

2500 TYLER ROAD – TRAVEL CENTER

SPECIAL USE PERMIT

Located in:

Montgomery County, Virginia

Project Number: 3327.0

Date: May 27, 2022

Revised: June 9, 2022

Revised: July 7, 2022



1260 Radford Street · Christiansburg, Virginia 24073
540.381.6011 office · 540.381.2773 fax
www.foresightdesignservices.com

2500 Tyler Road – Travel Center

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2500 Tyler Road – Travel Center

SPECIAL USE PERMIT APPLICATION



**MONTGOMERY
COUNTY, VIRGINIA**

Special Use Permit Application Form

Montgomery County, Virginia
755 Roanoke St. Suite 2A, Christiansburg, VA 24073
540-394-2148 | mcplan@montgomerycountyva.gov

Applicant Information: (PLEASE PRINT -- if additional owners, please attach additional sheets)

Owner of Record: 9DG LLC	Address: 118 Tobias Road, Vinton, VA 24179
Individual Name & Title: (Corporation, Partnership, or LLC) Jay Patel	118 Tobias Road, Vinton, VA 24179
Telephone: (848) 248-6034	Email: jay7249@yahoo.com

Applicant Name: Owner Contract Purchaser/Lessee JFM Hospitality, LLC	Address: 118 Tobias Road, Vinton, VA 24179
Name & Title of Representative: (Corporation/Business) Jay Patel	118 Tobias Road, Vinton, VA 24179
Telephone: (848) 248-6034	Email: jay7249@yahoo.com

Representative Name and Company: Foresight Design Services	Address: 1260 Radford Street, Christiansburg, VA 24073
Telephone: (540) 381-6011	Email: info@foresightdesignservices.com

Property Description:

Location or Address: (Describe in relation to nearest intersection) 2500 Tyler Road		
Parcel ID Number(s): 016517	Acreage: 2.600 Acres	Existing Zoning: GB
Comprehensive Plan Designation: UDA Boundary	Existing Use:	

Description of Request: (Please provide additional information on attached sheet if necessary)

Proposed Use(s) including acreage: Travel Center - 2.600 Acres

I certify that the information supplied on this application and on the attachments provided (maps or other information) is accurate and true to the best of my knowledge. In addition, I hereby grant permission to the agents and employees of Montgomery County and State of Virginia to enter the above property for the purposes of processing and reviewing the above application.

If signing on behalf of a Corporation, Partnership, or LLC, please specify your title, include the name of the entity and provide documentation clarifying your authority to sign on behalf of the entity.

J. Patel _____ Date 06/09/22
Owner 1 Signature

Owner 2 Signature (for add'l owners please attach separate sheet) Date

Applicant Signature Date

J. Patel _____ Date 6/9/22
Representative/Agent Signature

Schedule K-1 Control: 2

2021

(Form 1065)

Department of the Treasury
Internal Revenue Service

For calendar year 2021, or tax year

beginning 10-19 2021 ending 12-31-2021

Partner's Share of Income, Deductions, Credits, etc.

See separate instructions.

Part I Information About the Partnership

A Partnership's employer identification number
87-3155764

B Partnership's name, address, city, state, and ZIP code
9DG LLC
2500 TYLER RD
CHRISTIANSBURG, VA 24073

C IRS center where partnership filed return **E-FILE**

D Check if this is a publicly traded partnership (PTP)

Part II Information About the Partner

E Partner's SSN or TIN (Do not use TIN of a disregarded entity. See instr.)
~~11-11-2020~~

F Name, address, city, state, and ZIP code for partner entered in E. See instructions.
JAY PATEL
216 MINNIE BELL LANE
VINTON, VA 24179

G General partner or LLC member-manager Limited partner or other LLC member

H1 Domestic partner Foreign partner

H2 If the partner is a disregarded entity (DE), enter the partner's:
TIN _____ Name _____

I1 What type of entity is this partner? **INDIVIDUAL**

I2 If this partner is a retirement plan (IRA/SEP/Keogh/etc.), check here

J Partner's share of profit, loss, and capital (see instructions):

	Beginning	Ending
Profit	00.000000 %	00.000000 %
Loss	00.000000 %	00.000000 %
Capital	00.000000 %	00.000000 %

Check if decrease is due to sale or exchange of partnership interest

K Partner's share of liabilities:

	Beginning	Ending
Nonrecourse	\$	\$
Qualified nonrecourse financing	\$	\$
Recourse	\$	\$ 000000

Check this box if item K includes liability amounts from lower tier partnerships

L Partner's Capital Account Analysis

Beginning capital account	\$
Capital contributed during the year	\$ 000,000
Current year net income (loss)	\$ 000,000
Other increase (decrease) (attach explanation)	\$
Withdrawals and distributions	\$ (000,000)
Ending capital account	\$ 000,000

M Did the partner contribute property with a built-in gain (loss)?
 Yes No If "Yes," attach statement. See instructions.

N Partner's Share of Not Recognized Section 704(c) Gain or (Loss)

Beginning	\$
Ending	\$

Final K-1 Amended K-1

Part III Partner's Share of Current Year Income, Deductions, Credits, and Other Items

1 Ordinary business income (loss)	14 Self-employment earnings (loss)
2 Net rental real estate income (loss)	
3 Other net rental income (loss)	15 Credits
4a Guaranteed payments for services	
4b Guaranteed payments for capital	16 Schedule K-3 is attached if checked <input type="checkbox"/>
4c Total guaranteed payments	17 Alternative minimum tax (AMT) items
5 Interest income	
6a Ordinary dividends	
6b Qualified dividends	18 Tax-exempt income and nondeductible expenses
6c Dividend equivalents	
7 Royalties	
8 Net short-term capital gain (loss)	19 Distributions
9a Net long-term capital gain (loss)	
9b Collectibles (28%) gain (loss)	20 Other information
9c Unrecaptured section 1250 gain	
10 Net section 1231 gain (loss)	
11 Other income (loss)	
12 Section 179 deduction	Z * STMT
13 Other deductions	21 Foreign taxes paid or accrued
22 <input type="checkbox"/> More than one activity for at-risk purposes*	
23 <input type="checkbox"/> More than one activity for passive activity purposes*	
*See attached statement for additional information.	

For IRS Use Only

2500 Tyler Road – Travel Center

COMPREHENSIVE PLAN JUSTIFICATION

Special Use Permit Narrative

Below is a summary of the responses to the requirements of Section 10-54(1)(k)(4) of the Montgomery County Zoning Ordinance.

1. A full section entitled Comprehensive Plan Justification is provided at the end of this document to fulfill this requirement.
2. The current structures and businesses at the proposed project site have underutilized this valuable commercial property. A development utilizing today's zoning and building code requirements will adequately provide for safety from fire hazards. The fuel pump islands shall be equipped with emergency shut off switches and fire extinguishers will be provided at accessible locations.
3. The proposed uses on the site are similar to the previous uses that have historically been on the site. The only potential conflicting surrounding use is the residential property to the Southeast and the proposed project will install a buffer yard between the proposed use and the existing use. No noise greater than that created by the currently operating businesses in the area is anticipated.
4. Overall site lighting will be provided with the project and designed during the site plan stage. Lighting fixtures shall meet the requirements of the Montgomery County Zoning ordinance and additionally, no greater than 0.5fc of light shall be allowed to 'spill over' the property line. This will minimize glare or light that could impact the adjacent Right of Way and properties.
5. At this time, a specific sign location has not been selected; however, any proposed signage shall meet the current Montgomery County Sign ordinance for General Business property.
6. The subject property is currently completely developed with commercial and residential uses. Adjacent uses in the neighborhood are comparable to the proposed use. An existing travel center operates directly across Route 177. An automobile auto auction business and antique shop operates across Mudpike Road. A home occupation operates adjacent to the subject property as well and will be buffered with proposed trees.
7. A proposed concept plan has been submitted.
8. A proposed concept plan has been submitted.
9. The project will be constructed in a single phase and the Owner would like to start construction in the Fall of 2022.
10. The proposed project will be developed on a currently fully developed site. No negative impacts are anticipated by this project on natural, scenic, archaeological, or historic features of significant importance.
11. This project will raise the property value of the subject property substantially and will also provide job opportunities. Additionally, a future need of the community might be a restaurant for County residents in this area or interstate travelers. Those residents would also welcome a second option for gas purchase contributing to the welfare and convenience of the public.
12. This response is addressed in the TIA submitted for the proposed development.
13. All existing structures will be demolished and the proposed structures will be built utilizing current building codes.

14. It is anticipated that this development will be a minimal burden on essential public facilities and services on the whole and will certainly not increase that burden based on the previously operating businesses and residence on the property previously.
15. The proposed project should have no impact on the County's ground water supply.
16. The proposed project is comparable to the existing uses and buildings on the site and not effect to the structural capacity of the on site soils is expected.
17. Due to the nature of the project and the submitted TIA, the proposed development will be adequately served by the existing transportation network and will actually improve access management conditions in the area.
18. The subject property is currently completely developed with commercial and residential uses. The proposed development will serve to marginally improve wildlife habitat, vegetation, water quality, and air quality through the adherence to the regulations in place today. The existing development on site had no storm water management in place and allowed storms to transport sediment, hydrocarbons, and other materials that would negatively impact downstream wildlife and vegetation.
19. The proposed SUP will provide additional job opportunities and increase the tax base through the construction of a new modern travel center with an associated restaurant. The Comprehensive Plan Justification has been provided below.
20. The proposed use is allowed under the current zoning with an SUP. It will have no impact on the needs of agriculture, industry, and business other than the positive impact of providing additional opportunities to buy goods at Exit 109.
21. The proposed SUP has no impact, negative or positive on enhancing affordable shelter opportunities for residents of the County.
22. No outdoor storage is proposed as a part of this SUP.
23. The existing site is currently fully developed with no open space provided. This SUP will not negatively impact the amount of existing open space. A proposed buffer yard will be provided along the southeast property line to buffer the existing home occupation.
24. No major floodplain or steep slopes are existing.
25. All existing structures on the site shall be demolished and removed.
26. A proposed concept plan has been submitted illustrating the location of the proposed fuel pumps and the approximate location of the fuel tanks.
27. No accessory uses or structures are proposed other than as shown on the proposed concept plan.
28. A detailed summary of the subject property area is provided on the concept plan.
29. The proposed Travel Center and Restaurant will likely operate 24 hours per day.
30. A proposed concept plan has been submitted illustrating the proposed parking spaces.
31. No overall site security features are proposed. This site and business are proposed to be accessible to the public and customers. Building security features would be submitted as part of the building permit application process.
32. At this time, the exact number of employees is unknown; however, it is anticipated that the travel center would employ 2-4 employees in shifts the entire time the travel center is open and the restaurant would employ 2-4 employees as well.
33. The proposed concept plan illustrates the overall layout of the site. An approximate location for the storm water management facility has been shown on the concept plan. Water and sewer

services will be extended from the public street where PSA facilities are located. The site is served by both public water and sewer currently and the existing capacity will sufficiently meet the needs of the proposed redevelopment.

34. It is not anticipated that the proposed development will generate any odors that linger or become a nuisance.
35. The development of the site will be required to submit a site development plan to Montgomery County. Due to the nature of the site being surrounded on 3 sides by public streets, no negative impacts are anticipated to the surrounding existing neighborhood and no negative impacts to the schools are anticipated.

Comprehensive Plan Justification

Introduction:

Any development within Montgomery County is viewed by the Board of Supervisors, Planning Commission, County Staff, and Citizens through the prism of the comprehensive plan. The following narrative and analysis will address points within the comprehensive plan and the Route 177 Gateway area plan and discuss how the proposed use aligns with the vision, goals, and objectives of the comprehensive plan and the Route 177 Gateway area plan. Please note that below are excerpts from the adopted 2025 Comprehensive Plan and Route 177 Gateway area plan and one should refer to the Plan for the full text.

The subject property is identified in the Comprehensive Plan as being within an Urban Development Area.

Overview:

The project proposes to allow for Travel Center on approximately 2.6 acres along Route 177 just off Exit 109 of Interstate 81. The project will consist of an approximately 5,000 sq. ft. automobile convenience store with fuel sales for both automobiles and diesel trucks. The site will provide needed overnight parking for approximately 20 tractor trailers. A small quick serve restaurant without a drive thru will also be located on the site. A preliminary Traffic Impact Analysis has been performed for the site and submitted with the Special Use Application. Multiple meetings have been held with Planning Staff and VDOT to address the existing conditions of the site, the proposed development and the required transportation improvements. The site will be consolidating 6 entrances down to 4 and improving the location of those entrances to reduce intersection conflicts and improve safety. Stormwater Management will be achieved through the use of an onsite detention facility. Stormwater Quality will be handled by the purchase of nutrient credits or on site treatment.

Route 177 Gateway Area Plan

Introduction

The introduction of the Route 177 Gateway Area Plan discusses the area being recognized as an important growth area for Montgomery County. It also notes the assumption that commercial development at Interchange 109 will take place and that an entrance and intersection plan for the corridor frontage parcels is needed.

Discussion – This proposed use is allowed by SUP in the GB district and is consolidating entrances from 4 different uses into a comprehensive plan while reducing those 6 entrances to 4 entrances and also improving the safety of those entrances.

Land Use Concept

The Land Use Concept Map identifies the subject property as part of the Service-oriented mixed use.

LAND USE CONCEPT


Service-oriented mixed use

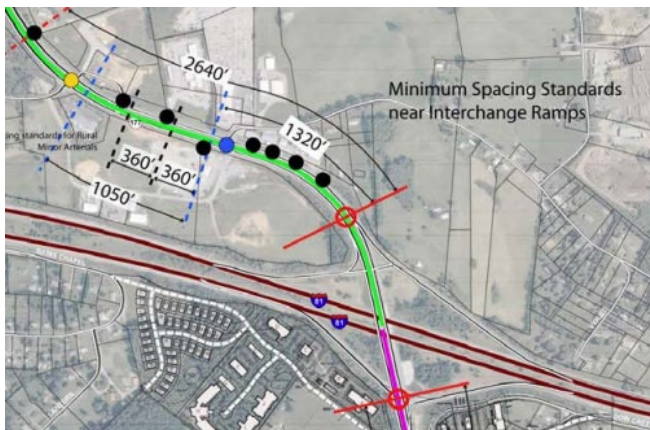


Discussion – The proposed use aligns with the idea of the businesses within this area being Service-oriented. Providing fuel for both cars and diesel trucks as well as providing a quick serve restaurant without a drive thru on the property allows for a mix of service uses within the project.

Access Management

Access Management is a key component of the Route 177 Gateway Area Plan. The Plan specifically states ‘As the Route 177 corridor continues to evolve in terms of new growth, it will be important to find opportunities to consolidate entrances for parcels fronting the roadway’.

Discussion – This proposed use is allowed by SUP in the GB district and is consolidating entrances from 4 different uses into a comprehensive plan while reducing those 6 entrances to 4 entrances and also improving the safety of those entrances.



Policy Chapters:

Planning and Land Use

PLU 1.0 Urban Development Areas:They are intended to serve as a focal point for growth over the next 10-20 years.

Discussion – The Exit 109 Interchange is one of 4 Interstate interchanges in Montgomery County and is served by public utilities. Growth of vehicular centered uses should be expected and anticipated. This project will serve to address growth pressures while also serving the traveling public and minimizing the intrusion of transient Interstate traffic into the local areas.

Transportation Resources

TRN 2.4 Access Management:

Encourage the practice of Access Management both in Montgomery County and Regionally, which will deter expensive road improvements, allow safer driving conditions while decreasing traffic congestion, and increase safety for pedestrians and cyclists. The preferred land uses for Resource Stewardship Areas include agriculture, forest uses, outdoor recreational uses,

Discussion – This project will consolidate entrances from a number of existing uses increasing the safety of the overall traveling public. A full Traffic Impact Analysis has been performed for the proposed use and submitted to Montgomery County and VDOT for review and approval.

Conclusion:

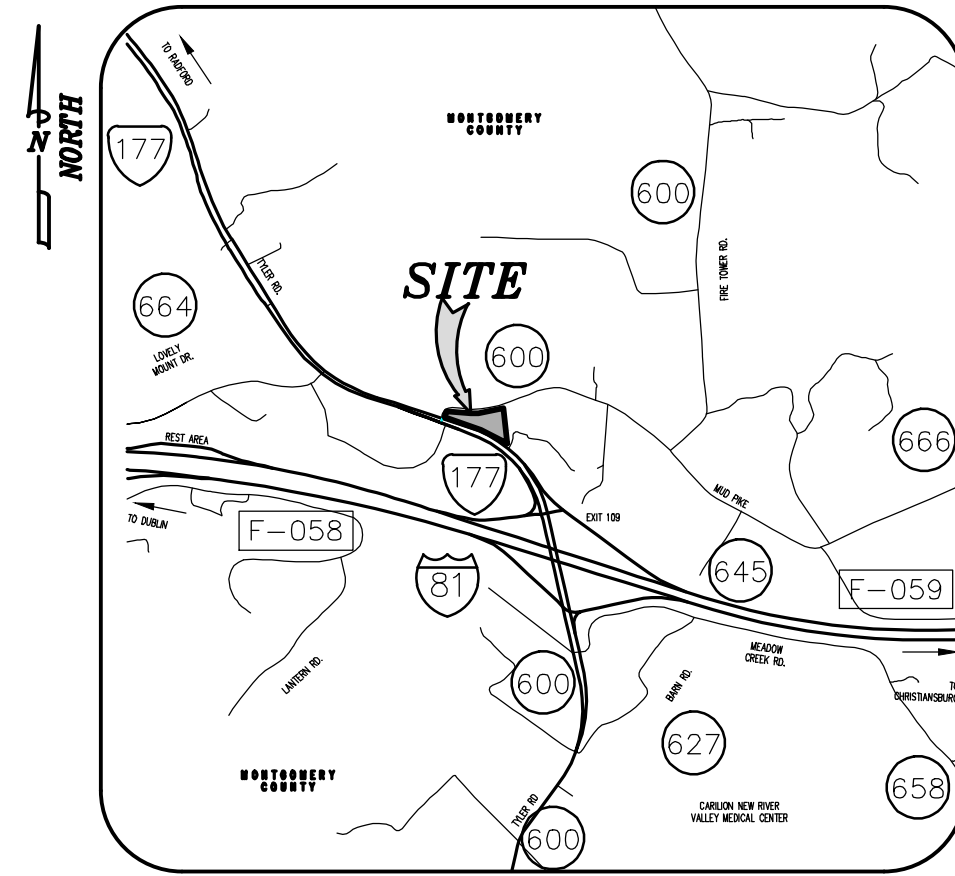
With the areas available for development at Interchange 109, the proposed project will significantly improve the aesthetics and visual character of the property as well as provide for new jobs within the area and add to the overall tax base of Montgomery County. This proposed SUP does further the overall goals and objectives of the Comprehensive Plan.

2500 Tyler Road – Travel Center

EXHIBITS

GENERAL NOTES:

- CURRENT OWNER: 9DG, LLC
118 TOBIAS RD
WINTON, VA, 24179
DEVELOPER: JFM HOSPITALITY, LLC
PROJECT LOCATION: 2500 TYLER RD
CHRISTIANSBURG, VA, 24073
- ZONING DISTRICT: GB
SETBACKS:
FRONT= 35' FROM ANY STREET RIGHT-OF-WAY
REAR= 10'
SIDE= 10' OR 10% OF THE LOT WIDTH
- LEGAL REFERENCE: INST. NO. 2021011574; P.B. 3 PG. 40
TAX PARCEL NO. 104-(A)-36; P.I.D. #016517
- THE TOPOGRAPHY, AS DEPICTED HEREON, IS THE RESULT OF AN ACTUAL FIELD SURVEY CONDUCTED BY GAY AND NEEL, INC. IN DECEMBER, 2021.
- THE SUBJECT PROPERTY LIES IN "ZONE 'X' - OTHER AREAS", AS DEFINED BY F.E.M.A. & AS SHOWN ON F.I.R.M. MAP NO. 51121C0210C, EFFECTIVE DATE OF SEPTEMBER 25, 2009. THIS DETERMINATION HAS BEEN MADE BY GRAPHIC METHODS ONLY. NO ELEVATION STUDY HAS BEEN PERFORMED AS A PART OF THIS PROJECT.
- ZONING/PLANNING AREAS:
TOTAL PROJECT/PARCEL AREA: 110,398 S.F. (2.54 AC.)
BUILDING USE(S): TRAVEL CENTER, RESTAURANT
BUILDING HEIGHT: LESS THAN 35 FEET



VICINITY MAP:
SCALE: 1"=±2,000'



GAY AND NEEL, INC.
ENGINEERING • LAND PLANNING • SURVEYING
1260 Radford Street
Christiansburg, Virginia 24073
Phone: (540) 381-6011
Fax: (540) 381-2773
Email: info@gayandneel.com
Web: www.gayandneel.com

The drawing, design, and digital files relating to this project are the property of Gay and Neel, Inc. The reproduction, copying, or other use of this drawing without GNI's written consent is prohibited.

**2500 TYLER ROAD
TRAVEL CENTER**
MONTGOMERY COUNTY, VA

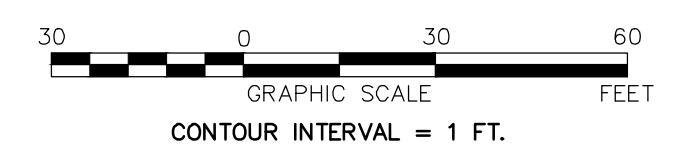
PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS		
NO.	COMMENTS	DATE

PROJECT TEAM	
PIE	JOHN T. NEEL, PE
PM	BRYANT H. ALTIZER, PE, LS
DESIGN	ZJM

ISSUE DATE	06/28/2022
GNI JOB NO.	3327
SHEET TITLE	CONCEPTUAL LAYOUT
SHEET NUMBER	C2-00

X:\Drawings\3327\ENGINEERING\Design\Plans\3327_Sht_1_Preliminary.dwg
C2-00 - CONCEPTUAL LAYOUT, 06/28/2022 10:50:35 AM, Zmoreno, AutoCAD PDF (General Documentation).pc3, 1:1



NOTES:

- THIS SURVEY WAS PREPARED FOR: JFM HOSPITALITY, LLC, AND REFLECTS FIELD CONDITIONS AS OF THE DATE SHOWN AND UTILIZES RECORD RESEARCH CONDUCTED ON 12/10/21.
- CURRENT OWNER & LEGAL REFERENCES: 906, LLC; INST. NO. 2021011574; P.B. 3 PG. 40. ADDITIONAL REFERENCES: HWY. P.B. 2 PGS. 239 & 242; PLATS IN D.B. 592 PG. 432 & D.B. 606 PG. 19. TAX PARCEL NO. 104-(A)-36; P.L.D. #016517. SITE ADDRESS: #2500, #2510 & #2520 TYLER RD. AND #3985 MUD PIKE CHRISTIANSBURG, VA. MAILING ADDRESS: 118 TOBIAS RD. VINTON, VA 24179.
- THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND THEREFORE MAY NOT INDICATE ALL ENCUMBRANCES AND EASEMENTS THAT MAY AFFECT THE SUBJECT PROPERTY.
- THIS TOPOGRAPHIC SURVEY WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF RALPH O. CLEMENTS, L.S. LIC. #1864, FROM AN ACTUAL GROUND SURVEY MADE UNDER MY SUPERVISION; THE ORIGINAL FIELD DATA WAS OBTAINED DURING DECEMBER, 2021; AND THAT THIS PLAT, MAP OR DIGITAL GEOSPATIAL DATA USING METADATA MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.
- ELEVATIONS AS SHOWN HEREON, ARE BASED ON NAVD 88 VERTICAL DATUM. HORIZONTAL DATUM, AS SHOWN HEREON, IS BASED ON GRID NORTH, VIRGINIA STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, NAD83(NAZ011), EPOCH 2010.00. HORIZONTAL AND VERTICAL UNITS OF MEASUREMENT UTILIZED IS U.S. SURVEY FOOT.
- CONTOUR INTERVAL=1 FT.
- THIS DRAWING IS BASED ON AN ACTUAL FIELD SURVEY, USING MONUMENTS FOUND TO EXIST AND THEREFORE MAY NOT CONFORM TO PREVIOUS DEEDS OR PLATS OF RECORD.
- THE SUBJECT PROPERTY LIES IN "ZONE 'X' - OTHER AREAS", AS DEFINED BY F.E.M.A. & AS SHOWN ON F.I.R.M. MAP NO. 5121C0210C, EFFECTIVE DATE OF SEPTEMBER 25, 2009. THIS DETERMINATION HAS BEEN MADE BY GRAPHIC METHODS ONLY. NO ELEVATION STUDY HAS BEEN PERFORMED AS A PART OF THIS PROJECT.

LEGEND:

- | | | | |
|-----------|----------------------------|--------|---------------------------------|
| — | PROPERTY LINE | □ | CONCRETE HIGHWAY MONUMENT FOUND |
| — P/W | ADJOINING PROPERTY LINE | ● | CAPPED ROD SET |
| — | ROAD / STREET RIGHT-OF-WAY | ▲ | MAG NAIL SET |
| — | LINE NOT TO SCALE | ⊗ L.P. | LIGHT POLE |
| — | PLAN CENTERLINE | ● U.P. | UTILITY POLE |
| — | EXISTING CURB | • EM | ELECTRIC METER |
| — | EXISTING EDGE OF PAVEMENT | □ WM | WATER METER |
| — | EDGE OF GRAVEL | ○ | MANHOLE |
| — OHU | OVERHEAD UTILITY LINE | → | GUY WIRE |
| — 15" S | EXISTING SANITARY SEWER | ○ C.O. | UTILITY CLEAN OUT |
| — 18" CMP | EXISTING STORM SEWER | ○ CP | COMMUNICATIONS PEDESTAL |
| — | EXISTING FENCE LINE | ⊙ | BENCH MARK |
| — | EXISTING BUILDING | ⊙ | SPOT ELEVATION |
| — | CONCRETE AREA | • | BOLLARD |
| — | GAS LINE PAINT MARKS | ⊙ GLIP | GAS LINE INDICATOR POST |
| — | COMMUNICATION PAINT MARKS | | TREE |
| — | WATER LINE PAINT MARKS | | |
| — | MAJOR CONTOUR LINE | | |
| — | MINOR CONTOUR LINE | | |
| — | DEPRESSED CONTOUR | | |
| ○ | EXISTING SIGN | | |
| ○ | PIPE FOUND | | |

NOTES REGARDING UTILITIES:

GAY AND NEEL, INC. AND THE LAND SURVEYOR WHOSE NAME AND SEAL IS AFFIXED HERETO, ASSUMES NO LIABILITY FOR THE LOCATION, INCLUSION, OMISSION, EXISTENCE, OPERATIONS OF, OR REPAIRS TO ANY UTILITY STRUCTURE OR FACILITY, ABOVE, OR BELOW GROUND, EITHER SHOWN OR NOT SHOWN ON THESE DRAWINGS. GAY AND NEEL, INC. CONTACTED VA811'S "POSITIVE RESPONSE SYSTEM" ON 12/13/21, WAS ISSUED 1 TICKET, AND WERE GIVEN THE FOLLOWING RESULTS OF THE UTILITY MARKINGS:
 TICKET #B134700174-008
 APPALACHIAN POWER (AEP111) - RESPONSE: "NO CONFLICT, UTILITY IS OUTSIDE OF STATED WORK AREA"
 CITIZENS TELEPHONE (CTC291) - RESPONSE: "NO CONFLICT, UTILITY IS OUTSIDE OF STATED WORK AREA"
 MONTGOMERY WATER & SEWER (MPS236) - RESPONSE: "MARKED"
 SHENTEL CABLE (STC555) - RESPONSE: "NO CONFLICT, UTILITY IS OUTSIDE OF STATED WORK AREA"
 ATMOS ENERGY (UCB437) - RESPONSE: "MARKED"
 VERIZON (VZN804) - RESPONSE: "MARKED"

LOCATIONS OF UNDERGROUND UTILITIES AS SHOWN HEREON ARE APPROXIMATE, BASED ON AVAILABLE SURFACE STRUCTURES, SUCH AS VALVES, MANHOLES, ETC. AND RECORD INFORMATION. VISIBLE UTILITY STRUCTURES WERE LOCATED IN ACCORDANCE WITH CI/ASCE 38-02 (CONSTRUCTION INSTITUTE OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS) QUALITY LEVEL 'C', WHICH IS DEFINED IN CI/ASCE 38-02 AS FOLLOWS:

UTILITY QUALITY LEVEL 'C': INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL 'D' INFORMATION.

ADDITIONAL UNDERGROUND UTILITY FEATURES DEPICTED HEREON MAY BE BASED ON SURFACE EVIDENCE AND/OR CI/ASCE STD. 38-02 QUALITY LEVEL 'D', DEFINED THEREIN AS FOLLOWS:

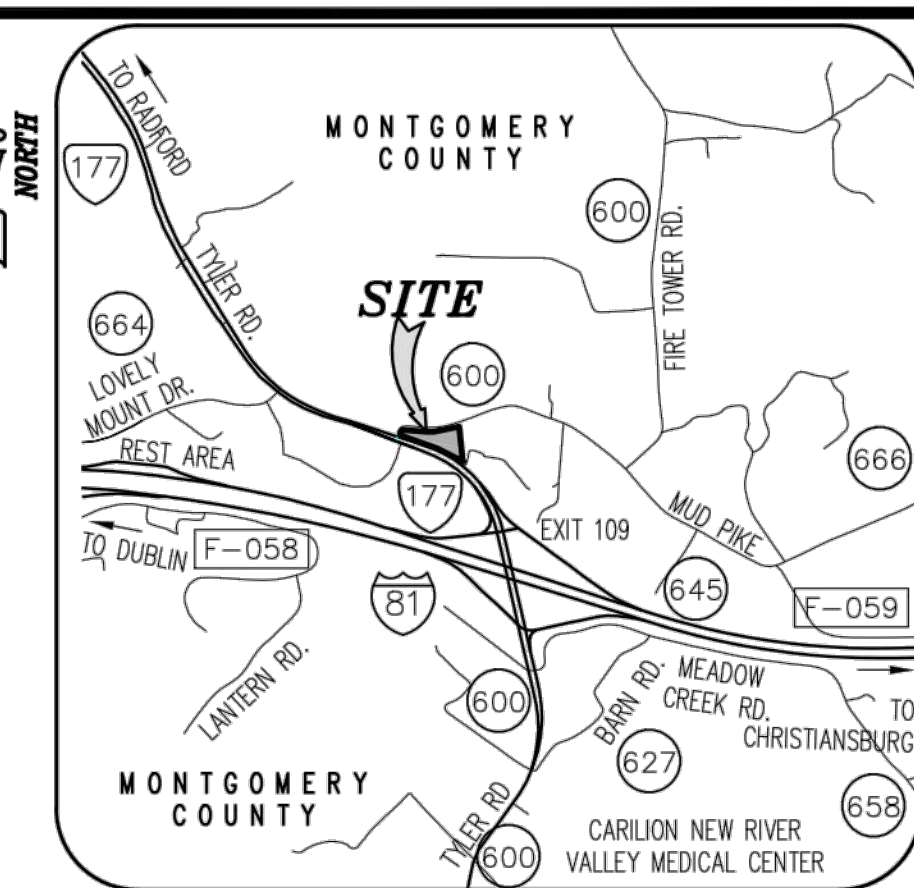
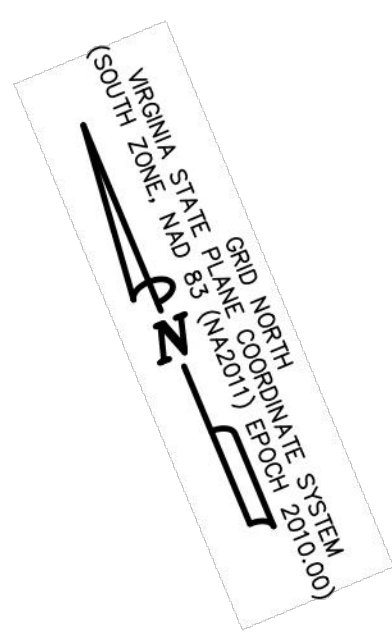
UTILITY QUALITY LEVEL 'D': INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

SURFACE MARKINGS PROVIDED BY MISS UTILITY RESPONDERS MAY NOT CORRELATE TO CI/ASCE STD. 38-02 DEFINITIONS AND QUALITY LEVEL INDICATORS FOR THOSE MARKS ARE NOT SHOWN HEREON.

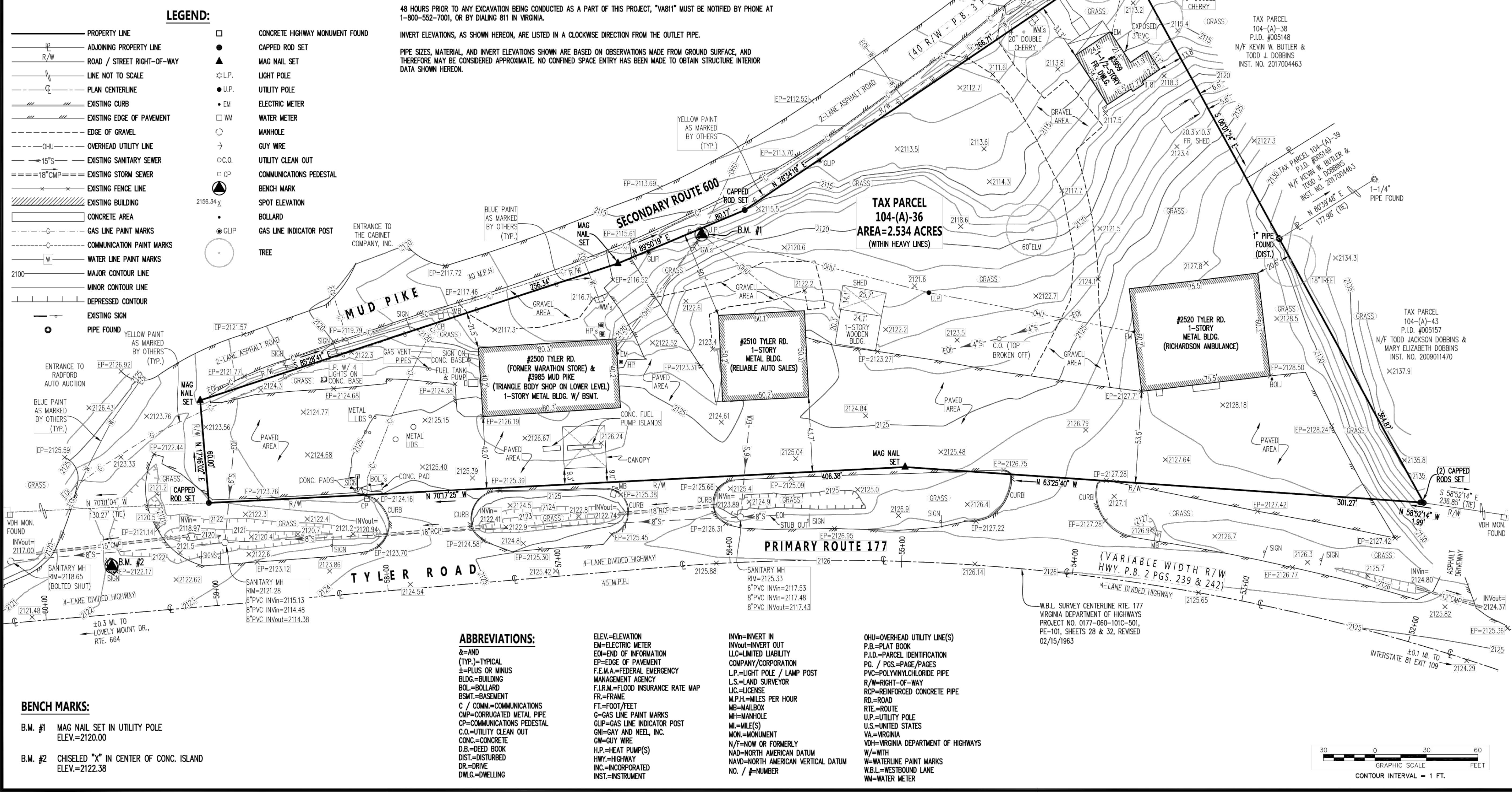
48 HOURS PRIOR TO ANY EXCAVATION BEING CONDUCTED AS A PART OF THIS PROJECT, "VA811" MUST BE NOTIFIED BY PHONE AT 1-800-552-7001, OR BY DIALING 811 IN VIRGINIA.

INVERT ELEVATIONS, AS SHOWN HEREON, ARE LISTED IN A CLOCKWISE DIRECTION FROM THE OUTLET PIPE.

PIPE SIZES, MATERIAL AND INVERT ELEVATIONS SHOWN ARE BASED ON OBSERVATIONS MADE FROM GROUND SURFACE, AND THEREFORE MAY BE CONSIDERED APPROXIMATE. NO CONFINED SPACE ENTRY HAS BEEN MADE TO OBTAIN STRUCTURE INTERIOR DATA SHOWN HEREON.



VICINITY MAP:
SCALE: 1"=±2,000'

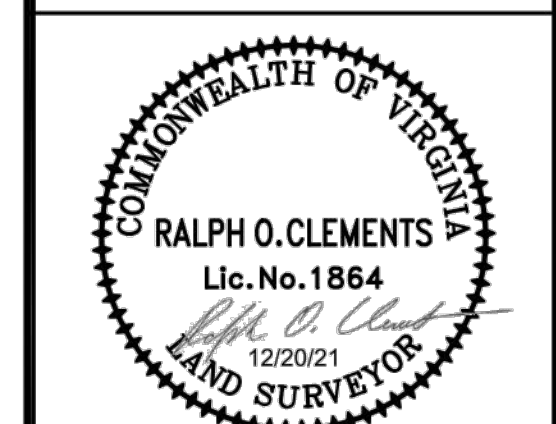


TAX PARCEL 104-(A)-38
P.L.D. #005148
N/F KEVIN W. BUTLER & TODD J. DOBBINS
INST. NO. 2017004463

TAX PARCEL 104-(A)-43
P.L.D. #005157
N/F TODD JACKSON DOBBINS & MARY ELIZABETH DOBBINS
INST. NO. 2009011470

**TOPOGRAPHIC & BOUNDARY SURVEY OF
TAX PARCEL No. 106-(A)-43
SITUATED AT THE INTERSECTION OF
TYLER ROAD, ROUTE 177 & MUD PIKE, ROUTE 600**

RINER MAGISTERIAL DISTRICT
MONTGOMERY COUNTY, VIRGINIA



REVISIONS		
NO.	COMMENTS	DATE

PROJECT TEAM	
PM	ROC
TECH	MTM
CREW	SCL LAS

ISSUE DATE	12/20/21
GNI JOB NO.	3327
TOPOGRAPHIC & BOUNDARY SURVEY	
SHEET NUMBER	C1-01

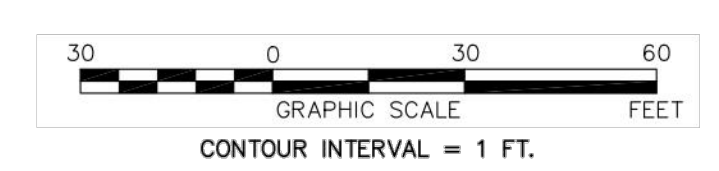
BENCH MARKS:

B.M. #1 MAG NAIL SET IN UTILITY POLE
ELEV.=2120.00

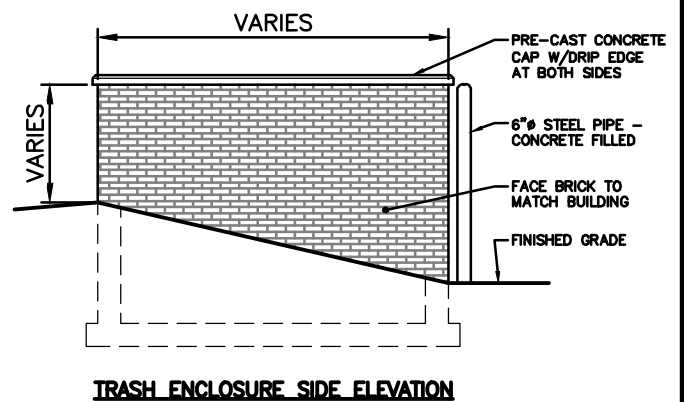
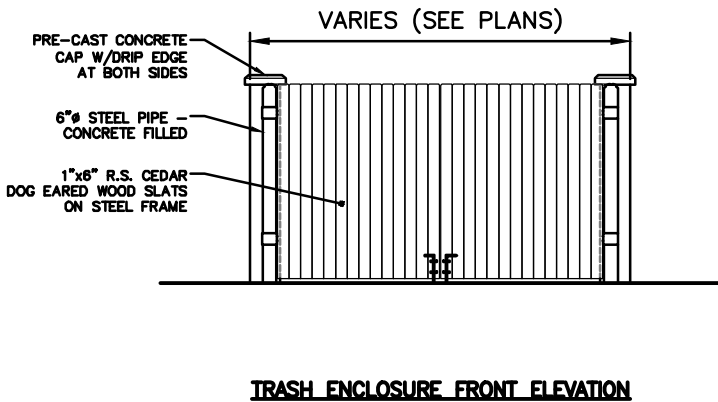
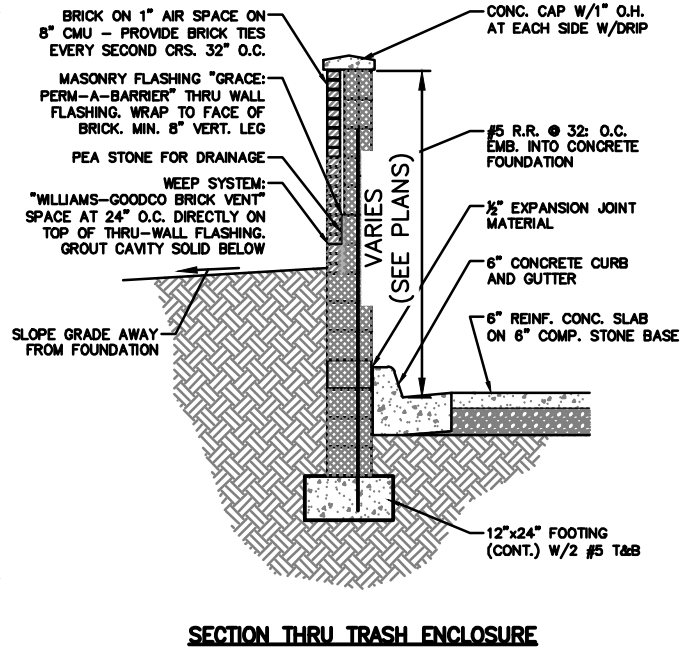
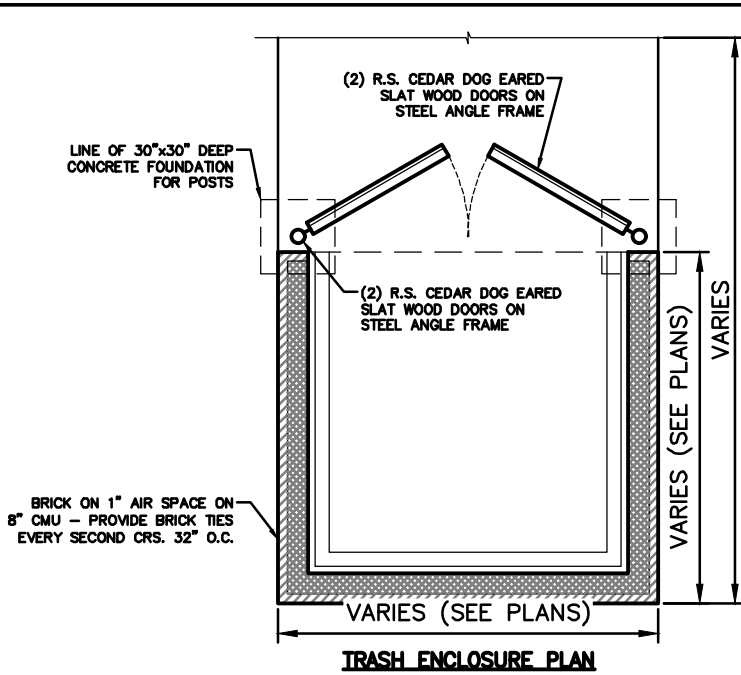
B.M. #2 CHISELED "X" IN CENTER OF CONC. ISLAND
ELEV.=2122.38

ABBREVIATIONS:

- | | | | |
|---|--|--|--|
| &=AND
(TYP.)=TYPICAL
±=PLUS OR MINUS
BLDG.=BUILDING
BOL.=BOLLARD
BSMT.=BASEMENT
C / COMM.=COMMUNICATIONS
CMP=CORRUGATED METAL PIPE
CP=COMMUNICATIONS PEDESTAL
C.O.=UTILITY CLEAN OUT
CONC.=CONCRETE
D.B.=DEED BOOK
DIST.=DISTURBED
DR.=DRIVE
DWLG.=DWELLING | ELEV.=ELEVATION
EM=ELECTRIC METER
EO=END OF INFORMATION
EP=EDGE OF PAVEMENT
F.E.M.A.=FEDERAL EMERGENCY MANAGEMENT AGENCY
F.I.R.M.=FLOOD INSURANCE RATE MAP
FR.=FRAME
FT.=FOOT/FEET
G=GAS LINE PAINT MARKS
GLIP=GAS LINE INDICATOR POST
GNI=GAY AND NEEL, INC.
GW=GUY WIRE
H.P.=HEAT PUMP(S)
HWY.=HIGHWAY
INC.=INCORPORATED
INST.=INSTRUMENT | INVn=INVERT IN
INVout=INVERT OUT
LLC=LIMITED LIABILITY COMPANY/CORPORATION
L.P.=LIGHT POLE / LAMP POST
L.S.=LAND SURVEYOR
LIC.=LICENSE
M.P.H.=MILES PER HOUR
MB=MAILBOX
MH=MANHOLE
MI=MILE(S)
MON.=MONUMENT
N/F=NOW OR FORMERLY
NAD=NORTH AMERICAN DATUM
NAVD=NORTH AMERICAN VERTICAL DATUM
NO. / #=NUMBER | OHU=OVERHEAD UTILITY LINE(S)
P.B.=PLAT BOOK
P.I.D.=PARCEL IDENTIFICATION
PG. / PGS.=PAGE/PAGES
PVC=POLYVINYLCHLORIDE PIPE
R/W=RIGHT-OF-WAY
RC=REINFORCED CONCRETE PIPE
RD.=ROAD
RTE.=ROUTE
U.P.=UTILITY POLE
U.S.=UNITED STATES
VA.=VIRGINIA
VDH=VIRGINIA DEPARTMENT OF HIGHWAYS
W.=WITH
W.=WATERLINE PAINT MARKS
W.B.L.=WESTBOUND LANE
WM=WATER METER |
|---|--|--|--|



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NO SCALE

DUMPSTER PAD SCREENING DETAIL

2500 Tyler Road – Travel Center

TRAFFIC IMPACT ANALYSIS

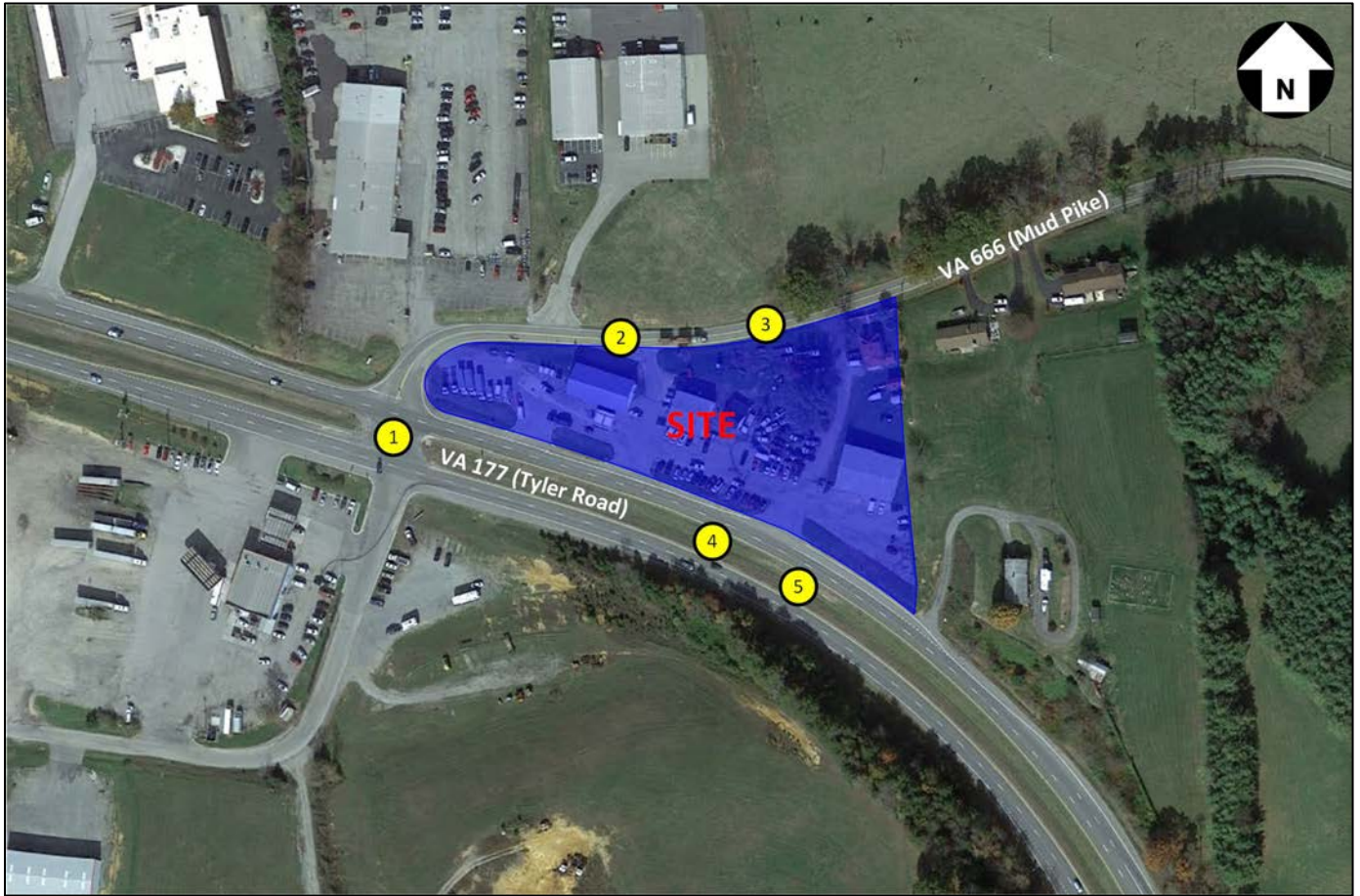


Figure 1: Site Location and Study Intersections

Existing Conditions (2022)

Existing Roadway Network

A description of the major roadways within the study area is presented in Table 1.

Table 1: Existing Roadway Network

Roadway	VDOT Classification	Lanes	Speed	On-Street Parking	AADT*
Tyler Road (VA 177)	Principal Arterial	4	45 mph	No	11,000
Mud Pike (VA 600/666)	Major Collector	2	40 mph	No	1,900

* VDOT 2019 Annual Average Daily Traffic (AADT) Data

Comprehensive Plan Recommendations

As identified in the Montgomery County Comprehensive Plan, the overall concept for the vision for the area where this project is proposed includes a variety of mixed use districts that are generally connected to one another via parallel roadways and bicycle and pedestrian facilities. The intent is that these mixed uses develop through a series of planned commercial, light industrial and residential developments.

The north end of the corridor (where this project is proposed) maintains a higher speed design character that serves as a landscaped gateway to Radford with mixed use development along both sides of the corridor.

The project is within a service-oriented mixed use area. This area includes a combination of service related commercial uses including hospitality, lodging, retail and office uses – some high density residential may be included. The development as proposed is consistent with the aims identified in the comprehensive plan.

Existing (2022) Traffic Volumes

To estimate existing traffic volumes, peak hour turning movements were collected at the intersection of Tyler Road and Mud Pike on Wednesday, March 23, 2022. The existing lane configurations in the study area are shown in Figure 8. The AM and PM peak hour volumes collected for this analysis are shown in Figure 3.

The count data are included in Appendix A.

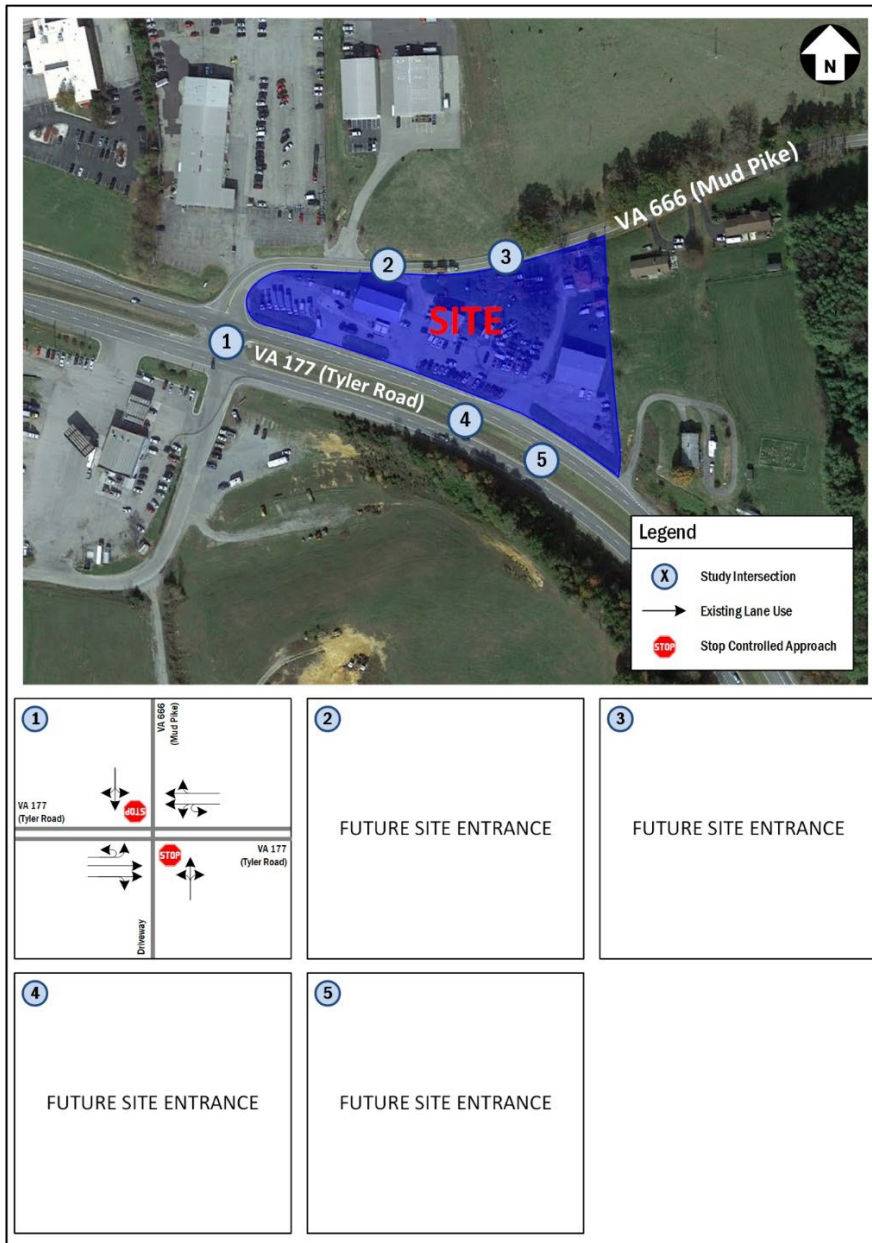


Figure 2: Existing (2022) Lane Configuration

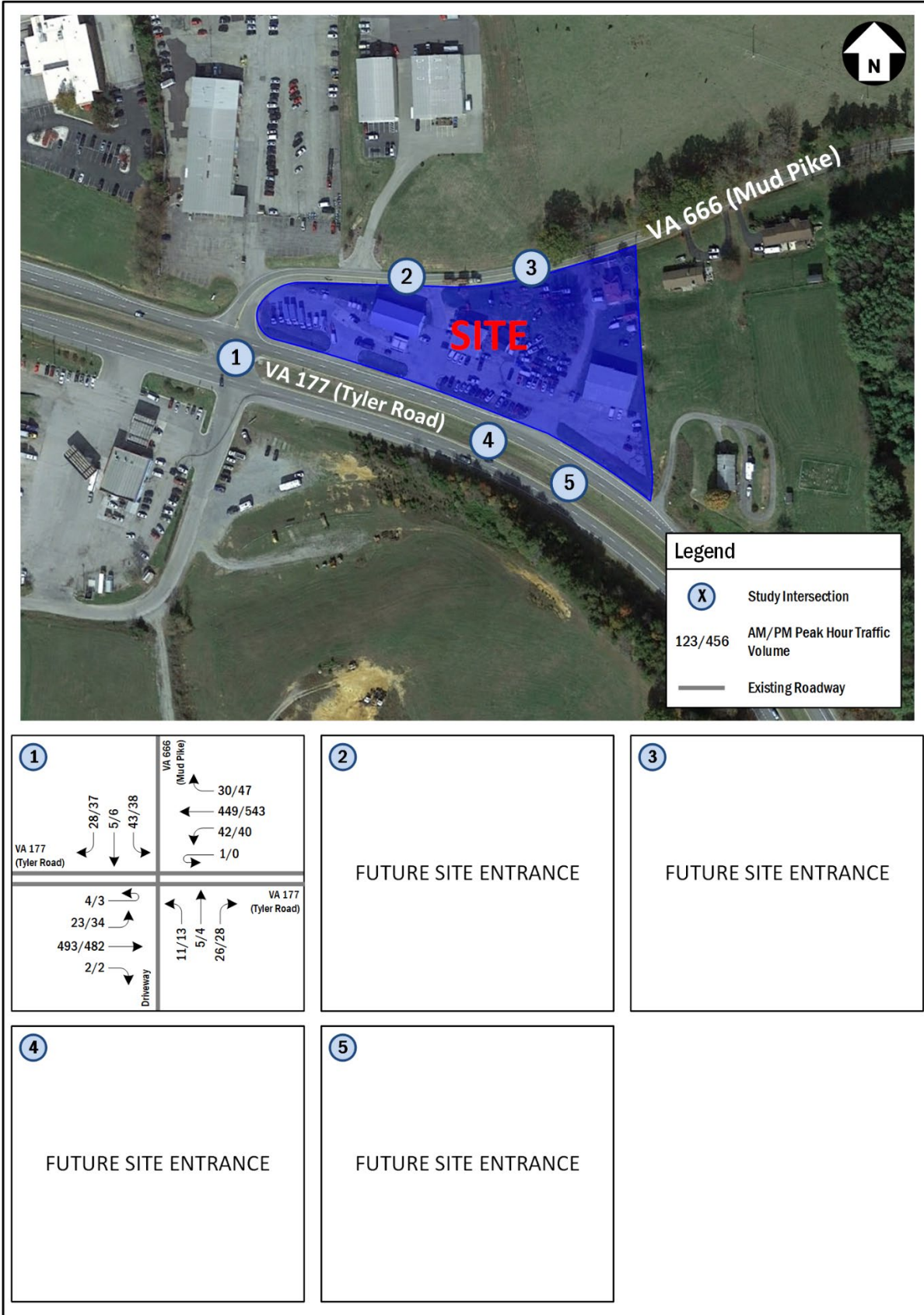


Figure 3: Existing AM and PM Peak Traffic Volumes

Existing (2022) Intersection Capacity Analysis

Capacity analysis was performed at the study intersections during the weekday morning and afternoon peak hours under the existing conditions (2022). *Synchro, Version 10.3* was used to analyze the study intersections based on the *Highway Capacity Manual* (HCM) 2010 methodology and includes level of service (LOS), delay, and queue length comparisons for the turning movements analyzed.

Consistent with VDOT analysis guidelines, a minimum value of 0.85 was used for the existing peak hour factors. A default minimum of 2 percent was used for heavy vehicle percentages.

The results of the intersection capacity analysis, expressed in LOS, delay (seconds per vehicle) per lane group, and 95th percentile queues (feet) are presented in Table 2. Level of service results are also presented in Figure 4. The detailed analysis worksheets for the existing conditions are included in Appendix B.

Table 2: Existing (2022) Intersection Capacity Analysis Results

No. Intersection (Movement)	Storage Bay Length (feet)	AM Peak			PM Peak		
		LOS	Delay (s/veh)	95 th Queue (ft)	LOS	Delay (s/veh)	95 th Queue (ft)
1 Tyler Road and Mud Pike/Radford Travel Center Driveway							
Overall Intersection (Unsignalized)		A	2.5		A	2.4	
Eastbound Approach		A	0.5		A	0.7	
Eastbound Left	200	A	9	3	A	9.3	5
Eastbound Thru		-	-	0	-	-	0
Eastbound Right		-	-	0	-	-	0
Westbound Approach		A	1.2		A	0.8	
Westbound Left		A	8.7	3	A	8.7	3
Westbound Thru		A	0.5	0	A	0.3	0
Westbound Right		-	-	0	-	-	0
Northbound Approach		B	13.8		B	14.5	
Northbound Left/Thru/Right		B	13.8	10	B	14.5	10
Southbound Approach		C	18.1		C	18.6	
Southbound Left/Thru/Right		C	18.1	25	C	18.6	28
2 Mud Pike and Site Driveway 1							Future Site Entrance
3 Mud Pike and Site Driveway 2							Future Site Entrance
4 Tyler Road and Site Driveway 3							Future Site Entrance
5 Tyler Road and Site Driveway 4							Future Site Entrance

For the purpose of this analysis, it is desirable to achieve an LOS D for each approach. The capacity analysis results indicate that all approaches operate at acceptable LOS under existing conditions (2022).

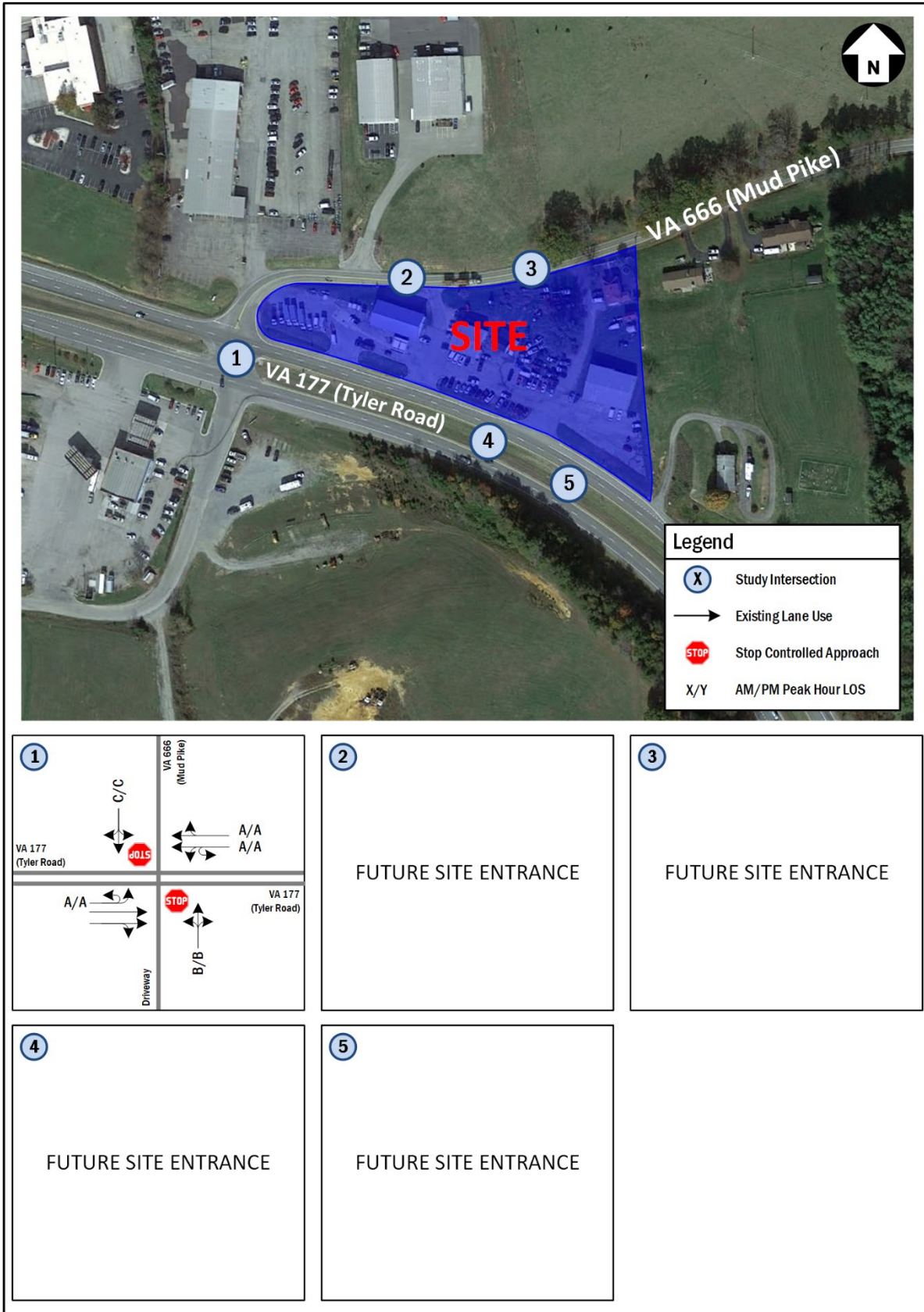


Figure 4: Existing (2022) Levels of Service

Future Conditions without Development (2024)

Future without Development (2024) Traffic Volumes

The anticipated project build-out year is 2024. Regional growth was added to the existing traffic volumes to develop the future without development (2024) traffic volumes.

Regional Growth

Future traffic volumes were projected by increasing the existing traffic volumes to the build-out year using a background growth rate of 1.0 percent applied to existing traffic volumes. Table 3 outlines the historical growth trends in the vicinity of the site. As shown in Table 3, the volumes on Tyler Road have remained generally consistent since 2010, indicating that the proposed growth rate of 1.0 percent presents a conservative analysis.

Table 3: Historical Growth

Route	From	To	ADT										Annual % Change (2010-2019)	
			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019		
Tyler Road (VA 177)	Tyler Road (VA 600)	Rock Road	11,000	10,000	11,000	11,000	11,000	11,000	11,000	12,000	12,000	11,000	11,000	0.0%
Tyler Road (VA 600)	Barn Road	Tyler Road (VA 177)	6,600	6,600	6,600	6,600	6,700	6,900	7,200	7,300	7,100	7,100	0.8%	
Mud Pike (VA 600/666)	Tyler Road (VA 177)	Fire Tower Road (VA 600)	2,200	2,200	2,200	2,000	2,100	2,100	1,900	2,000	1,900	1,900	-1.6%	
Mud Pike (VA 666)	Fire Tower Road (VA 600)	Seven Mile Tree Road	1,000	1,200	1,200	1,000	1,100	1,100	1,200	1,200	1,200	1,200	2.0%	
I-81	First Street (VA 232)	Tyler Road (VA 177)	38,000	38,000	38,000	39,000	39,000	41,000	43,000	43,000	43,000	43,000	1.4%	
I-81	Tyler Road (VA 177)	Riner Road/Main Street (VA 8)	42,000	41,000	42,000	42,000	43,000	45,000	47,000	48,000	48,000	47,000	1.3%	
TOTAL			100,800	99,000	101,000	101,600	102,900	107,100	112,300	113,500	112,200	111,200	1.1%	

Source: VDOT Traffic Data 2010 to 2019 (<http://www.virginia.gov/info/ct-trafficcounts.asp>)

Background Improvements

There are no background improvements assumed to be in place by 2024.

Background Developments

There are no background developments assumed to be in place by 2024.

The trips generated by the background regional growth were added to the existing traffic volumes in order to determine the future without development (2024) traffic volumes. The future without development (2024) traffic volumes are presented in Figure 5.

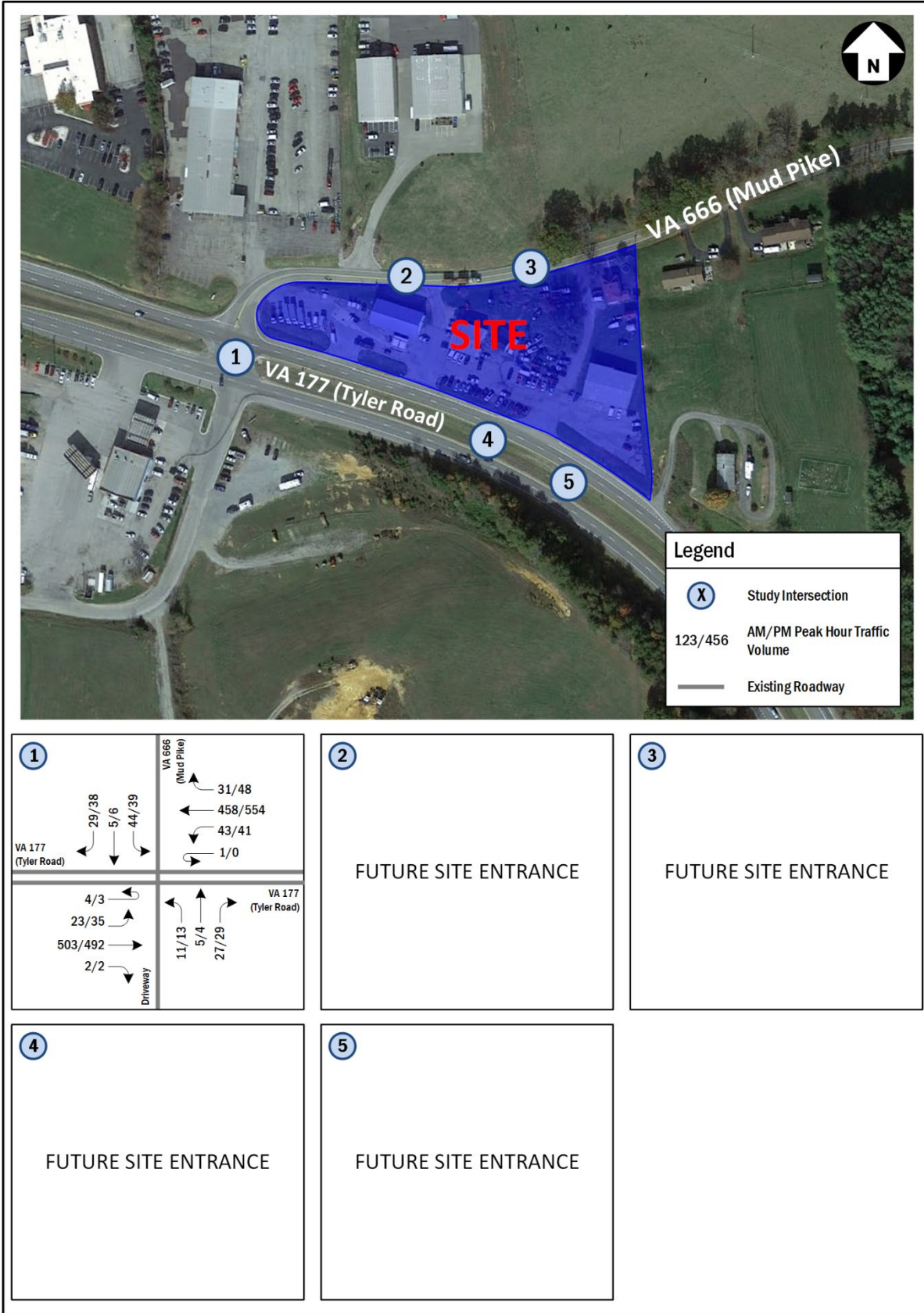


Figure 5: Future without Development (2024) Traffic Volumes

Future without Development (2024) Intersection Capacity Analysis

Capacity analysis was performed at the study intersections during the weekday morning and afternoon peak hours under the future conditions without development (2024). *Synchro, Version 10.3* was used to analyze the study intersections based on the HCM 2010 methodology and includes LOS, delay, and queue length comparisons for the turning movements analyzed.

Consistent with VDOT analysis guidelines, a minimum value of 0.92 was used for the future without development peak hour factors.

The results of the intersection capacity analysis, expressed in LOS, delay (seconds per vehicle) per lane group, and 95th percentile queues (feet) are presented in Table 4. Level of service results and proposed lane configurations for the future conditions without development are presented in Figure 6. The detailed analysis worksheets for the future conditions without development are included in Appendix C.

Table 4: Future without Development (2024) Intersection Capacity Analysis Results

No. Intersection (Movement)	Storage Bay Length (feet)	AM Peak			PM Peak		
		LOS	Delay (s/veh)	95 th Queue (ft)	LOS	Delay (s/veh)	95 th Queue (ft)
1 Tyler Road and Mud Pike/Radford Travel Center Driveway							
Overall Intersection (Unsignalized)		A	2.4		A	2.3	
Eastbound Approach		A	0.5		A	0.7	
Eastbound Left	200	A	9	3	A	9.3	3
Eastbound Thru		-	-	0	-	-	0
Eastbound Right		-	-	0	-	-	0
Westbound Approach		A	1.2		A	0.8	
Westbound Left		A	8.8	3	A	8.7	3
Westbound Thru		A	0.5	0	A	0.3	0
Westbound Right		-	-	0	-	-	0
Northbound Approach		B	13.6		B	14.2	
Northbound Left/Thru/Right		B	13.6	8	B	14.2	10
Southbound Approach		C	17.6		C	18.2	
Southbound Left/Thru/Right		C	17.6	23	C	18.2	25
2 Mud Pike and Site Driveway 1							Future Site Entrance
3 Mud Pike and Site Driveway 2							Future Site Entrance
4 Tyler Road and Site Driveway 3							Future Site Entrance
5 Tyler Road and Site Driveway 4							Future Site Entrance

For the purpose of this analysis, it is desirable to achieve an LOS D for each approach. The capacity analysis results indicate that all approaches operate at acceptable LOS under future conditions without development (2024).

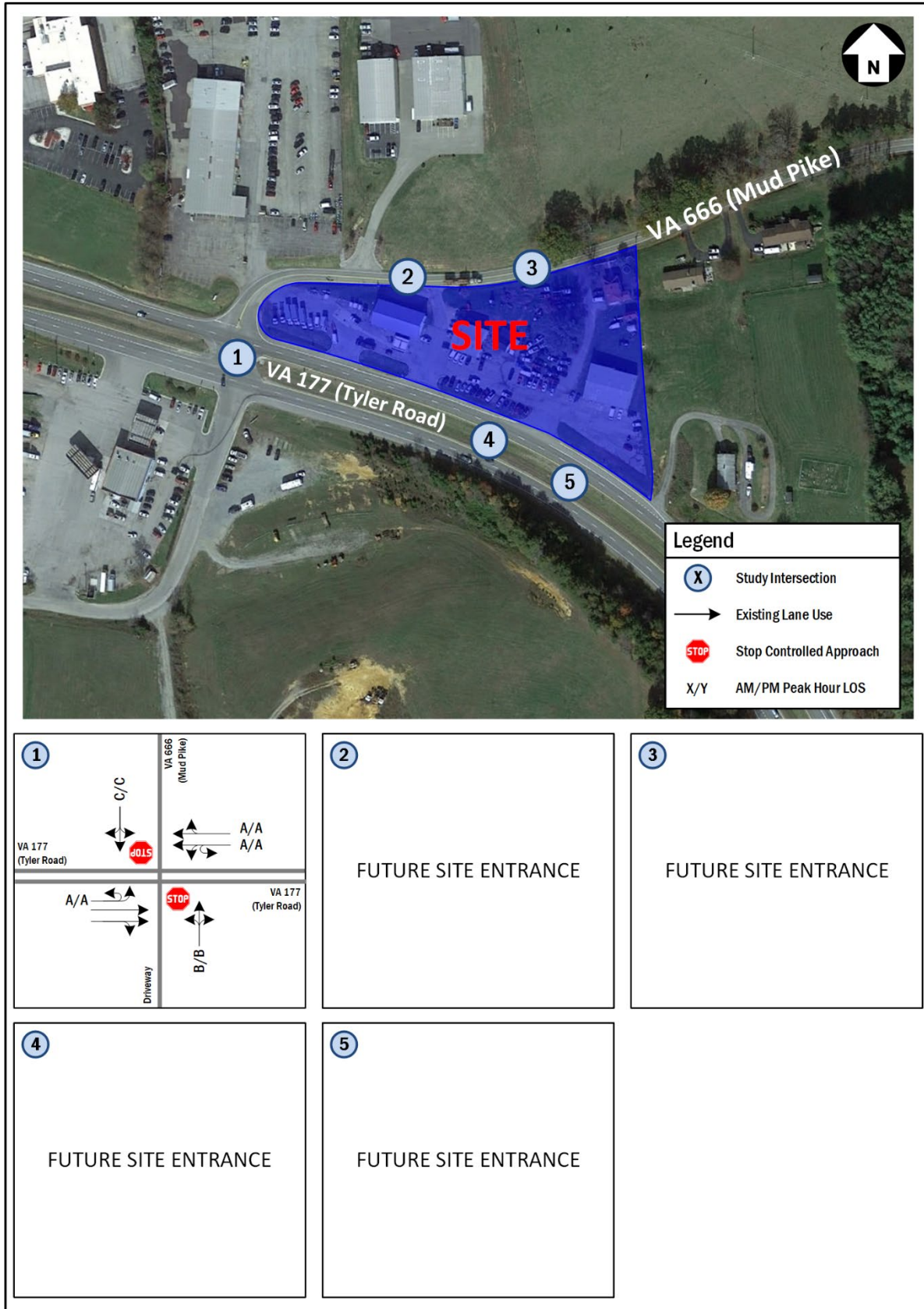


Figure 6: Future without Development (2024) Levels of Service and Lane Configuration

Future Conditions with Development (2024)

The proposed redevelopment includes construction of a convenience store with 12 gasoline fueling positions, two (2) diesel fueling positions, and a 2,000 square foot high-turnover sit-down restaurant.

Proposed Site Access

Site access is planned to be provided via Tyler Road and Mud Pike. Site Driveways 1 and 2 are proposed as full access, whereas Site Driveways 3 and 4 are proposed as right-in / right-out (RIRO) only. As part of the analysis, it was assumed the convenience store and restaurant traffic will use Site Driveways 1, 3 and 4. All trips originating west and north of the site will use Site Driveway 1. Of those trips originating from the east, 80% will use Site Driveway 3 and the remaining 20% will use Site Driveway 4. Additionally, it was assumed all truck traffic will use Site Driveways 2 and 4. Based on configuration of the site, it was additionally assumed Site Driveway 2 will be used only as an exit. The proposed access is shown in Figure 7.



Figure 7: Preliminary Site Plan (Prepared by Foresight Design Services)

Site Generated Volumes

ITE's *Trip Generation Manual*, 11th Edition was used to determine the future trips generated by the proposed redevelopment as shown in Table 5.

Table 5: Site Trip Generation

ITE Land Use Code <i>Trip Generation, 11th Ed.</i>				Quantity		----- Weekday -----			Daily <i>Total</i>	
						AM Peak Hour				PM Peak Hour
				<i>In</i>	<i>Out</i>	<i>Total</i>	<i>In</i>	<i>Out</i>	<i>Total</i>	
Proposed Use										
Commercial	932	High Turnover (Sit-Down) Restaurant	2,000 sf	10	9	19	11	7	18	214
Commercial	945	Convenience Store/Gas Station - GFA (4-5.5k)	12 fueling positions	162	162	324	137	136	273	3,086
Commercial	950	Truck Stop	2 fueling positions	14	14	28	16	15	31	448
Proposed Trips				186	185	371	164	158	322	3,748

As shown in Table 5, the proposed redevelopment is anticipated to generate approximately 371 trips during the weekday AM peak hour, 322 trips during the weekday PM peak hour, and 3,748 total daily trips on a typical weekday. To be conservative, the trip potential of the existing land uses on the property was not subtracted from the existing traffic volumes.

Pass-By Trips

Based on guidance from ITE's *Trip Generation Handbook*, 3rd Edition and as agreed upon in the scoping meeting with VDOT staff, it was assumed 76% of the AM and PM peak trips associated with the convenience store and truck stop and 43% of the PM peak trips associated with the restaurant were already driving by the site today and therefore were omitted from the site-generated trip totals. Trip generation for the development including reductions for pass-by trips is shown in Table 6.

Table 6: Site Trip Generation with Pass-By Reduction

ITE Land Use Code <i>Trip Generation, 11th Ed.</i>				Quantity		----- Weekday -----			Daily <i>Total</i>	
						AM Peak Hour				PM Peak Hour
				<i>In</i>	<i>Out</i>	<i>Total</i>	<i>In</i>	<i>Out</i>	<i>Total</i>	
Proposed Use										
Commercial	932	High Turnover (Sit-Down) Restaurant	2,000 sf	10	9	19	7	4	11	168
Commercial	945	Convenience Store/Gas Station - GFA (4-5.5k)	12 fueling positions	39	39	78	33	33	66	741
Commercial	950	Truck Stop	2 fueling positions	4	4	7	4	4	8	108
Proposed Trips with Pass-By Reduction Applied				53	52	104	44	41	85	1,017

Site Trip Distribution

The site trip distribution shown in Figure 8 was based on the projected existing volumes and roadway network, site access, anticipated traffic patterns of the proposed use, and input from VDOT staff. The inbound and outbound site trips calculated for the weekday AM and PM peak hours were routed based on the distribution shown in Figure 8. The proposed redevelopment site trips are shown in Figure 9. Pass-by trips are shown in Figure 10.

Future with Development (2024) Traffic Volumes

The proposed site-generated trips and pass by trips were added to the future without development traffic volumes in order to determine the future with development (2024) traffic volumes. The future with development (2024) traffic volumes are presented in Figure 11.



Figure 8: Primary Site Trip Distribution

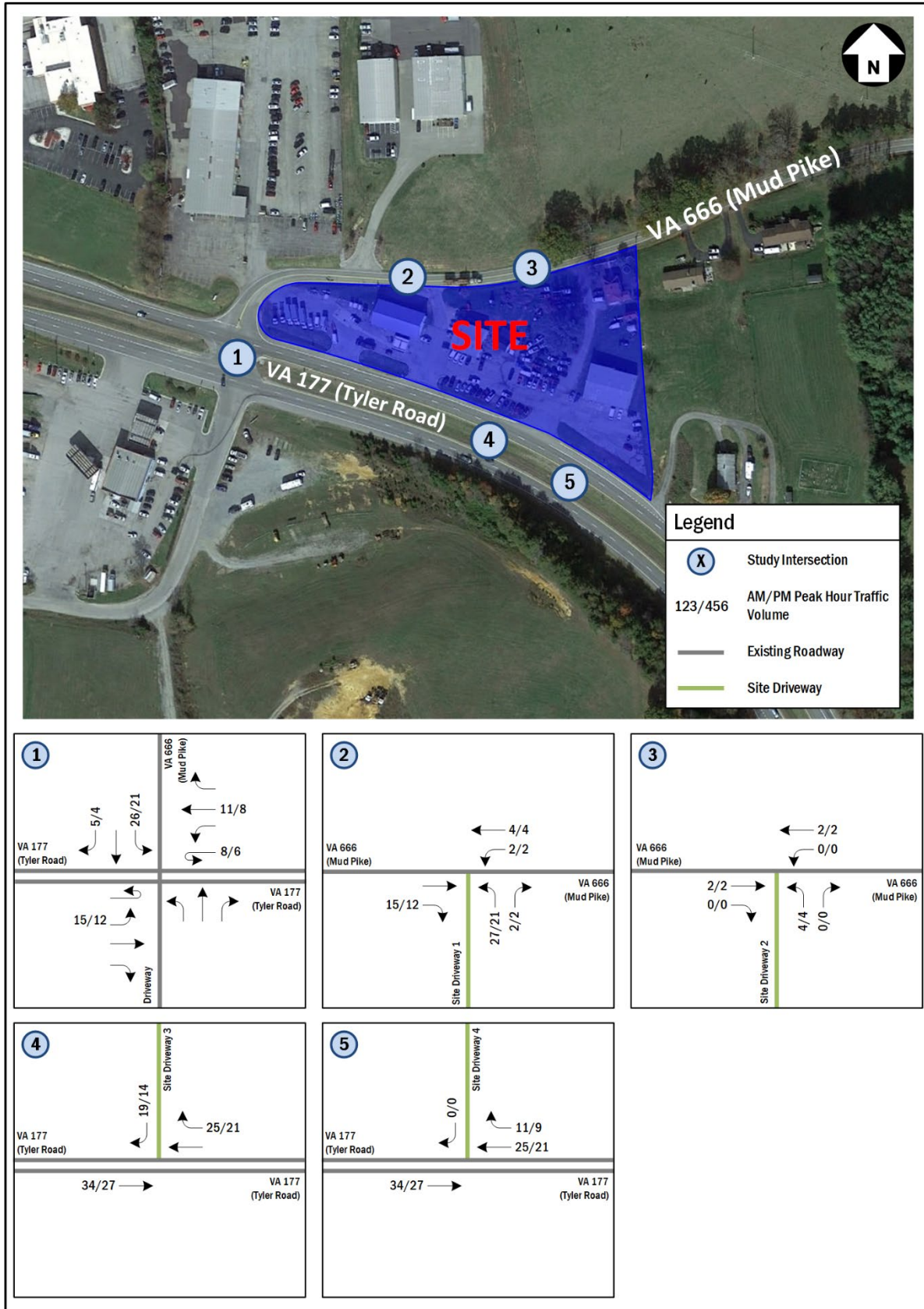


Figure 9: Primary Site Trips

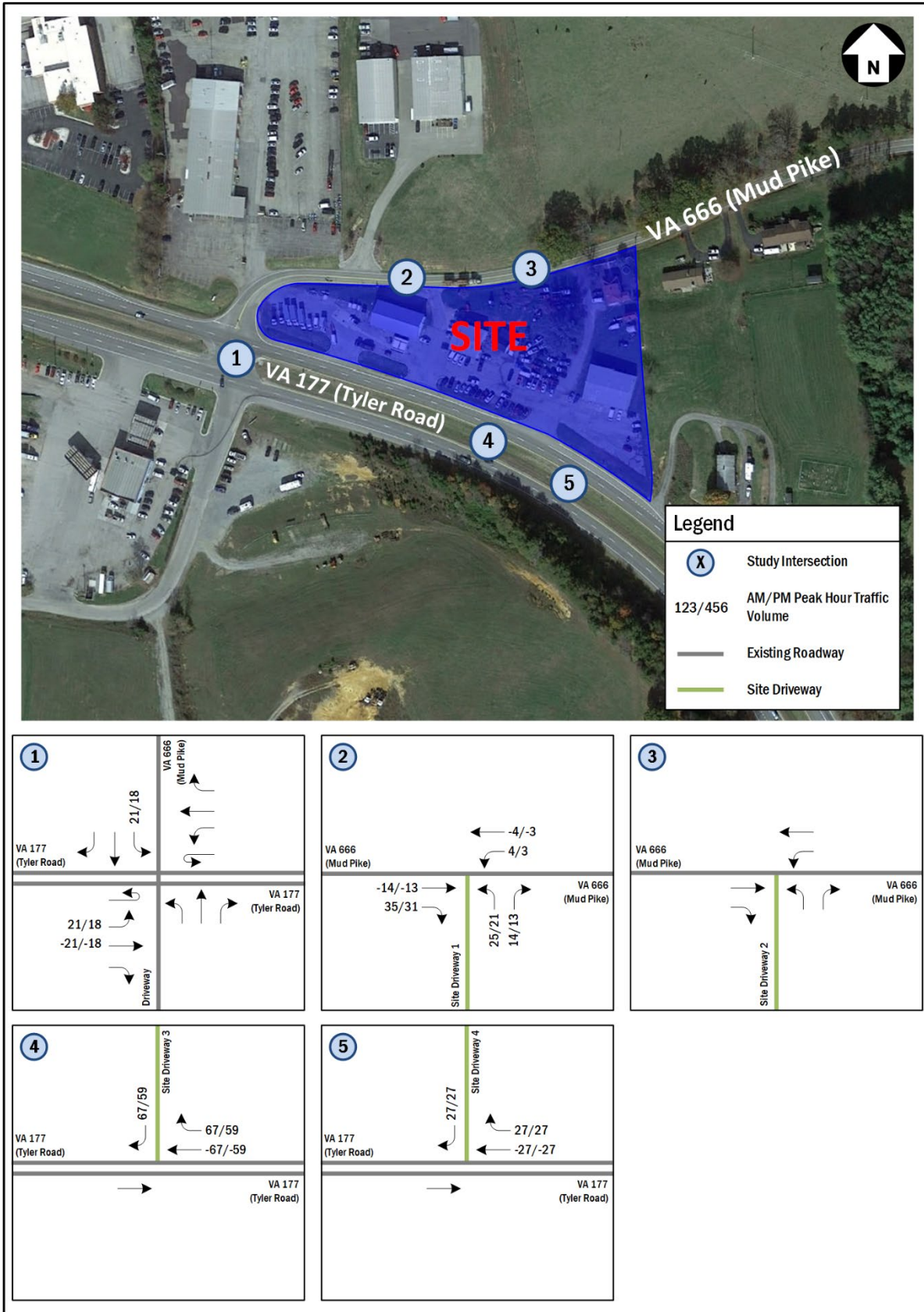


Figure 10: Proposed Pass-By Trips

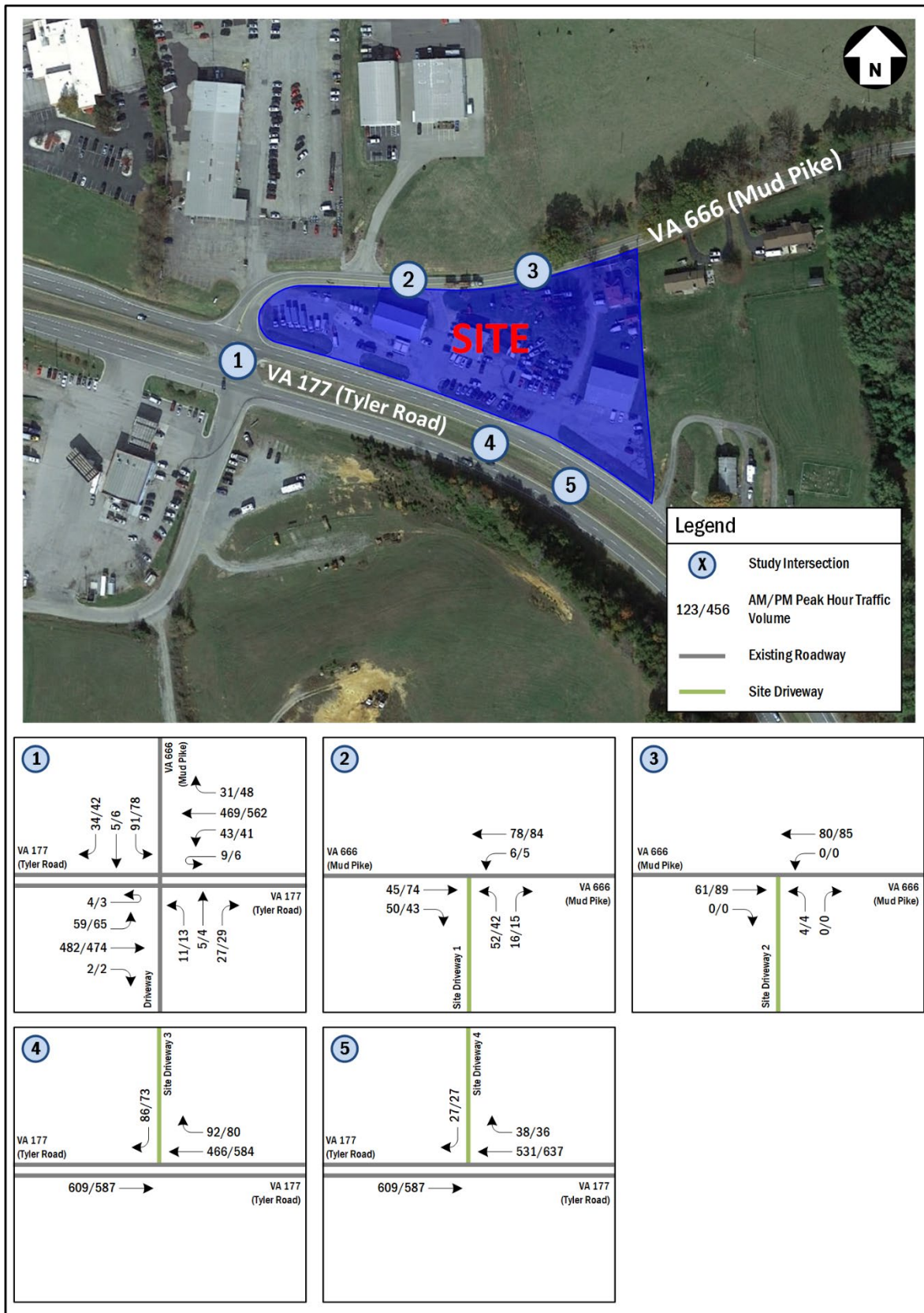


Figure 11: Future with Development (2024) Traffic Volumes

Access Management Standards

The spacing standards for access points near interchanges as outlined in Table 2-3 of VDOT's Road Design Manual, Appendix F are shown in Table 8. Site Driveway 4 is proposed with right-in / right-out access, and therefore a minimum spacing of 750 feet applies between the center of the driveway and the end of the off-ramp terminal from I-81.

Table 7: Minimum Spacing Standards for Accesses Near Interchange Areas on Multilane Crossroads

Minimum Spacing Standards for Accesses Near Interchange Areas on Multilane Crossroads		
X (Right-in/Right-out)	M (Directional Median Crossover)	Y (Four-legged Intersection)
750'	990'	1320'

TABLE 2-3 MINIMUM SPACING STANDARDS FOR ACCESSES NEAR INTERCHANGE AREAS ON MULTI LANE CROSSROADS¹

Source: *Access Control Design on Highway Interchanges, 2008.*

The intersection spacing standards as outlined in Table 2-2 of VDOT's Road Design Manual, Appendix F are shown in Table 8. Mud Pike is classified as a collector with a design speed of 40 mph. Therefore, spacing requirements of 335 feet and 250 feet apply to Site Driveway 1 (full access) and Site Driveway 2 (partial access), respectively. Tyler Road is classified as a principal arterial with a design speed of 45 mph. Therefore, a spacing requirement of 305 feet applies to Site Driveways 3 and 4, which are both partial access.

Table 8: Minimum Spacing Standards for Commercial Entrances, Intersections, and Median Crossovers

Functional Classification	Design Speed (See Note 2)	Minimum Spacing (Distance) in Feet			
		Type 1 (Signalized)	Type 2 (Unsignalized/ Full Crossover)	Type 3 (Full Access /Directional Crossover)	Type 4 (Partial Access)
Principal Arterial	≤ 30 mph	1,050	880	440	250
	35 to 45 mph	1,320	1,050	565	305
	≥ 50 mph	2,640	1,320	750	495
Minor Arterial	≤ 30 mph	880	660	355	200
	35 to 45 mph	1,050	660	470	250
	≥ 50 mph	1,320	1,050	555	425
Collector	≤ 30 mph	660	440	225	200
	35 to 45 mph	660	440	335	250
	≥ 50 mph	1,050	660	445	360
Local Street	See Note 1				

TABLE 2-2 MINIMUM SPACING STANDARDS FOR COMMERCIAL ACCESSSES, INTERSECTIONS AND MEDIAN CROSSOVERS¹

Notes to Table 2-2:

1. Local Street Spacing – No commercial entrance shall be allowed within the functional area of an intersection without prior approval from the Engineer at the Residency or District. For commercial entrances on local streets (not individual private entrance driveways to homes), a spacing distance of 50 feet between entrance radii is specified to assure a minimum separation between such entrances (illustrated in Figure 4-11).

No commercial entrance shall be within 115 feet minimum measured from the outer edge of the inscribed circle of a Roundabout, without prior approval from the Engineer at the Residency or District. If an entrance is approved within the 115 feet of the outer edge of the inscribed circle it shall be "Right-In, Right-Out" Only (115' feet minimum is based on the stopping sight distance for 20 mph).

Figure 12 shows the required and proposed spacing from the site entrances to the adjacent intersections.

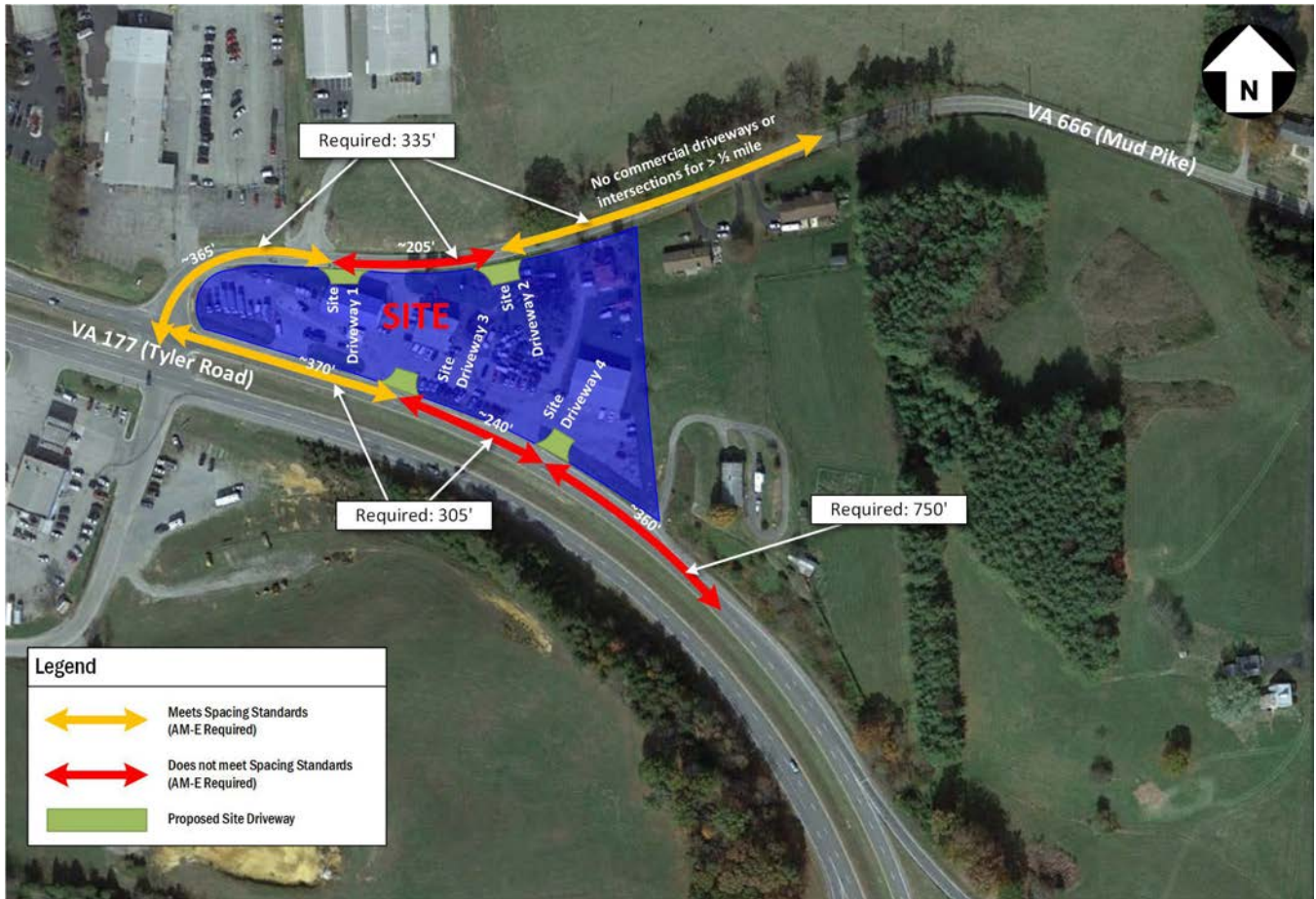


Figure 12: Intersection Spacing Standards

As shown in Figure 13, the proposed site entrances on Mud Pike and Tyler Road do not meet VDOT's spacing standard for collector and principal arterial roads, respectively.

An Access Management Exception (AM-E) request would need to be prepared and submitted for the entrances as proposed. However, the site proposes a consolidation of existing access points which do not meet spacing standards and are closer to the Tyler Road and Mud Pike intersection.

Turn Lane Warrant Analysis

This section presents the results of the turn lane warrant analysis conducted for the four (4) site driveways. This analysis utilizes the volumes associated with the Future with Development (2024) scenario.

The turn lane warrant analysis was conducted based on the guidelines presented in VDOT's *Road Design Manual*, Appendix F. The results of the right turn lane warrant analysis are presented in Table 9. The results of the left turn lane warrant analysis for Site Driveways 1 and 2 are presented in Table 10.

Table 9: Right Turn Lane Warrant Analysis

Study Scenario	Approach Volume	Right Turn Volume	Minimum Right Turn Taper Threshold	Minimum Right Turn Full Lane Threshold	Treatment
Mud Pike at Site Driveway 1 (EBR) - AM	74	52	63	108	Not Warranted
Mud Pike at Site Driveway 1 (EBR) - PM	99	44	60	105	Not Warranted
Mud Pike at Site Driveway 2 (EBR) - AM	61	0	64	110	Not Warranted
Mud Pike at Site Driveway 2 (EBR) - PM	89	0	61	106	Not Warranted
Tyler Road at Site Driveway 3 (WBR) - AM	565	112	23	85	Full-width Lane and Taper Required
Tyler Road at Site Driveway 3 (WBR) - PM	669	97	20	78	Full-width Lane and Taper Required
Tyler Road at Site Driveway 4 (WBR) - AM	569	14	23	85	Not Warranted
Tyler Road at Site Driveway 4 (WBR) - PM	673	16	20	78	Not Warranted

Table 10: Left Turn Lane Warrant Analysis

Study Scenario	Opposing Vol. (VPH)	Advancing Vol. (VPH)	Left Turn Vol. (VPH)	Left Turn %	VDOT Figure	Treatment
Mud Pike at Site Driveway 1 (WBL) - AM	74	84	8	9.52%	Fig. 3-6	Not Warranted
Mud Pike at Site Driveway 1 (WBL) - PM	99	89	7	7.87%	Fig. 3-6	Not Warranted
Mud Pike at Site Driveway 2 (WBL) - AM	61	80	0	0.00%	Fig. 3-5	Not Warranted
Mud Pike at Site Driveway 2 (WBL) - PM	89	85	0	0.00%	Fig. 3-5	Not Warranted

As shown in Table 9, a westbound right turn lane is warranted on Tyler Road at Site Driveway 3 during the AM and PM peak hours.

As shown in Table 10, left turn lanes are not warranted on Mud Pike at Site Driveways 1 or 2.

Future Conditions with Development and Mitigation (2024)

The proposed development is expected to generate impacts to transportation facilities within the study area. Mitigation measures are recommended to address those traffic impacts.

Future with Development and Mitigation (2024) Intersection Capacity Analysis

Capacity analysis was performed at the study intersections during the weekday morning and afternoon peak hours under the future conditions with development and mitigation (2024). *Synchro, Version 10.3* was used to analyze the study intersections based on the HCM 2010 methodology and includes LOS, delay, and queue length comparisons for the turning movements analyzed.

Consistent with VDOT analysis guidelines, a minimum value of 0.92 was used for the future with development peak hour factors.

The results of the intersection capacity analysis, expressed in LOS, delay (seconds per vehicle) per lane group, and 95th percentile queues (feet) are presented in Table 11. Level of service results and proposed lane configurations for the future conditions with development are presented in Figure 13. The detailed analysis worksheets for the future conditions with development are included in Appendix D.

Table 11: Future with Development and Mitigation (2024) Intersection Capacity Analysis Results

No.	Intersection (Movement)	Storage Bay Length (feet)	AM Peak			PM Peak		
			LOS	Delay (s/veh)	95 th Queue (ft)	LOS	Delay (s/veh)	95 th Queue (ft)
1 Tyler Road and Mud Pike/Radford Travel Center Driveway								
	Overall Intersection (Unsignalized)		A	4		A	3.7	
	Eastbound Approach		A	1		A	1.2	
	Eastbound Left	200	A	9	5	A	9.4	8
	Eastbound Thru		-	-	0	-	-	0
	Eastbound Right		-	-	0	-	-	0
	Westbound Approach		A	1.5		A	1.2	
	Westbound Left		A	9.1	5	A	8.9	3
	Westbound Thru		A	0.7	0	A	0.7	0
	Westbound Right		-	-	0	-	-	0
	Northbound Approach		B	14.5		C	15	
	Northbound Left/Thru/Right		B	14.5	10	C	15	10
	Southbound Approach		C	24.1		C	23.5	
	Southbound Left/Thru		D	28.9	48	D	29.9	43
	Southbound Right	100	B	10.4	5	B	10.8	5
2 Mud Pike and Site Driveway 1								
	Overall Intersection (Unsignalized)		A	2.8		A	2.3	
	Eastbound Approach		A	0		A	0	
	Eastbound Thru/Right		-	-	0	-	-	0
	Westbound Approach		A	0.5		A	0.4	
	Westbound Left/Thru		A	7.4	0	A	7.5	0
	Northbound Approach		A	9.7		A	9.8	
	Northbound Left/Right		A	9.7	8	A	9.8	5
3 Mud Pike and Site Driveway 2								
	Overall Intersection (Unsignalized)		A	0.3		A	0.2	
	Eastbound Approach		A	0		A	0	
	Eastbound Thru/Right		-	-	0	-	-	0
	Westbound Approach		A	0		A	0	
	Westbound Left/Thru		A	0	0	A	0	0
	Northbound Approach		B	10.5		B	10.8	
	Northbound Left/Right		B	10.5	0	B	10.8	0
4 Tyler Road and Site Driveway 3								
	Overall Intersection (Unsignalized)		A	0.7		A	0.6	
	Eastbound Approach		A	0		A	0	
	Eastbound Thru		-	-	0	-	-	0
	Westbound Approach		A	0		A	0	
	Westbound Thru		-	-	0	-	-	0
	Westbound Right		-	-	0	-	-	0
	Southbound Approach		B	10.5		B	11	
	Southbound Right		B	10.5	10	B	11	10
5 Tyler Road and Site Driveway 4								
	Overall Intersection (Unsignalized)		A	0.2		A	0.2	
	Eastbound Approach		A	0		A	0	
	Eastbound Thru		-	-	0	-	-	0
	Westbound Approach		A	0		A	0	
	Westbound Thru		-	-	0	-	-	0
	Westbound Right	75	-	-	0	-	-	0
	Southbound Approach		B	10.3		B	10.8	
	Southbound Right		B	10.3	3	B	10.8	3

For the purpose of this analysis, it is desirable to achieve an LOS D for each approach. The capacity analysis results indicate that all approaches operate at acceptable LOS under future conditions with development (2024).

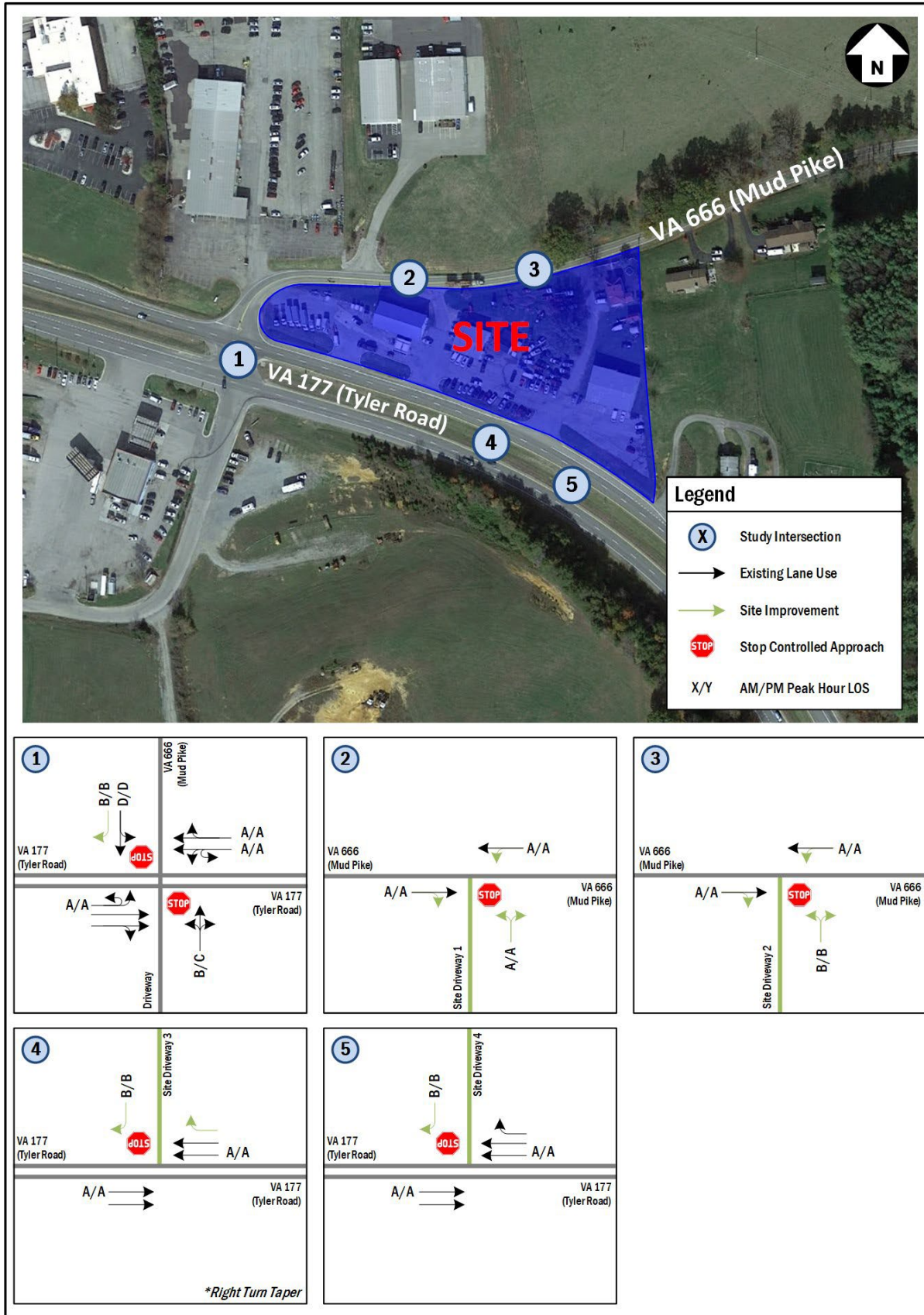


Figure 13: Future with Development and Mitigation (2024) Levels of Service and Lane Configuration

2024 Intersection Analysis Summary

As described in the previous sections, vehicular capacity analysis was performed for the following four (4) scenarios:

- **Existing 2022** – based on collected existing volumes.
- **Future without Development 2024** – assumes existing traffic plus additional traffic due to a 1.0 percent annual growth rate applied to existing volumes.
- **Future with Development 2024** – assumes existing traffic plus additional traffic due to a 1.0 percent annual growth rate applied to existing volumes, future traffic generated by the proposed Circle K, and roadway improvements proposed as part of traffic impact mitigation.

A level of service comparison for all three (3) scenarios is presented in Table 12, a delay comparison is presented in Table 13, and a 95th percentile queue comparison is presented in Table 14.

Table 12: Level of Service Comparison

No.	Intersection (Movement)	LOS Comparison					
		AM Peak			PM Peak		
		EX 2022	FB 2024	TF+M 2024	EX 2022	FB 2024	TF+M 2024
1	Tyler Road and Mud Pike/Radford Travel Center Driveway						
	Overall Intersection (Unsignalized)	A	A	A	A	A	A
	Eastbound Approach	A	A	A	A	A	A
	Eastbound Left	A	A	A	A	A	A
	Eastbound Thru	-	-	-	-	-	-
	Eastbound Right	-	-	-	-	-	-
	Westbound Approach	A	A	A	A	A	A
	Westbound Left	A	A	A	A	A	A
	Westbound Thru	A	A	A	A	A	A
	Westbound Right	-	-	-	-	-	-
	Northbound Approach	B	B	B	B	B	C
	Northbound Left/Thru/Right	B	B	B	B	B	C
	Southbound Approach	C	C	C	C	C	C
	Southbound Left/Thru/Right	C	C	D	C	C	D
	Southbound Right	-	-	B	-	-	B
2	Mud Pike and Site Driveway 1						
	Overall Intersection (Unsignalized)	-	-	A	-	-	A
	Eastbound Approach	-	-	A	-	-	A
	Eastbound Thru/Right	-	-	-	-	-	-
	Westbound Approach	-	-	A	-	-	A
	Westbound Left/Thru	-	-	A	-	-	A
	Northbound Approach	-	-	A	-	-	A
	Northbound Left/Right	-	-	A	-	-	A
3	Mud Pike and Site Driveway 2						
	Overall Intersection (Unsignalized)	-	-	A	-	-	A
	Eastbound Approach	-	-	A	-	-	A
	Eastbound Thru/Right	-	-	-	-	-	-
	Westbound Approach	-	-	A	-	-	A
	Westbound Left/Thru	-	-	A	-	-	A
	Northbound Approach	-	-	B	-	-	B
	Northbound Left/Right	-	-	B	-	-	B
4	Tyler Road and Site Driveway 3						
	Overall Intersection (Unsignalized)	-	-	A	-	-	A
	Eastbound Approach	-	-	A	-	-	A
	Eastbound Thru	-	-	-	-	-	-
	Westbound Approach	-	-	A	-	-	A
	Westbound Thru	-	-	-	-	-	-
	Westbound Right	-	-	-	-	-	-
	Southbound Approach	-	-	B	-	-	B
	Southbound Right	-	-	B	-	-	B
5	Tyler Road and Site Driveway 4						
	Overall Intersection (Unsignalized)	-	-	A	-	-	A
	Eastbound Approach	-	-	A	-	-	A
	Eastbound Thru	-	-	-	-	-	-
	Westbound Approach	-	-	A	-	-	A
	Westbound Thru	-	-	-	-	-	-
	Westbound Right	-	-	-	-	-	-
	Southbound Approach	-	-	B	-	-	B
	Southbound Right	-	-	B	-	-	B

- EX Existing (2022)
- FB Future without Development (2024)
- TF Future with Development (2024)
- m Volume for 95th percentile queue is metered by upstream signal.
- ~ Volume exceeds capacity, queue is theoretically infinite
- # 95th percentile volume exceeds capacity, queue may be longer.

As shown in Table 12 no movements degrade to unacceptable levels of service that were previously acceptable under future conditions without development (2024).

Table 13: Delay Comparison

No.	Intersection (Movement)	Delay Comparison					
		AM Peak			PM Peak		
		EX 2022	FB 2024	TF+M 2024	EX 2022	FB 2024	TF+M 2024
1	Tyler Road and Mud Pike/Radford Travel Center Driveway						
	Overall Intersection (Unsignalized)	2.5	2.4	4	2.4	2.3	3.7
	Eastbound Approach	0.5	0.5	1	0.7	0.7	1.2
	Eastbound Left	9	9	9	9.3	9.3	9.4
	Eastbound Thru	-	-	-	-	-	-
	Eastbound Right	-	-	-	-	-	-
	Westbound Approach	1.2	1.2	1.5	0.8	0.8	1.2
	Westbound Left	8.7	8.8	9.1	8.7	8.7	8.9
	Westbound Thru	0.5	0.5	0.7	0.3	0.3	0.7
	Westbound Right	-	-	-	-	-	-
	Northbound Approach	13.8	13.6	14.5	14.5	14.2	15
	Northbound Left/Thru/Right	13.8	13.6	14.5	14.5	14.2	15
	Southbound Approach	18.1	17.6	24.1	18.6	18.2	23.5
	Southbound Left/Thru/Right	18.1	17.6	28.9	18.6	18.2	29.9
	Southbound Right	-	-	10.4	-	-	10.8
2	Mud Pike and Site Driveway 1						
	Overall Intersection (Unsignalized)	-	-	2.8	-	-	2.3
	Eastbound Approach	-	-	0	-	-	0
	Eastbound Thru/Right	-	-	-	-	-	-
	Westbound Approach	-	-	0.5	-	-	0.4
	Westbound Left/Thru	-	-	7.4	-	-	7.5
	Northbound Approach	-	-	9.7	-	-	9.8
	Northbound Left/Right	-	-	9.7	-	-	9.8
3	Mud Pike and Site Driveway 2						
	Overall Intersection (Unsignalized)	-	-	0.3	-	-	0.2
	Eastbound Approach	-	-	0	-	-	0
	Eastbound Thru/Right	-	-	-	-	-	-
	Westbound Approach	-	-	0	-	-	0
	Westbound Left/Thru	-	-	0	-	-	0
	Northbound Approach	-	-	10.5	-	-	10.8
	Northbound Left/Right	-	-	10.5	-	-	10.8
4	Tyler Road and Site Driveway 3						
	Overall Intersection (Unsignalized)	-	-	0.7	-	-	0.6
	Eastbound Approach	-	-	0	-	-	0
	Eastbound Thru	-	-	-	-	-	-
	Westbound Approach	-	-	0	-	-	0
	Westbound Thru	-	-	-	-	-	-
	Westbound Right	-	-	-	-	-	-
	Southbound Approach	-	-	10.5	-	-	11
	Southbound Right	-	-	10.5	-	-	11
5	Tyler Road and Site Driveway 4						
	Overall Intersection (Unsignalized)	-	-	0.2	-	-	0.2
	Eastbound Approach	-	-	0	-	-	0
	Eastbound Thru	-	-	-	-	-	-
	Westbound Approach	-	-	0	-	-	0
	Westbound Thru	-	-	-	-	-	-
	Westbound Right	-	-	-	-	-	-
	Southbound Approach	-	-	10.3	-	-	10.8
	Southbound Right	-	-	10.3	-	-	10.8
EX	Existing (2022)						
FB	Future without Development (2024)						
TF	Future with Development (2024)						
m	Volume for 95th percentile queue is metered by upstream signal.						
~	Volume exceeds capacity, queue is theoretically infinite						
#	95th percentile volume exceeds capacity, queue may be longer.						
RED	Movement operates below acceptable LOS and delay increases by 10% or more compared to FB scenario						

As shown in Table 13, no movements had a significant degradation in delay compared to the future conditions without development (2024).

Table 14: 95th Percentile Queue Comparison

No.	Intersection (Movement)	Storage Length (feet)	Queue Length Comparison					
			AM Peak			PM Peak		
			EX 2022	FB 2024	TF+M 2024	EX 2022	FB 2024	TF+M 2024
1	Tyler Road and Mud Pike/Radford Travel Center Driveway							
	<i>Overall Intersection (Unsignalized)</i>							
	Eastbound Approach							
	Eastbound Left	200	3	3	5	5	3	8
	Eastbound Thru		0	0	0	0	0	0
	Eastbound Right		0	0	0	0	0	0
	Westbound Approach							
	Westbound Left		3	3	5	3	3	3
	Westbound Thru		0	0	0	0	0	0
	Westbound Right		0	0	0	0	0	0
	Northbound Approach							
	Northbound Left/Thru/Right		10	8	10	10	10	10
	Southbound Approach							
	Southbound Left/Thru/Right		25	23	48	28	25	43
	Southbound Right	100	-	-	5	-	-	5
2	Mud Pike and Site Driveway 1							
	<i>Overall Intersection (Unsignalized)</i>							
	Eastbound Approach							
	Eastbound Thru/Right		-	-	0	-	-	0
	Westbound Approach							
	Westbound Left/Thru		-	-	0	-	-	0
	Northbound Approach							
	Northbound Left/Right		-	-	8	-	-	5
3	Mud Pike and Site Driveway 2							
	<i>Overall Intersection (Unsignalized)</i>							
	Eastbound Approach							
	Eastbound Thru/Right		-	-	0	-	-	0
	Westbound Approach							
	Westbound Left/Thru		-	-	0	-	-	0
	Northbound Approach							
	Northbound Left/Right		-	-	0	-	-	0
4	Tyler Road and Site Driveway 3							
	<i>Overall Intersection (Unsignalized)</i>							
	Eastbound Approach							
	Eastbound Thru		-	-	0	-	-	0
	Westbound Approach							
	Westbound Thru		-	-	0	-	-	0
	Westbound Right		-	-	0	-	-	0
	Southbound Approach							
	Southbound Right		-	-	10	-	-	10
5	Tyler Road and Site Driveway 4							
	<i>Overall Intersection (Unsignalized)</i>							
	Eastbound Approach							
	Eastbound Thru		-	-	0	-	-	0
	Westbound Approach							
	Westbound Thru		-	-	0	-	-	0
	Westbound Right	75	-	-	0	-	-	0
	Southbound Approach							
	Southbound Right		-	-	3	-	-	3

- EX Existing (2022)
- FB Future without Development (2024)
- TF Future with Development (2024)
- m Volume for 95th percentile queue is metered by upstream signal.
- ~ Volume exceeds capacity, queue is theoretically infinite
- # 95th percentile volume exceeds capacity, queue may be longer.
- 123** Queue exceed storage length

As shown in Table 14 no new queues extend beyond the available storage.

Conclusions

All intersections within the study area operate at acceptable levels of service under existing conditions (2022), future conditions without development (2024), and future conditions with development and mitigation (2024).

The following off-site roadway improvements are recommended based on the traffic capacity analysis:

Tyler Road at Mud Pike:

- Restripe the southbound Mud Pike approach to create a short right-turn lane and one shared through-left lane

Tyler Road and Site Driveway 3:

- Extend the existing westbound right turn lane on Tyler Road at Site Driveway 4 to the west to create a right-turn lane into Site Driveway 3

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Appendix B – Synchro Output – Existing 2022 Conditions

Appendix C – Synchro Output – Future without Development 2024 Conditions

Appendix D – Synchro Output – Future with Development and Mitigation 2024 Conditions

A. Count Data



TRAFFIC DATA COLLECTION

File Name : Christianburg-Christianburg(Tyler and Mud pike)
 Site Code :
 Start Date : 3/23/2022
 Page No : 1

Groups Printed- Cars + - Trucks

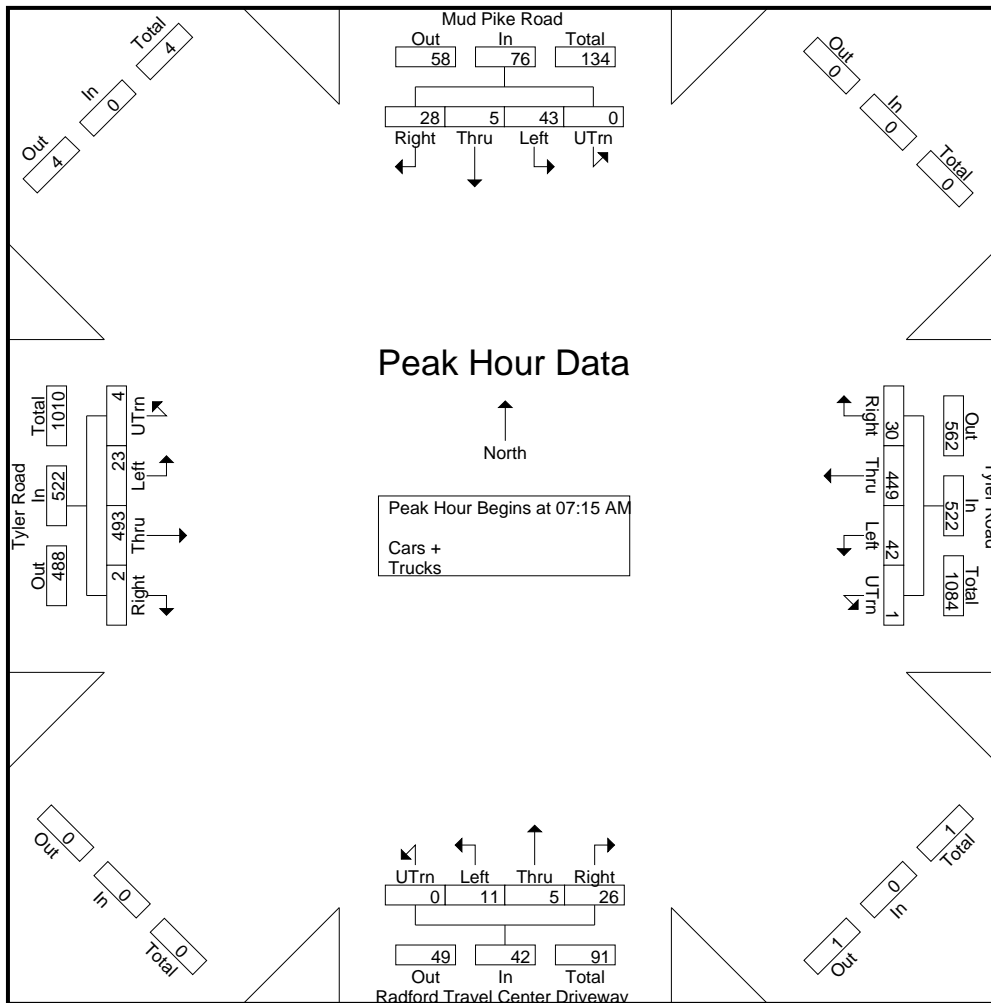
Start Time	Mud Pike Road Southbound					Tyler Road Westbound					Radford Travel Center Driveway Northbound					Tyler Road Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
07:00 AM	8	2	7	0	17	7	63	5	0	75	4	6	2	0	12	0	82	7	1	90	194
07:15 AM	3	2	16	0	21	5	95	15	0	115	2	1	2	0	5	2	123	4	0	129	270
07:30 AM	12	2	11	0	25	9	129	7	0	145	7	1	4	0	12	0	129	7	0	136	318
07:45 AM	7	0	9	0	16	8	128	12	1	149	12	2	2	0	16	0	136	4	0	140	321
Total	30	6	43	0	79	29	415	39	1	484	25	10	10	0	45	2	470	22	1	495	1103
08:00 AM	6	1	7	0	14	8	97	8	0	113	5	1	3	0	9	0	105	8	4	117	253
08:15 AM	7	1	11	0	19	5	98	9	0	112	4	2	2	0	8	0	97	5	2	104	243
08:30 AM	4	4	10	0	18	10	92	9	0	111	5	1	4	0	10	3	101	5	2	111	250
08:45 AM	8	2	10	0	20	7	89	7	0	103	9	3	3	0	15	1	85	6	1	93	231
Total	25	8	38	0	71	30	376	33	0	439	23	7	12	0	42	4	388	24	9	425	977
Grand Total	55	14	81	0	150	59	791	72	1	923	48	17	22	0	87	6	858	46	10	920	2080
Apprch %	36.7	9.3	54	0		6.4	85.7	7.8	0.1		55.2	19.5	25.3	0		0.7	93.3	5	1.1		
Total %	2.6	0.7	3.9	0	7.2	2.8	38	3.5	0	44.4	2.3	0.8	1.1	0	4.2	0.3	41.2	2.2	0.5	44.2	
Cars +	53	14	67	0	134	48	776	68	1	893	44	17	22	0	83	5	824	40	10	879	1989
% Cars +	96.4	100	82.7	0	89.3	81.4	98.1	94.4	100	96.7	91.7	100	100	0	95.4	83.3	96	87	100	95.5	95.6
Trucks	2	0	14	0	16	11	15	4	0	30	4	0	0	0	4	1	34	6	0	41	91
% Trucks	3.6	0	17.3	0	10.7	18.6	1.9	5.6	0	3.3	8.3	0	0	0	4.6	16.7	4	13	0	4.5	4.4



TRAFFIC DATA COLLECTION

File Name : Christianburg-Christianburg(Tyler and Mud pike)
 Site Code :
 Start Date : 3/23/2022
 Page No : 2

	Mud Pike Road Southbound					Tyler Road Westbound					Radford Travel Center Driveway Northbound					Tyler Road Eastbound					
Start Time	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	3	2	16	0	21	5	95	15	0	115	2	1	2	0	5	2	123	4	0	129	270
07:30 AM	12	2	11	0	25	9	129	7	0	145	7	1	4	0	12	0	129	7	0	136	318
07:45 AM	7	0	9	0	16	8	128	12	1	149	12	2	2	0	16	0	136	4	0	140	321
08:00 AM	6	1	7	0	14	8	97	8	0	113	5	1	3	0	9	0	105	8	4	117	253
Total Volume	28	5	43	0	76	30	449	42	1	522	26	5	11	0	42	2	493	23	4	522	1162
% App. Total	36.8	6.6	56.6	0		5.7	86	8	0.2		61.9	11.9	26.2	0		0.4	94.4	4.4	0.8		
PHF	.583	.625	.672	.000	.760	.833	.870	.700	.250	.876	.542	.625	.688	.000	.656	.250	.906	.719	.250	.932	.905





TRAFFIC DATA COLLECTION

File Name : Christianburg-Christianburg(Tyler and Mud pike)

Site Code :

Start Date : 3/23/2022

Page No : 1

Groups Printed- Cars + - Trucks

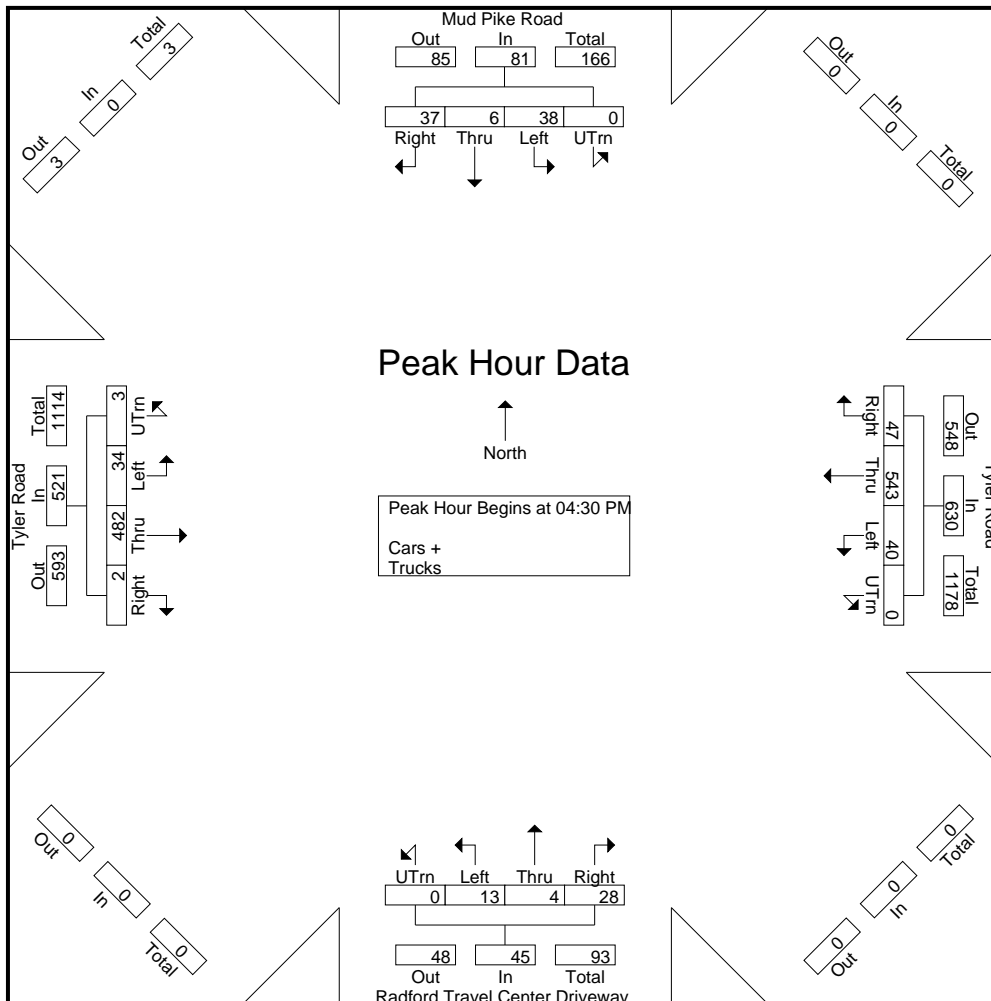
Start Time	Mud Pike Road Southbound					Tyler Road Westbound					Radford Travel Center Driveway Northbound					Tyler Road Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
04:00 PM	9	4	14	0	27	17	112	12	0	141	7	2	3	0	12	1	111	16	1	129	309
04:15 PM	13	4	4	0	21	17	142	8	0	167	7	1	3	0	11	0	86	8	2	96	295
04:30 PM	9	3	17	0	29	13	130	14	0	157	3	2	5	0	10	1	112	12	1	126	322
04:45 PM	8	0	9	0	17	13	129	6	0	148	5	0	1	0	6	0	106	6	1	113	284
Total	39	11	44	0	94	60	513	40	0	613	22	5	12	0	39	2	415	42	5	464	1210
05:00 PM	12	1	4	0	17	9	129	11	0	149	11	2	2	0	15	1	141	7	1	150	331
05:15 PM	8	2	8	0	18	12	155	9	0	176	9	0	5	0	14	0	123	9	0	132	340
05:30 PM	4	1	6	0	11	4	117	25	10	156	7	1	2	0	10	0	100	15	3	118	295
05:45 PM	4	1	3	0	8	5	83	20	12	120	5	3	3	0	11	1	96	17	0	114	253
Total	28	5	21	0	54	30	484	65	22	601	32	6	12	0	50	2	460	48	4	514	1219
Grand Total	67	16	65	0	148	90	997	105	22	1214	54	11	24	0	89	4	875	90	9	978	2429
Apprch %	45.3	10.8	43.9	0		7.4	82.1	8.6	1.8		60.7	12.4	27	0		0.4	89.5	9.2	0.9		
Total %	2.8	0.7	2.7	0	6.1	3.7	41	4.3	0.9	50	2.2	0.5	1	0	3.7	0.2	36	3.7	0.4	40.3	
Cars +	66	16	63	0	145	85	990	90	21	1186	51	11	24	0	86	4	861	88	9	962	2379
% Cars +	98.5	100	96.9	0	98	94.4	99.3	85.7	95.5	97.7	94.4	100	100	0	96.6	100	98.4	97.8	100	98.4	97.9
Trucks	1	0	2	0	3	5	7	15	1	28	3	0	0	0	3	0	14	2	0	16	50
% Trucks	1.5	0	3.1	0	2	5.6	0.7	14.3	4.5	2.3	5.6	0	0	0	3.4	0	1.6	2.2	0	1.6	2.1



TRAFFIC DATA COLLECTION

File Name : Christianburg-Christianburg(Tyler and Mud pike)
 Site Code :
 Start Date : 3/23/2022
 Page No : 2

Start Time	Mud Pike Road Southbound					Tyler Road Westbound					Radford Travel Center Driveway Northbound					Tyler Road Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	9	3	17	0	29	13	130	14	0	157	3	2	5	0	10	1	112	12	1	126	322
04:45 PM	8	0	9	0	17	13	129	6	0	148	5	0	1	0	6	0	106	6	1	113	284
05:00 PM	12	1	4	0	17	9	129	11	0	149	11	2	2	0	15	1	141	7	1	150	331
05:15 PM	8	2	8	0	18	12	155	9	0	176	9	0	5	0	14	0	123	9	0	132	340
Total Volume	37	6	38	0	81	47	543	40	0	630	28	4	13	0	45	2	482	34	3	521	1277
% App. Total	45.7	7.4	46.9	0		7.5	86.2	6.3	0		62.2	8.9	28.9	0		0.4	92.5	6.5	0.6		
PHF	.771	.500	.559	.000	.698	.904	.876	.714	.000	.895	.636	.500	.650	.000	.750	.500	.855	.708	.750	.868	.939



B. Synchro Output

Existing 2022 Conditions

1: Radford Travel Center Driveway/Mud Pike & Tyler Road

AM Peak

Intersection														
Int Delay, s/veh	2.5													
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↕				↕			↕			↕	
Traffic Vol, veh/h	4	23	493	2	1	42	449	30	11	5	26	43	5	28
Future Vol, veh/h	4	23	493	2	1	42	449	30	11	5	26	43	5	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	-	200	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	-	0	-	-	1	-	-	1	-
Grade, %	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	88	88	88	88	85	85	85	85	85	85
Heavy Vehicles, %	4	4	4	4	3	3	3	3	5	5	5	11	11	11
Mvmt Flow	4	25	530	2	1	48	510	34	13	6	31	51	6	33

Major/Minor	Major1			Major2			Minor1			Minor2				
Conflicting Flow All	544	544	0	0	532	532	0	0	945	1231	266	951	1215	272
Stage 1	-	-	-	-	-	-	-	-	589	589	-	625	625	-
Stage 2	-	-	-	-	-	-	-	-	356	642	-	326	590	-
Critical Hdwy	6.48	4.18	-	-	6.46	4.16	-	-	7.6	6.6	7	7.72	6.72	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	6.6	5.6	-	6.72	5.72	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	6.6	5.6	-	6.72	5.72	-
Follow-up Hdwy	2.54	2.24	-	-	2.53	2.23	-	-	3.55	4.05	3.35	3.61	4.11	3.41
Pot Cap-1 Maneuver	641	1007	-	-	657	1025	-	-	212	172	723	201	168	699
Stage 1	-	-	-	-	-	-	-	-	454	486	-	418	454	-
Stage 2	-	-	-	-	-	-	-	-	626	460	-	636	471	-
Platoon blocked, %			-	-			-	-						
Mov Cap-1 Maneuver	920	920	-	-	1010	1010	-	-	183	155	723	175	151	699
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	299	267	-	288	258	-
Stage 1	-	-	-	-	-	-	-	-	439	470	-	405	422	-
Stage 2	-	-	-	-	-	-	-	-	547	428	-	583	456	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	1.2	13.8	18.1
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	459	920	-	-	1010	-	-	364
HCM Lane V/C Ratio	0.108	0.032	-	-	0.047	-	-	0.246
HCM Control Delay (s)	13.8	9	-	-	8.7	0.5	-	18.1
HCM Lane LOS	B	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-	-	1

Intersection													
Int Delay, s/veh	2.4												
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↕			↕			↕			↕	
Traffic Vol, veh/h	3	34	482	2	40	543	47	13	4	28	38	6	37
Future Vol, veh/h	3	34	482	2	40	543	47	13	4	28	38	6	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	200	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	90	90	90	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	3	3	3	2	2	2
Mvmt Flow	3	39	554	2	44	603	52	15	5	33	45	7	44

Major/Minor	Major1			Major2			Minor1			Minor2			
Conflicting Flow All	656	655	0	0	556	0	0	1032	1382	278	1081	1357	328
Stage 1	-	-	-	-	-	-	-	639	639	-	717	717	-
Stage 2	-	-	-	-	-	-	-	393	743	-	364	640	-
Critical Hdwy	6.44	4.14	-	-	4.14	-	-	7.56	6.56	6.96	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.56	5.56	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.56	5.56	-	6.54	5.54	-
Follow-up Hdwy	2.52	2.22	-	-	2.22	-	-	3.53	4.03	3.33	3.52	4.02	3.32
Pot Cap-1 Maneuver	551	928	-	-	1011	-	-	186	142	716	172	148	668
Stage 1	-	-	-	-	-	-	-	428	466	-	387	432	-
Stage 2	-	-	-	-	-	-	-	600	418	-	627	468	-
Platoon blocked, %			-	-			-						
Mov Cap-1 Maneuver	872	872	-	-	1011	-	-	155	126	716	147	131	668
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	269	234	-	261	243	-
Stage 1	-	-	-	-	-	-	-	407	443	-	368	402	-
Stage 2	-	-	-	-	-	-	-	513	389	-	563	445	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.8	14.5	18.6
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	431	872	-	-	1011	-	-	359
HCM Lane V/C Ratio	0.123	0.049	-	-	0.044	-	-	0.265
HCM Control Delay (s)	14.5	9.3	-	-	8.7	0.3	-	18.6
HCM Lane LOS	B	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0.1	-	-	1.1

C. Synchro Output

Future without Development 2024 Conditions

Intersection														
Int Delay, s/veh	2.4													
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↕				↕			↕			↕	
Traffic Vol, veh/h	4	23	503	2	1	43	458	31	11	5	27	44	5	29
Future Vol, veh/h	4	23	503	2	1	43	458	31	11	5	27	44	5	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	-	200	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	-	0	-	-	1	-	-	1	-
Grade, %	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	3	3	3	3	5	5	5	11	11	11
Mvmt Flow	4	25	541	2	1	47	498	34	12	5	29	48	5	32

Major/Minor	Major1			Major2			Minor1			Minor2				
Conflicting Flow All	532	532	0	0	543	543	0	0	948	1228	272	942	1212	266
Stage 1	-	-	-	-	-	-	-	-	600	600	-	611	611	-
Stage 2	-	-	-	-	-	-	-	-	348	628	-	331	601	-
Critical Hdwy	6.48	4.18	-	-	6.46	4.16	-	-	7.6	6.6	7	7.72	6.72	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	6.6	5.6	-	6.72	5.72	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	6.6	5.6	-	6.72	5.72	-
Follow-up Hdwy	2.54	2.24	-	-	2.53	2.23	-	-	3.55	4.05	3.35	3.61	4.11	3.41
Pot Cap-1 Maneuver	652	1018	-	-	646	1015	-	-	211	173	717	204	168	706
Stage 1	-	-	-	-	-	-	-	-	447	481	-	426	461	-
Stage 2	-	-	-	-	-	-	-	-	633	467	-	632	466	-
Platoon blocked, %			-	-			-	-						
Mov Cap-1 Maneuver	931	931	-	-	1001	1001	-	-	184	156	717	178	152	706
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	300	269	-	291	259	-
Stage 1	-	-	-	-	-	-	-	-	433	466	-	413	430	-
Stage 2	-	-	-	-	-	-	-	-	556	435	-	580	452	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	1.2	13.6	17.6
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	463	931	-	-	1001	-	-	369
HCM Lane V/C Ratio	0.101	0.031	-	-	0.047	-	-	0.23
HCM Control Delay (s)	13.6	9	-	-	8.8	0.5	-	17.6
HCM Lane LOS	B	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.1	-	-	0.9

Intersection													
Int Delay, s/veh	2.3												
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↕			↕			↕			↕	
Traffic Vol, veh/h	3	35	492	2	41	554	48	13	4	29	39	6	38
Future Vol, veh/h	3	35	492	2	41	554	48	13	4	29	39	6	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	200	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	3	3	3	2	2	2
Mvmt Flow	3	38	535	2	45	602	52	14	4	32	42	7	41

Major/Minor	Major1			Major2			Minor1			Minor2			
Conflicting Flow All	654	654	0	0	537	0	0	1013	1362	269	1070	1337	327
Stage 1	-	-	-	-	-	-	-	618	618	-	718	718	-
Stage 2	-	-	-	-	-	-	-	395	744	-	352	619	-
Critical Hdwy	6.44	4.14	-	-	4.14	-	-	7.56	6.56	6.96	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.56	5.56	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.56	5.56	-	6.54	5.54	-
Follow-up Hdwy	2.52	2.22	-	-	2.22	-	-	3.53	4.03	3.33	3.52	4.02	3.32
Pot Cap-1 Maneuver	553	929	-	-	1027	-	-	192	146	726	175	152	669
Stage 1	-	-	-	-	-	-	-	441	477	-	386	431	-
Stage 2	-	-	-	-	-	-	-	599	417	-	638	478	-
Platoon blocked, %			-	-	-	-	-						
Mov Cap-1 Maneuver	875	875	-	-	1027	-	-	161	130	726	151	135	669
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	276	237	-	264	247	-
Stage 1	-	-	-	-	-	-	-	420	455	-	368	401	-
Stage 2	-	-	-	-	-	-	-	515	388	-	576	456	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.8	14.2	18.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	443	875	-	-	1027	-	-	363
HCM Lane V/C Ratio	0.113	0.047	-	-	0.043	-	-	0.249
HCM Control Delay (s)	14.2	9.3	-	-	8.7	0.3	-	18.2
HCM Lane LOS	B	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-	-	1

D. Synchro Output

Future with Development and Mitigation 2024 Conditions

Intersection														
Int Delay, s/veh	4													
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↕				↕			↕			↕	↕
Traffic Vol, veh/h	4	59	482	2	9	43	469	31	11	5	27	91	5	34
Future Vol, veh/h	4	59	482	2	9	43	469	31	11	5	27	91	5	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	-	200	-	-	-	-	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	-	0	-	-	-	0	-	-	1	-	-	1	-
Grade, %	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	3	3	3	3	5	5	5	11	11	11
Mvmt Flow	4	63	518	2	10	47	510	34	12	5	29	99	5	37

Major/Minor	Major1			Major2			Minor1			Minor2				
Conflicting Flow All	543	544	0	0	520	520	0	0	1025	1311	260	1037	1295	272
Stage 1	-	-	-	-	-	-	-	-	653	653	-	641	641	-
Stage 2	-	-	-	-	-	-	-	-	372	658	-	396	654	-
Critical Hdwy	6.48	4.18	-	-	6.46	4.16	-	-	7.6	6.6	7	7.72	6.72	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	6.6	5.6	-	6.72	5.72	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	6.6	5.6	-	6.72	5.72	-
Follow-up Hdwy	2.54	2.24	-	-	2.53	2.23	-	-	3.55	4.05	3.35	3.61	4.11	3.41
Pot Cap-1 Maneuver	642	1007	-	-	668	1035	-	-	185	154	730	174	150	699
Stage 1	-	-	-	-	-	-	-	-	415	454	-	409	446	-
Stage 2	-	-	-	-	-	-	-	-	613	452	-	577	440	-
Platoon blocked, %			-	-			-	-						
Mov Cap-1 Maneuver	967	967	-	-	936	936	-	-	152	131	730	145	127	699
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	259	232	-	254	230	-
Stage 1	-	-	-	-	-	-	-	-	386	422	-	380	407	-
Stage 2	-	-	-	-	-	-	-	-	522	412	-	508	409	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1			1.5			14.5			24.1		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	426	967	-	-	936	-	-	253	699
HCM Lane V/C Ratio	0.11	0.07	-	-	0.05	-	-	0.412	0.053
HCM Control Delay (s)	14.5	9	-	-	9.1	0.7	-	28.9	10.4
HCM Lane LOS	B	A	-	-	A	A	-	D	B
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0.2	-	-	1.9	0.2

Intersection						
Int Delay, s/veh	2.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	45	50	6	78	52	16
Future Vol, veh/h	45	50	6	78	52	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	11	11	2	11	2	2
Mvmt Flow	49	54	7	85	57	17

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	103	0	175 76
Stage 1	-	-	-	-	76 -
Stage 2	-	-	-	-	99 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1489	-	815 985
Stage 1	-	-	-	-	947 -
Stage 2	-	-	-	-	925 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1489	-	811 985
Mov Cap-2 Maneuver	-	-	-	-	811 -
Stage 1	-	-	-	-	947 -
Stage 2	-	-	-	-	920 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	846	-	-	1489	-
HCM Lane V/C Ratio	0.087	-	-	0.004	-
HCM Control Delay (s)	9.7	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	61	0	0	80	4	0
Future Vol, veh/h	61	0	0	80	4	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	11	2	2	11	100	100
Mvmt Flow	66	0	0	87	4	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	66	0	153
Stage 1	-	-	-	-	66
Stage 2	-	-	-	-	87
Critical Hdwy	-	-	4.12	-	7.4
Critical Hdwy Stg 1	-	-	-	-	6.4
Critical Hdwy Stg 2	-	-	-	-	6.4
Follow-up Hdwy	-	-	2.218	-	4.4
Pot Cap-1 Maneuver	-	-	1536	-	655
Stage 1	-	-	-	-	757
Stage 2	-	-	-	-	739
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1536	-	655
Mov Cap-2 Maneuver	-	-	-	-	655
Stage 1	-	-	-	-	757
Stage 2	-	-	-	-	739

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	655	-	-	1536	-
HCM Lane V/C Ratio	0.007	-	-	-	-
HCM Control Delay (s)	10.5	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	609	466	92	0	86
Future Vol, veh/h	0	609	466	92	0	86
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	2	2	2
Mvmt Flow	0	662	507	100	0	93

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	-	0	-	0	254
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	745
Stage 1	0	-	-	-	0
Stage 2	0	-	-	-	0
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	745
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	745
HCM Lane V/C Ratio	-	-	-	0.125
HCM Control Delay (s)	-	-	-	10.5
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.4

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	609	531	38	0	27
Future Vol, veh/h	0	609	531	38	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	75	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	36	2	2
Mvmt Flow	0	662	577	41	0	29

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	-	0	-	0	289
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0 708
Stage 1	0	-	-	-	0 -
Stage 2	0	-	-	-	0 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	708
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	708
HCM Lane V/C Ratio	-	-	-	0.041
HCM Control Delay (s)	-	-	-	10.3
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection														
Int Delay, s/veh	3.7													
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↕				↕			↕			↕	↕
Traffic Vol, veh/h	3	65	474	2	6	41	562	48	13	4	29	78	6	42
Future Vol, veh/h	3	65	474	2	6	41	562	48	13	4	29	78	6	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	-	200	-	-	-	-	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	-	0	-	-	-	0	-	-	1	-	-	1	-
Grade, %	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	3	3	3	2	2	2
Mvmt Flow	3	71	515	2	7	45	611	52	14	4	32	85	7	46

Major/Minor	Major1			Major2			Minor1			Minor2				
Conflicting Flow All	663	663	0	0	517	517	0	0	1077	1431	259	1149	1406	332
Stage 1	-	-	-	-	-	-	-	-	664	664	-	741	741	-
Stage 2	-	-	-	-	-	-	-	-	413	767	-	408	665	-
Critical Hdwy	6.44	4.14	-	-	6.44	4.14	-	-	7.56	6.56	6.96	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	6.56	5.56	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	6.56	5.56	-	6.54	5.54	-
Follow-up Hdwy	2.52	2.22	-	-	2.52	2.22	-	-	3.53	4.03	3.33	3.52	4.02	3.32
Pot Cap-1 Maneuver	545	922	-	-	675	1045	-	-	172	132	737	153	138	664
Stage 1	-	-	-	-	-	-	-	-	414	454	-	374	421	-
Stage 2	-	-	-	-	-	-	-	-	584	407	-	591	456	-
Platoon blocked, %			-	-			-	-						
Mov Cap-1 Maneuver	890	890	-	-	969	969	-	-	137	111	737	126	116	664
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	244	207	-	235	225	-
Stage 1	-	-	-	-	-	-	-	-	380	416	-	343	386	-
Stage 2	-	-	-	-	-	-	-	-	490	373	-	513	418	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.2	1.2	15	23.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	411	890	-	-	969	-	-	234	664
HCM Lane V/C Ratio	0.122	0.083	-	-	0.046	-	-	0.39	0.069
HCM Control Delay (s)	15	9.4	-	-	8.9	0.7	-	29.9	10.8
HCM Lane LOS	C	A	-	-	A	A	-	D	B
HCM 95th %tile Q(veh)	0.4	0.3	-	-	0.1	-	-	1.7	0.2

Intersection						
Int Delay, s/veh	2.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	74	43	5	84	42	15
Future Vol, veh/h	74	43	5	84	42	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	80	47	5	91	46	16

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	127	0	205
Stage 1	-	-	-	-	104
Stage 2	-	-	-	-	101
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1459	-	783
Stage 1	-	-	-	-	920
Stage 2	-	-	-	-	923
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1459	-	780
Mov Cap-2 Maneuver	-	-	-	-	780
Stage 1	-	-	-	-	920
Stage 2	-	-	-	-	919

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	819	-	-	1459	-
HCM Lane V/C Ratio	0.076	-	-	0.004	-
HCM Control Delay (s)	9.8	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	89	0	0	85	4	0
Future Vol, veh/h	89	0	0	85	4	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	100	100
Mvmt Flow	97	0	0	92	4	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	97	0	189
Stage 1	-	-	-	-	97
Stage 2	-	-	-	-	92
Critical Hdwy	-	-	4.12	-	7.4
Critical Hdwy Stg 1	-	-	-	-	6.4
Critical Hdwy Stg 2	-	-	-	-	6.4
Follow-up Hdwy	-	-	2.218	-	4.4
Pot Cap-1 Maneuver	-	-	1496	-	621
Stage 1	-	-	-	-	730
Stage 2	-	-	-	-	735
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1496	-	621
Mov Cap-2 Maneuver	-	-	-	-	621
Stage 1	-	-	-	-	730
Stage 2	-	-	-	-	735

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	621	-	-	1496	-
HCM Lane V/C Ratio	0.007	-	-	-	-
HCM Control Delay (s)	10.8	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	587	584	80	0	73
Future Vol, veh/h	0	587	584	80	0	73
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	638	635	87	0	79

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	-	0	-	0	- 318
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	-	-	- 6.94
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	- 3.32
Pot Cap-1 Maneuver	0	-	-	-	0 678
Stage 1	0	-	-	-	0 -
Stage 2	0	-	-	-	0 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	- 678
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	678
HCM Lane V/C Ratio	-	-	-	0.117
HCM Control Delay (s)	-	-	-	11
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.4

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Traffic Vol, veh/h	0	587	637	36	0	27
Future Vol, veh/h	0	587	637	36	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	75	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	44	2	2
Mvmt Flow	0	638	692	39	0	29

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	-	0	-	0	346
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0 650
Stage 1	0	-	-	-	0 -
Stage 2	0	-	-	-	0 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	650
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	650
HCM Lane V/C Ratio	-	-	-	0.045
HCM Control Delay (s)	-	-	-	10.8
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

2500 Tyler Road – Travel Center

APPENDIX

- VDOT Access Management Exception Requests

ACCESS MANAGEMENT EXCEPTION REQUEST: AM-E
ACCESS MANAGEMENT REGULATIONS 24 VAC 30-73
SECTION 120

Submitted by: Carl Hultgren, P.E., PTOE		Date: 06/30/22
Email Address: ch@goroveslade.com		Phone: (804) 362-0578
Address: 4951 Lake Brook Drive, Suite 250, Glen Allen, VA 23060		
Project Name: Circle K - Mud Pike	Rte # 666	Locality: Montgomery County
Description of Project: Proposed Circle K redevelopment in the northeast quadrant of the Tyler Road at Mud Pike intersection. The redevelopment plan includes a convenience store with 12 vehicle fueling positions, two diesel fueling positions, and one restaurant. There are currently 3 full-movement driveways on Mud Pike. The access plan includes eliminating the driveway closest to Tyler Road and shifting the two other driveways. This AME request is related to the spacing of the relocated driveways on Mud Pike.		
VDOT District: Salem	Area Land Use Engineer: Jesse Miller, P.E.	

- NOTES:**
- Submit this form and any attachments to one of the District's Area Land Use Engineers.
 - See Section 120 of the Regulations for details on the requirements, exceptions, and exception request review process.
 - Attach additional information as necessary to justify the exception request(s).
 - If a traffic engineering study is required, the decision on the request will be based on VDOT engineering judgment.
 - Use the LD-440 Design Exception or the LD-448 Design Waiver forms for *design and engineering standards*, e.g. radius, grade, sight distance. See [IIM-LD-227](#) on VDOT web site for additional instructions.

Select the Exception(s) Being Requested

Exception to the shared commercial entrance requirement. (Access M. Regulations Section 120 C.2)

Reason for exception:

A. An agreement to share the entrance could not be reached with adjoining property owner.

Attached: Written evidence that adjoining property owner will not share the entrance.

B. Physical constraints: topography, adjacent hazardous land use, stream, wetland, other.

Specify constraint: _____

Attached: Documentation of constraint such as aerial photo or topographic map.

Exception to the vehicular connection to adjoining undeveloped property requirement. (Section 120 C.4)

Reason for exception:

A. Physical constraints: topography, adjacent hazardous land use, stream, wetland, other.

Specify constraint: _____

Attached: Documentation of constraint such as aerial photo or topographic map.

B. Other reason: _____

- Exception to the commercial entrance shall not be located within the functional area of an intersection requirement.** (See Regulation Section 120 C. 1; Appendix F, Rd Design Manual)
 - Attached:** A traffic engineering study documenting that the operation of the intersection and public safety will not be adversely impacted.

EXCEPTION TO THE SPACING STANDARDS FOR:

- **Commercial entrances; intersections/median crossovers (Table 2-2);**
- **Commercial entrances/intersections near interchange ramps (Tables 2-3, 2-4); or**
- **Corner clearance (Figure 4-4).** Appendix F, Road Design Manual

Information on the Exception Request

ON A STATE HIGHWAY

Functional classification: Principal Arterial: Minor Arterial: Collector: Local:

Posted speed limit: 40 mph

NEAR AN INTERCHANGE RAMP (Submittal of a traffic engineering study required)

CORNER CLEARANCE (Submittal of a traffic engineering study required)

Type of intersection/entrance: Signalized Unsignalized Full Access Partial Access

Required spacing distance 335 ft

Proposed spacing distance 205 ft

Requested exception: Reduction in required spacing 130 ft

REASON FOR EXCEPTION:

- A. To be located on an older, established business corridor along a highway where existing spacing did not meet the standards prior to 7/1/08 or 10/14/09.** (Regulation Section 120 C.3.c)
 - Attached:** Dated aerial photo of corridor identifying proposed entrance/intersection location.
- B. Not enough property frontage to meet spacing standard, but the applicant does not want a partial access right-in/right-out entrance.** (Section 120 C.3.f)
 - Attached:** A traffic engineering study documenting that left turn movements at the entrance will not have a negative impact on highway operation or safety.
- C. To be located within a new urbanism mixed use type development.** (Section 120 C.3.d)
 - Attached:** The design of the development and compliance with intersection sight distance.
- D. The proposed entrance meets the signal warrants but does not meet the signalized intersection spacing standard. The applicant requests an exception to the spacing standard.**
 - Attached:** A traffic engineering study that (i) evaluates the location’s suitability for a roundabout and (ii) provides documentation that the proposed signal will not impact safety and traffic flow. (Section 120 C.5)

- E. The development's 2nd (or additional) entrance does not meet the spacing standards but is necessary for the streets to be accepted into the secondary system. (Section 120 C.3.e)
 - Attached: Information on the development that identifies the location of entrances.
- F. To be located within the limits of a VDOT and locality approved access management corridor plan.
 - Attached: Aerial photo of corridor identifying proposed entrance/intersection location. (Sect 120 C.3.b)

FOR VDOT USE ONLY

Recommendation on Exception Request: Approve <input type="checkbox"/> Deny <input type="checkbox"/> Date: _____
Area Land Use Engineer or: _____ Name _____
Remarks:

Exception Request Action: Approved <input type="checkbox"/> Denied <input type="checkbox"/> Date: _____
District Administrator or Designee: _____ Name (and position if Designee) _____
Remarks:

District Staff: Please email copy to Bradley.Shelton@VDOT.Virginia.gov

ACCESS MANAGEMENT EXCEPTION REQUEST: AM-E
ACCESS MANAGEMENT REGULATIONS 24 VAC 30-73
SECTION 120

Submitted by: Carl Hultgren, P.E., PTOE		Date: 06/30/22
Email Address: ch@goroveslade.com		Phone: (804) 362-0578
Address: 4951 Lake Brook Drive, Suite 250, Glen Allen, VA 23060		
Project Name: Circle K - Mud Pike	Rte # 177	Locality: Montgomery County
Description of Project: Proposed Circle K redevelopment in the northeast quadrant of the Tyler Road at Mud Pike intersection. The development plan includes a convenience store with 12 vehicle fueling positions, two diesel fueling positions, and one restaurant. There are currently 3 right-in / right-out driveways on Tyler Road. The access plan includes eliminating the driveway closest to Mud Pike and shifting the other two driveways to the east. This AME request is related to the spacing between site driveways 3 and 4.		
VDOT District: Salem	Area Land Use Engineer: Jesse Miller, P.E.	

- NOTES:**
- Submit this form and any attachments to one of the District's Area Land Use Engineers.
 - See Section 120 of the Regulations for details on the requirements, exceptions, and exception request review process.
 - Attach additional information as necessary to justify the exception request(s).
 - If a traffic engineering study is required, the decision on the request will be based on VDOT engineering judgment.
 - Use the LD-440 Design Exception or the LD-448 Design Waiver forms for *design and engineering standards*, e.g. radius, grade, sight distance. See [IIM-LD-227](#) on VDOT web site for additional instructions.

Select the Exception(s) Being Requested

Exception to the shared commercial entrance requirement. (Access M. Regulations Section 120 C.2)

Reason for exception:

A. An agreement to share the entrance could not be reached with adjoining property owner.

Attached: Written evidence that adjoining property owner will not share the entrance.

B. Physical constraints: topography, adjacent hazardous land use, stream, wetland, other.

Specify constraint: _____

Attached: Documentation of constraint such as aerial photo or topographic map.

Exception to the vehicular connection to adjoining undeveloped property requirement. (Section 120 C.4)

Reason for exception:

A. Physical constraints: topography, adjacent hazardous land use, stream, wetland, other.

Specify constraint: _____

Attached: Documentation of constraint such as aerial photo or topographic map.

B. Other reason: _____

Exception to the commercial entrance shall not be located within the functional area of an intersection requirement. (See Regulation Section 120 C. 1; Appendix F, Rd Design Manual)

Attached: A traffic engineering study documenting that the operation of the intersection and public safety will not be adversely impacted.

EXCEPTION TO THE SPACING STANDARDS FOR:

- **Commercial entrances; intersections/median crossovers (Table 2-2);**
- **Commercial entrances/intersections near interchange ramps (Tables 2-3, 2-4); or**
- **Corner clearance (Figure 4-4).** Appendix F, Road Design Manual

Information on the Exception Request

ON A STATE HIGHWAY

Functional classification: Principal Arterial: Minor Arterial: Collector: Local:

Posted speed limit: 45 mph

NEAR AN INTERCHANGE RAMP (Submittal of a traffic engineering study required)

CORNER CLEARANCE (Submittal of a traffic engineering study required)

Type of intersection/entrance: Signalized Unsignalized Full Access Partial Access

Required spacing distance 305 ft

Proposed spacing distance 240 ft

Requested exception: Reduction in required spacing 65 ft

REASON FOR EXCEPTION:

A. To be located on an older, established business corridor along a highway where existing spacing did not meet the standards prior to 7/1/08 or 10/14/09. (Regulation Section 120 C.3.c)

Attached: Dated aerial photo of corridor identifying proposed entrance/intersection location.

B. Not enough property frontage to meet spacing standard, but the applicant does not want a partial access right-in/right-out entrance. (Section 120 C.3.f)

Attached: A traffic engineering study documenting that left turn movements at the entrance will not have a negative impact on highway operation or safety.

C. To be located within a new urbanism mixed use type development. (Section 120 C.3.d)

Attached: The design of the development and compliance with intersection sight distance.

D. The proposed entrance meets the signal warrants but does not meet the signalized intersection spacing standard. The applicant requests an exception to the spacing standard.

Attached: A traffic engineering study that (i) evaluates the location's suitability for a roundabout and (ii) provides documentation that the proposed signal will not impact safety and traffic flow. (Section 120 C.5)

- E. The development's 2nd (or additional) entrance does not meet the spacing standards but is necessary for the streets to be accepted into the secondary system. (Section 120 C.3.e)
 - Attached: Information on the development that identifies the location of entrances.
- F. To be located within the limits of a VDOT and locality approved access management corridor plan.
 - Attached: Aerial photo of corridor identifying proposed entrance/intersection location. (Sect 120 C.3.b)

FOR VDOT USE ONLY

Recommendation on Exception Request: Approve <input type="checkbox"/> Deny <input type="checkbox"/> Date: _____
Area Land Use Engineer or: _____ Name _____
Remarks:

Exception Request Action: Approved <input type="checkbox"/> Denied <input type="checkbox"/> Date: _____
District Administrator or Designee: _____ Name (and position if Designee) _____
Remarks:

District Staff: Please email copy to Bradley.Shelton@VDOT.Virginia.gov

ACCESS MANAGEMENT EXCEPTION REQUEST: AM-E
ACCESS MANAGEMENT REGULATIONS 24 VAC 30-73
SECTION 120

Submitted by: Carl Hultgren, P.E., PTOE		Date: 06/30/22
Email Address: ch@goroveslade.com		Phone: (804) 362-0578
Address: 4951 Lake Brook Drive, Suite 250, Glen Allen, VA 23060		
Project Name: Circle K - Mud Pike	Rte # 177	Locality: Montgomery County
Description of Project: Proposed Circle K redevelopment in the northeast quadrant of the Tyler Road at Mud Pike intersection. The redevelopment plan includes a convenience store with 12 vehicle fueling positions, two diesel fueling positions, and one restaurant. There are currently 3 right-in / right-out driveways on Tyler Road. The access plan includes eliminating the driveway closest to Mud Pike and shifting the other two driveways. This AME request is related to the spacing of Site Driveway 4 to the I-81 exit ramp merge		
VDOT District: Salem	Area Land Use Engineer: Jesse Miller, P.E.	

- NOTES:**
- (1). Submit this form and any attachments to one of the District’s Area Land Use Engineers.
 - (2). See Section 120 of the Regulations for details on the requirements, exceptions, and exception request review process.
 - (3). Attach additional information as necessary to justify the exception request(s).
 - (4). If a traffic engineering study is required, the decision on the request will be based on VDOT engineering judgment.
 - (5). Use the LD-440 Design Exception or the LD-448 Design Waiver forms for *design and engineering standards*, e.g. radius, grade, sight distance. See [IIM-LD-227](#) on VDOT web site for additional instructions.

Select the Exception(s) Being Requested

Exception to the shared commercial entrance requirement. (Access M. Regulations Section 120 C.2)

Reason for exception:

A. An agreement to share the entrance could not be reached with adjoining property owner.

Attached: Written evidence that adjoining property owner will not share the entrance.

B. Physical constraints: topography, adjacent hazardous land use, stream, wetland, other.

Specify constraint: _____

Attached: Documentation of constraint such as aerial photo or topographic map.

Exception to the vehicular connection to adjoining undeveloped property requirement. (Section 120 C.4)

Reason for exception:

A. Physical constraints: topography, adjacent hazardous land use, stream, wetland, other.

Specify constraint: _____

Attached: Documentation of constraint such as aerial photo or topographic map.

B. Other reason: _____

Exception to the commercial entrance shall not be located within the functional area of an intersection requirement. (See Regulation Section 120 C. 1; Appendix F, Rd Design Manual)

Attached: A traffic engineering study documenting that the operation of the intersection and public safety will not be adversely impacted.

EXCEPTION TO THE SPACING STANDARDS FOR:

- **Commercial entrances; intersections/median crossovers (Table 2-2);**
- **Commercial entrances/intersections near interchange ramps (Tables 2-3, 2-4); or**
- **Corner clearance (Figure 4-4).** Appendix F, Road Design Manual

Information on the Exception Request

ON A STATE HIGHWAY
Functional classification: Principal Arterial: Minor Arterial: Collector: Local:
Posted speed limit: 45 mph

NEAR AN INTERCHANGE RAMP (Submittal of a traffic engineering study required)

CORNER CLEARANCE (Submittal of a traffic engineering study required)

Type of intersection/entrance: Signalized Unsignalized Full Access Partial Access

Required spacing distance 750 ft
Proposed spacing distance 360 ft
Requested exception: Reduction in required spacing 390 ft

REASON FOR EXCEPTION:

A. To be located on an older, established business corridor along a highway where existing spacing did not meet the standards prior to 7/1/08 or 10/14/09. (Regulation Section 120 C.3.c)

Attached: Dated aerial photo of corridor identifying proposed entrance/intersection location.

B. Not enough property frontage to meet spacing standard, but the applicant does not want a partial access right-in/right-out entrance. (Section 120 C.3.f)

Attached: A traffic engineering study documenting that left turn movements at the entrance will not have a negative impact on highway operation or safety.

C. To be located within a new urbanism mixed use type development. (Section 120 C.3.d)

Attached: The design of the development and compliance with intersection sight distance.

D. The proposed entrance meets the signal warrants but does not meet the signalized intersection spacing standard. The applicant requests an exception to the spacing standard.

Attached: A traffic engineering study that (i) evaluates the location's suitability for a roundabout and (ii) provides documentation that the proposed signal will not impact safety and traffic flow. (Section 120 C.5)

- E. The development's 2nd (or additional) entrance does not meet the spacing standards but is necessary for the streets to be accepted into the secondary system. (Section 120 C.3.e)
 - Attached: Information on the development that identifies the location of entrances.
- F. To be located within the limits of a VDOT and locality approved access management corridor plan.
 - Attached: Aerial photo of corridor identifying proposed entrance/intersection location. (Sect 120 C.3.b)

FOR VDOT USE ONLY

Recommendation on Exception Request: Approve <input type="checkbox"/> Deny <input type="checkbox"/> Date: _____
Area Land Use Engineer or: _____ Name _____
Remarks:

Exception Request Action: Approved <input type="checkbox"/> Denied <input type="checkbox"/> Date: _____
District Administrator or Designee: _____ Name (and position if Designee) _____
Remarks:

District Staff: Please email copy to Bradley.Shelton@VDOT.Virginia.gov