



COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION

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May 6, 2022

Steve Adams
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(Sent via E-mail)

Subject: Upper Magnolia Green West
Traffic Impact Analysis – VDOT Comments

Dear Mr. Adams:

In accordance with §15.2-2222.1 of the Code of Virginia and the Virginia Traffic Impact Analysis Regulations, 24 VAC 30-155 (also known as Chapter 527), a traffic impact analysis was prepared by Kimley-Horn in support of the rezoning case for the proposed development project entitled Upper Magnolia West, located in western Chesterfield County, to the north of Hull Street Road (US Route 360), east of Moseley Road (Route 605) and south of Genito Road (Route 604).

The original Traffic Impact Analysis report for the Upper Magnolia Green West zoning case was submitted to VDOT for review on January 14, 2022. The Department reviewed the original report and provided a comment letter dated February 2, 2022. The applicant revised the report to address VDOT comments, and resubmitted it for review on March 7, 2022 with a support memorandum provided by Kimley-Horn to document their written comment responses that were incorporated into the updated report. The Department reviewed the revised report and provided a comment letter dated April 1, 2022. The final revision to the report was submitted for review on April 7, 2022, and included a memorandum with written comment responses that summarized the updates to the report.

Based on the comment responses and the updated report, the Department finds that the report conforms to the requirements of Chapter 527 in regard to the accuracy of the methodologies, assumptions, and conclusions presented in the analysis, based on the approved scoping document in Appendix A of the report.

Summarized below are the key findings and recommendations identified in the report:

The proposed development will include a combination of the following land uses:

- 2,400 student High School
- 13,216,000 sq. ft. Industrial Park

The TIA Report includes the anticipated trip distribution for the proposed industrial uses that were discussed at the scoping meeting and included in the approved scope of work form. Since the high school was added to the TIA after the scoping report was finalized, the proposed trip distributions for the high school were included in the revised TIA Report.

The TIA Report does not provide a phasing plan for the development and includes an ultimate build-out year for the site in the year 2035. In accordance with the Chapter 527 requirements, the TIA Report includes an analysis for the 2035 Build-Out Year, and a future analysis year of 2041 to analyze traffic six years beyond the completion date of the site. In accordance with Chesterfield County traffic study requirements, a future analysis year of 2041 was included in the TIA to represent a 20-year future forecast from the initial year.

The anticipated trip generation for the development is defined in the report as the following:

- Weekday Average Traffic = 49,194 vehicles per day
- AM Peak Hour Traffic = 5,522 vehicles per hour
- PM Peak Hour Traffic = 4,829 vehicles per hour

Study Area:

The TIA Report identified the following intersections within the approved study area for analysis of the proposed site traffic:

- Hull Street Road at Skinquarter Road
- Hull Street Road at Beaver Bridge Road
- Hull Street Road at Magnolia Green Parkway (Signalized)
- Hull Street Road at Otterdale Road (Signalized)
- Magnolia Green Parkway at Creekshire Drive
- Woolridge Road at Creekshire Drive
- Otterdale Road at Duval Road
- Otterdale Road at Woolridge Road (Signalized)
- Woolridge Road at Fox Club Road (Signalized)
- Woolridge Road at Timber Bluff Parkway (Signalized)
- Woolridge Road at Genito Road (Signalized)
- Otterdale Road at Genito Road (Roundabout)
- Skinquarter Road at Duval Road
- Otterdale Road at Westerleigh Parkway
- Duval Road at North-South Collector (New Intersection)
- Westerleigh Parkway at North-South Collector (New Intersection)

- Woolridge Road at Magnolia Green Parkway (New Intersection)
- Duval Road at Magnolia Green Parkway (New Intersection)
- Future Thoroughfare Road Connection to Moseley Road (New Intersection)
- Genito Road at Mt. Hermon Road

Traffic Analysis Categories:

In order to determine the traffic impact of proposed site traffic, the report evaluated the following scenarios:

- Existing Conditions – Year 2021
- Projected No-Build Conditions – Year 2035
- Build-Out Conditions – Year 2035
- Projected No-Build Conditions – Year 2041
- Design Build-Out Conditions – Year 2041

Roadway Improvements:

Based on the results of the operational analysis of site traffic on the surrounding road network, the TIA report recommends the following road improvements:

- Extend Powhite Parkway as a limited-access expressway from its future planned terminus at Woolridge Road to intersect with Hull Street Road (US Route 360).
- Widen Hull Street Road from a four-lane divided arterial to a six-lane divided arterial from Beaver Bridge Road to the existing six lane arterial section of Hull Street Road approximately 1,200 feet east of the intersection of Cosby Road.
- Installing a signalized Green-T innovative intersection on Hull Street Road at Skinquarter Road, if warranted and recommended by a future Signal Justification Report (SJR).
- Restrict northbound left-turn movement from Beaver Bridge Road onto westbound Hull Street Road.
- Improve the existing signalized intersection of Hull Street Road with Magnolia Green Parkway and Baldwin Creek Road as follows:
 - Widen the southbound approach of Magnolia Green Parkway to dual left turn lanes, a through lane, and a right turn lane.
 - Widen the northbound approach of Baldwin Creek Road to an exclusive left turn lane, a single through lane, and an exclusive right turn lane.
- Widen the southbound approach of Otterdale Road to a dual left turn lane, dual through lanes, and a single right turn lane at the signalized intersection with Hull Street Road.
- Installing a signalized Green-T innovative intersection at the Otterdale Road intersection with Duval Road, if warranted and recommended by a future SJR.
- Widen Otterdale Road from a two-lane road to a four-lane road between Duval Road and Woolridge Road.
- Construct a new North-South Collector as a four-lane road between Duval Road and Westerleigh Parkway.

- Widen Duval Road from a two-lane road to a four-lane road between Otterdale Road and the proposed North-South Collector road.
- Install a traffic signal at the intersection of Duval Road at the proposed North-South Collector road, if warranted and recommended by a future SJR.
- Improve the existing signalized intersection of Woolridge Road with Otterdale Road as follows:
 - Add an additional through lane to northbound Otterdale Road
 - Add an additional left turn lane to southbound Otterdale Road
 - Add an additional left turn lane to westbound Woolridge Road
- Add an additional northbound through lane to Woolridge Road at the signalized intersection with Genito Road.
- Install a traffic signal at the intersection of Genito Road and Mt. Hermon Road, if warranted and recommended by a future SJR.
- Improve Genito Road between Otterdale Road and Mt. Hermon Road to include safety improvements, shoulders, and dedicated turn lanes at future intersection locations.
- Improve Mt. Hermon Road south of Genito Road to include safety improvements, shoulders, and dedicated turn lanes at future intersection locations.
- Improve Duval Road between Skinquarter Road and the proposed location of Powhite Parkway Extension to include safety improvements, shoulders, and dedicated turn lanes at future intersection locations.
- Improve Moseley Road between Skinquarter Road and the future Thoroughfare Road Connection to include safety improvements, shoulders, and dedicated turn lanes at future intersection locations.
- Improve Skinquarter Road between Hull Street Road and Moseley Road to include safety improvements, shoulders, and dedicated turn lanes at future intersection locations.

Future Traffic Studies:

Since a proposed phasing plan was not provided in the TIA Report, the road improvements recommended in the report are associated with the complete build-out of the development. Unless a developer constructs the entire industrial park land use in a single development, a phasing plan will be required to determine the appropriate road improvements for each portion of the overall industrial development built in the Upper Magnolia West property. A separate traffic study will be required for the high school, since the TIA Report does not include any phased road improvements based solely on the high school traffic.

The report states that the zoning case will include proffers requiring any future development within the Upper Magnolia Green West boundary to submit a traffic analysis report to define the road improvements necessary to mitigate the impact of site traffic on the surrounding road network. The road improvements will be based on the approved proffers for the zoning case, as determined by the site traffic mitigation measures documented in the TIA Report. Subsequent traffic analysis reports shall adhere to all VDOT requirements and policies for traffic analysis applicable at that time, including turn lane warrants, signal warrants, Signal

Justification Reports (SJR), Interchange Access Reports (IAR), and Operational and Safety Analysis Reports (OSAR).

Powhite Parkway Extension:

The TIA Report notes that there is a currently funded project in development to extend the Powhite Parkway from the current terminus at Charter Colony Parkway to Woolridge Road, scheduled for completion prior to the year 2035. The TIA Report includes the assumption that the Upper Magnolia Green West development will extend Powhite Parkway from Woolridge Road to Hull Street Road, providing a new limited-access expressway connection from Hull Street Road to the existing Powhite Parkway and Route 288. The trip distribution provided in this report assumes 50% of site traffic will utilize the Powhite Parkway Extension, with the remaining site trips using the surrounding road network. The VDOT acceptance of the TIA Report for Upper Magnolia Green West is predicated on the completion of the Powhite Parkway Extension to carry a significant portion of site traffic. Due to the complex nature of designing and constructing a new limited-access expressway with multiple interchanges, VDOT will need to be included in the planning, design, and construction of the Powhite Parkway Extension.

2035 Analysis of Full Site Build-Out Traffic:

The operational analysis for the Build-Out Year 2035 is summarized in Table 6 for the AM Peak Hour and Table 7 for the PM Peak Hour of the TIA Report. The table provides the Level of Service (LOS) for the future year condition without the site traffic, the future year condition with site traffic, and then the future year condition with site traffic and the proposed mitigation measures. In addition, Table 10 summarizes the 95th percentile queue lengths for each traffic movement at all study area intersections in the AM and PM Peak Hours.

Overall intersection LOS determined for the study area intersections for the year 2035 with site traffic and proposed road improvements is similar to the projected 2035 year traffic without any site traffic or road improvements. All study area intersection will operate with an overall LOS of D or better, except the following intersections:

Woolridge Road at Timber Bluff:	AM = D; PM = F
Woolridge Road at Genito Road:	AM = E; PM = F

The following intersection approach movements will operate with an LOS of E or F in either the AM or PM Peak Hour:

Northbound (NB) Magnolia Green Pkwy at Hull Street Road	AM = E; PM = E
Southbound (SB) Magnolia Green Pkwy at Hull Street Road	AM = E; PM = E
NB Otterdale Road at Hull Street Road	AM = E; PM = E
SB Otterdale Road at Hull Street Road	AM = E; PM = E
Eastbound (EB) Woolridge Road at Otterdale Road	AM = D; PM = E
SB Otterdale Road at Woolridge Road	AM = D; PM = E
NB Fox Club Road at Woolridge Road	AM = D; PM = E

SB Fox Light Pkwy at Woolridge Road	AM = D; PM = E
Westbound (WB) Woolridge Road at Timber Bluff Road	AM = D; PM = F
NB Timber Bluff Road at Woolridge Road	AM = E; PM = F
EB Genito Road at Woolridge Road	AM = E; PM = F
WB Genito Road at Woolridge Road	AM = E; PM = F
NB Woolridge Road at Genito Road	AM = E; PM = E
SB Woolridge Road at Genito Road	AM = E; PM = F

The results in Tables 6 and 7 indicate that a majority of the operational performances of these movements, as measured in average delay in seconds, will be better with site traffic and the proposed road improvements than the projected background traffic without any site traffic or road improvements. Intersection movements that deteriorated between the no-build condition and site traffic with improvements condition include eastbound Woolridge Road at Otterdale Road, westbound Woolridge Road at Timber Bluff road, northbound Timber Bluff Road at Woolridge Road, northbound Woolridge Road at Genito Road, and southbound Woolridge Road at Genito Road.

2041 Analysis of Full Site Build-Out Traffic:

The operational analysis for the Build-Out Year 2035 is summarized in Table 8 for the AM Peak Hour and Table 9 for the PM Peak Hour of the TIA Report. The table provides the LOS for the future year condition without the site traffic, the future year condition with site traffic, and then the future year condition with site traffic and the proposed mitigation measures. In addition, Table 10 summarizes the 95th percentile queue lengths for each traffic movement at all study area intersections in the AM and PM Peak Hours.

Overall intersection LOS determined for the study area intersections for the year 2041 with site traffic and proposed road improvements is similar to the projected 2041 year traffic without any site traffic or road improvements. All study area intersection will operate with an overall LOS of D or better, except the following intersections:

Woolridge Road at Otterdale Road:	AM = D; PM = E
Woolridge Road at Timber Bluff:	AM = E; PM = F
Woolridge Road at Genito Road:	AM = E; PM = F

The following intersection approach movements will operate with an LOS of E or F in either the AM or PM Peak Hour:

NB Magnolia Green Pkwy at Hull Street Road	AM = E; PM = E
SB Magnolia Green Pkwy at Hull Street Road	AM = E; PM = E
NB Otterdale Road at Hull Street Road	AM = E; PM = F
SB Otterdale Road at Hull Street Road	AM = E; PM = F
EB Woolridge Road at Otterdale Road	AM = D; PM = E
NB Otterdale Road at Woolridge Road	AM = D; PM = E
SB Otterdale Road at Woolridge Road	AM = D; PM = E
NB Fox Club Road at Woolridge Road	AM = D; PM = E

Upper Magnolia Green West – TIA

May 6, 2022

Page 7 of 8

SB Fox Light Pkwy at Woolridge Road	AM = D; PM = E
WB Woolridge Road at Timber Bluff Road	AM = E; PM = F
NB Timber Bluff Road at Woolridge Road	AM = F; PM = F
EB Genito Road at Woolridge Road	AM = F; PM = F
WB Genito Road at Woolridge Road	AM = F; PM = F
NB Woolridge Road at Genito Road	AM = E; PM = F
SB Woolridge Road at Genito Road	AM = E; PM = F

The results in Tables 8 and 9 indicate that a majority of the operational performances of these movements, as measured in average delay in seconds, will be better with site traffic and the proposed road improvements than the projected background traffic without any site traffic or road improvements. Intersection movements that deteriorated between the no-build condition and site traffic with improvements condition include eastbound Woolridge Road at Otterdale Road, westbound Woolridge Road at Timber Bluff road, northbound Timber Bluff Road at Woolridge Road, and southbound Woolridge Road at Genito Road.

Site Traffic Mitigation Measures:

Section 5.4 of the TIA report provides a summary of the impact of site traffic on each study area intersection and the proposed road improvements to mitigate the site traffic. In addition to the road improvements listed previously, the TIA Report includes the following road improvements not specifically identified to mitigate site traffic, but included in the conditions of the zoning case:

- Extend Westerleigh Parkway from the proposed North-South Collector Road to Magnolia Green Parkway Extended, with a future Thoroughfare Road Connection to Moseley Road.
- Extend Magnolia Green Parkway from Woolridge Road to Westerleigh Parkway
- Extend Mt. Hermon Road from Westerleigh Parkway to Genito Road

In the discussion of the site traffic impact to the signalized intersection of Woolridge Road and Genito Road, the TIA Report acknowledges that while many of the traffic movements will perform better in the full build-out condition with improvements as compared to the no-build condition, all of the overall intersection approaches will operate at a LOS E or F in the year 2035, and at a LOS F in the year 2041. The TIA Report recommends that a future traffic study be performed at this intersection to determine the appropriate improvements to address these operational results. The report states that additional road improvements were explored at this intersection, but deemed infeasible due to the proximity of the Swift Creek Reservoir.

The operational analysis performed for the 2021 existing condition identified a LOS F for the westbound Woolridge Road left turn movement onto Timber Bluff Road. While no site traffic is projected to utilize this turning movement, the 2035 and 2041 build-out years show the movement will continue to degrade with the background traffic growth included in the TIA analysis, and will result in a significant delay and queue length in both future analysis years. The TIA recommends that a future traffic study be performed to address these operational results.

Chesterfield Zoning Case 21SN0675 – Upper Magnolia Green East:

The TIA Report for the Upper Magnolia Green West case references the active zoning case for the adjacent property, identified as Upper Magnolia Green East. Figure 1: Site Location and Figure 2: Preliminary Conceptual Plan included in the report clearly identify the location of both properties and their geographic relationship to each other. The applicant has submitted a separate Chapter 527 TIA Report for the East case to quantify the site traffic generated by the proposed lane uses for the development, distribute the site traffic on the surrounding road network, and analyze the impact of site traffic on the study area intersections. The TIA Report for the East case has been accepted by VDOT, as documented in the TIA Acceptance Letter dated April 19, 2022.

Note that the TIA Report is intended to be a stand-alone document to quantify the impact of site traffic generated by the development in the future analysis years identified in the report. Since the proposed zoning case for Upper Magnolia Green East has not been approved by the Board of Supervisors, the report for the West case does not include the projected site traffic generated by the East case. Future traffic studies performed in accordance with the conditions of zoning for this case will be required to collect updated traffic counts to capture actual traffic volumes at the study area intersections to ensure the appropriate road improvements are identified and developed.

The purpose of the traffic impact analysis report and the summary of findings is to assist the Planning Director, the Planning Commission, and/or the Board of Supervisors in their decision-making process regarding the proposed development. I am available at your convenience to meet and discuss the traffic impact analysis report and the findings.

If you have any questions or require any additional information, I can be reached at (804) 674-2384.

Sincerely,



Adam Wilkerson, P.E.

Area Land Use Engineer, Central

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