



July 17, 2025

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Reference: [REDACTED] – Forsyth County, North Carolina

Subject: Turn Lane Warrant Analysis

Dear Mr. Bankhead:

RFK Engineers PLLC (RFK) has performed a turn lane warrant analysis for Phases 1 and 2 of the proposed residential development that is to be located on Ketner Road in Forsyth County, North Carolina. As discussed during our meeting on July 8, 2025, Phases 3 and 4 will not be developed until a stream crossing is constructed, but a turn lane warrant analysis was performed for those phases as well. Access to the development is initially proposed to be provided via the intersection of Shallowford Road and Ketner Road, until a connection is made to an approved development [to the north] that will provide access to Robinhood Road.

This letter summarizes the trip generation potential of the proposed development and compares the peak traffic volumes at the intersection of Shallowford Road and Ketner Road to the NCDOT turn lane warrants.

Existing Traffic Volumes

Existing traffic volumes were obtained from turning movement counts that were conducted in May of 2025 at the subject intersection during typical weekday AM (7:00 to 9:00) and PM (4:00 to 6:00) peak periods while school was in session. Refer to the attached appendix for a copy of all raw traffic count data, as well as an illustration of the existing (2025) peak hour traffic volumes.

Trip Generation and Assignment

Average weekday AM and PM peak hour site trips were calculated utilizing methodology contained within the 11th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual, which is the current edition. Traffic was generated utilizing equations for the peak hour of adjacent street traffic based on the number of dwelling units as the independent variable for the following ITE land uses: Low-Rise Multifamily Housing (ITE Code 220) and Single-Family Detached Housing (ITE Code 210). Refer to the attached appendix for a copy of the site plan and table summarizing the trip generation results for Phases 1-4.

For this study, site trip distribution percentages were developed based on existing traffic patterns and engineering judgment. The site trips for each phase were assigned to the subject intersection using the trip distribution percentages. Refer to the attached appendix for an illustration of the site trip distribution as well as illustrations of the site trip assignment under Phases 1-4.

Build Traffic Volumes

Based on a review of the historical daily traffic volumes obtained from NCDOT's AADT data, traffic volumes have not changed much over the years, so the site-generated trips were added to the existing (2025) traffic volumes to determine the future build traffic volumes. Refer to the attached appendix for an illustration of the build volumes under Phases 1-4.

Turn Lane Warrant Analysis

Utilizing the turn lane warrants contained within the NCDOT's "Policy on Street and Driveway Access to North Carolina Highways" and Roadway Design Manual, the existing and build traffic volumes were evaluated to identify if a turn lane is warranted at the intersection. Refer to the attached appendix for a table summarizing the peak hour traffic volumes and results of the turn lane warrant analysis, including the turn lane warrant exhibits with the weekday AM and PM peak hour volumes graphed.

Findings and Conclusions

Based on the findings of the analysis, the following determinations were made.

Existing Conditions

- A right turn lane is currently warranted based on the AM peak hour volumes, but not the PM peak hour volumes. Per discussions with Forsyth Country Day School staff, parents use Ketner Road to access the rear of the school during morning drop-off, which is the contributing factor for the right turn lane being warranted.
- A left turn lane is not warranted.

Build (Phase 1) Conditions

- A right turn lane is warranted based on the AM peak hour volumes, but not the PM peak hour volumes. As previously stated, the existing school traffic is the contributing factor for the right turn lane being warranted.
- A left turn lane is not warranted.

Build (Phases 1 and 2) Conditions

- A right turn lane is warranted based on the AM peak hour volumes, but not the PM peak hour volumes. As previously stated, the existing school traffic is the contributing factor for the right turn lane being warranted.
- A left turn lane is not warranted.

Build (Phases 1-3) Conditions

- A right turn lane is warranted based on the AM peak hour volumes, but not the PM peak hour volumes. As previously stated, the existing school traffic is the contributing factor for the right turn lane being warranted.
- A left turn lane is not warranted based on the AM peak hour traffic volumes but is warranted based on the PM peak hour traffic volumes.

Build (Phases 1-4) Conditions

- A right turn lane is warranted based on the AM peak hour volumes and PM peak hour volumes. As previously stated, the existing school traffic is the contributing factor for the right turn lane being warranted. With the added site trips, a right turn lane would be warranted based on the PM peak hour volumes.
- A left turn lane is warranted based on the AM and PM peak hour volumes.

In conclusion, a right turn lane on Shallowford Road is currently warranted due to the traffic that currently uses Ketner Road to access the rear of Forsyth Country Day School during morning drop-off. A right turn lane would not be warranted based on the PM peak hour traffic volumes (with the addition of site trips) as a result of the heavier influx of site traffic returning home in the afternoon until Phase 4 of the proposed residential development (which assumes all development traffic accesses via this intersection). As for a left turn lane on Shallowford Road, it is not expected to be warranted until Phase 3 of the proposed residential development (which assumes all development traffic accesses via this intersection). Furthermore, the Winston-Salem Northern Beltway is to be constructed in the vicinity under STIP R-2247CB, and a portion of Ketner Road is to be relocated to intersect Shallowford Road further west. Taking this into account, and with the timing of Phases 3 and 4 uncertain due to the stream crossing that is needed, it appears that no turn lanes are needed on Shallowford Road at Ketner Road prior to the development of Phase 3 or 4. Depending on the construction of the approved development [to the north] and the Northern Beltway, the need for turn lanes may need to be reevaluated when development of Phases 3 and/or 4 begin.

If you should have any questions regarding this correspondence, please contact me via email (jclapp@rfkengineers.com) or at (336) 202-0629.

Sincerely,
RFK Engineers PLLC

Jayson B. Clapp, Jr., P.E., PTOE
Principal

Attachment