



MEMORANDUM

To: Adam Wilkerson, P.E., Area Land Use Engineer / Chesterfield Residency
Virginia Department of Transportation

From: Omar Kanaan, P.E.
Brian McPeters, P.E.

Date: February 28, 2022

**Subject: Upper Magnolia Green East TIA
Response to Comments**

We have received comments provided by VDOT dated February 2, 2022. We offer the following responses:

Required Elements for a VDOT Traffic Impact Analysis Report:

1. In accordance with the required elements of a VDOT TIA, the report shall be updated to include a summary of the current Chesterfield County Comprehensive Plan recommendation for the subject property, the current zoning for the subject property, and if the proposed zoning will be consistent with the plan.

Response: Discussion was added to the report summarizing the current Chesterfield County Comprehensive Plan for the property, the current zoning, and the proposed rezoning.

2. In accordance with the requirements of a VDOT TIA, the report shall be updated to include map to illustrate the current land uses of the surrounding properties, including the current zoning of adjacent properties. The report shall be updated to discuss the compatibility of the proposed land use with the neighboring properties.

Response: A map was added to the appendix of the report summarizing the land uses and zoning of adjacent properties.

Overall Report Comments:

3. In order to visualize the location of the proposed land uses identified in the report, a conceptual plan shall be included to provide the approximate location of the proposed schools, library, and residential units. The sketch shall include the anticipated location of access points to both existing and proposed roads. This information will provide context to the location of the major traffic generators proposed on the property.

Response: A preliminary conceptual plan was added to the report.

4. Since future development within the property that is in accordance with this zoning action will be classified as by-right, this TIA shall serve as the formal documentation of site traffic impacts on the surrounding road network. In order to determine the portion of development responsible for the proposed mitigation measures documented in this report, the report shall be updated to provide the framework for future traffic studies to be required by Chesterfield County for the site traffic generated by development governed by this zoning action. VDOT policy shall be used to establish the requirements for Turn Lane Warrants, Signal Warrants, Signal Justification Reports (SJR) and Interchange Justification Reports (IJR) to determine the appropriate road improvements.

Response: The report was updated to clarify that Chesterfield County will require further analyses, compliant with VDOT policy, to establish the requirements for turn lanes, signal warrants, signal justification reports (SJR), and interchange justification reports (IJR) to determine the appropriate road improvements.

5. Since the proposed rezoning will include the construction of an Elementary, Middle, and High School in a residential area, the report shall be updated to discuss the potential for bicycle and pedestrian trips generated by the school campus. The report shall document the existing bicycle and pedestrian accommodations on roads that will access the school campus, such as Westerleigh Parkway, and discuss proposed bicycle and pedestrian accommodations along existing and proposed roads within the study area.

Response: The report was updated to include discussion about existing and proposed multimodal connectivity.

Section 2 – Existing Conditions

6. Clarify the functional classification data in Table 1: Existing Roadway Characteristics to clearly reference the official VDOT functional classification for all existing roads in the study area. A separate column can be added to note the Chesterfield County classification document in the Thoroughfare Plan. Update the table to include the state route number for all state-maintained roads.

Response: Table 1 was updated to address this comment.

Section 3 – Projected No Build Conditions

7. In order to visualize the proximity of the planned road improvements listed in Section 3.2 of the report, include a map of the surrounding area, similar to Figure 1: Site Location that highlights the location of the proposed road improvement and how they will facilitate access from the site to the surrounding road network, including Hull Street Road (US Route 360) to the south, Midlothian Turnpike (US Route 60) to the north, and Route 288 to the east.

Response: The requested map was added to the report.

8. Typically, TIA reports are only required to reference approved zoning cases in the background traffic projections for the analysis. Due to the unique nature of the concurrent zoning cases for Upper Magnolia Green East and West, the report shall be updated to reference the proposed rezoning for the Upper Magnolia Green West property. At a minimum, the report shall include a summary of the proposed land uses and trip generation for the adjacent property and a discussion of the street connections between the two developments. VDOT recommends that impact of site traffic for the West property be considered in the analysis of the East property.

Response: Discussion was added to the report referencing the accompanying Upper Magnolia West rezoning application.

Section 4 – Project Traffic:

9. The summary of the proposed zoning case includes the construction of a public library, which is not included in Table 3: Trip Generation Calculation Summary. Update the table to include an entry for a public library, using ITE Code 590.

Response: Trip generation calculations were updated to include the library.

10. The methodology utilized to determine the peak hour traffic for the three proposed public schools is stated as taking half the peak hour traffic for each school, as it is assumed the schools will have staggered arrival and dismissal times over a two-hour period. VDOT requests additional justification to support the method of allocating the peak hour traffic from the school sites. Adding a statement regarding the standard Chesterfield County School start times for Elementary, Middle, and High Schools would help support the peak hour trip assignment assumption.

The trip generation support data provided in Appendix D indicate that peak hour calculations for each school were based on the peak hour of the adjacent street. Using the peak hour of the adjacent street indicate the trip generated by the schools should be within the same peak hour. If distributing the peak hour school traffic over two hours is justified, then VDOT recommends revising the trip generation for each school to use the peak hour generation method for each ITE Land Use Code.

Response: Based on discussion with VDOT staff, the AM peak hour trip generation for the school was updated to peak hour of generator. Additionally, supporting documentation about the surrounding schools' arrival and dismissal times was added to the report.

11. In order to clearly visualize how the peak hour traffic for the full build out year and future design year were computed, VDOT recommends that the following two (2) additional tables be added to section 4.1 Trip Generation, after Table 3: Trip Generation Calculation Summary:

Table 3A – Phase One – Full peak hour trip generation for the Middle School

Table 3B – Build-Out – The appropriate trip generation for the build-out of the site, after addressing comment ten

Response: The trip generation table was updated to address this comment.

12. In order to visualize the actual site traffic being distributed to the surrounding road network, add two additional figures to Section 4 to show the calculated site trips at each study area intersection in the Initial Phase Year (2024) and Build-Out Year (2035) scenarios, based on the distribution percentages provided in Figures 6 and 7.

Response: Additional figures summarizing the project trip assignment were added to the report.

13. For all figures that include the distribution or projection of the site traffic onto the surrounding road network, update the map to clearly identify the limits of the proposed site, including Figures 6, 7, 8, 9, and 10.

Response: The figures were updated to address this comment.

14. For all figures that include a map of the study intersections, VDOT recommends that the alignment for the Powhite Parkway Extension be highlighted and clearly labeled, as it a regionally significant future improvement identified on the Chesterfield County Thoroughfare Plan and serves as the west boundary of the subject property.

Response: The figures were updated to address this comment.

15. On Figure 6 – Initial Phase Year (2024) Trip Distribution and Figure 8 – Initial Phase Year (2024) Turning Movement Volumes, traffic is included on Node 16, which appears to the proposed North/South Collector Road to be constructed by the build-out year of 2035, but not included in Phase One. Clarify if Node 16 should be included in the Initial Phase (2024) analysis. In addition, update the figures to include an approximate location of the phase one development and the proposed access location(s) to help illustrate the source of site traffic.

Response: Clarification was added to the report that a portion of the North-South Collector will be built in the Initial Phase (2024) to provide access to the middle school from Westerleigh Parkway.

16. There appear to be some irregularities with the Turning Movement Data provided in Figures 8, 9, and 10 for Intersection 14 (Otterdale Road/Westerleigh Parkway). A reduction in volume between the Initial Phase (2024) movements and the Build-Out Year (2035) movements can be explained by the construction of the North/South Collector between Westerleigh Parkway and Duval Road; however, it is unclear why the volumes at Intersection 14 decrease between the Build-Out Year (2035) and the Design Year (2041).

Response: The figures were revised to address the irregularities.

Section 5 – Traffic Operational Analysis:

17. The information presented in Tables 5, 6, 7, 8, 9, 10, and 11 include the Level of Service (LOS) and Delay measured at each intersection approach for the study area intersections for the Existing Year (2021), the Initial Phase Year (2024), the Build-Out Year (2035), and the Design Year (2041). Traditionally, this information is presented for each lane group in order to account for all traffic movements at each intersection, including left turns, right turns, and through movements. Update the tables in Section 5 to report on the LOS and Delay for each lane group at each intersection.

Response: The tables were revised to include each lane group.

18. In order to determine the impact of site traffic on existing intersections, it is standard practice for TIA reports to tabulate and provide the available queue storage length and the peak hour queue length for each study intersection. While this standard measure of effectiveness was not explicitly discussed during the scoping meeting, VDOT assumes this information will be provided for all TIA reports, unless specifically requested and agreed to not be included. VDOT requests that this information be added to the intersection capacity analysis tables in Section 5 for review.

Response: Based on discussion with VDOT staff, 95th percentile Synchro queues were added to the report.

19. The narrative of the report does not include a discussion of the impact of site traffic on the study intersections that are presented in Section 5. At a minimum, a comparison of the no build, build, and build with proposed mitigations shall be provided for each intersection, with a summary of the operational issues resulting from site traffic. This information is necessary in order to evaluate the proposed mitigation measures identified in Section 5.3.

Response: A discussion about the proposed rezoning's impact on each intersection was added to the report.

20. The following study area intersections appear to require additional mitigation measures to accommodate the projected site traffic:

Intersection 8 (Woolridge Road / Otterdale Road):

The overall intersection will have a LOS E in both peak hours in the Build-Out Year 2035, with all approach LOS operating at either an E or F.

Intersection 10 (Woolridge Road / Timber Bluff Road):

The overall intersection will have a LOS F in the PM Peak Hour for the 2035 Build-Out Year and 2041 Design Year, with significant delay on the westbound approach.

Intersection 11 (Woolridge Road / Genito Road):

The overall intersection will have a LOS F in the PM Peak Hour for the 2035 Build- Out Year and 2041 Design Year, with significant delay on the eastbound, westbound, and southbound approaches.

Intersection 14 (Westerleigh Parkway / Otterdale Road):

New signalized intersection with a LOS of E for the eastbound approach in the Initial Phase 2024 (AM only), 2035 Build-Out Year (AM and PM) and the 2041 Design Year (AM and PM), with a LOS of F in the PM Peak Hour of the Initial Phase 2024.

Response: Improvements are recommended to mitigate the project's impact at the study intersections by improving intersection delays to better than no-build conditions for intersections operating at LOS E or LOS F.

Intersection 8: With the updated trip generation and proposed mitigation, the intersection operates at LOS D under all build conditions.

Intersection 10: This signalized intersection experiences excessive delays under all analysis conditions, including existing conditions, due to a high westbound left-turn volume. As the proposed rezoning traffic does not cause the existing excessive delays, no mitigation was recommended.

Intersection 11: The proposed mitigation results in the intersection operating at better than no-build conditions for the 2035 and 2041 analysis conditions.

Intersection 14: With the updated trip generation and proposed mitigation, the referenced eastbound approach operates at LOS C under all build conditions.

21. In the Initial Phase Year (2024), the reported Delay in Table 6 is different between the No-Build and Build scenarios, even though there does not appear to be any site trip distribution to this intersection. Review the analysis for both scenarios and provide context for the results.

Response: The tables have been updated to address this comment. The update results in minimal impacts to overall intersection results.

Detailed Traffic Analysis Comments:

22. The operational analysis of the proposed signalized intersections appear to have been coded into Synchro with default values for minimum green time, yellow time, and all-red time. While this is a planning study and the future signalized intersection have not been designed, the default values should be updated to reflect standard VDOT signal timing policy. In addition, the proposed signals appear to have recall settings that are not consistent with VDOT practice. Update the parameters for the proposed signals in Synchro to incorporate VDOT policy for signal timing.

Response: The proposed signalized intersections' timings were updated based on TOSAM guidance to use the TE 306.1 Memorandum. All results have been updated in the report to address this comment. The update results in minimal impacts to overall intersection results.

23. The parameters used in SIDRA to model roundabouts does not appear to conform to the requirements of the VDOT Traffic Operations and Safety Analysis Manual (TOSAM). For example, the SIDRA Standard Capacity Model should be used instead of the US HCM 6, with the HCM Delay Formula not selected for the analysis. Review the parameters for the roundabout analysis and ensure it conforms to the VDOT TOSAM requirements.

Response: SIDRA parameters were updated based on TOSAM guidance and the results are updated in the report. The update results in minimal impacts to overall intersection results.

24. The proposed mitigation at Intersection 7 (Otterdale Road at Duval Road) does not appear to have been correctly modeled in Synchro for the proposed mitigation improvement for a signalized Green-T, as it appears to be missing an eastbound receiving lane for the side street movement.

Response: An eastbound receiving lane was added to this intersection improvement and the results are updated in the report. The update results in minimal impacts to overall intersection results.