



COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION

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Commissioner

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April 19, 2022

Steve Adams
Chesterfield County Department of Transportation
9800 Government Center Parkway
PO Box 40
Chesterfield, Virginia 23832-0040

(Sent via E-mail)

Subject: Upper Magnolia Green East – 21SN0675
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 East, located in western Chesterfield County, to the north of Duval Road (Route 668) and to the west of Otterdale Road (Route 667) and Westerleigh Parkway (Route 7495).

The original Traffic Impact Analysis report for the Upper Magnolia Green East 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 1, 2022, including 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 March 30, 2022. The final revision to the report was submitted for review on April 6, 2022 and included a memorandum with written comment responses summarizing the updates to the report.

Based on the comment responses and 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.

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

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

- 1,000 student Elementary School
- 1,800 student Middle School
- 600 single family homes
- 1 public library (approx. 25,000 sq. ft.)

The TIA report states that the site will be developed in two phases, with phase one completed by the year 2024 and the second phase completed in the year 2035. A summary of the level of development for each phase is as follows:

Phase 1 – 2024 Initial Phase Year

- 1,800 student Middle School

Phase 2 – 2035 Build-Out Year

- 1,000 student Elementary School
- 600 single family homes
- 1 public library (approx. 25,000 sq. ft.)

In accordance with the Chapter 527 requirements, the TIA includes traffic analysis for the 2024 Build-Out Year of Phase 1, the 2035 Build-Out Year of Phase 2, and the future year 2041 for six years past the completion of Phase 2. 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 first phase of the development is calculated by the data in the report as follows:

- Weekday Average Traffic = 3,717 vehicles per day
- AM Peak Hour Traffic = 1,206 vehicles per hour
- PM Peak Hour Traffic = 270 vehicles per hour

The anticipated trip generation for the full build-out of the site, including phases one and two is defined in the report as follows:

- Weekday Average Traffic = 13,092 vehicles per day
- AM Peak Hour Traffic = 2,423 vehicles per hour
- PM Peak Hour Traffic = 1,189 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)

The proposed development will construct a new roadway, identified in the report as North-South Collector, which will provide a direct connection between Duval Road and Westerleigh Parkway.

Traffic Analysis Categories:

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

- Existing Condition – Year 2021
- Projected No-Build Conditions – Year 2024
- Initial Phase Development Condition – Year 2024
- Projected No-Build Conditions – Year 2035
- Build-Out Condition – 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:

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- Widen southbound Otterdale Road at Hull Street Road from a single lane to a five (5) lane section, including two left turn lanes, two through lanes, and an exclusive right turn lane.
- Improve the existing intersection of Woolridge Road with Otterdale Road by adding an additional through lane to northbound Otterdale Road, an additional left turn lane for southbound Otterdale Road, and extending the existing westbound right turn lane by approximately 150 feet.
- Widen Otterdale Road from two to four lanes between Woolridge Road and Duval Road.
- Construct the North-South Collector road as a four lane road between Duval Road and Westerleigh Parkway.
- Widen Duval Road from two to four lanes between Otterdale Road and the proposed North-South Collector Road.
- Install a Signalized Green-T at the intersection of Otterdale Road and Duval Road, to permit a free-flow eastbound movement from Duval Road to Otterdale Road, if warranted and recommended by a future Signal Justification Report (SJR)
- Improve the intersection of Woolridge Road at Genito Road by adding an additional northbound through lane on Woolridge Road.
- Install a traffic signal at the intersection of Otterdale Road and Westerleigh Parkway, with a free-flow channelized eastbound right turn lane, if warranted and recommended by a future SJR
- Install a roundabout at the intersection of Westerleigh Parkway and the proposed North-South Collector Road

Based on the operational analysis for the initial phase, the road improvements recommended to be provided with the initial phase in 2024 include improvements to the intersection of Otterdale Road at Hull Street Road, installation of a signaled Green-T at the intersection of Otterdale Road at Duval Road, and the signalization of the intersection of Otterdale Road at Westerleigh Parkway.

No signal warrants were included in the TIA report, so a supplemental traffic study will be required with the initial phase development in 2024 to determine if signals will be warranted at the intersections of Otterdale Road at Duval Road and Otterdale Road at Westerleigh Parkway. In the event signals are warranted at either intersection, a Signal Justification Report (SJR) will need to be completed and submitted to VDOT to determine the appropriate intersection controls at each intersection.

The other recommended improvements would be needed at the full build-out of the development in the year 2035. Supplemental traffic analysis would be needed if the remaining development occurs incrementally, to determine the appropriate road improvements for each portion of the development. VDOT recommends that the zoning case include a condition that requires a phasing plan with supporting traffic analysis for the site traffic generated by each portion of the property.

2024 Analysis of Initial Phase Traffic:

The operational analysis for the Initial Phase of development in the year 2024 is summarized in Table 8 for the AM Peak Hour and Table 9 for the PM Peak Hour. 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 14 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 2024 with site traffic and proposed road improvements out site traffic is similar to the projected 2024 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 = C; 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 = D; PM = E
Eastbound (EB) Duval Road at Otterdale Road	AM = E; PM = E
SB Otterdale Road at Woolridge Road	AM = D; PM = E
NB Fox Light Pkwy at Woolridge Road	AM = D; PM = E
SB Fox Club Road at Woolridge Road	AM = D; PM = E
Westbound (WB) Woolridge Road at Timber Bluff Road	AM = B; PM = F
EB Genito Road at Woolridge Road	AM = E; PM = F
WB Genito Road at Woolridge Road	AM = F; PM = F
NB Woolridge Road at Genito Road	AM = D; PM = E
SB Woolridge Road at Genito Road	AM = D; PM = E

The results in Tables 8 and 9 indicate that a majority of the operational performance 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.

2035 Analysis of Full Site Build-Out Traffic:

The operational analysis for the Build-Out Year 2035 is summarized in Table 10 for the AM Peak Hour and Table 11 for the PM Peak Hour. 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 14

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 out site traffic 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 = D; 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 = E
SB Otterdale Road at Hull Street Road	AM = D; PM = E
NB Otterdale Road at Woolridge Road	AM = E; PM = E
SB Otterdale Road at Woolridge Road	AM = D; PM = E
NB Fox Light Pkwy at Woolridge Road	AM = D; PM = E
SB Fox Club Road at Woolridge Road	AM = D; PM = E
WB Woolridge Road at Timber Bluff Road	AM = D; PM = F
NB Timber Bluff Road at Woolridge Road	AM = E; PM = E
EB Genito Road at Woolridge Road	AM = E; PM = F
WB Genito Road at Woolridge Road	AM = F; PM = F
NB Woolridge Road at Genito Road	AM = D; PM = E
SB Woolridge Road at Genito Road	AM = D; PM = F

The results in Tables 10 and 11 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.

2041 Analysis of Future Year Full Site Build-Out Traffic:

The operational analysis for the Build-Out Year 2041 is summarized in Table 12 for the AM Peak Hour and Table 13 for the PM Peak Hour. 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 14 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 out site traffic is similar to the projected 2041 year

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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:

Hull Street Road at Otterdale Road:	AM = E; 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:

SB Skinquarter Road at Hull Street Road	AM = E; PM = F
NB Beaver Bridge Road at Hull Street Road	AM = E; PM = D
NB Magnolia Green Pkwy at Hull Street Road	AM = E; PM = E
SB Magnolia Green Pkwy at Hull Street Road	AM = E; PM = E
EB Hull Street Road at Otterdale Road	AM = E; PM = D
NB Otterdale Road at Hull Street Road	AM = F; PM = F
SB Otterdale Road at Hull Street Road	AM = F; PM = F
NB Otterdale Road at Woolridge Road	AM = E; PM = E
SB Otterdale Road at Woolridge Road	AM = D; PM = E
NB Fox Light Pkwy at Woolridge Road	AM = D; PM = E
SB Fox Club Road 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 = E; PM = F
WB Genito Road at Woolridge Road	AM = E; PM = F
NB Woolridge Road at Genito Road	AM = D; PM = E
SB Woolridge Road at Genito Road	AM = D; PM = F

The results in Tables 10 and 11 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.

Chesterfield Zoning Case 21SN0676 – Upper Magnolia Green West:

The TIA Report for the Upper Magnolia Green East case references the active zoning case for the adjacent property, identified as Upper Magnolia Green West. 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 West 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 West case is currently under review by VDOT, and a separate comment letter will be provided once the review is complete.

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 West has not been approved by the Board of Supervisors, the report for the East case does not include the projected site traffic generated by the West 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,

A handwritten signature in blue ink that reads "Adam Wilkerson". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Adam Wilkerson, P.E.
Area Land Use Engineer, Central

CC (Via E-mail): R. Worley (VDOT – Chesterfield Residency)
H. Joseph (VDOT – Richmond District)
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