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## MEMORANDUM

**To:** RADKE, LLC  
**From:** Corinne Tobias, PE, PTOE  
William J. Scully, P.E.  
**Date:** April 27, 2020  
**Project Name:** Proposed Residential Development in Walpole  
**Project Number:** Green No. 19113  
**Subject:** Traffic Assessment for Proposed Residential Development

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Green has prepared this traffic assessment the proposed Walpole 40B Residential Development project located near 270 Moose Hill Road, Walpole, MA. The development consists of 4 townhouses comprising of 8 residential units and developed by RADKE, LLC. A limited assessment is provided in accordance with the current requirements of the Board of Appeals given that this project includes less than 20 residential units.

Access to and from the proposed project is to be provided by a site driveway at 270 Moose Hill Road to the west. Land use within the project area is primarily residential with some open forest land near the northern outskirts of the project. The project location is shown in Figure 1 with respect to the surrounding area. This assessment includes:

- A summary of the existing characteristics of the abutting roadway network
- A summary of existing volumes near the project site
- Trip generation projections for the proposed residential development
- Sight distance analysis at the proposed site access driveway locations

**Figure 1 - Overall Project Area**



## EXISTING ROADWAY NETWORK

The assessment focused on the roadway network in the vicinity of the proposed project with an emphasis on the proposed site access driveway locations. As part of this assessment, a field reconnaissance was conducted to verify the physical and geometric layout of the study area roadways and to observe traffic operations in the study area. A description of the study roadways serving the project site is as follows:

### ***Moose Hill Road***

Moose Hill Road is functionally classified as a Local Road that is owned and maintained by the town of Walpole. It is generally oriented in the north-south direction. Throughout the study area, Moose Hill Road operates as a two-lane, two-way roadway accommodating northbound and southbound vehicles. The total width of the roadway is approximately 22 feet next to the proposed site driveway. There are no markings for shoulders or centerlines along this stretch of roadway. There are no pedestrian or bicycle accommodations along this roadway within the project area. The surrounding land use(s) is primarily residential with some open land/forests on the outskirts. The speed limit for Moose Hill Road is 30 MPH.



*Moose Hill Road looking north*

### ***Moose Hill Road at Cricket Lane***



*Moose Hill Road at Cricket Lane,  
Looking north from Moose Hill Road*

Moose Hill Road and Cricket Lane form an unsignalized T-intersection. Plymouth Street operates freely as the North-South leg, while Cricket Lane operates stop-controlled as the minor westbound approach. The approaches of this intersection are at approximately 90 degrees of each other, along with a slight grade at the northbound approach. The only pedestrian accommodation is the sidewalk along the south side of Cricket Lane that includes a curb ramp at the intersection approach.

### ***Moose Hill Road at Proposed Site Driveway***

At this proposed 'T'-type intersection, Moose Hill Road forms the North-South legs, while the Site Driveway forms the east leg. The proposed site driveway is expected to operate under STOP controlled and should be signed and marked accordingly. The County Street approaches are expected to operate freely at this intersection. The proposed travel way for the site driveway is approximately 26 feet wide.



*Moose Hill Road at Proposed Site  
Driveway, looking from west*

**EXISTING TRAFFIC VOLUMES**

As part of this study, traffic volume data for the study intersections were obtained and used to form the basis of the traffic analysis. Data collected for the study intersections and roadway segments consisted of weekday peak periods (7:00-9:00 AM and 4:00-6:00 PM). Manual turning movement counts (TMC) were collected on January 15<sup>th</sup>, 2020 for the Moose Hill Road and Cricket Lane intersection that abuts the development site. The count program was conducted on January 15<sup>th</sup>, 2020 and also included 48-hour vehicle counts on Moose Hill Road (north of Cricket Lane) using Automatic Traffic Recorders (ATR's). The complete TMC and ATR data collected as a part of this study are included in the Appendix.

Table 1 summarizes the ATR and TMC data that was collected as part of this study. As indicated, the weekday average daily traffic (ADT) volumes on Moose Hill Road was approximately 402 vehicles per day (vpd). On Moose Hill Road the morning peak hour traffic volumes represent approximately 11.6% and 8.0% of daily traffic in the morning and afternoon peak hours, respectively. During the morning peak hour approximately 89% of traffic on Moose Hill Road travels northbound. The afternoon peak hour approximately 53% of the traffic flows in the southbound direction. As can be seen, even following the development of the major apartment complex that abuts the site of the proposed development, Moose Hill Road continues to be a low volume roadway.

**Table 1 – Summary of Moose Hill Road Traffic Volumes**

2020 Existing Conditions	Weekday Average	AM Peak Hour	PM Peak Hour
Automatic Traffic Recorders			
Time Period	Daily	7:15-8:15	3:15-4:15
Traffic Volume	402	47	32
K-Factor	-	11.57%	7.96%
Directional Distribution	65.8% NB	89.2% NB	53.1% SB
Average Speed	28 MPH NB / 26 MPH SB		
85th % Speed	32 MPH NB / 30 MPH SB		
<u>Abbreviations:</u> vpd = volume per day vph = volume per hour EB = Eastbound WB = Westbound NB = Northbound SB = Southbound	<u>Notes:</u> K-Factor = Percent of daily traffic that occurs during the peak hour 85th % Speed = 85th percentile speed Volumes are rounded, based on ATR data (Month xx-xx), unadjusted		

**PROPOSED PROJECT SITE CHARACTERISTICS**

The proposed development project consists of a total of 8 units of housing within 4 duplex buildings. The development is set to be constructed at the address of 270 Moose Hill Road, with one proposed driveway to access Moose Hill Road to form a T-intersection. The proposed site plan for the project is included in the

Appendix. The site plan access was reviewed with respect to safety. In addition, the drive was reviewed in terms of fire apparatus maneuvering and input was provided to the site designer.

**SITE GENERATED TRAFFIC**

In order to estimate the number of trips that could be generated by the proposed development, statistics published by the Institute of Transportation Engineers (ITE) in Trip Generation Manual<sup>1</sup> for similar land uses were examined. Based on a review of the ITE database, Land Use Code (LUC) 210 – Single Family Detach Housing, while somewhat conservative, has been selected to forecast traffic for the proposed residential units.

In summary, the proposed project is expected to generate a total of approximately 102 net new vehicle trips over the course of an average weekday including 51 entering trips and 51 exiting trips. On a typical weekday morning peak hour, the proposed development is expected to generate a total of 11 vehicle trips, including 3 entering and 8 exiting trips. During the average weekday afternoon peak hour, the proposed development is expected to generate approximately 9 vehicle trips with 6 entering and 3 exiting trips.

Table 2 summarizes the trip generation calculations. The trip generation worksheets are provided in the Appendix.

**Table 2 – Summary of Project Trip Generation**

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour			Weekday Daily		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Residential Housing (8 units)	3	8	11	6	3	9	51	51	102

**SIGHT DISTANCE EVALUATION**

Adequate sight distance is an important safety consideration at intersections and driveways. Stopping and Intersection Sight distances were reviewed at the proposed site drive location.

The minimum criteria are defined by the American Association of State and Highway and Transportation Officials (AASHTO)<sup>2</sup>. SSD relates specifically to safety. As indicated by AASHTO, if the available ISD meets or exceeds the minimum SSD criteria, then there is adequate safe sight distance available for motorists to avoid collisions.

The posted speed limit on Moose Hill Road is 30 mph in the vicinity of the project site. Mean average speeds on Moose Hill Road between north of Cricket Lane were observed to be 27 mph in each direction while the 85<sup>th</sup> percentile speeds on Moose Hill Road were observed to be 31 mph in each direction. To be somewhat conservative, travel speeds of 35 mph and 30 mph were used in the sight distance analysis for the proposed site driveway intersection with Moose Hill Road. It should also be noted that there is a 4% upgrade on Moose Hill Road south of Cricket Lane, which decreases the required sight distance for the northbound direction. The actual SSD and ISD available were measured in the field on Moose Hill Road in relation to the proposed

<sup>1</sup> Institute of Transportation Engineers, Trip Generation Manual, 10<sup>th</sup> Edition, Washington, D.C., September 2017.

<sup>2</sup> American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Streets, (Green Book) Washington, D.C., 2018.

site driveway and compared the measured distances to the AASHTO minimum and desirable distances. Table 3 summarizes the results of the evaluation. As indicated in Table 3, the SSD and ISD substantially exceeds the minimum sight distances under both the posted speed limit of 30 mph and 85<sup>th</sup> percentile speed of 35 mph.

**Table 3 – Summary of Sight Distance Analysis: 270 Moose Hill Road**

MOOSE HILL ROAD-SITE DRIVEWAY	MEASURED (FT)	SIGHT DISTANCE		SIGHT DISTANCE	
		POSTED SPEED LIMIT (30 MPH)		85TH %-ILE SPEED (35 MPH)	
		MINIMUM REQUIRED (FT)	DESIRABLE REQUIRED (FT)	MINIMUM REQUIRED (FT)	DESIRABLE REQUIRED (FT)
<b>STOPPING SIGHT DISTANCE</b>					
Moose Hill Road Northbound	350	195*	-	235*	-
Moose Hill Road Southbound	500	200	-	250	-
<b>INTERSECTION SIGHT DISTANCE</b>					
Site Drive, looking south (Moose Hill Road NB traffic)	350	195*	335	235*	390
Site Drive, looking north (Moose Hill Road SB traffic)	500	200	335	250	350

\* NOTE: Value adjusted to account for 4% upgrade

**CONCLUSIONS AND RECOMMENDATIONS**

As has been demonstrated and described in the above sections, the proposed project comprising of 8 residential units will be a low generator of additional traffic and with Moose Hill Road currently experiencing a low volume of traffic, it is expected that the proposed project will easily be accommodated. A review of the visibility showed that more than adequate sight distances will be available to provide safe access and egress conditions. That said, several recommendations have been made in relation to the site drive as follows:

- The site drive should be STOP sign controlled with appropriate markings and the sign compliant with MUTCD requirements,
- Landscaping and project signage in the vicinity of the proposed site drive approach to Moose Hill Road should be set back and low lying so as not to create obstructions to sight distances.

## Appendix

Traffic Volumes  
Trip Generation Calculations



Moosehill Road  
north of Cricket Lane  
City, State: Walpole, MA  
Client: Green International/ C. Tobias  
Site Code: TBA



PDI File #: 207390 ATR-A

Count Date:  
Wednesday, January 15, 2020

**Volume**

NB					SB					Combined							
Start Time:	15 min	60 min	15 min	60 min	Start Time:	15 min	60 min	15 min	60 min	Start Time:	15 min	60 min	15 min	60 min			
12:00 AM	0		12:00 PM	7	12:00 AM	0		12:00 PM	2	12:00 AM	0		12:00 PM	9			
12:15 AM	0		12:15 PM	6	12:15 AM	0		12:15 PM	1	12:15 AM	0		12:15 PM	7			
12:30 AM	1		12:30 PM	10	12:30 AM	0		12:30 PM	4	12:30 AM	1		12:30 PM	14			
12:45 AM	0	1	12:45 PM	5	28	12:45 AM	0	0	12:45 PM	3	10	12:45 AM	0	1	12:45 PM	8	38
1:00 AM	0		1:00 PM	4		1:00 AM	0		1:00 PM	2		1:00 AM	0		1:00 PM	6	
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2:00 AM	0		2:00 PM	3		2:00 AM	0		2:00 PM	1		2:00 AM	0		2:00 PM	4	
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2:30 AM	0		2:30 PM	4		2:30 AM	0		2:30 PM	0		2:30 AM	0		2:30 PM	4	
2:45 AM	0	0	2:45 PM	2	10	2:45 AM	0	0	2:45 PM	4	7	2:45 AM	0	0	2:45 PM	6	17
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Total	135		133		Total	46		90		Total	181		223				
Percent	50.37%		49.63%		Percent	33.82%		66.18%		Percent	44.80%		55.20%				
Day Total			268		Day Total			136		Day Total			404				
Peak Hour	7:15 AM		12:00 PM		Peak Hour	8:00 AM		3:15 PM		Peak Hour	7:15 AM		12:00 PM				
Volume	42		28		Volume	14		19		Volume	50		38				
P.H.F.	0.875		0.700		P.H.F.	0.500		0.679		P.H.F.	0.781		0.679				

Moosehill Road  
north of Cricket Lane  
City, State: Walpole, MA  
Client: Green International/ C. Tobias  
Site Code: TBA



PDI File #: 207390 ATR-A

Count Date:

Thursday, January 16, 2020

**Volume**

NB					SB					Combined							
Start Time:	15 min	60 min	15 min	60 min	Start Time:	15 min	60 min	15 min	60 min	Start Time:	15 min	60 min	15 min	60 min			
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12:15 AM	0		12:15 PM	1	12:15 AM	0		12:15 PM	0	12:15 AM	0		12:15 PM	1			
12:30 AM	1		12:30 PM	2	12:30 AM	1		12:30 PM	2	12:30 AM	2		12:30 PM	4			
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3:30 AM	0		3:30 PM	2	3:30 AM	0		3:30 PM	9	3:30 AM	0		3:30 PM	11			
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8:00 AM	10		8:00 PM	0	8:00 AM	0		8:00 PM	5	8:00 AM	10		8:00 PM	5			
8:15 AM	6		8:15 PM	2	8:15 AM	3		8:15 PM	4	8:15 AM	9		8:15 PM	6			
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11:00 AM	2		11:00 PM	0	11:00 AM	0		11:00 PM	2	11:00 AM	2		11:00 PM	2			
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11:30 AM	4		11:30 PM	2	11:30 AM	0		11:30 PM	0	11:30 AM	4		11:30 PM	2			
11:45 AM	3	11	11:45 PM	0	2	11:45 AM	1	2	11:45 PM	2	4	11:45 AM	4	13	11:45 PM	2	6
Total	138		123		Total	35		104		Total	173		227				
Percent	52.87%		47.13%		Percent	25.18%		74.82%		Percent	43.25%		56.75%				
Day Total			261		Day Total			139		Day Total			400				
Peak Hour	7:15 AM		1:45 PM		Peak Hour	8:15 AM		2:45 PM		Peak Hour	7:00 AM		1:45 PM				
Volume	41		22		Volume	12		17		Volume	43		33				
P.H.F.	0.932		0.786		P.H.F.	0.500		0.472		P.H.F.	0.896		0.750				



Moosehill Road  
north of Cricket Lane  
City, State: Walpole, MA  
Client: Green International/ C. Tobias  
Site Code: TBA  
Count Date: Wednesday, January 15, 2020



PDI File #: 207390 ATR-A

**Speed (60-minute)**

NB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 +	Total	85th %ile	Ave Speed
12:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	23.0	23.0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#####	#####
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#####	#####
3:00 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	2	30.1	28.0
4:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	23.0	23.0
5:00 AM	0	0	2	4	3	0	0	0	0	0	0	0	0	9	30.0	28.1
6:00 AM	0	0	3	12	5	1	0	0	0	0	0	0	0	21	31.0	27.4
7:00 AM	0	1	6	15	10	3	0	0	0	0	0	0	0	35	32.9	28.2
8:00 AM	0	0	5	17	4	2	0	0	0	0	0	0	0	28	30.0	27.5
9:00 AM	0	1	2	4	6	2	0	0	0	0	0	0	0	15	31.9	28.6
10:00 AM	0	0	0	3	5	0	0	0	0	0	0	0	0	8	33.0	30.8
11:00 AM	0	0	3	8	2	2	0	0	0	0	0	0	0	15	32.0	27.9
12:00 PM	0	2	8	6	6	4	1	1	0	0	0	0	0	28	35.0	29.2
1:00 PM	1	0	4	6	7	0	0	0	0	0	0	0	0	18	33.0	27.3
2:00 PM	0	2	1	5	2	0	0	0	0	0	0	0	0	10	29.7	25.1
3:00 PM	0	2	3	5	4	0	0	0	0	0	0	0	0	14	30.1	26.5
4:00 PM	0	1	2	6	1	0	0	0	0	0	0	0	0	10	29.0	25.6
5:00 PM	0	1	1	10	3	1	0	0	0	0	0	0	0	16	32.3	27.9
6:00 PM	0	1	2	2	1	0	0	0	0	0	0	0	0	6	29.5	25.7
7:00 PM	0	1	0	5	3	3	0	0	0	0	0	0	0	12	35.4	30.1
8:00 PM	0	0	0	4	0	0	0	0	0	0	0	0	0	4	27.0	26.5
9:00 PM	0	0	1	1	4	0	0	0	0	0	0	0	0	6	30.5	29.0
10:00 PM	0	0	2	2	3	0	0	0	0	0	0	0	0	7	31.2	27.4
11:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	2	33.1	31.0
Total	1	12	47	117	71	18	1	1	0	0	0	0	0	268	32.0	27.8
Percent	0.37%	4.48%	17.54%	43.66%	26.49%	6.72%	0.37%	0.37%	0.00%	0.00%	0.00%	0.00%	0.00%			
AM Peak		7:00 AM	7:00 AM	8:00 AM	7:00 AM	7:00 AM									7:00 AM	
Volume	0	1	6	17	10	3	0	0	0	0	0	0	0	35		
PM Peak	1:00 PM	12:00 PM	12:00 PM	5:00 PM	1:00 PM	12:00 PM	12:00 PM	12:00 PM								12:00 PM
Volume	1	2	8	10	7	4	1	1	0	0	0	0	0	28		

<b>15th Percentile:</b>	<b>24.0 MPH</b>	<b>Average Speed:</b>	<b>27.8 MPH</b>	<b>Posted Speed Limit:</b>	<b>30 MPH</b>
<b>50th Percentile:</b>	<b>28.0 MPH</b>	<b>10 MPH Pace:</b>	<b>24 to 33 MPH</b>	<b>Number of Vehicles &gt; 30 MPH:</b>	<b>69</b>
<b>85th Percentile:</b>	<b>32.0 MPH</b>	<b>Number in Pace:</b>	<b>204</b>	<b>Percent of Vehicles &gt; 30 MPH:</b>	<b>25.7%</b>
<b>95th Percentile:</b>	<b>35.0 MPH</b>	<b>Percent in Pace:</b>	<b>76.1%</b>		

Moosehill Road  
north of Cricket Lane  
City, State: Walpole, MA  
Client: Green International/ C. Tobias  
Site Code: TBA  
Count Date: Thursday, January 16, 2020



PDI File #: 207390 ATR-A

**Speed (60-minute)**

NB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 +	Total	85th %ile	Ave Speed
12:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	21.0	21.0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#####	#####
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#####	#####
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#####	#####
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#####	#####
5:00 AM	0	1	2	6	1	0	0	0	0	0	0	0	0	10	28.7	26.0
6:00 AM	0	0	6	11	6	2	0	0	0	0	0	0	0	25	31.4	27.9
7:00 AM	0	0	8	16	12	0	0	0	0	0	0	0	0	36	31.8	27.6
8:00 AM	0	0	9	17	4	2	0	0	0	0	0	0	0	32	30.0	27.1
9:00 AM	0	1	2	3	6	2	0	0	0	0	0	0	0	14	32.2	28.9
10:00 AM	0	0	1	4	3	0	1	0	0	0	0	0	0	9	33.8	30.2
11:00 AM	0	0	3	2	6	0	0	0	0	0	0	0	0	11	32.5	28.8
12:00 PM	0	0	1	5	2	0	0	0	0	0	0	0	0	8	30.0	27.6
1:00 PM	0	0	1	15	2	0	0	0	0	0	0	0	0	18	29.0	27.6
2:00 PM	0	1	1	7	8	2	1	0	0	0	0	0	0	20	34.2	30.1
3:00 PM	0	1	0	6	6	0	0	0	0	0	0	0	0	13	31.0	28.8
4:00 PM	1	0	2	8	2	0	1	0	0	0	0	0	0	14	32.1	28.1
5:00 PM	1	1	3	4	4	1	0	0	0	0	0	0	0	14	32.0	26.4
6:00 PM	0	0	2	6	0	2	1	0	0	0	0	0	0	11	35.5	29.5
7:00 PM	0	2	1	2	2	1	0	0	0	0	0	0	0	8	33.9	26.8
8:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	2	30.1	28.0
9:00 PM	0	0	2	3	1	1	0	0	0	0	0	0	0	7	34.2	28.0
10:00 PM	0	0	1	3	2	0	0	0	0	0	0	0	0	6	30.0	27.8
11:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	37.9	37.5
Total	2	7	46	119	68	15	4	0	0	0	0	0	0	261	32.0	28.1
Percent	0.77%	2.68%	17.62%	45.59%	26.05%	5.75%	1.53%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
AM Peak		5:00 AM	8:00 AM	8:00 AM	7:00 AM	6:00 AM	10:00 AM									7:00 AM
Volume	0	1	9	17	12	2	1	0	0	0	0	0	0	36		
PM Peak	4:00 PM	7:00 PM	5:00 PM	1:00 PM	2:00 PM	2:00 PM	2:00 PM									2:00 PM
Volume	1	2	3	15	8	2	1	0	0	0	0	0	0	20		

<b>15th Percentile:</b>	<b>24.0 MPH</b>	<b>Average Speed:</b>	<b>28.1 MPH</b>	<b>Posted Speed Limit:</b>	<b>30 MPH</b>
<b>50th Percentile:</b>	<b>28.0 MPH</b>	<b>10 MPH Pace:</b>	<b>23 to 32 MPH</b>	<b>Number of Vehicles &gt; 30 MPH:</b>	<b>69</b>
<b>85th Percentile:</b>	<b>32.0 MPH</b>	<b>Number in Pace:</b>	<b>205</b>	<b>Percent of Vehicles &gt; 30 MPH:</b>	<b>26.4%</b>
<b>95th Percentile:</b>	<b>35.0 MPH</b>	<b>Percent in Pace:</b>	<b>78.5%</b>		

Moosehill Road  
north of Cricket Lane  
City, State: Walpole, MA  
Client: Green International/ C. Tobias  
Site Code: TBA  
Count Date: Wednesday, January 15, 2020



PDI File #: 207390 ATR-A

**Speed (60-minute)**

SB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 +	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#####	#####
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#####	#####
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#####	#####
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#####	#####
4:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	1	31.0	31.0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#####	#####
6:00 AM	0	0	2	1	1	0	0	0	0	0	0	0	0	4	29.1	25.3
7:00 AM	1	1	2	2	0	1	0	0	0	0	0	0	0	7	26.9	22.9
8:00 AM	1	1	6	4	2	0	0	0	0	0	0	0	0	14	28.1	23.8
9:00 AM	0	0	1	4	3	1	0	0	0	0	0	0	0	9	33.0	29.6
10:00 AM	0	1	2	0	0	0	0	0	0	0	0	0	0	3	21.0	20.3
11:00 AM	0	0	0	7	1	0	0	0	0	0	0	0	0	8	29.0	27.5
12:00 PM	0	0	4	5	1	0	0	0	0	0	0	0	0	10	28.7	25.7
1:00 PM	0	1	1	2	1	0	0	0	0	0	0	0	0	5	28.0	24.6
2:00 PM	0	1	1	4	0	0	1	0	0	0	0	0	0	7	28.3	26.4
3:00 PM	0	4	3	7	3	1	0	0	0	0	0	0	0	18	31.0	24.9
4:00 PM	0	0	3	3	8	0	0	0	0	0	0	0	0	14	32.1	28.9
5:00 PM	0	2	2	2	2	0	0	0	0	0	0	0	0	8	29.8	23.8
6:00 PM	0	2	3	2	0	0	0	0	0	0	0	0	0	7	25.0	22.0
7:00 PM	0	0	0	3	0	1	0	0	0	0	0	0	0	4	32.3	29.5
8:00 PM	0	0	0	2	1	0	1	0	0	0	0	0	0	4	35.5	31.0
9:00 PM	0	0	1	2	2	1	0	0	0	0	0	0	0	6	32.5	29.3
10:00 PM	0	0	0	2	0	1	0	0	0	0	0	0	0	3	35.4	30.7
11:00 PM	0	0	0	3	0	1	0	0	0	0	0	0	0	4	32.9	28.8
Total	2	13	31	55	26	7	2	0	0	0	0	0	0	136	31.0	26.2
Percent	1.47%	9.56%	22.79%	40.44%	19.12%	5.15%	1.47%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
AM Peak	7:00 AM	7:00 AM	8:00 AM	11:00 AM	9:00 AM	7:00 AM										8:00 AM
Volume	1	1	6	7	3	1	0	0	0	0	0	0	0	14		
PM Peak		3:00 PM	12:00 PM	3:00 PM	4:00 PM	3:00 PM	2:00 PM									3:00 PM
Volume	0	4	4	7	8	1	1	0	0	0	0	0	0	18		

<b>15th Percentile:</b>	<b>21.0 MPH</b>	<b>Average Speed:</b>	<b>26.2 MPH</b>	<b>Posted Speed Limit:</b>	<b>30 MPH</b>
<b>50th Percentile:</b>	<b>26.0 MPH</b>	<b>10 MPH Pace:</b>	<b>22 to 31 MPH</b>	<b>Number of Vehicles &gt; 30 MPH:</b>	<b>27</b>
<b>85th Percentile:</b>	<b>31.0 MPH</b>	<b>Number in Pace:</b>	<b>94</b>	<b>Percent of Vehicles &gt; 30 MPH:</b>	<b>19.9%</b>
<b>95th Percentile:</b>	<b>35.3 MPH</b>	<b>Percent in Pace:</b>	<b>69.1%</b>		

Moosehill Road  
north of Cricket Lane  
City, State: Walpole, MA  
Client: Green International/ C. Tobias  
Site Code: TBA  
Count Date: Thursday, January 16, 2020



PDI File #: 207390 ATR-A

**Speed (60-minute)**

SB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 +	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	1	25.0	25.0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#####	#####
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#####	#####
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	#####	#####
4:00 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	2	29.1	27.0
5:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	24.0	24.0
6:00 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	2	21.7	21.0
7:00 AM	1	1	4	0	1	0	0	0	0	0	0	0	0	7	24.6	21.1
8:00 AM	0	1	2	2	1	0	0	0	0	0	0	0	0	6	27.8	24.2
9:00 AM	0	0	1	6	2	0	0	0	0	0	0	0	0	9	31.4	27.9
10:00 AM	1	1	0	3	0	0	0	0	0	0	0	0	0	5	26.0	21.6
11:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	2	29.1	24.5
12:00 PM	0	0	2	4	1	0	0	0	0	0	0	0	0	7	28.2	25.9
1:00 PM	0	1	2	2	0	0	0	0	0	0	0	0	0	5	25.4	22.6
2:00 PM	0	1	2	6	2	0	0	0	0	0	0	0	0	11	29.5	25.6
3:00 PM	0	2	2	6	6	1	0	0	0	0	0	0	0	17	32.6	27.8
4:00 PM	0	2	4	4	2	0	0	0	0	0	0	0	0	12	29.1	24.6
5:00 PM	0	3	1	5	2	0	0	0	0	0	0	0	0	11	30.0	24.5
6:00 PM	0	2	2	4	1	0	0	0	0	0	0	0	0	9	26.6	23.8
7:00 PM	0	1	1	2	2	0	0	0	0	0	0	0	0	6	31.0	26.7
8:00 PM	0	2	2	8	2	0	0	0	0	0	0	0	0	14	29.1	25.8
9:00 PM	0	0	2	1	3	0	0	0	0	0	0	0	0	6	33.3	28.2
10:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	2	29.3	27.5
11:00 PM	0	1	1	1	1	0	0	0	0	0	0	0	0	4	29.7	24.5
Total	2	19	32	56	29	1	0	0	0	0	0	0	0	139	30.0	25.3
Percent	1.44%	13.67%	23.02%	40.29%	20.86%	0.72%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
AM Peak	7:00 AM	7:00 AM	7:00 AM	9:00 AM	9:00 AM										9:00 AM	
Volume	1	1	4	6	2	0	0	0	0	0	0	0	0	9		
PM Peak		5:00 PM	4:00 PM	8:00 PM	3:00 PM	3:00 PM									3:00 PM	
Volume	0	3	4	8	6	1	0	0	0	0	0	0	0	17		

<b>15th Percentile:</b>	<b>19.7 MPH</b>	<b>Average Speed:</b>	<b>25.3 MPH</b>	<b>Posted Speed Limit:</b>	<b>30 MPH</b>
<b>50th Percentile:</b>	<b>26.0 MPH</b>	<b>10 MPH Pace:</b>	<b>22 to 31 MPH</b>	<b>Number of Vehicles &gt; 30 MPH:</b>	<b>20</b>
<b>85th Percentile:</b>	<b>30.0 MPH</b>	<b>Number in Pace:</b>	<b>99</b>	<b>Percent of Vehicles &gt; 30 MPH:</b>	<b>14.4%</b>
<b>95th Percentile:</b>	<b>32.0 MPH</b>	<b>Percent in Pace:</b>	<b>71.2%</b>		

**TRIP GENERATION WORKSHEET**

LAND USE: *Single Family Detached Housing*  
 LAND USE CODE: 210 Independent Variable---Trips per DU  
 SETTING/LOCATION: General Urban / Suburban  
 JOB: Proposed Moose Hill Road Residential Development, Walpole, MA  
 JOB NUMBER: 19113 Number of Units: 8

**WEEKDAY**

RATES:	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	9.44	4.81	19.39	50%	50%	159
AM PEAK	0.74	0.33	2.27	25%	75%	173
PM PEAK	0.99	0.44	2.98	63%	37%	190
PK GEN AM	0.76	0.36	2.27	26%	74%	157
PK GEN PM	1	0.49	2.98	64%	36%	165

	BY AVERAGE		
	Total	Enter	Exit
DAILY	76	38	38
AM PEAK	6	2	5
PM PEAK	8	5	3
PK GEN AM	6	2	4
PK GEN PM	8	5	3

	BY REGRESSION			R <sup>2</sup>
	Total	Enter	Exit	
DAILY	102	51	51	0.95
AM PEAK	10	3	8	0.89
PM PEAK	9	6	3	0.92
PK GEN AM	8	2	6	0.89
PK GEN PM	10	6	4	0.92

**SATURDAY**

RATES:	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	9.54	5.32	15.25	50%	50%	52
PEAK HR	0.93	0.64	1.75	54%	46%	31

	BY AVERAGE		
	Total	Enter	Exit
DAILY	76	38	38
PEAK HR	7	4	3

	BY REGRESSION			R <sup>2</sup>
	Total	Enter	Exit	
DAILY	91	46	46	0.91
PEAK HR	25	14	12	0.87

**SUNDAY**

RATES:	Total Trip Ends			Directional Dist.		Number of Studies
	Average	Low	High	Enter	Exit	
DAILY	8.55	4.74	11.82	50%	50%	51
PEAK HR	0.85	0.6	1.45	53%	47%	31

	BY AVERAGE		
	Total	Enter	Exit
DAILY	68	34	34
PEAK HR	7	4	3

	BY REGRESSION			R <sup>2</sup>
	Total	Enter	Exit	
DAILY	6	3	3	0.94
PEAK HR	17	9	8	0.88