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Ref: 8188

June 27, 2019

Ms. Marcia J. Gasses
Town Planner & Land Use Administrator
P.O. Box 660
333 Calef Hwy
Barrington, NH 03825

Re: Response to Engineering Review
The Ridge at Green Hill – Calef Highway
Barrington, New Hampshire

Dear Marcia:

Vanasse & Associates, Inc. (VAI) is providing responses to the comments that were raised in the June 17, 2019 letter prepared by DuBois & King (D&K) on behalf of the Planning Board in reference to their review of the April 2019 *Traffic Impact Study* (the "April 2019 TIS") prepared by VAI in support of the proposed mixed-use development to be known as The Ridge at Green Hill and located off Calef Highway (NH Route 125) in Barrington, New Hampshire (hereafter referred to as the "Project"). The April 2019 TIS has been revised to address the comments that were raised in D&K's review letter and reissued as "Amended June 2019". Listed below are the comments that were identified in the subject letter pertaining to the April 2019 TIS followed by our response on behalf of the Applicant, the results of which are reflected in the Amended June 2019 Traffic Impact Study.

Comment 28: *We recommend that the applicant revise the Table of Contents to correctly reference the Tables. Table 1 in the report is shown as Table 2 in the Table of Contents.*

Response: The Table of Contents has been revised accordingly.

Comment 29: *We recommend that the applicant remove the duplicate phrase "issued by" in the first paragraph on page 1.*

Response: The narrative has been revised accordingly.

Comment 30: *Executive Summary - Bullet 2 on page 1 indicates the project not having a significant impact (increase) on motorist delays or vehicle queueing. Table 8 and Table 9 in the report do not show delays for approaches with LOS F, therefore the difference in delays for these cannot be determined from the report (delays for approaches with LOS F show as ">80.0" for signalized intersection approaches and ">50.0" for unsignalized intersection approaches). We recommend showing the delays in Table 8 and Table 9 in order to make a determination as to the impact of delays due to the project.*

Response: Tables 8 and 9 have been revised as requested and continue to demonstrate that the Project will not have a significant impact on traffic operations at the study area intersections. (Tables

being said, the Applicant has committed to implementing specific improvements that are intended to off-set the impact of the Project and to address existing operational and safety deficiencies that were identified independent of the Project.

Comment 31: *Executive Summary - On page 2, bullet 4, we recommend that the applicant states that what is shown in the text is based on using the 85th percentile speed. Additionally, if the sight distance requirements are met for the speed limit, we recommend that the applicant include this information.*

Response: The narrative has been revised accordingly to include a reference to the 85th percentile vehicle travel speed and the requirements for the posted speed limit.

Comment 32: *Executive Summary, Recommendations, Project Access - The text refers to a future connection between the Project site and property to the north of Old Green Hill Road. Considering that this future connection could take some traffic away from the site drives on NH Route 125, we recommend that the applicant provide more discussion on the future connector and make note that it would likely decrease the delay at the site drive intersections with NH Route 125 (which are showing as LOS E and LOS F).*

Response: The narrative has been expanded to include a discussion of the potential benefits that could result from formalizing the future connection to Old Green Hill Road. That being said, formalization of this connection is not proposed as a part of the Project.

Comment 33: *Executive Summary, Recommendations, Off-Site (and related to later discussion of analyses) - The NH Route 125 / NH Route 9 discussion notes an increase in vehicle queue of 5 vehicles at the NH Route 125 / NH Route 9 intersection due to the project. This seems low. We recommend that the applicant confirm how long the model was run for obtaining queueing results, and confirm that the link distance in the model for south of the intersection is long enough to capture the full queues.*

Response: The traffic operations analysis was performed using the Synchro® intersection capacity analysis software.

Comment 34: *Executive Summary, Recommendations, Off-Site - NH Route 125 / NH Route 9: We recommend that the applicant indicate the anticipated extent to which delays could improve with optimization of signal timing and phasing, and provide a big-picture summary of before and after optimization improvements to delay for this intersection for the worst case of the peak hours for 2030.*

Response: The narrative has been revised to indicate the improvement (reduction) in motorist delays that can be attained with the proposed improvements.

Comment 35: *Project Description, Figure 1 - We recommend that the applicant corrects the label for Scruton Pond Road (shown on Figure 1 as Green Hill Road).*

Response: Figure 1 has been revised accordingly.

Comment 36: *Existing Conditions, Existing Traffic Volumes, Figure 2, Existing Intersection Lane Use, Travel Lane Width and Pedestrian Facilities - We recommend that the applicant revises Figure 2 to show the southbound approach of the NH Route 125 / NH Route 9 intersection right-most lane to be a through/right turn lane.*

Response: Figure 2 has been revised accordingly.

Comment 37: *Existing Conditions, Existing Traffic Volumes, Seasonal Adjustments - We recommend that the applicant revise the study to use NHDOT count station No. 02255001 for determination of an adjustment factor. The NH Rte. 125 count location appears to be more representative of the project area. The count station in Rochester is considered an urban interstate and the count station in Lee is an urban highway. A preliminary review of count station No. 0225501 indicates an adjustment factor of 1.25 instead of 1.33.*

Response: The seasonal adjustment has been revised to reflect the use of NHDOT count station No. 02255001, and all associated figures, tables and analyses have been revised accordingly.

Comment 38: *Existing Conditions, Existing Traffic Volumes, Seasonal Adjustments - We recommend that the applicant revise the text in the paragraph below Table 1 to change the reference of "Table 2" to "Table 1".*

Response: The narrative has been revised accordingly.

Comment 39: *Existing Conditions, Existing Traffic Volumes, Seasonal Adjustments - Table 1: the K factor appears low, and it is unclear how the K factor was determined. It appears that the average traffic volumes in this table are based on use of the K factor. We recommend that the applicant clarify how the K factor was determined, as well as evaluating whether the factor shown is accurate.*

Response: Table 1 has been revised to incorporate the updated traffic volumes resulting from the revised seasonal adjustment factor. The K factors are derived by dividing the peak-hour traffic volume by the respective daily traffic volume.

Comment 40: *Existing Conditions, Existing Traffic Volumes, Seasonal Adjustments - Table 1: D&K calculated directional distribution of the AM and Saturday peak hours to be 66.4% SB and 52.6% SB, respectively. We recommend that the applicant confirm that the numbers shown in the table are correct, and revise if needed.*

Response: Table 1 has been revised and corrected as necessary.

Comment 41: *Future Conditions, Future Traffic Growth - Figure 4: D&K calculates the NB approach through movement volume at the Rte 125 intersection with Greenhill Road/ Tolend Road for the AM Peak Hour to be 584 (shown as 556). It appears that traffic volumes associated with the planned gas station nearby are not included in the number shown. We recommend that the applicant confirm that the number is correct at this location on Figure 4 and revise if needed.*

Response: The future condition traffic volume networks have been revised to reflect the change in the seasonal adjustment factor and to incorporate traffic volumes associated with the proposed convenience store and fueling facility that is currently under construction.

Comment 42: *Future Conditions, Future Traffic Growth - Figure 5: The values for the PM peak hour, Rte 125 intersection with Franklin Pierce Highway NB right turn volume and WB right turn volume appear to be typos. We recommend that the applicant confirm these numbers and revise as needed, including updating the analyses as needed to reflect the correct numbers.*

Response: The future condition traffic volume networks have been revised to reflect the change in the seasonal adjustment factor and include any required corrections or adjustments.

Comment 43: *Future Conditions, Project-Generated Traffic, Pass-By Trips - We recommend that the applicant expands the discussion of pass-by rates to indicate that these vary by the peak hour (as noted in Table 4, footnote h).*

Response: The narrative has been revised accordingly.

Comment 44: *Future Conditions, Project-Generated Traffic, Pass-By Trips - Table 4: We recommend that the applicant uses the fitted curve equation to calculate the AM peak hour trip generation for the office building land use (fitted curve equation was used for PM peak hour).*

Response: The trip-generation calculations have been revised as requested.

Comment 45: *Future Conditions, Project-Generated Traffic, Trip Distribution and Assignment -We recommend that the applicant clarify what the draw for traffic to the north (49%) is as compared to the south (28%) in Figure 7, trip distribution map for the commercial component.*

Response: The Trip Distribution and Assignment narrative has been expanded to include a discussion regarding the methodology used to develop the trip pattern for the commercial component of the Project.

Comment 46: *Future Conditions, Future Traffic Volumes - Build Condition - We recommend that the applicant changes the title of Figure 10 from "2030 Opening-Year Build" to "2030 Build".*

Response: Figure 10 has been revised accordingly.

Comment 47: *Future Conditions, Future Traffic Volumes - Build Condition - In Figure 10, similar to Figure 5, the values for the PM peak hour, Rte 125 intersection with Franklin Pierce Highway NB right turn volume and WB right turn volume appear to be typos. We recommend that the applicant confirm these numbers and revise as needed, including any subsequent changes to analyses with revised numbers.*

Response: The subject figures have been revised.

Comment 48: *Future Conditions, Future Traffic Volumes - Build Condition - We recommend that the applicant deletes the bold, italicized sentence on Page 17 since no analyses were conducted outside of the immediate study area to confirm this text.*

Response: The narrative has been revised accordingly.

Comment 49: *Future Conditions, Future Traffic Volumes - Build Condition - We recommend that the applicant update this table accordingly if changes to traffic volumes result due to prior comments.*

Response: The subject table and the accompanying narrative have been revised.

Comment 50: *Traffic Operations Analysis, Analysis Results, Signalized Intersections - We recommend that the applicant correct the heading shown as "NH Route 125 at Greenhill Road and Tolend Road" on page 22 to read "NH Route 125 at NH Route 9 intersection".*

Response: The narrative has been revised accordingly.

Comment 51: *"Traffic Operations Analysis, Analysis Results - We recommend that the applicant shows the anticipated delays for LOS F instead of showing as ">80.0" and ">50.0 " to more easily portray any locations with very significant delays. For example, the NH Rte 125 / NH Rte 9 intersection northbound approach has an anticipated delay of 422.9 seconds (7 minutes) for the 2030 Build Weekday Evening Peak Hour.*

Response: The traffic operations analysis summary tables (Tables 8 and 9) have been revised accordingly.

Comment 52: *Traffic Operations Analysis, Analysis Results, Unsignalized Intersections - The site driveways have LOS E or LOS F for all build scenarios. We recommend that the applicant evaluates additional alternatives to the site drive approaches that could decrease delays experienced on this approach. Two alternative examples are : 1) Site drive intersection operations with two-lane approaches, one of which would being a storage lane; 2) Right turn lane on NH Route 125.*

Response: The recommendations for the Project site access have been revised to include a recommendation that separate left and right-turn lanes be provided existing the Project site in order to reduce motorist delays and vehicle queuing; the addition of a right-turn lane on NH Route 125 approaching the Project site driveways did not appreciably improve operating conditions at the intersections.

Comment 53: *Sight Distance Evaluation - We recommend that the applicant elaborate on the phrase on page 28 that states "could be made to exceed the recommended minimum" by adding reference from the footnote from Table 10 that this could be done by regrading the embankment along the east side of NH Route 125. Understanding that the required minimums are based on the 85th percentile speeds, we recommend that the applicant specify whether measured sight distances meet the posted speed limit.*

Response: The narrative pertaining to the sight distance analysis has been expanded to include a discussion pertaining to the regrading of the embankment to the north of the north Project site roadway and an assessment of sight line requirements for the posted speed limit.

Comment 54: *Appendices, Capacity Analysis Worksheets - We recommend that the applicant confirm that the Route 125 / Route 9 intersection phases with yellow times of 6 seconds is correct.*

Response: The traffic signal timing for the NH Route 125/NH Route 9 intersection was obtained from NHDOT and verified by field measurements.

Comment 55: *Appendices , Turn Lane Warrants Analyses - In the left turn lane warrant spreadsheets, the cell for opposing volume should include throughs plus rights from the opposing direction. Numbers in the spreadsheets did not appear to include the opposing right turning vehicles . While this will not impact the results, we recommend that the applicant update the sheets accordingly.*

Response: The left-turn lane warrants analysis spreadsheets have been updated and corrected.

Comment 56: *Appendices, Turn Lane Warrants Analyses - In the right turn lane warrant spreadsheets, the cell for major-road volume (one direction) should include through movements as well as left and right turn movements. Numbers in the spreadsheets only included the through movement. While this will not impact the results, we recommend that the applicant update the sheets accordingly.*

Response: The right-turn lane warrants analysis spreadsheets have been updated and corrected.

We trust that this information is responsive to the comments that were raised in the June 17, 2019 letter from D&K concerning their review of the April 2019 TIS prepared in support of the Project. If you should have any questions or would like to discuss our responses in more detail, please feel free to contact me.

Sincerely,

VANASSE & ASSOCIATES, INC.

Jeffrey S. Dirk, P.E., PTOE, FITE
Partner

Professional Engineer in CT, MA, ME, NH, RI and VA

JSD/jsd

cc: J. Falzone – Emerald Grove, Inc. (via email)
S. Cole – Beals Associates, PLLC (via email)