

February 6, 2024

NEX-2300442.00

Ms. Allison Rees, P.E.  
Underwood Engineers  
25 Vaughan Mall  
Portsmouth, New Hampshire 03801

SUBJECT: Traffic Peer Review – Proposed Mixed-Use Development  
3 Railroad Street – Newmarket, New Hampshire

Dear Ms. Rees:

**Greenman-Pedersen Inc.** (GPI) performed a review of the transportation impacts associated with the proposed mixed-use development to be located at 3 Railroad Street in Newmarket, New Hampshire. The following documents were submitted for our review:

- *Traffic Impact Study, Residential & Commercial Development, Railroad Street, Newmarket, New Hampshire*; prepared by Barton & Loguidice. (B&L); November, 2023.
- *Condor Capital LLC Site Plan, 3 Railroad Street*, prepared by Horizons Engineering; October 17, 2023 (no revisions).
- *Letter of Intent – Site Plan Review for Concord Capital, LLC, Mixed-Use Development*, prepared by Horizons Engineering; November 13, 2023.

The following describes GPI's traffic-related comments associated with the documents described above.

## Study Area & Scope

1. The Traffic Impact Study provides capacity and queue analysis for the following intersections:
  - a. South Main Street (NH Route 152) at Packers Falls Road & Maple Street (unsignalized)
  - b. South Main Street at Railroad Street (unsignalized)
  - c. South Main Street at Beech Street Extension & Gerry Avenue.

Based on the size of the development and volume of traffic generated by the Project, GPI concurs with the appropriateness of this study area on the surrounding roadway network; however, no subsequent traffic volume projections or analysis of the proposed site driveway intersection with Railroad Street was performed. Due to the dead-end nature of Railroad Street, we understand why its intersection with South Main Street was analyzed as the de facto site driveway, and there is little to be gained by analyzing the new site driveway location separately. **No Response required.**

## Existing Traffic Volumes

2. The Traffic Impact Study notes that traffic volumes were collected in October 2023 at the study area intersections during an extended weekday period; weekday morning (7:00 to 9:00 AM), and weekday evening (3:00 to 6:00 PM). Based on a review of the raw turning movement count data, afternoon data collection actually began at 1:30 PM and extended to 6:00 PM. Presumably, the extended afternoon count period was conducted due to the proximity of the Newmarket public schools. The data showed that the AM peak hour occurred between either 7:00 to 8:00 AM or 7:30 to 8:30, depending on location. Similarly, the data showed that the PM peak hour occurred between either 3:00 to 4:00 PM or 3:30 to 4:30 PM, depending on location. Based on a review of the raw turning movement count data,

appropriate peak hour periods were identified. However, the resulting 2023 peak hour traffic volume network (Figure 1) appears to have transposed AM and PM peak hour traffic volumes at the intersection of South Main Street at Railroad Street; this transposition appears to have carried through the analysis. **The applicant's traffic engineer should revisit the network volume diagram(s) to confirm AM and PM peak hour volumes are appropriately labeled in their schematic form, and, if not, make any necessary adjustments.**

### Traffic Volume Adjustments

3. The Traffic Impact Study notes that the adjustments reviewed to reflect seasonal variation were based on the NHDOT Group 4 (Urban Highways) Averaged for adjustment to peak month conditions, resulting in a 5-percent upward adjustment. While no supporting calculations or worksheets were provided in the Appendix, we concur with this adjustment (GPI has attached supporting documentation for this assumption). **No response required.**
4. The Traffic Impact Study applied no adjustment to account for traffic volume variations attributable to the COVID-19 Pandemic. Per current NHDOT traffic study guidelines (reaffirmed in January 2024), a COVID adjustment is still required.

For reference, GPI has attached calculations for a COVID adjustment that has previously been accepted and preferred by NHDOT. The methodology utilized data from the same the closest continuous count station Data from pre-covid (October 2019) was compared to data from the month traffic counts were performed for the project (October 2023). An adjustment was calculated for each peak period individually since daily traffic patterns have shifted as a result of work-from-home. This methodology indicated that the following adjustments should be applied:

- a. Weekday morning (7:00 to 9:00 AM) – 19 percent
- b. Weekday evening (3:00 to 6:00 PM) – 9 percent

The back-up data and calculations for this methodology are attached to the letter. **Supplemental traffic projections with appropriate Covid adjustments should be provided.**

### Motor Vehicle Crash Data

5. No crash data or crash summaries were presented in the study. Such data can be useful in determining any identifiable crash patterns or safety concerns in the immediate study area. **The public intersections under study should be investigated from available NHDOT crash data and/or the Newmarket Police Department to determine if there any identifiable crash patterns.**

### Development by Others

6. The Traffic Impact Study accounts for the following development by others: 1) the mixed-use development located at 50-56 Exeter Road; and 2) the multi-family age-restricted residential development located at 242 South Main Street. The traffic associated with the mixed-use development located at 50-56 Exeter Road was generated based on traffic assessment for that project, and assigned to the roadway network based on existing travel patterns. The traffic associated with the 242 South Main Street residential development was based on traffic volume networks provided in that study, which were in turn assigned to the study area network based on existing travel patterns. While GPI generally concurs with this methodology, as noted previously certain peak hour (AM & PM) traffic volumes may have been transposed in Figure 1 and carried throughout the study. **Accordingly, the applicant's traffic engineer should confirm the assignment of traffic from other developments after revisiting the peak hour networks.**

### General Background Traffic Growth / Future Conditions

7. The Applicant has applied a 0.5 percent annual growth rate to project traffic volumes to from 2023 to a presumed Opening Year of 2024; however, no supporting documentation is provided. Per NHDOT guidelines, the following should be noted:
  - a. NHDOT guidelines suggest that for general planning purposes, an annual growth rate for private development traffic study should not be less than 1.0 percent compounded annually, although a higher rate can be utilized if supported by local data; and
  - b. NHDOT guidelines require an analysis of both Opening Year and Horizon Year (Opening Year plus ten years) traffic volume projections.

Based on GPI's historical growth calculations (attached to this letter), the annual growth rate appears to be closer to 1.5 percent. **Supplemental traffic projections with a revised growth factor should be provided for both an Opening Year of 2024 and a Horizon Year of 2034.**

### Trip Generation

8. The Applicant estimated the trips generated by the proposed mixed-use development (2,500 sf office and 41 dwelling units) proposed by utilizing Institute of Transportation Engineers (ITE) *Trip Generation Manual*<sup>1</sup> data for Land Use Code (LUC) 710 (General Office Building) and LUC 220 (Multifamily Housing – Low Rise (Not Close to Rail Transit)). The average rate was utilized as opposed to the fitted curve equation. It should be noted that utilization of the fitted curve would have yielded higher overall trip results, and no justification is provided for the method utilized. It should also be noted that the trip generation estimates assume a credit for the planned demolition of the existing 2,000 sf office presently on site. Given the size of the office space involved, it may have been more appropriate to utilize LUC 712 (Small Office Building), which is applicable to office buildings with less than 10,000 sf. However, the results would have been negligibly different. **Explanation/justification for the trip generation method utilized (rate vs. fitted curve) should be provided.**

### Trip Distribution

9. The Applicant based the distribution of site-generated trips on existing travel patterns in the area. While this is an acceptable method, the Town should be aware that trip distribution patterns for office and residential land uses are often based on a more detailed analysis of U.S. Census Journey-to-Work data ("commuting in" to Newmarket for office, and "commuting out" of Newmarket for residential), and then refined based on review of existing traffic patterns. While GPI was able to reasonably recreate the distribution patterns utilized in the study, it is unclear why no trips were assigned to Beech St. Extension, which exhibits comparable, if not higher, peak hour traffic volumes than Packers Fall Road. Further, there may be typographical errors in the site generated volumes in Figure 3, particularly in the AM peak hour, west of the site, and at the South Main Street intersection with Railroad Street (more vehicles entering than calculated in Table 1.5). **GPI requests that the trip distribution calculations and a revised Figure 3 be provided. Additionally, comparison of trip distribution results to the more conventional Journey-to-Work based method should also be provided.**

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<sup>1</sup> ITE *Trip Generation Manual*, 11<sup>th</sup> Edition; Institute of Transportation Engineers; Washington, DC; 2021.

### Capacity Analysis

10. The Applicant presented SimTraffic traffic simulation results as the basis for Level of Service (LOS), delay and queuing summaries presented in Tables 3.1 and 3.2. Current NHDOT traffic study guidelines require Highway Capacity Manual (HCM) analysis methodology to evaluate traffic operations. SimTraffic results are usually only submitted to substantiate or confirm HCM results, particularly along signalized corridors, as the HCM methodology may not appropriately account for the progression of vehicles along congested signalized corridors. **While results may be similar, GPI requests HCM based operational summaries for all pre- and post-development conditions for Opening Year and Horizon Year.**

### Sight Distance Analysis

11. The Traffic Impact Study concludes that the available sight distance at the intersection of South Main Street at Railroad Street is satisfactory for safe traffic operations. The following should be noted: 1) it is not clear if the Study is referring to stopping sight distance or intersection sight distance; 2) the evaluation claims to be based on AASHTO criteria; however the sight distance requirements cited in the Sight Distance Standards Table on page 10 do not correlate to values contained in the 2018 AASHTO Green Book; 3) the assessment was based on a posted speed limit of 30 mph on South Main Street, with no measure of or assumption for prevailing speeds (85<sup>th</sup> percentile typically utilized for design); 4) neither the height of object cited (4.25 feet), nor the distance from travel way cited (10 feet), correspond to current AASHTO criteria. Additionally, no sight distance evaluation was provided for the proposed site driveway intersection with Railroad Street. **As an existing public intersection, GPI requests that available sight distance at the Railroad Street intersection with South Main Street be confirmed with appropriate criteria cited/referenced from the most current AASHTO Green Book. Further, GPI requests that the sight triangle areas be provided on a sight line diagram based on the proposed plan and profile of the finished grade at the following location: Railroad Street at the proposed site driveway location. If vegetation or other obstructions are to be cleared, they should be indicated on the diagrams. Further, where appropriate, documentation or substantiation should be provided for the governing speed utilized for sight line determination.**

### Auxiliary Lane Warrants Analysis

12. The Traffic Impact Study concludes that neither a dedicated left-turn lane nor a right-turn lane on South Main Street at its intersection with Railroad Street are warranted. **While results may be similar, GPI requests reanalysis for all pre- and post-development conditions for Opening Year and Horizon Year, due to consideration of items previously noted: lack of Covid Adjustment; revisiting background traffic growth; no Horizon Year (Opening + 10 years) traffic volume projections provided; utilization of prevailing/85<sup>th</sup> percentile speed (rather than posted speed limit). Additionally, total advancing and opposing vehicles utilized in this analysis should match schematic volume diagrams, and follow NCHRP guidance: for left-turn lane warrants, Volume Advancing = Through + LT movements, and Volume Opposing = Through + RT movements; and for right-turn lane warrants, Volume Advancing = Through + RT movements.**

### Parking, Site Access, Pedestrian, and Off-Site Considerations

13. The project narrative indicates that previously approved zoning relief allows for the 62 spaces shown on the plan (Site & Utility Plan sheet). **No response required.**
14. Although a STOP-control on the site driveway approach to Railroad Street is implied, the approach could be supplemented with a STOP-sign and STOP-bar pavement marking, so as to reinforce the intended vehicular right-of way. **Providing a STOP-sign and STOP-bar pavement marking, both per MUTCD**

**standards, on the proposed site driveway approach to Railroad Street is advisable and should be considered.**

15. Residents/tenants utilizing the 10-vehicle parking lot area, immediately south of the proposed site driveway, will need to cross in the path of vehicles entering/exiting the site in order to gain access to the building. **As there is the potential for conflict pedestrian/vehicular conflict, providing a marked crosswalk, per MUTCD standards, from the 10-vehicle parking area to the landscaped area/sidewalk on the south side of the proposed building is advisable and should be considered.**
16. **The existing STOP-sign and STOP-bar on the Railroad Street approach to South Main Street should be reviewed against MUTCD standards, and replaced or refreshed as appropriate.**

In conclusion, the following is being requested from GPI:

- The existing peak hour traffic volumes (Figure 1) should be revisited to confirm AM and PM peak hour volumes are appropriately labeled in their schematic form (Railroad Street at South Main Street).
- Supplemental traffic projections with appropriate Covid adjustments should be provided.
- The public intersections under study should be investigated from available NHDOT crash data and/or the Newmarket Police Department to determine if there any identifiable crash patterns.
- The applicant's traffic engineer should confirm the assignment of traffic from other developments after revisiting the peak hour networks.
- Supplemental traffic projections with a revised growth factor should be provided for both an Opening Year of 2024 and a Horizon Year of 2034.
- Explanation/justification for the trip generation method utilized (rate vs. fitted curve) should be provided.
- Trip distribution calculations should be provided; if there are changes/revisions, volume diagrams should be updated accordingly.
- Operational summaries (LOS, delay, queuing) should be reported per HCM standards for all pre- and post-development conditions for Opening Year (2024) and Horizon Year (2034).
- Revisit available sight distance at the intersection of Railroad Street at South Main Street, based on current AASHTO criteria, and document assumptions for governing speed utilized for sight line determination.
- Provide a sight line diagram showing the currently proposed site driveway location on Railroad Street, the sight line triangles, and the vegetation or other obstructions to be cleared in order to meet the required sight distances, and document assumptions for governing speed utilized for sight line determination.
- Reevaluate Auxiliary Lane Warrants Analysis based on volume adjustments previously noted.
- Address items noted for Parking, Site Access, Pedestrian, and Off-Site Considerations, as noted in comments 13-16.

Ms. Allison Rees  
February 6, 2024  
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Should you have any questions or require additional information, please feel free to contact me at (603) 766-5229 or [bbollinger@gpinet.com](mailto:bbollinger@gpinet.com).

Sincerely,

**GREENMAN-PEDERSEN, INC.**



Robert E. Bollinger, P.E., PTOE  
Traffic Engineering Department Head  
116 S. River Road, Bldg. B, Suite 1  
Bedford, New Hampshire 03110

Attachments:

1. Peak Month Seasonal Adjustment Data
2. GPI's COVID Adjustment Calculations
3. GPI's Historical Growth Rate Calculations

Year 2019 Monthly Data

Group 4 Averages: Urban Highways

Month	ADT	Adjustment to Average	Adjustment to Peak	GROUP	COUNTER	TOWN	LOCATION
January	11,431	1.12	1.23	04	02051003	BOW	NH 3A south of Robinson Rd
February	11,848	1.08	1.18	04	02089001	CHICHESTER	NH 28 (Suncook Valley Rd) north of Bear Hill Rd
March	12,141	1.06	1.15	04	02091001	CLAREMONT	NH 12/103 east of Vermont SL
April	12,860	1.00	1.09	04	62099056	CONCORD	NH 106 (Sheep Davis Rd) at Loudon TL (north of Ashby Rd)
May	13,551	0.95	1.03	04	72099278	CONCORD	US 3 (Fisherville Rd) north of Sewalls Falls Rd
June	13,785	0.93	1.02	04	02125001	DOVER	Dover Point Rd south of Thornwood Ln
July	13,942	0.92	1.01	04	02133021	DURHAM	US 4 east of NH 108
August	14,016	0.92	1.00	04	82197076	HAMPTON	US 1 (Lafayette Rd) south of Ramp to NH 101
September	13,379	0.96	1.05	04	02229022	HUDSON*	<i>Circumferential Hwy east of Nashua TL</i>
October	13,339	0.96	1.05	04	02253025	LEBANON	NH 120 1 mile south of Hanover TL (south of Lahaye Dr)
November	12,265	1.05	1.14	04	02255001	LEE	NH 125 (Calef Hwy) north of Pinkham Rd
December	11,496	1.12	1.22	04	02287001	MARLBOROUGH	NH 12 at Swanzey TL
				04	02297001	MERRIMACK	US 3 (Daniel Webster Hwy) north of Hilton Dr
Average ADT:	12,838			04	02303001	MILFORD*	<i>NH 101A at Amherst TL (west of Overlook Dr)</i>
Peak ADT:	14,016			04	02315051	NASHUA*	<i>NH 111 (Bridge / Ferry St) at Hudson TL</i>
				04	02339001	NEWPORT	NH 10 1 mile south of Croydon TL (north of Corbin Rd)
				04	02345001	NORTH HAMPTON	US 1 (Lafayette Rd) north of North Rd
				04	62387052	RINDGE*	<i>US 202 at Jaffrey TL (north of County Rd)</i>
				04	02445001	TEMPLE	NH 101 at Wilton TL (west of Old County Farm Rd)
				04	02489001	WINDHAM	NH 28 at Derry TL (north of Northland Rd)

*\* denotes counter that is not included in calculation*

Count 3						
N/A For Aggregated Counts						
INTERVAL:60-MIN						
Time	60-min Interval				Hourly Count	% Diff
	1st	2nd	3rd	4th		
0:00-1:00	-	-	-	-	172	-43.3
1:00-2:00	-	-	-	-	112	-10.2
2:00-3:00	-	-	-	-	96	8.7
3:00-4:00	-	-	-	-	175	55.5
4:00-5:00	-	-	-	-	479	106.1
5:00-6:00	-	-	-	-	1499	110.2
6:00-7:00	-	-	-	-	2930	99.5
7:00-8:00	-	-	-	-	4243	105.5
8:00-9:00	-	-	-	-	3658	55.8
9:00-10:00	-	-	-	-	2657	0.6
10:00-11:00	-	-	-	-	2454	-27.3
11:00-12:00	-	-	-	-	2573	-38.3
12:00-13:00	-	-	-	-	2655	-34.0
13:00-14:00	-	-	-	-	2722	-24.5
14:00-15:00	-	-	-	-	3305	-9.9
15:00-16:00	-	-	-	-	4055	12.1
16:00-17:00	-	-	-	-	4649	35.4
17:00-18:00	-	-	-	-	4548	45.2
18:00-19:00	-	-	-	-	2689	9.1
19:00-20:00	-	-	-	-	1679	-7.9
20:00-21:00	-	-	-	-	1203	3.8
21:00-22:00	-	-	-	-	884	31.4
22:00-23:00	-	-	-	-	562	43.3
23:00-24:00	-	-	-	-	359	40.9
<b>Total</b>	<b>Counts = 23</b>				<b>50358</b>	<b>17.1</b>

  

Count Criteria	
Local Id	02153001
Start Date	10/01/2019
End Date	10/31/2019
Aggregation	AVG
Include Abnormal	False
Selected Days	Monday Tuesday Wednesday Thursday Friday

Count 1						
N/A For Aggregated Counts						
INTERVAL:15-MIN						
Time	15-min Interval				Hourly Count	% Diff
	1st	2nd	3rd	4th		
0:00-1:00	43	37	35	30	145	-59.2
1:00-2:00	28	26	25	22	101	-20.4
2:00-3:00	25	25	26	27	103	15.7
3:00-4:00	34	42	52	63	191	63.4
4:00-5:00	76	99	121	156	452	101.8
5:00-6:00	208	304	370	359	1241	96.4
6:00-7:00	429	541	667	717	2354	82.2
7:00-8:00	745	873	966	984	3568	92.5
8:00-9:00	881	860	844	769	3354	47.7
9:00-10:00	673	646	645	617	2581	-2.3
10:00-11:00	587	607	622	617	2433	-28.1
11:00-12:00	612	636	650	645	2543	-39.5
12:00-13:00	655	653	659	656	2623	-35.2
13:00-14:00	652	665	695	708	2720	-24.5
14:00-15:00	743	798	834	877	3252	-11.5
15:00-16:00	912	956	1021	1022	3911	8.4
16:00-17:00	1053	1052	1108	1052	4265	27.0
17:00-18:00	1101	1090	955	825	3971	32.1
18:00-19:00	733	667	575	501	2476	0.9
19:00-20:00	450	424	355	315	1544	-16.3
20:00-21:00	300	299	260	249	1108	-4.4
21:00-22:00	234	215	191	175	815	23.4
22:00-23:00	142	131	126	106	505	33.0
23:00-24:00	91	84	73	67	315	28.3
<b>Total</b>	<b>Counts = 22</b>				<b>46571</b>	<b>9.3</b>

  

Count Criteria	
Local Id	02153001
Start Date	10/01/2023
End Date	10/31/2023
Aggregation	AVG
Include Abnormal	False
Selected Days	Monday Tuesday Wednesday Thursday Friday

LOCATION INFO	
Location ID	02153001
Type	SPOT
Funct'l Class	2
Located On	NH Route 101 W
Loc On Alias	NH 101 AT MILEPOST 127.4 BETWEEN EXITS 11-12 (EB-WB) (01153150 - 01153151)
Direction	2-WAY
County	ROCKINGHAM
Community	EXETER
MPO ID	
HPMS ID	
Agency	New Hampshire DOT

Weekday Morning  
4243 / 3568 1.19

Weekday Evening  
4649 / 4265 1.09

Weekday Daily  
50358 / 46571 1.08

# Traffic Growth Rate<sup>a</sup>

Location	2013	2014	2015	2016	2017	2018	2019	Annual Rate
STATION 82337052 - NEWMARKET - NH 152, EAST OF MAPLECREST ST		5,300				5,588		0.9%
STATION 82337054 - NEWMARKET - GRANT ROAD, WEST OF NH 152	2,900			2,673			3,075	1.1%
STATION 82337059 - NEWMARKET - NH 152 AT PISCASSIC RIVER	2,500			2,766			3,258	4.5%
STATION 62337050 - NEWMARKET - NH 108 AT NEWFIELDS TL	17,000			18,756			19,434	2.3%
STATION 62337058 - NEWMARKET - NH 108 AT LAMPREY RIVER				11,447			11,154	-0.9%

Average Annual Growth Rate = **1.6%**  
**USE 1.5%**

<sup>a</sup> Source: Based upon historical data; NHDOT Transportation Data Management System.

