

# MEMORANDUM

**TO:** Ms. Christine Brestrup  
Planning Director  
Town of Amherst  
4 Boltwood Avenue  
Amherst, MA 01002

**FROM:** Mr. Shaun P. Kelly <sup>SPK</sup>  
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**DATE:** March 25, 2021

**RE:** 8865

**SUBJECT:** Transportation Impact Assessment  
Proposed Residential Development  
11 East Pleasant Street  
Amherst, Massachusetts

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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 redevelopment of an existing commercial building located at 11 East Pleasant Street in Amherst, Massachusetts, in order to accommodate a proposed 55-unit residential apartment development (hereafter referred to as the “Project”). Specifically, this assessment: i) reviews the existing conditions context of the transportation infrastructure serving the Project site; ii) qualitatively evaluates the potential impact of the Project along East Pleasant Street; and iii) provides an evaluation of the safety characteristics of the transportation facilities serving the site, including an evaluation of lines of sight at the Project site driveway intersection with East Pleasant Street.

This assessment was conducted pursuant to the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such evaluations. Based on this assessment, we have concluded the following with respect to the Project:

1. The Project is expected to generate approximately 9 vehicle trips (2 vehicles entering and 7 vehicles exiting) during the weekday morning peak-hour, and 14 vehicle trips (8 vehicles entering and 6 vehicles exiting) expected during the weekday evening peak-hour;
2. In comparison to the prior use of the building as commercial space, including a convenience market, the Project results in less traffic, both by automobile and non-automobile modes of travel, during both the weekday morning and weekday evening peak hours;
3. In the context of the overall volume of traffic on East Pleasant Street, the Project is expected to represent an approximate 1 to 2 percent increase in traffic during peak hours, which is within the range of normal daily traffic volume fluctuations and would not result in an increase in motorist delays or vehicle queuing over current conditions;



4. No apparent safety deficiencies were noted in the immediate proximity of the Project site based on a review of available data; and
5. Lines of sight at the intersections of East Pleasant Street with the site driveway were found to exceed the recommended minimum distances for safe and efficient operation based on the measured travel speed along the corridor.

In consideration of the above, we have concluded that the transportation infrastructure affords sufficient capacity to accommodate the Project in a safe and efficient manner.

The following details our assessment of the Project.

## **PROJECT DESCRIPTION**

The proposed project entails the redevelopment of two commercial buildings, totaling approximately 12,600± square feet (sf) located on the eastern portion of the site. The vacant commercial buildings had previously housed a number of retail uses, including a convenience store with liquor sales, a consignment store, a barber shop, a nail salon, and other retail stores.

The proposed redevelopment project entails the razing of the existing structures on site and the construction of a new five-story structure that will provide a total of 55-units of residential apartments, with approximately 1,500± sf of ground level ancillary retail space provided. On-site parking will be provided for sixteen (16) spaces, including two (2) handicap accessible spaces. Access to the site will continue to be provided via a curb cut onto the eastern side of East Pleasant Street.

Figure 1 depicts the site location in relation to the local roadway network.

**Figure 1 – Site Location Map**



Source: Google Earth Imagery, 2021



## **EXISTING CONDITIONS CONTEXT**

In order to establish the existing conditions context of the Project with respect to the transportation infrastructure, a comprehensive field inventory of existing conditions within the study area was conducted in February 2021. The field investigation consisted of an inventory of existing roadway geometrics; pedestrian and bicycle facilities; and public transportation services; as well as posted speed limits and land use information along East Pleasant Street in the vicinity of the Project site. The following provides a description of the transportation infrastructure serving the Project site.

### **Roadways**

#### **East Pleasant Street**

East Pleasant Street is a rural minor arterial under the jurisdiction of the Town of Amherst that traverses the study area in a general north-south orientation and provides connections between downtown Amherst to the south and Pine Street to the north. East Pleasant Street provides connections to North Pleasant Street to the north, which travels through the nearby University of Massachusetts at Amherst campus. To the south East Pleasant Street continues onto North Pleasant Street and South Pleasant Street, providing connections to the Main Street, College Street and Northampton Road (Route 9) corridors, which provide connections to the adjacent communities of Belchertown, Hadley, and Northampton. The posted speed limit along East Pleasant Street, in the vicinity of the project site is 25 miles per hour (mph).

Within the study area East Pleasant Street generally provides a single approximate 12-foot travel lane in each direction, separated by a painted double-yellow centerline. In the vicinity of the project site, approximate 5-foot painted bicycle lanes are also provided along both the eastern and western sides of the corridor. Sidewalks are provided along both the eastern and western sides of East Pleasant Street, with a grass strip separating the sidewalk from the East Pleasant Street travel way on the eastern side of the roadway, adjacent to the project site. On both the eastern and western sides of the corridor, bus stops are provided in close proximity to the site, including shelters provided by the Pioneer Valley Transit Authority (PVTA). Crosswalks are provided at a number of locations along East Pleasant Street and North Pleasant Street, in the downtown area. In the vicinity of the project site illumination is provided along the corridor by way of overhead street lights located on the eastern side of the roadway.

Land use along East Pleasant Street, in the vicinity of the project site is predominantly commercial and residential in nature including several restaurants, a gas station, convenience store and other commercial uses.

### **Traffic Volumes**

Due to the impact of COVID-19 on area traffic volumes, new traffic counts were not collected as part of this assessment as they are not expected to be representative of typical operating conditions along the corridor. Traffic counts collected by MassDOT along Route 116, just south of the downtown area were instead reviewed to identify typical traffic conditions within the study area. Based on this data it is estimated that East Pleasant Street accommodates approximately 11,500 vehicles per day (vpd) during times when area colleges are in session, including approximately 900 vehicles per hour (vph) during the weekday morning peak hour and 800 vph during the weekday evening peak period.

### **Vehicle Speed Data**

Vehicle speeds along East Pleasant Street were recorded in February 2021 in order to identify prevailing



travel speeds along the corridor. As previously noted, the speed limit on East Pleasant Street is 25 mph. Based on the collected data, the average vehicle speeds in the northbound and southbound directions were determined to be 32 mph. The 85<sup>th</sup> percentile travel speed, which is utilized for the determination of required sight distance was determined to be 35 mph in the northbound direction and 36 mph in the southbound direction.

### **Pedestrian and Bicycle Accommodations**

A comprehensive inventory of the available pedestrian and bicycle accommodations was undertaken as part of the existing condition assessment. In general, concrete sidewalks are provided continuously along both sides of the East Pleasant Street corridor, adjacent to the Project site, with painted crosswalks provide in a number of locations, including adjacent to the Project site opposite Hallock Street. Formal bicycle facilities are also currently provided within the study area, including painted bicycle lanes in both the northbound and southbound directions.

### **Public Transportation Services**

Regularly scheduled public transportation services are currently provided in the vicinity of the Project site by the Pioneer Valley Transit Authority (PVTA). Specifically, the PVTA provides regular bus service to the Project via the following routes:

- Route 30 – North Amherst/Old Belchertown Road
- Route 31 – Sunderland/South Amherst
- Route 33 – Puffers Pond/Stop & Shop
- Route 34 – Campus Shuttle Northbound
- Route 35 – Campus Shuttle Southbound
- Route 38 – Mount Holyoke College-Hampshire College-Amherst College-UMass
- Route 45 – Belchertown Center/UMass
- Route 46 – Whately via South Deerfield Center/UMass

Given the immediate proximity of the site to area transit services and the proximity of other commercial uses, it is expected that a significant percentage of Project-related traffic activity will occur via transit, walking and bicycle trips, thereby not representing new vehicle trips on the adjacent roadway network.

### **Motor Vehicle Crash Data**

Motor vehicle crash information for East Pleasant Street, in the vicinity of the Project site was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2015 through 2019, inclusive) in order to examine motor vehicle crash trends occurring at this location. Based on a review of this data, a total of two (2) motor vehicle crashes were reported to have occurred in the vicinity of the intersection of the site access driveway with East Pleasant Street over the last five years. Based on the crash history, the motor vehicle crash rate for this location falls well below MassDOT's average crash rate for unsignalized intersections in this MassDOT District.



## **Sight Distance Analysis**

Sight distance measurements were performed at site driveway intersection with East Pleasant Street in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)<sup>1</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.

As previously noted, the 85<sup>th</sup> percentile travel speed, which is utilized for design purposes, was 35 mph in the northbound direction and 36 mph in the southbound direction. Based on these travel speeds a minimum of 250 feet of sight distance is required to and from the south, while 260 feet of sight distance is required to and from the north. Field measurements at the site driveway location reveal sight lines that exceed 300 feet to the south and 500 feet to the north, well exceeding the AASHTO required sight distances along the corridor.

## **PROJECT-GENERATED TRAFFIC**

In order to develop the traffic characteristics of the project, trip-generation statistics published by the Institute of Transportation Engineers (ITE)<sup>2</sup> were reviewed. Specifically, trip generation data for Land Use Code (LUC) 221 – Multi-Family Housing (Mid-Rise) and LUC 820 – Shopping Center were utilized to identify the anticipated peak hour traffic increases associated with the Project. Additionally, ITE data for LUC 814 – Variety Store was also utilized to identify the trip generation characteristics of the prior use of the site.

Trip generation calculations were performed for the weekday morning and weekday evening peak hours, which represent the critical time periods for residential traffic activity. Based on a review of U.S. Census Journey to Work data for the Amherst Center area, only 44 percent of commuters utilized automobile as a means of transportation. A significant percentage of trips were instead made via other means including transit trips, bicycle trips and walking trips. As such, the ITE projections for both the proposed Project and prior commercial uses were adjusted to reflect the anticipated mode split for the downtown area. Table 1 provides a summary of the trip generation characteristics of the existing and proposed uses of the site.

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<sup>1</sup>*A Policy on Geometric Design of Highway and Streets*, 7<sup>th</sup> Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2018.

<sup>2</sup>*Trip Generation*, Ninth Edition; Institute of Transportation Engineers; Washington, DC; 2013.





**Table 1**  
**TRIP-GENERATION SUMMARY**

Time Period/Direction	Proposed Project Trips <sup>a</sup>	Prior Commercial Trips <sup>b</sup>	Delta
Weekday Morning			
Peak Hour:			
Entering	2	6	-4
<u>Exiting</u>	<u>7</u>	<u>4</u>	<u>3</u>
Total	9	10	-1
Weekday Evening			
Peak Hour:			
Entering	8	9	-1
<u>Exiting</u>	<u>6</u>	<u>10</u>	<u>-4</u>
Total	14	19	-5

a – Based on LUC 221 trip rates applied to 55 residential units and LUC 820 trip rates applied to 1,500 sf, with 44 percent automobile mode split

b – Based on LUC 814 trip rates applied to 5,200 sf and LUC 820 trip rates applied to 7,400 sf, with 44 percent automobile mode split

As summarized in Table 1, the proposed residential redevelopment is expected to generate approximately 9 vehicle trips (2 entering and 7 exiting) during the weekday morning peak hour and approximately 14 vehicle trips (8 entering and 6 exiting) during the weekday evening peak hour. In comparison to the prior commercial use of the site the Project results in 1 fewer trip during the weekday morning peak hour and 5 fewer vehicle trips during the weekday evening peak hour.

*In the context of the overall volume of traffic on East Pleasant Street, the Project represents an approximate 1 to 2 percent increase in traffic, which is within the range of normal daily traffic volume fluctuations and would not result in an increase in motorist delays or vehicle queuing over current conditions.*

## **SUMMARY**

VAI has completed a detailed assessment of the potential impacts on the transportation infrastructure associated with a proposed 55-unit residential apartment development. Specifically, this assessment has: i) reviewed the existing conditions context of the transportation infrastructure serving the Project site; ii) qualitatively evaluated the potential impact of the Project along East Pleasant Street; and iii) provides a safety analysis including an evaluation of both crash history and lines of sight at the Project site driveway intersection with East Pleasant Street. Based on this assessment, we have concluded the following with respect to the Project:

1. The Project is expected to generate approximately 9 vehicle trips (2 vehicles entering and 7 vehicles exiting) during the weekday morning peak-hour, and 14 vehicle trips (8 vehicles entering and 6 vehicles exiting) expected during the weekday evening peak-hour;
2. In comparison to the prior use of the building as a convenience market, the Project results in less



peak hour traffic, both by automobile and non-automobile modes of travel, during both the weekday morning and weekday evening peak hours;

3. In the context of the overall volume of traffic on East Pleasant Street, the Project is expected to represent an approximate 1 to 2 percent increase in traffic during peak hours, which is within the range of normal daily traffic volume fluctuations and would not result in an increase in motorist delays or vehicle queuing over current conditions;
4. No apparent safety deficiencies were noted in the immediate proximity of the Project site based on a review of available data; and
5. Lines of sight at the intersections of East Pleasant Street with the site driveway were found to exceed the recommended minimum distances for safe and efficient operation based on the measured travel speed along the corridor.

In consideration of the above, we have concluded that the transportation infrastructure affords sufficient capacity to accommodate the Project in a safe and efficient manner with implementation of the following recommendations.

## **Recommendations**

### **Project Access**

Access to the Project site will continue to be provided by way of the existing driveway that intersects the western side of East Pleasant Street. The following recommendations are offered with respect to the design and operation of the Project:

- Vehicles exiting the site should be placed under STOP-sign control with a marked STOP-line provided.
- All signs and pavement markings to be installed within the Project site should conform to the applicable standards of the *Manual on Uniform Traffic Control Devices (MUTCD)*.<sup>3</sup>
- Signs and landscaping to be installed as a part of the Project within the intersection sight triangle areas of the Project site driveway should be designed and maintained so as not to restrict lines of sight.
- Snow windrows within sight triangle areas of the Project site driveways should be promptly removed where such accumulations would impede 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.

cc: K. Wilson, Archipelago Investments, LLC  
File

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<sup>3</sup>*Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.



## APPENDIX

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TRAFFIC COUNT DATA  
MOTOR VEHICLE CRASH DATA  
VEHICLE SPEED DATA  
TRIP GENERATION CALCULATIONS



TRAFFIC COUNT DATA

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Location ID	2108	Located On	SOUTH PLEASANT STREET	Community	Amherst
Counted By	TCDS_Combined	SOUTH OF	RTE.9	County	Hampshire
Start Date	9/15/2016			Module	
Start Time	11:00:00 AM	Direction	2-WAY	Agency	MHD
Source	Syst_Combine	QC Status	Accepted	Owner ID	mhd1

### FHWA-Scheme F Classification

Start Time	Motor cycle	Car	Light Truck	Bus	2A SU	3A SU	>3A SU	<5A 2U	5A 2U	>5A 2U	<6A >2U	6A >2U	>6A >2U	14	15	Total
12:00 AM	3	134	4	0	6	0	0	0	0	0	0	0	0	0	0	147
1:00 AM	3	102	3	0	3	0	0	0	0	0	0	0	0	0	0	111
2:00 AM	0	57	3	0	2	0	0	0	0	0	0	0	0	0	0	62
3:00 AM	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	18
4:00 AM	1	29	4	0	1	0	0	1	1	0	0	0	0	0	0	37
5:00 AM	1	99	13	0	0	0	0	0	2	0	0	0	0	0	0	115
6:00 AM	0	288	28	0	5	10	2	0	1	0	0	0	0	0	0	334
7:00 AM	3	585	51	3	27	7	4	2	7	1	0	0	0	0	0	690
8:00 AM	12	794	58	1	21	10	1	4	2	0	1	2	0	0	1	907
9:00 AM	9	597	50	0	20	6	2	4	7	0	0	0	1	0	0	696
10:00 AM	11	550	49	2	19	5	2	3	1	1	0	0	0	0	0	643
11:00 AM	2	521	59	4	15	7	3	4	4	0	0	0	0	0	0	619
12:00 PM	7	515	44	0	15	4	4	8	5	0	1	0	0	0	0	603
1:00 PM	8	514	47	2	23	9	3	8	2	1	0	0	0	0	0	617
2:00 PM	15	627	61	1	19	10	3	5	1	0	0	0	0	0	0	742
3:00 PM	10	645	62	3	17	8	2	4	0	0	0	0	0	0	0	751
4:00 PM	11	721	32	0	14	2	1	3	0	0	0	1	0	0	0	785
5:00 PM	11	709	33	0	15	1	0	4	1	0	0	0	0	0	0	774
6:00 PM	17	619	26	0	14	0	0	7	0	0	0	0	0	0	0	683
7:00 PM	9	491	14	0	9	0	0	5	1	0	0	1	0	0	0	530
8:00 PM	6	522	11	0	10	0	0	2	2	0	0	0	0	0	1	554
9:00 PM	5	466	23	0	7	3	0	3	0	0	0	0	0	0	0	507
10:00 PM	4	340	9	0	7	0	0	1	0	0	0	0	0	0	0	361
11:00 PM	7	188	3	0	6	0	0	0	1	0	0	0	0	0	0	205
<b>TOTAL</b>	<b>155</b>	<b>10131</b>	<b>687</b>	<b>16</b>	<b>275</b>	<b>82</b>	<b>27</b>	<b>68</b>	<b>38</b>	<b>3</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>11491</b>

MOTOR VEHICLE CRASH DATA

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Crash Number	City	Town	Crash Date	Crash Severity	Crash Time	Crash Number of	First Harmful Event	Light Conditions	Manner of Collision	Non-Motorist Type (All Persons)	Road Surface	Weather Conditions
4385104	AMHERST	AMHERST	06/18/2017	Non-fatal injury	4:11 PM	2	Collision with motor vehicle in traffic	Daylight	Angle		Dry	Clear
4449581	AMHERST	AMHERST	11/03/2017	No Injury	6:15 PM	1	Collision with pedestrian	Dusk	Single vehicle crash	P2: Pedestrian	Dry	Clear

VEHICLE SPEED DATA

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**Vehicle Speed Data - East Pleasant Street at 11 East Pleasant Street**

**Date: 2/17/21 2:00 PM**

Observation	Northbound	Southbound		Northbound	Southbound
1	33	31	26	31	34
2	34	34	27	31	33
3	30	34	28	24	33
4	36	39	29	38	28
5	35	28	30	30	34
6	32	36	31	34	36
7	32	36	32	29	31
8	33	31	33	29	28
9	28	26	34	32	35
10	34	31	35	36	29
11	35	30	36	36	29
12	33	28	37	26	33
13	28	29	38	28	38
14	30	28	39	30	29
15	32	31	40	31	33
16	28	31	41	31	34
17	31	34	42	29	30
18	37	38	43	34	33
19	31	36	44	36	35
20	38	34	45	31	32
21	29	31	46	33	34
22	33	36	47	35	33
23	29	35	48	28	34
24	33	37	49	33	29
25	26	31	50	31	31

  

	Northbound	Southbound
Average	32	32
85th %	35	36



## TRIP GENERATION CALCULATIONS

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**Institute of Transportation Engineers (ITE)**  
**Trip Generation, 10th Edition**  
**Land Use Code (LUC) 221 - Multifamily Housing (Mid-Rise)**

Average Vehicle Trips Ends vs: Dwelling Units  
Independent Variable (X): 55

**AVERAGE WEEKDAY DAILY**

$T = 5.44 * (X)$   
 $T = 5.44 * 55$   
 $T = 299.20$   
 $T = 300.00$   
 $T = 300$  vehicle trips  
with 50% ( 150 vpd) entering and 50% ( 150 vpd) exiting.

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$T = 0.36 * (X)$   
 $T = 0.36 * 55$   
 $T = 19.80$   
 $T = 20$  vehicle trips  
with 26% ( 5 vph) entering and 74% ( 15 vph) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$T = 0.44 * (X)$   
 $T = 0.44 * 55$   
 $T = 24.20$   
 $T = 24.00$   
 $T = 24$  vehicle trips  
with 61% ( 15 vph) entering and 39% ( 9 vph) exiting.

**AVERAGE SATURDAY**

$T = 4.91 * (X)$   
 $T = 4.91 * 55$   
 $T = 270.05$   
 $T = 270.00$   
 $T = 270$  vehicle trips  
with 50% ( 135 vpd) entering and 50% ( 135 vpd) exiting.

**SATURDAY MIDDAY PEAK HOUR OF GENERATOR**

$T = 0.44 * (X)$   
 $T = 0.44 * 55$   
 $T = 24.20$   
 $T = 24$  vehicle trips  
with 49% ( 12 vph) entering and 51% ( 12 vph) exiting.

**Institute of Transportation Engineers (ITE)**  
**Trip Generation, 10th Edition**  
**Land Use Code (LUC) 814 - Variety Store**

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area  
 Independent Variable (X): 5.200

**AVERAGE WEEKDAY DAILY**

$T = 63.47 * (X)$   
 $T = 63.47 * 5.200$   
 $T = 330.04$   
 $T = 330$  vehicle trips  
 with 50% ( 165 vpd) entering and 50% ( 165 vpd) exiting.

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$T = 3.18 * (X)$   
 $T = 3.18 * 5.200$   
 $T = 16.54$   
 $T = 17$  vehicle trips  
 with 57% ( 10 vph) entering and 43% ( 7 vph) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$T = 6.84 * (X)$   
 $T = 6.84 * 5.200$   
 $T = 35.57$   
 $T = 36$  vehicle trips  
 with 52% ( 19 vph) entering and 48% ( 17 vph) exiting.

**SATURDAY DAILY**

$$\frac{\text{ITE LUC 815 Average Weekday Trip Rate}}{\text{ITE LUC 815 Saturday Daily Trip Rate}} = \frac{\text{ITE LUC 814 Average Weekday Trip Rate}}{\text{ITE LUC 814 Saturday Daily Trip Rate}}$$

$$\frac{53.12}{70.76} = \frac{63.47}{(Y)} \quad Y = 84.547011$$

$T = Y * 5.200$   
 $T = 440$   
 $T = 440$  vehicle trips  
 with 50% ( 220 vph) entering and 50% ( 220 vph) exiting.

*(same distribution split as ITE LUC 815 during a Saturday)*

**SATURDAY MIDDAY PEAK HOUR**

$$\frac{\text{ITE LUC 815 Saturday Midday Trip Rate}}{\text{ITE LUC 815 Saturday Daily Trip Rate}} = \frac{\text{ITE LUC 814 Saturday Midday Trip Rate}}{\text{ITE LUC 814 Saturday Daily Trip Rate}}$$

$$\frac{6.94}{70.76} = \frac{(Y)}{84.55} \quad Y = 8.2924958$$

$T = Y * 5.200$   
 $T = 43.1$   
 $T = 43$  vehicle trips  
 with 51% ( 22 vph) entering and 49% ( 21 vph) exiting.

*(same distribution split as ITE LUC 815 during the Saturday midday peak hour of generator)*

**Institute of Transportation Engineers (ITE)**  
**Trip Generation, 10th Edition**  
**Land Use Code (LUC) 820 - Shopping Center**

Average Vehicle Trips Ends vs: 1,000 Square Feet Gross Leasable Area  
Independent Variable (X): 7.400

**AVERAGE WEEKDAY DAILY**

$$T = 37.75 * X$$

$$T = 37.75 * 7.400$$

$$T = 279.35$$

$$T = 280 \text{ vehicle trips}$$

with 50% ( 140 vpd) entering and 50% ( 140 vpd) exiting.

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 0.94 * (X)$$

$$T = 0.94 * 7.400$$

$$T = 6.96$$

$$T = 7 \text{ vehicle trips}$$

with 62% ( 4 vph) entering and 38% ( 3 vph) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 3.81 * X$$

$$T = 3.81 * 7.400$$

$$T = 28.19$$

$$T = 28 \text{ vehicle trips}$$

with 48% ( 13 vph) entering and 52% ( 15 vph) exiting.

**SATURDAY DAILY**

$$T = 46.12 * X$$

$$T = 46.12 * 7.400$$

$$T = 341.29$$

$$T = 342 \text{ vehicle trips}$$

with 50% ( 171 vph) entering and 50% ( 171 vph) exiting.

**SATURDAY MIDDAY PEAK HOUR OF GENERATOR**

$$T = 4.50 * X$$

$$T = 4.50 * 7.400$$

$$T = 33.30$$

$$T = 33 \text{ vehicle trips}$$

with 52% ( 17 vph) entering and 48% ( 16 vph) exiting.

**Institute of Transportation Engineers (ITE)**  
**Trip Generation, 10th Edition**  
**Land Use Code (LUC) 820 - Shopping Center**

Average Vehicle Trips Ends vs: 1,000 Square Feet Gross Leasable Area  
Independent Variable (X): 1.500

**AVERAGE WEEKDAY DAILY**

$$T = 37.75 * X$$

$$T = 37.75 * 1.500$$

$$T = 56.63$$

$$T = 56 \text{ vehicle trips}$$

with 50% ( 28 vpd) entering and 50% ( 28 vpd) exiting.

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 0.94 * (X)$$

$$T = 0.94 * 1.500$$

$$T = 1.41$$

$$T = 1 \text{ vehicle trips}$$

with 62% ( 1 vph) entering and 38% ( 0 vph) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 3.81 * X$$

$$T = 3.81 * 1.500$$

$$T = 5.72$$

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

with 48% ( 3 vph) entering and 52% ( 3 vph) exiting.

**SATURDAY DAILY**

$$T = 46.12 * X$$

$$T = 46.12 * 1.500$$

$$T = 69.18$$

$$T = 70 \text{ vehicle trips}$$

with 50% ( 35 vph) entering and 50% ( 35 vph) exiting.

**SATURDAY MIDDAY PEAK HOUR OF GENERATOR**

$$T = 4.50 * X$$

$$T = 4.50 * 1.500$$

$$T = 6.75$$

$$T = 7 \text{ vehicle trips}$$

with 52% ( 4 vph) entering and 48% ( 3 vph) exiting.

Trip Generation Summary - 11 East Pleasant Street - Amherst, Massachusetts

	Proposed			Prior Use			Proposed			Prior Use		
	Total Trips		Total	Total Trips		Total	Vehicle Trips		Total	Vehicle Trips		Total
	Apartment	Retail		C-Store	Retail		Apartment	Retail		C-Store	Retail	
<b>Weekday Morning Peak Hour</b>												
Enter	5	1	6	10	4	14	2	0	2	4	2	6
Exit	15	0	15	7	3	10	7	0	7	3	1	4
<b>Total</b>	<b>20</b>	<b>1</b>	<b>21</b>	<b>17</b>	<b>7</b>	<b>24</b>	<b>9</b>	<b>0</b>	<b>9</b>	<b>7</b>	<b>3</b>	<b>10</b>
<b>Weekday Evening Peak Hour</b>												
Enter	15	3	18	19	3	22	7	1	8	8	1	9
Exit	9	3	12	17	3	20	4	2	6	8	2	10
<b>Total</b>	<b>24</b>	<b>6</b>	<b>30</b>	<b>36</b>	<b>6</b>	<b>42</b>	<b>11</b>	<b>3</b>	<b>14</b>	<b>16</b>	<b>3</b>	<b>19</b>

\* Vehicle Trips based on 44% automobile mode split