



**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: March 4, 2022

***Subject: Upper Magnolia Green West 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 a 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. Chesterfield County zoning case number 21SN0676 – Upper Magnolia Green West proposes to rezone approximately 1,732 acres from residential to industrial (Zoning District I-2), to include up to 13,856,000 square feet of industrial development. The report does not include a phasing plan for the development, and projects all of the site traffic (46,695 daily trips) in the build-out year of 2035. VDOT requests that the report be updated to include the following information:
  - a. In order to visualize the internal access to existing and proposed roads, VDOT requests that a conceptual plan, such as a bubble diagram map, be provided to breakdown the

overall parcel into smaller areas, with future access points to existing or proposed roads illustrated on the plan.

- b. 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: A preliminary conceptual plan was added to the report. Additionally, 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.*

4. A substantial portion of site traffic is distributed to the proposed Powhite Parkway Extension, which will ultimately connect Hull Street Road (US Route 360) with existing Powhite Parkway (Route 76). While the report references the extension of Powhite Parkway to Hull Street Road as an off-site improvement in both the Executive Summary and Recommendations and Conclusion sections of the report, the body of the report does not clearly identify the proposed site traffic utilizing the extension and does not provide a threshold level of development that would warrant the construction of this regionally significant arterial highway.

Update the report to clearly define the significance of the Powhite Parkway Extension to the overall site traffic distribution and the amount of site traffic projected to utilize the extension. A supplemental traffic analysis will be required if significant development is approved on the subject property without the construction of the Powhite Parkway Extension.

*Response: The trip distribution section was updated to clarify the site trips that will use the Powhite Parkway Extension. In addition, discussion about the requirement of further studies as site plans are developed to account for the Powhite Parkway Extension was added to the executive summary.*

5. Due to the nature of the proposed industrial land use for the subject property, the report shall be updated to discuss the anticipated amount of heavy truck traffic projected as a percentage of overall site traffic. The report shall include a conceptual plan for the routing of heavy trucks to access the site from Hull Street Road to the south and the Route 288 corridor to the north-east.

*Response: Based on discussion with VDOT, the analysis updated the heavy vehicle percentage at all movements providing access to project traffic to account for the expected site-generated heavy vehicles.*

6. During the Scoping Meeting for the TIA, VDOT requested a Safety Inventory Analysis for the following roads within the study area:

Route 603 – Skinquarter Road  
Route 605 – Moseley Road  
Route 606 – Mt. Hermon Road  
Route 668 – Duval Road

The Safety Inventory Analysis should include a field inspection of the road segments and a summary of the basic cross-sectional elements. Additional information, such as sharp horizontal and vertical alignment, limited sight distance, and crash history can be provided to identify specific locations in need of improvements. Update the report to include a section to address the required Safety Inventory Analysis for these routes.

*Response: A safety inventory analysis was added to the report summarizing roadway characteristics, ADT, posted speed limit, and crash history.*

## Section 2 – Existing Conditions

7. 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

8. 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.*

9. 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 East 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 East property be considered in the analysis of the West property.

*Response: Discussion was added to the report referencing the accompanying Upper Magnolia East rezoning application*

#### Section 4 – Project Traffic:

10. Due to the uncertain nature of the location of future access points to the Powhite Parkway Extension, VDOT concurred with the request to not show the location of intersections and/or interchanges along the Powhite Parkway Extension. In reviewing the Trip Distribution Figures provided in the report, it is difficult to determine the amount of traffic being projected onto the Powhite Parkway Extension. VDOT recommends that the preliminary alignment of the Powhite Parkway Extension be highlighted and clearly labeled on all figures, with an overall site traffic distribution percentage shown to the south (Hull Street Road) and to the north (existing Powhite Parkway) utilizing the Extension.

*Response: The figures were updated to address this comment.*

11. In order to visualize the actual site traffic being distributed to the surrounding road network, add an additional figure to Section 4 to show the calculated site trips at each study area intersection in the Build-Out Year (2035) scenario, based on the distribution percentages provided in Figure 4.

*Response: The figures were updated to address this comment.*

12. 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 5, 6, and 7.

*Response: The figures were updated to address this comment.*

13. In reviewing the proposed site traffic that is distributed to proposed roadways within the limits of the study area, it is unclear if the analysis redistributed some of the projected trips on existing roads to utilize the proposed roads in order to access the Powhite Parkway Extended, or existing residential neighborhoods that will be connected to the new road network. At a minimum, the report should include a discussion of this potential and provide a methodology for approximating these trips along the proposed roads.

*Response: Discussion was added to the report clarifying that background traffic was not redistributed/reassigned to the proposed site's internal roadway network.*

## Section 5 – Traffic Operational Analysis:

14. The information presented in Tables 5, 6, 7, 8, and 9 include the Level of Service (LOS) and Delay measured at each intersection approach for the study area intersections for the Existing Year (2021), 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.*

15. 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, 95<sup>th</sup> percentile Synchro queues were added to the report.*

16. 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.*

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

Intersection 3 (US 360 / Magnolia Green Parkway):

The northbound and southbound approaches will have a LOS E in the 2035 PM Peak Hour and a LOS F in the 2041 PM Peak Hour.

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 and southbound approaches.

Intersection 18 (New North/South Arterial / Duval Road)

New signalized intersection with a LOS of E for both eastbound and westbound approaches in the AM Peak Hour in the 2035 Build-Out Year and the 2041 Design Year.

*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 3: 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: With the addition of the mitigation measures, the overall intersection delay is expected to improve to better than no-build conditions during the AM peak hour under 2035 and 2041 analysis conditions and to within 10.5 seconds of no-build conditions during the PM peak hour under 2035 and 2041 analysis conditions. Note that additional improvements were explored at this intersection but deemed unfeasible due to the proximity of the intersection to multiple bridges and the Swift Creek reservoir.*

*Intersection 18: Proposed configuration at this intersection was revised. Note that a signal justification report will be prepared to support the recommended signalization at the time of development.*

18. The mitigation measures recommended for Hull Street Road (US Route 360) include widening the road to a six (6) lane facility between Cosby Road and Beaver Bridge Road. Note that improvements to eastbound Hull Street Road would need to be extended approximately 1,000 feet east of the intersection of Cosby Road in order to connect to the existing six lane section of Hull Street Road.

*Response: Discussion was added to the report to address this comment.*

19. The mitigation measures presented in Section 5.3 are based on the full build-out of the proposed development and cover a large number of the study area intersections. The narrative for this section of the report shall be expanded to discuss the need for a phasing plan by the applicant to determine when the proposed mitigation measures will be required.

*Response: Chesterfield County is in the process of developing a phasing plan for the proposed improvements. The improvements and phasing will be included in the approval conditions of the rezoning application.*

## Detailed Traffic Analysis Comments:

20. 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.*

21. A detailed review of the Synchro model indicate that the default 2% heavy vehicle percentage was used for all new intersections, while all pre-existing intersections were modeled with a constant heavy vehicle percentage. The ITE Trip Generation Manual, 10<sup>th</sup> Edition Supplement states that for Land Use Code 130 (Industrial Park), trucks comprise 17% of Weekday Total Traffic and 10% of Weekday AM and PM Peak Hour traffic. In order to account for the projected volume of truck traffic for the proposed land use, the Synchro model shall be updated to reflect the ITE recommended truck percentages for site traffic.

*Response: The heavy vehicle percentage was updated to address this comment.*

22. 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.*

23. The proposed mitigation at Intersection 4 (US 360 and Otterdale Road) does not appear to have been correctly modeled in Synchro for the Build Improvement models. While the lane configuration was correctly updated in these models to match the proposed mitigation, the signal in these models is still operating under northbound/southbound split phasing, which the TIA identifies as being removed (Section 5.3, page 25).

*Response: The synchro and results were updated to address this comment.*



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.*