

August 16, 2021

Mr. Patrick P. Doherty, P.E.  
Midpoint Engineering + Consulting, LLC  
37 Sutton Road  
Webster, MA 01570

RE: Evaluation of The Revised Site Plan  
Hotel and Restaurant Redevelopment Plan  
21 New Boston Road, Sturbridge, MA

Dear Mr. Doherty:

In response to your request, I have reviewed and evaluated a revised layout plan for the above referenced redevelopment project located at 21 New Boston Road in Sturbridge, Massachusetts, dated July 29, 2021, to compare with a previously approved layout plan for the same project as was originally approved by the Sturbridge Planning Board. I understand the revised plan will be resubmitted to the Planning Board for the Town of Sturbridge, Massachusetts for approval.

In reviewing these two plans, I have concluded that the new layout is identical to the previously approved plan, except for the site of the proposed restaurant as compared to the previously approved bank. Essentially, the new plan calls for a 5,000 square feet (sf) restaurant in the place of a previously approved 3,775-sf bank with drive-through windows. The new 5,000-sf building will be used to house a high turn-over (sit-down) restaurant. This building will also have a small outdoor seating area. The attached drawing shows the location and the size of the 5,000-sf building. To evaluate the impacts of the revised building size and land use on the area, the following factors were examined in detail.

- The internal traffic circulation relative to the proposed 5,000-sf high turn-over restaurant.
- Trip generation related to the proposed high turn-over restaurant compared with the approved bank land use.
- Capacity analysis to determine the impact of the proposed restaurant compared to the approved bank.

**Internal Traffic Circulation:** As stated herein above, the proposed restaurant will be a high turn-over (sit-down) restaurant with a seating capacity of 192 and a total of 65 parking spaces. A pedestrian walk path will allow for pedestrian activities between the proposed restaurant and other uses across the driveway via a crosswalk.

There is a crosswalk to serve pedestrian traffic by connecting the restaurant area to the retail area including the location of Panara Bread, approximately a 200' walk. Although minimal pedestrian traffic is anticipated to use this pedestrian crossing, it is intended to provide a designated safe crossing zone. A stop sign and a stop bar are installed approximately 5' in advance of the proposed crosswalk for the existing crosswalk located across from the Panera Bread drive-through lane. This provides optimal safety when pedestrians intend to cross or are present in the crosswalk.

The revised site plan includes a larger restaurant building consisting of a 5,000-sf high turn-over restaurant in place of a 3,775-sf bank with drive-through windows. This trip generation data for this restaurant is then compared with trip generation data for the previously approved bank based on the latest ITE *Trip Generation Manual*. The ITE Trip Generation reference provided trip generation data for both land uses in the original traffic impact study. The restaurant land use was substituted for the previously approved bank for morning and afternoon peak hour trips to reflect the changes in trips associated with the new restaurant.

**Trip Generation:** The latest Institute of Transportation Engineers (ITE) *Trip Generation Manual* was used to project trips to and from the site during both AM and PM peak periods for both site plans, the plan included the previously approved 3,775-sf bank, and the plan with the proposed 5,000-sf restaurant. The following Table 1 shows trip generation relationships that were used to calculate the number of new morning and afternoon peak hour trips associated with the proposed high turn-over restaurant.

**Table 1 Trip Generation For 5,000-sf High Turn-Over Restaurant**

High Turn-Over Restaurant (5,000 Sf)		Total	In	Out
Morning Peak Hour	9.94 Trips Per 1,000 SF	50	27	23
Afternoon Peak Hour	9.77 Trips Per 1,000 SF	49	30	19

The following Table 2 shows the traffic associated with 3,775-sf bank with drive-through windows.

**Table 2 Trip Generation for 3,775-sf Bank with Drive-through window**

Drive-In Bank (3,775 Sf)		Total	In	Out
Morning Peak Hour	9.50 Trips Per 1,000 SF	36	21	15
Afternoon Peak Hour	20.45 Trips Per 1,000 SF	77	38	39

The following Table 3 depicts the trip generation associated with all land uses within the site when replacing the 3,775-sf bank with the proposed 5,000-sf high turn-over restaurant. A computer printout of the trip generation data statistics is attached hereto.

**Table 3 Trip Generation for the entire site**

77 Room Hotel		Total	In	Out
Morning Peak Hour	0.62 Trips Per Room	55	32	23
Afternoon Peak Hour	0.73 Trips Per Room	56	27	29

Quality Restaurant (2,400 SF)		Total	In	Out
Morning Peak Hour	0.73 Trips Per 1,000 SF	2	1	1
Afternoon Peak Hour	7.80 Trips Per 1,000 SF	19	13	6

Panera Bread Restaurant (4,200 SF)		Total	In	Out
Morning Peak Hour	1.0 Trips Pr 1,000 SF	4	2	2
Afternoon Peak Hour	9.2i Trips Per 1,000 SF	37	19	18

High Turn-Over Restaurant (5,000 Sf)		Total	In	Out
Morning Peak Hour	9.94 Trips Per 1,000 SF	50	27	23
Afternoon Peak Hour	9.77 Trips Per 1,000 SF	49	30	19

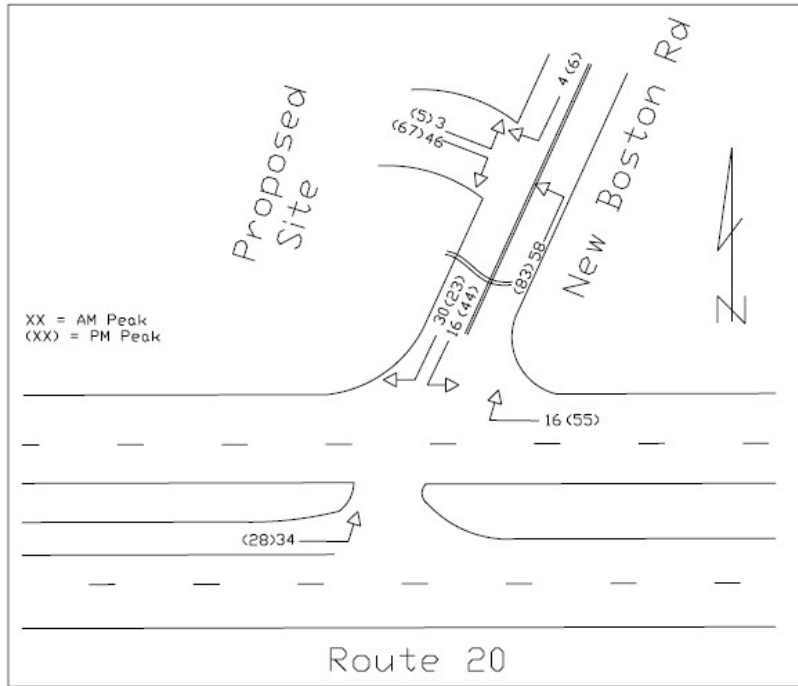
  

Morning Peak Hour	Total	111	62	49
Afternoon Peak Hour	Total	161	89	72

The new trip generation data were used to evaluate intersection capacity analyses in order to determine Levels Of Service (LOS) for both the intersections of New Boston Road with Route 20 and the site driveway.

As seen in the above tables, the total trips associated with the revised site plan that includes a high turn-over restaurant is higher by only 14 one-way trips or 14%, or further broken down into 6 vehicles during morning peak and 8 vehicle trips during afternoon/critical peak hours. This translates into 62 trips arriving at the site during AM peak period instead of 56 trips under the previously approved site plan, and 49 trips will be exiting the site instead of 41 trips under the previously approved site plan. Similarly, during PM peak period, a total of 89 vehicles will be arriving at the site, compared to 97 trips under the previously approved site plan, or 15% less trips. Also, during PM peak, a total of 72 vehicles will be exiting the site compared to 92 trips for the previously approved plan, or a reduction of 15% in trips. The following figure 1 shows trip distribution along Route 20 and New Boston Road.

Figure 1  
Trip Generation and Distribution for the proposed Restaurant and the rest of the land uses



**Capacity Analyses:** The above data were used to reanalyze the intersections of New Boston Road with Route 20 and the site driveway. Due to the reductions in traffic volumes caused by the Covid-19 pandemic, taking new traffic counts in 2021 may undercount the current traffic conditions. To perform these analyses, the turning movement data from the original traffic study were used. However, the peak hour traffic counts from the original traffic study were adjusted to pre-Covid-19 condition.

A more concise method is using the *massDOT* guidance as prescribed in an engineering directive. The *massDOT* Yearly Growth Rates data from 2014-2019 are shown in the attachment. The growth rates go back to 2014, and therefore, the rates were averaged and then expanded to an eight-year period to adjust for the Covid-19 pandemic. The average annual growth rate was calculated at 0.0034. This rate was multiplied by eight to get the total increased rate of 0.0272 for the Covid-19 adjustment. Therefore, the turning movement counts from the original traffic study were increased by a factor of 0.0272. Again, as per *massDOT* guidance, this increase also accounts for all future traffic from any other additional developments that may take place in the general area of the proposed development site. The turning movement counts from the original traffic study are shown in Figure 2 below. The COVID adjusted peak hour turning movement counts are shown in the following Figure 3.

Figure 2 - Turning Movement Counts from Original Traffic Study

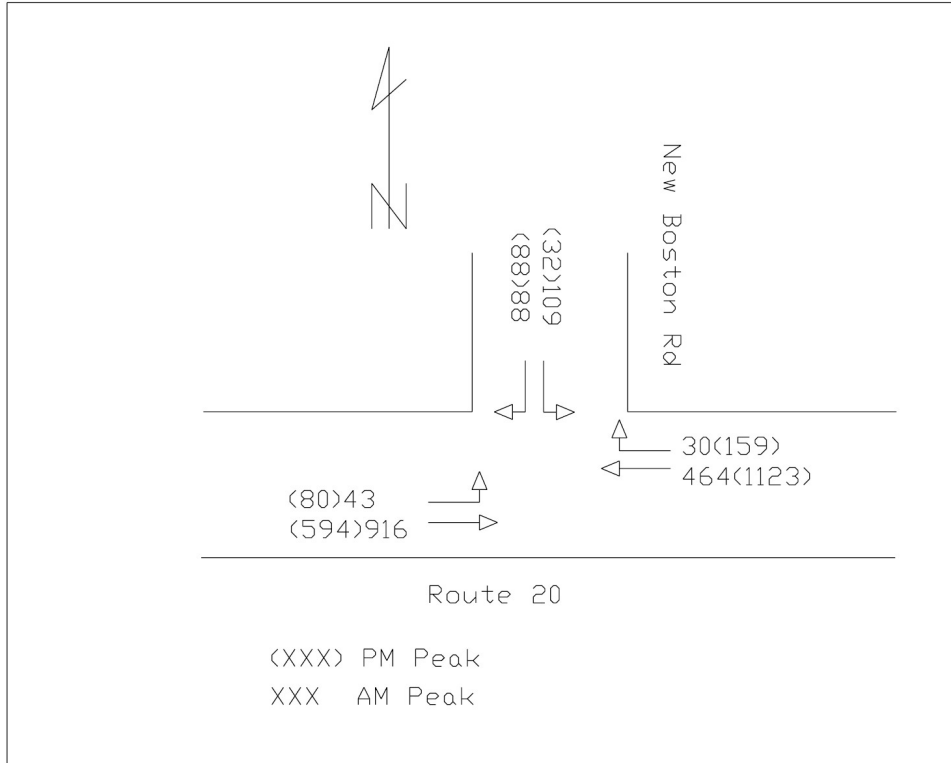
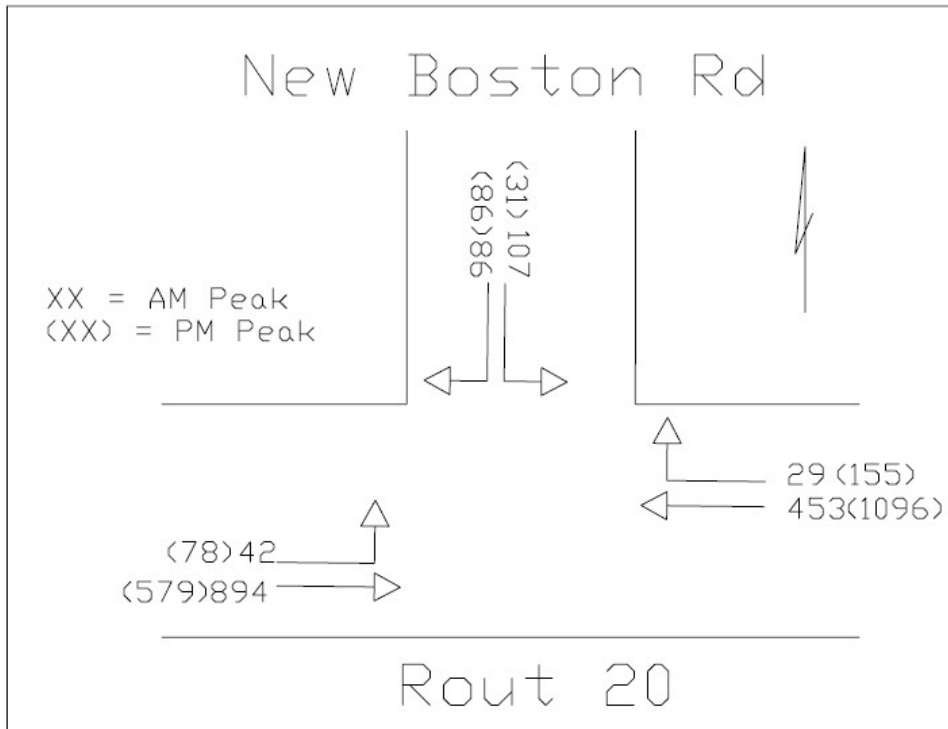
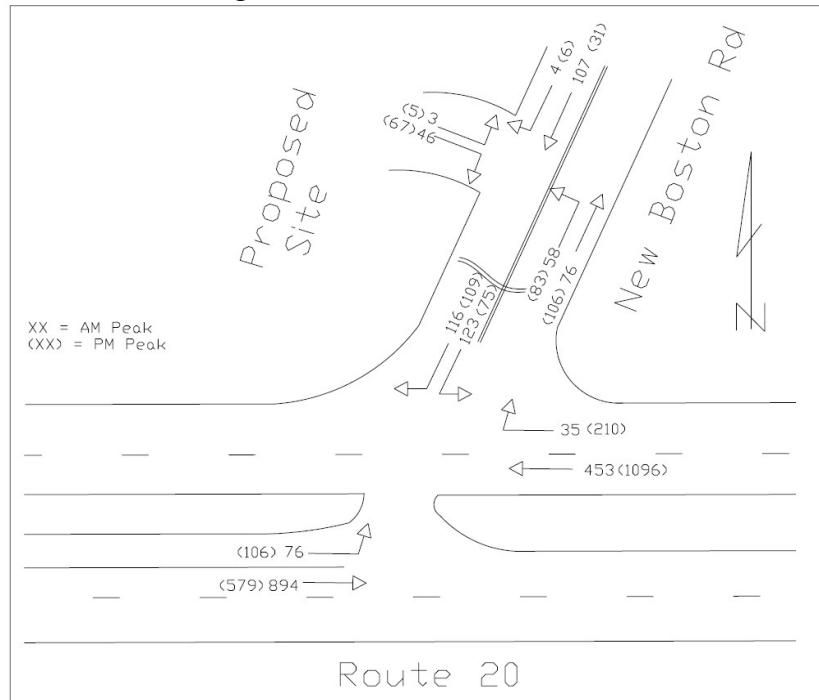


Figure 3 – COVID Adjusted Turning Movement Counts



The new trip generation data were added to the adjusted turning movement counts to reflect full development conditions that includes the traffic from the proposed restaurant and all other land uses at the site. The following Figure 4 shows traffic through these intersections which includes adjusted turning movement counts plus trips from all land uses, also called build condition.

Figure 4 – Build Condition Traffic



The capacity analysis showed that the intersections of New Boston Road with both Route 20 and the site driveway will be operating at approximately the same as the values presented in the original traffic study. The eastbound traffic from Route 20 will be operating at Level Of Service (LOS) "A" during morning and LOS "C" during afternoon peak periods. The southbound approach traffic from New Boston Road is expected to operate at LOS "B" during AM and LOS "F" during afternoon peak periods. Table 4 below shows the resulting capacity analysis, and a copy of the analysis sheets is attached hereto. It should be noted that the LOS "F" was calculated for the southbound approach in the original traffic study compared to LOS "B" under the new conditions that include a 5,000-sf high turn-over restaurant. The reason being, the original study evaluated a one-lane approach for the southbound direction, whereas it now has two lanes, one for left-turn and one for right-turn movements.

The eastbound left-turn lane of Route 20 will be operating at LOS "F" during afternoon peak hour with the new restaurant in place of a previously approved bank, which is similar to LOS "F" that was calculated in the original traffic study.

Table 4 – Capacity Analysis

Rt 29 at New Boston Rd

From Original Report			Based on New 5,000 sf Restaurant	
Intersection	AM Pk		Average	Level of
Critical	Average	Level of	Delay	Service
Movement	Delay	Service	Delay	Service
EB Left Turn	8.9	A	8.8	A
SB Left Turn	73.7*	F*	11.4	B
*At that time, SB approach had only one lane				
PM Peak				
EB Left Turn	18.3	C	16.9	C
SB Left Turn	300+	F	260.9	F

New Boston Rd at Driveway

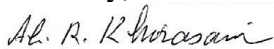
From Original Report			Based on New 5,000 sf Restaurant	
AM Pk				
EB Left Turn	9.7	A	9.4	A
NB Left Turn	7.8	A	3.6	A
PM Pk				
EB Left Turn	9.8	A	9	A
NB Left Turn	7.7	A	3.6	A

Therefore, as shown in Tables 1 & 2, a high turn-over restaurant will generate 57% less traffic than a 3,775-sf bank during afternoon peak hour (critical peak), and only 28% more traffic during morning peak hour. It should also be noted that the afternoon peak hour is the critical peak since traffic volumes on the roadway area network are greater during that period.

In conclusion, it is my opinion that the traffic associated with proposed high turn-over restaurant in the revised site plan is not significantly different from that associated with the previously approved bank with drive through windows. The local area roadway network has the capacity to safely and efficiently accommodate the 14 additional trips which will be generated by the proposed restaurant during morning peak hour.

I trust the above evaluation will suffice. However, please feel free to contact me should you have any questions or need additional information.

Sincerely,



Ali R. Khorasani, P.E.

Attachments







**DATA STATISTICS**

**Land Use:**  
High-Turnover (Sit-Down) Restaurant (932)  
[Click for more details](#)

**Independent Variable:**  
1000 Sq. Ft. GFA

**Time Period:**  
Weekday  
Peak Hour of Adjacent Street Traffic  
One Hour Between 7 and 9 a.m.

**Setting/Location:**  
General Urban/Suburban

**Trip Type:**  
Vehicle

**Number of Studies:**  
39

**Avg. 1000 Sq. Ft. GFA:**  
5

**Average Rate:**  
9.94

**Range of Rates:**  
0.76 - 102.39

**Standard Deviation:**  
11.33

**Fitted Curve Equation:**  
Not Given

**R<sup>2</sup>:**  
\*\*\*\*

**Directional Distribution:**  
55% entering, 45% exiting

**Calculated Trip Ends:**  
Average Rate: 50 (Total), 27 (Entry), 23 (Exit)

**DATA STATISTICS**

**Land Use:**  
High-Turnover (Sit-Down) Restaurant (932)  
[Click for more details](#)

**Independent Variable:**  
1000 Sq. Ft. GFA

**Time Period:**  
Weekday  
Peak Hour of Adjacent Street Traffic  
One Hour Between 4 and 6 p.m.

**Setting/Location:**  
General Urban/Suburban

**Trip Type:**  
Vehicle

**Number of Studies:**  
107

**Avg. 1000 Sq. Ft. GFA:**  
6

**Average Rate:**  
9.77

**Range of Rates:**  
0.92 - 62.00

**Standard Deviation:**  
7.37

**Fitted Curve Equation:**  
Not Given

**R<sup>2</sup>:**  
\*\*\*\*

**Directional Distribution:**  
62% entering, 38% exiting

**Calculated Trip Ends:**  
Average Rate: 49 (Total), 30 (Entry), 19 (Exit)

**DATA STATISTICS**

<b>Land Use:</b>
High-Turnover (Sit-Down) Restaurant (932) <a href="#">Click for more details</a>
<b>Independent Variable:</b>
Seats
<b>Time Period:</b>
Weekday Peak Hour of Adjacent Street Traffic One Hour Between 7 and 9 a.m.
<b>Setting/Location:</b>
General Urban/Suburban
<b>Trip Type:</b>
Vehicle
<b>Number of Studies:</b>
9
<b>Avg. Num. of Seats:</b>
155
<b>Average Rate:</b>
0.48
<b>Range of Rates:</b>
0.30 - 0.76
<b>Standard Deviation:</b>
0.15
<b>Fitted Curve Equation:</b>
Not Given
<b>R<sup>2</sup>:</b>
****
<b>Directional Distribution:</b>
52% entering, 48% exiting
<b>Calculated Trip Ends:</b>
Average Rate: 92 (Total), 48 (Entry), 44 (Exit)

**DATA STATISTICS**

<b>Land Use:</b>
High-Turnover (Sit-Down) Restaurant (932) <a href="#">Click for more details</a>
<b>Independent Variable:</b>
Seats
<b>Time Period:</b>
Weekday Peak Hour of Adjacent Street Traffic One Hour Between 4 and 6 p.m.
<b>Setting/Location:</b>
General Urban/Suburban
<b>Trip Type:</b>
Vehicle
<b>Number of Studies:</b>
16
<b>Avg. Num. of Seats:</b>
142
<b>Average Rate:</b>
0.42
<b>Range of Rates:</b>
0.16 - 1.73
<b>Standard Deviation:</b>
0.37
<b>Fitted Curve Equation:</b>
Not Given
<b>R<sup>2</sup>:</b>
****
<b>Directional Distribution:</b>
57% entering, 43% exiting
<b>Calculated Trip Ends:</b>
Average Rate: 81 (Total), 46 (Entry), 35 (Exit)

**DATA STATISTICS**

<b>Land Use:</b>
Hotel (310) <a href="#">Click for more details</a>
<b>Independent Variable:</b>
Occupied Rooms
<b>Time Period:</b>
Weekday Peak Hour of Adjacent Street Traffic One Hour Between 7 and 9 a.m.
<b>Setting/Location:</b>
General Urban/Suburban
<b>Trip Type:</b>
Vehicle
<b>Number of Studies:</b>
12
<b>Avg. Num. of Occupied Rooms:</b>
242
<b>Average Rate:</b>
0.62
<b>Range of Rates:</b>
0.36 - 1.10
<b>Standard Deviation:</b>
0.20
<b>Fitted Curve Equation:</b>
$\ln(T) = 0.87 \ln(X) + 0.22$
<b>R<sup>2</sup>:</b>
0.54
<b>Directional Distribution:</b>
58% entering, 42% exiting
<b>Calculated Trip Ends:</b>
Average Rate: 48 (Total), 28 (Entry), 20 (Exit) Fitted Curve: 55 (Total), 32 (Entry), 23 (Exit)

**DATA STATISTICS**

<b>Land Use:</b>
Hotel (310) <a href="#">Click for more details</a>
<b>Independent Variable:</b>
Occupied Rooms
<b>Time Period:</b>
Weekday Peak Hour of Adjacent Street Traffic One Hour Between 4 and 6 p.m.
<b>Setting/Location:</b>
General Urban/Suburban
<b>Trip Type:</b>
Vehicle
<b>Number of Studies:</b>
15
<b>Avg. Num. of Occupied Rooms:</b>
231
<b>Average Rate:</b>
0.73
<b>Range of Rates:</b>
0.37 - 1.11
<b>Standard Deviation:</b>
0.22
<b>Fitted Curve Equation:</b>
$T = 0.73(X) - 0.49$
<b>R<sup>2</sup>:</b>
0.59
<b>Directional Distribution:</b>
49% entering, 51% exiting
<b>Calculated Trip Ends:</b>
Average Rate: 56 (Total), 27 (Entry), 29 (Exit) Fitted Curve: 56 (Total), 27 (Entry), 29 (Exit)



**DATA STATISTICS**

<b>Land Use:</b>
Quality Restaurant (931) <a href="#">Click for more details</a>
<b>Independent Variable:</b>
1000 Sq. Ft. GFA
<b>Time Period:</b>
Weekday Peak Hour of Adjacent Street Traffic One Hour Between 7 and 9 a.m.
<b>Setting/Location:</b>
General Urban/Suburban
<b>Trip Type:</b>
Vehicle
<b>Number of Studies:</b>
7
<b>Avg. 1000 Sq. Ft. GFA:</b>
10
<b>Average Rate:</b>
0.73
<b>Range of Rates:</b>
0.25 - 1.60
<b>Standard Deviation:</b>
0.42
<b>Fitted Curve Equation:</b>
Not Given
<b>R<sup>2</sup>:</b>
****
<b>Directional Distribution:</b>
Not available
<b>Calculated Trip Ends:</b>
Average Rate: 2 (Total)

**DATA STATISTICS**

<b>Land Use:</b>
Quality Restaurant (931) <a href="#">Click for more details</a>
<b>Independent Variable:</b>
1000 Sq. Ft. GFA
<b>Time Period:</b>
Weekday Peak Hour of Adjacent Street Traffic One Hour Between 4 and 6 p.m.
<b>Setting/Location:</b>
General Urban/Suburban
<b>Trip Type:</b>
Vehicle
<b>Number of Studies:</b>
19
<b>Avg. 1000 Sq. Ft. GFA:</b>
9
<b>Average Rate:</b>
7.80
<b>Range of Rates:</b>
2.62 - 18.68
<b>Standard Deviation:</b>
4.49
<b>Fitted Curve Equation:</b>
Not Given
<b>R<sup>2</sup>:</b>
****
<b>Directional Distribution:</b>
67% entering, 33% exiting
<b>Calculated Trip Ends:</b>
Average Rate: 19 (Total), 13 (Entry), 6 (Exit)

**DATA STATISTICS**

<b>Land Use:</b>
Drive-in Bank (912) <a href="#">Click for more details</a>
<b>Independent Variable:</b>
1000 Sq. Ft. GFA
<b>Time Period:</b>
Weekday Peak Hour of Adjacent Street Traffic One Hour Between 7 and 9 a.m.
<b>Setting/Location:</b>
General Urban/Suburban
<b>Trip Type:</b>
Vehicle
<b>Number of Studies:</b>
46
<b>Avg. 1000 Sq. Ft. GFA:</b>
5
<b>Average Rate:</b>
9.50
<b>Range of Rates:</b>
0.89 - 29.47
<b>Standard Deviation:</b>
5.85
<b>Fitted Curve Equation:</b>
Not Given
<b>R<sup>2</sup>:</b>
****
<b>Directional Distribution:</b>
58% entering, 42% exiting
<b>Calculated Trip Ends:</b>
Average Rate: 36 (Total), 21 (Entry), 15 (Exit)

**DATA STATISTICS**

<b>Land Use:</b>
Drive-in Bank (912) <a href="#">Click for more details</a>
<b>Independent Variable:</b>
1000 Sq. Ft. GFA
<b>Time Period:</b>
Weekday Peak Hour of Adjacent Street Traffic One Hour Between 4 and 6 p.m.
<b>Setting/Location:</b>
General Urban/Suburban
<b>Trip Type:</b>
Vehicle
<b>Number of Studies:</b>
115
<b>Avg. 1000 Sq. Ft. GFA:</b>
4
<b>Average Rate:</b>
20.45
<b>Range of Rates:</b>
3.04 - 109.91
<b>Standard Deviation:</b>
15.01
<b>Fitted Curve Equation:</b>
Not Given
<b>R<sup>2</sup>:</b>
****
<b>Directional Distribution:</b>
50% entering, 50% exiting
<b>Calculated Trip Ends:</b>
Average Rate: 77 (Total), 38 (Entry), 39 (Exit)

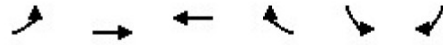
### MassDOT Yearly Growth Rates

Data from 2014 to 2018

Growth Factors					
Group	Grow 2014 to 2015	Grow 2015 to 2016	Grow 2016 to 2017	Grow 2017 to 2018	Grow 2018 to 2019
R1	0	0.023	0.004	0.018	0.016
R2	0.05	0.068	0.004	0.014	0.014
R3	-0.038	0.002	0.008	0.011	0.06
R4-7	-0.01	0.003	0.001	0.011	0.012
Rec - East		0.032	0.02	0.041	0.025
Rec - West		0.051	-0.008	0.029	0
U1-Boston	0.061	0.07	-0.003	0.012	0.006
U1-Essex	0.024	0.025	0.007	0.014	0.011
U1-Southeast	0.05	0.062	0.021	0.014	0
U1-West	0.03	-0.027	0.02	0.028	0.013
U1-Worcester	0.042	0.005	0.018	0.01	0.01
U2	0.04	0.048	0.008	0.01	0.02
U3	0.011	0.013	0.011	0.014	0.004
U4-7	0.023	0.062	0.017	0.003	-0.004

updated  
 5/1/2020

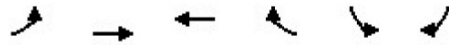
Rt 20 at New Boston Road AM Peak New High Turn-Over Restaurant



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	76	894	453	35	123	116
Peak Hour Factor	0.90	0.91	0.94	0.68	0.74	0.67
Hourly flow rate (veh/h)	84	982	482	51	166	173
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						7
Median type					None	
Median storage veh						
vC, conflicting volume	533				1168	267
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				3	76
cM capacity (veh/h)	1030				171	731
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	84	491	491	321	212	339
Volume Left	84	0	0	0	0	166
Volume Right	0	0	0	0	51	173
cSH	1030	1700	1700	1700	1700	903
Volume to Capacity	0.08	0.29	0.29	0.19	0.12	0.38
Queue Length (ft)	7	0	0	0	0	44
Control Delay (s)	8.8	0.0	0.0	0.0	0.0	11.4
Lane LOS	A					B
Approach Delay (s)	0.7			0.0		11.4
Approach LOS						B
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			43.0%		ICU Level of Service	A



Rt 20 at New Boston Road PM Peak New High Turn-Over Restaurant



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	106	579	1096	210	75	109
Peak Hour Factor	0.77	0.90	0.89	0.75	0.80	0.79
Hourly flow rate (veh/h)	138	643	1231	280	94	138
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						7
Median type					None	
Median storage veh						
vC, conflicting volume	1511				1968	756
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	69				0	61
cM capacity (veh/h)	438				38	351
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	138	322	322	821	690	232
Volume Left	138	0	0	0	0	94
Volume Right	0	0	0	0	280	138
cSH	438	1700	1700	1700	1700	166
Volume to Capacity	0.31	0.19	0.19	0.48	0.41	1.39
Queue Length (ft)	33	0	0	0	0	356
Control Delay (s)	16.9	0.0	0.0	0.0	0.0	260.9
Lane LOS	C					F
Approach Delay (s)	3.0			0.0		260.9
Approach LOS						F
Intersection Summary						
Average Delay			24.9			
Intersection Capacity Utilization			65.8%		ICU Level of Service	B

New Boston Road at Site Driveway AM Peak New High Turn-Over Restaurant



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↕	↕	
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	3	46	58	76	107	4
Peak Hour Factor	0.92	0.92	0.68	0.68	0.74	0.67
Hourly flow rate (veh/h)	3	50	85	112	145	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
vC, conflicting volume	430	148	151			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	94	94			
cM capacity (veh/h)	547	899	1431			
<b>Direction, Lane #</b>						
	EB 1	NB 1	SB 1			
Volume Total	53	197	151			
Volume Left	3	85	0			
Volume Right	50	0	6			
cSH	865	1431	1700			
Volume to Capacity	0.06	0.06	0.09			
Queue Length (ft)	5	5	0			
Control Delay (s)	9.4	3.6	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.4	3.6	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			3.0			
Intersection Capacity Utilization			31.9%	ICU Level of Service	A	

New Boston Road at Site Driveway PM Peak New High Turn-Over Restaurant



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	5	67	83	106	31	6
Peak Hour Factor	0.92	0.92	0.75	0.75	0.80	0.80
Hourly flow rate (veh/h)	5	73	111	141	39	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
vC, conflicting volume	405	42	46			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	93	93			
cM capacity (veh/h)	559	1028	1561			
<b>Direction, Lane #</b>						
	EB 1	NB 1	SB 1			
Volume Total	78	252	46			
Volume Left	5	111	0			
Volume Right	73	0	8			
cSH	971	1561	1700			
Volume to Capacity	0.08	0.07	0.03			
Queue Length (ft)	7	6	0			
Control Delay (s)	9.0	3.6	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.0	3.6	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			4.3			
Intersection Capacity Utilization			31.7%	ICU Level of Service	A	