


# MEMORANDUM

**TO:** Mr. Joseph Trefethen  
Senior Team Operations Manager  
Sail Energy  
210 Commerce Way, Suite 210  
Portsmouth, NH 03801

**FROM:** Mr. Jeffrey S. Dirk, P.E., PTOE, FITE   
Partner  
Vanasse & Associates, Inc.  
35 New England Business Center Drive  
Suite 140  
Andover, MA 01810-1066  
(978) 269-6830  
[jdirk@rdva.com](mailto:jdirk@rdva.com)  
*Professional Engineer in CT, MA, ME, NH, RI and VA*

**DATE:** July 22, 2020

**RE:** 8665

**SUBJECT:** Transportation Impact Assessment  
Proposed Propane Storage Facility - 59 Technology Park Road  
Sturbridge, Massachusetts

---

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed addition of a propane storage facility to the existing Pioneer Oil & Propane facility located at 59 Technology Park Road in Sturbridge, Massachusetts (hereafter referred to as the “Project”). This study evaluates the following specific areas as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; and identifies and analyzes existing traffic conditions and future traffic conditions, both with and without the Project, along Charlton Road (Route 20) and Picker Road, and at the intersections of Route 20 at Picker Road and Fiske Hill Road and Picker Road at Technology Park Road.

***The Project is not expected to result in a material increase in traffic over existing conditions given that propane delivery services are currently provided at the Project site. Any increase in traffic would be associated with the bulk delivery of propane to fill the storage tanks, which is expected to occur one (1) to two (2) times per week. As such, we have concluded that the Project will not result in a material increase in motorist delays or vehicle queueing over existing conditions and that the transportation infrastructure affords sufficient capacity to accommodate the Project in a safe and efficient manner with consideration of the specific recommendations presented herein.***

The following details our assessment of the Project.

## **PROJECT DESCRIPTION**

The Project will entail the addition of a propane storage facility to the existing Pioneer Oil & Propane facility located at 59 Technology Park Road in Sturbridge, Massachusetts. Pioneer Oil & Propane currently delivers oil and propane from the Project site which includes above-ground storage tanks for fuel oil; however, the propane is obtained from an off-site vendor. The Project site is bounded by commercial properties and areas of open and wooded space to the north and west; Technology Park Road and a



commercial property to the south; and Technology Park Road to the east. Figure 1 depicts the Project site location in relation to the existing roadway network. Access to the Project site is an will continue to be provided by way of two (2) existing driveways that intersect the west side of Technology Park Road approximately 600 and 900 feet northeast of Picker Road, respectively.

## **STUDY METHODOLOGY**

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

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

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

The third stage of the study presents and evaluates measures to address deficiencies in the transportation infrastructure, if any, identified in stage two of the study.

## **EXISTING CONDITIONS**

In order to establish the existing conditions context of the Project with respect to the transportation infrastructure, a comprehensive field inventory of existing conditions was conducted in July 2020. The field investigation consisted of an inventory of existing roadway geometrics; traffic volumes; public transportation services; and pedestrian and bicycle facilities; as well as posted speed limits and land use information within the study area. The study area that was assessed for the Project consisted of Route 20, Picker Road and Technology Park Road, and at the intersections of Route 20 at Picker Road and Fiske Hill Road and Picker Road at Technology Park Road. The following summarizes existing conditions within the study area.

### **Roadways**

#### **Charlton Road (Route 20)**

- Four-lane urban principal arterial roadway under MassDOT jurisdiction
- Traverses the study area in a general east-west direction parallel to and south of Interstate 90 (I-90, a.k.a. the Massachusetts Turnpike) and provides access to I-395 to the east of the Project site (Exit 6) and to I-84 to the west (Exit 3)
- Provides two (2) 12-foot wide travel lanes per direction in the vicinity of the Project site that are separated by a double-yellow centerline, painted median or raised median, with variable width marked shoulders





Figure 1  
Site Location Map

- Sidewalks are not provided within the study area
- Illumination is provided intermittently by way of street lights mounted on wood poles
- Posted speed limit is 50 miles per hour (mph) in the vicinity of the Project site
- Land use within the study area consists of commercial properties and areas of open and wooded space

### **Picker Road**

- Two-lane local roadway under Town jurisdiction
- Traverses a general north-south direction ending at the driveway to 8 Picker Road approximately 1,200 feet north of Route 20
- Consists of a 24-foot wide paved roadway that accommodates two-way travel with no pavement markings provided
- A posted speed limit is not provided and, as such, the statutory or “prima facie” speed limit is 30 mph<sup>1</sup>
- Sidewalks are not provided
- Land use within the study area consists of the Project site, commercial properties, and areas of open and wooded space

### **Technology Park Road**

- Two-lane local roadway under Town jurisdiction
- Traverses a general northeast-southwest direction ending in a cul-de-sac approximately 1,400 feet northeast of Picker Road
- Consists of a 22-24-foot wide paved roadway that accommodates two-way travel with no pavement markings provided
- A posted speed limit is not provided and, as such, the statutory or “prima facie” speed limit is 30 mph
- Sidewalks are not provided
- Land use within the study area consists of the Project site, commercial properties, and areas of open and wooded space

### **Intersections**

Table 1 and Figure 2 summarize lane use, traffic control, and pedestrian and bicycle accommodations at the study area intersections as observed in July 2020.

---

<sup>1</sup>The statutory or “prima facie” speed is defined in M.G.L. c. 90 § 17, as the speed which would be deemed reasonable and proper to operate a motor vehicle.



**Table 1**  
**STUDY AREA INTERSECTION DESCRIPTION**

<b>Intersection</b>	<b>Traffic Control Type<sup>a</sup></b>	<b>No. of Travel Lanes Provided</b>	<b>Shoulder Provided? (Yes/No/Width)</b>	<b>Pedestrian Accommodations? (Yes/No/Description)</b>	<b>Bicycle Accommodations? (Yes/No/Description)</b>
Rte. 20/ Fiske Hill Rd./ Picker Rd.	S	2 general purpose lanes on Rte. 20 EB; 1 left-turn lane, 1 through lane and 1 through/right lane on Rte. 20 WB; 1 through/right-turn lane on Fiske Hill Rd.; 1 general purpose lane on Picker Rd. Left-turns from Fiske Hill Rd. are prohibited	Yes – 1 to 8 feet on Rte. 20	No	Yes – shared traveled-way <sup>b</sup>
Picker Rd./ Technology Park Rd.	S <sup>c</sup>	1 general purpose lane on all approaches	No	No	No

<sup>a</sup>TS = traffic signal control; S = STOP-sign control; NC = no control present.

<sup>b</sup>Combined shoulder and travel lane width equal to or exceed 14 feet.

<sup>c</sup>A stop sign is not currently provided on Technology Park Road.

### Existing Traffic Volumes

In order to determine existing traffic-volume demands and flow patterns within the study area, manual turning movement counts (TMCs) and vehicle classification counts were obtained for the Route 20/Picker Road/Fiske Hill Road intersection from a prior study conducted by VAI.<sup>2</sup> The TMCs were performed during the weekday morning (6:00 to 9:00 AM) and evening (3:00 to 6:00 PM) peak periods on Thursday, May 14, 2020. These time periods were selected for analysis purposes as they are representative of the peak traffic volume hours for both the Project and the adjacent roadway network. Traffic volumes for the Picker Road/Technology Park Road intersection were developed using the TMCs on Picker Road at Route 20 and then assigning the traffic volumes on a proportionate basis to Picker Road and Technology Park Road based on the nature of the abutting land use.

### **Traffic-Volume Adjustments**

In order to evaluate the potential for fluctuation of traffic volumes within the study area due to the “stay-at-home order” that was issued by the Governor on March 24, 2020 due to the COVID-19 pandemic, recent traffic volume data collected in September 2019 at the adjacent Route 20/Route 49 intersection was used and compared to the May 2020 traffic volume data. Based on a review of traffic count data from MassDOT Continuous Count Station No. 3929 located on I-84 south of Route 20 in Sturbridge<sup>3</sup> traffic volumes for the month of September are approximately 3.0 percent above average-month conditions. The September 2019 was adjusted to 2020 conditions by applying a general background traffic growth rate of 1.0 percent (discussed in further detail in the *General Background Traffic Growth* section of this assessment).

A comparison of the projected September 2020 peak-hour traffic volumes along Route 20 at the Route 20/Picker Road/Fiske Hill Road intersection to the corresponding data collected in May 2020 indicates that the May 2020 traffic volumes are approximately 92 percent lower during the weekday

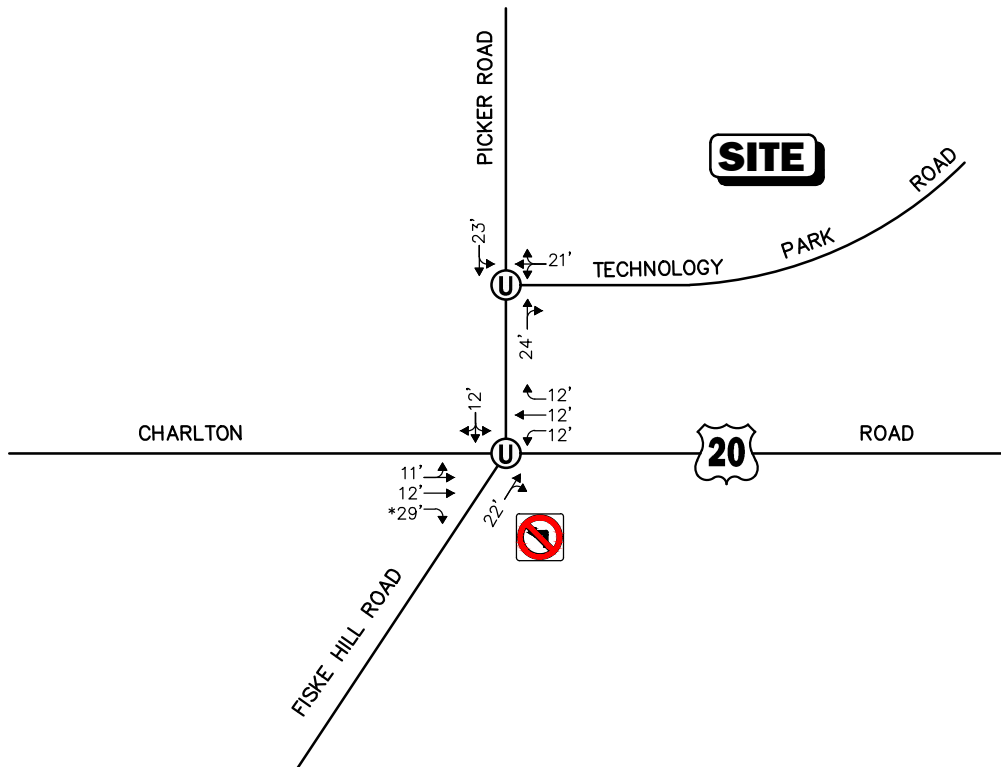
<sup>2</sup>*Transportation Impact Assessment*, Proposed Cold Storage Warehouse, 6 Picker Road, Sturbridge, Massachusetts; VAI; July 2020.

<sup>3</sup>MassDOT Traffic Volumes for the Commonwealth of Massachusetts; 2020.



**Legend:**

- ⓪ Unsignalized Intersection
- XX' ↔ Lane Use and Travel Lane Width
- \*XX' ↘ Channelized Right-Turn
- ⊘ Left Turns Prohibited



Ⓝ Not To Scale



**Figure 2**

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

morning peak-hour and 40 percent lower during the weekday evening peak-hour. As such, the May 2020 peak-hour traffic volume data was adjusted upward accordingly in order to account for the reduced traffic volumes resulting from the “stay-at-home order”.

The 2020 Existing weekday morning and evening peak-hour traffic volumes are graphically depicted on Figure 3.

### **Pedestrian and Bicycle Facilities**

A comprehensive field inventory of pedestrian and bicycle facilities within the study area was undertaken in July 2020. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study roadways and at the study intersections, as well as the location of existing and planned future bicycle facilities. As detailed on Figure 2, sidewalks or other pedestrian accommodations are not currently provided within the study area. Formal bicycle facilities were not identified within the study area; however, both Route 20 and Picker Road generally provide sufficient width (paved shoulder or combined travel lane and paved shoulder) to support bicycle travel in a shared traveled-way configuration.<sup>4</sup>

### **Public Transportation**

The Town of Sturbridge is a member of the Worcester Regional Transit Authority (WRTA); however, regularly scheduled, fixed-route public transportation services are not currently provided within the Town.

### **Motor Vehicle Crash Data**

Motor vehicle crash information for the study area intersections was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2013 through 2017, inclusive) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized by intersection, type, severity, roadway and weather conditions, and day of occurrence, and presented in Table 2.

As can be seen in Table 2, 23 motor vehicle crashes were reported to have occurred at the Route 20/Fiske Hill Road/Picker Road intersection over the five-year review period, or an average of approximately 4.6 crashes per year, the majority of which occurred on a weekday, during daylight, under clear weather conditions and involved angle-type collisions that resulted in property damage only. The calculated motor vehicle crash rate was found to be below both the MassDOT statewide and District averages for an unsignalized intersection for the MassDOT Highway Division District in which the intersections is located (District 3). No (0) motor vehicle crashes were reported to have occurred at the Picker Road/Technology Park Road intersection over the five year review period

A review of the MassDOT statewide High Crash Location List indicated that there are no locations within the study area that are included on MassDOT’s Highway Safety Improvement Program (HSIP) listing as high crash locations. In addition, no motor vehicle crashes that resulted in a fatality were identified to have occurred at the study area intersection over the five-year review period.

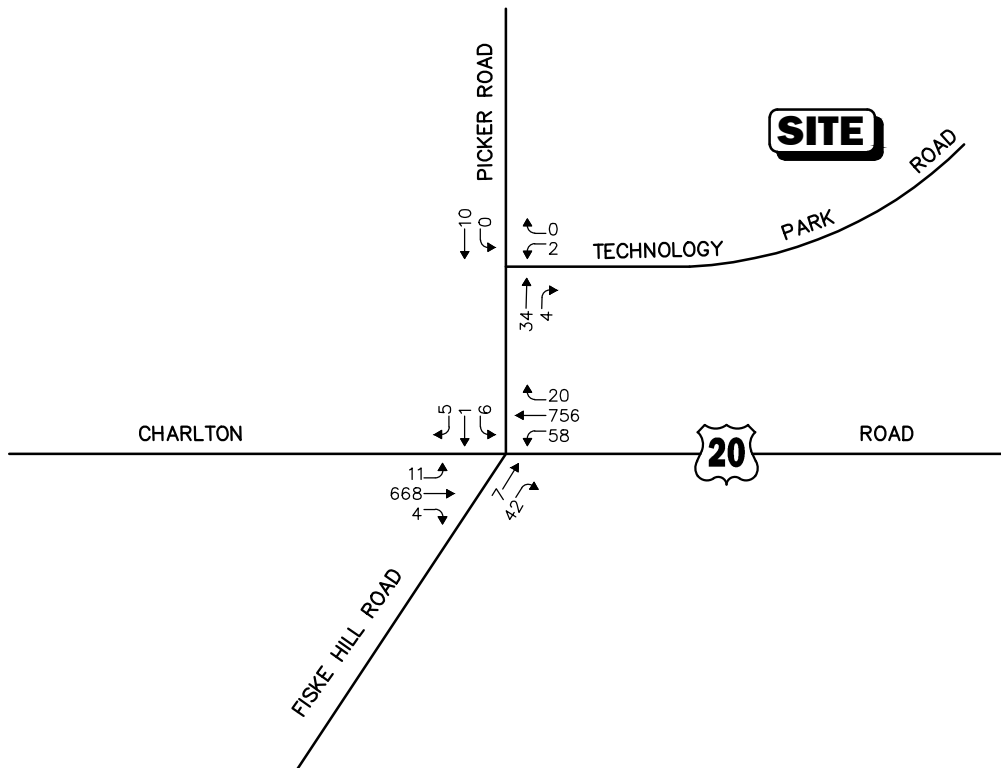
***Based on a review of the MassDOT motor vehicle crash data, no discernible safety deficiencies were apparent within the study area.*** The detailed MassDOT Crash Rate Worksheet and HSIP mapping are provided in the Appendix.

---

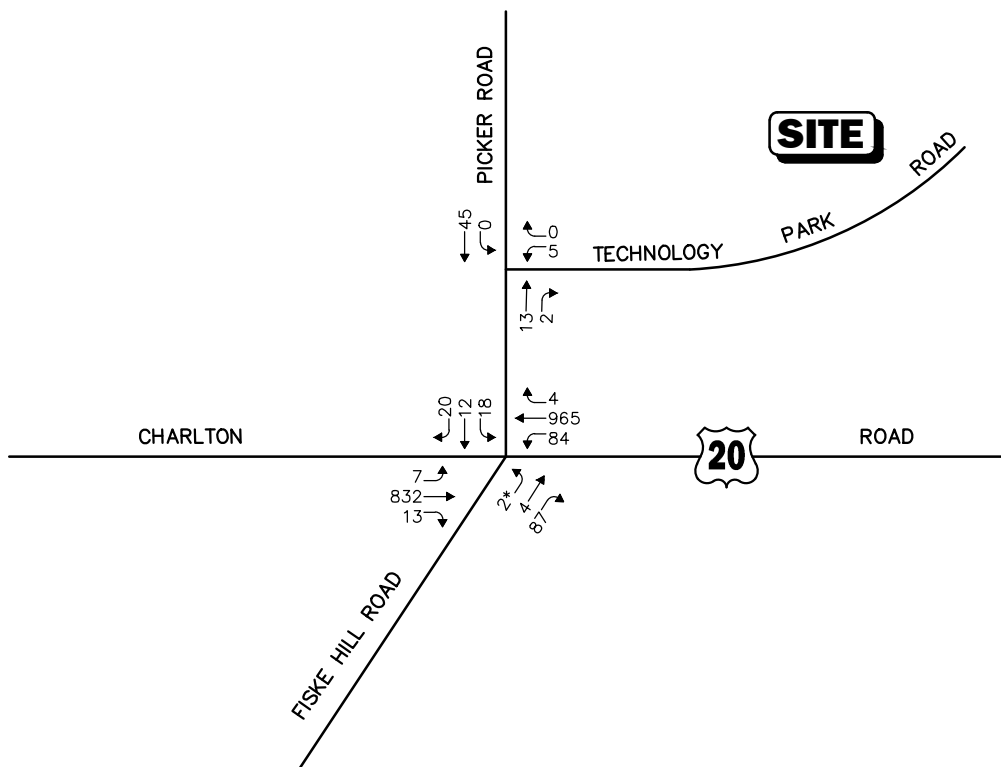
<sup>4</sup>A minimum combined travel lane and paved shoulder width of 14-feet is required to support bicycle travel in a shared traveled-way condition.



WEEKDAY MIDDAY PEAK HOUR (7:45 - 8:45 AM)



WEEKDAY EVENING PEAK HOUR (3:30 - 4:30 PM)



\* Illegal movement.  
Not To Scale



Figure 3

2020 Existing Peak Hour Traffic Volumes



**Table 2**  
**MOTOR VEHICLE CRASH DATA SUMMARY<sup>a</sup>**

	Route 20/Picker Road/ Fiske Hill Road	Picker Road/ Technology Park Road
Traffic Control Type <sup>b</sup>	U	U
<i>Year:</i>		
2013	5	0
2014	1	0
2015	4	0
2016	7	0
<u>2017</u>	<u>6</u>	<u>0</u>
Total	23	0
Average Rate <sup>c</sup>	4.6	0.0
MassDOT Crash Rate <sup>d</sup>	0.57/0.61	0.57/0.61
Significant <sup>e</sup>	No	No
<i>Type:</i>		
Angle	11	0
Rear-End	6	0
Head-On	3	0
Sideswipe	2	0
Fixed Object	1	0
<u>Other</u>	<u>0</u>	<u>0</u>
Total	23	0
<i>Conditions:</i>		
Clear	15	0
Cloudy	4	0
Snow/Ice	2	0
rain	2	0
<u>Unknown</u>	<u>0</u>	<u>0</u>
Total	23	0
<i>Lighting:</i>		
Daylight	19	0
Dawn/Dusk	1	0
Dark (lit)	3	0
Dark (unlit)	0	0
<u>Unknown</u>	<u>0</u>	<u>0</u>
Total	23	0
<i>Day of Week:</i>		
Monday through Friday	19	0
Saturday	2	0
<u>Sunday</u>	<u>2</u>	<u>0</u>
Total	23	0
<i>Severity:</i>		
Property Damage Only	13	0
Personal Injury	10	0
Fatality	0	0
<u>Unknown</u>	<u>0</u>	<u>0</u>
Total	23	0

<sup>a</sup>Source: MassDOT Safety Management/Traffic Operations Unit records, 2013 through 2017.

<sup>b</sup>Traffic Control Type: U = unsignalized; TS = traffic signal.

<sup>c</sup>Crash rate per million vehicles entering the intersection.

<sup>d</sup>Statewide/District crash rate.

<sup>e</sup>The intersection crash rate is significant if it is found to exceed the MassDOT statewide and/or District crash rate for the MassDOT Highway Division District in which the Project is located (District 3).



## FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2027, which reflects a seven-year planning horizon consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. Independent of the Project, traffic volumes on the roadway network in the year 2027 under No-Build conditions include all existing traffic and new traffic resulting from background traffic growth. Anticipated Project-generated traffic volumes superimposed upon the 2027 No-Build traffic volumes reflect 2027 Build traffic volume conditions with the Project.

### Future Traffic Growth

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

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

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

### Specific Development by Others

The Planning Departments of the Towns of Sturbridge and Charlton were contacted in order to determine if there were any projects planned within the study area that would have an impact on future traffic volumes at the study intersection. Based on these discussions, the following projects were identified for inclusion in this assessment:

- ***Cold Storage Warehouse, 6 Picker Road, Sturbridge, Massachusetts.*** This Project will entail the construction of a 120,662± square foot (sf) cold storage warehouse building that will be located at 6 Picker Road in Sturbridge, Massachusetts.
- ***Propane Facility, 51 Technology Park Road, Sturbridge, Massachusetts.*** This project entails the construction of a 10,000± sf service building with a 30,000 gallon underground propane storage tank to be located at 51 technology Park Road.
- ***Marijuana Dispensary, 660 Main Street, Sturbridge, Massachusetts.*** This project will entail the construction of a 3,292± sf marijuana dispensary to be located at 660 Main Street.
- ***Marijuana Dispensary, 365 Main Street, Sturbridge, Massachusetts.*** This project will entail the construction of a 2,592± sf marijuana dispensary and 2,400± sf of retail space to be located at 365 Main Street.



- ***Tree House Brewing Expansion, 129 Sturbridge Road Charlton, Massachusetts.*** This project consists of the expansion of the existing Tree House Brewing brewery located at 129 Sturbridge Road from 43,000± sf to 67,718± sf, of which 43,000± sf will continue as the brewery operation, 20,710± sf will be devoted to retail sales and 4,008± sf will consist of a timber frame pavilion to provide additional outdoor space for customers. In addition, a 7,600± sf outdoor “beer garden” area will also be constructed between the main building and the pavilion. This project is not expected to result in an increase in traffic during the weekday commuter peak hours that would exceed the general background traffic growth rate.
- ***Marijuana Dispensary, 144 Sturbridge Road, Charlton, Massachusetts.*** This project will entail the construction of a 20,000± sf marijuana dispensary to be located at 144 Sturbridge Road.
- ***Auto Storage and Towing Facility, 299 Sturbridge Road, Charlton, Massachusetts.*** This project is currently under construction at 299 Sturbridge Road and is not expected to result in an increase in traffic during the weekday commuter peak hours that would exceed the general background traffic growth rate.
- ***Warehouse Development, Sturbridge Road, Charlton, Massachusetts.*** This proposed project entails the construction of a 1,400,000± sf warehouse to be located off Sturbridge Road east of the Project site.

Traffic volumes associated with the aforementioned specific development projects by others were obtained from the traffic study prepared in support of the project or developed by using trip-generation information available from the Institute of Transportation Engineers (ITE)<sup>5</sup> for the appropriate land use, and were assigned onto the study area roadway network based on existing traffic patterns where no other information was available. No other developments were identified at this time that are expected to result in an increase in traffic within the study area beyond the general background traffic growth rate.

### **General Background Traffic Growth**

Traffic-volume data compiled by MassDOT from Continuous Count Station No. 3929 located on I-84 south of Route 20 in Sturbridge were reviewed in order to determine general traffic growth trends in the area. Based on a review of this data, it was determined that traffic volumes within the study area have increased by approximately 0.86 percent per year over the past several years. In order to provide a conservative (high) analysis scenario and a prudent planning condition for the Project, a slightly higher 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**

MassDOT and the Town of Sturbridge were consulted in order to determine if there were any planned future roadway improvement projects expected to be complete by 2027 within the study area. Based on this consultation, the following roadway improvement project was identified:

- ***Route 20 Roadway Improvements (Project No. 608435)*** – MassDOT is in the process of advancing design plans for the reconstruction of Route 20 between Route 49 and I-84 in Sturbridge that will include roadway reconstruction, widening, traffic signal installation/replacement/upgrades and the potential installation of a median barrier. This project is in the preliminary design stage and is not included in the future condition analysis.

---

<sup>5</sup>*Trip Generation*, 10<sup>th</sup> Edition; Institute of Transportation Engineers; Washington, DC; 2017.



No other roadway improvement projects aside from routine maintenance activities were identified to be planned within the study area at this time.

### **No-Build Traffic Volumes**

The 2027 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 2020 Existing peak-hour traffic volumes and then adding the additional traffic associated with the identified specific development projects by others. The resulting 2027 No-Build weekday morning and evening peak-hour traffic volumes are shown on Figure 4.

### **PROJECT-GENERATED TRAFFIC**

As proposed, the Project will entail the addition of a propane storage facility to the existing Pioneer Oil & Propane facility. As described previously, Pioneer Oil & Propane currently delivers oil and propane from the Project site; however, the propane is obtained from an off-site vendor. With the completion of the Project, the propane delivery truck will be able to load fuel at the Project site before making deliveries. The only new traffic associated with the Project will be the addition of one (1) to two (2) bulk propane deliveries per week to fill the storage tanks. For the purpose of this analysis, it was assumed that one (1) additional trip would be generated during the weekday morning and evening peak hours, which is conservative (high).

### **Trip Distribution and Assignment**

The directional distribution of generated trips to and from the Project site was determined based on the review of existing traffic patterns within the study area during the peak periods. The general trip distribution for the Project is graphically depicted on Figure 5, with the additional traffic that is expected to be generated by the Project assigned on the study area roadway network as shown on Figure 6.

### **Build Traffic Volumes**

The 2027 Build condition traffic volumes were developed by adding the traffic expected to be generated by the Project to the 2027 No-Build condition traffic volumes. The 2027 Build weekday morning and evening peak-hour traffic-volumes are graphically depicted on Figure 7.

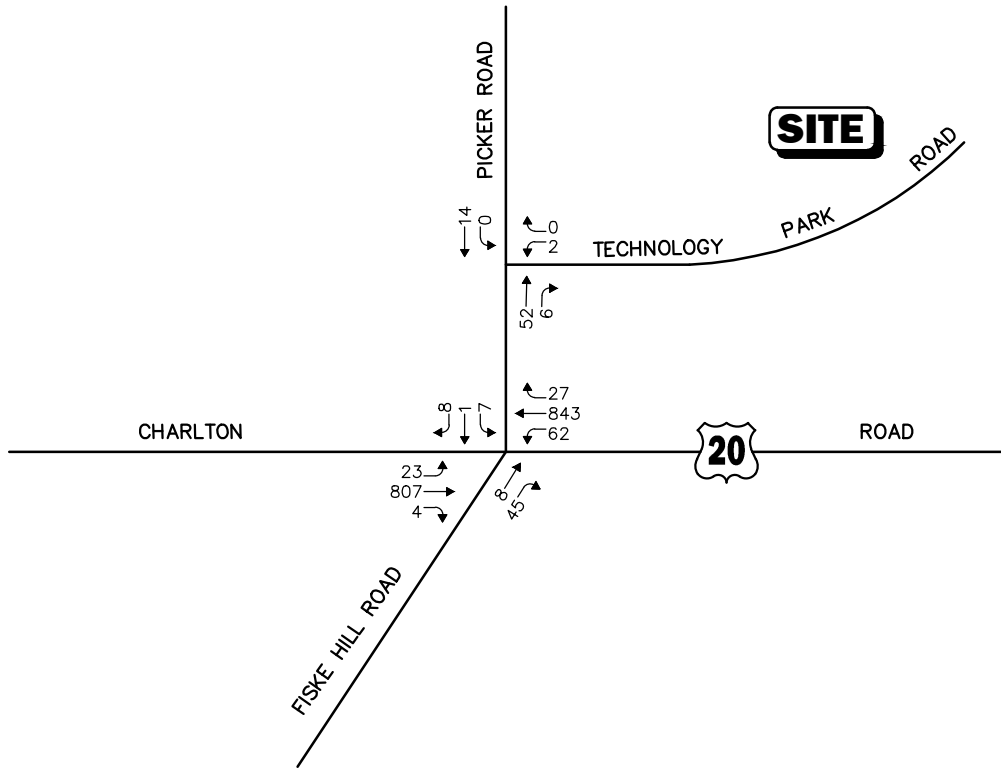
### **TRAFFIC OPERATIONS ANALYSIS**

In order to assess the potential impact of the Project on the roadway network, a detailed traffic operations and vehicle queue analysis (“LOS analysis”) was performed at the study area intersections. Capacity analyses provide an indication of how well transportation 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.

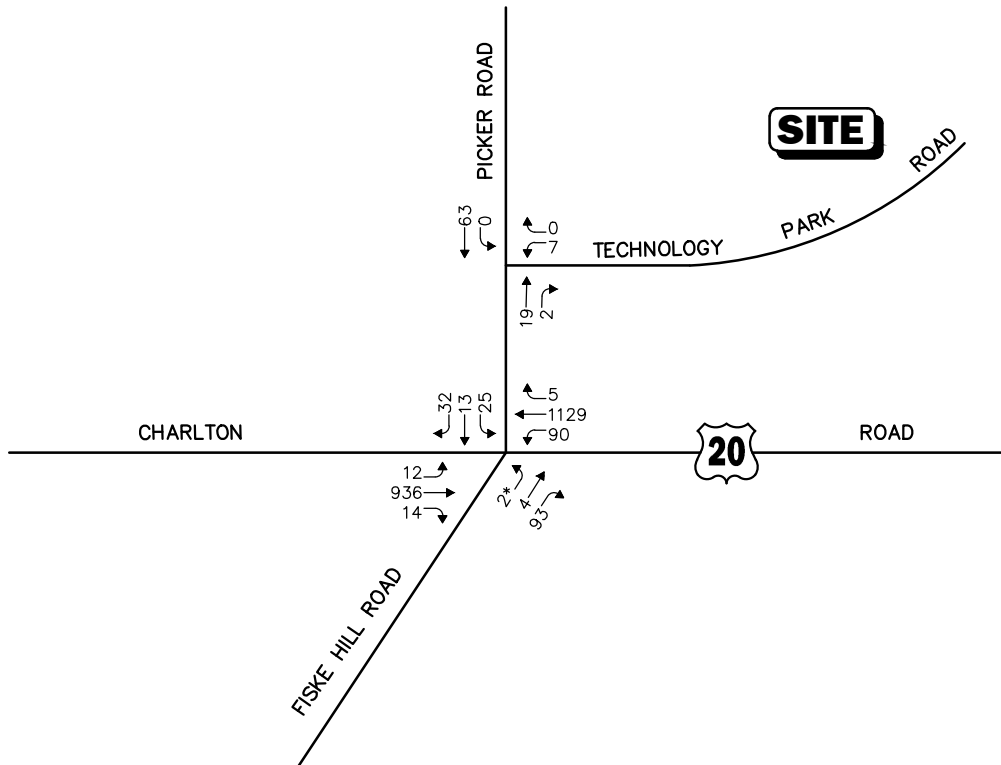
In brief, six levels of service are defined for each type of facility. They are given letter designations ranging from A to F, with level-of-service (LOS) “A” representing the best operating conditions and LOS “F” representing congested or constrained operations. An LOS of “E” is representative of a transportation facility that is operating at its design capacity with an LOS of “D” generally defined as the limit of “acceptable” traffic operations. Since the level-of-service of a traffic facility is a function of the 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 the year. The Synchro® intersection capacity analysis software, which is



WEEKDAY MIDDAY PEAK HOUR (7:45 - 8:45 AM)



WEEKDAY EVENING PEAK HOUR (3:30 - 4:30 PM)



\* Illegal movement.  
Not To Scale

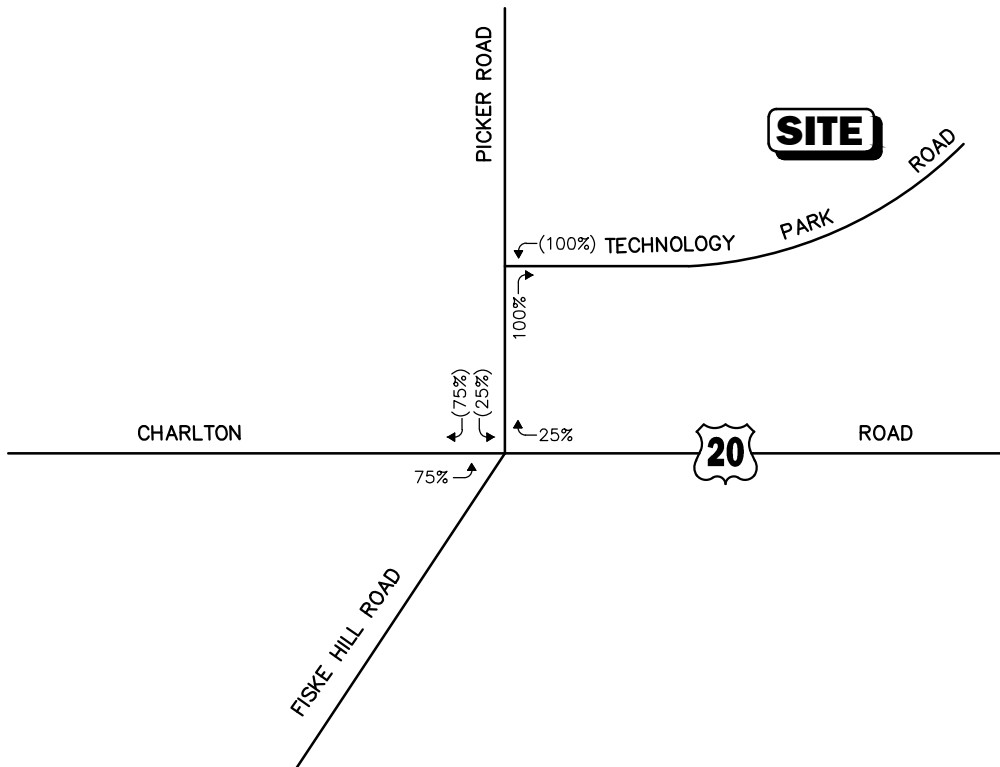


Figure 4

2027 No-Build Peak Hour Traffic Volumes

**Legend:**

- XX Entering Trips
- (XX) Exiting Trips



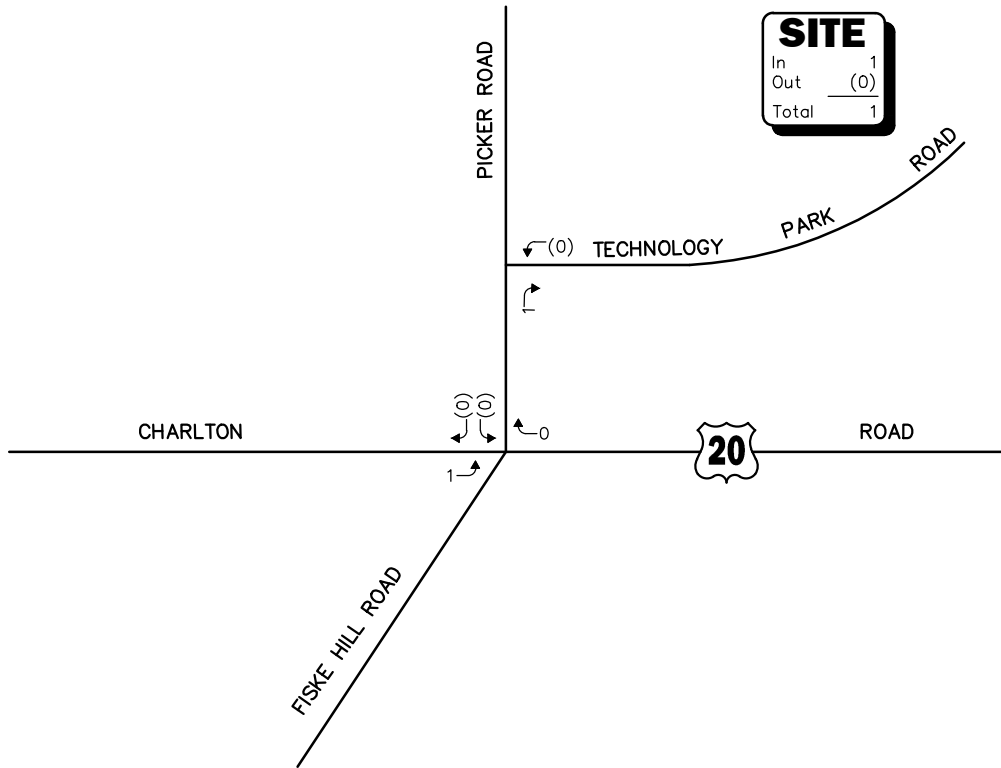
 Not To Scale

Figure 5

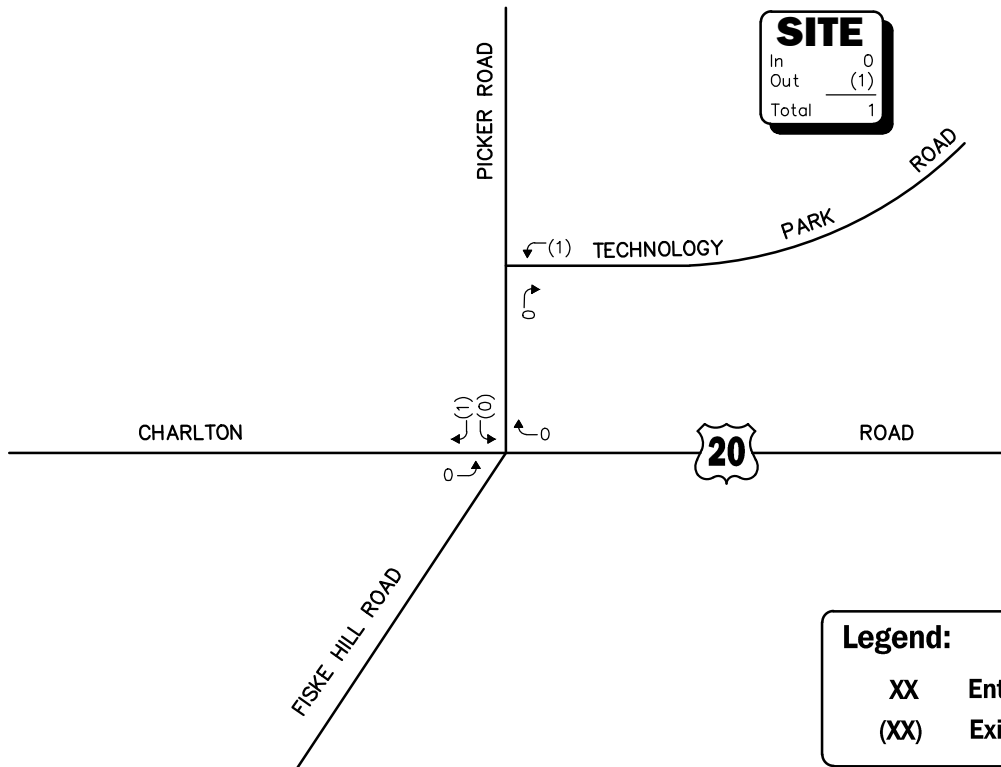
Trip Distribution Map



WEEKDAY MIDDAY PEAK HOUR (7:45 - 8:45 AM)



WEEKDAY EVENING PEAK HOUR (3:30 - 4:30 PM)



**Legend:**

- XX Entering Trips
- (XX) Exiting Trips

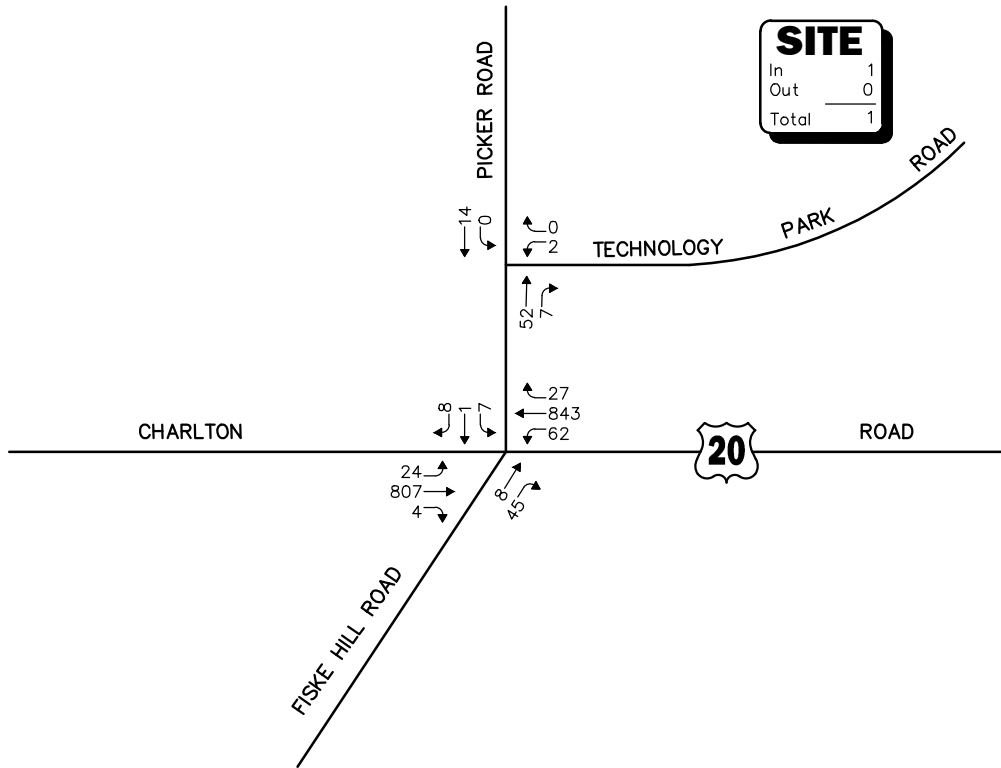
 \* Illegal movement.  
Not To Scale

Figure 6

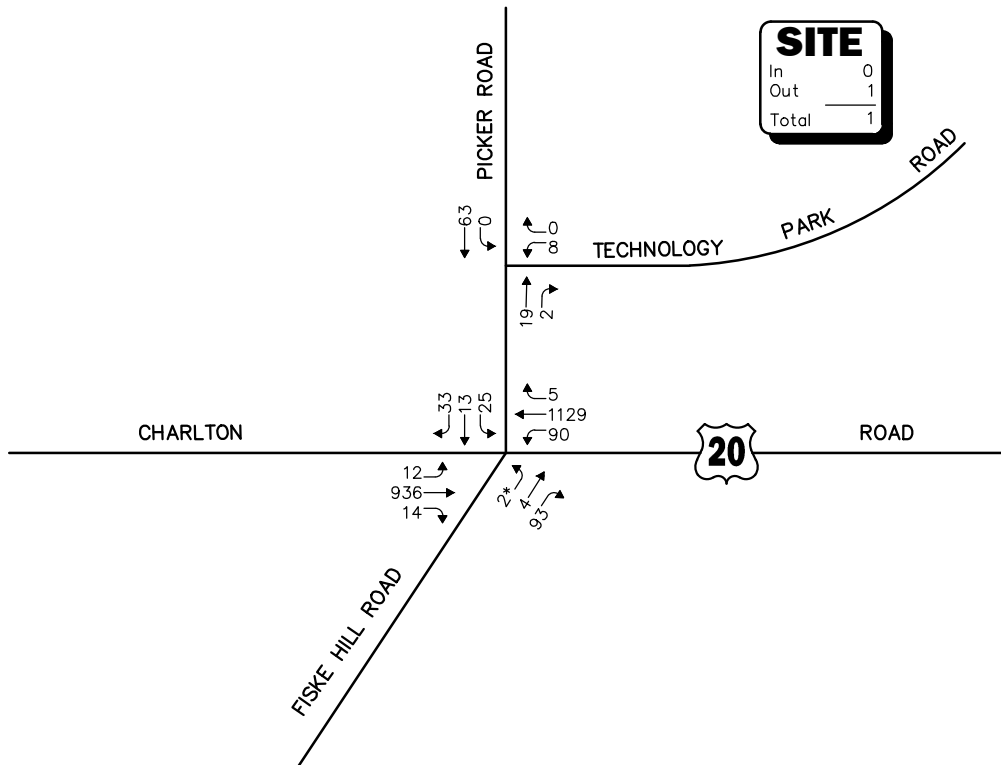
Project-Generated Peak Hour Traffic Volumes



WEEKDAY MIDDAY PEAK HOUR (7:45 - 8:45 AM)



WEEKDAY EVENING PEAK HOUR (3:30 - 4:30 PM)



 \* Illegal movement.  
Not To Scale

Figure 7

2027 Build  
Peak Hour Traffic Volumes





based on the analysis methodologies and procedures presented in the 2010 *Highway Capacity Manual* (HCM)<sup>6</sup> for signalized and unsignalized intersections, was used to complete the level-of-service and vehicle queue analyses.

### **Analysis Results**

Level-of-service and vehicle queue analyses were conducted for 2020 Existing, 2027 No-Build and 2027 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized on Table 4, with the detailed analysis results presented in the Appendix. Project-related impacts at the study area intersections were identified as follows:

***Route 20/Fiske Hill Road/Picker Road*** – No change in LOS or vehicle queuing is predicted to occur over No-Build conditions. Independent of the Project it was noted that through/right movements from Fiske Hill Road during the weekday morning peak-hour and all movements from Picker Road during both the weekday morning and evening peak hours are currently or are predicted to operate at or over capacity (defined as LOS “E” or “F”, respectively) with residual vehicle queues of up to two (2) vehicles on Fiske Hill Road and up to 16 vehicles on Picker Road.

***Picker Road/Technology Park Road*** – All movements were shown to operate at LOS A during both the weekday morning and evening peak hours with negligible vehicle queuing predicted. That being said, motorist delays on the Technology Park Road approach are directly related to operating conditions on the Picker Road approach to Route 20. As such, during the weekday evening peak-hour it is likely that motorist delays are higher than predicted by the analysis model given that vehicle queues on Picker Road approaching Route 20 are predicted to extend to or beyond Technology Park Road.

---

<sup>6</sup>*Highway Capacity Manual*, Transportation Research Board; Washington, DC; 2010.



**Table 4  
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY**

Unsignalized Intersection/ Peak Hour/Movement	2020 Existing				2027 No-Build				2027 Build			
	Demand <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup> 95 <sup>th</sup>	Demand	Delay	LOS	Queue 95 <sup>th</sup>	Demand	Delay	LOS	Queue 95 <sup>th</sup>
<b>Route 20 at Fiske Hill Road and Picker Road</b>												
<i>Weekday Morning:</i>												
Route 20 EB LT/TH/RT	683	0.3	A	0	834	0.7	A	0	835	0.7	A	0
Route 20 WB LT	58	9.8	A	1	62	10.6	B	1	62	10.6	B	1
Route 20 WB TH/RT	776	0.0	A	0	870	0.0	A	0	870	0.0	A	0
Fiske Hill Road NB TH/RT	49	22.7	C	1	53	38.9	E	2	53	38.9	E	2
Picker Road SB LT/TH/RT	12	48.2	E	1	16	>50.0	F	2	16	>50.0	F	2
<i>Weekday Evening:</i>												
Route 20 EB LT/TH/RT	852	0.2	A	0	962	0.4	A	0	962	0.5	A	0
Route 20 WB LT	84	10.5	B	1	90	11.2	B	1	90	11.2	B	1
Route 20 WB TH/RT	969	0.0	A	0	1,134	0.0	A	0	1,134	0.0	A	0
Fiske Hill Road NB TH/RT	91	20.1	C	2	97	28.1	D	2	97	28.1	D	2
Picker Road SB LT/TH/RT	50	>50.0	F	9	70	>50.0	F	16	71	>50.0	F	16
<b>Picker Road at Technology Park Road</b>												
<i>Weekday Morning:</i>												
Technology Park Road WB LT/RT	2	8.8	A	0	2	8.9	A	0	2	8.9	A	0
Picker Road NB TH/RT	38	0.0	A	0	58	0.0	A	0	59	0.0	A	0
Picker Road SB LT/TH	10	0.0	A	0	14	0.0	A	0	14	0.0	A	0
<i>Weekday Evening:</i>												
Technology Park Road WB LT/RT	5	8.8	A	0	7	9.0	A	0	8	9.0	A	0
Picker Road NB TH/RT	15	0.0	A	0	21	0.0	A	0	21	0.0	A	0
Picker Road SB LT/TH	45	0.0	A	0	63	0.0	A	0	63	0.0	A	0

<sup>a</sup>Demand in vehicles per hour.

<sup>b</sup>Average control delay per vehicle (in seconds).

<sup>c</sup>Level-of-Service.

<sup>d</sup>Queue length in vehicles.

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



## SIGHT DISTANCE ASSESSMENT

Sight distance measurements were performed at the Technology Park Road intersection with Picker Road and at the Route 20/Fiske Hill Road/Picker Road intersection in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)<sup>7</sup> requirements. Both stopping sight distance (SSD) and intersection sight distance (ISD) measurements were performed. In brief, SSD is the distance required by a vehicle traveling at the design speed of a roadway, on wet pavement, to stop prior to striking an object in its travel path. ISD or corner sight distance (CSD) is the sight distance required by a driver entering or crossing an intersecting roadway to perceive an on-coming vehicle and safely complete a turning or crossing maneuver with on-coming traffic. In accordance with AASHTO standards, if the measured ISD is at least equal to the required SSD value for the appropriate design speed, the intersection can operate in a safe manner. Table 5 presents the measured SSD and ISD at the subject intersections.

**Table 5**  
**SIGHT DISTANCE MEASUREMENTS<sup>a</sup>**

Intersection/Sight Distance Measurement	Feet		
	Required Minimum (SSD)	Desirable (ISD) <sup>b</sup>	Measured
<b>Route 20 at Fiske Hill Road and Picker Road</b>			
<i>Stopping Sight Distance:</i>			
Route 20 approaching from the east	495	--	650+
Route 20 approaching from the west	495	--	650+
<i>Intersection Sight Distance:</i>			
Looking to the east from Picker Road	495	610	650+
Looking to the west from Picker Road	495	650	650+
<b>Picker Road at the Technology Park Road</b>			
<i>Stopping Sight Distance:</i>			
Picker Road approaching from the north	200	--	214
Picker Road approaching from the south	80	--	137 <sup>d</sup>
<i>Intersection Sight Distance:</i>			
Looking to the north from the Technology Park Road	200	335	169/283 <sup>c</sup>
Looking to the south from the Technology Park Road	80	145	137 <sup>d</sup>

<sup>a</sup>Recommended minimum values obtained from *A Policy on Geometric Design of Highways and Streets*, 7<sup>th</sup> Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018; and based on a 55 mph approach speed for Route 20 and 30 mph approach speed along Picker Road approaching Technology Park Road from the north and 15 mph approach speed approaching from the south.

<sup>b</sup>Values shown are the intersection sight distance for a vehicle turning right or left exiting a roadway under STOP control such that motorists approaching the intersection on the major street should not need to adjust their travel speed to less than 70 percent of their initial approach speed. The gap time for the intersection sight distance values along Route 20 was increased by 0.5 seconds in order to account for the increased time required to cross the additional travel lanes.

<sup>c</sup>With selective trimming/removal of vegetation along the east side of Picker Road north of Technology Park Road.

<sup>d</sup>Clear line of sight is provided to/from Route 20.

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



As can be seen in Table 5, clear line of sight is provided to and from the Technology Park Road along Picker Road from Route 20 which indicates that motorists can perceive and react to potential conflicts that may be present. We note that although the statutory speed limit along Picker Road is 30 mph in the absence of a posted speed limit, the short distance of the roadway between Route 20 and Technology Park Road (approximately 135 feet) would limit actual travel speeds to approximately 15 mph on northbound direction. In addition, with the selective trimming/removal of trees and vegetation located along the east side of Picker Road and north of the Technology Park Road, the available lines of sight to and from Picker Road were found to exceed the recommended minimum distances for the intersection to function in a safe manner (SSD) based on a 30 mph approach speed on southbound direction.

Lines of sight along Route 20 and to and from Picker Road at its intersection with Route 20 were found to exceed the required minimum distances to function in a safe (SSD) and efficient (ISD) manner based on a 55 mph approach speed along Route 20, which is 5 mph above the posted speed limit in the vicinity of the Project site (50 mph).



## SUMMARY

VAI has prepared a detailed assessment of the potential impacts on the transportation infrastructure associated with the proposed addition of a propane storage facility to the existing Pioneer Oil & Propane facility located at 59 Technology Park Road in Sturbridge, Massachusetts. The following specific areas have been evaluated as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; under existing and future conditions, both with and without the Project.

Based on this assessment, we have determined that the Project is not expected to result in a material increase in traffic over existing conditions given that propane delivery services are currently provided at the Project site. Any increase in traffic would be associated with the bulk delivery of propane to fill the storage tanks, which is expected to occur one (1) to two (2) times per week. As such, we have concluded that the Project will not result in a material increase in motorist delays or vehicle queuing over existing conditions and that the transportation infrastructure affords sufficient capacity to accommodate the Project in a safe and efficient manner. This conclusion is predicated on implementation of the following specific recommendations that should be advanced as a part of the Project:

1. A STOP-sign control and marked STOP-line should be provided on the Technology Park Road approach to Picker Road in order to reinforce the assignment of the vehicular right-of-way at the intersection and define the desired stopping point for vehicles.
2. 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)*.<sup>8</sup>
3. Signs and landscape features located within the site triangle areas of the Project site driveways shall be designed and maintained so as not to restrict lines of sight.
4. Snow windrows located within the sight triangle areas of the Project site driveways shall be promptly removed where such accumulations would inhibit sight lines.
5. Existing trees and vegetation located along the east side of Picker Road and north of the Technology Park Road should be selectively trimmed or removed and maintained so as to provide the necessary lines of sight to and from the north of the intersection.
6. Snow windrows along the Technology Park Road frontage within the sight triangle areas of the Project site roadway shall be promptly removed where such accumulations would inhibit sight lines.

With implementation of the above recommendations, 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.

---

<sup>8</sup>*Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.



## APPENDIX

---

PROJECT SITE PLAN

MANUAL TURNING MOVEMENT COUNT DATA

SEASONAL ADJUSTMENT DATA

CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING

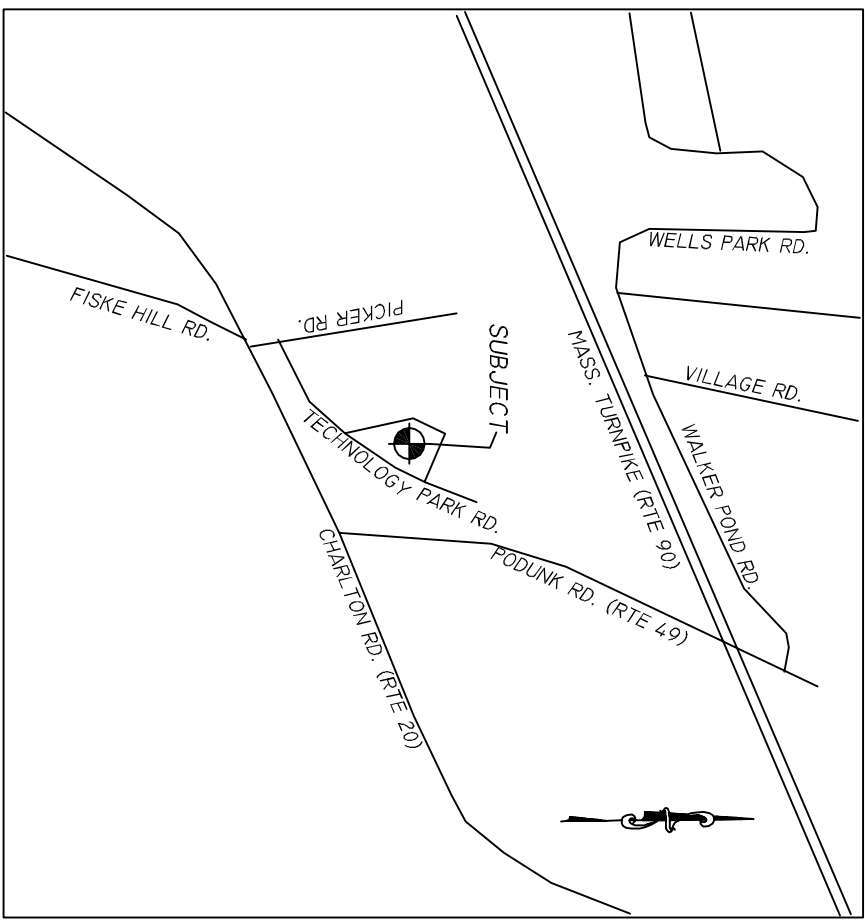
GENERAL BACKGROUND TRAFFIC GROWTH

BACKGROUND DEVELOPMENT TRAFFIC VOLUME NETWORKS

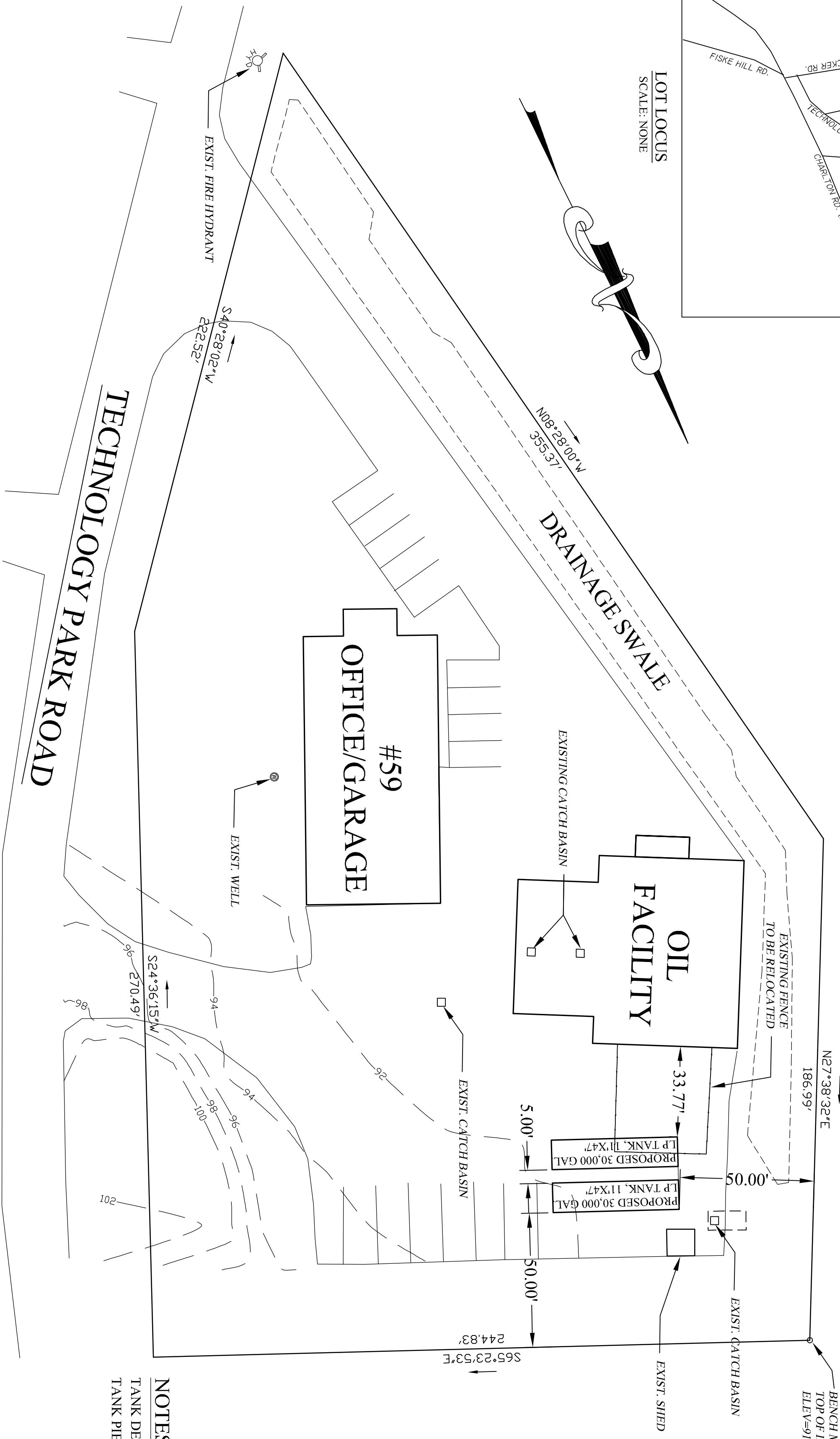
CAPACITY ANALYSIS WORKSHEETS

PROJECT SITE PLAN

---



LOT LOCUS  
SCALE: NONE



STURBRIDGE ZONING: INDUSTRIAL PARK	
REQUIRED	EXISTING
AREA: 2 ACRE	AREA: 2 ACRE
FRONTAGE: 300'	FRONTAGE: 493.01'
FRONT YARD: .60'	FRONT YARD: 61.37'
SIDE YARD: .30'	SIDE YARD: 29.12 / 75.54'
REAR YARD: .30'	REAR YARD: 31.70'
%COVERAGE: .33	%COVERAGE: 6.2

SITE IS SERVICED BY PUBLIC SEWER AND WATER.

BENCH MARK  
TOP OF I.P.  
ELEV=91.03'

**NOTES**

TANK DESIGN AND PRECAST CONCRETE  
TANK PIERS DESIGN TO BE BY OTHERS.



*Leonard Jalbert*

MAP 22 PARCEL 59

ORIGINAL	BY	REVISIONS	DESCRIPTION	MADE	CHK'D	APVD
DATE 6/16/20	AMT					
DRAFTED BY: LSJ						
CHECKED BY: LSJ						
SUPERVISOR: MLJ						
REVIEWED						
REVIEWED						

**JALBERT ENGINEERING, INC.**  
CIVIL ENGINEERS & SURVEYORS

54 Main Street  
Sturbridge, Massachusetts 01566-1244  
Telephone: (508) 347-5136 • Toll Free: 1-800-339-5136  
Fax: (508) 347-7962

**PROPOSED SITE PLAN**  
SAIL ENERGY, LLC  
59 TECHNOLOGY PARK ROAD  
STURBRIDGE, MASSACHUSETTS

PLAN DATE:	6/16/20
DWG NUMBER	20059



MANUAL TURNING MOVEMENT COUNT DATA

---

# Vanasse & Associates

Route 20 at Picker Rd / Gifford Rd  
Sturbridge, MA

Weather: Clear

File Name : 863301am

Site Code : 00863301

Start Date : 5/14/2020

Page No : 1

## Groups Printed- Cars - Trucks

Start Time	Picker Road From North					Route 20 From East					Gifford Road From South					Route 20 From West					Int Total
	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	
06:00 AM	0	1	1	0	2	0	53	4	0	57	5	0	1	0	6	0	50	2	0	52	117
06:15 AM	0	0	0	0	0	1	62	4	0	67	5	0	0	0	5	2	72	1	0	75	147
06:30 AM	0	0	0	0	0	5	58	23	0	86	12	2	0	0	14	0	72	2	0	74	174
06:45 AM	0	1	0	0	1	3	78	14	0	95	6	7	0	0	13	1	68	4	0	73	182
Total	0	2	1	0	3	9	251	45	0	305	28	9	1	0	38	3	262	9	0	274	620
07:00 AM	0	0	1	0	1	2	72	7	0	81	14	1	0	0	15	5	70	1	0	76	173
07:15 AM	1	0	1	0	2	4	70	9	0	83	13	3	0	0	16	2	80	2	0	84	185
07:30 AM	0	0	1	0	1	1	93	10	0	104	6	2	0	0	8	2	47	6	0	55	168
07:45 AM	1	0	1	0	2	10	91	18	0	119	13	1	0	0	14	1	101	3	0	105	240
Total	2	0	4	0	6	17	326	44	0	387	46	7	0	0	53	10	298	12	0	320	766
08:00 AM	2	1	1	0	4	4	74	17	0	95	9	1	0	0	10	0	75	4	0	79	188
08:15 AM	1	0	4	0	5	3	91	12	0	106	7	3	0	0	10	2	78	1	0	81	202
08:30 AM	1	0	0	0	1	3	90	11	0	104	13	2	0	0	15	1	82	3	0	86	206
08:45 AM	1	0	0	0	1	5	77	15	0	97	10	0	0	0	10	1	76	2	0	79	187
Total	5	1	5	0	11	15	332	55	0	402	39	6	0	0	45	4	311	10	0	325	783
Grand Total	7	3	10	0	20	41	909	144	0	1094	113	22	1	0	136	17	871	31	0	919	2169
Apprch %	35	15	50	0		3.7	83.1	13.2	0		83.1	16.2	0.7	0		1.8	94.8	3.4	0		
Total %	0.3	0.1	0.5	0	0.9	1.9	41.9	6.6	0	50.4	5.2	1	0	0	6.3	0.8	40.2	1.4	0	42.4	
Cars	7	3	9	0	19	39	849	141	0	1029	110	21	1	0	132	16	796	30	0	842	2022
% Cars	100	100	90	0	95	95.1	93.4	97.9	0	94.1	97.3	95.5	100	0	97.1	94.1	91.4	96.8	0	91.6	93.2
Trucks	0	0	1	0	1	2	60	3	0	65	3	1	0	0	4	1	75	1	0	77	147
% Trucks	0	0	10	0	5	4.9	6.6	2.1	0	5.9	2.7	4.5	0	0	2.9	5.9	8.6	3.2	0	8.4	6.8

# Vanasse & Associates

Route 20 at Picker Rd / Gifford Rd  
Sturbridge, MA

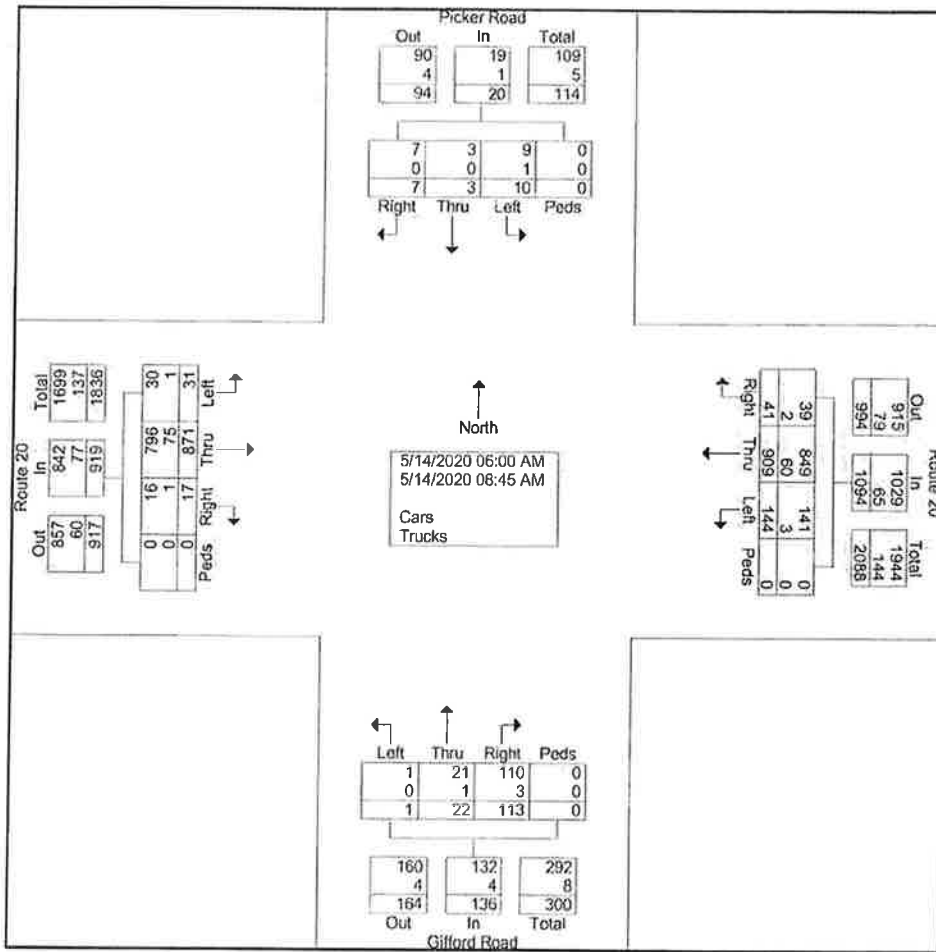
Weather: Clear

File Name : 863301am

Site Code : 00863301

Start Date : 5/14/2020

Page No : 2



# Vanasse & Associates

Route 20 at Picker Rd / Gifford Rd  
Sturbridge, MA

Weather: Clear

File Name : 863301am

Site Code : 00863301

Start Date : 5/14/2020

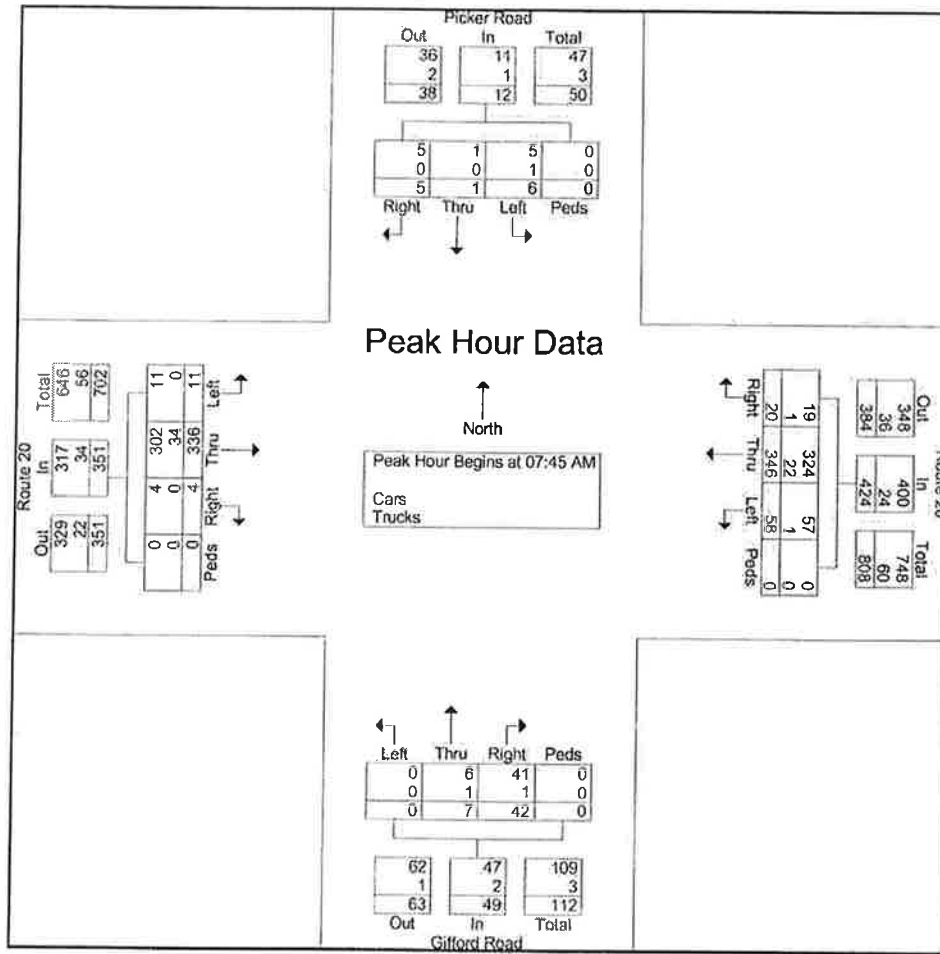
Page No : 3

Start Time	Picker Road From North					Route 20 From East					Gifford Road From South					Route 20 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	1	0	1	0	2	10	91	18	0	119	13	1	0	0	14	1	101	3	0	105	240
08:00 AM	2	1	1	0	4	4	74	17	0	95	9	1	0	0	10	0	75	4	0	79	188
08:15 AM	1	0	4	0	5	3	91	12	0	106	7	3	0	0	10	2	78	1	0	81	202
08:30 AM	1	0	0	0	1	3	90	11	0	104	13	2	0	0	15	1	82	3	0	86	206
Total Volume	5	1	6	0	12	20	346	58	0	424	42	7	0	0	49	4	336	11	0	351	836
% App. Total	41.7	8.3	50	0		4.7	81.6	13.7	0		85.7	14.3	0	0		1.1	95.7	3.1	0		
PHF	.625	.250	.375	.000	.600	.500	.951	.806	.000	.891	.808	.583	.000	.000	.817	.500	.832	.688	.000	.836	.871
Cars	5	1	5	0	11	19	324	57	0	400	41	6	0	0	47	4	302	11	0	317	775
% Cars	100	100	83.3	0	91.7	95.0	93.6	98.3	0	94.3	97.6	85.7	0	0	95.9	100	89.9	100	0	90.3	92.7
Trucks	0	0	1	0	1	1	22	1	0	24	1	1	0	0	2	0	34	0	0	34	61
% Trucks	0	0	16.7	0	8.3	5.0	6.4	1.7	0	5.7	2.4	14.3	0	0	4.1	0	10.1	0	0	9.7	7.3

# Vanasse & Associates

Route 20 at Picker Rd / Gifford Rd  
 Sturbridge, MA  
 Weather: Clear

File Name : 863301am  
 Site Code : 00863301  
 Start Date : 5/14/2020  
 Page No : 4



# Vanasse & Associates

Route 20 at Picker Rd / Gifford Rd  
Sturbridge, MA

Weather: Clear

File Name : 863301am

Site Code : 00863301

Start Date : 5/14/2020

Page No : 1

## Groups Printed- Cars

Start Time	Picker Road From North					Route 20 From East					Gifford Road From South					Route 20 From West					Int Total
	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	
06:00 AM	0	1	1	0	2	0	49	4	0	53	5	0	1	0	6	0	47	2	0	49	110
06:15 AM	0	0	0	0	0	1	58	4	0	63	5	0	0	0	5	1	65	1	0	67	135
06:30 AM	0	0	0	0	0	5	56	23	0	84	12	2	0	0	14	0	60	2	0	62	160
06:45 AM	0	1	0	0	1	2	75	14	0	91	6	7	0	0	13	1	63	4	0	68	173
Total	0	2	1	0	3	8	238	45	0	291	28	9	1	0	38	2	235	9	0	246	578
07:00 AM	0	0	1	0	1	2	67	7	0	76	13	1	0	0	14	5	66	1	0	72	163
07:15 AM	1	0	1	0	2	4	67	8	0	79	13	3	0	0	16	2	74	2	0	78	175
07:30 AM	0	0	1	0	1	1	85	10	0	96	6	2	0	0	8	2	47	5	0	54	159
07:45 AM	1	0	0	0	1	10	86	18	0	114	13	1	0	0	14	1	91	3	0	95	224
Total	2	0	3	0	5	17	305	43	0	365	45	7	0	0	52	10	278	11	0	299	721
08:00 AM	2	1	1	0	4	4	71	17	0	92	8	1	0	0	9	0	68	4	0	72	177
08:15 AM	1	0	4	0	5	3	84	12	0	99	7	2	0	0	9	2	71	1	0	74	187
08:30 AM	1	0	0	0	1	2	83	10	0	95	13	2	0	0	15	1	72	3	0	76	187
08:45 AM	1	0	0	0	1	5	68	14	0	87	9	0	0	0	9	1	72	2	0	75	172
Total	5	1	5	0	11	14	306	53	0	373	37	5	0	0	42	4	283	10	0	297	723
Grand Total	7	3	9	0	19	39	849	141	0	1029	110	21	1	0	132	16	796	30	0	842	2022
Apprch %	36.8	15.8	47.4	0		3.8	82.5	13.7	0		83.3	15.9	0.8	0		1.9	94.5	3.6	0		
Total %	0.3	0.1	0.4	0	0.9	1.9	42	7	0	50.9	5.4	1	0	0	6.5	0.8	39.4	1.5	0	41.6	

# Vanasse & Associates

Route 20 at Picker Rd / Gifford Rd  
Sturbridge, MA

Weather: Clear

File Name : 863301am

Site Code : 00863301

Start Date : 5/14/2020

Page No : 1

## Groups Printed- Trucks

Start Time	Picker Road From North					Route 20 From East					Gifford Road From South					Route 20 From West					Inl. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
06:00 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
06:15 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	1	7	0	0	8	12
06:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	12	0	0	12	14
06:45 AM	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	0	5	0	0	5	9
Total	0	0	0	0	0	1	13	0	0	14	0	0	0	0	0	1	27	0	0	28	42
07:00 AM	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	0	4	0	0	4	10
07:15 AM	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	6	0	0	6	10
07:30 AM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	1	0	1	9
07:45 AM	0	0	1	0	1	0	5	0	0	5	0	0	0	0	0	0	10	0	0	10	16
Total	0	0	1	0	1	0	21	1	0	22	1	0	0	0	1	0	20	1	0	21	45
08:00 AM	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	0	7	0	0	7	11
08:15 AM	0	0	0	0	0	0	7	0	0	7	0	1	0	0	1	0	7	0	0	7	15
08:30 AM	0	0	0	0	0	1	7	1	0	9	0	0	0	0	0	0	10	0	0	10	19
08:45 AM	0	0	0	0	0	0	9	1	0	10	1	0	0	0	1	0	4	0	0	4	15
Total	0	0	0	0	0	1	26	2	0	29	2	1	0	0	3	0	28	0	0	28	60
Grand Total	0	0	1	0	1	2	60	3	0	65	3	1	0	0	4	1	75	1	0	77	147
Apprch %	0	0	100	0		3.1	92.3	4.6	0		75	25	0	0		1.3	97.4	1.3	0		
Total %	0	0	0.7	0	0.7	1.4	40.8	2	0	44.2	2	0.7	0	0	2.7	0.7	51	0.7	0	52.4	

# Vanasse & Associates

Route 20 at Picker Rd / Gifford Rd  
Sturbridge, MA

*Weather: Clear*

File Name : 863301pm

Site Code : 00863301

Start Date : 5/14/2020

Page No : 1

## Groups Printed- Cars - Trucks - Buses

Start Time	Picker Road From North					Route 20 From East					Gifford Road From South					Route 20 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
03:00 PM	1	0	0	0	1	2	145	22	0	169	14	0	0	0	14	4	160	1	0	165	349
03:15 PM	1	0	2	0	3	3	153	24	0	180	14	0	0	0	14	3	137	1	0	141	338
03:30 PM	8	9	8	0	25	1	160	29	0	190	18	2	2	0	22	2	134	0	0	136	373
03:45 PM	5	1	4	0	10	1	195	15	0	211	20	0	0	0	20	3	144	4	0	151	392
<b>Total</b>	<b>15</b>	<b>10</b>	<b>14</b>	<b>0</b>	<b>39</b>	<b>7</b>	<b>653</b>	<b>90</b>	<b>0</b>	<b>750</b>	<b>66</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>70</b>	<b>12</b>	<b>575</b>	<b>6</b>	<b>0</b>	<b>593</b>	<b>1452</b>
04:00 PM	2	2	4	0	8	1	154	21	0	176	26	1	0	0	27	4	134	3	0	141	352
04:15 PM	5	0	2	0	7	1	148	19	0	168	23	1	0	0	24	4	157	0	0	161	360
04:30 PM	5	1	6	0	12	1	153	19	0	173	24	1	0	0	25	5	144	0	0	149	359
04:45 PM	4	0	1	0	5	0	145	22	0	167	19	0	0	0	19	5	133	1	0	139	330
<b>Total</b>	<b>16</b>	<b>3</b>	<b>13</b>	<b>0</b>	<b>32</b>	<b>3</b>	<b>600</b>	<b>81</b>	<b>0</b>	<b>684</b>	<b>92</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>95</b>	<b>18</b>	<b>568</b>	<b>4</b>	<b>0</b>	<b>590</b>	<b>1401</b>
05:00 PM	2	0	6	0	8	1	180	27	0	208	17	0	1	0	18	8	143	0	0	151	385
05:15 PM	0	0	0	0	0	0	152	20	0	172	26	0	0	0	26	2	149	0	0	151	349
05:30 PM	1	0	0	0	1	1	167	24	0	192	15	0	1	0	16	4	134	1	0	139	348
05:45 PM	1	0	0	0	1	0	151	19	0	170	16	0	0	0	16	3	127	0	0	130	317
<b>Total</b>	<b>4</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>10</b>	<b>2</b>	<b>650</b>	<b>90</b>	<b>0</b>	<b>742</b>	<b>74</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>76</b>	<b>17</b>	<b>553</b>	<b>1</b>	<b>0</b>	<b>571</b>	<b>1399</b>
<b>Grand Total</b>	<b>35</b>	<b>13</b>	<b>33</b>	<b>0</b>	<b>81</b>	<b>12</b>	<b>1903</b>	<b>261</b>	<b>0</b>	<b>2176</b>	<b>232</b>	<b>5</b>	<b>4</b>	<b>0</b>	<b>241</b>	<b>47</b>	<b>1696</b>	<b>11</b>	<b>0</b>	<b>1754</b>	<b>4252</b>
<b>Apprch %</b>	<b>43.2</b>	<b>16</b>	<b>40.7</b>	<b>0</b>		<b>0.6</b>	<b>87.5</b>	<b>12</b>	<b>0</b>		<b>96.3</b>	<b>2.1</b>	<b>1.7</b>	<b>0</b>		<b>2.7</b>	<b>96.7</b>	<b>0.6</b>	<b>0</b>		
<b>Total %</b>	<b>0.8</b>	<b>0.3</b>	<b>0.8</b>	<b>0</b>	<b>1.9</b>	<b>0.3</b>	<b>44.8</b>	<b>6.1</b>	<b>0</b>	<b>51.2</b>	<b>5.5</b>	<b>0.1</b>	<b>0.1</b>	<b>0</b>	<b>5.7</b>	<b>1.1</b>	<b>39.9</b>	<b>0.3</b>	<b>0</b>	<b>41.3</b>	
<b>Cars</b>	<b>34</b>	<b>13</b>	<b>30</b>	<b>0</b>	<b>77</b>	<b>12</b>	<b>1845</b>	<b>261</b>	<b>0</b>	<b>2118</b>	<b>232</b>	<b>5</b>	<b>4</b>	<b>0</b>	<b>241</b>	<b>46</b>	<b>1656</b>	<b>10</b>	<b>0</b>	<b>1712</b>	<b>4148</b>
<b>% Cars</b>	<b>97.1</b>	<b>100</b>	<b>90.9</b>	<b>0</b>	<b>95.1</b>	<b>100</b>	<b>97</b>	<b>100</b>	<b>0</b>	<b>97.3</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>97.9</b>	<b>97.6</b>	<b>90.9</b>	<b>0</b>	<b>97.6</b>	<b>97.6</b>
<b>Trucks</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>58</b>	<b>0</b>	<b>0</b>	<b>58</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>39</b>	<b>1</b>	<b>0</b>	<b>41</b>	<b>103</b>
<b>% Trucks</b>	<b>2.9</b>	<b>0</b>	<b>9.1</b>	<b>0</b>	<b>4.9</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>2.7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2.1</b>	<b>2.3</b>	<b>9.1</b>	<b>0</b>	<b>2.3</b>	<b>2.4</b>
<b>Buses</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>
<b>% Buses</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.1</b>	<b>0</b>	<b>0</b>	<b>0.1</b>	<b>0</b>



# Vanasse & Associates

Route 20 at Picker Rd / Gifford Rd  
Sturbridge, MA

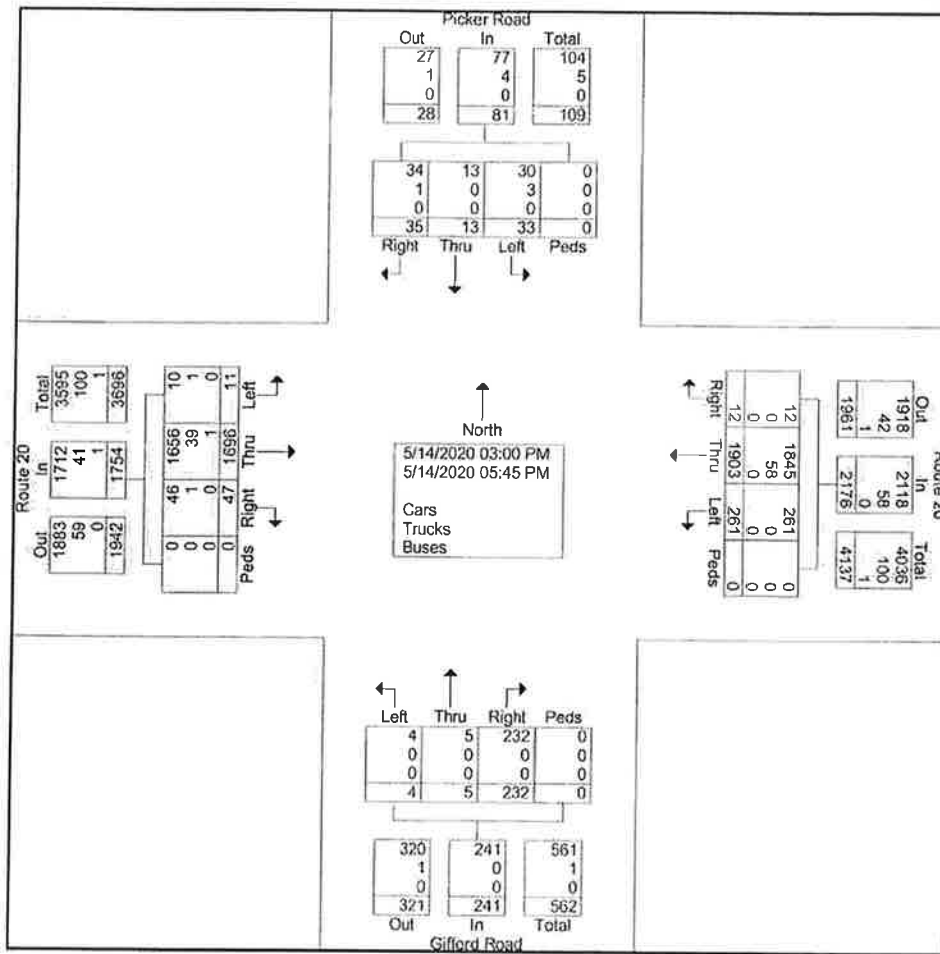
Weather: Clear

File Name : 863301pm

Site Code : 00863301

Start Date : 5/14/2020

Page No : 2





# Vanasse & Associates

Route 20 at Picker Rd / Gifford Rd  
Sturbridge, MA

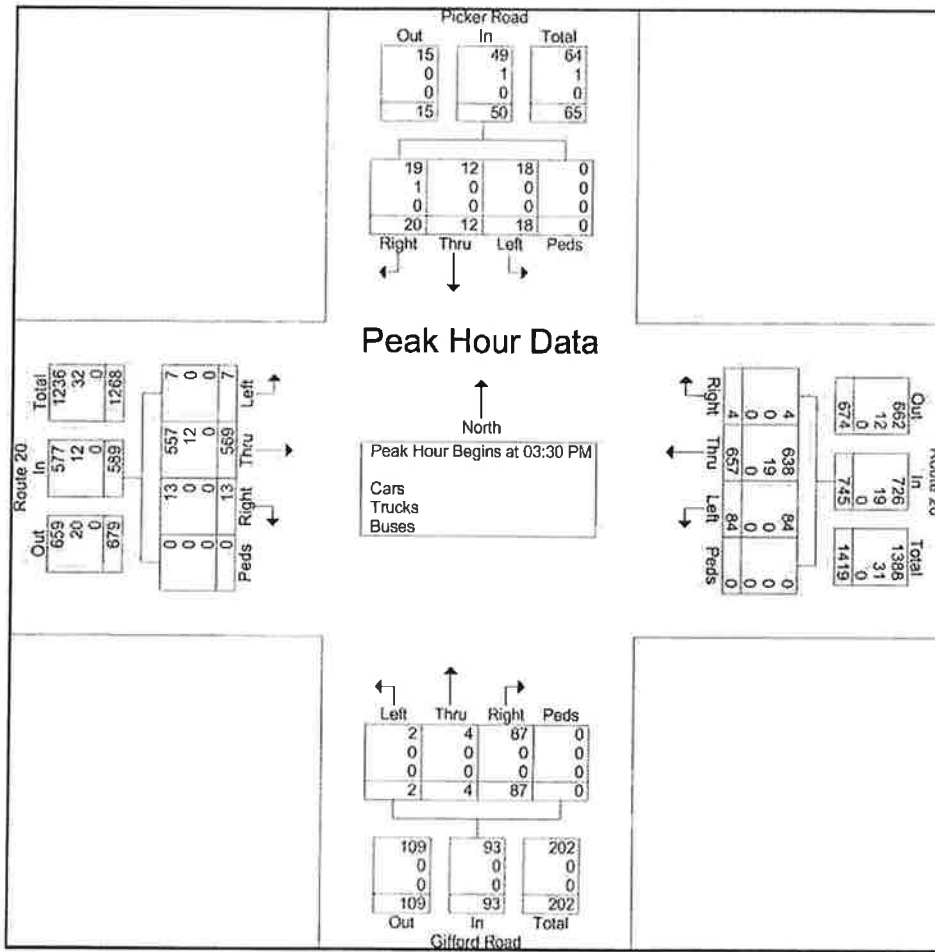
Weather: Clear

File Name : 863301pm

Site Code : 00863301

Start Date : 5/14/2020

Page No : 4



# Vanasse & Associates

Route 20 at Picker Rd / Gifford Rd  
Sturbridge, MA

Weather: Clear

File Name : 863301pm

Site Code : 00863301

Start Date : 5/14/2020

Page No : 1

## Groups Printed- Cars

Start Time	Picker Road From North					Route 20 From East					Gifford Road From South					Route 20 From West					Int Total
	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	
03:00 PM	1	0	0	0	1	2	141	22	0	165	14	0	0	0	14	4	155	1	0	160	340
03:15 PM	1	0	2	0	3	3	139	24	0	166	14	0	0	0	14	3	129	1	0	133	316
03:30 PM	8	9	8	0	25	1	153	29	0	183	18	2	2	0	22	2	130	0	0	132	362
03:45 PM	4	1	4	0	9	1	191	15	0	207	20	0	0	0	20	3	141	4	0	148	384
Total	14	10	14	0	38	7	624	90	0	721	66	2	2	0	70	12	555	6	0	573	1402
04:00 PM	2	2	4	0	8	1	151	21	0	173	26	1	0	0	27	4	130	3	0	137	345
04:15 PM	5	0	2	0	7	1	143	19	0	163	23	1	0	0	24	4	156	0	0	160	354
04:30 PM	5	1	6	0	12	1	147	19	0	167	24	1	0	0	25	5	140	0	0	145	349
04:45 PM	4	0	1	0	5	0	141	22	0	163	19	0	0	0	19	4	130	0	0	134	321
Total	16	3	13	0	32	3	582	81	0	666	92	3	0	0	95	17	556	3	0	576	1369
05:00 PM	2	0	3	0	5	1	175	27	0	203	17	0	1	0	18	8	140	0	0	148	374
05:15 PM	0	0	0	0	0	0	149	20	0	169	26	0	0	0	26	2	147	0	0	149	344
05:30 PM	1	0	0	0	1	1	164	24	0	189	15	0	1	0	16	4	131	1	0	136	342
05:45 PM	1	0	0	0	1	0	151	19	0	170	16	0	0	0	16	3	127	0	0	130	317
Total	4	0	3	0	7	2	639	90	0	731	74	0	2	0	76	17	545	1	0	563	1377
Grand Total	34	13	30	0	77	12	1845	261	0	2118	232	5	4	0	241	46	1656	10	0	1712	4148
Approch %	44.2	16.9	39	0		0.6	87.1	12.3	0		96.3	2.1	1.7	0		2.7	96.7	0.6	0		
Total %	0.8	0.3	0.7	0	1.9	0.3	44.5	6.3	0	51.1	5.6	0.1	0.1	0	5.8	1.1	39.9	0.2	0	41.3	

# Vanasse & Associates

Route 20 at Picker Rd / Gifford Rd  
Sturbridge, MA

Weather: Clear

File Name : 863301pm

Site Code : 00863301

Start Date : 5/14/2020

Page No : 1

## Groups Printed- Trucks

Start Time	Picker Road From North					Route 20 From East					Gifford Road From South					Route 20 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
03:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	9
03:15 PM	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	0	7	0	0	7	21
03:30 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	4	0	0	4	11
03:45 PM	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	8
Total	1	0	0	0	1	0	29	0	0	29	0	0	0	0	0	0	19	0	0	19	49
04:00 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	7
04:15 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	1	0	0	1	6
04:30 PM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	10
04:45 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	1	3	1	0	5	9
Total	0	0	0	0	0	0	18	0	0	18	0	0	0	0	0	1	12	1	0	14	32
05:00 PM	0	0	3	0	3	0	5	0	0	5	0	0	0	0	0	0	3	0	0	3	11
05:15 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
05:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	6
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	3	0	3	0	11	0	0	11	0	0	0	0	0	0	8	0	0	8	22
Grand Total	1	0	3	0	4	0	58	0	0	58	0	0	0	0	0	1	39	1	0	41	103
Apprch %	25	0	75	0		0	100	0	0		0	0	0	0		2.4	95.1	2.4	0		
Total %	1	0	2.9	0	3.9	0	56.3	0	0	56.3	0	0	0	0	0	1	37.9	1	0	39.8	

# Vanasse & Associates

Route 20 at Picker Rd / Gifford Rd  
Sturbridge, MA

Weather: Clear

File Name : 863301pm

Site Code : 00863301

Start Date : 5/14/2020

Page No : 1

## Groups Printed- Buses

Start Time	Picker Road From North					Route 20 From East					Gifford Road From South					Route 20 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	100	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	100	

# Accurate Counts

978-664-2565

N/S Street : Route 49  
 E/W Street : Route 20  
 City/State : Charlton, MA  
 Weather : Clear

File Name : 83840002  
 Site Code : 83840002  
 Start Date : 9/25/2019  
 Page No : 1

Start Time	Groups Printed- Cars - Trucks						Int. Total
	Route 49 From North Left	Right	Route 20 From East Thru	Right	Route 20 From West Left	Thru	
07:00 AM	5	70	84	1	50	95	305
07:15 AM	8	81	81	5	61	117	353
07:30 AM	9	106	88	4	55	115	377
07:45 AM	5	122	116	9	59	126	437
Total	27	379	369	19	225	453	1472
08:00 AM	7	88	101	5	74	124	399
08:15 AM	6	101	104	7	53	103	374
08:30 AM	14	79	88	2	48	104	335
08:45 AM	7	69	83	8	66	69	302
Total	34	337	376	22	241	400	1410
Grand Total	61	716	745	41	466	853	2882
Approch %	7.9	92.1	94.8	5.2	35.3	64.7	
Total %	2.1	24.8	25.9	1.4	16.2	29.6	
Cars	53	666	700	37	424	809	2689
% Cars	86.9	93	94	90.2	91	94.8	93.3
Trucks	8	50	45	4	42	44	193
% Trucks	13.1	7	6	9.8	9	5.2	6.7

# Accurate Counts

978-664-2565

N/S Street : Route 49  
 EW Street: Route 20  
 City/State : Charlton, MA  
 Weather : Clear

File Name : 83840002  
 Site Code : 83840002  
 Start Date : 9/25/2019  
 Page No : 2

Start Time	Route 49 From North			Route 20 From East			Route 20 From West			
	Left	Right	Thru	Right	Left	Thru	Left	Thru	Thru	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	9	106	88	4	92	115	55	115	170	377
07:45 AM	5	122	116	9	125	126	59	126	185	437
08:00 AM	7	88	101	5	106	124	74	124	198	399
08:15 AM	6	101	104	7	111	103	53	103	156	374
Total Volume	27	417	409	25	434	468	241	468	709	1587
% App. Total	6.1	93.9	94.2	5.8	868	66	34	66	895	908
PHF	.750	.855	.881	.694	.868	.929	.814	.929	.895	.908
Cars	21	393	384	24	408	444	219	444	663	1485
% Cars	77.8	94.2	93.9	96.0	94.0	94.9	90.9	94.9	93.5	93.6
Trucks	6	24	25	1	26	24	22	24	46	102
% Trucks	22.2	5.8	6.1	4.0	6.0	5.1	9.1	5.1	6.5	6.4

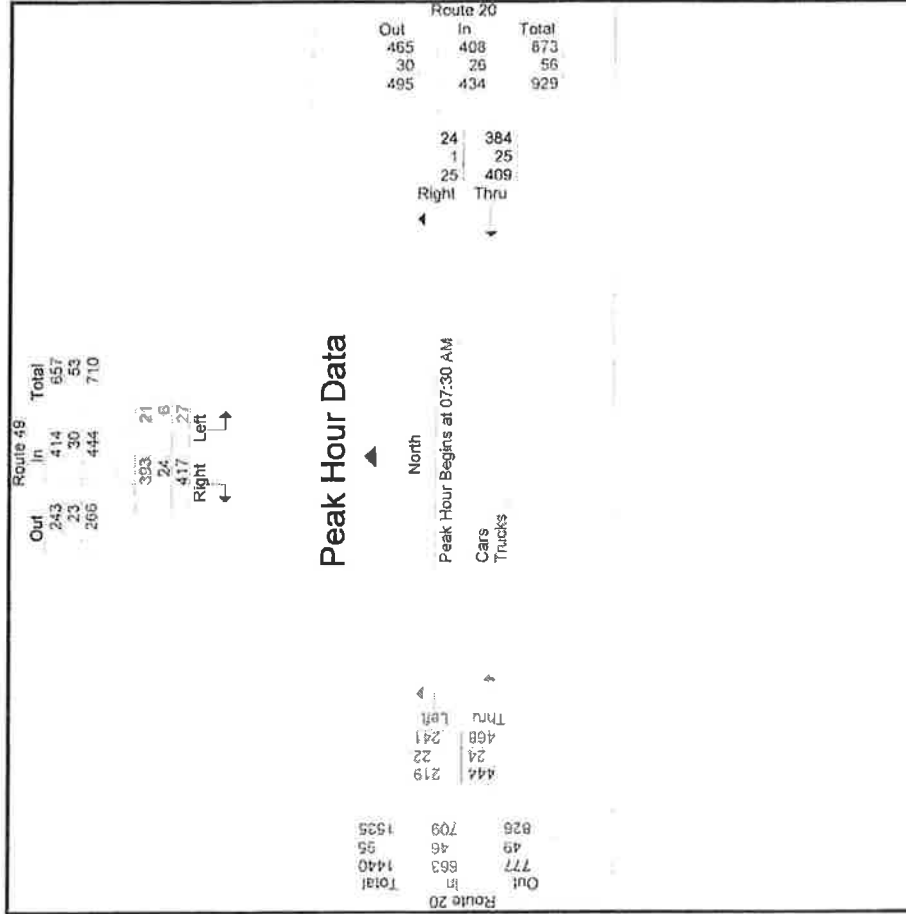


# Accurate Counts

978-664-2565

File Name : 83840002  
 Site Code : 83840002  
 Start Date : 9/25/2019  
 Page No : 3

N/S Street : Route 49  
 E/W Street : Route 20  
 City/State : Charlton, MA  
 Weather : Clear



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

### Peak Hour for Each Approach Begins at:

	07:30 AM	07:15 AM
+0 mins.	115	88
+15 mins.	127	116
+30 mins.	95	101
+45 mins.	107	104
Total Volume	444	409
	4	25
	92	61
	125	55
	106	59
	111	74
	434	249
	117	178
	115	170
	126	185
	124	198
	482	731

## Accurate Counts

978-664-2565

N/S Street : Route 49  
 EW Street: Route 20  
 City/State : Charlton, MA  
 Weather : Clear

File Name : 83840002  
 Site Code : 83840002  
 Start Date : 9/25/2019  
 Page No : 5

Start Time	Route 49				Route 20				Int. Total
	From North	Right	Thru	From East	From West	Right	Thru	From West	
07:00 AM	5	66	78	78	42	1	87	42	279
07:15 AM	8	76	78	78	53	5	112	53	332
07:30 AM	6	102	82	82	48	4	110	48	352
07:45 AM	4	119	107	107	56	8	118	56	412
Total	23	363	345	345	199	18	427	199	1375
08:00 AM	5	84	95	95	65	5	118	65	372
08:15 AM	6	88	100	100	50	7	98	50	349
08:30 AM	13	72	84	84	44	1	101	44	315
08:45 AM	6	59	76	76	66	6	65	66	278
Total	30	303	355	355	225	19	382	225	1314
Grand Total	53	666	700	700	424	37	809	424	2689
Approch %	7.4	92.6	95	95	34.4	5	65.6	34.4	
Total %	2	24.8	26	26	15.8	1.4	30.1	15.8	

**Accurate Counts**  
978-664-2565

File Name : 83840002  
Site Code : 83840002  
Start Date : 9/25/2019  
Page No : 9

N/S Street : Route 49  
E/W Street : Route 20  
City/State : Charlton, MA  
Weather : Clear

Start Time	Route 49						Route 20			Int. Total
	From North	Right	From East	Thru	Right	From West	From West	Thru		
07:00 AM	0	4	6	0	0	8	8	8	26	
07:15 AM	0	5	3	0	0	8	8	5	21	
07:30 AM	3	4	6	0	0	7	7	5	25	
07:45 AM	1	3	9	1	1	3	3	8	25	
Total	4	16	24	1	1	26	26	26	97	
08:00 AM	2	4	6	0	0	9	9	6	27	
08:15 AM	0	13	4	0	0	3	3	5	25	
08:30 AM	1	7	4	1	1	4	4	3	20	
08:45 AM	1	10	7	2	2	0	0	4	24	
Total	4	34	21	3	3	16	16	18	96	
Grand Total	8	50	45	4	4	42	42	44	193	
Approch %	13.8	86.2	91.8	8.2	8.2	48.8	48.8	51.2		
Total %	4.1	25.9	23.3	2.1	2.1	21.8	21.8	22.8		



**Accurate Counts**  
978-664-2565

N/S Street : Route 49  
E/W Street: Route 20  
City/State : Charlton, MA  
Weather : Clear

File Name : 83840002  
Site Code : 83840002  
Start Date : 9/25/2019  
Page No : 14

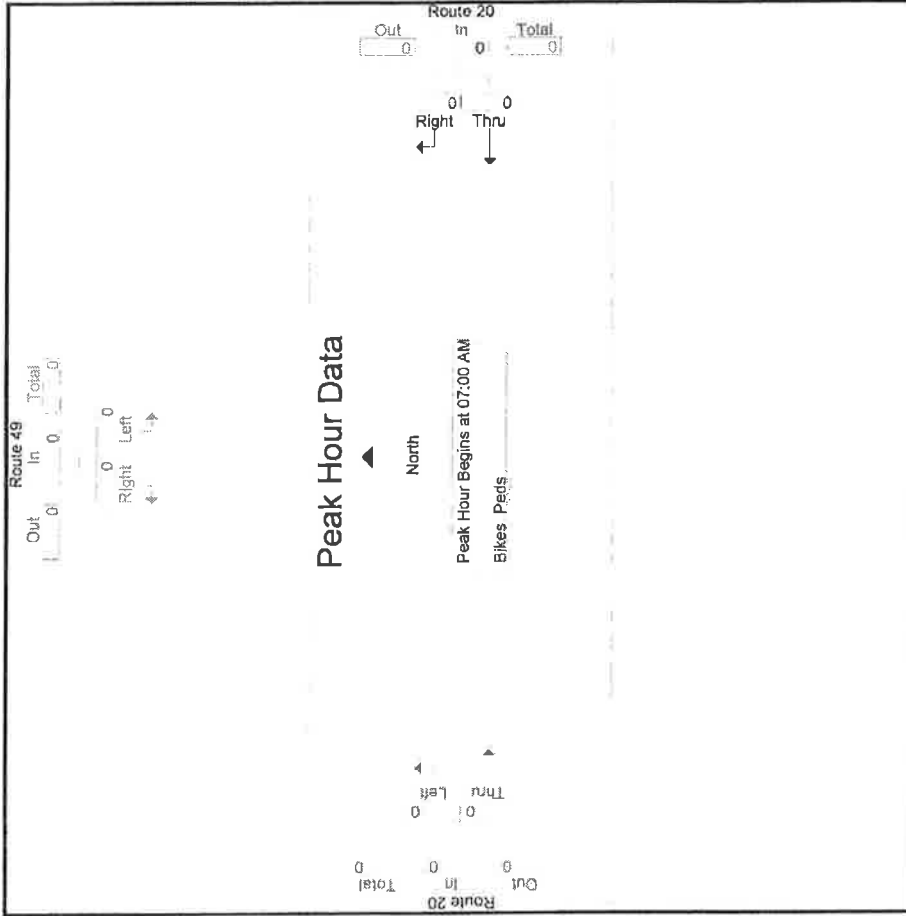
Start Time	Route 49 From North		Route 20 From East		Route 20 From West		Int. Total
	Left	Right	Thru	Right	Thru	Left	
07:00 AM	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000

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

**Accurate Counts**  
978-664-2565

File Name : 83840002  
Site Code : 83840002  
Start Date : 9/25/2019  
Page No : 15

N/S Street : Route 49  
E/W Street : Route 20  
City/State : Chariton, MA  
Weather : Clear



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

Peak Hour for Each Approach Begins at:

	07:00 AM	07:00 AM	07:00 AM
+0 mins.	0	0	0
+15 mins.	0	0	0
+30 mins.	0	0	0
+45 mins.	0	0	0
Total Volume	0	0	0

# Accurate Counts

978-664-2565

N/S Street : Route 49  
 E/W Street: Route 20  
 City/State : Charlton, MA  
 Weather : Clear

File Name : 83840002  
 Site Code : 83840002  
 Start Date : 9/25/2019  
 Page No : 1

Start Time	Route 49 From North		Route 20 From East		Route 20 From West		Thru	Int. Total
	Left	Right	Thru	Right	Left	Right		
03:00 PM	6	56	148	12	87	115	424	
03:15 PM	8	66	161	13	89	133	470	
03:30 PM	12	68	177	10	80	138	485	
03:45 PM	11	104	181	15	94	142	547	
Total	37	294	667	50	350	528	1926	
04:00 PM	9	82	186	10	86	135	508	
04:15 PM	5	86	146	9	109	117	472	
04:30 PM	7	86	172	6	116	129	516	
04:45 PM	7	63	158	11	102	118	459	
Total	28	317	662	36	413	499	1955	
05:00 PM	12	53	180	11	106	149	511	
05:15 PM	7	56	151	11	106	123	454	
05:30 PM	5	53	135	7	64	132	396	
05:45 PM	3	52	151	10	88	98	402	
Total	27	214	617	39	364	502	1763	
Grand Total	92	825	1946	125	1127	1529	5644	
Approch %	10	90	94	6	42.4	57.6		
Total %	1.6	14.6	34.5	2.2	20	27.1		
Cars	84	790	1902	119	1106	1497	5498	
% Cars	91.3	95.8	97.7	95.2	98.1	97.9	97.4	
Trucks	8	35	44	6	21	32	146	
% Trucks	8.7	4.2	2.3	4.8	1.9	2.1	2.6	

# Accurate Counts

978-664-2565

N/S Street : Route 49  
 E/W Street: Route 20  
 City/State : Charlton, MA  
 Weather : Clear

File Name : 83840002  
 Site Code : 83840002  
 Start Date : 9/25/2019  
 Page No : 2

Start Time	Route 49 From North			Route 20 From East			Route 20 From West			Int. Total		
	Left	Right	Thru	Right	Thru	Left	Right	Thru	Left		Thru	Left
03:45 PM	11	104	181	15	115	181	15	115	94	142	236	547
04:00 PM	9	82	186	10	91	186	10	91	86	135	221	508
04:15 PM	5	86	146	9	91	146	9	91	109	117	226	472
04:30 PM	7	86	172	6	93	172	6	93	116	129	245	516
Total Volume	32	358	685	40	390	685	40	390	405	523	928	2043
% App. Total	8.2	91.8	94.5	5.5	92.5	94.5	5.5	92.5	43.6	56.4	94.7	934
PHF	.727	.861	.921	.667	.848	.921	.667	.848	.873	.921	.947	.934
Cars	30	340	667	39	370	667	39	370	400	516	916	1992
% Cars	93.8	95.0	97.4	97.5	94.9	97.4	97.5	94.9	98.8	98.7	98.7	97.5
Trucks	2	18	18	1	20	18	1	20	5	7	12	51
% Trucks	6.3	5.0	2.6	2.5	5.1	2.6	2.5	5.1	1.2	1.3	1.3	2.5

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Entire Intersection Begins at 03:45 PM

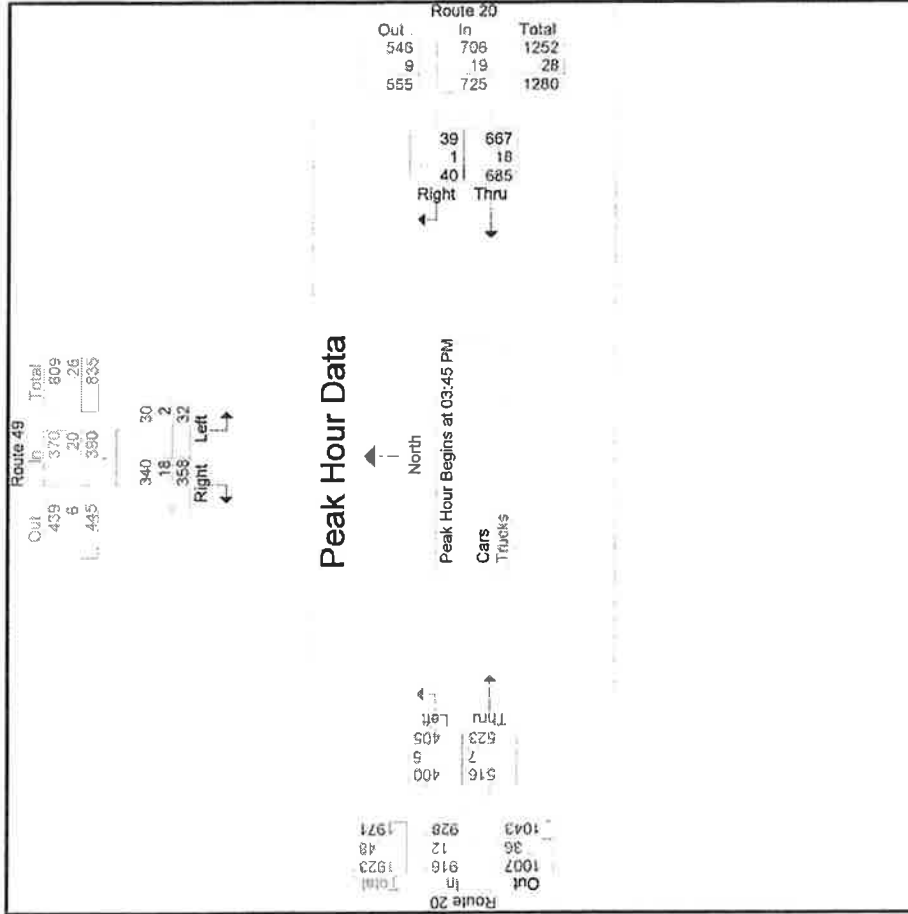


# Accurate Counts

978-664-2565

File Name : 83840002  
 Site Code : 83840002  
 Start Date : 9/25/2019  
 Page No : 3

N/S Street : Route 49  
 E/W Street : Route 20  
 City/State : Charlton, MA  
 Weather : Clear



Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	03:15 PM	03:45 PM	04:15 PM	04:30 PM
+0 mins.	115	161	13	116
+15 mins.	91	177	10	118
+30 mins.	91	181	15	149
+45 mins.	93	186	10	123
Total Volume	390	705	48	519
% App. Total	8.2	93.6	6.4	54.7
PHF	.848	.948	.800	.871

# Accurate Counts

978-664-2565

N/S Street : Route 49  
 E/W Street : Route 20  
 City/State : Charlton, MA  
 Weather : Clear

File Name : 83840002  
 Site Code : 83840002  
 Start Date : 9/29/2019  
 Page No : 5

Start Time	Groups Printed - Cars						Int. Total
	Route 49 From North Left	Right	Route 20 From East Thru	Route 20 From West Left	Thru	Int. Total	
03:00 PM	5	53	146	84	107	406	
03:15 PM	7	64	156	86	129	454	
03:30 PM	12	63	174	78	133	468	
03:45 PM	10	99	177	92	140	533	
Total	34	279	653	340	509	1861	
04:00 PM	9	77	180	85	135	496	
04:15 PM	4	81	143	107	115	459	
04:30 PM	7	83	167	116	126	504	
04:45 PM	5	61	153	101	117	447	
Total	25	302	643	409	493	1906	
05:00 PM	12	53	177	106	145	504	
05:15 PM	7	55	148	102	122	445	
05:30 PM	3	51	134	62	130	387	
05:45 PM	3	50	147	87	98	395	
Total	25	209	606	357	495	1731	
Grand Total	84	790	1902	1106	1497	5498	
Approch %	9.6	90.4	94.1	42.5	57.5		
Total %	1.5	14.4	34.6	20.1	27.2		

**Accurate Counts**  
978-664-2565

N/S Street : Route 49  
E/W Street: Route 20  
City/State : Charlton, MA  
Weather : Clear

File Name : 83840002  
Site Code : 83840002  
Start Date : 9/25/2019  
Page No : 9

Start Time	Route 49 From North		Route 20 From East		Route 20 From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
03:00 PM	1	3	2	1	3	8	18
03:15 PM	1	2	5	1	3	4	16
03:30 PM	0	5	3	2	2	5	17
03:45 PM	1	5	4	0	2	2	14
Total	3	15	14	4	10	19	65
04:00 PM	0	5	6	0	1	0	12
04:15 PM	1	5	3	0	2	2	13
04:30 PM	0	3	5	1	0	3	12
04:45 PM	2	2	5	1	1	1	12
Total	3	15	19	2	4	6	49
05:00 PM	0	0	3	0	0	4	7
05:15 PM	0	1	3	0	4	1	9
05:30 PM	2	2	1	0	2	2	9
05:45 PM	0	2	4	0	1	0	7
Total	2	5	11	0	7	7	32
Grand Total	8	35	44	6	21	32	146
Apprch %	18.6	81.4	88	12	39.6	60.4	
Total %	5.5	24	30.1	4.1	14.4	21.9	

# Accurate Counts

978-664-2565

N/S Street : Route 49  
 EW Street: Route 20  
 City/State : Charlton, MA  
 Weather : Clear

File Name : 83840002  
 Site Code : 83840002  
 Start Date : 9/25/2019  
 Page No : 13

Start Time	Groups Printed- Bikes Peds														
	Route 49			Route 20			Route 20			Route 20	Route 20				
	Left	From North	From Right	Peds	Thru	From East	From Right	Peds	Left	Thru	From West	Peds	Exclu. Total	Inclu. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
Grand Total	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
Approxn %	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0
Total %	0	0	0	0	0	0	0	0	100	0	0	0	0	100	100

**Accurate Counts**  
978-664-2565

N/S Street : Route 49  
E/W Street: Route 20  
City/State : Charlton, MA  
Weather : Clear

File Name : 83840002  
Site Code : 83840002  
Start Date : 9/25/2019  
Page No : 14

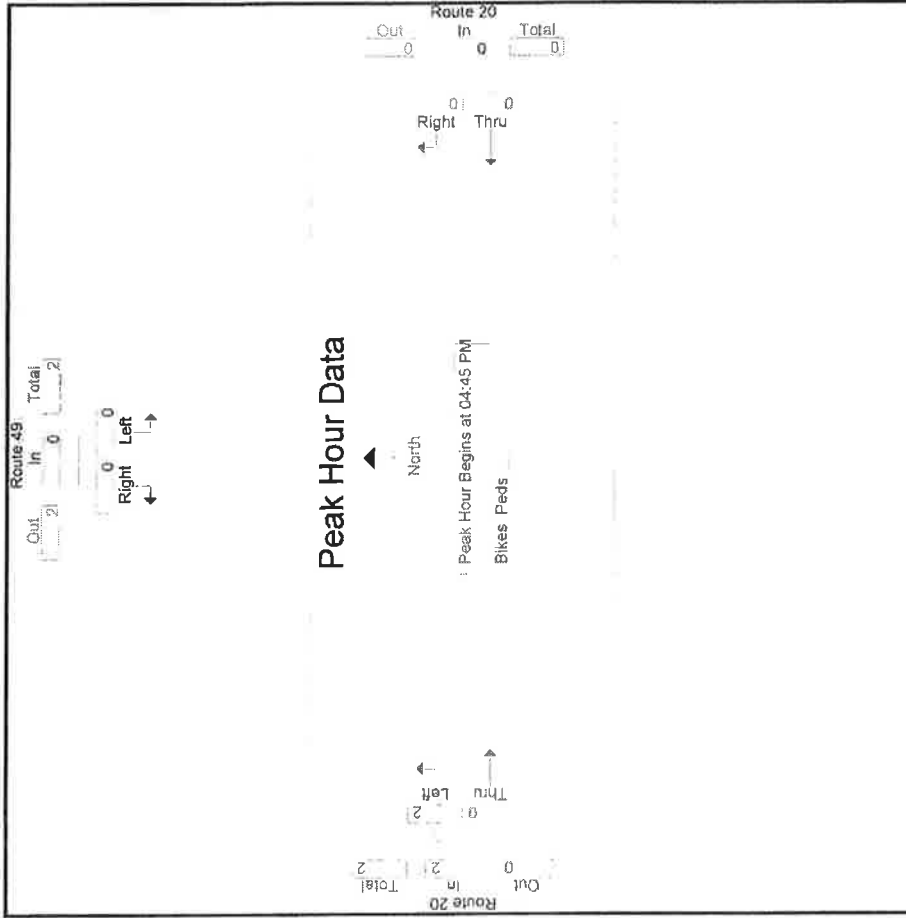
Start Time	Route 49 From North			Route 20 From East			Route 20 From West			Int. Total	
	Left	Right	Thru	App. Total	Right	Thru	App. Total	Left	Thru		App. Total
04:45 PM	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	2	0	2	2
Total Volume	0	0	0	0	0	0	0	2	0	2	2
% App. Total	0	0	0	.000	0	0	.000	.250	0	.250	.250
PHF	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 04:45 PM

**Accurate Counts**  
978-664-2565

File Name : 83840002  
Site Code : 83840002  
Start Date : 9/25/2019  
Page No : 15

N/S Street : Route 49  
E/W Street : Route 20  
City/State : Charlton, MA  
Weather : Clear



Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	03:00 PM	03:00 PM	04:45 PM
+0 mins.	0	0	0
+15 mins.	0	0	0
+30 mins.	0	0	0
+45 mins.	0	0	2
Total Volume	0	0	2
% App. Total	0	0	100
PHF	.000	.000	.250

SEASONAL ADJUSTMENT DATA

---

# Massachusetts Highway Department

## 3929: Monthly Hourly Volume for September 2015

Location ID: 3929		Seasonal Factor Group: U1-Worcester																TOTAL									
County: Worcester		Daily Factor Group:																									
Functional Class: 1		Axle Factor Group: U1-Worcester																									
Location: WILBUR CROSS HIGHWAY		Growth Factor Group:																									
		0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	
1	895	571	511	570	589	802	1294	2007	2033	2521	2459	3208	3201	3174	3428	3440	3498	3133	2939	2590	2160	1974	1612	1242	1136	51305	
2	660	472	514	648	842	1348	2093	2585	2660	2898	3079	3430	3509	3786	3868	3934	3561	3126	2968	2709	2280	2116	1727	1260	895	50729	
3	629	558	489	662	916	1307	2089	2590	2845	3446	4112	4652	4702	4632	5062	4973	4254	5037	5209	4401	4438	3469	2469	1679	1651	58772	
4	1233	720	661	622	719	1063	1627	2889	4131	5311	5925	5098	5471	5423	4855	4097	3900	3576	2994	2647	2504	2045	1604	1135	69878	75558	
5	1088	676	567	533	719	1063	1627	2889	4131	5311	5925	5098	5471	5423	4855	4097	3900	3576	2994	2647	2504	2045	1604	1135	69878	75558	
6	637	451	318	267	257	436	740	1305	2151	3330	4350	4854	4882	4601	4221	4142	4201	4095	3888	3575	3360	2754	2119	1384	62318	62318	
7	847	556	361	350	337	425	744	1385	2150	3483	4489	5086	5958	5512	5745	5518	5199	5339	4883	4031	3750	3092	2280	1413	72933	72933	
8	750	609	500	559	881	1554	2423	2762	2646	3023	3519	3819	3714	3598	3680	3593	3179	3026	2548	1950	1625	1415	1145	994	53512	53512	
9																											
10	748	534	532	629	881	1299	1966	2407	2456	2709	2747	2886	3207	3366	3734	3837	3141	2817	3193	2703	2095	1667	1508	1097	52159	52159	
11	945	898	692	629	798	1173	1879	2291	2387	2656	3562	4203	4561	4588	4787	4711	4438	4245	4130	4226	3300	2350	1918	1484	66831	66831	
12	861	580	490	472	529	806	1359	2283	3407	4028	5089	5439	5252	4621	4357	4310	4198	3603	2897	2548	2125	1771	1344	1056	63425	63425	
13	902	644	476	277	253	378	723	1244	1969	3081	4219	5005	5505	5239	5629	5644	5637	5390	4308	3644	2922	2650	1604	949	68272	68272	
14	698	535	464	531	728	1447	2281	2689	2656	2872	3338	3481	3519	3459	3618	3636	3308	3066	2704	2007	1756	1448	1088	842	52171	52171	
15	592	501	485	539	805	1307	2094	2437	2363	2590	2855	2926	2861	2944	3158	3341	3002	2853	2483	2131	1676	1464	1104	854	47365	47365	
16	714	502	492	605	850	1379	1968	2481	2271	2464	2818	2653	2798	3049	3226	3264	3078	2620	2425	1862	1699	1344	1045	884	46491	46491	
17	593	495	483	631	798	1344	1980	2394	2286	2581	3057	2982	3071	3269	3509	3574	3324	3033	2800	2372	2378	1730	1320	962	50966	50966	
18	773	594	604	659	924	1240	1920	2349	2441	2879	3662	4240	4233	4614	5002	4576	3978	4173	3951	3698	3893	2805	1937	1485	66680	66680	
19	860	572	484	503	508	765	1408	2328	3269	4165	4662	4873	4536	4609	4117	3885	3703	3463	2821	2423	2289	1959	1470	1004	60676	60676	
20	631	381	300	270	240	429	716	1279	2129	3209	4346	4957	5075	4877	5326	5569	5432	5470	5244	4171	3350	2647	1972	1148	69168	69168	
21	753	521	443	518	817	1464	2307	2617	2420	2839	3241	3246	3190	2972	3242	3204	3020	2729	2308	1816	1609	1380	1043	797	48496	48496	
22	630	501	480	579	785	1307	2003	2340	2305	2414	2454	2687	2665	2817	2981	3179	3062	2731	2303	1645	1577	1329	953	869	44596	44596	
23	720	486	560	591	769	1309	1952	2376	2402	2631	2784	2785	2845	3036	3370	3393	3141	2882	2622	1990	1726	1514	1230	881	47995	47995	
24	772	544	510	590	814	1363	2096	2551	2342	2501	3263	3281	3253	3578	3709	3677	3503	3153	2861	2481	2345	1735	1505	1249	53656	53656	
25	801	602	537	603	831	1288	1917	2345	2477	2965	3992	4424	4470	4760	5297	5081	4703	4343	4572	4336	3848	3062	1916	1578	70748	70748	
26	1005	698	478	464	534	806	1389	2512	3622	4778	5432	5131	4963	4923	4575	4248	3999	3815	3241	2810	2644	2136	1675	1120	66998	66998	
27																											
28	1010	722	469	546	784	1467	2276	2564	2562	2678	2783	4064	3645	3199	3226	3414	3132	2811	2297	1945	1625	1306	983	818	50326	50326	
29	583	529	497	589	766	1323	2022	2349	2271	2336	2554	2736	2567	2735	2865	2980	2810	2727	2265	1712	1512	1310	1062	728	43808	43808	
30	586	502	448	520	720	821	1587	1838	2614	2166	2492	2641	2555	2913	2952	3219	3190	2770	2327	1840	1558	1254	1082	784	43379	43379	

Average Monthly = 57471.82  
 Yearly Average = 55467  
 Adjustment factor = 0.97



MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Sturbridge                      COUNT DATE : May-20

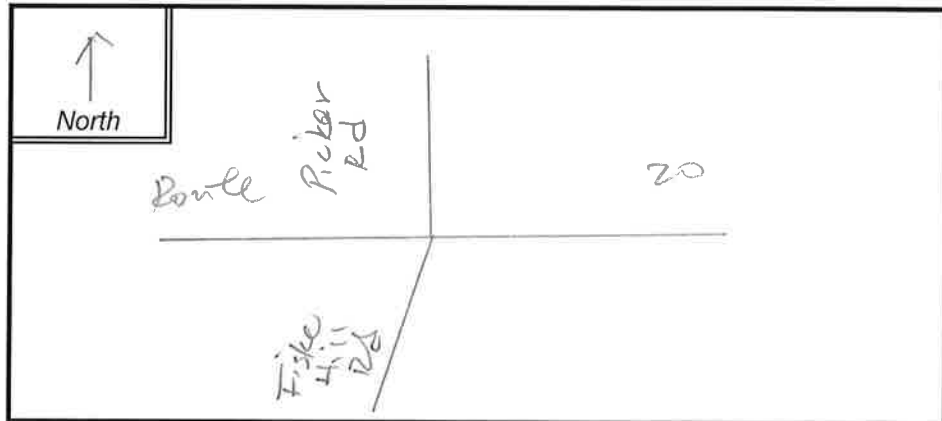
DISTRICT : 3                      UNSIGNALIZED :                       SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Route 20

MINOR STREET(S) : Picker Road/Fiske Hill Road

**INTERSECTION  
 DIAGRAM**  
 (Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (PM) :	852	1,053	93	50		2,048

" K " FACTOR :                       INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

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

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

Comments : Below MassDOT District 3 crash rate  
 Project Title & Date : Proposed Cold Storage Warehouse- May 2020

route 20,charlton,ma



Show search results for route 20,charlton,ma

Input fields for search filters

CrashClusters

Top 200 Intersection Cluster 2014-2016

HSIP Cluster 2014-2016

2007-2016 HSIP Bicycle Cluster

2007-2016 HSIP Pedestrian Cluster

MAS

STUR

90

0.2mi

-72 018 42 125 Degrees

Top Crash Locations

LIBRARY LN

WALKER POND RD

WELLS PARK RD

WINDLAWN DR

PICKER RD

SHAW-WOOD RD

FISKE HALL RD

RECAUORY RD

LANE

ORANGE RD

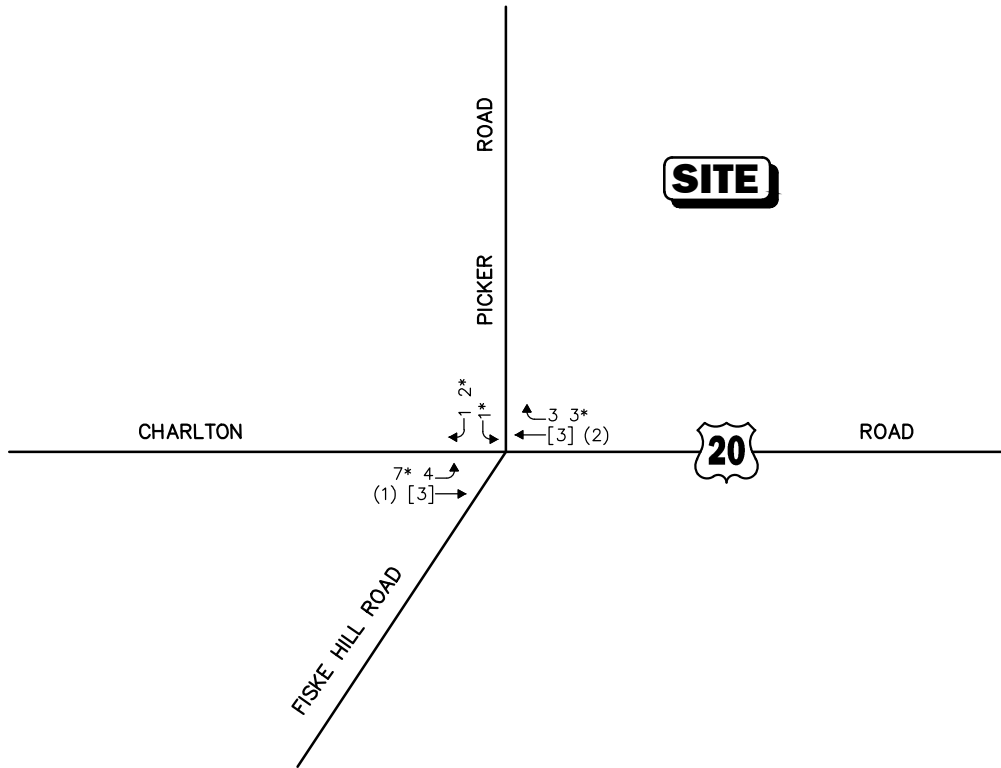
GENERAL BACKGROUND TRAFFIC GROWTH

**General Background Traffic Growth**

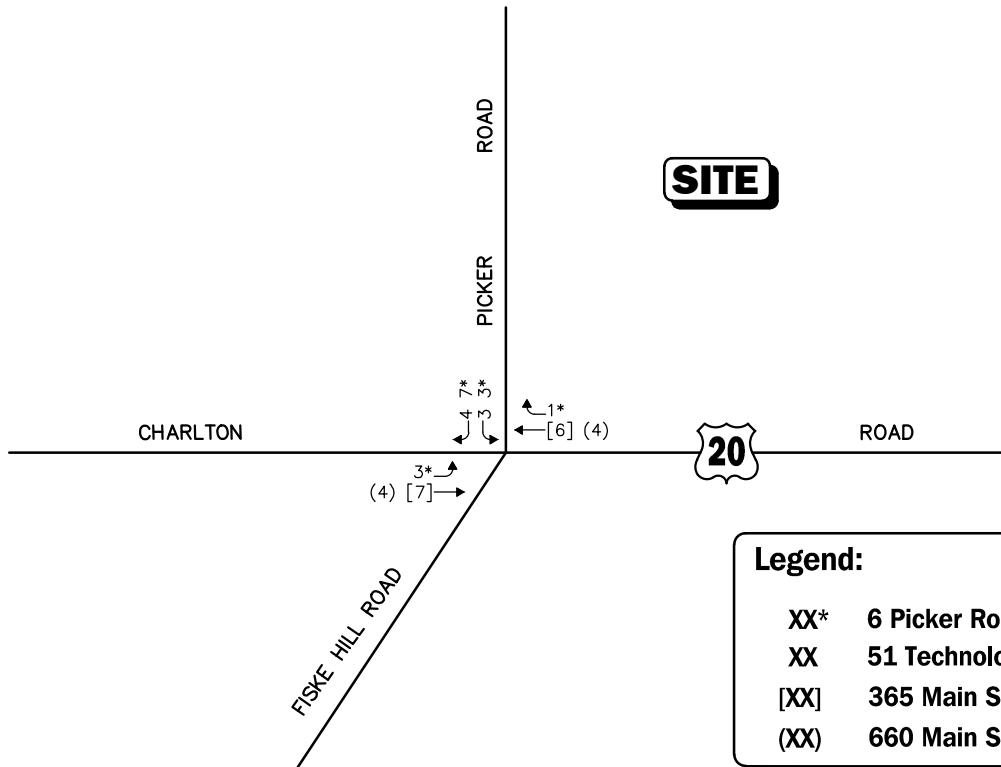
STA.	CITY/TOWN	ROUTE/STREET	LOCATION	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average Annual Growth Rate
3929	Sturbridge	I-84	South of Route 20	55,400	53,645	51,486	52,177	52,522	55,467	55,862	56,868	57,167	57,566	0.86%
														0.86%

BACKGROUND DEVELOPMENT TRAFFIC-VOLUME NETWORKS

WEEKDAY MIDDAY PEAK HOUR (7:45 - 8:45 AM)



WEEKDAY EVENING PEAK HOUR (3:30 - 4:30 PM)



**Legend:**

- XX\* 6 Picker Road
- XX 51 Technology Park Road
- [XX] 365 Main Street
- (XX) 660 Main Street

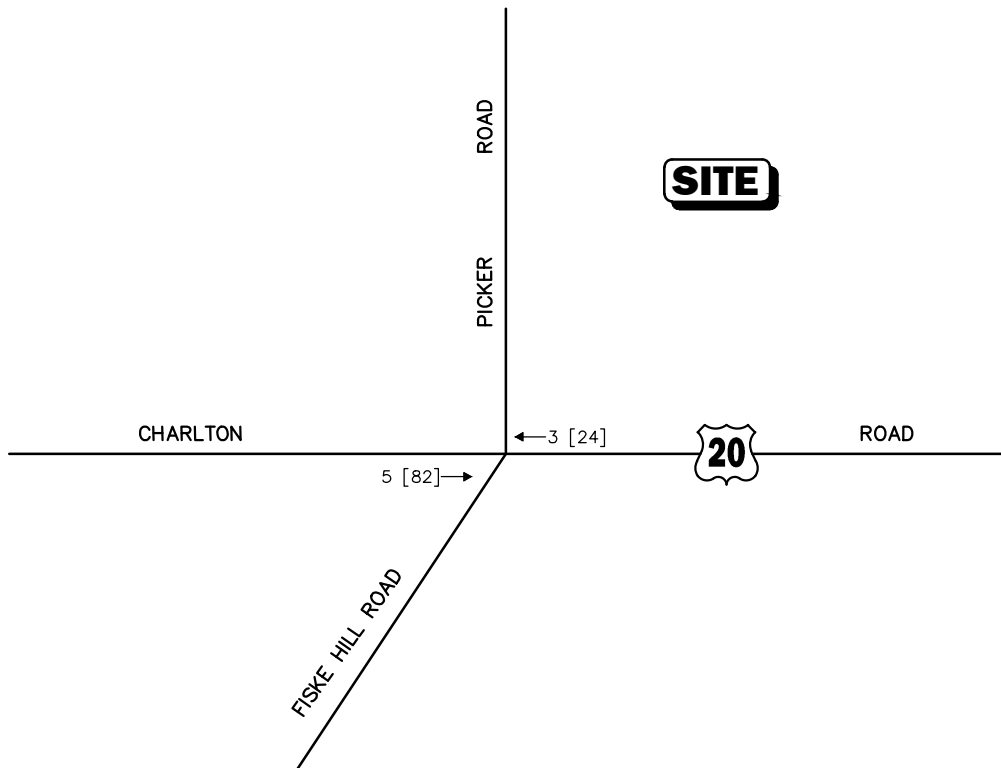
Not To Scale

Figure A-1

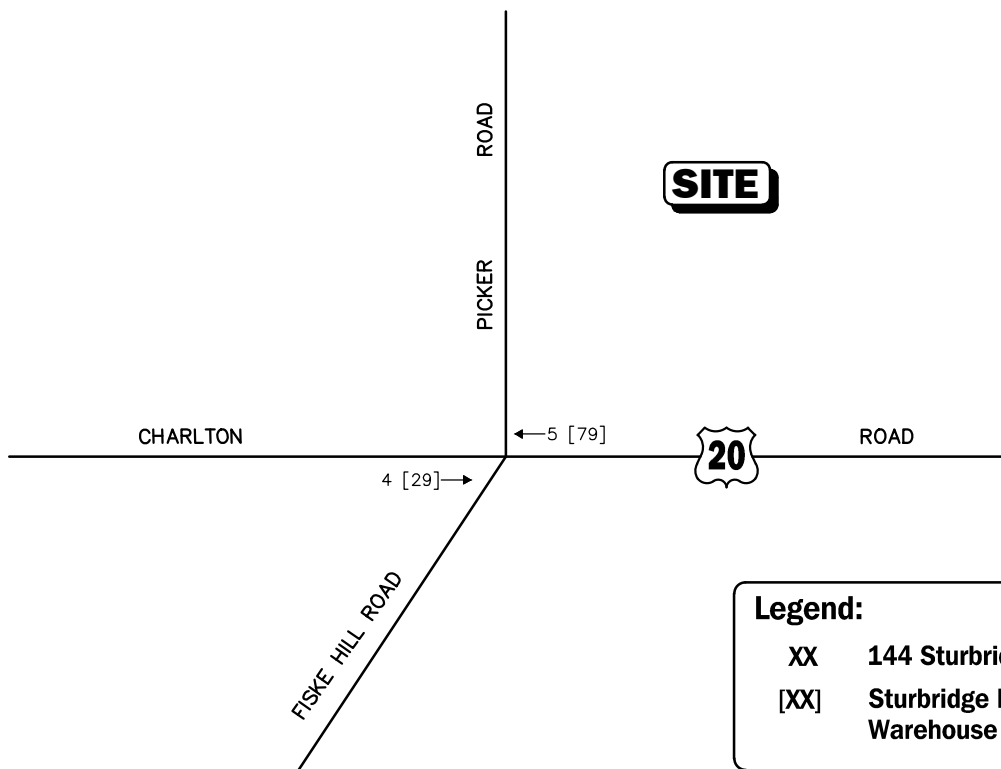


Sturbridge, Massachusetts  
Background Developments

WEEKDAY MIDDAY PEAK HOUR (7:45 - 8:45 AM)



WEEKDAY EVENING PEAK HOUR (3:30 - 4:30 PM)



**Legend:**

- XX 144 Sturbridge Road
- [XX] Sturbridge Road Proposed Warehouse

Not To Scale

Figure A-2



Charlton, Massachusetts Background Developments



**CAPACITY ANALYSIS**

---


















Route 20/Fiske Hill Road and Picker Road  
Picker Road/Technology Park Road

Route 20/Fiske Hill Road and Picker Road

---

2020 Existing Wkdy AM Peak  
 1: Fiske Hill Road/Picker Road & Route 20

07/20/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	668	4	58	756	20	0	7	42	6	1	5
Future Volume (vph)	11	668	4	58	756	20	0	7	42	6	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	12	12
Storage Length (ft)	0		0	240		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.996			0.885				0.946
Flt Protected		0.999		0.950								0.976
Satd. Flow (prot)	0	3282	0	1770	3393	0	0	1836	0	0	1617	0
Flt Permitted		0.999		0.950								0.976
Satd. Flow (perm)	0	3282	0	1770	3393	0	0	1836	0	0	1617	0
Link Speed (mph)		30			30			30				30
Link Distance (ft)		823			845			358				407
Travel Time (s)		18.7			19.2			8.1				9.3
Adj. Flow (vph)	13	795	5	65	849	22	0	9	51	10	2	8
Lane Group Flow (vph)	0	813	0	65	871	0	0	60	0	0	20	0
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type: Other

Control Type: Unsignalized

2020 Existing Wkdy AM Peak  
1: Fiske Hill Road/Picker Road & Route 20

07/20/2020

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔			↗	↕↔			↕			↔↔	
Traffic Vol, veh/h	11	668	4	58	756	20	0	7	42	6	1	5
Future Vol, veh/h	11	668	4	58	756	20	0	7	42	6	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	240	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	89	89	89	82	82	82	60	60	60
Heavy Vehicles, %	0	10	0	2	6	5	0	14	2	17	0	0
Mvmt Flow	13	795	5	65	849	22	0	9	51	10	2	8


















Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	871	0	0	800	0	0	-	1825	400	1418	1816	436
Stage 1	-	-	-	-	-	-	-	824	-	990	990	-
Stage 2	-	-	-	-	-	-	-	1001	-	428	826	-
Critical Hdwy	4.1	-	-	4.14	-	-	-	6.78	6.94	7.84	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.78	-	6.84	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.78	-	6.84	5.5	-
Follow-up Hdwy	2.2	-	-	2.22	-	-	-	4.14	3.32	3.67	4	3.3
Pot Cap-1 Maneuver	783	-	-	819	-	-	0	67	600	85	79	574
Stage 1	-	-	-	-	-	-	0	358	-	237	327	-
Stage 2	-	-	-	-	-	-	0	293	-	537	389	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	783	-	-	819	-	-	-	60	600	64	71	574
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	60	-	64	71	-
Stage 1	-	-	-	-	-	-	-	347	-	230	301	-
Stage 2	-	-	-	-	-	-	-	270	-	465	377	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.7	22.7	48.2
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	263	783	-	-	819	-	-	103
HCM Lane V/C Ratio	0.227	0.017	-	-	0.08	-	-	0.194
HCM Control Delay (s)	22.7	9.7	0.1	-	9.8	-	-	48.2
HCM Lane LOS	C	A	A	-	A	-	-	E
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0.3	-	-	0.7

2020 Existing Wkdy PM Peak  
 1: Fiske Hill Road/Picker Road & Route 20

07/20/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	832	13	84	965	4	0	4	87	18	12	20
Future Volume (vph)	7	832	13	84	965	4	0	4	87	18	12	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	12	12
Storage Length (ft)	0		0	240		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		823			845			358			327	
Travel Time (s)		18.7			19.2			8.1			7.4	
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.86	0.86	0.86	0.50	0.50	0.50
Heavy Vehicles (%)	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	926	0	95	1102	0	0	106	0	0	100	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other  
 Control Type: Unsignalized

2020 Existing Wkdy PM Peak  
1: Fiske Hill Road/Picker Road & Route 20

07/20/2020

**Intersection**

Int Delay, s/veh 23

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↔	↔↔			↔			↔	
Traffic Vol, veh/h	7	832	13	84	965	4	0	4	87	18	12	20
Future Vol, veh/h	7	832	13	84	965	4	0	4	87	18	12	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	240	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	88	88	88	86	86	86	50	50	50
Heavy Vehicles, %	0	2	0	0	3	0	0	0	0	0	0	5
Mvmt Flow	8	904	14	95	1097	5	0	5	101	36	24	40

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	1102	0	0	918	0	0	-	2219	459	1761	2224	551
Stage 1	-	-	-	-	-	-	-	927	-	1290	1290	-
Stage 2	-	-	-	-	-	-	-	1292	-	471	934	-
Critical Hdwy	4.1	-	-	4.1	-	-	-	6.5	6.9	7.5	6.5	7
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	-	4	3.3	3.5	4	3.35
Pot Cap-1 Maneuver	641	-	-	752	-	-	0	44	554	55	44	470
Stage 1	-	-	-	-	-	-	0	350	-	176	236	-
Stage 2	-	-	-	-	-	-	0	236	-	548	347	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	641	-	-	752	-	-	-	37	554	36	37	470
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	37	-	36	37	-
Stage 1	-	-	-	-	-	-	-	341	-	171	206	-
Stage 2	-	-	-	-	-	-	-	206	-	430	338	-


















Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.8	20.1	\$ 503.3
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	343	641	-	-	752	-	-	58
HCM Lane V/C Ratio	0.308	0.012	-	-	0.127	-	-	1.724
HCM Control Delay (s)	20.1	10.7	0.1	-	10.5	-	-	\$ 503.3
HCM Lane LOS	C	B	A	-	B	-	-	F
HCM 95th %tile Q(veh)	1.3	0	-	-	0.4	-	-	9.3

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

2027 No-Build Wkdy AM Peak  
 1: Fiske Hill Road/Picker Road & Route 20

07/20/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	807	4	62	843	27	0	8	45	7	1	8
Future Volume (vph)	23	807	4	62	843	27	0	8	45	7	1	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	12	12
Storage Length (ft)	0		0	240		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.995			0.886				0.935
Flt Protected		0.999		0.950								0.978
Satd. Flow (prot)	0	3285	0	1770	3390	0	0	1837	0	0	1615	0
Flt Permitted		0.999		0.950								0.978
Satd. Flow (perm)	0	3285	0	1770	3390	0	0	1837	0	0	1615	0
Link Speed (mph)		30			30			30				30
Link Distance (ft)		823			845			358				307
Travel Time (s)		18.7			19.2			8.1				7.0
Adj. Flow (vph)	27	961	5	70	947	30	0	10	55	12	2	13
Lane Group Flow (vph)	0	993	0	70	977	0	0	65	0	0	27	0
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type: Other  
 Control Type: Unsignalized

2027 No-Build Wkdy AM Peak  
1: Fiske Hill Road/Picker Road & Route 20

07/20/2020

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔			↔	↔↔			↔		↔↔		
Traffic Vol, veh/h	23	807	4	62	843	27	0	8	45	7	1	8
Future Vol, veh/h	23	807	4	62	843	27	0	8	45	7	1	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	240	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	89	89	89	82	82	82	60	60	60
Heavy Vehicles, %	0	10	0	2	6	5	0	14	2	17	0	0
Mvmt Flow	27	961	5	70	947	30	0	10	55	12	2	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	977	0	0	966	0	0	-	2135	483	1642	2122	489
Stage 1	-	-	-	-	-	-	-	1018	-	1102	1102	-
Stage 2	-	-	-	-	-	-	-	1117	-	540	1020	-
Critical Hdwy	4.1	-	-	4.14	-	-	-	6.78	6.94	7.84	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.78	-	6.84	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.78	-	6.84	5.5	-
Follow-up Hdwy	2.2	-	-	2.22	-	-	-	4.14	3.32	3.67	4	3.3
Pot Cap-1 Maneuver	714	-	-	709	-	-	0	42	530	57	51	530
Stage 1	-	-	-	-	-	-	0	288	-	201	290	-
Stage 2	-	-	-	-	-	-	0	257	-	457	317	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	714	-	-	709	-	-	-	35	530	35	42	530
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	35	-	35	42	-
Stage 1	-	-	-	-	-	-	-	264	-	185	261	-
Stage 2	-	-	-	-	-	-	-	232	-	362	291	-


















Approach	EB		WB		NB		SB	
HCM Control Delay, s	0.7		0.7		38.9		90.5	
HCM LOS	E		E		E		F	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	169	714	-	-	709	-	-	67
HCM Lane V/C Ratio	0.382	0.038	-	-	0.098	-	-	0.398
HCM Control Delay (s)	38.9	10.2	0.4	-	10.6	-	-	90.5
HCM Lane LOS	E	B	A	-	B	-	-	F
HCM 95th %tile Q(veh)	1.6	0.1	-	-	0.3	-	-	1.5



2027 No-Build Wkdy PM Peak  
 1: Fiske Hill Road/Picker Road & Route 20

07/20/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	936	14	90	1129	5	0	4	93	25	13	32
Future Volume (vph)	12	936	14	90	1129	5	0	4	93	25	13	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	12	12
Storage Length (ft)	0		0	240		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		823			845			358			387	
Travel Time (s)		18.7			19.2			8.1			8.8	
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.86	0.86	0.86	0.50	0.50	0.50
Heavy Vehicles (%)	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1045	0	102	1289	0	0	113	0	0	140	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

2027 No-Build Wkdy PM Peak  
1: Fiske Hill Road/Picker Road & Route 20

07/20/2020

Intersection

Int Delay, s/veh 81.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕↕			↙	↕↕			↕		↕↕		
Traffic Vol, veh/h	12	936	14	90	1129	5	0	4	93	25	13	32
Future Vol, veh/h	12	936	14	90	1129	5	0	4	93	25	13	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	240	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	88	88	88	86	86	86	50	50	50
Heavy Vehicles, %	0	2	0	0	3	0	0	0	0	0	0	5
Mvmt Flow	13	1017	15	102	1283	6	0	5	108	50	26	64

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	1289	0	0	1032	0	0	-	2544	516	2027	2548	645
Stage 1	-	-	-	-	-	-	-	1051	-	1490	1490	-
Stage 2	-	-	-	-	-	-	-	1493	-	537	1058	-
Critical Hdwy	4.1	-	-	4.1	-	-	-	6.5	6.9	7.5	6.5	7
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	-	4	3.3	3.5	4	3.35
Pot Cap-1 Maneuver	545	-	-	681	-	-	0	27	509	~ 35	27	408
Stage 1	-	-	-	-	-	-	0	306	-	132	189	-
Stage 2	-	-	-	-	-	-	0	188	-	501	304	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	545	-	-	681	-	-	-	22	509	~ 20	~ 22	408
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	22	-	~ 20	~ 22	-
Stage 1	-	-	-	-	-	-	-	289	-	125	161	-
Stage 2	-	-	-	-	-	-	-	160	-	366	287	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.8	28.1	\$ 1528
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	266	545	-	-	681	-	-	36
HCM Lane V/C Ratio	0.424	0.024	-	-	0.15	-	-	3.889
HCM Control Delay (s)	28.1	11.8	0.3	-	11.2	-	-	-\$ 1528
HCM Lane LOS	D	B	A	-	B	-	-	F
HCM 95th %tile Q(veh)	2	0.1	-	-	0.5	-	-	16.2

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

2027 Build Wkdy AM Peak  
 1: Fiske Hill Road/Picker Road & Route 20

07/22/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↔	↔↔			↔			↔↔	
Traffic Volume (vph)	24	807	4	62	843	27	0	8	45	7	1	8
Future Volume (vph)	24	807	4	62	843	27	0	8	45	7	1	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	12	12
Storage Length (ft)	0		0	240		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.995			0.886				0.935
Flt Protected		0.999		0.950								0.978
Satd. Flow (prot)	0	3285	0	1770	3390	0	0	1837	0	0	1615	0
Flt Permitted		0.999		0.950								0.978
Satd. Flow (perm)	0	3285	0	1770	3390	0	0	1837	0	0	1615	0
Link Speed (mph)		30			30			30				30
Link Distance (ft)		823			845			358				537
Travel Time (s)		18.7			19.2			8.1				12.2
Adj. Flow (vph)	29	961	5	70	947	30	0	10	55	12	2	13
Lane Group Flow (vph)	0	995	0	70	977	0	0	65	0	0	27	0
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type: Other

Control Type: Unsignalized

2027 Build Wkdy AM Peak  
 1: Fiske Hill Road/Picker Road & Route 20

07/22/2020

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↔	↔↔			↔			↔↔	
Traffic Vol, veh/h	24	807	4	62	843	27	0	8	45	7	1	8
Future Vol, veh/h	24	807	4	62	843	27	0	8	45	7	1	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	240	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	89	89	89	82	82	82	60	60	60
Heavy Vehicles, %	0	10	0	2	6	5	0	14	2	17	0	0
Mvmt Flow	29	961	5	70	947	30	0	10	55	12	2	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	977	0	0	966	0	0	-	2139	483	1646	2126	489
Stage 1	-	-	-	-	-	-	-	1022	-	1102	1102	-
Stage 2	-	-	-	-	-	-	-	1117	-	544	1024	-
Critical Hdwy	4.1	-	-	4.14	-	-	-	6.78	6.94	7.84	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.78	-	6.84	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.78	-	6.84	5.5	-
Follow-up Hdwy	2.2	-	-	2.22	-	-	-	4.14	3.32	3.67	4	3.3
Pot Cap-1 Maneuver	714	-	-	709	-	-	0	42	530	56	51	530
Stage 1	-	-	-	-	-	-	0	287	-	201	290	-
Stage 2	-	-	-	-	-	-	0	257	-	455	315	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	714	-	-	709	-	-	-	35	530	34	42	530
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	35	-	34	42	-
Stage 1	-	-	-	-	-	-	-	262	-	183	261	-
Stage 2	-	-	-	-	-	-	-	232	-	358	287	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.7			38.9			94.5		
HCM LOS							E			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	169	714	-	-	709	-	-	65
HCM Lane V/C Ratio	0.382	0.04	-	-	0.098	-	-	0.41
HCM Control Delay (s)	38.9	10.3	0.4	-	10.6	-	-	94.5
HCM Lane LOS	E	B	A	-	B	-	-	F
HCM 95th %tile Q(veh)	1.6	0.1	-	-	0.3	-	-	1.6

2027 Build Wkdy PM Peak  
 1: Fiske Hill Road/Picker Road & Route 20

07/22/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↖	↕↕			↗			↕↕	
Traffic Volume (vph)	12	936	14	90	1129	5	0	4	93	25	13	33
Future Volume (vph)	12	936	14	90	1129	5	0	4	93	25	13	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	16	12	12	12	12
Storage Length (ft)	0		0	240		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		30			30			30				30
Link Distance (ft)		823			845			358				547
Travel Time (s)		18.7			19.2			8.1				12.4
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.86	0.86	0.86	0.50	0.50	0.50
Heavy Vehicles (%)	0%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1045	0	102	1289	0	0	113	0	0	142	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other  
 Control Type: Unsignalized

2027 Build Wkdy PM Peak  
1: Fiske Hill Road/Picker Road & Route 20

07/22/2020

Intersection												
Int Delay, s/veh	80.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔		↕	↕↔			↔			↕↔	
Traffic Vol, veh/h	12	936	14	90	1129	5	0	4	93	25	13	33
Future Vol, veh/h	12	936	14	90	1129	5	0	4	93	25	13	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	240	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	88	88	88	86	86	86	50	50	50
Heavy Vehicles, %	0	2	0	0	3	0	0	0	0	0	0	5
Mvmt Flow	13	1017	15	102	1283	6	0	5	108	50	26	66

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1289	0	0	1032	0	0	-	2544	516	2027	2548	645
Stage 1	-	-	-	-	-	-	-	1051	-	1490	1490	-
Stage 2	-	-	-	-	-	-	-	1493	-	537	1058	-
Critical Hdwy	4.1	-	-	4.1	-	-	-	6.5	6.9	7.5	6.5	7
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	-	4	3.3	3.5	4	3.35
Pot Cap-1 Maneuver	545	-	-	681	-	-	0	27	509	~ 35	27	408
Stage 1	-	-	-	-	-	-	0	306	-	132	189	-
Stage 2	-	-	-	-	-	-	0	188	-	501	304	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	545	-	-	681	-	-	-	22	509	~ 20	~ 22	408
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	22	-	~ 20	~ 22	-
Stage 1	-	-	-	-	-	-	-	289	-	125	161	-
Stage 2	-	-	-	-	-	-	-	160	-	366	287	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0.4		0.8		28.1		\$ 1499.6	
HCM LOS					D		F	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	266	545	-	-	681	-	-	37
HCM Lane V/C Ratio	0.424	0.024	-	-	0.15	-	-	3.838
HCM Control Delay (s)	28.1	11.8	0.3	-	11.2	-	-	\$ 1499.6
HCM Lane LOS		D	B	A	-	B	-	F
HCM 95th %tile Q(veh)		2	0.1	-	-	0.5	-	16.4

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

Picker Road/Technology Park Road

---

2020 Existing Wkdy AM Peak  
 6: Picker Road & Technology Park Road

07/20/2020



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↑	↘	↙	↓
Traffic Volume (vph)	2	0	34	4	0	10
Future Volume (vph)	2	0	34	4	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.987			
Flt Protected	0.950					
Satd. Flow (prot)	1711	0	1839	0	0	1863
Flt Permitted	0.950					
Satd. Flow (perm)	1711	0	1839	0	0	1863
Link Speed (mph)	30		30			30
Link Distance (ft)	665		407			330
Travel Time (s)	15.1		9.3			7.5
Adj. Flow (vph)	2	0	37	4	0	11
Lane Group Flow (vph)	2	0	41	0	0	11
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type: Other  
 Control Type: Unsignalized



2020 Existing Wkdy AM Peak  
6: Picker Road & Technology Park Road

07/20/2020

Intersection

Int Delay, s/veh 0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Traffic Vol, veh/h	2	0	34	4	0	10
Future Vol, veh/h	2	0	34	4	0	10
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	2	0	37	4	0	11

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	50	39	0	0	41
Stage 1	39	-	-	-	-
Stage 2	11	-	-	-	-
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	959	1033	-	-	1568
Stage 1	983	-	-	-	-
Stage 2	1012	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	959	1033	-	-	1568
Mov Cap-2 Maneuver	959	-	-	-	-
Stage 1	983	-	-	-	-
Stage 2	1012	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	959	1568
HCM Lane V/C Ratio	-	-	0.002	-
HCM Control Delay (s)	-	-	8.8	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

2020 Existing Wkdy PM Peak  
 6: Picker Road & Technology Park Road

07/20/2020



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	0	13	2	0	45
Future Volume (vph)	5	0	13	2	0	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12
Link Speed (mph)	30		30			30
Link Distance (ft)	530		327			410
Travel Time (s)	12.0		7.4			9.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	0	16	0	0	49
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

2020 Existing Wkdy PM Peak  
6: Picker Road & Technology Park Road

07/20/2020

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T		T	
Traffic Vol, veh/h	5	0	13	2	0	45
Future Vol, veh/h	5	0	13	2	0	45
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	5	0	14	2	0	49

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	64	15	0	0	16
Stage 1	15	-	-	-	-
Stage 2	49	-	-	-	-
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	942	1065	-	-	1602
Stage 1	1008	-	-	-	-
Stage 2	973	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	942	1065	-	-	1602
Mov Cap-2 Maneuver	942	-	-	-	-
Stage 1	1008	-	-	-	-
Stage 2	973	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	942	1602
HCM Lane V/C Ratio	-	-	0.006	-
HCM Control Delay (s)	-	-	8.8	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

2027 No-Build Wkdy AM Peak  
 6: Picker Road & Tehnology Park Road

07/20/2020



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	0	52	6	0	14
Future Volume (vph)	2	0	52	6	0	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.985			
Flt Protected	0.950					
Satd. Flow (prot)	1711	0	1835	0	0	1863
Flt Permitted	0.950					
Satd. Flow (perm)	1711	0	1835	0	0	1863
Link Speed (mph)	30		30			30
Link Distance (ft)	453		307			430
Travel Time (s)	10.3		7.0			9.8
Adj. Flow (vph)	2	0	57	7	0	15
Lane Group Flow (vph)	2	0	64	0	0	15
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

2027 No-Build Wkdy AM Peak  
6: Picker Road & Tehnology Park Road

07/20/2020

**Intersection**

Int Delay, s/veh	0.2					
<b>Movement</b>	<b>WBL</b>	<b>WBR</b>	<b>NBT</b>	<b>NBR</b>	<b>SBL</b>	<b>SBT</b>
Lane Configurations	Y		↑			↑
Traffic Vol, veh/h	2	0	52	6	0	14
Future Vol, veh/h	2	0	52	6	0	14
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	2	0	57	7	0	15

**Major/Minor**

	<b>Minor1</b>	<b>Major1</b>	<b>Major2</b>		
Conflicting Flow All	76	61	0	0	64
Stage 1	61	-	-	-	-
Stage 2	15	-	-	-	-
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	927	1004	-	-	1538
Stage 1	962	-	-	-	-
Stage 2	1008	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	927	1004	-	-	1538
Mov Cap-2 Maneuver	927	-	-	-	-
Stage 1	962	-	-	-	-
Stage 2	1008	-	-	-	-

**Approach**

	<b>WB</b>	<b>NB</b>	<b>SB</b>
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

**Minor Lane/Major Mvmt**

	<b>NBT</b>	<b>NBRWBLn1</b>	<b>SBL</b>	<b>SBT</b>
Capacity (veh/h)	-	-	927	1538
HCM Lane V/C Ratio	-	-	0.002	-
HCM Control Delay (s)	-	-	8.9	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

2027 No-Build Wkdy PM Peak  
 6: Picker Road & Technology Park Road

07/20/2020



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	7	0	19	2	0	63
Future Volume (vph)	7	0	19	2	0	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12
Link Speed (mph)	30		30			30
Link Distance (ft)	500		387			350
Travel Time (s)	11.4		8.8			8.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	8	0	23	0	0	68
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type: Other  
 Control Type: Unsignalized

2027 No-Build Wkdy PM Peak  
 6: Picker Road & Technology Park Road

07/20/2020

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T			T
Traffic Vol, veh/h	7	0	19	2	0	63
Future Vol, veh/h	7	0	19	2	0	63
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	8	0	21	2	0	68

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	90	22	0	0	23
Stage 1	22	-	-	-	-
Stage 2	68	-	-	-	-
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	910	1055	-	-	1592
Stage 1	1001	-	-	-	-
Stage 2	955	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	910	1055	-	-	1592
Mov Cap-2 Maneuver	910	-	-	-	-
Stage 1	1001	-	-	-	-
Stage 2	955	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	910	1592
HCM Lane V/C Ratio	-	-	0.008	-
HCM Control Delay (s)	-	-	9	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

2027 Build Wkdy AM Peak  
 2: Picker Road & Technology Park Road

07/22/2020



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	0	52	7	0	14
Future Volume (vph)	2	0	52	7	0	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.983					
Fl <sub>t</sub> Protected	0.950					
Satd. Flow (prot)	1770	0	1831	0	0	1863
Fl <sub>t</sub> Permitted	0.950					
Satd. Flow (perm)	1770	0	1831	0	0	1863
Link Speed (mph)	30		30		30	
Link Distance (ft)	512		537		200	
Travel Time (s)	11.6		12.2		4.5	
Adj. Flow (vph)	2	0	57	8	0	15
Lane Group Flow (vph)	2	0	65	0	0	15
Sign Control	Stop		Free		Free	

Intersection Summary

Area Type: Other  
 Control Type: Unsignalized



2027 Build Wkdy AM Peak  
2: Picker Road & Technology Park Road

07/22/2020

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	2	0	52	7	0	14
Future Vol, veh/h	2	0	52	7	0	14
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	2	0	57	8	0	15

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	76	61	0	0	65	0
Stage 1	61	-	-	-	-	-
Stage 2	15	-	-	-	-	-
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	927	1004	-	-	1537	-
Stage 1	962	-	-	-	-	-
Stage 2	1008	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	927	1004	-	-	1537	-
Mov Cap-2 Maneuver	927	-	-	-	-	-
Stage 1	962	-	-	-	-	-
Stage 2	1008	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	927	1537
HCM Lane V/C Ratio	-	-	0.002	-
HCM Control Delay (s)	-	-	8.9	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

2027 Build Wkdy PM Peak  
 2: Picker Road & Technology Park Road

07/22/2020



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	8	0	19	2	0	63
Future Volume (vph)	8	0	19	2	0	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12
Link Speed (mph)	30		30			30
Link Distance (ft)	411		547			190
Travel Time (s)	9.3		12.4			4.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	0	23	0	0	68
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

2027 Build Wkdy PM Peak  
2: Picker Road & Technology Park Road

07/22/2020

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	0	19	2	0	63
Future Vol, veh/h	8	0	19	2	0	63
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	9	0	21	2	0	68

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	90	22	0	0	23	0
Stage 1	22	-	-	-	-	-
Stage 2	68	-	-	-	-	-
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	910	1055	-	-	1592	-
Stage 1	1001	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	910	1055	-	-	1592	-
Mov Cap-2 Maneuver	910	-	-	-	-	-
Stage 1	1001	-	-	-	-	-
Stage 2	955	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	910	1592
HCM Lane V/C Ratio	-	-	0.01	-
HCM Control Delay (s)	-	-	9	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0