April 21, 2022

Mr. Tyler Morrow City of Hendersonville Community Development Department 100 N. King Street Hendersonville, NC 28712

#### **RE: Tracy Grove Road Residential Development TIA Review**

Dear Tyler,

At the request of the City of Hendersonville, Kimley-Horn has conducted a review of the revised traffic impact analysis (TIA) prepared for the Tracy Grove Road Residential Development, dated February 12, 2022 by J.M. Teague Engineering & Planning. The proposed site is located along Tracy Grove Road, just south of the intersection with Dana Road. Based on the approved scoping document dated December 1, 2021, up to 161 single-family detached dwelling units and 300 multifamily mid-rise dwelling units are proposed as part of the development. Access to the site is planned to consist of three total driveways on Wilmont Drive (approximately 575 feet west of Tracy Grove Road) and Tracy Grove Road (approximately 1,210 and 2,960 feet south of Dana Road, respectively). The northernmost access point on Tracy Grove Road is located approximately 140 feet south of Wilmont Drive.

The analyses contained with the sealed TIA were reviewed for conformance with the traffic impact analysis guidelines presented within the NCDOT *Policy on Street and Driveway Access to North Carolina* Highways, NCDOT *Congestion Management Capacity Analysis Guidelines*, and City of Hendersonville *Zoning Ordinance*. This memo outlines our technical review of the revised TIA and corresponding recommendations.

#### **TECHNICAL REVIEW COMMENTS**

Based on a technical review of the revised TIA report as submitted, several elements of the report and analysis do not address comments provided by Kimley-Horn on January 3, 2022. These unaddressed comments are summarized in the bulleted list below, with the relative impact on the analysis results and recommendations noted in brackets.

- In Figure 9, an imbalance of +1 vehicle during the PM peak hour is still shown between the intersections of US 64 with Dana Road and Dana Road with Tracy Grove Road. The imbalance is most likely attributable to rounding error but should be corrected in the figure for clarity. [Low Impact] This has been corrected in the updated TIA.
- In Tables 6 through 9 and supporting text within the body of the report, the terms "queue length" and "queue" are used generically. The tables and report text should be updated to specify that these queue lengths correspond to the maximum queue length observed in SimTraffic. [Low Impact] This has been corrected in the updated TIA.

- In Tables 6 through 9, the reported queue lengths are categorized by approach. Queue lengths should be reported by movement to provide further insight into the critical turning movements they apply to. [Low Impact] This was noted in the response, but the engineer did not change how they reported the findings.
- A review of the mitigation presented in the TIA and on Figure 11 offers the following observations:
  - The TIA recommends a new eastbound right-turn lane from Dana Road to Tracy Grove Road with 150 feet of storage. However, the maximum queue length observed in SimTraffic for this movement (per the revised analysis results) is approximately 200 feet. The recommended storage length should be extended to accommodate this queue.
     [Moderate Impact] – This has been addressed in the updated TIA. In the comments it is noted that right of way needs to be provided by a party with eminent domain. The procurement of the necessary right of way for the improvement should be the responsibility of the developing party. Furthermore, economics relative to the cost born by a developer relative to an improvement should not be a factor by which an improvement is to be considered or not.
- Proposed Access 1 is located 140 feet from existing Wilmont Drive. Consideration should be given to relocating this driveway further south on Tracy Grove Road to maximize separation between Access 1 and Wilmont Drive. [High Impact] – This has been addressed in the updated TIA.
  - A third access point is shown in the approved scoping document but was not analyzed as part of the TIA. This access point should be removed from the scoping document and submitted for reapproval or added to the TIA accordingly. [High Impact] This has been addressed in the TIA.

The following additional comments are offered based on a review of the revised TIA against NCDOT and City of Hendersonville guidelines and should be addressed as appropriate:

- On Page 4, the word "cope" should be corrected to "scope" on Line 3 of the Parameters and Study Area section. [Low Impact] – This has been addressed in the TIA
- In Table 3, the following should be added or corrected:
  - The applicable year should be provided for all NCDOT AADTs. [Low Impact] This has been addressed in the TIA
  - The speed limit on US 64 is 35 mph to the north of Dana Road and 45 mph to the south of Dana Road; this should be noted in the "Speed Limit" column or as a footnote to the table. [Low Impact] This has been addressed in the TIA
  - The speed limit on Wilmont Drive is posted at 20 mph per Google Street View; the "Speed Limit" column should be updated accordingly. [Low Impact] - This has been addressed in the TIA
- On Page 6, the definition of the Peak Hour Factor is not correct. The text should be revised to note that the Peak Hour Factor is defined as "the hourly volume during the maximum-volume hour of the day divided by **four times** the highest 15-minute flow rate..." and "A PHF of **1.0**

means that traffic during the peak is steady." [Low Impact] - This has been addressed in the TIA

- In Figure 7 and Figure 10, several turning movement volumes less than 4 vehicles per hour are shown. Per NCDOT Congestion Management *Capacity Analysis Guidelines*, all turning movement volumes should be increased to a minimum of 4 vehicles per hour under future conditions. The report figures and analysis should be updated as appropriate. [Low Impact]-This has been addressed in the TIA
- On Page 15, references to ITE Land Use Code 220 should be replaced with "221". This has been addressed in the TIA
- In Table 5, the total AM Peak Hour trip generation should read "119" not "191". This has been addressed in the TIA
- Based on a review of the Synchro capacity analysis reports in Appendix B, the following analysis elements should be corrected as appropriate:
  - Detector size and placement in Synchro are not in agreement with that shown in the signal plans at the intersections of Dana Road/Duncan Hill Road with 7<sup>th</sup> Avenue and Tracy Grove Road. [Low Impact] This has not been addressed in the updated TIA.
  - Protected-permissive phasing is coded at the intersection of Dana Road/Duncan Hill Road with 7<sup>th</sup> Avenue under future conditions. Per NCDOT Congestion Management Capacity Analysis Guidelines, the westbound left-turn movement should be coded to operate with protected only phasing. The analysis should be updated or justification for deviating from the guidance otherwise provided within the report text. [Moderate Impact] - The comment responses contained in the Appendix A, notes that this item has been addressed. A review of the analysis files contained in the Appendix B indicates that the coding of Dana Road/Duncan Hill Road at 7<sup>th</sup> Avenue for the WB left is still shown with Protected Permissive phasing. Furthermore, it is noted that slits (time for each phase) were modified between the Existing, Background, and Build scenarios for signalized intersections. Phasing splits should be maintained consistent between the background and build scenarios for accurate comparison to measure the impact of the development and determine the necessary mitigation. It is appropriate to show a change in splits between existing and background as it can be reasonably assumed that timings will change from current (existing) conditions.
  - A protected northbound left-turn phase (Phase 5) is coded at the intersection of Duncan Hill Road with 7<sup>th</sup> Avenue under some scenarios, but the existing signal does not operate with this phasing per the signal plans included in Appendix D. Signal phasing should be adjusted in the analysis accordingly or justification for deviating from existing phasing should otherwise be provided within the report text. [Moderate Impact] The synchro files contained in the Appendix still show the NB left has been coded with protected + permissive phasing. The comment response in Appendix A indicates that this has been corrected. Per Congestion Management guidelines dedicated left-turns at signalized intersection with a phase should be coded as protected only.

- The signal cycle length and splits differ between scenarios, making comparisons of delay and queue length more convoluted. The report text should clearly state that signal splits were optimized between scenarios and provide justification. [Moderate Impact] See note above. The cycle lengths are consistent, but the splits are varying between scenarios.
- On Page 23, increases in queue length on the eastbound approach of the intersection of Duncan Hill Road with 7<sup>th</sup> Avenue should be acknowledged in the text. If no mitigation is proposed, additional justification should be provided as to why. [Low Impact] – The response noted in Appendix A dealing with this comment indicates text has been correct. The document provided does not contain this text.
- On Page 23, the text states that a "queue increase of over 25% is expected along the southbound approach" at the intersection of US 64 with Duncan Hill Road/Dana Road. The text should be revised to replace "queue" with "delay" or otherwise note that delay increases by more than 60 seconds per vehicle on the southbound approach under Build conditions.
  [Low Impact] No change in the TIA made
- On Page 23, for Dana Road at Tracy Grove Road, the phrase "While the westbound approach increase is greater than..." should be revised to clarify what is increasing. [Low Impact] No change in the TIA made
- The Turn Lane Warrants section of the TIA report examines the need for left-turn lanes at the site access points but does not explore the potential need for right-turn lanes. [High Impact]
  - Based on the proposed site trip distribution and the nomograph provided within the NCDOT Policy on Street and Driveway Access to North Carolina Highways, a right-turn lane is warranted at the intersection of Tracy Grove Road with Proposed Site Access 1.

Right-turn lane warrants should be analyzed and included in revisions to the TIA report. Turn lane warrants were provided for Access 1, but not for Wilmont Drive and Tracy Grove Road and Wilmont Drive and Access 2. Both of these are unsignalized and will have the presence of site traffic. Clarification on why these were not analyzed should be provided.

• The recommended storage shown for the southbound right-turn lane from Dana Road to Tracy Grove Road in Figure 11 differs from that mentioned in the report text. One or both should be revised for agreement. [Low Impact] – this has been addressed

#### CONCLUSIONS

A review of the April 11<sup>th</sup>, 2022 provided by the applicant indicates that the TIA provides a reasonable representation of the traffic impacts associated with the proposed development on the adjacent street network and generally conforms with NCDOT and City of Hendersonville guidelines, but does not adhere to all of the guidelines for analysis of a site. However, several comments provided by Kimley-Horn during initial review and noted in the March 3<sup>rd</sup> Memo have not been addressed in the TIA report submitted for review and should be revised in a final sealed study.

Based on a technical review of the revised TIA as submitted, the additional comments presented herein should be addressed as appropriate. Most critically:

- Existing protected-permissive signal phasing should be coded as protected-only phasing under future conditions at all applicable study intersections per NCDOT guidelines.
- The northbound left-turn movement at the intersection of Duncan Hill Road with 7<sup>th</sup> Avenue should be modeled with permissive phasing under all scenarios based on the existing signal plans included in Appendix D.
- The Turn Lane Warrants section of the TIA report examines the need for left-turn lanes at the site access points but does not explore the potential need for right-turn lanes.
  - Based on the proposed site trip distribution and the nomograph provided within the NCDOT Policy on Street and Driveway Access to North Carolina Highways, a right-turn lane is warranted at the intersection of Tracy Grove Road with Proposed Site Access 1.
  - Right-turn lane warrants should be analyzed and included in revisions to the TIA report.

#### In review of the mitigation provided for the proposed development we recommend the following mitigation for the proposed development:

- Construct a EB right turn lane on Dana Road with 200 feet of full width storage and appropriate taper
- Modify the existing traffic signal at Dana Road and Tracey Grove Road to accommodate the addition of the EB right turn lane
- Construction of a NB left-turn lane at Access 1 with 150 feet of storage and appropriate taper

Please contact me at (704) 488-3055 or jonathan.guy@kimley-horn.com should you have any questions regarding this analysis.

Sincerely,

John R.

704 333 5131



Jonathan Guy, PE, AICP, PTOE Vice President



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