucks	0	0	0	2.7	0	0.8	0	0	0	0	0.3	0	0.2

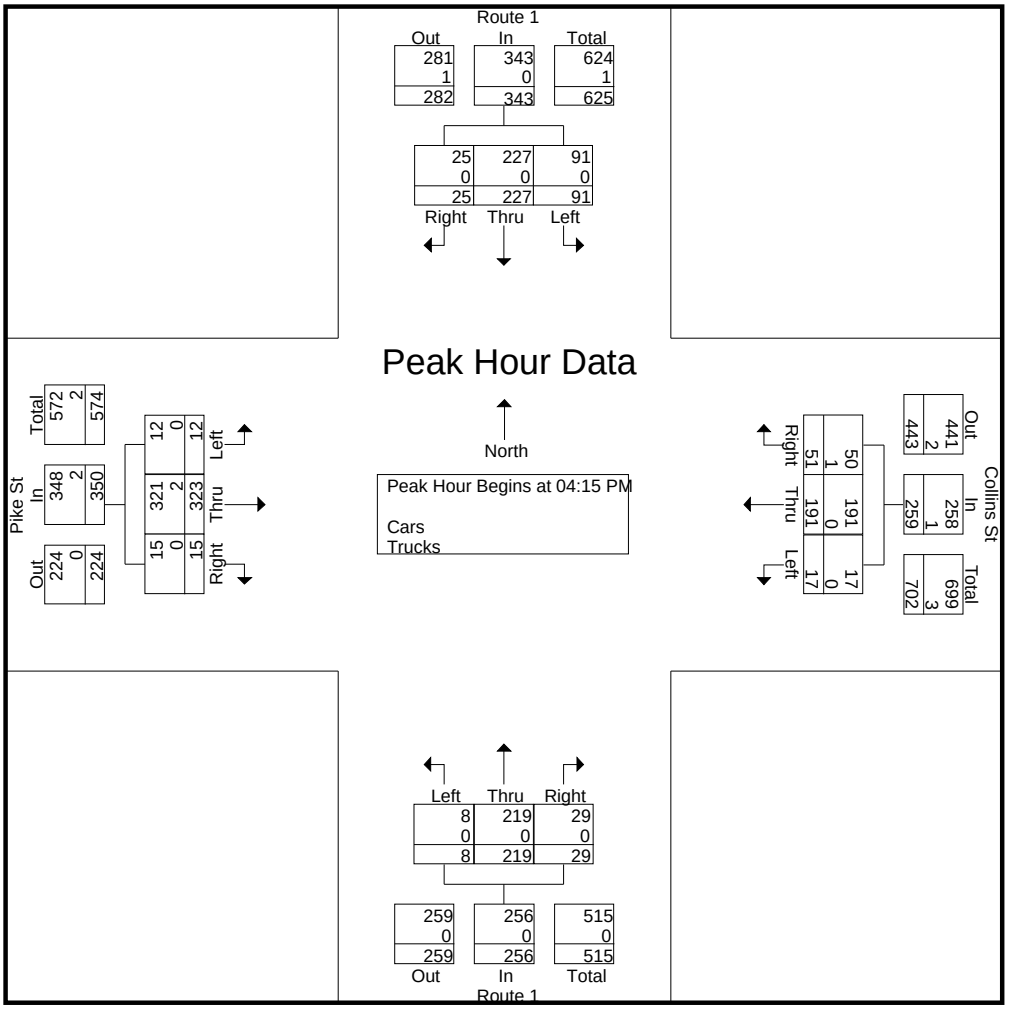
	Route 1 From North				Collins St From East				Route 1 From South				Pike St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	19	57	7	83	4	**60**	**16**	**80**	2	**62**	9	**73**	**4**	63	**5**	72	308
04:30 PM	**26**	56	**11**	**93**	5	48	8	61	1	60	**10**	71	2	**96**	4	**102**	**327**
04:45 PM	25	**65**	2	92	2	33	15	50	2	47	7	56	4	77	3	84	282
05:00 PM	21	49	5	75	**6**	50	12	68	**3**	50	3	56	2	87	3	92	291
Total Volume	91	227	25	343	17	191	51	259	8	219	29	256	12	323	15	350	1208
% App. Total	26.5	66.2	7.3		6.6	73.7	19.7		3.1	85.5	11.3		3.4	92.3	4.3		
PHF	.875	.873	.568	.922	.708	.796	.797	.809	.667	.883	.725	.877	.750	.841	.750	.858	.924
Cars	91	227	25	343	17	191	50	258	8	219	29	256	12	321	15	348	1205
% Cars	100	100	100	100	100	100	98.0	99.6	100	100	100	100	100	99.4	100	99.4	99.8
Trucks	0	0	0	0	0	0	1	1	0	0	0	0	0	2	0	2	3
% Trucks	0	0	0	0	0	0	2.0	0.4	0	0	0	0	0	0.6	0	0.6	0.2

Accurate Counts

978-664-2565

N/S Street : Route 1
E/W Street : Collins St / Pike St
City/State : Salisbury, MA
Weather : Clear

File Name : 90800001
Site Code : 90800001
Start Date : 9/16/2021
Page No : 2



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

	04:00 PM				05:00 PM				04:00 PM				04:30 PM			
+0 mins.	16	57	5	78	**6**	**50**	12	68	**3**	61	**11**	**75**	2	**96**	**4**	**102**
+15 mins.	19	57	7	83	5	49	**22**	**76**	2	**62**	9	73	**4**	77	3	84
+30 mins.	**26**	56	**11**	**93**	3	49	20	72	1	60	10	71	2	87	3	92
+45 mins.	25	**65**	2	92	6	50	19	75	2	47	7	56	3	68	3	74
Total Volume	86	235	25	346	20	198	73	291	8	230	37	275	11	328	13	352
% App. Total	24.9	67.9	7.2		6.9	68	25.1		2.9	83.6	13.5		3.1	93.2	3.7	
PHF	.827	.904	.568	.930	.833	.990	.830	.957	.667	.927	.841	.917	.688	.854	.813	.863
Cars	86	235	25	346	20	198	73	291	8	230	37	275	11	326	13	350
% Cars	100	100	100	100	100	100	100	100	100	100	100	100	100	99.4	100	99.4
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0	0.6

Accurate Counts

978-664-2565

N/S Street : Route 1
E/W Street : Collins St / Pike St
City/State : Salisbury, MA
Weather : Clear

File Name : 908000S1
Site Code : 90800001
Start Date : 9/18/2021
Page No : 1

Groups Printed- Cars - Trucks

	Route 1 From North			Collins St From East			Route 1 From South			Pike St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
11:00 AM	26	53	3	4	53	29	1	78	12	2	56	6	323
11:15 AM	30	67	4	10	62	15	0	82	5	3	65	0	343
11:30 AM	26	67	2	2	53	19	5	66	10	5	64	4	323
11:45 AM	41	65	4	13	55	20	2	98	6	4	70	7	385
Total	123	252	13	29	223	83	8	324	33	14	255	17	1374
12:00 PM	23	68	5	2	51	16	0	80	11	4	66	1	327
12:15 PM	33	64	3	5	58	28	0	107	11	3	80	1	393
12:30 PM	24	70	5	7	55	23	4	83	8	5	62	3	349
12:45 PM	20	74	3	5	66	19	1	78	7	0	72	1	346
Total	100	276	16	19	230	86	5	348	37	12	280	6	1415
01:00 PM	25	88	6	10	59	18	2	75	6	2	68	1	360
01:15 PM	33	61	4	11	55	18	2	80	15	3	78	4	364
01:30 PM	30	65	5	13	73	23	4	76	8	0	88	6	391
01:45 PM	30	55	6	6	68	15	2	63	7	1	94	3	350
Total	118	269	21	40	255	74	10	294	36	6	328	14	1465
Grand Total	341	797	50	88	708	243	23	966	106	32	863	37	4254
Apprch %	28.7	67.1	4.2	8.5	68.1	23.4	2.1	88.2	9.7	3.4	92.6	4	
Total %	8	18.7	1.2	2.1	16.6	5.7	0.5	22.7	2.5	0.8	20.3	0.9	
Cars	341	796	50	87	702	243	23	965	106	32	861	37	4243
% Cars	100	99.9	100	98.9	99.2	100	100	99.9	100	100	99.8	100	99.7
Trucks	0	1	0	1	6	0	0	1	0	0	2	0	11
% Trucks	0	0.1	0	1.1	0.8	0	0	0.1	0	0	0.2	0	0.3

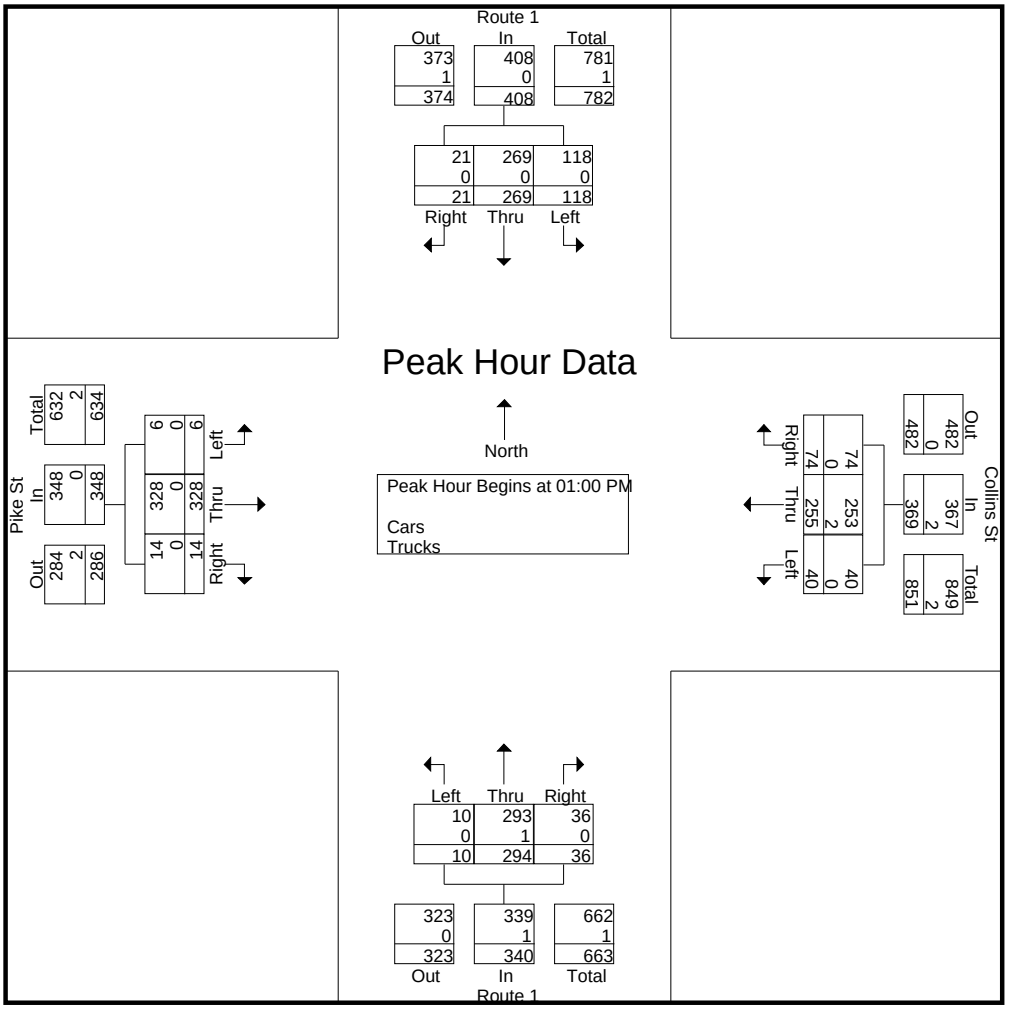
	Route 1 From North				Collins St From East				Route 1 From South				Pike St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:00 PM																	
01:00 PM	25	**88**	**6**	**119**	10	59	18	87	2	75	6	83	2	68	1	71	360
01:15 PM	**33**	61	4	98	11	55	18	84	2	**80**	**15**	**97**	**3**	78	4	85	364
01:30 PM	30	65	5	100	**13**	**73**	**23**	**109**	**4**	76	8	88	0	88	**6**	94	**391**
01:45 PM	30	55	6	91	6	68	15	89	2	63	7	72	1	**94**	3	**98**	350
Total Volume	118	269	21	408	40	255	74	369	10	294	36	340	6	328	14	348	1465
% App. Total	28.9	65.9	5.1		10.8	69.1	20.1		2.9	86.5	10.6		1.7	94.3	4		
PHF	.894	.764	.875	.857	.769	.873	.804	.846	.625	.919	.600	.876	.500	.872	.583	.888	.937
Cars	118	269	21	408	40	253	74	367	10	293	36	339	6	328	14	348	1462
% Cars	100	100	100	100	100	99.2	100	99.5	100	99.7	100	99.7	100	100	100	100	99.8
Trucks	0	0	0	0	0	2	0	2	0	1	0	1	0	0	0	0	3
% Trucks	0	0	0	0	0	0.8	0	0.5	0	0.3	0	0.3	0	0	0	0	0.2

Accurate Counts

978-664-2565

N/S Street : Route 1
E/W Street : Collins St / Pike St
City/State : Salisbury, MA
Weather : Clear

File Name : 908000S1
Site Code : 90800001
Start Date : 9/18/2021
Page No : 2



Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:15 PM				12:45 PM				11:45 AM				01:00 PM			
+0 mins.	**33**	64	3	100	5	66	19	90	2	98	6	106	2	68	1	71
+15 mins.	24	70	5	99	10	59	18	87	0	80	**11**	91	**3**	78	4	85
+30 mins.	20	74	3	97	11	55	18	84	0	**107**	11	**118**	0	88	**6**	94
+45 mins.	25	**88**	**6**	**119**	**13**	**73**	**23**	**109**	**4**	83	8	95	1	**94**	3	**98**
Total Volume	102	296	17	415	39	253	78	370	6	368	36	410	6	328	14	348
% App. Total	24.6	71.3	4.1		10.5	68.4	21.1		1.5	89.8	8.8		1.7	94.3	4	
PHF	.773	.841	.708	.872	.750	.866	.848	.849	.375	.860	.818	.869	.500	.872	.583	.888
Cars	102	295	17	414	39	251	78	368	6	368	36	410	6	328	14	348
% Cars	100	99.7	100	99.8	100	99.2	100	99.5	100	100	100	100	100	100	100	100
Trucks	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0
% Trucks	0	0.3	0	0.2	0	0.8	0	0.5	0	0	0	0	0	0	0	0

Accurate Counts

978-664-2565

N/S Street : Toll Road / Route 1
E/W Street : Route 1 / Site Driveway
City/State : Salisbury, MA
Weather : Clear

File Name : 90800003
Site Code : 90800003
Start Date : 9/16/2021
Page No : 1

Groups Printed- Cars - Trucks

	Toll Rd From North			Route 1 From East			Route 1 From South			Site Dwy From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	3	48	0	61	0	1	0	42	75	0	0	0	230
04:15 PM	3	34	0	62	0	8	0	39	71	0	0	0	217
04:30 PM	4	53	0	58	0	5	0	42	64	0	0	0	226
04:45 PM	2	52	0	66	0	5	0	46	59	0	0	0	230
Total	12	187	0	247	0	19	0	169	269	0	0	0	903
05:00 PM	1	56	0	53	0	5	0	60	61	0	0	0	236
05:15 PM	4	60	0	45	0	6	0	48	64	0	0	0	227
05:30 PM	3	41	0	52	0	5	0	41	50	0	0	0	192
05:45 PM	5	42	0	59	0	2	0	30	72	0	0	0	210
Total	13	199	0	209	0	18	0	179	247	0	0	0	865
Grand Total	25	386	0	456	0	37	0	348	516	0	0	0	1768
Apprch %	6.1	93.9	0	92.5	0	7.5	0	40.3	59.7	0	0	0	
Total %	1.4	21.8	0	25.8	0	2.1	0	19.7	29.2	0	0	0	
Cars	24	381	0	455	0	37	0	346	516	0	0	0	1759
% Cars	96	98.7	0	99.8	0	100	0	99.4	100	0	0	0	99.5
Trucks	1	5	0	1	0	0	0	2	0	0	0	0	9
% Trucks	4	1.3	0	0.2	0	0	0	0.6	0	0	0	0	0.5

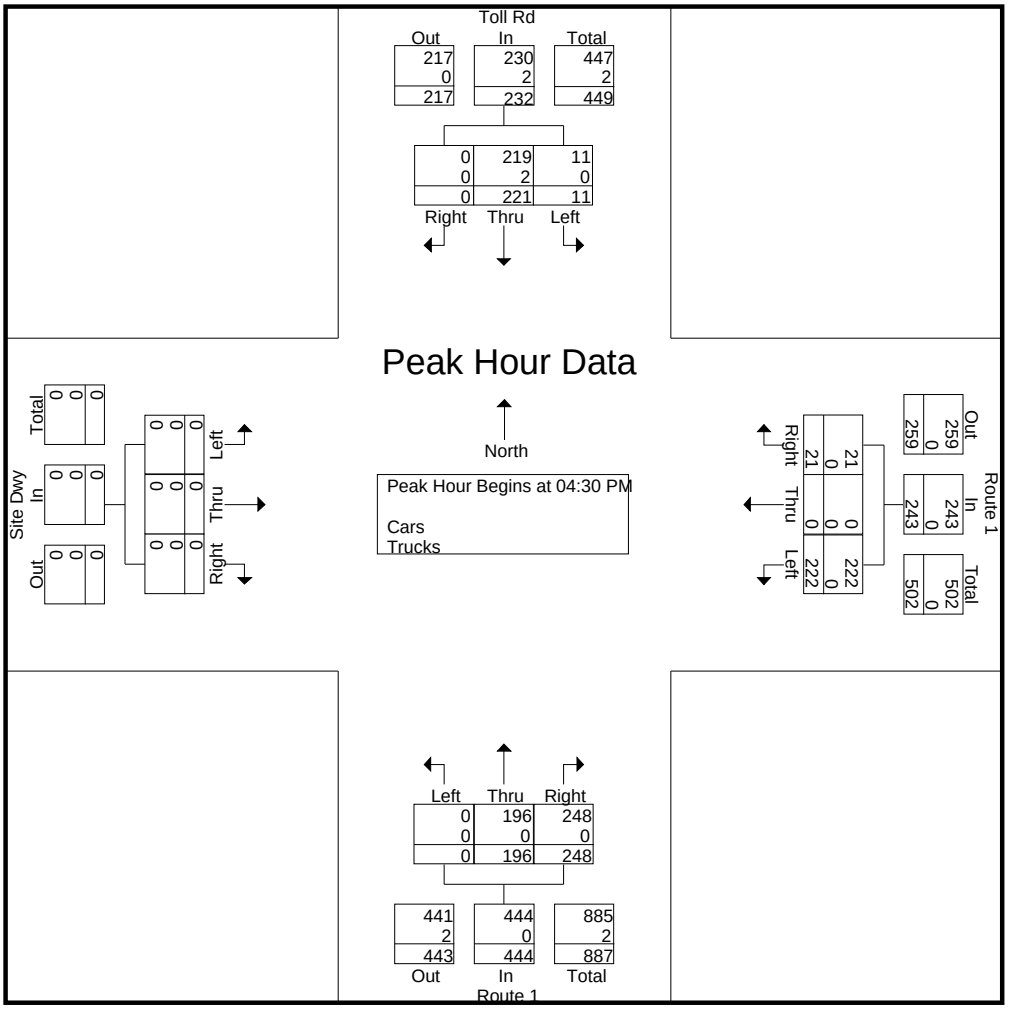
	Toll Rd From North				Route 1 From East				Route 1 From South				Site Dwy From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**4**	53	0	57	58	0	5	63	0	42	**64**	106	0	0	0	0	226
04:45 PM	2	52	0	54	**66**	0	5	**71**	0	46	59	105	0	0	0	0	230
05:00 PM	1	56	0	57	53	0	5	58	0	**60**	61	**121**	0	0	0	0	**236**
05:15 PM	4	**60**	0	**64**	45	0	**6**	51	0	48	64	112	0	0	0	0	227
Total Volume	11	221	0	232	222	0	21	243	0	196	248	444	0	0	0	0	919
% App. Total	4.7	95.3	0		91.4	0	8.6		0	44.1	55.9		0	0	0		
PHF	.688	.921	.000	.906	.841	.000	.875	.856	.000	.817	.969	.917	.000	.000	.000	.000	.974
Cars	11	219	0	230	222	0	21	243	0	196	248	444	0	0	0	0	917
% Cars	100	99.1	0	99.1	100	0	100	100	0	100	100	100	0	0	0	0	99.8
Trucks	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
% Trucks	0	0.9	0	0.9	0	0	0	0	0	0	0	0	0	0	0	0	0.2

Accurate Counts

978-664-2565

N/S Street : Toll Road / Route 1
E/W Street : Route 1 / Site Driveway
City/State : Salisbury, MA
Weather : Clear

File Name : 90800003
Site Code : 90800003
Start Date : 9/16/2021
Page No : 2



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

	04:30 PM				04:00 PM				04:30 PM				04:00 PM			
+0 mins.	**4**	53	0	57	61	0	1	62	0	42	**64**	106	0	0	0	0
+15 mins.	2	52	0	54	62	0	**8**	70	0	46	59	105	0	0	0	0
+30 mins.	1	56	0	57	58	0	5	63	0	**60**	61	**121**	0	0	0	0
+45 mins.	4	**60**	0	**64**	**66**	0	5	**71**	0	48	64	112	0	0	0	0
Total Volume	11	221	0	232	247	0	19	266	0	196	248	444	0	0	0	0
% App. Total	4.7	95.3	0		92.9	0	7.1		0	44.1	55.9		0	0	0	
PHF	.688	.921	.000	.906	.936	.000	.594	.937	.000	.817	.969	.917	.000	.000	.000	.000
Cars	11	219	0	230	246	0	19	265	0	196	248	444	0	0	0	0
% Cars	100	99.1	0	99.1	99.6	0	100	99.6	0	100	100	100	0	0	0	0
Trucks	0	2	0	2	1	0	0	1	0	0	0	0	0	0	0	0
% Trucks	0	0.9	0	0.9	0.4	0	0	0.4	0	0	0	0	0	0	0	0

Accurate Counts

978-664-2565

N/S Street : Toll Road / Route 1
E/W Street : Route 1 / Site Driveway
City/State : Salisbury, MA
Weather : Clear

File Name : 908000S3
Site Code : 90800003
Start Date : 9/18/2021
Page No : 1

Groups Printed- Cars - Trucks

	Toll Rd From North			Route 1 From East			Route 1 From South			Site Dwy From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
11:00 AM	3	54	0	55	0	1	0	51	93	0	0	0	257
11:15 AM	4	51	0	67	0	2	0	45	90	0	0	0	259
11:30 AM	2	40	0	72	0	6	0	54	73	0	0	0	247
11:45 AM	9	54	0	76	0	4	0	40	102	0	0	0	285
Total	18	199	0	270	0	13	0	190	358	0	0	0	1048
12:00 PM	4	47	0	70	0	2	0	47	99	0	0	0	269
12:15 PM	4	47	0	61	0	5	0	44	115	0	0	0	276
12:30 PM	2	35	0	76	0	2	0	41	80	0	0	0	236
12:45 PM	0	44	0	79	0	2	0	40	79	0	0	0	244
Total	10	173	0	286	0	11	0	172	373	0	0	0	1025
01:00 PM	5	56	0	90	0	4	0	47	86	0	0	0	288
01:15 PM	5	67	0	67	0	5	0	52	87	0	0	0	283
01:30 PM	3	48	0	85	0	3	0	37	85	0	0	0	261
01:45 PM	1	59	0	60	0	6	0	22	66	0	0	0	214
Total	14	230	0	302	0	18	0	158	324	0	0	0	1046
Grand Total	42	602	0	858	0	42	0	520	1055	0	0	0	3119
Apprch %	6.5	93.5	0	95.3	0	4.7	0	33	67	0	0	0	
Total %	1.3	19.3	0	27.5	0	1.3	0	16.7	33.8	0	0	0	
Cars	42	600	0	858	0	42	0	516	1054	0	0	0	3112
% Cars	100	99.7	0	100	0	100	0	99.2	99.9	0	0	0	99.8
Trucks	0	2	0	0	0	0	0	4	1	0	0	0	7
% Trucks	0	0.3	0	0	0	0	0	0.8	0.1	0	0	0	0.2

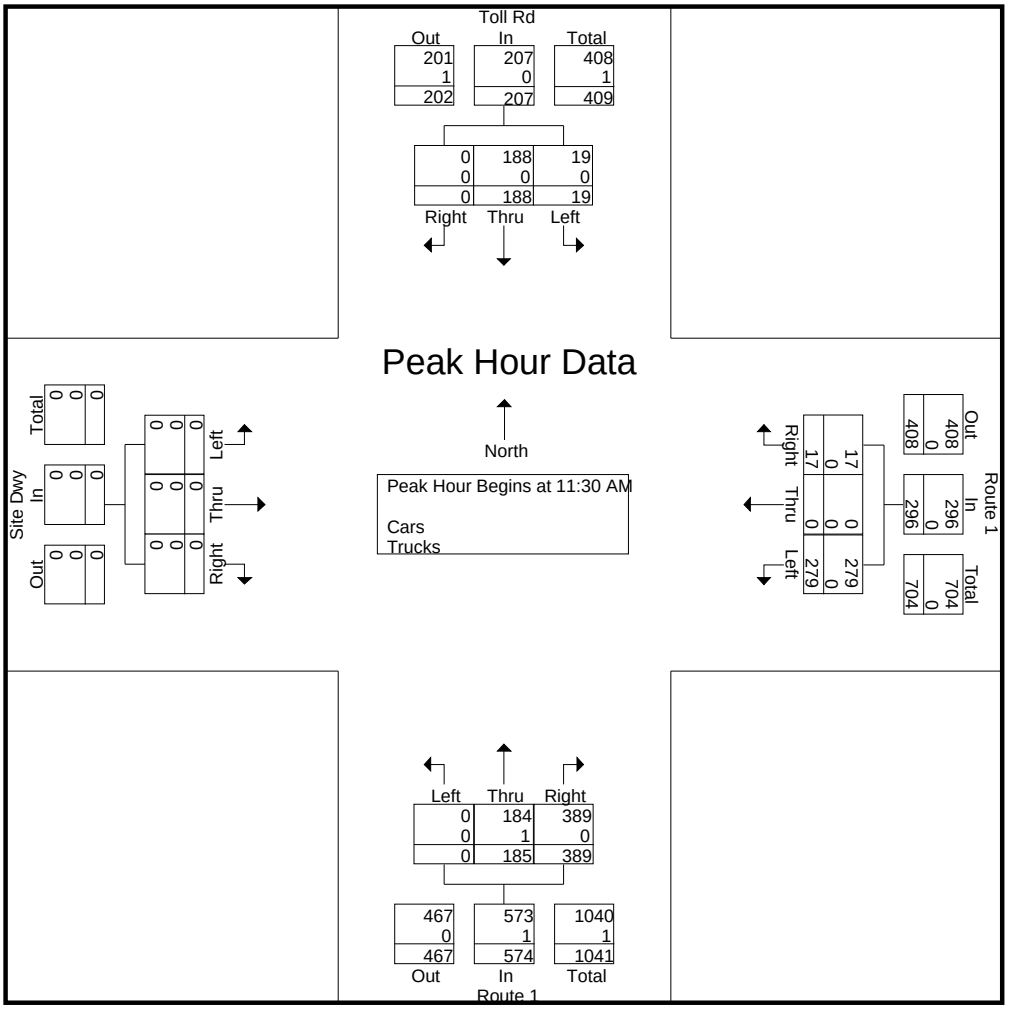
	Toll Rd From North				Route 1 From East				Route 1 From South				Site Dwy From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:30 AM																	
11:30 AM	2	40	0	42	72	0	**6**	78	0	**54**	73	127	0	0	0	0	247
11:45 AM	**9**	**54**	0	**63**	**76**	0	4	**80**	0	40	102	142	0	0	0	0	**285**
12:00 PM	4	47	0	51	70	0	2	72	0	47	99	146	0	0	0	0	269
12:15 PM	4	47	0	51	61	0	5	66	0	44	**115**	**159**	0	0	0	0	276
Total Volume	19	188	0	207	279	0	17	296	0	185	389	574	0	0	0	0	1077
% App. Total	9.2	90.8	0		94.3	0	5.7		0	32.2	67.8		0	0	0		
PHF	.528	.870	.000	.821	.918	.000	.708	.925	.000	.856	.846	.903	.000	.000	.000	.000	.945
Cars	19	188	0	207	279	0	17	296	0	184	389	573	0	0	0	0	1076
% Cars	100	100	0	100	100	0	100	100	0	99.5	100	99.8	0	0	0	0	99.9
Trucks	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
% Trucks	0	0	0	0	0	0	0	0	0	0.5	0	0.2	0	0	0	0	0.1

Accurate Counts

978-664-2565

N/S Street : Toll Road / Route 1
E/W Street : Route 1 / Site Driveway
City/State : Salisbury, MA
Weather : Clear

File Name : 908000S3
Site Code : 90800003
Start Date : 9/18/2021
Page No : 2



Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1

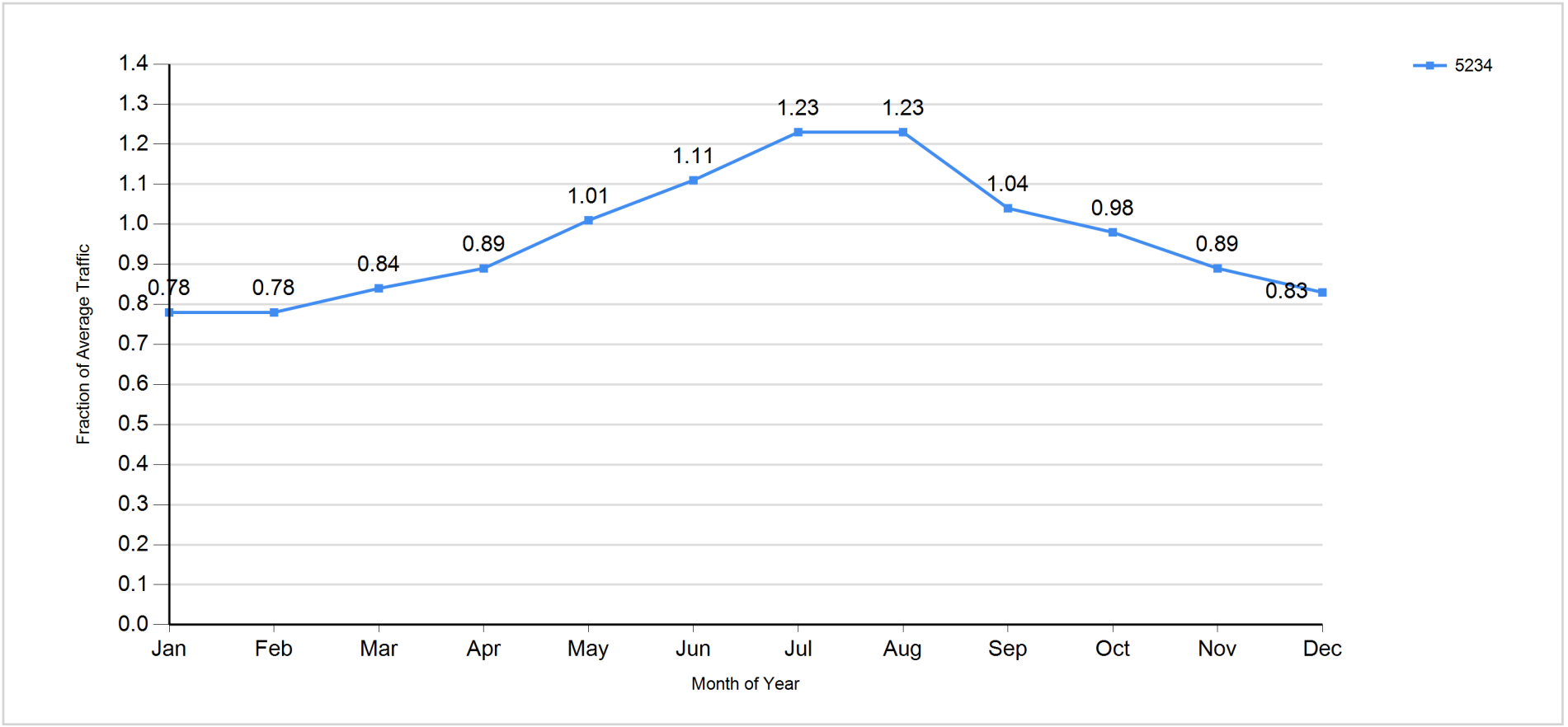
Peak Hour for Each Approach Begins at:

	01:00 PM				12:45 PM				11:30 AM				11:00 AM			
+0 mins.	**5**	56	0	61	79	0	2	81	0	**54**	73	127	0	0	0	0
+15 mins.	5	**67**	0	**72**	**90**	0	4	**94**	0	40	102	142	0	0	0	0
+30 mins.	3	48	0	51	67	0	**5**	72	0	47	99	146	0	0	0	0
+45 mins.	1	59	0	60	85	0	3	88	0	44	**115**	**159**	0	0	0	0
Total Volume	14	230	0	244	321	0	14	335	0	185	389	574	0	0	0	0
% App. Total	5.7	94.3	0		95.8	0	4.2		0	32.2	67.8		0	0	0	
PHF	.700	.858	.000	.847	.892	.000	.700	.891	.000	.856	.846	.903	.000	.000	.000	.000
Cars	14	229	0	243	321	0	14	335	0	184	389	573	0	0	0	0
% Cars	100	99.6	0	99.6	100	0	100	100	0	99.5	100	99.8	0	0	0	0
Trucks	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
% Trucks	0	0.4	0	0.4	0	0	0	0	0	0.5	0	0.2	0	0	0	0

SEASONAL AND COVID ADJUSTMENT DATA

Massachusetts Highway Department

Traffic Pattern by Month for 1/1/2019 - 12/31/2019
Criteria: Location ID = 5234, From 1/1/1900 To 12/31/2049 12:00:00 AM



Massachusetts Highway Department

Traffic Pattern by Month for 1/1/2019 - 12/31/2019
Criteria: Location ID = 5234, From 1/1/1900 To 12/31/2049 12:00:00 AM

Factor Group	Station	Weight	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
U1-Essex	5234	0	0.777	0.784	0.842	0.892	1.012	1.112	1.232	1.234	1.038	0.981	0.889	0.834
	Average of Weighted Factors		**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**

2021 COVID Adjustement			
Continues Count Station No.5234-I495			
Year	Month	Average-Month Count Data	Adjustement to 2021
2019	Septmeber	76,802	78346
2021	Septemebr	6,297	72,383
Covid Adjustement Rate			1.08
From Traffic Study that was prepared for 76 Townhose units on Forest Road, south of School House Lane			
Covid Adjustement Rate			1.03

Adjust 2021 Volume up to 6%

Note: 1.0% Background Growth Rate per Year

Adjustement for Travel Reduction as Route 1 Construction

Route 1 at Route 286:

2021 COUNTS	Raw PM	Adjusted to Average Month PM
EB L	13	12
EB T	342	328
EB R	16	15
WB L	18	17
WB T	202	194
WB R	54	52
NB L	8	8
NB T	232	223
NB R	31	30
SB L	96	92
SB T	241	231
SB R	27	26

	PM			
EB Approach	355	228	West of Rte 1	
WB Approach	263	450	East of Rte 1	
NB Approach	261	254	South of 286	
SB Approach	349	287	North of 286	

		PM		
	count station	985	1.548742	
		349		
		287		
		636		
in	228		450	
out	355	Route 1 at	263	
total	583	Route 286	713	
count station 607		261		837 count station
1.04117		254		1.173913
		515		
	count station	781	1.516505	

AVERAGE 1.320082

USE 32%

North of site driveway

Location Info	
Location ID	257581
Type	I-SECTION
Functional Class	4
Located On	LAFAYETTE ROAD
NORTH OF	INTERSTATE 95 CONNECTOR
Direction	2-WAY
Community	Salisbury
MPO_ID	
HPMS ID	
Agency	Massachusetts Highway Department

Count Data Info	
Start Date	6/21/2016
End Date	6/22/2016
Start Time	9:00 AM
End Time	9:00 AM
Direction	
Notes	
Count Source	v257851
File Name	
Weather	
Study	
Owner	rpa07
QC Status	Accepted

Interval: 15 mins

Time	15 Min				Hourly Count
	1st	2nd	3rd	4th	
00:00 - 01:00	7	2	13	6	28
01:00 - 02:00	1	3	2	5	11
02:00 - 03:00	6	1	3	5	15
03:00 - 04:00	2	8	3	3	16
04:00 - 05:00	9	11	13	17	50
05:00 - 06:00	25	37	35	56	153
06:00 - 07:00	60	75	84	81	300
07:00 - 08:00	65	114	113	122	414
08:00 - 09:00	131	115	122	124	492
09:00 - 10:00	156	130	136	141	563
10:00 - 11:00	156	147	183	163	649
11:00 - 12:00	182	202	175	188	747
12:00 - 13:00	180	192	184	186	742
13:00 - 14:00	179	170	196	190	735
14:00 - 15:00	157	196	187	185	725
15:00 - 16:00	212	215	192	215	834
16:00 - 17:00	213	195	203	203	814
17:00 - 18:00	187	166	151	165	669
18:00 - 19:00	151	166	128	142	587
19:00 - 20:00	116	127	120	110	473
20:00 - 21:00	95	80	79	72	326
21:00 - 22:00	63	47	53	62	225
22:00 - 23:00	26	32	18	24	100
23:00 - 24:00	18	13	15	15	61
TOTAL					9729
PM Peak					15:15-16:15 835

		2016	2021	0.89
Growth	1.01	835	**878**	781
5			June'	Average Month

Location Info	
Location ID	3372659
Type	I-SECTION
Functional Class	4
Located On	PIKE STREET
WEST OF	LAFAYETTE ROAD
Direction	2-WAY
Community	Salisbury
MPO_ID	
HPMS ID	
Agency	Massachusetts Highway Department

Count Data Info		
Start Date	11/2/2017	**Thur**
End Date	11/3/2017	
Start Time	12:00 PM	
End Time	12:00 PM	
Direction		
Notes		
Count Source	0	
File Name		
Weather		
Study		
Owner	rpa07	
QC Status	Accepted	

Interval: 15 mins

Time	15 Min				Hourly Count
	1st	2nd	3rd	4th	
00:00 - 01:00	17	15	11	5	48
01:00 - 02:00	7	9	5	9	30
02:00 - 03:00	4	4	4	3	15
03:00 - 04:00	4	4	5	3	16
04:00 - 05:00	6	7	14	14	41
05:00 - 06:00	26	38	34	57	155
06:00 - 07:00	56	70	53	73	252
07:00 - 08:00	80	113	112	103	408
08:00 - 09:00	106	123	105	90	424
09:00 - 10:00	85	89	82	82	338
10:00 - 11:00	82	88	83	76	329
11:00 - 12:00	89	85	69	89	332
12:00 - 13:00	79	80	77	81	317
13:00 - 14:00	72	84	102	88	346
14:00 - 15:00	99	75	110	84	368
15:00 - 16:00	99	107	125	113	444
16:00 - 17:00	116	108	105	125	454
17:00 - 18:00	124	127	140	134	525
18:00 - 19:00	120	132	104	95	451
19:00 - 20:00	101	66	73	51	291
20:00 - 21:00	52	37	55	42	186
21:00 - 22:00	47	52	36	36	171
22:00 - 23:00	33	39	29	37	138
23:00 - 24:00	27	22	28	14	91
TOTAL					6170
PM Peak					17:30-18:30 526

		2017	2021	1.11
Growth	1.01	526	**547**	607
4				AVG

On 286, east of Route 1

Location Info	
Location ID	258235
Type	I-SECTION
Functional Class	4
Located On	COLLINS STREET
AT	NEW HAMPSHIRE STATE LINE
Direction	2-WAY
Community	Salisbury
MPO_ID	
HPMS ID	
Agency	Massachusetts Highway Department

Count Data Info	
Start Date	7/15/2015
End Date	7/16/2015
Start Time	1:00 PM
End Time	1:00 PM
Direction	
Notes	
Count Source	258235
File Name	
Weather	
Study	
Owner	rpa07
QC Status	Accepted

Interval: 15 mins

Time	15 Min				Hourly Count
	1st	2nd	3rd	4th	
00:00 - 01:00	37	26	15	19	97
01:00 - 02:00	19	14	17	5	55
02:00 - 03:00	6	9	4	4	23
03:00 - 04:00	3	6	5	5	19
04:00 - 05:00	8	14	22	27	71
05:00 - 06:00	43	54	56	76	229
06:00 - 07:00	81	102	129	159	471
07:00 - 08:00	147	137	143	206	633
08:00 - 09:00	151	167	165	172	655
09:00 - 10:00	180	183	205	245	813
10:00 - 11:00	227	253	255	270	1005
11:00 - 12:00	249	256	279	266	1050
12:00 - 13:00	246	229	246	250	971
13:00 - 14:00	171	208	203	227	809
14:00 - 15:00	193	208	208	190	799
15:00 - 16:00	228	226	220	243	917
16:00 - 17:00	280	240	229	238	987
17:00 - 18:00	242	268	262	252	1024
18:00 - 19:00	228	210	236	256	930
19:00 - 20:00	248	213	157	198	816
20:00 - 21:00	171	134	138	131	574
21:00 - 22:00	131	136	87	90	444
22:00 - 23:00	125	162	90	93	470
23:00 - 24:00	60	55	44	33	192
TOTAL					14054
PM Peak					17:00-18:00 1,024

		2015	2021	0.77
Growth	1.01	1,024	**1087**	837
6			Jul	AVG

Route 1, north of 286

Location Info	
Location ID	225938
Type	I-SECTION
Functional Class	4
Located On	LAFAYETTE ROAD
AT	NEW HAMPSHIRE STATE LINE
Direction	2-WAY
Community	Salisbury
MPO_ID	
HPMS ID	
Agency	Massachusetts Highway Department

Count Data Info		
Start Date	11/2/2017	
End Date	11/3/2017	**Thu**
Start Time	11:00 AM	
End Time	11:00 AM	
Direction		
Notes		
Count Source	0	
File Name		
Weather		
Study		
Owner	rpa07	
QC Status	Accepted	

Interval: 15 mins

Time	15 Min				Hourly Count
	1st	2nd	3rd	4th	
00:00 - 01:00	14	8	4	8	34
01:00 - 02:00	6	4	6	1	17
02:00 - 03:00	3	3	2	3	11
03:00 - 04:00	0	7	6	6	19
04:00 - 05:00	4	6	20	16	46
05:00 - 06:00	23	25	38	38	124
06:00 - 07:00	59	58	85	85	287
07:00 - 08:00	81	105	91	132	409
08:00 - 09:00	118	154	123	138	533
09:00 - 10:00	150	155	158	174	637
10:00 - 11:00	163	184	177	210	734
11:00 - 12:00	197	157	189	193	736
12:00 - 13:00	179	183	199	185	746
13:00 - 14:00	178	194	230	190	792
14:00 - 15:00	186	205	198	183	772
15:00 - 16:00	207	202	217	226	852
16:00 - 17:00	206	194	204	188	792
17:00 - 18:00	195	198	216	193	802
18:00 - 19:00	160	151	142	140	593
19:00 - 20:00	124	111	96	90	421
20:00 - 21:00	84	71	63	71	289
21:00 - 22:00	61	55	49	46	211
22:00 - 23:00	48	28	28	14	118
23:00 - 24:00	12	12	9	16	49
TOTAL					10024
PM Peak					15:00-16:00 852

		2017	2021	1.11
Growth	1.01	852	**887**	985
4			Nov	AVG

VEHICLE TRAVEL SPEED DATA

Location : Route 1 90800001
Location : Just North of South Driveway
City/State: Salisbury, MA
Direction: SB,

9/17/2021 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	5	3	4	0	0	0	0	0	0	12
1:00	0	0	0	0	0	3	0	2	0	0	0	0	0	5
2:00	0	0	0	1	1	0	1	1	0	0	0	0	0	4
3:00	0	0	0	1	1	0	1	0	0	0	0	0	0	3
4:00	0	0	1	0	2	6	3	1	0	0	0	0	0	13
5:00	1	0	1	1	3	8	7	2	0	0	0	0	0	23
6:00	0	1	4	0	10	23	23	5	0	1	0	0	0	67
7:00	4	4	6	8	33	26	8	0	0	0	0	0	0	89
8:00	2	12	2	9	35	32	6	0	0	0	0	0	0	98
9:00	1	7	6	17	38	31	5	1	0	0	0	0	0	106
10:00	5	9	8	30	59	28	3	0	0	0	0	0	0	142
11:00	1	2	1	23	84	38	10	0	0	0	0	0	0	159
12:00 PM	6	11	10	41	91	35	0	0	0	0	0	0	0	194
1:00	1	7	6	24	84	45	3	0	0	0	0	0	0	170
2:00	2	9	17	38	96	70	8	1	0	0	0	0	0	241
3:00	0	5	4	12	46	100	42	3	1	0	0	0	0	213
4:00	0	3	2	9	48	126	34	6	1	0	0	0	0	229
5:00	0	6	4	9	40	102	48	9	1	0	0	0	0	219
6:00	1	6	0	15	39	84	30	7	2	0	0	0	0	184
7:00	0	2	3	14	63	52	10	0	0	0	0	0	0	144
8:00	0	5	6	11	27	47	11	3	1	0	0	0	0	111
9:00	0	1	0	3	22	28	14	2	1	0	0	0	0	71
10:00	0	0	1	4	11	17	8	0	1	0	0	0	0	42
11:00	0	0	0	2	4	5	5	1	0	0	0	0	0	17
Total	24	90	82	272	842	909	284	44	8	1	0	0	0	2556

Percentile	15th	50th	85th	95th
Speed	29.9	34.9	39.9	42.9

Mean Speed (Average)	34.2
10 MPH Pace Speed	30-39
Number in Pace	1738
Percent in Pace	68.0%
Number > 35 MPH	1246
Percent > 35 MPH	48.7%

Location : Route 1 90800001
Location : Just North of South Driveway
City/State: Salisbury, MA
Direction: SB,

9/18/2021 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	8	3	2	0	0	0	0	0	0	13
1:00	0	0	0	1	0	2	1	1	0	0	0	0	0	5
2:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2
3:00	0	0	1	0	0	2	0	0	0	0	0	0	0	3
4:00	0	1	0	1	0	1	1	0	0	0	0	0	0	4
5:00	0	1	1	0	3	11	4	1	0	0	0	0	0	21
6:00	1	4	0	2	13	5	3	0	0	0	0	0	0	28
7:00	0	2	0	6	23	26	13	2	0	0	0	0	0	72
8:00	0	2	0	5	25	54	22	4	0	0	0	0	0	112
9:00	0	5	4	9	48	73	33	2	3	0	0	0	0	177
10:00	0	3	2	15	70	116	31	14	2	0	0	0	0	253
11:00	1	2	2	17	81	110	34	10	1	0	0	0	0	258
12:00 PM	2	3	5	13	78	110	45	6	1	0	0	0	0	263
1:00	0	3	2	14	70	128	61	5	0	0	0	0	0	283
2:00	2	7	5	15	93	154	42	3	0	1	0	0	0	322
3:00	0	5	11	19	81	116	48	7	0	0	0	0	0	287
4:00	0	8	5	5	91	123	39	4	0	1	0	0	0	276
5:00	0	3	7	7	58	99	48	3	1	0	0	0	0	226
6:00	0	0	4	10	70	99	38	2	1	0	0	0	0	224
7:00	0	2	0	11	63	54	20	1	0	0	0	0	0	151
8:00	1	1	3	12	27	34	15	2	0	0	0	0	0	95
9:00	0	0	2	4	26	40	9	3	1	0	0	0	0	85
10:00	0	1	0	5	19	12	1	1	0	0	0	0	0	39
11:00	0	1	0	3	4	5	1	0	0	0	0	0	0	14
Total	7	54	54	174	952	1378	511	71	10	2	0	0	0	3213
			Percentile	15th	50th	85th	95th							
			Speed	31.9	36.9	40.9	43.9							
			Mean Speed (Average)	35.9										
			10 MPH Pace Speed	30-39										
			Number in Pace	2306										
			Percent in Pace	71.8%										
			Number > 35 MPH	1972										
			Percent > 35 MPH	61.4%										
Grand Total	31	144	136	446	1794	2287	795	115	18	3	0	0	0	5769
Stats			Percentile	15th	50th	85th	95th							
			Speed	30.9	35.9	40.9	43.9							
			Mean Speed (Average)	35.2										
			10 MPH Pace Speed	30-39										
			Number in Pace	4044										
			Percent in Pace	70.1%										
			Number > 35 MPH	3218										
			Percent > 35 MPH	55.8%										

Location : Route 1 90800001
Location : Just North of South Driveway
City/State: Salisbury, MA
Direction: NB,

9/17/2021 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	2	0	0	1	0	2	0	0	0	0	0	0	5
1:00	0	0	0	2	1	2	0	0	0	0	0	0	0	5
2:00	0	0	0	0	0	0	0	1	0	0	0	0	0	1
3:00	0	0	0	2	0	1	0	0	0	0	0	0	0	3
4:00	1	1	2	3	4	4	1	2	0	0	0	0	0	18
5:00	1	1	0	1	9	11	4	1	0	0	0	0	0	28
6:00	1	4	1	3	26	14	2	1	0	0	0	0	0	52
7:00	2	5	1	0	0	0	0	0	0	0	0	0	0	8
8:00	2	1	2	0	1	0	0	0	0	0	0	0	0	6
9:00	2	2	1	1	0	0	0	0	0	0	0	0	0	6
10:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
11:00	0	1	2	0	1	0	0	0	0	0	0	0	0	4
12:00 PM	3	4	3	0	0	0	0	0	0	0	0	0	0	10
1:00	0	1	0	1	0	0	0	0	0	0	0	0	0	2
2:00	1	4	4	8	13	4	2	0	0	0	0	0	0	36
3:00	0	5	11	67	108	58	9	1	0	0	0	0	0	259
4:00	0	4	5	33	136	73	9	1	1	0	0	0	0	262
5:00	0	7	14	45	142	78	9	2	0	0	0	0	0	297
6:00	1	3	7	33	88	70	11	3	0	0	0	0	0	216
7:00	1	7	10	23	61	50	5	1	0	0	0	0	0	158
8:00	0	4	2	16	36	20	8	1	0	0	0	0	0	87
9:00	0	0	1	8	25	19	6	1	0	0	0	0	0	60
10:00	0	0	0	4	16	14	3	2	0	0	0	0	0	39
11:00	0	0	0	5	11	9	3	0	0	0	0	0	0	28
Total	15	59	66	255	679	427	74	17	1	0	0	0	0	1593

Percentile	15th	50th	85th	95th
Speed	27.9	33.9	37.9	40.9

Mean Speed (Average)	32.5
10 MPH Pace Speed	30-39
Number in Pace	1103
Percent in Pace	69.2%
Number > 35 MPH	519
Percent > 35 MPH	32.6%

Location : Route 1 90800001
Location : Just North of South Driveway
City/State: Salisbury, MA
Direction: NB,

9/18/2021 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	3	4	5	1	0	0	0	0	0	0	13
1:00	0	0	0	0	1	3	0	0	0	0	0	0	0	4
2:00	0	0	0	0	4	1	0	0	0	0	0	0	0	5
3:00	0	0	1	0	1	1	0	0	0	0	0	0	0	3
4:00	0	1	0	0	0	2	2	2	0	0	0	0	0	7
5:00	0	0	0	4	9	6	2	0	0	0	0	0	0	21
6:00	1	2	1	9	22	13	4	1	0	0	0	0	0	53
7:00	0	2	0	12	34	33	8	0	0	0	0	0	0	89
8:00	0	2	4	16	55	65	14	1	0	0	0	0	0	157
9:00	0	4	6	27	99	83	12	1	0	0	0	0	0	232
10:00	0	4	2	32	169	78	4	0	0	0	0	0	0	289
11:00	2	3	7	69	181	95	7	1	0	0	0	0	0	365
12:00 PM	1	8	8	68	197	88	7	2	0	0	0	0	0	379
1:00	1	1	5	47	169	86	13	2	0	0	0	0	0	324
2:00	0	4	6	48	121	98	11	0	0	0	0	0	0	288
3:00	4	3	5	37	100	98	12	2	0	0	0	0	0	261
4:00	0	4	3	37	119	83	17	1	1	0	0	0	0	265
5:00	3	8	6	15	90	107	22	1	0	1	0	0	0	253
6:00	0	4	2	24	80	73	13	3	0	0	0	0	0	199
7:00	0	1	2	22	83	42	5	0	1	0	0	0	0	156
8:00	0	2	2	11	44	32	1	3	0	0	0	0	0	95
9:00	0	2	1	14	40	22	8	0	0	0	0	0	0	87
10:00	0	0	1	6	11	16	4	0	0	0	0	0	0	38
11:00	0	0	1	4	12	5	6	0	0	0	0	0	0	28
Total	12	55	63	505	1645	1135	173	20	2	1	0	0	0	3611
			Percentile	15th	50th	85th	95th							
			Speed	29.9	33.9	37.9	40.9							
		Mean Speed (Average)		33.5										
		10 MPH Pace Speed		30-39										
		Number in Pace		2767										
		Percent in Pace		76.6%										
		Number > 35 MPH		1331										
		Percent > 35 MPH		36.9%										
Grand Total	27	114	129	760	2324	1562	247	37	3	1	0	0	0	5204
Stats			Percentile	15th	50th	85th	95th							
			Speed	29.9	33.9	37.9	40.9							
		Mean Speed (Average)		33.2										
		10 MPH Pace Speed		30-39										
		Number in Pace		3870										
		Percent in Pace		74.4%										
		Number > 35 MPH		1850										
		Percent > 35 MPH		35.5%										

Location : Route 1 90800001
Location : Just North of South Driveway
City/State: Salisbury, MA
Direction: Combined

9/17/2021 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	2	0	0	6	3	6	0	0	0	0	0	0	17
1:00	0	0	0	2	1	5	0	2	0	0	0	0	0	10
2:00	0	0	0	1	1	0	1	2	0	0	0	0	0	5
3:00	0	0	0	3	1	1	1	0	0	0	0	0	0	6
4:00	1	1	3	3	6	10	4	3	0	0	0	0	0	31
5:00	2	1	1	2	12	19	11	3	0	0	0	0	0	51
6:00	1	5	5	3	36	37	25	6	0	1	0	0	0	119
7:00	6	9	7	8	33	26	8	0	0	0	0	0	0	97
8:00	4	13	4	9	36	32	6	0	0	0	0	0	0	104
9:00	3	9	7	18	38	31	5	1	0	0	0	0	0	112
10:00	5	12	8	30	59	28	3	0	0	0	0	0	0	145
11:00	1	3	3	23	85	38	10	0	0	0	0	0	0	163
12:00 PM	9	15	13	41	91	35	0	0	0	0	0	0	0	204
1:00	1	8	6	25	84	45	3	0	0	0	0	0	0	172
2:00	3	13	21	46	109	74	10	1	0	0	0	0	0	277
3:00	0	10	15	79	154	158	51	4	1	0	0	0	0	472
4:00	0	7	7	42	184	199	43	7	2	0	0	0	0	491
5:00	0	13	18	54	182	180	57	11	1	0	0	0	0	516
6:00	2	9	7	48	127	154	41	10	2	0	0	0	0	400
7:00	1	9	13	37	124	102	15	1	0	0	0	0	0	302
8:00	0	9	8	27	63	67	19	4	1	0	0	0	0	198
9:00	0	1	1	11	47	47	20	3	1	0	0	0	0	131
10:00	0	0	1	8	27	31	11	2	1	0	0	0	0	81
11:00	0	0	0	7	15	14	8	1	0	0	0	0	0	45
Total	39	149	148	527	1521	1336	358	61	9	1	0	0	0	4149

Percentile	15th	50th	85th	95th
Speed	28.9	34.9	38.9	42.9

Mean Speed (Average)	33.5
10 MPH Pace Speed	30-39
Number in Pace	2841
Percent in Pace	68.5%
Number > 35 MPH	1765
Percent > 35 MPH	42.5%

Location : Route 1 90800001
Location : Just North of South Driveway
City/State: Salisbury, MA
Direction: Combined

9/18/2021 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	3	12	8	3	0	0	0	0	0	0	26
1:00	0	0	0	1	1	5	1	1	0	0	0	0	0	9
2:00	0	0	0	0	5	2	0	0	0	0	0	0	0	7
3:00	0	0	2	0	1	3	0	0	0	0	0	0	0	6
4:00	0	2	0	1	0	3	3	2	0	0	0	0	0	11
5:00	0	1	1	4	12	17	6	1	0	0	0	0	0	42
6:00	2	6	1	11	35	18	7	1	0	0	0	0	0	81
7:00	0	4	0	18	57	59	21	2	0	0	0	0	0	161
8:00	0	4	4	21	80	119	36	5	0	0	0	0	0	269
9:00	0	9	10	36	147	156	45	3	3	0	0	0	0	409
10:00	0	7	4	47	239	194	35	14	2	0	0	0	0	542
11:00	3	5	9	86	262	205	41	11	1	0	0	0	0	623
12:00 PM	3	11	13	81	275	198	52	8	1	0	0	0	0	642
1:00	1	4	7	61	239	214	74	7	0	0	0	0	0	607
2:00	2	11	11	63	214	252	53	3	0	1	0	0	0	610
3:00	4	8	16	56	181	214	60	9	0	0	0	0	0	548
4:00	0	12	8	42	210	206	56	5	1	1	0	0	0	541
5:00	3	11	13	22	148	206	70	4	1	1	0	0	0	479
6:00	0	4	6	34	150	172	51	5	1	0	0	0	0	423
7:00	0	3	2	33	146	96	25	1	1	0	0	0	0	307
8:00	1	3	5	23	71	66	16	5	0	0	0	0	0	190
9:00	0	2	3	18	66	62	17	3	1	0	0	0	0	172
10:00	0	1	1	11	30	28	5	1	0	0	0	0	0	77
11:00	0	1	1	7	16	10	7	0	0	0	0	0	0	42
Total	19	109	117	679	2597	2513	684	91	12	3	0	0	0	6824
			Percentile	15th	50th	85th	95th							
			Speed	30.9	34.9	39.9	42.9							
		Mean Speed (Average)		34.7										
		10 MPH Pace Speed		30-39										
		Number in Pace		5073										
		Percent in Pace		74.3%										
		Number > 35 MPH		3303										
		Percent > 35 MPH		48.4%										
Grand Total	58	258	265	1206	4118	3849	1042	152	21	4	0	0	0	10973
Stats			Percentile	15th	50th	85th	95th							
			Speed	29.9	34.9	39.9	42.9							
		Mean Speed (Average)		34.2										
		10 MPH Pace Speed		30-39										
		Number in Pace		7914										
		Percent in Pace		72.1%										
		Number > 35 MPH		5068										
		Percent > 35 MPH		46.2%										

Location : Route 1 90800001
Location : Just North of South Driveway
City/State: Salisbury, MA

9/18/2021	SB,		Hour Totals		NB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	4	63			7	90				
12:15	4	46			1	125				
12:30	4	76			2	83				
12:45	1	78	13	263	3	81	13	379	26	642
1:00	1	85			0	81				
1:15	2	65			2	97				
1:30	1	72			2	78				
1:45	1	61	5	283	0	68	4	324	9	607
2:00	1	78			0	77				
2:15	0	79			5	73				
2:30	0	90			0	62				
2:45	1	75	2	322	0	76	5	288	7	610
3:00	0	60			1	75				
3:15	1	83			1	63				
3:30	1	67			0	63				
3:45	1	77	3	287	1	60	3	261	6	548
4:00	0	65			2	65				
4:15	0	72			0	70				
4:30	2	76			1	71				
4:45	2	63	4	276	4	59	7	265	11	541
5:00	3	56			4	65				
5:15	4	53			4	63				
5:30	5	64			5	62				
5:45	9	53	21	226	8	63	21	253	42	479
6:00	5	61			6	55				
6:15	11	63			12	43				
6:30	3	51			16	52				
6:45	9	49	28	224	19	49	53	199	81	423
7:00	13	39			22	44				
7:15	20	51			20	39				
7:30	17	33			17	42				
7:45	22	28	72	151	30	31	89	156	161	307
8:00	18	32			30	27				
8:15	26	30			47	19				
8:30	38	22			45	30				
8:45	30	11	112	95	35	19	157	95	269	190
9:00	31	25			56	23				
9:15	33	18			53	18				
9:30	42	18			67	19				
9:45	71	24	177	85	56	27	232	87	409	172
10:00	55	9			59	9				
10:15	58	14			67	12				
10:30	66	9			82	13				
10:45	74	7	253	39	81	4	289	38	542	77
11:00	49	5			90	8				
11:15	68	3			93	3				
11:30	71	3			76	5				
11:45	70	3	258	14	106	12	365	28	623	42
Total	948	2265			1238	2373			2186	4638
Percent	29.5%	70.5%			34.3%	65.7%			32.0%	68.0%
Grand Total	1669	4100			1377	3827			3046	7927
Percent	28.9%	71.1%			26.5%	73.5%			27.8%	72.2%
ADT		ADT: 5,486		AADT: 5,486						

CRASH DATA

Crash Number	Crash Date	Date	Crash Severity	Crash Year	Max Injury Severity Reported	Driver Contributing Circumstances (All Drivers)	Light Conditions	Manner of Collision	Road Surface Condition	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Latitude	Longitude	Roadway
3804367	05/15/2014	Thursday	Non-fatal injury	2014	injury - Non-incap	D1: (Failed to yield right of way) / D2: (No improper driving)	Daylight	Head-on	Dry	V1: Turning left / V2: Travelling straight ahead	V1: W / V2: E	Clear	42.86789	-70.8806	TOLL ROAD / PIKE STREET Rte 286
3878683	07/10/2014	Thursday	Property damage only (none injured)	2014	No injury	D1: (Inattention),(Distracted) / D2: (No improper driving)	Daylight	Rear-end	Dry	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1: S / V2: S	Clear	42.86789	-70.8806	TOLL RD / PIKE ST Rte 286 E
3898715	08/01/2014	Friday	Property damage only (none injured)	2014	No injury	D1: (No improper driving) / D2: (Other improper action)	Daylight	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: S / V2: S	Clear	42.86789	-70.8806	TOLL ROAD / PIKE STREET Rte 286
4051843	06/10/2015	Wednesday	Non-fatal injury	2015	tal injury - Incapac	D1: (Inattention),(Failed to yield right of way) / D2: (No improper driving)	Daylight	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1: W / V2: S	Clear	42.86789	-70.8806	PIKE ST Rte 286 W / TOLL RD
4066531	07/24/2015	Friday	Non-fatal injury	2015	-fatal injury - Poss	D1: (Inattention),(Distracted) / D2: (No improper driving) / D3: (No improper driving)	Daylight	Angle	Dry	V1: Turning left / V2: Slowing or stopped in traffic / V3: Slowing or stopped in traffic	V1: E / V2: N / V3: N	Clear/Cloudy	42.86789	-70.8806	TOLL RD
4079585	08/30/2015	Sunday	Property damage only (none injured)	2015	No injury	D1: (No improper driving) / D2: (No improper driving)	Daylight	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: S / V2: S	Clear	42.86789	-70.8806	PIKE STREET Rte SR286 / INTERSTATE 95 CONNECTOR
4137472	01/16/2016	Saturday	Non-fatal injury	2016	-fatal injury - Poss	D1: (Driving too fast for conditions)	Daylight	le vehicle c	Snow	V1: Turning left	V1: S	Snow	42.86789	-70.8806	PIKE ST / TOLL RD
4211361	06/27/2016	Monday	Property damage only (none injured)	2016	No injury	D1: (No improper driving) / D2: (No improper driving) / D3: (Inattention)	Daylight	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Travelling straight ahead	V1: S / V2: S / V3: S	Clear	42.86789	-70.8806	PIKE STREET Rte SR286 / INTERSTATE 95 CONNECTOR
4299459	12/06/2016	Tuesday	Property damage only (none injured)	2016	No injury	D1: (No improper driving) / D2: (Inattention)	lighted roa	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1: W / V2: W	Clear	42.86789	-70.8806	TOLL RD / PIKE ST
4363062	05/14/2017	Sunday	Property damage only (none injured)	2017	No injury	D1: (Inattention) / D2: (No improper driving)	Daylight	Rear-end	Wet	V1: Turning left / V2: Slowing or stopped in traffic	V1: E / V2: E	Rain	42.86789	-70.8806	TOLL RD / PIKE ST Rte 286
4368363	03/03/2017	Friday	Non-fatal injury	2017	-fatal injury - Poss	D1: (No improper driving) / D2: (Disregarded traffic signs, signals, road markings)	Daylight	Angle	Dry	V1: Travelling straight ahead / V2: Travelling straight ahead	V1: W / V2: S	Clear	42.86789	-70.8806	TOLL RD / PIKE ST
4376743	06/10/2017	Saturday	Property damage only (none injured)	2017	No injury	D1: (Unknown) / D2: (Unknown)	Daylight	Angle	Dry	V1: Travelling straight ahead / V2: Travelling straight ahead	V1: W / V2: S	Clear/Cloudy	42.86789	-70.8806	PIKE STREET Rte SR286 E / INTERSTATE 95 CONNECTOR
4403712	07/16/2017	Sunday	Property damage only (none injured)	2017	No injury	D1: (Failed to yield right of way) / D2: (No improper driving)	Daylight	Head-on	Dry	V1: Turning left / V2: Travelling straight ahead	V1: W / V2: S	Clear/Other	42.8679	-70.8805	PIKE STREET Rte SR286 W / INTERSTATE 95 CONNECTOR / TOLL ROAD
4443438	10/20/2017	Friday	Non-fatal injury	2017	injury - Non-incap	D1: (Failed to yield right of way) / D2: (No improper driving)	Daylight	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1: S / V2: N	Clear	42.86789	-70.8806	TOLL RD / PIKE ST
4538879	05/13/2018	Sunday	Property damage only (none injured)	2018	No injury	D1: (No improper driving) / D2: (Unknown)	Daylight	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1: W / V2: W	Clear	42.86789	-70.8806	PIKE ST Rte 286 W / TOLL RD
4544357	05/26/2018	Saturday	Property damage only (none injured)	2018	No injury	D1: (No improper driving) / D2: (Inattention)	Daylight	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Backing	V1: S / V2: W	Clear	42.86789	-70.8806	PIKE ST / TOLL RD
4573382	07/25/2018	Wednesday	Property damage only (none injured)	2018	No injury	D1: (No improper driving) / D2: (Visibility obstructed)	Daylight	Angle	Wet	V1: Slowing or stopped in traffic / V2: Backing	V1: S / V2: N	Clear/Cloudy	42.86817	-70.8809	TOLL RD
4576434	07/30/2018	Monday	Property damage only (none injured)	2018	No injury	D1: (No improper driving),(Unknown) / D2: (No improper driving),(Unknown)	Daylight	Rear-end	Dry	V2: Slowing or stopped in traffic / V1: Travelling straight ahead	V2: S / V1: S	Clear/Unknown	42.86789	-70.8806	TOLL ROAD / PIKE STREET
4593009	06/13/2018	Wednesday	Property damage only (none injured)	2018	No injury	D1: (Unknown) / D2: (No improper driving)	Daylight	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1: S / V2: S	Cloudy	42.86789	-70.8806	TOLL RD / PIKE ST
3923492	08/18/2014	Monday	Non-fatal injury	2014	-fatal injury - Poss	D1: (Unknown)	Daylight	le vehicle c	Dry	V1: Slowing or stopped in traffic	V1: S	Clear/Unknown	42.86125	-70.8737	TOLL RD
4127264	12/24/2015	Thursday	Property damage only (none injured)	2015	No injury	D1: (Inattention) / D2: (No improper driving)	lighted roa	Angle	Dry	V1: Changing lanes / V2: Travelling straight ahead	V1: N / V2: N	Clear	42.86126	-70.8737	LAFAYETTE ROAD Rte US1 N / INTERSTATE 95 CONNECTOR
4217657	07/18/2016	Monday	Property damage only (none injured)	2016	No injury	D1: (Unknown) / D2: (No improper driving)	Daylight	Angle	Dry	V1: Travelling straight ahead / V2: Travelling straight ahead	V1: N / V2: N	Clear	42.86125	-70.8737	INTERSTATE 95 CONNECTOR / LAFAYETTE ROAD Rte US1 S
4319879	01/31/2017	Tuesday	Non-fatal injury	2017	injury - Non-incap	D1: (Unknown)	Dusk	le vehicle c	Other	V1: Travelling straight ahead	V1: S	Cloudy	42.86125	-70.8737	INTERSTATE 95 CONNECTOR / LAFAYETTE ROAD Rte US1 S

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : Manchester by the sea COUNT DATE : 2020

DISTRICT : 4 UNSIGNALIZED : x SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Toll Road ST #

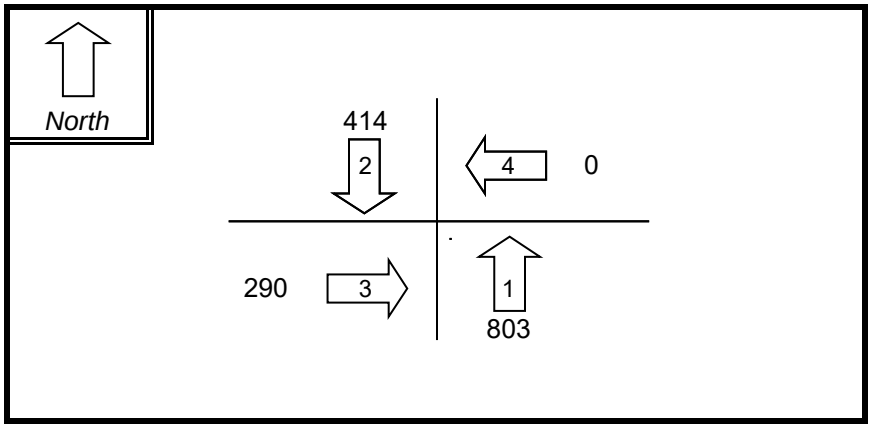
MINOR STREET(S) : Route 128 Southbound Ramp ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	NEB			
VOLUMES (PM) :	803	414	290			1,507

" K " FACTOR : 0.092 APPROACH ADT : 16,380 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 4 # OF YEARS : 5 AVERAGE # OF ACCIDENTS (**A**) : 0.80

CRASH RATE CALCULATION : 0.13 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Accident Rate for District 4 signalized intersections = 0.73

Accident Rate for District 4 unsignalized intersections = 0.57

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

S:\Jobs\9080\5-Crash\Crash Rates Worksheet

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : Manchester by the sea COUNT DATE : 2020

DISTRICT : 4 UNSIGNALIZED : x SIGNALIZED :

MHD USE ONLY

Source #

~ INTERSECTION DATA ~

MAJOR STREET : Route 1 ST #

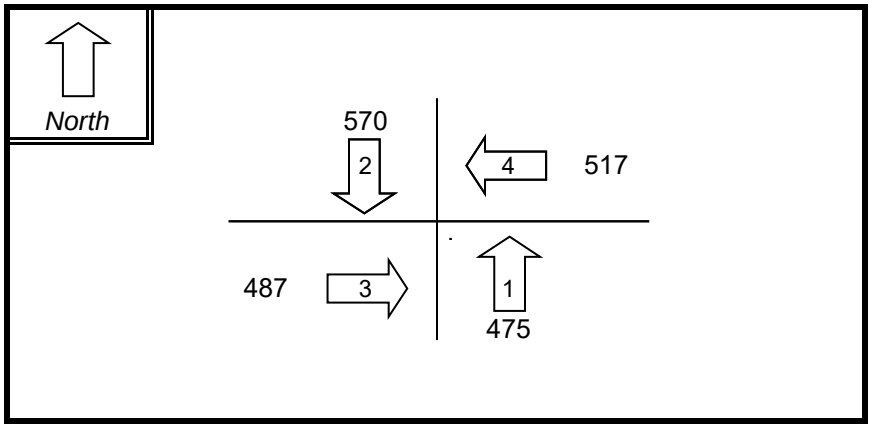
MINOR STREET(S) : Route 286 ST #

ST #

ST #

ST #

INTERSECTION DIAGRAM
(Label Approaches)



INTERSECTION REF #

Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB	WB		
VOLUMES (PM) :	475	570	487	517		2,049

" K " FACTOR : 0.092 APPROACH ADT : 22,272 **ADT** = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 19 # OF YEARS : 5 AVERAGE # OF ACCIDENTS (**A**) : 3.80

CRASH RATE CALCULATION : 0.47 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Accident Rate for District 4 signalized intersections = 0.73

Accident Rate for District 4 unsignalized intersections = 0.57

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

S:\Jobs\9080\5-Crash\Crash Rates Worksheet

PARKING OBSERVATION DATA

VAI Calculations

Job:	Millbury	Job Number:	8667
Location:	266 N. Main Street	Date:	7/25/20
Title:	Traffic Count (Saturday)	Sheet:	1 of 1
Calculated by:	SRF	Checked by:	
		Size:	3,700 SF

Start Time	Ins	Outs	Total	Parking Demand	Parking Demand Ratio
11:00AM	14	14	28	18	4.86
11:15	12	14	26	16	4.32
11:30	11	13	24	14	3.78
11:45	15	14	29	15	4.05
12:00	8	10	18	13	3.51
12:15	14	11	25	16	4.32
12:30	13	11	24	18	4.86
12:45	10	10	20	18	4.86
1:00	10	11	21	17	4.59
1:15	9	8	17	18	4.86
1:30	10	9	19	19	5.14
1:45	6	11	17	14	3.78
Total	132	136	268		
Pk Hr Total	52	55	107		

* 17 cars and 1 box truck in lot at 11:00 a

*** 14 cars in lot at 2:00 pm.

** 1 of the outs in interval 1 (11:00-11:15) was the box truck

VAI Calculations

Job:	Millbury	8667
Location:	266 N. Main Street	7/29/20
Title:	Traffic Count (Weekday)	1 of 1
Calculated by:	SRF	3,700 SF

Start Time	Ins	Outs	Parking Demand	Parking Demand Ratio
7:00AM	0	0	1	0.27
7:15	1	0	2	0.54
7:30	1	0	3	0.81
7:45	2	0	5	1.35
8:00	1	0	6	1.62
8:15	3	0	9	2.43
8:30	1	0	10	2.70
8:45	0	0	10	2.70
9:00	1	0	11	2.97
9:15	0	0	11	2.97
9:30	0	0	11	2.97
9:45	2	0	13	3.51
10:00	7	5	15	4.05
10:15	11	7	19	5.14
10:30	11	15	15	4.05
10:45	10	7	18	4.86
11:00	7	10	15	4.05
11:15	10	8	17	4.59
11:30	6	8	15	4.05
11:45	7	6	16	4.32
12:00	9	10	15	4.05
12:15	7	6	16	4.32
12:30	13	7	22	5.95
12:45	8	15	15	4.05
1:00	10	9	16	4.32
1:15	9	5	20	5.41
1:30	5	8	17	4.59
1:45	7	5	19	5.14
2:00	10	9	20	5.41
2:15	5	7	18	4.86
2:30	4	3	19	5.14
2:45	7	6	20	5.41
3:00	10	9	21	5.68
3:15	8	12	17	4.59
3:30	11	11	17	4.59
3:45	7	9	15	4.05
4:00	11	10	16	4.32
4:15	11	13	14	3.78
4:30	17	10	21	5.68
4:45	11	20	12	3.24
5:00	10	10	12	3.24
5:15	11	13	10	2.70
5:30	6	7	9	2.43
5:45	12	7	14	3.78
6:00	9	11	12	3.24
6:15	15	12	15	4.05
6:30	8	12	11	2.97
6:45	10	8	13	3.51
Total	342	330		
Pk Hr Total	50	53		

: in lot at 7:00 am / 13 cars in lot at

GENERAL BACKGROUND TRAFFIC GROWTH

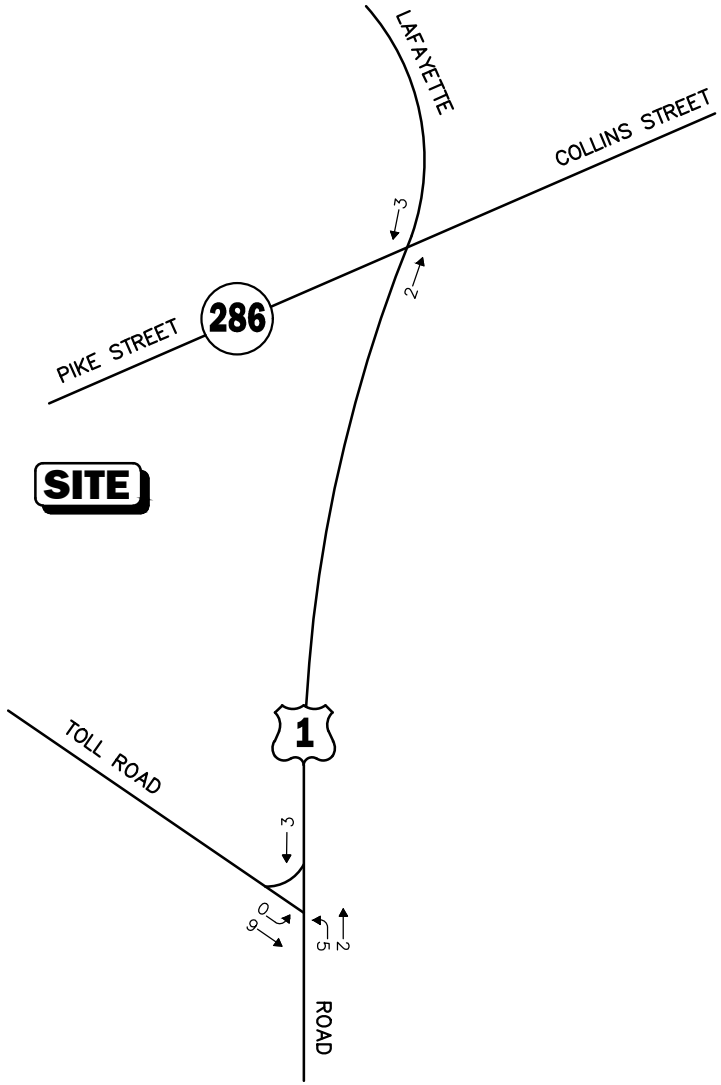
General Background Traffic Growth - Daily Traffic Volumes

Station Number	ROUTE/STREET	LOCATION	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average Annual Growth Rate
5108	INTERSTATE 95	SOUTH OF MAIN ST.	99,787	100,000	104,307	100,735	105,993	105,357	107,886	110,583	111,357	112,916	114,158	**1.42%**
225926	LAFAYETTE ROAD SOUTH OF 1000FT S OF TOLL ROAD	NORTH OF WATER STREET								11,613	11,810	11,845	11,798	**0.51%**
257581	LAFAYETTE ROAD NORTH OF INTERSTATE 95 CONNECTOR	NORTH OF WATER STREET								8,361	8,503	8,529	8,495	**0.51%**
														0.82%

USE:1.0%

BACKGROUND PROJECT NETWORKS

WEEKDAY EVENING PEAK HOUR (4:15 - 5:15 PM)



SATURDAY MIDDAY PEAK HOUR (1:00 - 2:00 PM)

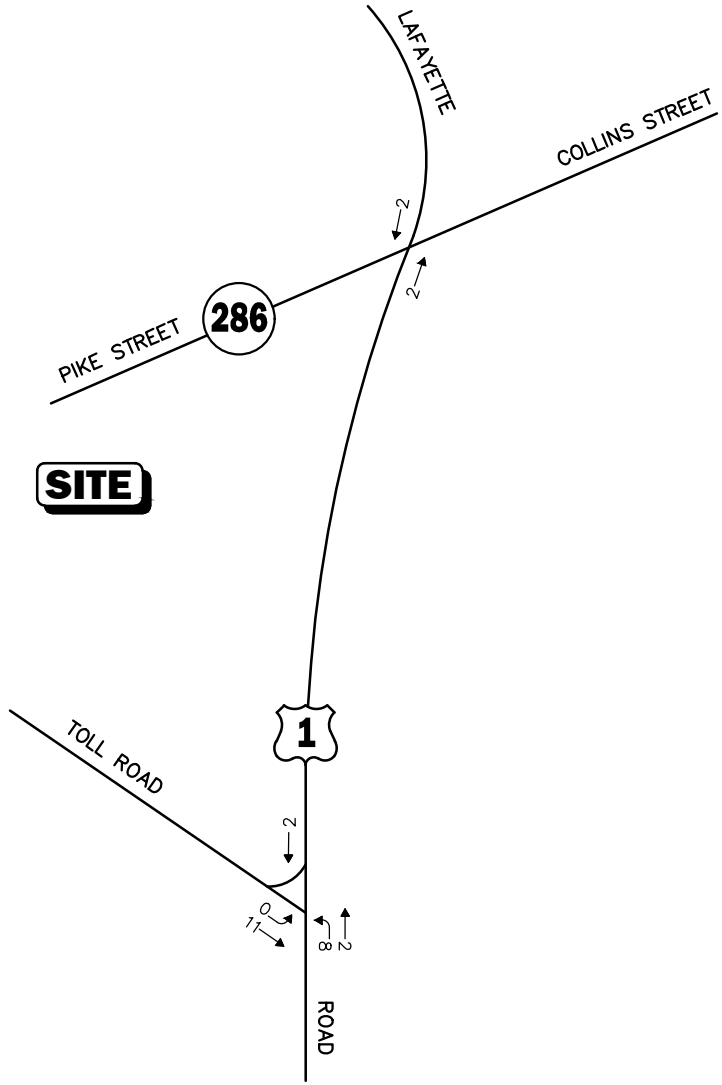


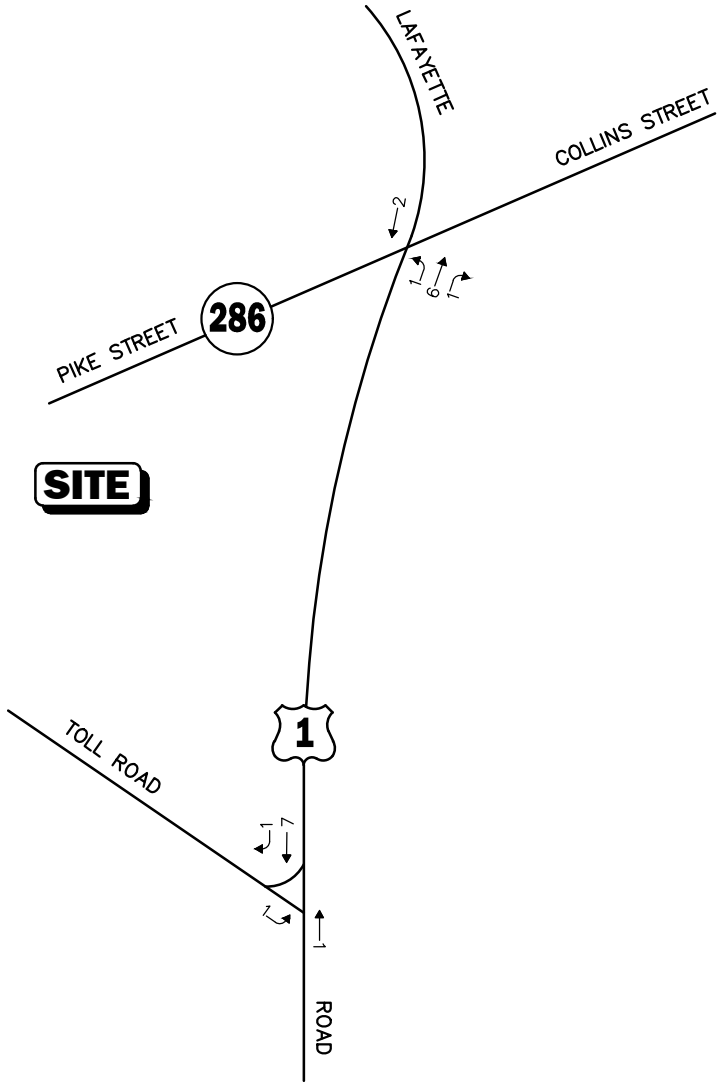
Figure A-1

76 Town House Units
Off Forest Road
Peak-Hour Traffic Volumes

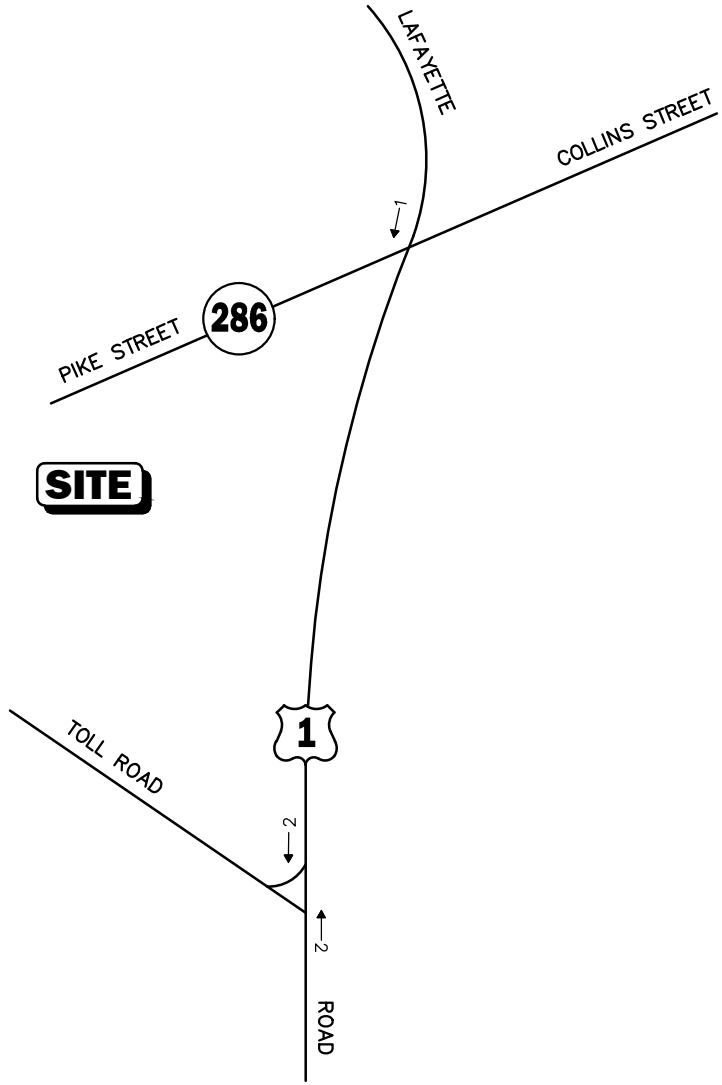
Vanasse & Associates inc

R:\9080\9080NT1Landscape.dwg, 10/14/2021 6:15:41 PM

WEEKDAY EVENING PEAK HOUR (4:15 - 5:15 PM)



SATURDAY MIDDAY PEAK HOUR (1:00 - 2:00 PM)



Note: No Trips on Saturday Midday for facility employees

Figure A-2

Vanasse & Associates inc

Marijuana Cultivation Facility
187 Lafayette Road
Peak-Hour Traffic Volumes

TRIP-GENERATION CALCULATIONS

Brewery Tap Room
(971)

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

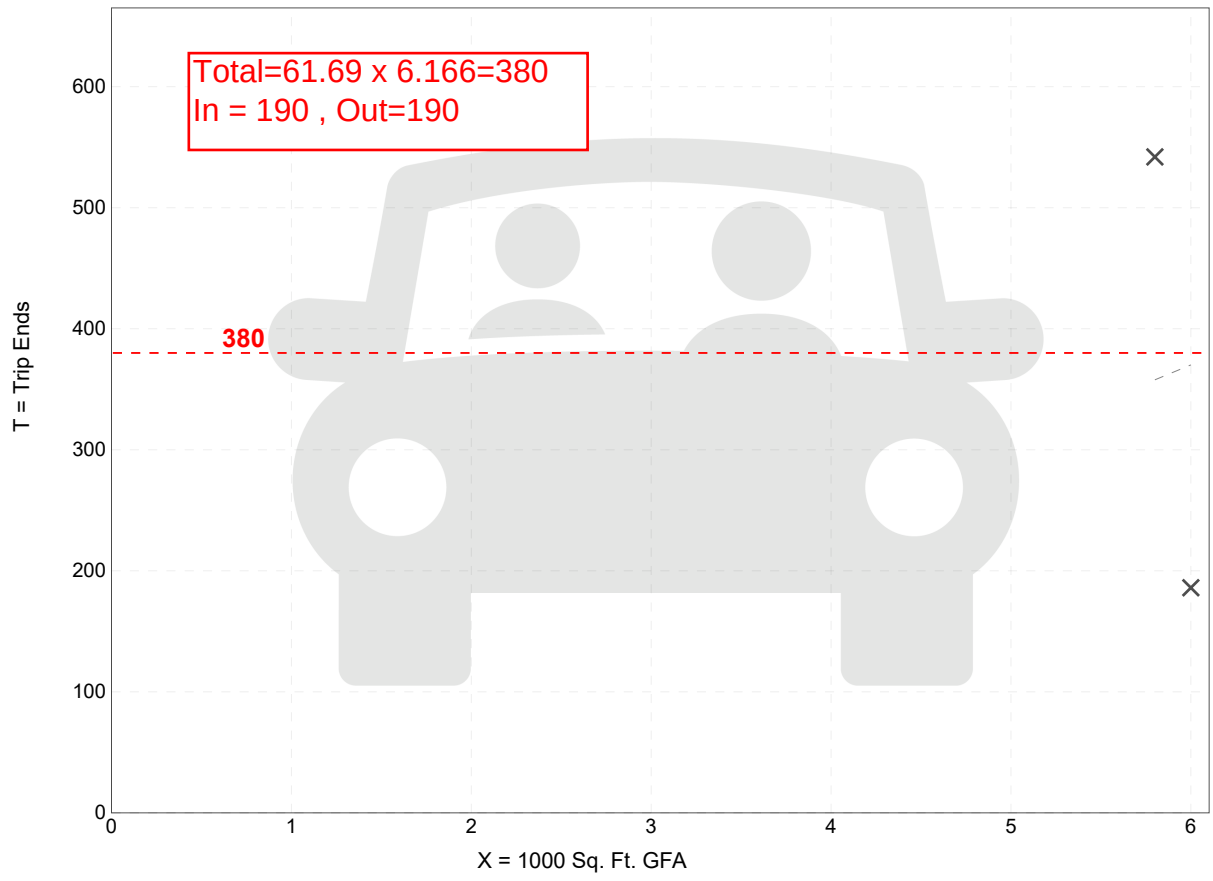
Setting/Location: **General Urban/Suburban**
Number of Studies: 2
Avg. 1000 Sq. Ft. GFA: 6
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
61.69	31.00 - 93.45	*

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= **

Brewery Tap Room
(971)

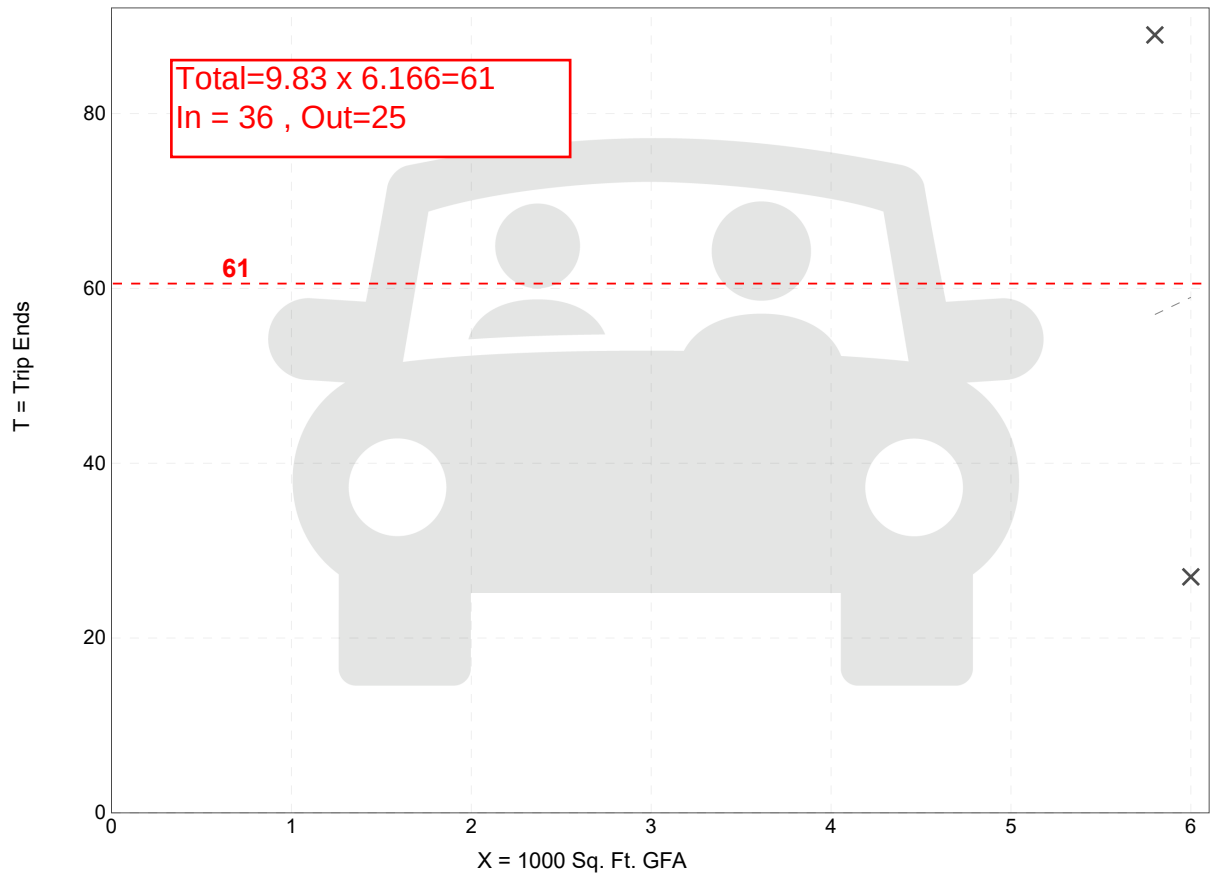
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 2
Avg. 1000 Sq. Ft. GFA: 6
Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.83	4.50 - 15.34	*

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= **

Brewery Tap Room
(971)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Saturday**

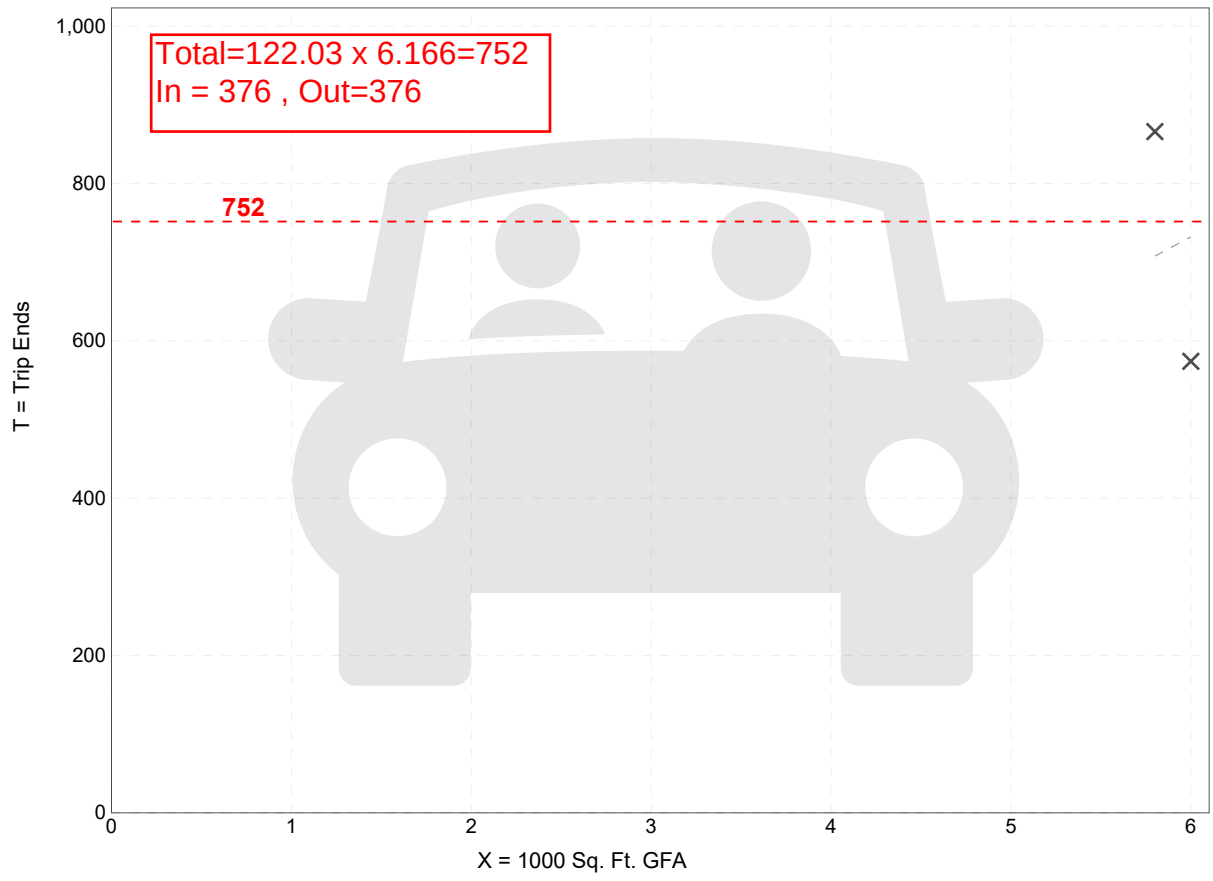
Setting/Location: **General Urban/Suburban**
Number of Studies: 2
Avg. 1000 Sq. Ft. GFA: 6
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
122.03	95.67 - 149.31	*

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= **

Brewery Tap Room
(971)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Saturday, Peak Hour of Generator**

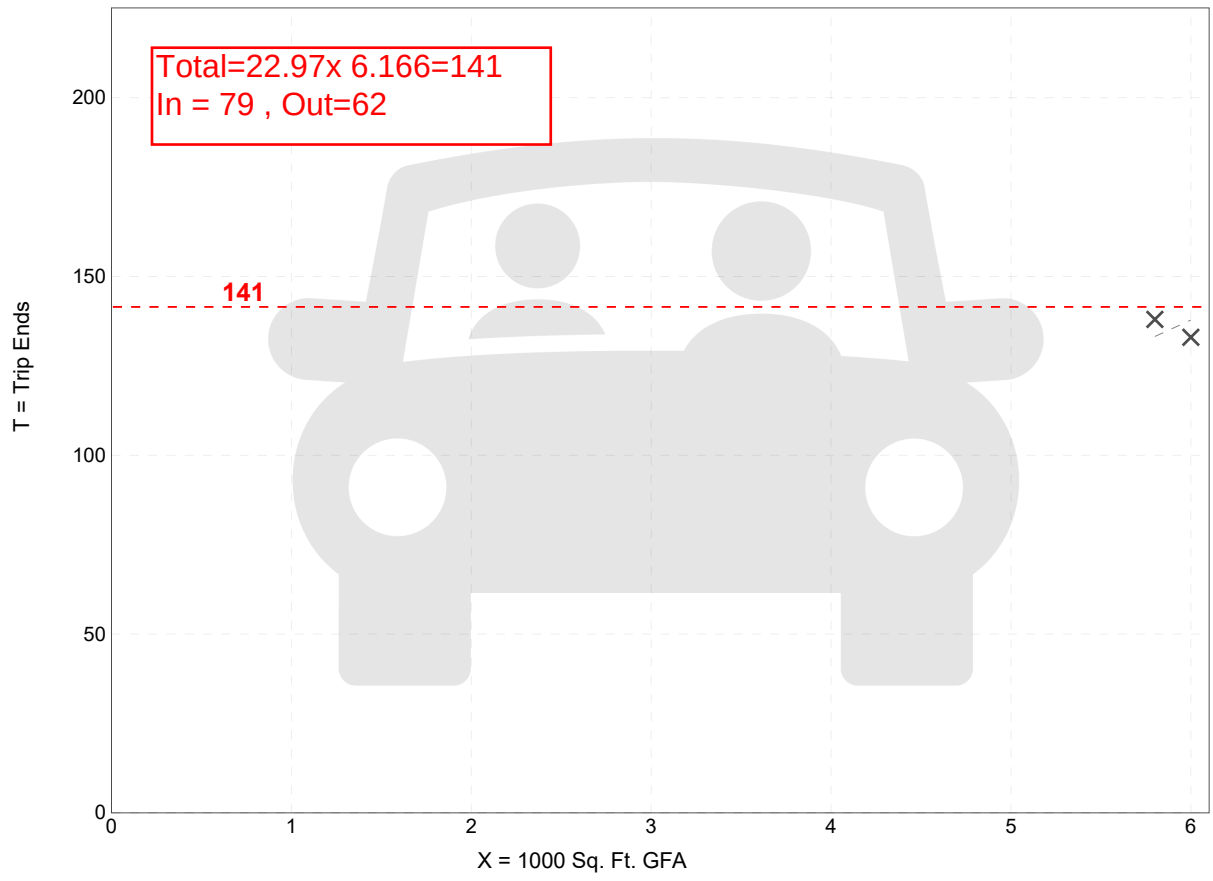
Setting/Location: **General Urban/Suburban**
Number of Studies: 2
Avg. 1000 Sq. Ft. GFA: 6
Directional Distribution: 56% entering, 44% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
22.97	22.17 - 23.79	*

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= **

Marijuana Dispensary
(882)

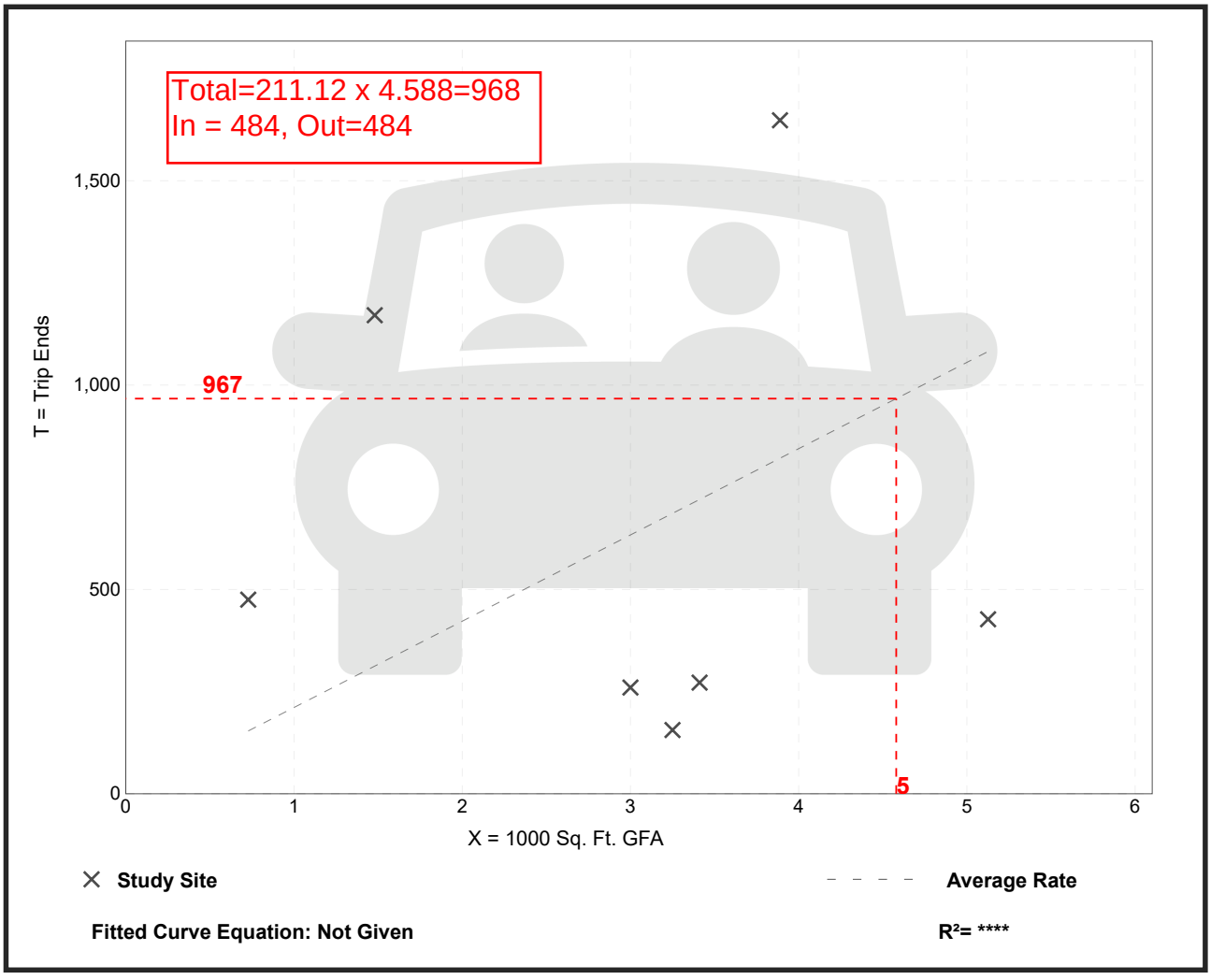
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 7
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
211.12	48.00 - 791.22	246.90

Data Plot and Equation



Marijuana Dispensary
(882)

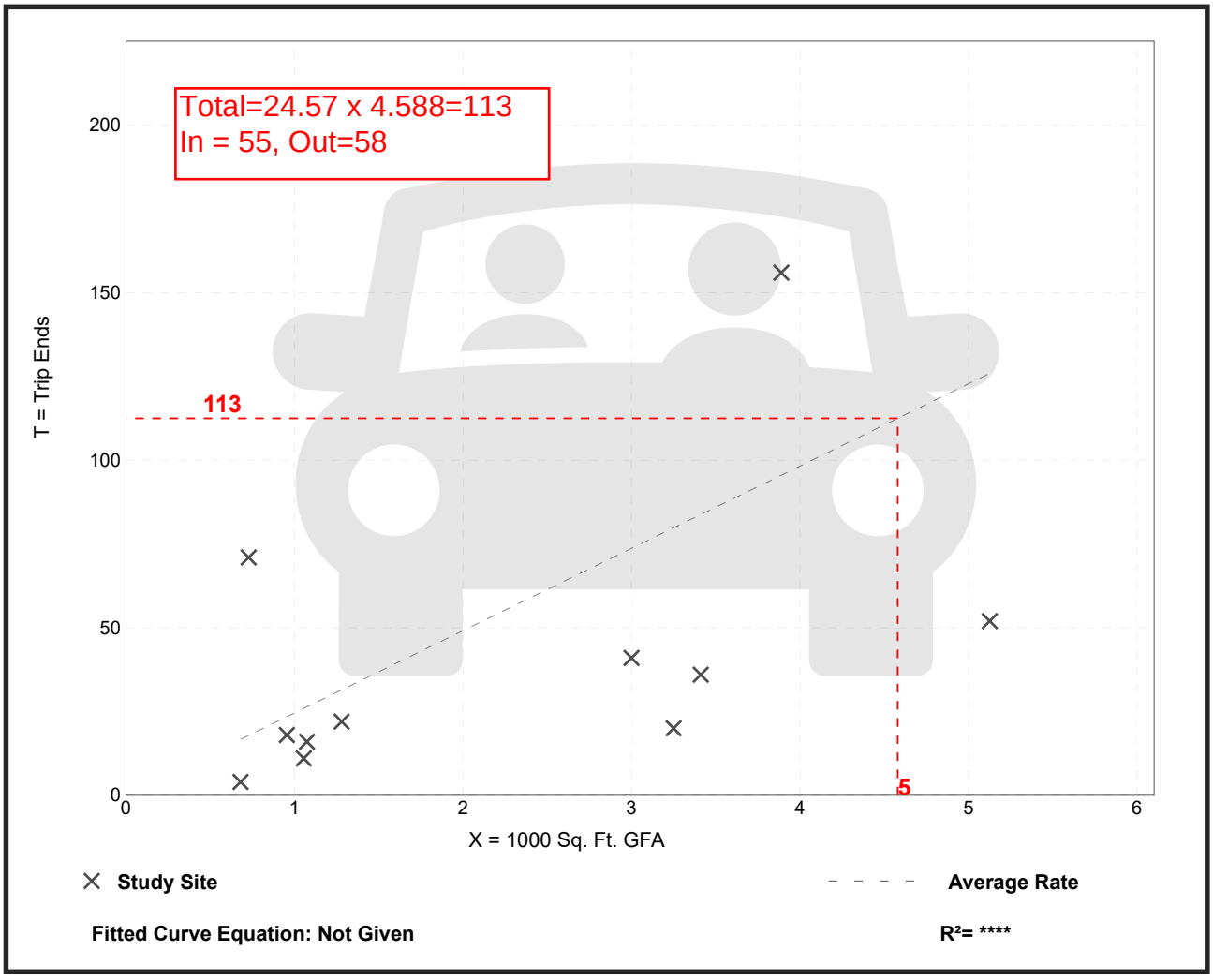
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
PM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 12
Avg. 1000 Sq. Ft. GFA: 2
Directional Distribution: 49% entering, 51% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
24.57	5.88 - 128.38	32.18

Data Plot and Equation



Marijuana Dispensary
(882)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Saturday**

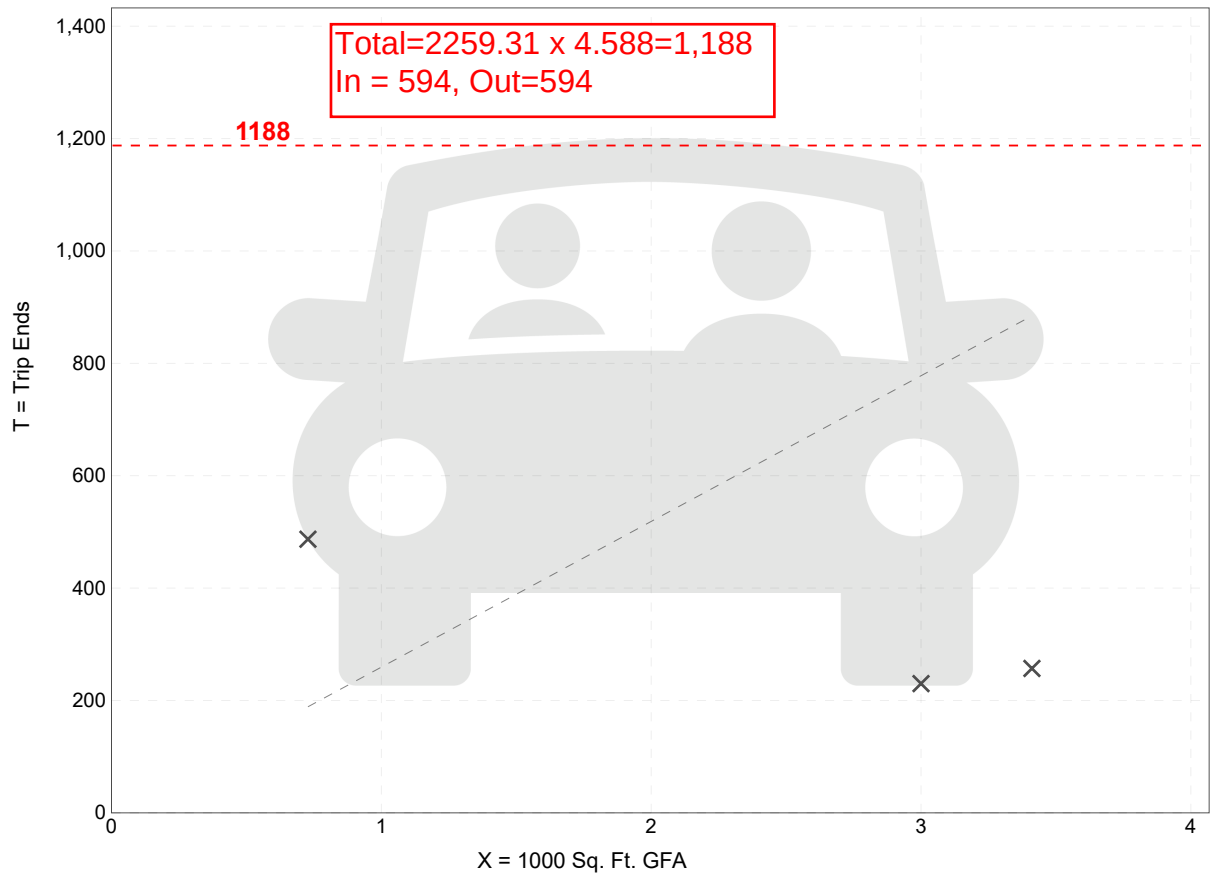
Setting/Location: **General Urban/Suburban**
Number of Studies: 4
Avg. 1000 Sq. Ft. GFA: 2
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
259.31	75.34 - 852.03	364.24

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ****

Marijuana Dispensary
(882)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Saturday, Peak Hour of Generator**

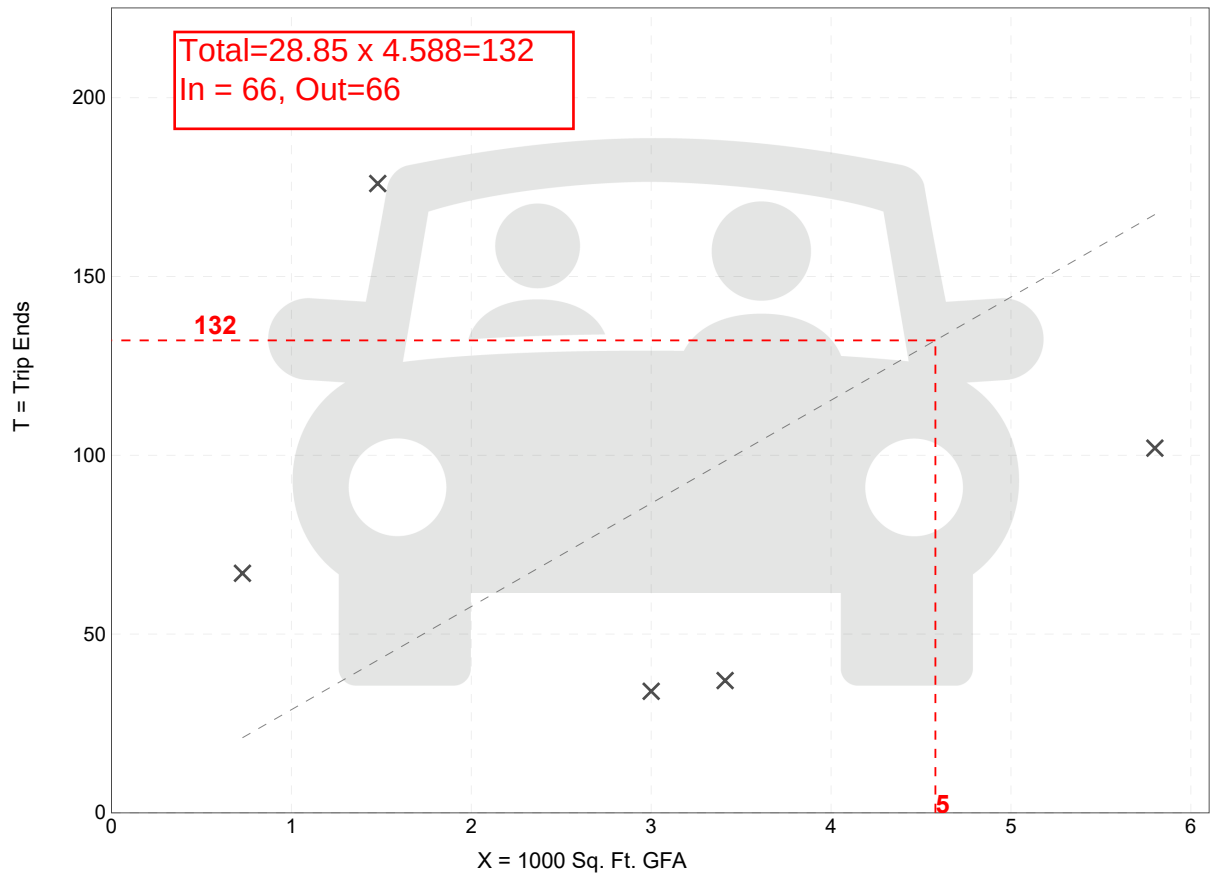
Setting/Location: **General Urban/Suburban**
Number of Studies: 5
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
28.85	10.85 - 118.92	39.14

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ****

Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

CAPACITY ANALYSIS WORKSHEETS

CAPACITY ANALYSIS WORKSHEETS

Route 1 at Route 286
Toll Road at Route 1
Route 1 at Proposed Site Driveway
Route 1 at Existing Site Driveway (187 Lafayette Road)

Route 1 at Route 286

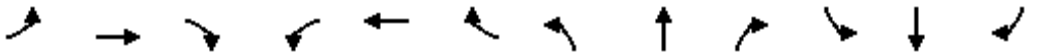
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	452	21	24	267	71	11	306	41	165	376	29
Future Volume (vph)	17	452	21	24	267	71	11	306	41	165	376	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	13	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	2054	0	0	1897	0	0	1866	0	0	1860	0
Flt Permitted		0.978			0.941			0.966			0.761	
Satd. Flow (perm)	0	2013	0	0	1791	0	0	1806	0	0	1436	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			15			7			4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		552			684			664			381	
Travel Time (s)		12.5			15.5			15.1			8.7	
Lane Group Flow (vph)	0	570	0	0	448	0	0	408	0	0	620	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4			8			2			6 10	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6 10	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0		
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5		
Total Split (s)	44.0	44.0		44.0	44.0		36.0	36.0		36.0		
Total Split (%)	44.0%	44.0%		44.0%	44.0%		36.0%	36.0%		36.0%		
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5		
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0		
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		4.5			4.5			4.5				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max		Max		
Act Effct Green (s)		39.5			39.5			31.5			51.5	
Actuated g/C Ratio		0.40			0.40			0.32			0.52	
v/c Ratio		0.72			0.63			0.71			0.84	
Control Delay		31.5			28.2			37.8			32.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		31.5			28.2			37.8			32.7	
LOS		C			C			D			C	
Approach Delay		31.5			28.2			37.8			32.7	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)		299			218			225			320	
Queue Length 95th (ft)		398			278			324			#544	
Internal Link Dist (ft)		472			604			584			301	
Turn Bay Length (ft)												
Base Capacity (vph)		796			716			573			741	
Starvation Cap Reductn		0			0			0			0	

Lane Group	Ø10
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	22.5
Total Split (s)	20.0
Total Split (%)	20%
Yellow Time (s)	3.5
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.72			0.63			0.71			0.84	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Pretimed			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 32.4		Intersection LOS: C	
Intersection Capacity Utilization 90.9%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Route 1 & Route 286



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	459	20	56	357	104	14	411	50	165	376	29
Future Volume (vph)	8	459	20	56	357	104	14	411	50	165	376	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	13	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	2077	0	0	1888	0	0	1872	0	0	1860	0
Flt Permitted		0.990			0.829			0.966			0.713	
Satd. Flow (perm)	0	2059	0	0	1573	0	0	1810	0	0	1345	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			15			6			4	
Link Speed (mph)		30			30			40			30	
Link Distance (ft)		552			684			664			381	
Travel Time (s)		12.5			15.5			11.3			8.7	
Lane Group Flow (vph)	0	547	0	0	608	0	0	540	0	0	663	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4			8			2			6 10	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6 10	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0		
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5		
Total Split (s)	44.0	44.0		44.0	44.0		36.0	36.0		36.0		
Total Split (%)	44.0%	44.0%		44.0%	44.0%		36.0%	36.0%		36.0%		
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5		
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0		
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		4.5			4.5			4.5				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		Max	Max		Max		
Act Effct Green (s)		39.5			39.5			31.5			51.5	
Actuated g/C Ratio		0.40			0.40			0.32			0.52	
v/c Ratio		0.67			0.97			0.94			0.96	
Control Delay		29.8			58.5			59.8			49.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		29.8			58.5			59.8			49.5	
LOS		C			E			E			D	
Approach Delay		29.8			58.5			59.8			49.5	
Approach LOS		C			E			E			D	
Queue Length 50th (ft)		281			365			330			383	
Queue Length 95th (ft)		393			#540			#520			#591	
Internal Link Dist (ft)		472			604			584			301	
Turn Bay Length (ft)												
Base Capacity (vph)		814			630			574			694	
Starvation Cap Reductn		0			0			0			0	

Lane Group	Ø10
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	22.5
Total Split (s)	20.0
Total Split (%)	20%
Yellow Time (s)	3.5
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.67			0.97			0.94			0.96	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Pretimed			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 49.6		Intersection LOS: D	
Intersection Capacity Utilization 125.1%		ICU Level of Service H	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Route 1 & Route 286

LANE SUMMARY

Site: 101 [2028 No-Build PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Route 1													
Lane 1[d]	428	0.0	746	0.574	100	14.0	LOS B	3.9	96.4	Full	1600	0.0	0.0
Approach	428	0.0		0.574		14.0	LOS B	3.9	96.4				
NorthEast: Collins Street													
Lane 1[d]	422	0.4	939	0.449	100	9.2	LOS A	2.4	59.1	Full	1600	0.0	0.0
Approach	422	0.4		0.449		9.2	LOS A	2.4	59.1				
North: Route 1													
Lane 1[d]	565	0.0	977	0.579	100	11.5	LOS B	5.0	124.4	Full	1600	0.0	0.0
Approach	565	0.0		0.579		11.5	LOS B	5.0	124.4				
SouthWest: Pike Street													
Lane 1[d]	572	0.9	829	0.690	100	16.8	LOS C	7.0	176.1	Full	1600	0.0	0.0
Approach	572	0.9		0.690		16.8	LOS C	7.0	176.1				
Intersection	1987	0.3		0.690		13.1	LOS B	7.0	176.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Route 1

Mov. From S To Exit:	L3 SW	T1 N	R1 NE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	14	365	49	428	0.0	746	0.574	100	NA	NA
Approach	14	365	49	428	0.0		0.574			

NorthEast: Collins Street

Mov. From NE To Exit:	L1 S	T1 SW	R3 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	28	311	83	422	0.4	939	0.449	100	NA	NA
Approach	28	311	83	422	0.4		0.449			

North: Route 1											
Mov.	L3	T1	R1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane
From N To Exit:	NE	S	SW			veh/h	v/c	%	Ov. %		No.
Lane 1	148	376	41	565	0.0	977	0.579	100	NA		NA
Approach	148	376	41	565	0.0		0.579				
SouthWest: Pike Street											
Mov.	L1	T1	R3	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane
From SW To Exit:	N	NE	S			veh/h	v/c	%	Ov. %		No.
Lane 1	20	527	25	572	0.9	829	0.690	100	NA		NA
Approach	20	527	25	572	0.9		0.690				

	Total	%HV	Deg.Satn (v/c)
Intersection	1987	0.3	0.690

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Route 1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
NorthEast Exit: Collins Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Route 1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
SouthWest Exit: Pike Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [2028 No-Build SAT (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Route 1													
Lane 1[d]	557	0.0	725	0.768	100	23.2	LOS C	8.1	203.4	Full	1600	0.0	0.0
Approach	557	0.0		0.768		23.2	LOS C	8.1	203.4				
NorthEast: Collins Street													
Lane 1[d]	603	0.7	860	0.701	100	16.9	LOS C	7.8	195.0	Full	1600	0.0	0.0
Approach	603	0.7		0.701		16.9	LOS C	7.8	195.0				
North: Route 1													
Lane 1[d]	667	0.0	870	0.767	100	20.2	LOS C	10.7	266.6	Full	1600	0.0	0.0
Approach	667	0.0		0.767		20.2	LOS C	10.7	266.6				
SouthWest: Pike Street													
Lane 1[d]	567	0.0	747	0.760	100	22.2	LOS C	8.2	204.5	Full	1600	0.0	0.0
Approach	567	0.0		0.760		22.2	LOS C	8.2	204.5				
Intersection	2395	0.2		0.768		20.5	LOS C	10.7	266.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Route 1

Mov. From S To Exit:	L3 SW	T1 N	R1 NE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	16	482	59	557	0.0	725	0.768	100	NA	NA
Approach	16	482	59	557	0.0		0.768			

NorthEast: Collins Street

Mov. From NE To Exit:	L1 S	T1 SW	R3 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	65	416	122	603	0.7	860	0.701	100	NA	NA
Approach	65	416	122	603	0.7		0.701			

North: Route 1											
Mov.	L3	T1	R1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane
From N To Exit:	NE	S	SW			veh/h	v/c	%	Ov. %		No.
Lane 1	192	441	34	667	0.0	870	0.767	100	NA		NA
Approach	192	441	34	667	0.0		0.767				
SouthWest: Pike Street											
Mov.	L1	T1	R3	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane
From SW To Exit:	N	NE	S			veh/h	v/c	%	Ov. %		No.
Lane 1	10	535	23	567	0.0	747	0.760	100	NA		NA
Approach	10	535	23	567	0.0		0.760				

	Total	%HV	Deg.Satn (v/c)
Intersection	2395	0.2	0.768

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Route 1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
NorthEast Exit: Collins Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Route 1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
SouthWest Exit: Pike Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [2028 Build PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Route 1													
Lane 1[d]	473	0.0	746	0.634	100	16.0	LOS C	4.9	122.1	Full	1600	0.0	0.0
Approach	473	0.0		0.634		16.0	LOS C	4.9	122.1				
NorthEast: Collins Street													
Lane 1[d]	426	0.4	910	0.468	100	9.7	LOS A	2.7	67.1	Full	1600	0.0	0.0
Approach	426	0.4		0.468		9.7	LOS A	2.7	67.1				
North: Route 1													
Lane 1[d]	604	0.0	970	0.623	100	12.7	LOS B	6.3	156.7	Full	1600	0.0	0.0
Approach	604	0.0		0.623		12.7	LOS B	6.3	156.7				
SouthWest: Pike Street													
Lane 1[d]	577	0.9	802	0.720	100	18.7	LOS C	7.6	191.7	Full	1600	0.0	0.0
Approach	577	0.9		0.720		18.7	LOS C	7.6	191.7				
Intersection	2080	0.3		0.720		14.5	LOS B	7.6	191.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Route 1

Mov. From S To Exit:	L3 SW	T1 N	R1 NE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	18	401	53	473	0.0	746	0.634	100	NA	NA
Approach	18	401	53	473	0.0		0.634			

NorthEast: Collins Street

Mov. From NE To Exit:	L1 S	T1 SW	R3 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	33	311	83	426	0.4	910	0.468	100	NA	NA
Approach	33	311	83	426	0.4		0.468			

North: Route 1											
Mov.	L3	T1	R1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane
From N To Exit:	NE	S	SW			veh/h	v/c	%	Ov. %		No.
Lane 1	148	415	41	604	0.0	970	0.623	100	NA		NA
Approach	148	415	41	604	0.0		0.623				
SouthWest: Pike Street											
Mov.	L1	T1	R3	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane
From SW To Exit:	N	NE	S			veh/h	v/c	%	Ov. %		No.
Lane 1	20	527	30	577	0.9	802	0.720	100	NA		NA
Approach	20	527	30	577	0.9		0.720				
	Total	%HV	Deg.Satn (v/c)								
Intersection	2080	0.3	0.720								

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Route 1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
NorthEast Exit: Collins Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Route 1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
SouthWest Exit: Pike Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [2028 Build SAT (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Route 1													
Lane 1[d]	626	0.0	725	0.864	100	32.2	LOS D	12.7	316.6	Full	1600	0.0	0.0
Approach	626	0.0		0.864		32.2	LOS D	12.7	316.6				
NorthEast: Collins Street													
Lane 1[d]	611	0.7	819	0.746	100	19.8	LOS C	8.8	221.0	Full	1600	0.0	0.0
Approach	611	0.7		0.746		19.8	LOS C	8.8	221.0				
North: Route 1													
Lane 1[d]	730	0.0	860	0.849	100	27.0	LOS D	15.6	390.9	Full	1600	0.0	0.0
Approach	730	0.0		0.849		27.0	LOS D	15.6	390.9				
SouthWest: Pike Street													
Lane 1[d]	575	0.0	707	0.814	100	27.4	LOS D	9.6	240.7	Full	1600	0.0	0.0
Approach	575	0.0		0.814		27.4	LOS D	9.6	240.7				
Intersection	2542	0.2		0.864		26.6	LOS D	15.6	390.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Route 1

Mov. From S To Exit:	L3 SW	T1 N	R1 NE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	24	537	65	626	0.0	725	0.864	100	NA	NA
Approach	24	537	65	626	0.0		0.864			

NorthEast: Collins Street

Mov. From NE To Exit:	L1 S	T1 SW	R3 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	73	416	122	611	0.7	819	0.746	100	NA	NA
Approach	73	416	122	611	0.7		0.746			

North: Route 1											
Mov.	L3	T1	R1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane
From N To Exit:	NE	S	SW			veh/h	v/c	%	%		No.
Lane 1	192	504	34	730	0.0	860	0.849	100	NA		NA
Approach	192	504	34	730	0.0		0.849				
SouthWest: Pike Street											
Mov.	L1	T1	R3	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov.	Ov. Lane
From SW To Exit:	N	NE	S			veh/h	v/c	%	%		No.
Lane 1	10	535	30	575	0.0	707	0.814	100	NA		NA
Approach	10	535	30	575	0.0		0.814				

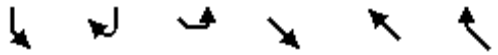
	Total	%HV	Deg.Satn (v/c)
Intersection	2542	0.2	0.864

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Route 1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
NorthEast Exit: Collins Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Route 1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
SouthWest Exit: Pike Street Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

Toll Road at Route 1

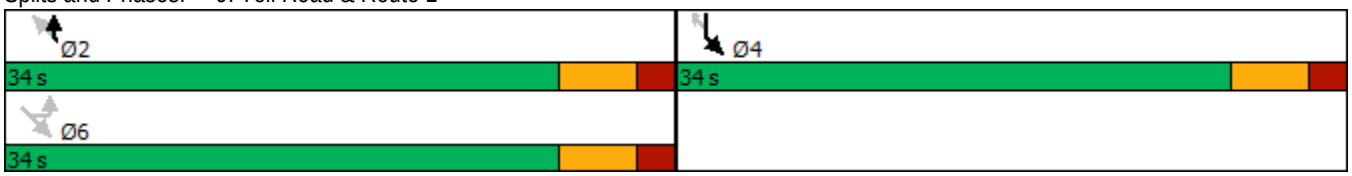


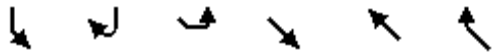
Lane Group	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	311	29	15	309	274	347
Future Volume (vph)	311	29	15	309	274	347
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	11	11	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Satd. Flow (prot)	2046	1830	0	3450	3610	1615
Flt Permitted	0.950			0.936		
Satd. Flow (perm)	1669	1830	0	3235	3610	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		34				377
Link Speed (mph)	30			30	30	
Link Distance (ft)	1224			1220	584	
Travel Time (s)	27.8			27.7	13.3	
Lane Group Flow (vph)	362	34	0	356	298	377
Turn Type	Prot	Perm	custom	NA	NA	custom
Protected Phases	4					2
Permitted Phases		4	6	6	2	
Detector Phase	4	4	6	6	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Max	Max	Max	Max
Act Effct Green (s)	14.7	14.7		28.2	28.2	28.2
Actuated g/C Ratio	0.27	0.27		0.51	0.51	0.51
v/c Ratio	0.66	0.07		0.21	0.16	0.37
Control Delay	24.0	6.1		8.5	8.2	2.5
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	24.0	6.1		8.5	8.2	2.5
LOS	C	A		A	A	A
Approach Delay	22.5			8.5	5.0	
Approach LOS	C			A	A	
Queue Length 50th (ft)	104	0		30	24	0
Queue Length 95th (ft)	164	14		62	52	39
Internal Link Dist (ft)	1144			1140	504	
Turn Bay Length (ft)						
Base Capacity (vph)	1049	954		1658	1851	1011
Starvation Cap Reductn	0	0		0	0	0

Lane Group	SBL	SBR	SEL	SET	NWT	NWR
Spillback Cap Reductn	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0
Reduced v/c Ratio	0.35	0.04		0.21	0.16	0.37

Intersection Summary			
Area Type:	Other		
Cycle Length: 68			
Actuated Cycle Length: 54.9			
Natural Cycle: 50			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 10.7		Intersection LOS: B	
Intersection Capacity Utilization 46.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 9: Toll Road & Route 1





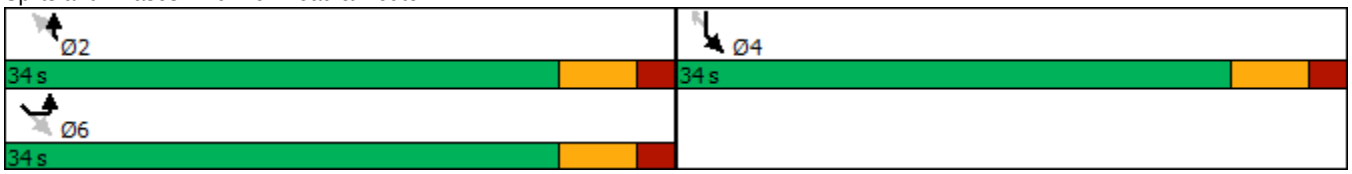
Lane Group	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Volume (vph)	390	24	27	263	259	544
Future Volume (vph)	390	24	27	263	259	544
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	11	11	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	1	0			1
Taper Length (ft)	25		25			
Satd. Flow (prot)	2046	1830	0	3472	3574	1615
Flt Permitted	0.950			0.906		
Satd. Flow (perm)	1771	1830	0	3162	3574	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		26				604
Link Speed (mph)	40			40	40	
Link Distance (ft)	1224			1220	584	
Travel Time (s)	20.9			20.8	10.0	
Lane Group Flow (vph)	424	26	0	354	288	604
Turn Type	Prot	Perm	Prot	NA	NA	custom
Protected Phases	4		6!			2!
Permitted Phases		4		6	2!	
Detector Phase	4	4	6	6	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	34.0	34.0	34.0	34.0	34.0	34.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Max	Max	Max	Max
Act Effct Green (s)	16.7	16.7		28.1	28.1	28.1
Actuated g/C Ratio	0.29	0.29		0.49	0.49	0.49
v/c Ratio	0.71	0.05		0.23	0.16	0.55
Control Delay	24.7	6.2		9.6	9.2	3.3
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	24.7	6.2		9.6	9.2	3.3
LOS	C	A		A	A	A
Approach Delay	23.6			9.6	5.2	
Approach LOS	C			A	A	
Queue Length 50th (ft)	126	0		33	25	0
Queue Length 95th (ft)	205	13		61	55	51
Internal Link Dist (ft)	1144			1140	504	
Turn Bay Length (ft)						
Base Capacity (vph)	1012	918		1564	1768	1104
Starvation Cap Reductn	0	0		0	0	0

Lane Group	SBL	SBR	SEL	SET	NWT	NWR
Spillback Cap Reductn	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0
Reduced v/c Ratio	0.42	0.03		0.23	0.16	0.55

Intersection Summary			
Area Type:	Other		
Cycle Length: 68			
Actuated Cycle Length: 56.9			
Natural Cycle: 50			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 11.0		Intersection LOS: B	
Intersection Capacity Utilization 51.8%		ICU Level of Service A	
Analysis Period (min) 15			

! Phase conflict between lane groups.

Splits and Phases: 9: Toll Road & Route 1



LANE SUMMARY

Site: 101 [2028 No Build PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Route1													
Lane 1[d]	734	0.0	1268	0.578	100	9.5	LOS A	4.0	100.4	Full	1600	0.0	0.0
Approach	734	0.0		0.578		9.5	LOS A	4.0	100.4				
NorthEast: Route 1													
Lane 1[d]	408	0.0	999	0.408	100	8.1	LOS A	1.8	44.4	Full	1600	0.0	0.0
Approach	408	0.0		0.408		8.1	LOS A	1.8	44.4				
NorthWest: Toll Road													
Lane 1[d]	387	1.0	953	0.406	100	8.4	LOS A	1.7	43.0	Full	1600	0.0	0.0
Approach	387	1.0		0.406		8.4	LOS A	1.7	43.0				
Intersection	1528	0.2		0.578		8.9	LOS A	4.0	100.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Route1									
Mov. From S To Exit:	L1 NW	R1 NE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	325	409	734	0.0	1268	0.578	100	NA	NA
Approach	325	409	734	0.0		0.578			

NorthEast: Route 1									
Mov. From NE To Exit:	L1 S	R2 NW	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	373	35	408	0.0	999	0.408	100	NA	NA
Approach	373	35	408	0.0		0.408			

NorthWest: Toll Road									
Mov. From NW To Exit:	L2 NE	R1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	17	370	387	1.0	953	0.406	100	NA	NA
Approach	17	370	387	1.0		0.406			

	Total	%HV	Deg.Satn (v/c)
Intersection	1528	0.2	0.578

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Route1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
NorthEast Exit: Route 1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
NorthWest Exit: Toll Road Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [2028 No Build SAT (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Route 1													
Lane 1[d]	949	0.3	1250	0.759	100	15.1	LOS C	8.6	215.8	Full	1600	0.0	0.0
Approach	949	0.3		0.759		15.1	LOS C	8.6	215.8				
NorthEast: Route 1													
Lane 1[d]	487	0.0	1007	0.484	100	9.3	LOS A	2.7	67.2	Full	1600	0.0	0.0
Approach	487	0.0		0.484		9.3	LOS A	2.7	67.2				
NorthWest: Toll Road													
Lane 1[d]	350	0.0	900	0.389	100	8.5	LOS A	1.7	42.1	Full	1600	0.0	0.0
Approach	350	0.0		0.389		8.5	LOS A	1.7	42.1				
Intersection	1786	0.2		0.759		12.2	LOS B	8.6	215.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Route 1

Mov. From S To Exit:	L1 NW	R1 NE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	311	638	949	0.3	1250	0.759	100	NA	NA
Approach	311	638	949	0.3		0.759			

NorthEast: Route 1

Mov. From NE To Exit:	L1 S	R2 NW	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	459	28	487	0.0	1007	0.484	100	NA	NA
Approach	459	28	487	0.0		0.484			

NorthWest: Toll Road

Mov. From NW To Exit:	L2 NE	R1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	32	318	350	0.0	900	0.389	100	NA	NA
Approach	32	318	350	0.0		0.389			

	Total	%HV	Deg.Satn (v/c)
Intersection	1786	0.2	0.759

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Route 1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
NorthEast Exit: Route 1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
NorthWest Exit: Toll Road Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [2028 Build PM (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Route1													
Lane 1[d]	777	0.0	1263	0.615	100	10.4	LOS B	4.6	116.0	Full	1600	0.0	0.0
Approach	777	0.0		0.615		10.4	LOS B	4.6	116.0				
NorthEast: Route 1													
Lane 1[d]	453	0.0	999	0.454	100	8.8	LOS A	2.2	55.1	Full	1600	0.0	0.0
Approach	453	0.0		0.454		8.8	LOS A	2.2	55.1				
NorthWest: Toll Road													
Lane 1[d]	392	0.9	923	0.425	100	8.9	LOS A	2.0	51.2	Full	1600	0.0	0.0
Approach	392	0.9		0.425		8.9	LOS A	2.0	51.2				
Intersection	1623	0.2		0.615		9.6	LOS A	4.6	116.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Route1										
Mov. From S To Exit:	L1 NW	R1 NE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	325	452	777	0.0	1263	0.615	100	NA	NA	
Approach	325	452	777	0.0		0.615				
NorthEast: Route 1										
Mov. From NE To Exit:	L1 S	R2 NW	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	414	39	453	0.0	999	0.454	100	NA	NA	
Approach	414	39	453	0.0		0.454				
NorthWest: Toll Road										
Mov. From NW To Exit:	L2 NE	R1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	

Lane 1	23	370	392	0.9	923	0.425	100	NA	NA
Approach	23	370	392	0.9		0.425			

	Total	%HV	Deg.Satn (v/c)
Intersection	1623	0.2	0.615

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Route1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
NorthEast Exit: Route 1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
NorthWest Exit: Toll Road Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [2028 Build SAT (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Route 1													
Lane 1[d]	1020	0.3	1242	0.821	100	18.6	LOS C	11.8	295.4	Full	1600	0.0	0.0
Approach	1020	0.3		0.821		18.6	LOS C	11.8	295.4				
NorthEast: Route 1													
Lane 1[d]	557	0.0	1007	0.553	100	10.7	LOS B	4.3	106.7	Full	1600	0.0	0.0
Approach	557	0.0		0.553		10.7	LOS B	4.3	106.7				
NorthWest: Toll Road													
Lane 1[d]	359	0.0	857	0.419	100	9.3	LOS A	2.1	51.4	Full	1600	0.0	0.0
Approach	359	0.0		0.419		9.3	LOS A	2.1	51.4				
Intersection	1935	0.2		0.821		14.6	LOS B	11.8	295.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Route 1

Mov. From S To Exit:	L1 NW	R1 NE	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	311	709	1020	0.3	1242	0.821	100	NA	NA
Approach	311	709	1020	0.3		0.821			

NorthEast: Route 1

Mov. From NE To Exit:	L1 S	R2 NW	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	522	35	557	0.0	1007	0.553	100	NA	NA
Approach	522	35	557	0.0		0.553			

NorthWest: Toll Road

Mov. From NW To Exit:	L2 NE	R1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	40	318	359	0.0	857	0.419	100	NA	NA
Approach	40	318	359	0.0		0.419			

	Total	%HV	Deg.Satn (v/c)
Intersection	1935	0.2	0.821

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Route 1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
NorthEast Exit: Route 1 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
NorthWest Exit: Toll Road Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

Route 1 at Proposed Site Driveway

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	39	25	29	537	516	43
Future Vol, veh/h	39	25	29	537	516	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	27	32	584	561	47

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1233	585	608	0	-	0
Stage 1	585	-	-	-	-	-
Stage 2	648	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	195	511	970	-	-	-
Stage 1	557	-	-	-	-	-
Stage 2	521	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	185	511	970	-	-	-
Mov Cap-2 Maneuver	185	-	-	-	-	-
Stage 1	530	-	-	-	-	-
Stage 2	521	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.3	0.5	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	970	-	246	-	-
HCM Lane V/C Ratio	0.032	-	0.283	-	-
HCM Control Delay (s)	8.8	0	25.3	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0.1	-	1.1	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	39	25	29	537	516	43
Future Vol, veh/h	39	25	29	537	516	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	27	32	584	561	47

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1233	585	608	0	-	0
Stage 1	585	-	-	-	-	-
Stage 2	648	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	195	511	970	-	-	-
Stage 1	557	-	-	-	-	-
Stage 2	521	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	185	511	970	-	-	-
Mov Cap-2 Maneuver	185	-	-	-	-	-
Stage 1	530	-	-	-	-	-
Stage 2	521	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.3	0.5	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	970	-	246	-	-
HCM Lane V/C Ratio	0.032	-	0.283	-	-
HCM Control Delay (s)	8.8	0	25.3	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0.1	-	1.1	-	-

Route 1 at Existing Site Driveway (187 Lafayette Road)

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	40	46	541	511	30
Future Vol, veh/h	25	40	46	541	511	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	43	50	588	555	33

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1260	572	588	0	-	0
Stage 1	572	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	188	520	987	-	-	-
Stage 1	565	-	-	-	-	-
Stage 2	499	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	174	520	987	-	-	-
Mov Cap-2 Maneuver	174	-	-	-	-	-
Stage 1	523	-	-	-	-	-
Stage 2	499	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21	0.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	987	-	295	-	-
HCM Lane V/C Ratio	0.051	-	0.239	-	-
HCM Control Delay (s)	8.8	0	21	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.9	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	40	46	541	511	30
Future Vol, veh/h	25	40	46	541	511	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	43	50	588	555	33

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1260	572	588	0	-	0
Stage 1	572	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	188	520	987	-	-	-
Stage 1	565	-	-	-	-	-
Stage 2	499	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	174	520	987	-	-	-
Mov Cap-2 Maneuver	174	-	-	-	-	-
Stage 1	523	-	-	-	-	-
Stage 2	499	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21	0.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	987	-	295	-	-
HCM Lane V/C Ratio	0.051	-	0.239	-	-
HCM Control Delay (s)	8.8	0	21	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.9	-	-