

REF.: NHX2009600.01

September 16, 2016

Mr. Michael Scully, Chair
Town of Grafton Planning Board
30 Providence Road
Grafton, MA 01519

SUBJECT: Letter of Commitment
Proposed Residential Development
Institute Road, Grafton, MA

Dear Mr. Scully:

On behalf of the Proponent, Guerriere & Halnon, Inc., **Greenman-Pedersen, Inc. (GPI)** previously prepared a *Traffic Impact and Access Study*¹ (TIAS) for a proposed residential development to be located on Institute Road, south of Westboro Road (Route 30), in Grafton, Massachusetts. The site is currently undeveloped and the project is proposed to include the construction of 46 single-family homes. Access to the site is proposed via two unsignalized, full access / egress roadways on Institute Road. The TIAS included an evaluation of the traffic operations and safety of the intersections immediately surrounding the site both with and without the proposed development. Based on the results of the capacity and queue analysis contained within the TIAS, traffic exiting Institute Road northbound onto Westboro Road (Route 30) is anticipated to operate at level-of-service (LOS) F during the weekday morning and evening peak periods under 2021 Build (with the proposed development) conditions with increases in delay of approximately 30 seconds per vehicle resulting from the additional traffic generated by the proposed development. To mitigate the impacts of the project, the Proponent has proposed to construct a dedicated right-turn lane on the Institute Road northbound approach to Westboro Road (Route 30). This letter is intended to provide a summary of the mitigation measures proposed by the Proponent and evaluate the impacts of such measures.

Utilizing the traffic-volume projections conducted as part of the TIAS, GPI performed a capacity and queue analysis for the Institute Road / Westboro Road (Route 30) intersection and compared the results for the 2021 No-Build (without the development), 2021 Build (with the proposed development), and 2021 Build Mitigated (with the proposed development and right-turn lane) conditions to assess the adequacy of the proposed right-turn lane to mitigate the impacts of the development. It should be noted that at the time that the TIAS was prepared, the project was proposed to consist of 51 residential units. Therefore, the results of the capacity analysis represent a conservative (worse than expected) condition. The detailed analysis worksheets are provided as an Attachment to this letter and Table 1 provides a summary of the resulting analysis.

¹ *Traffic Impact and Access Study, Proposed Residential Development, Institute Road – Grafton, Massachusetts*; Prepared by Greenman-Pedersen, Inc.; November 5, 2014.



Mr. Michael Scully
 September 16, 2016
 Page 2 of 3

Table 1
INTERSECTION CAPACITY ANALYSIS SUMMARY

Intersection/Peak Hour/Lane Group	2021 No-Build				2021 Build				2021 Bu	
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Del
Westboro Road at Institute Road										
<i>Weekday AM:</i>										
Westboro Road WB left-turns/through	0.04	10.6	B	<25	0.05	10.6	B	<25	0.05	10
Institute Road NB left/right-turns	0.73	50.2	F	128	0.90	79.5	F	193	--	38
Institute Road NB left-turns	--	--	--	--	--	--	--	--	0.26	39
Institute Road NB right-turns	--	--	--	--	--	--	--	--	0.65	38
<i>Weekday PM:</i>										
Westboro Road WB left-turns/through	0.16	8.5	A	<25	0.18	8.6	A	<25	0.18	8
Institute Road NB left/right-turns	0.47	51.6	F	55	0.70	81.7	F	98	--	64
Institute Road NB left-turns	--	--	--	--	--	--	--	--	0.63	130
Institute Road NB right-turns	--	--	--	--	--	--	--	--	0.07	10

^a Volume-to-capacity ratio.

^b Average control delay in seconds per vehicle.

^c Level of service.

^d 95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

^e Represents the weighted average delay per vehicle by approach.

Mr. Michael Scully
May 10, 2016
Page 3 of 3

As shown in Table 1, the construction of the right-turn lane on the Institute Road northbound approach to Westboro Road (Route 30) is anticipated to significantly reduce delay and queues exiting Institute Road to better than No-Build conditions during the weekday morning peak period. Although the left-turns exiting Institute Road will still experience level-of-service (LOS) F during the weekday evening peak hour under 2021 Build with Mitigation conditions, the overall delay on the Institute Road approach to the intersection will be reduced by approximately 17 seconds per vehicle. In addition, adequate storage will be provided to allow right-turning vehicles to bypass vehicles waiting to turn left, significantly reducing delay for right-turning vehicles. Furthermore, the volume-to-capacity (V/C) ratios will be well below 1.00, indicating that adequate capacity exists to accommodate the anticipated traffic volumes. No additional project-specific mitigation is warranted at this location.

Based on the results of the capacity and queue analysis described above, the Proponent has committed to constructing an exclusive right-turn lane on the Institute Road northbound approach to Westboro Road (Route 30) to provide a minimum of 100 feet of vehicle storage. The turning lane will require widening of Institute Road to provide two 10-foot turning lanes on the approach. In addition, a new STOP line will be striped and a new STOP sign (R1-1) will be installed on Institute Road at the intersection with Westboro Road (Route 30). Due to sight distance limitations and grades approaching the intersection, a STOP AHEAD sign will be installed on Institute Road in advance of Westboro in accordance with the *Manual on Uniform Traffic Control Devices*².

Should you have any questions, or require additional information, please contact me at (978) 570-2946.

Sincerely,

GREENMAN – PEDERSEN, INC.



Rebecca L. Brown, P.E., PTOE
Project Manager

enclosure(s)

c. Normand Gamache, Guerrier & Halnon, Inc.
Town of Grafton Planning Board

² *Manual on Uniform Traffic Control Devices; 2009 Edition*; U.S. Department of Transportation, Federal Highway Administration; 2009.