

AGENDA
JAMES CITY COUNTY BOARD OF SUPERVISORS
REGULAR MEETING
COUNTY GOVERNMENT CENTER BOARD ROOM
101 MOUNTS BAY ROAD, WILLIAMSBURG, VA 23185
January 13, 2026
5:00 PM

A. CALL TO ORDER

B. ROLL CALL

C. MOMENT OF SILENCE

D. PLEDGE OF ALLEGIANCE

E. PUBLIC COMMENT

F. CONSENT CALENDAR

1. Grant Award - \$37,500 - James City County CONECT Program
2. Grant Award - \$191,990 - Child Abuse and Neglect State Grant (Kinship Navigator Program)

G. PUBLIC HEARING(S)

1. Pre-Budget Public Hearing
2. Z-25-0007/MP-25-0005. 6810 Richmond Road, The Williamsburg Pottery Proffer and Master Plan Amendment
3. SUP-25-0014. 4300 John Tyler Hwy., Williamsburg School for the Arts & Innovation
4. SUP-25-0007. 4797 Fenton Mill Road Contractor's Office
5. SUP-25-0013. 5255 Riverview Road Family Subdivision
6. SUP-25-0015. 4900 Stadium Rd & 4620 Opportunity Way, General Services Headquarters

H. BOARD CONSIDERATION(S)

I. BOARD REQUESTS AND DIRECTIVES

J. REPORTS OF THE COUNTY ADMINISTRATOR

K. CLOSED SESSION

1. Consideration of a personnel matter, the appointment of individuals to County Boards and/or Commissions, pursuant to Section 2.2-3711 of the Code of Virginia
 - a. Citizen Terms Expiring in 2026

- b. Planning Commission Appointments
 - c. Social Services Advisory Board Appointment
- 2. Certification of Closed Session

L. ADJOURNMENT

- 1. Adjourn until 1 pm on January 27, 2026 for the Business Meeting

MEMORANDUM

DATE: January 13, 2026

TO: The Board of Supervisors

FROM: Lynette Diaz, Assistant Director of Social Services

SUBJECT: Grant Award - \$37,500 - James City County CONECT Program

The James City County (JCC) Community, Outreach, Network, Educate, Care, Thrive (CONECT) program has received funding through a grant received by the Williamsburg Health Foundation (WHF) to support service delivery through the Department of Social Services (DSS). The program is a Mobile Integrated Health (MIH) partnership between the JCC DSS and Fire/Emergency Medical Services (EMS). It aims to reach individuals throughout the County who need supportive services and resources. This free program “connects” residents, regardless of income or insurance, with resources to aid and support individualized needs in the home.

The efforts of the staff from the DSS specifically focus on supportive resources and services related to the social determinants of health for individuals who are 60 and older, or 18-59 with a disability. Through the program, participants may engage with Social Services case managers for support with: providing and/or connecting eligible adults to appropriate partners in the areas of adult day services, advocacy, assisted living facility placement, companion services, counseling, emergency assistance, emergency shelter, financial management/counseling, food assistance, hoarding/decluttering, home maintenance, home-delivered meals, housing services, legal assistance public assistance, respite care, Medicaid screening, and transportation. The Fire/EMS staff manage the medical side of the partnership for the participants who are working with Social Services, and any other residents in the community who benefit from the MIH model.

The WHF’s grant award in the amount of \$37,500 is to specifically respond to the social needs of the growing population of seniors and adults with disabilities. This funding will support safe and stable home environments to support healthy aging-in-place and in-home health services, support to prevent displacement or social isolation, and healthy nutrition and food security.

Staff respectfully requests that the Board accept the grant award in the amount of \$37,500 for Calendar Year 2026.

LD/tm
GA-CONECTCY26-mem

Attachment

RESOLUTION

GRANT AWARD - \$37,500 - JAMES CITY COUNTY CONECT PROGRAM

WHEREAS, the Williamsburg Health Foundation (WHF) seeks to support service delivery through the James City County (JCC) Community, Outreach, Network, Educate, Care, Thrive (CONECT) program, the goal of which is to connect individuals who are 60 and older, or 18-59 with a disability, with services and resources related to social determinants of health; and

WHEREAS, the program is a Mobile Integrated Health partnership between the JCC Departments of Social Services (DSS) and Fire/Emergency Medical Services; and

WHEREAS, the WHF has awarded \$37,500 (the “Grant”) to JCC to specifically respond to the social needs of the growing population of seniors and adults with disabilities; and

WHEREAS, no direct financial support is needed from the County to continue the JCC CONECT program except in-kind services provided by DSS.

NOW, THEREFORE, BE IT RESOLVED that the Board of Supervisors of James City County, Virginia, hereby directs the County Administrator to execute the Grant contract and authorizes the acceptance of the Grant and the following appropriation to the Special Projects/Grants Fund:

Revenue:

Calendar Year (CY) 2026 CONECT Program	<u>\$37,500</u>
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Expenditure:

CY2026 CONECT Program	<u>\$37,500</u>
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Chair, Board of Supervisors

ATTEST:

Teresa J. Saeed
Deputy Clerk to the Board

	VOTES			
	<u>AYE</u>	<u>NAY</u>	<u>ABSTAIN</u>	<u>ABSENT</u>
NULL	_____	_____	_____	_____
HIPPLE	_____	_____	_____	_____
MCGLENNON	_____	_____	_____	_____
ICENHOUR	_____	_____	_____	_____
LARSON	_____	_____	_____	_____

Adopted by the Board of Supervisors of James City County, Virginia, this 13th day of January, 2026.

MEMORANDUM

DATE: January 13, 2026

TO: The Board of Supervisors

FROM: Lynette Diaz, Assistant Director of Social Services

SUBJECT: Grant Award - \$191,990 - Child Abuse and Neglect State Grant (Kinship Navigator Program)

James City County Department of Social Services (JCC DSS) has been chosen as a subrecipient awardee of the Child Abuse and Neglect State Grant to support the Kinship Navigator Program. The award is in the amount of \$191,990 from the Virginia Department of Social Services (VDSS). These funds are being made available to effectively administer the regional Kinship Navigator Program to assist informal and formal kinship caregivers in utilizing services to meet the needs of the children they are raising. Disbursement of funds shall follow a cost reimbursement procedure and shall be for actual funds expended. VDSS has agreed to pay the department \$191,990 for completion of the services described in the contract's scope of work and deliverables. Payment will be made monthly by the *Locality Automated System for Electronic Reimbursement (LASER)* for reimbursement of services, and the cash transfers will be considered a pass-through. The period of performance for the services outlined in the agreement will be through September 30, 2026. JCC DSS plans to submit an annual budget for review and approval no later than August 1 each year for subsequent approval of federal fiscal year agreements.

JCC DSS currently offers both formal and informal services and supports to kinship caregivers. However, VDSS has now adopted the Washington Kinship Navigator Program Model to structure services with an evidence-based framework that will qualify services for Title IV-E funding reimbursement. Kinship Navigator Program services provided by JCC DSS will include promotion, completion of needs assessments, case management services, caregiver education, and provision of urgent funds to families. In addition, clear performance metrics have been identified to align all programs across the Commonwealth.

JCC DSS plans to continue partnering with the City of Williamsburg Department of Human Services, the York-Poquoson Department of Social Services, Williamsburg-James City County (WJCC) Schools, Colonial Behavioral Health, the 9th District Court Services Unit and other local faith-based and nonprofit organizations in the outreach and coordination efforts to ensure that all kinship caregivers have the support they need.

These funds are to be used for salary, employee benefits, outreach/advertising, office and programming, equipment, and urgent funds to families. JCC DSS is requesting the Board's authorization to appropriate the Kinship Navigator position within this program funding. This position will be responsible for ensuring fidelity to all elements of the model's service framework, with oversight from department leadership.

Staff respectfully requests that the Board accept the allocation in the amount of \$191,990 and approve the appropriation of the Kinship Navigator position within this funding.

LD/tm
GA-KinshipNProg-mem

Attachment

RESOLUTION

GRANT AWARD - \$191,990 - CHILD ABUSE AND NEGLECT STATE GRANT

(KINSHIP NAVIGATOR PROGRAM)

WHEREAS, James City County Department of Social Services (JCC DSS) has been chosen as a subrecipient awardee of the Child Abuse and Neglect State Grant to support the Kinship Navigator Grant Program in the amount of \$191,990 by the Virginia Department of Social Services (VDSS); and

WHEREAS, these funds are being made available to effectively administer the regional Kinship Navigator Program to assist informal and formal kinship caregivers in meeting the needs of the children they are raising; and

WHEREAS, disbursement of funds shall follow a cost reimbursement procedure and shall be for actual funds expended; and

WHEREAS, VDSS has agreed to pay the department \$191,990 for completion of the services described in the contract's scope of work and deliverables through September 30, 2026; and

WHEREAS, payment will be made monthly by the *Locality Automated System for Electronic Reimbursement (LASER)* for reimbursement of services, and the cash transfers will be considered a pass-through; and

WHEREAS, JCC DSS is requesting the Board's authorization to appropriate the Kinship Navigator position within this program funding to ensure fidelity to all elements of the model's service framework, with oversight from department leadership.

NOW, THEREFORE, BE IT RESOLVED that the Board of Supervisors of James City County, Virginia, hereby authorizes the acceptance of the grant award, including the appropriation of the Kinship Navigator position within this funding, and the following appropriation amendment to the Virginia Public Assistance Fund:

Revenue:

From The Commonwealth	<u>\$191,990</u>
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Expenditure:

Administration - Staff and Operations	<u>\$191,990</u>
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Chair, Board of Supervisors

ATTEST:

Teresa J. Saeed
Deputy Clerk to the Board

WAINWRIGHT
NULL
LARSON
MCLENNON
ICENHOUR

VOTES

<u>AYE</u>	<u>NAY</u>	<u>ABSTAIN</u>	<u>ABSENT</u>
_____	_____	_____	_____
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Adopted by the Board of Supervisors of James City County, Virginia, this 13th day of
January, 2026.

GA-KinshipNProg-res

MEMORANDUM

DATE: January 13, 2026

TO: The Board of Supervisors

FROM: Sharon B. McCarthy, Director of Financial and Management Services

SUBJECT: Pre-Budget Public Hearing - FY2027-FY2028 Budget

The purpose of this public hearing is to invite comments and suggestions from citizens for the upcoming County Budget. The comments and suggestions made at this pre-budget Public Hearing will help guide staff in preparing a budget proposal for the Board's review in May. No Board action is requested at this time.

**REZONING-25-0007/MASTER PLAN AMENDMENT-25-0005. 6810 Richmond Road
The Williamsburg Pottery Proffer and Master Plan Amendment
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing**

SUMMARY FACTS

Applicant:	Ms. Dawn Griggs, with Thalhimer Realty Partners, on behalf of Coastal Community Church
Landowner:	Williamsburg Pottery Properties, LLC
Proposal:	Proffer and Master Plan Amendment to allow for institutional uses on the previously adopted Master Plan to allow Coastal Community Church to occupy an existing building at the Williamsburg Pottery.
Locations:	6810 Richmond Road 6710 Richmond Road
Tax Map/Parcel Nos.:	2430100024A 2430100024B
Project Acreage:	± 14.012 acres
Zoning:	M-1, Limited Business/Industrial
Comprehensive Plan:	Mixed Use
Primary Service Area (PSA)	Inside
Staff Contact:	Kyle Sirico, Planner

PUBLIC HEARING DATES

Planning Commission: December 3, 2025, 6:00 p.m.

Board of Supervisors: January 13, 2026, 5:00 p.m.

FACTORS FAVORABLE

1. Staff finds the proposed proffers mitigate expected impacts to surrounding properties and development.
2. Staff finds the proposal consistent with the Comprehensive Plan.
3. Impacts: See Impact Analysis on Pages 6-8.

FACTORS UNFAVORABLE

1. Impacts: See Impact Analysis on Pages 6-8.

PLANNING COMMISSION RECOMMENDATION

At its December 3, 2025, Regular Meeting, the Planning Commission voted 6-0 to recommend approval of the Rezoning and Master Plan Amendment request to the Board of Supervisors, subject to the proposed proffers.

SUMMARY STAFF RECOMMENDATION

Staff recommends the Board of Supervisors approve the proposed Proffer and Master Plan Amendment, subject to the proposed proffers.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

REZONING-25-0007/MASTER PLAN AMENDMENT-25-0005. 6810 Richmond Road
The Williamsburg Pottery Proffer and Master Plan Amendment
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CHANGES MADE SINCE THE PLANNING COMMISSION MEETING

None.

PROJECT DESCRIPTION

Ms. Dawn Griggs of Thalhimer Realty Partners has applied for a Proffer and Master Plan Amendment to allow for the inclusion of institutional uses on the previously adopted Master Plan. The change is to allow for Coastal Community Church to occupy the existing Building B, the large, central structure on the (future) Parcel A-2, as shown on the attached Master Plan (Attachment No. 5). The property is bordered by Colonial Heritage to the west, the Action Park of Williamsburg to the north, North Carolina Furniture & Mattress to the south, and Industrial Zoned property to the east, across the railroad tracks. Currently, the property is zoned M-1 (Limited Business/Industrial). Churches are defined as a Place of Public Assembly, which is an institutional use in the Zoning Ordinance. The adopted Master Plan and Proffers for the Williamsburg Pottery, do not include institutional uses as an allowable use group. A Proffer and Master Plan Amendment is required to include institutional uses on the Master Plan. The property is designated Mixed Use as shown in the 2045 Comprehensive Plan. The existing building is a vacant former retail structure.

Coastal Community Church's build-out will have a maximum capacity of 1,000 seats with two currently proposed services on Sunday mornings at 9 a.m. and 11 a.m. During the week, there will be small group meetings, bible studies, and office hours.

The southern half of 6810 Richmond Road includes 236 parking spaces. A subdivision of the parcel is proposed that would include 208 parking spaces with the church and 28 parking spaces with the outbuilding near Richmond Road. The church proposes 1,000 seats in the main worship area as well as classrooms and gathering spaces. Staff finds the proposed parcel with 208 parking spaces is adequate for 1,040 seats at a rate of one parking space per five seats. The applicant narrative states that services will take place at 9 a.m. and 11 a.m. and will last just over an hour. Proffer No. 3 requires a 30-minute time gap between events with more than 50 attendees to allow for adequate time for attendees to vacate the parking lot and create space for the next event attendees. Per Proffer No. 6, prior to Certificate of Occupancy, the applicant shall establish a cross access and parking easement for 50 additional parking spaces located on Parcel A2 as well the access to Route 60 as located on the property.

There are no proposed changes to the exterior of the building. Internal renovations are proposed and minor modifications to the parking area will provide additional handicapped parking.

PLANNING AND ZONING HISTORY

- SUP-0015-2001
 - This Special Use Permit (SUP) was approved by the Board of Supervisors on September 25, 2001, to allow for a building replacement located at the Williamsburg Pottery.
- Z-0008-2006, MP-0009-2006, SUP-36-2006
 - This Rezoning, Master Plan, and SUP was approved by the Board of Supervisors on May 8, 2007, to redevelop the property as a retail shopping center of up to 161,000 square feet and to rezone the property to M-1, Limited Business, with Proffers.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

REZONING-25-0007/MASTER PLAN AMENDMENT-25-0005. 6810 Richmond Road
The Williamsburg Pottery Proffer and Master Plan Amendment
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

- Z-0002-2010, MP-0001-2010, SUP-0029-2010
 - This Zoning Amendment, Master Plan Amendment, and SUP were approved by the Board of Supervisors on March 22, 2011, to revise the existing Master Plan and proffers to slightly increase the size of the project, to relocate one of the entrances, revise the associated Traffic Improvement Proffers, and to add corporate offices as a use on the property.
- S-25-0028
 - A subdivision plat is currently under review to subdivide Parcel No. 2430100024 into three separate parcels. Once approved, each building would be located on an individual parcel.

SURROUNDING ZONING AND DEVELOPMENT

	ZONING DESIGNATION	EXISTING LAND USE	FUTURE LAND USE DESIGNATION
NORTH	B-1, General Business/ A-1, General Agricultural	Action Park of Williamsburg/ Agricultural	Mixed Use
SOUTH	M-1, Limited Business/Industrial	Retail Development	Mixed Use
EAST	M-1, Limited Business/Industrial	Industrial Zoned Land	Economic Opportunity
WEST	MU, Mixed Use	Colonial Heritage	Mixed Use

Transportation

The Williamsburg Pottery once operated as a full shopping center consisting of up to 200,000 square feet of commercial and retail space. In the 2010 Rezoning and Master Plan Amendment application, the applicant provided a Traffic Impact Analysis that determined there would be 633 A.M. weekday peak-hour trips and 820 P.M. weekday peak-hour trips generated by the shopping center. The shopping center anticipated 8,996 total weekday daily trips in and out of the site.

The total weekday peak-hour trips for this church are not anticipated to be greater than 100 trips. This section of Richmond Road, from Lightfoot Road to Croaker Road, currently operates as Level of Service (LOS) Low in the P.M. peak period. A LOS Low equates to a LOS of A-C which is an acceptable LOS.

Both entrances to the site are controlled by existing traffic signals and turn lanes that were designed and installed prior to the Certificate of Occupancy for 120,000 square feet of buildings on the property, per SUP-0029-2010 approved by the Board of Supervisors on March 22, 2011. The applicant has provided proffers stating that cross access easements will allow the church to use both signalized Richmond Road intersections.

Proffer No. 5 states that Coastal Community Church will provide “traffic management” services to mitigate any traffic impacts from regular Sunday services and special events, such as Christmas Eve.

The proposed church has proffered (Attachment No. 3) to have a maximum capacity of 1,000 seats and anticipates the majority of its trips to occur on Sundays, which is outside of the A.M. and P.M. weekday peak-hour period. According to the applicant, during the week, only small group meetings would be offered such as bible study and office hours. These meetings typically occur during the middle of the day or in the evenings.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

REZONING-25-0007/MASTER PLAN AMENDMENT-25-0005. 6810 Richmond Road
The Williamsburg Pottery Proffer and Master Plan Amendment
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Per Proffer Condition No. 4, any use of Parcel A-2 as a place of public assembly that shall exceed an aggregate of 250 trips on any weekday that is not a federally recognized holiday shall be limited to occurring between the hours of 9:30 a.m. to 3:30 p.m. and 7 p.m. to 5:30 a.m.

Proffer Condition No. 2 states that there shall be no more than one place of public assembly operated on Parcel A-2 which shall not exceed a seating capacity of 1,000 seats.

The proposed church services anticipate a seating capacity of up to 1,000 and 208 parking spaces. While the application narrative notes the currently proposed services on Sunday mornings would occur at 9 a.m. and 11 a.m., such restrictions on service times are not proffered. The applicant has provided Proffer No. 3 which limits successive use, to require a 30-minute separation in events of 50 people or more to mitigate traffic impacts.

The proposed shared parking location is shown on the Master Plan (Attachment No. 5) as reference only. The shared parking agreement will be approved prior to Certificate of Occupancy.

The Virginia Department of Transportation reviewed this application and did not provide any concerns with the proposal.

Use Group “I - Institutional or Public Uses”

This application proposes to include the use group “I - Institutional or Public Uses” in Building B only. Use Group “I” would allow for the following six additional uses to be permitted by-right in Building B:

- Fire Stations
- Governmental offices
- Libraries
- Non-emergency medical transport
- Places of public assembly
- Post offices

The applicant has provided proffers (Attachment No. 3) to exclude these six additional by-right uses as well as daycares from Building B.

Schools are a specially permitted use and would require approval through the legislative process should one be proposed for this building in the future.

This proposal does not eliminate any by-right use that was previously approved and allowed by the existing Master Plan and within the M-1, Limited Business/Industrial District. The existing Master Plan allows for Use Group “E - Commercial” and Use Group “G - Office uses.” No Use Group changes are proposed for existing Building A or the existing outparcel building.

Existing Proffers

This application amends existing Proffer No. 1 and the Master Plan to allow for institutional land uses (with conditions; see Attachment No. 6) and all other existing proffers will remain in effect.

There is no proposed change or expansion to the existing building. Any future proposal to expand the footprint of the building, would need to be consistent with the Master Plan or through a Master Plan Amendment, depending on the extent of the expansion. Additionally, the existing proffers limit any changes to the façade and require changes to be consistent with the adopted Design Guidelines. Any lighting changes for the property must be reviewed and approved by the Director of Planning.

REZONING-25-0007/MASTER PLAN AMENDMENT-25-0005. 6810 Richmond Road
The Williamsburg Pottery Proffer and Master Plan Amendment
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

Pending Subdivision

The entire property is subject to the existing Master Plan which consists of two parcels; the north parcel which is developed with buildings labeled “A” and “B” on-site, and the small commercial building near the entrance along with all the parking associated with these buildings. The second parcel is developed with a building labeled “C” (North Carolina Furniture Store) and associated parking. There is a pending subdivision application (S-25-0028) which would create three separate parcels on the property for a total of four. All three newly created parcels would still need to operate and exist within the adopted Proffers and Master Plan and be consistent with the design guidelines.

The existing proffers and design guidelines govern the signage that is permissible on the entire property. Ordinarily, individual parcels developed with non-residential uses are permitted to have individual ground signs. In this case the design guidelines limit ground signage to that which exists and is required to be shared by the entire center. Unrelated uses located on outparcels may have their own ground sign. The proposed church use in Building B, and any future uses that may occupy Building A, will utilize the existing monument signs. The outparcel, if utilized for a use which is unrelated to the main building uses, will be permitted to have an additional ground sign. Wall signs are limited in their location on the buildings to a uniform height.

The proposed Master Plan (Attachment No. 5) shows the proposed parcel layout and the associated parking for each building; however, this case is still in review, and the provided layout is tentative.

Should the subdivision be approved, and additional offsite parking be needed for any of the proposed parcels, cross easements and shared parking agreements would be required to allow for offsite parking.

Approval of the proposed subdivision would also require an access easement to allow access to the church property from Richmond Road.

REZONING-25-0007/MASTER PLAN AMENDMENT-25-0005. 6810 Richmond Road
The Williamsburg Pottery Proffer and Master Plan Amendment
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

Impacts/Potentially Unfavorable Conditions	Status <i>(No Mitigation Required/Mitigated/Not Fully Mitigated)</i>	Considerations/Proposed Mitigation of Potentially Unfavorable Conditions
<u>Public Transportation: Vehicular</u>	<u>Mitigated</u>	- The proposal would not exceed 100 peak-hour trips. - Trips will typically occur primarily on Sundays, avoiding peak-hour trips during weekdays. - During the occasional weekday events, approximately 402 trips would be generated based on a 1,000-seat capacity. - The Richmond Road intersections have existing signals, which were designed for a shopping center that generated 8,996 daily weekday trips. The proposed church would generate far fewer than the 8,996 trips generated from the shopping center. - Per Proffer No. 5, Coastal Community Church will provide “parking management” after each use of the public assembly area.
<u>Public Transportation: Bicycle/Pedestrian</u>	<u>No Mitigation Required</u>	- Per the Adopted Regional Bikeways Map and Pedestrian Accommodations Master Plan, a bike lane and sidewalk are required. A bike lane and sidewalk already exist along the frontage of the site. - This location is within walking distance to a Williamsburg Area Transit Authority bus stop.
<u>Public Safety</u>	<u>No Mitigation Required</u>	- Fire Station 1 on Forge Road serves this area of the County and is approximately 3.8 miles from the project site. - A change of use and a change of occupancy for the building is required to allow a church. A code analysis for fire protection and life safety building and fire code requirements will be necessary including reviews for means of egress, additional or revised fire suppression, and alarm systems, etc. This review will be handled through the change of use process with the Building Safety and Permits Division.
<u>Public Schools</u>	<u>No Mitigation Required</u>	- N/A since no residential dwelling units are proposed.
<u>Public Parks and Recreation</u>	<u>No Mitigation Required</u>	- N/A since no residential dwelling units are proposed.
Impacts/Potentially Unfavorable Conditions	Status <i>(No Mitigation Required/Mitigated/Not Fully Mitigated)</i>	Considerations/Proposed Mitigation of Potentially Unfavorable Conditions

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

REZONING-25-0007/MASTER PLAN AMENDMENT-25-0005. 6810 Richmond Road
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<u>Public Libraries and Cultural Centers</u>	<u>No Mitigation Required</u>	- Staff finds that the facility does not generate impacts that require mitigation.
<u>Groundwater and Drinking Water Resources</u>	<u>No Mitigation Required</u>	- The property receives public water and sewer. - James City Service Authority has reviewed this application and has no comments at this time.
<u>Watersheds, Streams, and Reservoirs</u> Project is located in the Skimino Creek watershed.	<u>No Mitigation Required</u>	- The Stormwater and Resource Protection Division has reviewed this application and has no comments at this time.
<u>Military Influence Overlay District</u>	<u>No Mitigation Required</u>	- N/A since the proposal is not within the Military Influence Overlay District.
<u>Cultural/Historic</u>	<u>No Mitigation Required</u>	- The subject property has been previously disturbed and has no known cultural resources on-site.
<u>Nearby and Surrounding Properties</u>	<u>Mitigated</u>	- Existing Proffer No. 5 limits the light pole height to 30 feet. All external lights on the property shall be recessed fixtures with no globe, bulb, or lens extending below the casing or otherwise unshielded by the case so that the light source is visible from the side of the fixture. No glare, defined as 0.1-footcandle or higher, shall extend outside the property lines of the Property unless otherwise approved by the Director of Planning. The owner shall submit a lighting plan to the Director of Planning for review and approval for consistency with this proffer prior to final site plan approval. - A shared parking agreement is proposed in the proffers, thereby providing for cross access easements, access to both signalized intersections on Richmond Road, and providing 50 additional parking spaces, above and beyond that currently shown on Parcel A-2.
Impacts/Potentially Unfavorable Conditions	Status (No Mitigation Required/Mitigated/Not Fully Mitigated)	- Considerations/Proposed Mitigation of Potentially Unfavorable Conditions

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

REZONING-25-0007/MASTER PLAN AMENDMENT-25-0005. 6810 Richmond Road
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<u>Community Character</u> The proposal is located along the Richmond Road Community Character Corridor (CCC).	<u>No Mitigation Required</u>	- Per existing Proffer No. 6, there shall be a variable width CCC buffer with a minimum average width of 37 feet and a minimum width of 20 feet along the Route 60 frontage of the property generally as shown on the approved Master Plan.
<u>Covenants and Restrictions</u>	<u>No Mitigation Required</u>	- The applicant has verified that she is not aware of any covenants or restrictions on the properties that prohibit the proposed use.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

REZONING-25-0007/MASTER PLAN AMENDMENT-25-0005. 6810 Richmond Road
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COMPREHENSIVE PLAN

The site is designated Mixed Use on the Comprehensive Plan Land Use Map.

Mixed Use Developments should refer to the Residential and Commercial/Industrial development Standards. These standards pertain to 1) compatibility; 2) public services; utilities, adequacy of infrastructure; 3) environmental protection; and 4) transportation.

- *The proposal meets these standards by locating a place of public assembly in existing commercial developments. There will be no impact to public services, utilities, infrastructure, or existing environmental protections. Furthermore, the project will utilize existing traffic improvements such as turn lanes and signals.*

According to the 2045 Comprehensive Plan, Promotion of Infill and Redevelopment, “Infill development initiatives are important for residential, commercial, and mixed-use developments to help with the creation of complete communities close to existing amenities and activities, and to help direct development to appropriate locations within the PSA.”

- *The proposed church will occupy an existing building on the Williamsburg Pottery site that has been underutilized for a number of years. Using this existing space will create a more complete community within the PSA. There is existing infrastructure available that mitigates traffic impacts associated with uses of a greater intensity than is proposed and no additional impervious area is proposed.*
 - Goal LU 4 in the 2045 Comprehensive Plan states a goal for the county is to “direct growth into designated growth areas in an efficient and low impact manner”.

- LU 4.7 states the county should “Facilitate the development of sub-area/corridor master plans for strategic areas such as the County’s interstate interchanges, Economic Opportunity Designations, and Mixed-Use Designations/Urban Development Areas.”
- *The proposed church will be in a Mixed-Use area of the Williamsburg Pottery and adjacent to existing developments such as Colonial Heritage.*

PROPOSED PROFFERS

The full text of the proposed proffers is provided in Attachment No. 3.

STAFF RECOMMENDATION

Staff finds the proposed Rezoning and Master Plan Amendment to be compatible with surrounding development and is consistent with the recommendations of the Comprehensive Plan and the Zoning Ordinance.

Staff recommends the Board of Supervisors approve the proposed Proffer and Master Plan Amendment, subject to the proposed proffers.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

REZONING-25-0007/MASTER PLAN AMENDMENT-25-0005. 6810 Richmond Road
The Williamsburg Pottery Proffer and Master Plan Amendment
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

KS/ap
RZ25-7_MP25-5-6810RichRd

Attachments:

1. Ordinance
2. Location Map
3. Proposed Proffers
4. Project Narrative
5. Proposed Master Plan
6. Approved Proffers Z-0002-2010
7. Approved Master Plan Z-0002-2010
8. Unapproved Minutes of the December 3, 2025, Planning Commission Regular Meeting

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

ORDINANCE NO. _____

AN ORDINANCE TO AMEND EXISTING PROFFERS RECORDED AS INSTRUMENT NOS. 070016264 AND 110009765, APPROVED AS PART OF Z-0008, 2006, MP-0009-2006, SUP-0036-2006 AND Z-0002-2010, MP-0001-2010, SUP-0029-2010, TO AMEND THE MASTER PLAN AND PROFFERS TO INCLUDE INSTITUTIONAL USES AND AS DESCRIBED IN CASE NO. Z-25-0007.

WHEREAS, on May 8, 2007, the Board of Supervisors approved Case Nos. Z-0008-2006, MP-0009-2006, and SUP-0036-2006 which included Proffers and a Master Plan that allowed the development of a retail shopping center by rezoning the property to M-1, Limited Business/Industrial on parcels located at 6810 and 6710 Richmond Road, James City County, Virginia, and further identified as James City County Real Estate Tax Map Parcel Nos. 2430100024A and 2430100024B, respectively (collectively, the “Property”); and

WHEREAS, on March 22, 2011, the Board of Supervisors approved Case Nos. Z-0002-2010, MP-0001-2010, and SUP-0029-2010 which included Proffers and Master Plan Amendments to increase the size of the commercial development and relocate the entrances on parcels on the Property; and

WHEREAS, Ms. Dawn Griggs of Thalhimer Realty Partners has applied for an amendment to the existing proffers on behalf of the owners, Williamsburg Pottery and Coastal Community Church, to revise the Master Plan and Proffers to include institutional uses; and

WHEREAS, the Planning Commission, following its public hearing on December 3, 2025, recommended approval of Case Nos. MP-25-0005 and Z-25-0007 by a vote of 6-0; and

WHEREAS, the Board of Supervisors of James City County, Virginia, finds Case Nos. MP-25-0005 and Z-25-0007 to be required by public necessity, convenience, general welfare, and good zoning practice.

NOW, THEREFORE, BE IT ORDAINED by the Board of Supervisors of James City County, Virginia, that Case Nos. MP-25-0005 and Z-25-0007 is hereby approved as described therein and the amended voluntary proffers are accepted.

????????

Chair, Board of Supervisors

ATTEST:

VOTES

AYE

NAY

ABSTAIN

ABSENT

WAINWRIGHT

NULL

LARSON

MCGLENNON

ICENHOUR

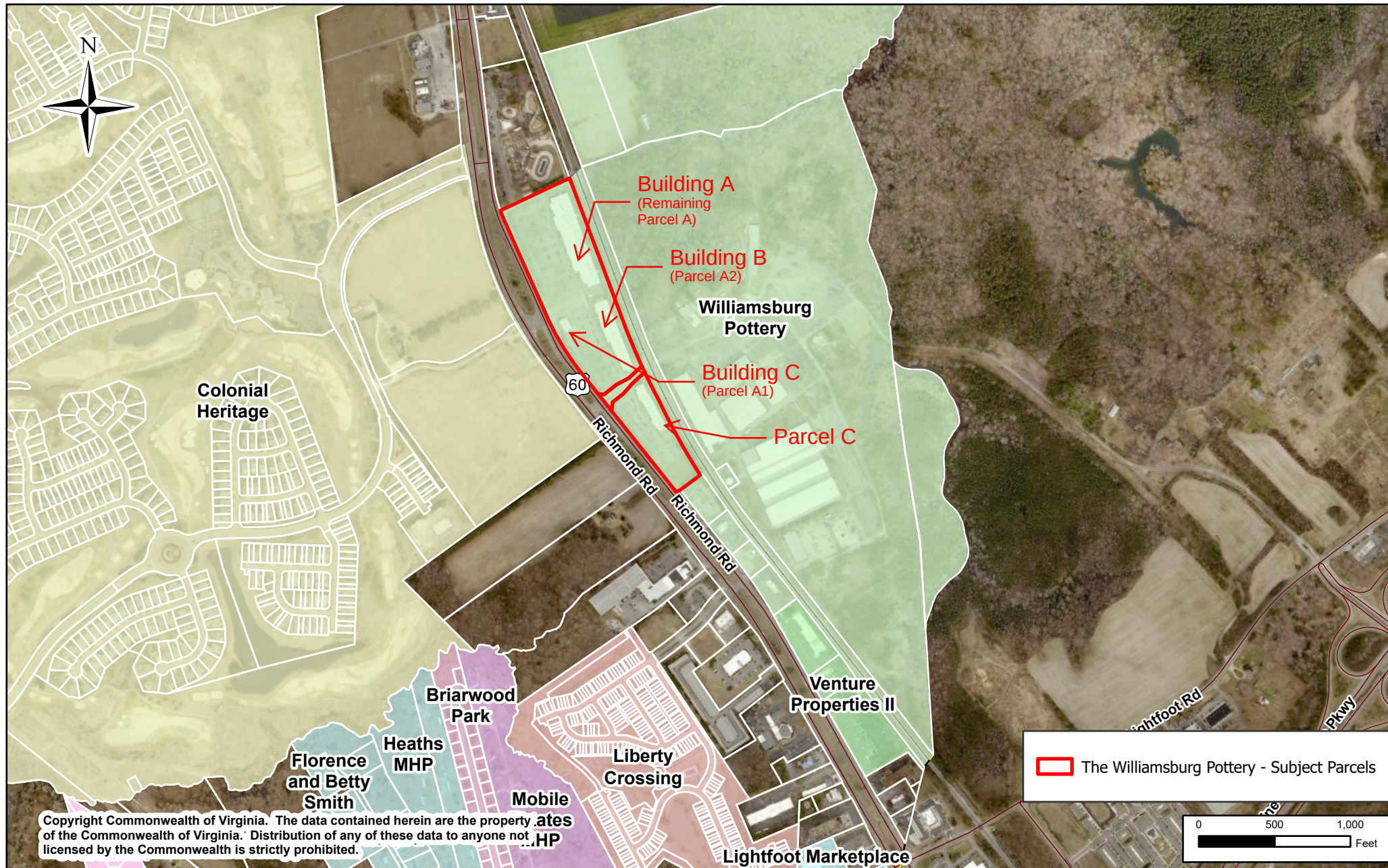
Teresa J. Saeed
Deputy Clerk to the Board

Adopted by the Board of Supervisors of James City County, Virginia, this 13th day of
January, 2026.

RZ25-7_MP25-5-6810RichRd-ord

Z-25-0007/MP-25-0005

6810 Richmond Road The Williamsburg Pottery Master Plan and Proffer Amendment



Tax Parcel Numbers. 2430100024A and 2430100024B

AMENDED PROFFERS

THESE AMENDED PROFFERS ("Proffers") are made this 12th day of November, 2025, by and between the WILLIAMSBURG POTTERY PROPERTIES, LLC, a Virginia limited liability company (collectively, together with their successors in title to the Property, the "Owner") (to be indexed as grantor); COASTAL COMMUNITY CHURCH, a Virginia nonstock corporation ("Purchaser") (to be indexed as grantor), and THE COUNTY OF JAMES CITY, VIRGINIA, a political subdivision of the Commonwealth of Virginia ("County") (to be indexed as grantee), provides as follows:

RECITALS

A. Owner is the owner of certain real property located in James City County, Virginia, being more particularly described on Exhibit A attached hereto and made a part hereof (the "Property"). Purchaser is the contract purchaser of a portion of the Property ("Parcel A2") being more particularly shown as "PARCEL A2" on the Amended Master Plan (hereinafter defined).

B. The Property is currently zoned M-1 and is subject to (i) Proffers dated January 28, 2011 and recorded in the James City County Circuit Court Clerk's Office as Instrument No. 110009765 (the "Existing Proffers") and (ii) a master plan entitled "Master Plan and Rezoning Amendment for the Williamsburg Pottery for the Williamsburg Pottery Factory Inc", dated, January 27, 2011, prepared by AES Consulting Engineers (the "Existing Master Plan").\

C. Purchaser desires to utilize Parcel A2 as a place of public assembly.

D. Owner and Purchaser (collectively, the "Applicant") have applied to the County to amend the Existing Proffers and to amend the Existing Master Plan (collectively, the "Application"). In connection with the Application, the Applicant has submitted to the County an amended master plan entitled "Master Plan Amendment Williamsburg Pottery, Coastal Church", dated September 5, 2025, (the "Amended Master Plan") for Parcel A2 in accordance with the County Zoning Ordinance.

E. Applicant desires to amend the Existing Proffers as more particularly set forth herein.

F. The County constitutes a high-growth locality as defined by Section 15.2-2298 of the Code of Virginia, as amended (the "Virginia Code").

G. The provisions of the Zoning Ordinance, Section 24-1, et seq., may be deemed inadequate for protecting and enhancing orderly development of the Property. Accordingly, Owner, in furtherance of the Application, desires to proffer certain conditions in addition to the regulations provided for by the Zoning Ordinance for the protection and enhancement of the development of the Property, in accordance with the provisions of Sections 15.2-2303 and 15.2-2303.4(D)(1) of the Virginia Code, Ordinance Number 31A-346 adopted by the James City County Board of Supervisors on October 8, 2019 and Sec 24-16 of the Zoning Ordinance.

NOW, THEREFORE, for and in consideration of the approval by the Board of Supervisors of the County of the Application, and pursuant to Sections 15.2-2303 and 15.2-2303.4(D)(1) of the Virginia Code, and Section 24-16 of the Zoning Ordinance, it is agreed that all of the following conditions shall be met and

satisfied in connection with the use of the Property, which shall amend the Existing Proffers as set forth below.

PROFFERS

1. **Amended Master Plan.** The Existing Master Plan is hereby amended as to Parcel A2 which shall be developed and utilized generally as shown on the Amended Master Plan with only changes thereto that the County or its duly authorized designee determines do not alter the basic concept or character of the development in accordance with Section 24-23(a)(2)(f) of the Zoning Ordinance in effect on the date hereof; provided, however, such development shall be expressly subject to such changes in configuration, composition and location as required by all other governmental authorities having jurisdiction over such development.
2. **Seating Capacity.** There shall be no more than one place of public assembly operated on Parcel A2 which shall not exceed a seating capacity of 1,000 seats.
3. **Limitation on Successive Use.** In the event of any use of the primary assembly area within the place of public assembly on Parcel A2 that exceeds 50 persons (a "Material Sanctuary Use"), there shall be no subsequent Material Sanctuary Use for a period of at least 30 minutes following the conclusion of the preceding Material Sanctuary Use.
4. **Limitations on Weekday Use.** Any uses of Parcel A2 as a place of public assembly which, in the aggregate, exceed 250 vehicle trips in an hour (collectively, a "Material Place of Public Assembly Use") on any weekday (i.e., Monday through Friday) that is not a federally recognized holiday shall be limited to occurring between the hours of 9:30 a.m. to 3:30 p.m. and 7:00 p.m. to 5:30 a.m.
5. **Parking Management.** During the thirty minutes prior to a Material Place of Public Assembly Use, the Applicant shall provide parking management consisting of at least two persons directing the flow of traffic and parking on the Property in an effort to reduce the potential for back-up of vehicles on Rt. 60.
6. **Cross Access and Parking Easement.** Prior to issuance of a Certificate of Occupancy for a place of public assembly on Parcel A2, the Applicant shall establish of record in the County Circuit Court Clerk's Office an agreement in a form and content satisfactory to the County Attorney, which provides, at a minimum, that the owner of Parcel A2, its occupants and invitees, shall have the non-exclusive right to utilize (a) all of the accesses to Rt. 60 located on the Property, (b) all of the open drive aisles on the Property as the same may exist from time to time, and (c) 50 parking spaces in addition to those located on Parcel A2.
7. **Prohibited Uses.** The following uses shall be prohibited on Parcel A2:
 - a. Post Offices;
 - b. Nonemergency Medical Transport;
 - c. Libraries;
 - d. Fire Stations;
 - e. Governmental Offices; and
 - f. Child day care centers.
8. **Headings.** All section headings and subheadings of these Proffers are for convenience only and shall not be read as a part of these Proffers or utilized in interpretation thereof.
9. **Delegation of Subsequent Approvals.** The County Board of Supervisors by accepting these Proffers is exercising its legislative function. While these Proffers provide for subsequent approvals by the County or by its duly authorized designees appointed by the County, such subsequent approvals by

any duly authorized designee of the County shall not include the exercise of any legislative function.

10. **Severability.** In the event that any clause, sentence, paragraph, section or subsection of these Proffers shall be adjudged by any court of competent jurisdiction to be invalid or unenforceable for any reason, including a declaration that it is contrary to the Constitution of the Commonwealth of Virginia or of the United States, or if the application thereof to any owner of any portion of the Property or to any government agency is held invalid, such judgment or holding shall be confined in its operation to the clause, sentence, paragraph, section or subsection hereof, or the specific application thereof directly involved in the controversy in which the judgment or holding shall have been rendered or made, and shall not in any way affect the validity of any other clause, sentence, paragraph, section or provision hereof.

11. **Successors and Assigns.** These Proffers shall be binding upon and shall inure to the benefit of the parties hereto, and their respective heirs, successors and/or assigns; provided, however once a party ceases to own any portion of the Property, such party shall have no continuing liability hereunder.

12. **Void if Application Not Approved.** In the event that any component of the Application is not approved by the County as submitted or is overturned by subsequent judicial determination, these Proffers shall be null and void.

13. **Reasonable Proffers.** The Owner, as evidenced by its signature below, deems these Proffers to be reasonable and appropriate.

14. **Existing Proffers.** Except as modified herein, the Existing Proffers shall remain in full force and effect. In the event of any conflict between the provisions of these Proffers and the Existing Proffers, the provisions of these Proffers shall prevail.

[Signatures located on subsequent pages]

[Signature page to Amended Proffers]

Witness the following signatures.

Coastal Community Church

By: Shawn Brown

Name: [Signature]

Title: President

COMMONWEALTH OF VIRGINIA

CITY/COUNTY OF Yorktown, to wit:

The foregoing instrument was acknowledged before me this 20th day of November 2025, by Shawn Brown President of Coastal Community Church.

Rachel Ann Kline
Notary Public

My commission expires: 05/31/2028

Registration No.: 00285938



County/City of Yorktown
Commonwealth/State of Virginia
The foregoing instrument was subscribed and
sworn before me this 20th day of November
2025 by Shawn Brown
(name of person seeking acknowledgement)
Rachel Ann Kline
Notary Public
My Commission Expires: 05/31/2028

[Signature page to Amended Proffers]

Williamsburg Pottery Properties, LLC

By: [Signature]

Name: PETER KAO

Title: CEO

COMMONWEALTH OF VIRGINIA

CITY/COUNTY OF James City to wit:

The foregoing instrument was acknowledged before me this 24th day of November 2025, by Peter Kao as CEO of Williamsburg Pottery Properties, LLC.

[Signature]
Notary Public

My commission expires: 10/31/2026

Registration No.: 7792057

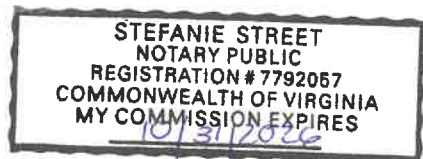


EXHIBIT A

All those certain pieces or parcels of land lying, being, and situate in the Stonehouse Magisterial District of James City County, Virginia, shown and designated as "PARCEL 'A' 610,360 S.F. 14.012 AC." and "PARCEL 'B' 21,059 S.F. 0.483 AC." on that certain plat entitled "PLAT OF SUBDIVISION AND RIGHT OF WAY DEDICATION WILLIAMSBURG POTTERY PROPERTIES, LLC. TO VIRGINIA DEPARTMENT OF TRANSPORTATION", dated February 13, 2012, prepared by AES Consulting Engineers, and recorded in the James City County Circuit Court Clerk's Office as Instrument Number 120007012.



To James City County Planning Division,

In accordance with our submission request for zoning (proffers) and Pottery Master Plan amendment, please find the below narrative on the proposed use of the property.

NARRATIVE:

Coastal Church has been a longstanding pillar in the Hampton Roads community for almost twenty-five years. With over 3,000 weekly attenders, 7 campuses, and long-tenured senior leadership, Coastal is well positioned for further growth and community service in the years ahead. Coastal has a history of turning commercial spaces into worship facilities – in 2017, they completed a multi-million-dollar capital project, purchasing and converting the 55 thousand square foot Kroger building on Victory Blvd. in Yorktown into a facility that holds over 1,700 people on a weekly basis.

In 2023, Coastal launched a Williamsburg campus that has since grown to over 500 regular attendees and is looking for a permanent home in the community. Williamsburg Pottery (building B) is a good candidate for that permanent home, and the church has an agreed upon a contract, with the hopes of closing by the end of this calendar year. Therefore, we are happy to begin the rezoning (proffers) and Change to The Pottery Master Plan to allow Church (Assembly) "USE." The church has already been pre-approved for the purchase (Prism Bank) and depending on county timing, would begin renovations in the new year, with a planned opening in December of 2026.

As of this writing, Coastal currently holds two Sunday morning services – a 9am service, and an 11am service. Within the service times, Sunday School will be offered to the children of the parishioners (there will be no school operated from the premises at all). These services (which each run a little over an hour) are intentionally spaced out to both minimize traffic and parking congestion, as well as to give ample time for the auditorium and kids spaces to clear out and change over. This would remain the goal at the Pottery – therefore, even if the church grows to three services over time, there wouldn't be overflow or parking concerns, given that only a half to a third of the total congregation would be gathering in the building at any given time.

Furthermore, to manage future growth Coastal does not want bigger buildings in one location, but to help revitalize hurting or dying churches or to plant a new campus in a new location. We want to send our members to all communities and not just stay in one area.

Coastal is a relationally driven church, Sunday morning focused church, which means that their only large gatherings happen on Sunday mornings. Throughout the week, there would be scattered small groups meeting in the building (10-30 people), staff holding office hours (5-10 people) and the occasional volunteers coming in and out.

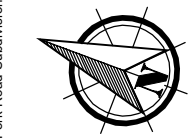
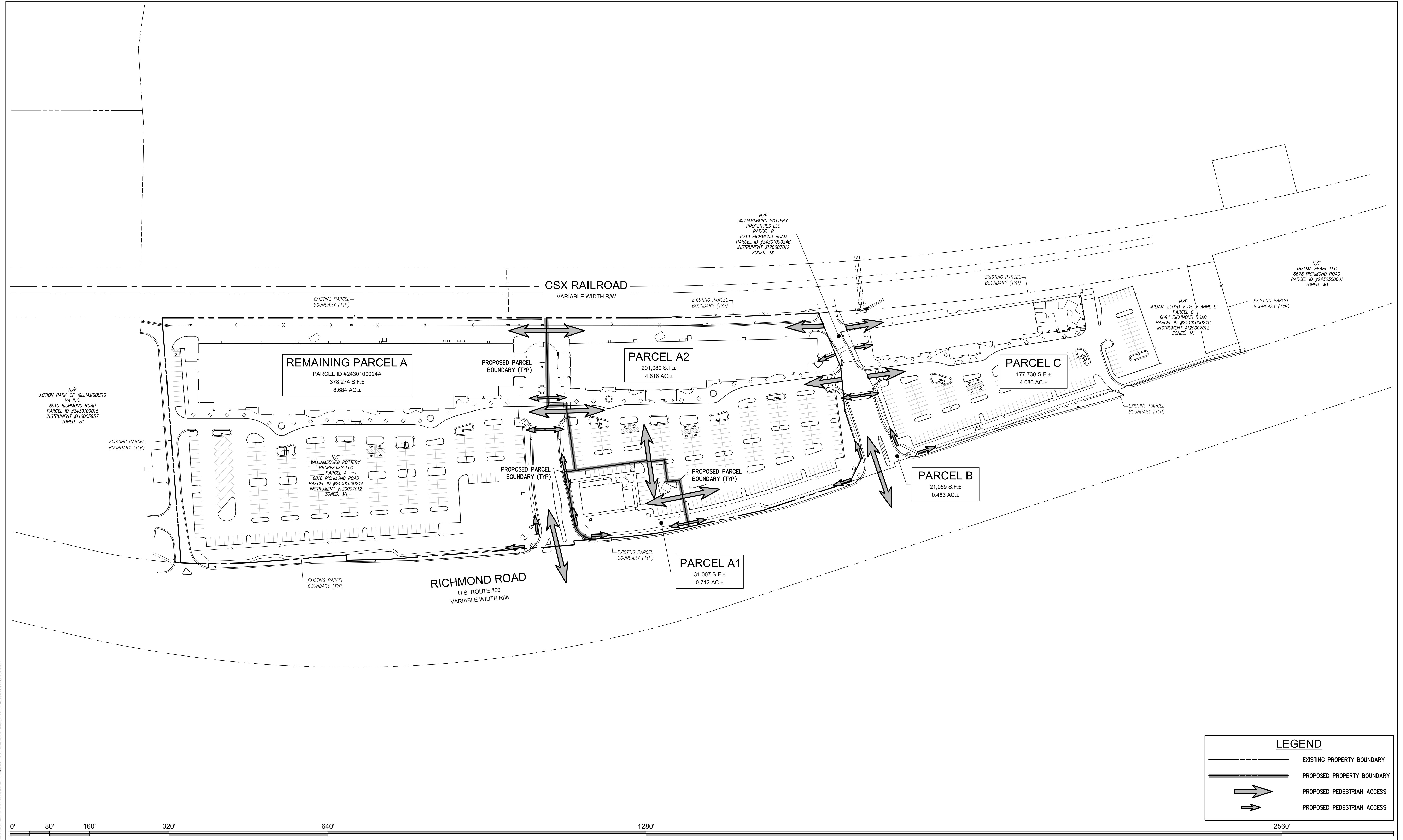
The church has a history of sending people out into the community to be good and active citizens, rather than filling its members' calendars with events at the building. The only large gathering during the week throughout the year would be annual Christmas Eve services. We would mitigate this challenge by hiring traffic management at every Christmas Eve service and any rare event like a funeral that could take place during the week, but we would also pick times that would not be during the rush hour in the mornings or evening times.

Coastal has no plans to paint the exterior of the building, or "enclose" the covered area on the west side of the building. Apart from small, county-approved signage, awning repairs/removal and power washing, the church has no plans to alter the exterior of the space.

Above all, Coastal plans to be a good neighbor to the citizens of James City County. The church is already actively involved in helping provide food to lower income individuals through local non-profits, holding backpack and school supply drives to benefit JCC students and teachers, and teaching English to non-native speakers. Coastal has a history of making a positive impact on its community and hopes to become a long-standing pillar in James City County through the revitalization and renewal of the Pottery space.

Thank you for your attention to this matter,

Coastal Community Church



DATE: OCTOBER 16, 2025
SCALE: 1"=80'

SHEET 1 of 2

MASTER PLAN AMENDMENT
WILLIAMSBURG POTTERY, COASTAL CHURCH
JAMES CITY COUNTY, VIRGINIA
(AES PROJECT #: W10671-05 - AES PROJECT CONTACT: ADAM REIMERT, P.E.)

LEGEND

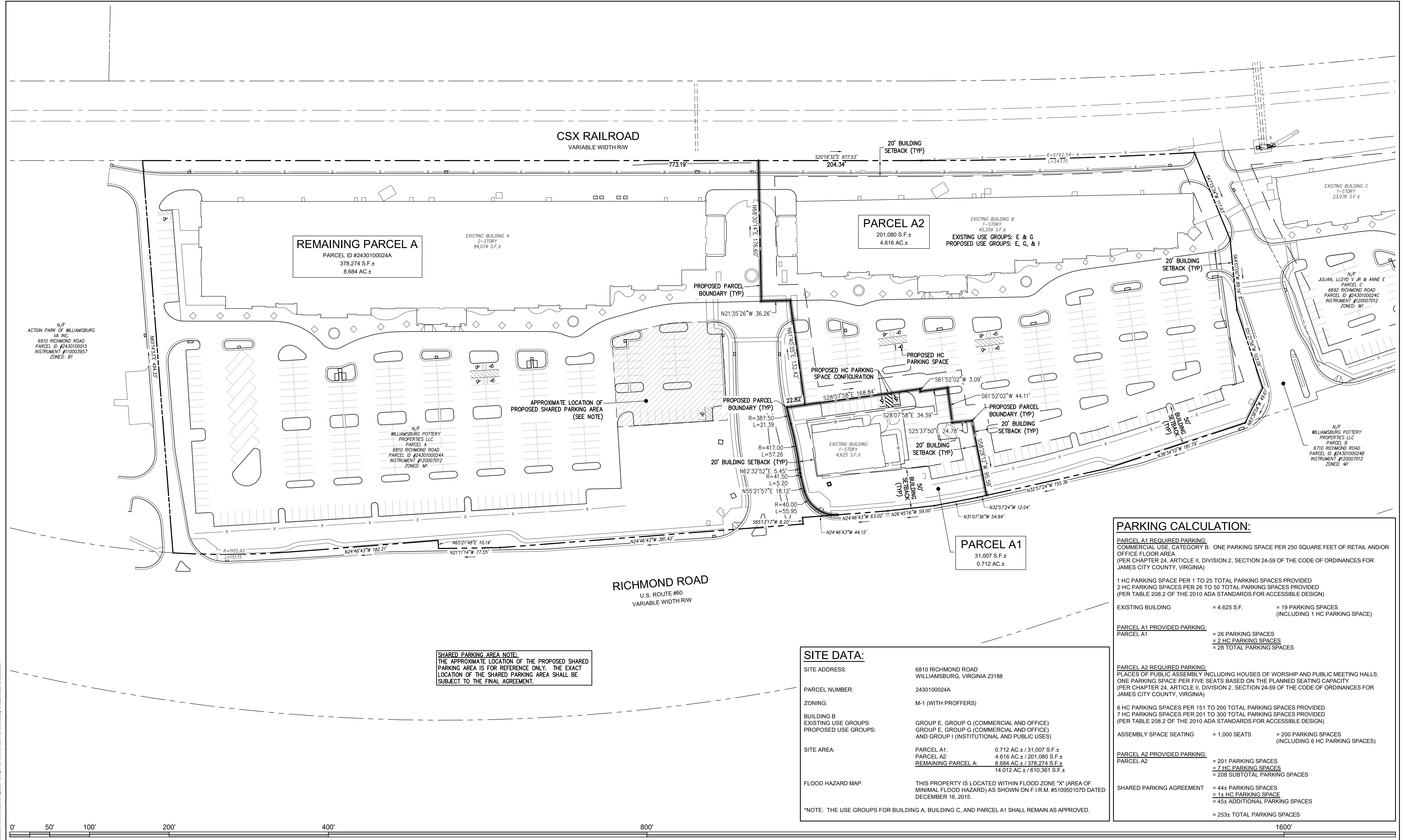
EXISTING PROPERTY BOUNDARY

PROPOSED PROPERTY BOUNDARY

AES

CONSULTING ENGINEERS

5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
Phone: (757) 255-0040
Fax: (757) 220-8994
www.aesva.com
Hampton Roads | Central Virginia | Middle Peninsula



PARKING CALCULATION:			
PARCEL A1 REQUIRED PARKING: COMMERCIAL USE, CATEGORY B: ONE PARKING SPACE PER 250 SQUARE FEET OF RETAIL AND/OR OFFICE FLOOR AREA (PER CHAPTER 24, ARTICLE II, DIVISION 2, SECTION 24-59 OF THE CODE OF ORDINANCES FOR JAMES CITY COUNTY, VIRGINIA)			
1 HC PARKING SPACE PER 1 TO 25 TOTAL PARKING SPACES PROVIDED 2 HC PARKING SPACES PER 26 TO 50 TOTAL PARKING SPACES PROVIDED (PER TABLE 208.2 OF THE 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN)			
EXISTING BUILDING	= 4,625 S.F.	= 19 PARKING SPACES (INCLUDING 1 HC PARKING SPACE)	
PARCEL A1 PROVIDED PARKING:			
PARCEL A1	= 26 PARKING SPACES = 2 HC PARKING SPACES = 28 TOTAL PARKING SPACES		
PARCEL A2 REQUIRED PARKING: PLACES OF PUBLIC ASSEMBLY INCLUDING HOUSES OF WORSHIP AND PUBLIC MEETING HALLS: ONE PARKING SPACE PER FIVE SEATS BASED ON THE PLANNED SEATING CAPACITY (PER CHAPTER 24, ARTICLE II, DIVISION 2, SECTION 24-59 OF THE CODE OF ORDINANCES FOR JAMES CITY COUNTY, VIRGINIA)			
6 HC PARKING SPACES PER 151 TO 200 TOTAL PARKING SPACES PROVIDED 7 HC PARKING SPACES PER 201 TO 300 TOTAL PARKING SPACES PROVIDED (PER TABLE 208.2 OF THE 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN)			
ASSEMBLY SPACE SEATING	= 1,000 SEATS	= 200 PARKING SPACES (INCLUDING 6 HC PARKING SPACES)	
PARCEL A2 PROVIDED PARKING:			
PARCEL A2	= 201 PARKING SPACES = 7 HC PARKING SPACES = 208 SUBTOTAL PARKING SPACES		
SHARED PARKING AGREEMENT			
	= 44± PARKING SPACES = 1± HC PARKING SPACE = 45± ADDITIONAL PARKING SPACES = 253± TOTAL PARKING SPACES		

SITE DATA:	
SITE ADDRESS:	6810 RICHMOND ROAD WILLIAMSBURG, VIRGINIA 23188
PARCEL NUMBER:	2430100024A
ZONING:	M-1 (WITH PROFFERS)
BUILDING B EXISTING USE GROUPS: PROPOSED USE GROUPS:	GROUP E, GROUP G (COMMERCIAL AND OFFICE) GROUP E, GROUP G (COMMERCIAL AND OFFICE) AND GROUP I (INSTITUTIONAL AND PUBLIC USES)
SITE AREA:	PARCEL A1: 0.712 AC. ± / 31,007 S.F. ± PARCEL A2: 4.616 AC. ± / 201,080 S.F. ± REMAINING PARCEL A: 8.684 AC. ± / 378,274 S.F. ± 14.012 AC. ± / 610,361 S.F. ±
FLOOD HAZARD MAP:	THIS PROPERTY IS LOCATED WITHIN FLOOD ZONE "X" (AREA OF MINIMAL FLOOD HAZARD) AS SHOWN ON F.I.R.M. #510950107D DATED DECEMBER 16, 2015.
*NOTE: THE USE GROUPS FOR BUILDING A, BUILDING C, AND PARCEL A1 SHALL REMAIN AS APPROVED.	

MASTER PLAN AMENDMENT

WILLIAMSBURG POTTERY, COASTAL CHURCH

JAMES CITY COUNTY, VIRGINIA

(AES PROJECT #: W10671-05 - AES PROJECT CONTACT: ADAM REIMERT, P.E.)

070016264

PROFFERS

THESE PROFFERS are made this 11 day of March, 2007 by WILLIAMSBURG POTTERY FACTORY, INC., a Virginia corporation (together with its successors and assigns, the "Owner").

RECITALS

A. Owner is the owner of a tract or parcel of land located in James City County, Virginia, with an address of 6692 Richmond Road, Williamsburg, Virginia, being Tax Parcel 2430100024, and containing 18.9± acres, being more particularly described on Exhibit A attached hereto (the "Property"). The Property is now zoned A-1 and M-1.

B. Owner has applied to rezone the Property from A-1 and M-1 to M-1, with proffers, and for a special use permit to construct a shopping center on the Property.

C. Owner has submitted to the County a master plan entitled "Rezoning and Special Use Permit for the Promenade at the Williamsburg Pottery for the Williamsburg Pottery Factory Inc", prepared by AES Consulting Engineers dated November 29, 2006, and revised January 25, 2007, (the "Master Plan") for the Property in accordance with the County Zoning Ordinance.

E. Owner desires to offer to the County certain conditions on the development of the Property not generally applicable to land zoned M-1.

NOW, THEREFORE, for and in consideration of the approval of the requested rezoning, and pursuant to Section 15.2-2298 of the Code of Virginia, 1950, as amended, and the County Zoning Ordinance, Owner agrees that it shall meet and comply with all of the following conditions in developing the Property. If the requested rezoning is not granted by the County, these Proffers shall be null and void.

CONDITIONS

1. **Master Plan.** The Property shall be redeveloped generally as shown on the Master Plan, with only minor changes thereto that the Development Review Committee determines do not change the basic concept or character of the development.

2. **Water Conservation.** The Owner shall be responsible for developing water conservation standards to be submitted to and approved by the James City Service Authority and subsequently for enforcing these standards. The standards shall address such water conservation measures as limitations on the installation and use of irrigation systems and irrigation wells, the use of approved landscaping materials and the use of water conserving fixtures and appliances to promote water conservation and minimize the use of public water resources. Irrigation wells shall only draw water from the Upper Potomac or Aquia Aquifers and shall be subject to the approval of the General Manager of James City Service Authority. The standards shall be approved by the James City Service Authority prior to final site plan approval.

4. **Road Improvements/Entrances.** (a) The entrance into Parcel 3 of the Property shall be located at the approximate location shown on the Master Plan as "Relocated Signalized Crossover" and the location shall be shown on the site plan for the Property and subject to the approval of the Director of Planning and the Virginia Department of Transportation ("VDOT"). When the entrance is relocated, the existing entrance shall be closed and the existing crossover labeled on the Master Plan as "Signalized Crossover to be Relocated" shall be closed within 30 days of the completion of the new entrance. At the entrance (i) an eastbound left turn lane with 200 feet of

storage and a 200 foot taper; (ii) a westbound left turn lane with 200 feet of storage and a 200 foot taper and (iii) a westbound right turn lane with 150 feet of storage and a 200 foot taper shall be constructed and a new traffic signal shall be installed. Three egress lanes with at least 100 feet of storage consisting of two dedicated left turn lanes and one dedicated right turn lane shall be constructed at this entrance. Construction of these improvements shall be completed or bonded in form satisfactory to the County Attorney prior to the County being obligated to issue building permits for any building in the phase of the development served by this entrance.

(b) Owner shall install a right in, right out entrance to the Property from Route 60 on Parcel 2 of the Property in the approximate location shown on the Master Plan connecting to the existing Pottery access road. When this entrance is installed, a westbound right turn lane from Route 60 into this entrance with 150 feet of storage and a 200 foot taper shall be constructed. One egress lane and one ingress lane with a raised channelizing island shall be constructed at this entrance. Construction shall be completed or bonded in form satisfactory to the County Attorney prior to the County being obligated to issue building permits for any building in the phase of the development served by this entrance.

(c) Owner shall install a new entrance from Route 60 into Parcel 1 of the Property at the Colonial Heritage east crossover in the approximate location shown on the Master Plan as "Proposed Traffic Signal at Crossover per Colonial Heritage Rezoning Conditions". When this entrance is constructed, a westbound right turn lane with 150 feet of storage and a 200 foot taper and an eastbound left turn lane shall be constructed. Three egress lanes with 200 feet of storage consisting of two dedicated left turn lanes and

one dedicated right turn lane and one ingress lane shall be constructed at this entrance. Owner shall be responsible for and shall pay the costs of any necessary modifications to the traffic signal proffered for this intersection by Colonial Heritage so the signal will serve this entrance to and from the Property. At such time as a traffic signal is installed at this intersection and subject to VDOT approval, Owner shall install or pay the costs of installation of crosswalks, median refuge islands, signage and pedestrian signal heads at the intersection. Construction shall be completed or bonded in form satisfactory to the County Attorney prior to the County being obligated to issue building permits for any building in the phase of the development served by this entrance.

(e) Owner shall construct a right in, right out only entrance from Parcel 1 of the Property onto westbound Route 60 at the western end of the Property in the approximate location shown on the Master Plan. When this entrance is constructed, a westbound right turn lane with 150 feet of storage and a 200 foot taper shall be constructed. Construction shall be completed or bonded in form satisfactory to the County Attorney prior to the County being obligated to issue building permits for any building in the phase of the development served by this entrance.

(f) The turn lanes and entrances, crosswalks, median refuge islands, signage and pedestrian signal heads proffered hereby shall be constructed in accordance with VDOT standards and shall be approved by VDOT.

(g) The right turn lanes and entrances proffered hereby shall include four foot shoulder bike lanes.

(f) Prior to the County being obligated to issue building permits for more than 115,000 square feet of buildings on the Property, Owner shall conduct a traffic signal

warrant study at the entrance from Route 60 into Parcel 2 of the Property at the Colonial Heritage east crossover in the approximate location shown on the Master Plan as “Proposed Traffic Signal at Crossover per Colonial Heritage Rezoning Conditions” and submit the study to the County and VDOT for their review and approval.

(g) At the time of site plan submittal, Owner shall submit to the County a traffic study of the Saturday peak hour traffic at the Property for the review and approval of the Director of Planning and shall incorporate any modifications to the improvements proffered in this Section that the study indicates are required.

(h) After approval of the first final site plan for the redevelopment of the Property and within 30 days of a request from VDOT, Owner shall pay to VDOT a pro rata share (based on 1.5 signals divided by the total number of signals included in the project) of any VDOT Route 60 signal coordination project that includes the signalized intersections at entrances into the Property. The costs of the signal coordination project may include traffic signal equipment and utility relocation within the existing right of way and easements to accommodate traffic signal equipment, but will not include any right of way acquisition expenses or road construction changes.

5. Lighting. All light poles on the Property shall not exceed 30 feet in height. All external lights on the Property shall be recessed fixtures with no globe, bulb or lens extending below the casing or otherwise unshielded by the case so that the light source is visible from the side of the fixture. No glare defined as 0.1 footcandle or higher shall extend outside the property lines of the Property unless otherwise approved by the Director of Planning. Owner shall submit a lighting plan to the Director of Planning for review and approval for consistency with this Proffer prior to final site plan approval.

6. Route 60 Buffer. There shall be a variable width community character corridor buffer with a minimum average width of 37 feet and a minimum width of 20 feet along the Route 60 frontage of the Property generally as shown on the Master Plan. The buffer shall contain enhanced (defined as 125% of Ordinance size requirements) landscaping as shown on the Conceptual Landscape Plan for Route 60 Buffer made by AES Consulting Engineers dated March 19, 2007 submitted herewith and on file with the County Planning Department and a fence at least 42 inches in height approved by the Director of Planning. The fence shall also be installed along both sides of the entrance located on Parcel 1. A detailed landscape plan for the entire buffer shall be submitted to the Director of Planning with the initial site plan for development on the Property for his review and approval for consistency with this proffer. The buffer shall be planted or the planting bonded in a form satisfactory to the County Attorney prior to the County being obligated to issue building permits for buildings located on the Property.

7. Environmental. (a) Stormwater from the Property will be directed away from the Yarmouth Creek watershed to reduce existing negative impacts to that watershed; provided, however, drainage from the community character corridor buffer area adjacent to the VDOT right-of-way and up to 15,000 square feet of impervious cover associated with entrances, sidewalks or similar features may drain to the VDOT right-of-way and thus will continue to drain to the Yarmouth Creek watershed.

(b) Owner shall upgrade the existing farm pond shown on the Master Plan as "Proposed Regional SWM Facility for the Williamsburg Pottery Factory Complex" to County standards to function as a Group A wet pond generally consistent with the provisions contained in the James City County Guidelines for the Design and

Construction of Stormwater Management BMP's, including any necessary channel improvements leading into the pond or bond the upgrade in form satisfactory to the County Attorney prior to the County being obligated to issue any building permits for building on the Property . The pond shall receive the redirected stormwater flows from the Property in addition to the existing flows from the Williamsburg Pottery Factory complex.

(c) Owner shall install six standard size tree box filters capable of treating stormwater from approximately one and one-half acres of impervious cover in the parking lots on the Property.

8. Architectural Review. (a) Owner has submitted to the County conceptual architectural renderings and Design Standards for the entire Property (the "Guidelines") prepared by Dayton & Thompson, PC and dated January 26, 2007, revised February 23, 2007, March 16, 2007 and March 23, 2007. All buildings, landscaping and site design on the Property shall be consistent with the Guidelines. No building on the property shall exceed thirty-five (35) feet in height as defined in the Zoning Ordinance.

(b) Prior to the County being obligated to grant final site plan approval for development of the Property, Owner shall submit to the Director of Planning conceptual architectural plans, including architectural elevations, for the buildings and any associated structures for the Director of Planning to review and approve for consistency with the Guidelines and this Proffer. Decisions of the Director of Planning may be appealed to the Development Review Committee, whose decision shall be final. Completed buildings shall be consistent with the approved plans.

9. WAT Stop. Owner shall retain the Williamsburg Area Transit (“WAT”) bus stop on the Property with a pull-off per VDOT standards in a location approved by Owner, WAT, the Director of Planning and VDOT. The location shall be shown on the site plan for the Property and approved prior to final site plan approval.

10. Existing Railroad Crossing and Pedestrian Tunnel. The existing railroad crossing and pedestrian tunnel under the railroad tracks shall be retained.

11. Route 60 Median Planting. Subject to VDOT approval, Owner shall install landscaping in the portion of the Route 60 median along the frontage of the Property not already landscaped by the Colonial Heritage project consistent with the landscaping provided by Colonial Heritage. A landscape plan for the median shall be submitted to the Director of Planning with the initial site plan for development on the Property for his review and approval for consistency with this proffer. The median shall be planted or the planting bonded in a form satisfactory to the County Attorney prior to the County being obligated to issue building permits for buildings located on the Property.

12. Landscape Maintenance. The Owner, or its agents or assigns, shall be responsible for the maintenance, repair and replacement of all landscaping materials, fences and barriers proffered hereby in accordance with standards set forth in Section 24-87(e) of the Zoning Ordinance.

Witness the following signatures.

WILLIAMSBURG POTTERY FACTORY INC.

By: Kim A. Maloney

Title: _____

STATE OF VIRGINIA

CITY/COUNTY OF WILLIAMSBURG

The foregoing instrument was acknowledged before me this 19th day of ~~January~~ ^{March}, 2007, by Kim A. Maloney as President of Williamsburg Pottery Factory, Inc. on behalf of the corporation.

Vernon M. Geddy III

Notary Public

My commission expires: 12/31/09

Prepared by:

Vernon M. Geddy, III, Esquire
Geddy, Harris, Franck & Hickman, LLP
1177 Jamestown Road
Williamsburg, VA 23185
(757) 220-6500

Exhibit A
Property Description
Tax Map Parcel #(24-3)(1-24)
Williamsburg Pottery Factory, Inc.

All that certain piece, parcel or tract of land, situate, lying and being in the Stonehouse District of James City County, Virginia, containing total of 18.776 acres more or less and being more particularly described as follows:

Beginning at a point along the westerly right-of-way line of U.S. Route #60, Richmond Road, said point being approximately 2,885' in a northerly direction from the intersection of State Route #646, Lightfoot Road, a corner to the parcel described hereon and the property now or formerly standing in the name of Thomas C. and Carl A. Chestnut; thence leaving said corner and lying along the westerly right-of-way line of U.S. Route #60, Richmond Road, N38°34'10"W, a distance of 1,063.42' to a point, said point being along a curve to the right, having a radius of 957.22' and an arc length of 230.40' to a point; thence N24°46'43"W, a distance of 565.99' to a point; thence N65°21'48"E, a distance of 15.00' to a point; thence N24°46'43"W, a distance of 182.21' to a point, said point being along a curve to the right, having a radius of 1,105.92' and an arc length of 151.15' to a point, a corner to the property described hereon and the property now or formerly standing in the name of Action Park of Williamsburg, Va., Inc.; thence leaving said corner and right-of-way line of U.S. Route #60, Richmond Road and lying along the line of the property now or formerly standing in the name of Action Park of Williamsburg, Va., Inc., N65°14'53"E, a distance of 494.33' to a point, a corner to the property described hereon, the property now or formerly standing in the name of Action Park of Williamsburg, Va., Inc. and being a point along the westerly right-of-way line of CSX Transportation (formerly the C & O railroad); thence leaving said corner and lying along the westerly right-of-way line of CSX Transportation (formerly the C & O railroad), S20°19'32"E, a distance of 977.53' to a point, said point being along a non-tangent curve to the left, having a radius of 5,792.65' and an arc length of 1,146.89' to a point, a corner to the property described hereon, the property now or formerly standing in the name of Thomas C. and Carl A. Chestnut and being a point along the westerly right-of-way line of CSX Transportation (formerly the C & O railroad); thence leaving said corner and right-of-way line of CSX Transportation (formerly the C & O railroad) and lying along the line of the property now or formerly standing in the name of Thomas C. and Carl A. Chestnut, S53°05'15"W, a distance of 191.35' to the aforesaid point of beginning.

This being the same property as shown on that certain plat prepared by AES Consulting Engineers, dated January 8, 2007 and entitled "Plat of Survey, A Parcel of Land Containing 18.776 Acres+/- Standing in the Name of Williamsburg Pottery Factory, Inc., a copy of which is recorded herewith."

PLAT ATTACHED

VIRGINIA: CITY OF WILLIAMSBURG & COUNTY OF JAMES CITY
This document was admitted to record on 7 June 07
at 12:27 AM/PM. The taxes imposed by Virginia Code
Section 58.1-801, 58.1-802 & 58.1-814 have been paid.
STATE TAX LOCAL TAX ADDITIONAL TAX

\$ _____ \$ _____ \$ _____

TESTE: BETSY B. WOOLRIDGE, CLERK

BY: Betsy B. Woolridge Clerk

1. THIS SURVEY IS BASED ON THE JAMES CITY COUNTY
GEODETIC CONTROL NETWORK - VIRGINIA STATE PLANE
COORDINATES - SOUTH ZONE 4502 - NAD 83
HORIZONTAL DATUM. THIS SURVEY WAS PREPARED USING
CONVENTIONAL METHODS.

2. PROPERTY AS SHOWN LIES IN ZONE "X", AREAS
TO BE OUTSIDE THE 500-YEAR FLOODPLAIN
- - - - - JLRM #510201-0020-B, DATED FEBRUARY 6,
1991.

3. PROPERTY AS SHOWN IS CURRENTLY ZONED M-1,
LIMITED BUSINESS / INDUSTRIAL DISTRICT.

4. TOTAL AREA OF PARCEL = 18.776 ACRES±.

WILLIAMSBURG POTTERY FACTORY, INC.
TAX MAP PARCEL # (24-3)(1-31)
PROPERTY ADDRESS: #6692 RICHMOND ROAD
PARCEL AREA = 113.08 ACRES±
D.B. 324, PG. 810
D.B. 298, PG. 662
D.B. 368, PG. 704
P.B. 46, PG. 98

NOW OR FORMERLY
WILLIAMSBURG POTTERY FACTORY, INC.
TAX MAP PARCEL # (24-3)(1-16)

CSX TRANSPORTATION
(FORMERLY C & O RAILROAD)
(100' R/W)
D.B. & PG. 51
R/W AND TRACK MAP #31 -

NOW OR FORMERLY
ACTION PARK OF
WILLIAMSBURG, VA., INC
TAX MAP PARCEL #24-3(1-15)
D.B. 617, PG. 113
P.B. 38, PG. 41

WILLIAMSBURG POTTERY FACTORY, IN
PARCEL AREA =
817,891 S.F.± OR 18.776 ACRES±
D.B. 324, PG. 810
D.B. 298, PG. 662
D.B. 368, PG. 704
P.B. 26, PG. 64
P.B. 46, PG. 98

—CURVE DATA

DELTA=11°20'39"
RADIUS=5792.65'
LENGTH=1146.89'
TANGENT=575.33'
CHORD=1145.02"
C.B.=S26°00'02"E

4)(C) MA -FPM: 7: 76 NUMBER 20605139

VICINITY MAP

SCALE: 1" = 2000'

NOW OR FORMERLY
THOMAS C & CAROL A CHESTNUT
TAX MAP PARCEL # (24-3)(3-1)
INSTR. #040027038
PB 41, PG 33

PAVEMENT
U.S. ROUTE #60 - RICHMOND ROAD
(VARIABLE WIDTH R/W)
PROJ. 0080-047-101, R/W 203
0080-047-101, C-S&S, PE-101

- CURVE DATA

DELTA=13°47'27"
RADIUS=957.22'
LENGTH=230.40'
TANGENT=115.78'
CHORD=229.84'
C.B.=N31°40'27"W

(A) EXISTING 50' INGRESS AND EGRESS EASEMENT SHOWN
ON PLAT RECORDED IN P.B. 26, PG. 64
DATED: SEPTEMBER 24, 1969.

⑬ EXISTING 15' WIDE C&P TELEPHONE EASEMENT
GRANTED BY DEED. RECORDED IN D.B. 298, PG 47
DATED: MARCH 20, 1986.

© EXISTING 10' WIDE J.C.S.A. EASEMENT.
D.B. 214, PGS. 257 - 260.

① EXISTING VARIABLE WIDTH J.C.S.A. EASEMENT
GRANTED BY DEED, RECORD IN D.B. 185, PG. 150.
DATED: MARCH 28, 1978, AND D.B. 185, PG. 152.
DATED: JULY 6, 1977.

(E) EXISTING 25' x 50' EASEMENT TO JAMES CITY COUNTY BY DEED RECORDED IN D.B. 727, PG. 817 DATED: JANUARY 23, 1995.

ADDITIONAL REFERENCES:

DEED BOOK 27, PAGE 424 (V.E.P.CO. ESMT.)
DEED BOOK 28, PAGE 383 (V.E.P.CO. ESMT.)
V.E.P.CO. PLAT BOOK 6, PAGE 32
DEED BOOK 27, PAGE 426 (V.E.P.CO. ESMT.)
V.E.P.CO. PLAT BOOK 6, PAGE 13
DEED BOOK 42, PAGE 498 (V.E.P.CO. ESMT.)
DEED BOOK 67, PAGE 127 (V.E.P.CO. ESMT.)
V.E.P.CO. PLAT BOOK 1, PAGE 287
DEED BOOK 120, PAGE 639 (V.E.P.CO. ESMT.)
V.E.P.CO. PLAT BOOK 3, PAGE 256
V.E.P.CO. PLAT BOOK 35, PAGE 12 (J.C.S.A. ESMT.)
DEED BOOK 232, PAGES 148-151 (V.E.P.CO. ESMT.)
DEED BOOK 262, PAGES 362-364 (V.E.P.CO. ESMT.)

DB = DEED BOOK
PB = PLAT BOOK
PG = PAGE
P.O.B. = POINT OF BEGINNING
----- = EASEMENT LINES

TAX PARCEL: (24-3)(1-24)
STREET ADDRESS: #6692 RICHMOND ROAD



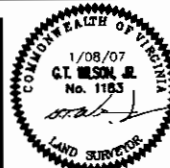
5248 Olde Towne Road, Suite 1
Williamsburg, Virginia 23188
(757) 253-0040
Fax (757) 220-8994

PLAT OF SURVEY
A PARCEL OF LAND CONTAINING 18.776 ACRES±
STANDING IN THE NAME OF
WILLIAMSBURG POTTERY FACTORY, INC.

STONEMOUSE DISTRICT

JAMES CITY COUNTY

MIRGNEA



1.	5/1/97	ADDED P.O.B. AND ROAD TRIP DISTANCE	JOB	REV
No.	DATE	REVISION / COMMENT / NOTE	REVISED	REVISED

Designed AES	Drawn JDB
Scale 1"=200'	Date 1/08/07
Project No. 9510-01	
Drawing No. 1 OF 1	

110009765

AMENDED AND RESTATED PROFFERS

THESE AMENDED AND RESTATED PROFFERS are made this 28th day of January, 2011 by WILLIAMSBURG POTTERY PROPERTIES, LLC., a Virginia limited liability company (together with its successors and assigns, the "Owner") ("Grantor"), for the benefit of JAMES CITY COUNTY, VIRGINIA ("Grantee").

RECITALS

A. Owner is the owner of a tract or parcel of land located in James City County, Virginia, with an address of 6692 Richmond Road, Williamsburg, Virginia, being Tax Parcel 2430100024, and containing 18.78± acres, being more particularly described on Exhibit A attached hereto (the "Property"). The Property is now zoned M-1 and is subject to (i) Proffers dated March 19, 2007 and recorded in the Clerk's Office of the Circuit Court of the City of Williamsburg and County of James City as Instrument No. 070016264 (the "Existing Proffers") and (ii) a master plan entitled "Rezoning and Special Use Permit for the Promenade at the Williamsburg Pottery for the Williamsburg Pottery Factory Inc", prepared by AES Consulting Engineers dated November 29, 2006, and last revised March 19, 2007, (the "Existing Master Plan").

B. Owner has applied to amend and restate the Existing Proffers and to amend the Existing Master Plan in certain respects.

C. Owner has submitted to the County an amended master plan entitled "Master Plan and Rezoning Amendment for the Williamsburg Pottery for the Williamsburg Pottery Factory, Inc.", prepared by AES Consulting Engineers with a revision date of January 27, 2011 (the "Amended Master Plan") for the Property in accordance with the County Zoning Ordinance.

E. Owner desires to amend and restate the Existing Proffers in order to offer to the County certain amended conditions on the development of the Property not generally applicable to land zoned M-1.

NOW, THEREFORE, for and in consideration of the approval of the requested rezoning, and pursuant to Section 15.2-2298 of the Code of Virginia, 1950, as amended, and the County Zoning Ordinance, Owner agrees that it shall meet and comply with all of the following conditions in developing the Property. If the requested rezoning is not granted by the County, these Amended and Restated Proffers shall be null and void and the Existing Proffers shall remain in full force and effect.

CONDITIONS

1. **Amended Master Plan.** The Property shall be redeveloped generally as shown on the Amended Master Plan, with only minor changes thereto that the Development Review Committee determines do not change the basic concept or character of the development.

2. **Water Conservation.** The Owner shall be responsible for developing water conservation standards to be submitted to and approved by the James City Service Authority and subsequently for enforcing these standards. The standards shall address such water conservation measures as limitations on the installation and use of irrigation systems and irrigation wells, the use of approved landscaping materials and the use of water conserving fixtures and appliances to promote water conservation and minimize the use of public water resources. Irrigation wells shall only draw water from the Upper Potomac or Aquia Aquifers and shall be subject to the approval of the General Manager of James City Service Authority. The standards shall be approved by the James City

Service Authority prior to final site plan approval.

3. Road Improvements/Entrances. (a) With the prior approval of the Virginia Department of Transportation ("VDOT"), Owner may install a right in only entrance into the Property from Route 60 approximately in the middle of Parcel 3 of the Property. When and if this entrance is constructed, a westbound right turn lane with 200 feet of storage and a 200 foot taper shall be constructed if necessary as determined by VDOT.

(b) The entrance into Parcel 2 of the Property shall be located at the approximate location shown on the Amended Master Plan as "Proposed Signalized Crossover" and the location shall be shown on the site plan for the Property and subject to the approval of the Director of Planning and VDOT. When the entrance is relocated, the existing entrance shall be closed and the existing crossover labeled on the Amended Master Plan as "Signal and Crossover to be Removed and Relocated" shall be closed within 30 days of the completion of the new entrance. At the entrance (i) an eastbound left turn lane with 200 feet of storage and a 200 foot taper; (ii) a westbound left turn lane with 200 feet of storage and a 200 foot taper and (iii) a westbound right turn lane with 200 feet of storage and a 200 foot taper shall be constructed and a new traffic signal shall be installed. Four egress lanes with at least 150 feet of storage consisting of two dedicated left turn lanes, one dedicated right turn lane and one ingress lane shall be constructed at this entrance. Construction of these improvements shall be completed or bonded in form satisfactory to the County Attorney prior to the County being obligated to issue building permits for any building in the phase of the development served by this entrance.

(c) Owner shall install a new entrance from Route 60 into Parcel 1 of the Property at the Colonial Heritage east crossover in the approximate location shown on the

Amended Master Plan as "Proposed Traffic Signal at Crossover per Colonial Heritage Rezoning Proffers". When this entrance is constructed, a westbound right turn lane with 200 feet of storage and a 200 foot taper and an eastbound left turn lane shall be constructed. Three egress lanes with 200 feet of storage consisting of two dedicated left turn lanes and one dedicated right turn lane and one ingress lane shall be constructed at this entrance. Owner shall be responsible for and shall pay the costs of any necessary modifications to the traffic signal proffered for this intersection by Colonial Heritage so the signal will serve this entrance to and from the Property. At such time as a traffic signal is installed at this intersection and subject to VDOT approval, Owner shall install or pay the costs of installation of crosswalks, median refuge islands, signage and pedestrian signal heads at the intersection. Construction shall be completed or bonded in form satisfactory to the County Attorney prior to the County being obligated to issue building permits for any building in the phase of the development served by this entrance.

(d) Owner shall construct a right in, right out only entrance from Parcel 1 of the Property onto westbound Route 60 at the western end of the Property in the approximate location shown on the Amended Master Plan. When this entrance is constructed, a westbound right turn lane with 200 feet of storage and a 200 foot taper shall be constructed. Construction shall be completed or bonded in form satisfactory to the County Attorney prior to the County being obligated to issue building permits for any building in the phase of the development served by this entrance.

(e) The turn lanes and entrances, crosswalks, median refuge islands, signage and pedestrian signal heads proffered hereby shall be constructed in accordance with VDOT standards and shall be approved by VDOT.

(f) The right turn lanes and entrances proffered hereby shall include four foot bike lanes.

(g) After approval of the first final site plan for the redevelopment of the Property and within 30 days of a request from VDOT, Owner shall pay to VDOT a pro rata share (based on 1.5 signals divided by the total number of signals included in the project) of any VDOT Route 60 signal coordination project that includes the signalized intersections at entrances into the Property. The costs of the signal coordination project may include traffic signal equipment and utility relocation within the existing right of way and easements to accommodate traffic signal equipment, but will not include any right of way acquisition expenses or road construction changes.

4. Lighting. All light poles on the Property shall not exceed 30 feet in height. All external lights on the Property shall be recessed fixtures with no globe, bulb or lens extending below the casing or otherwise unshielded by the case so that the light source is visible from the side of the fixture. No glare defined as 0.1 footcandle or higher shall extend outside the property lines of the Property unless otherwise approved by the Director of Planning. Owner shall submit a lighting plan to the Director of Planning for review and approval for consistency with this Proffer prior to final site plan approval.

5. Route 60 Buffer. There shall be a variable width community character corridor buffer with a minimum average width of 37 feet and a minimum width of 20 feet along the Route 60 frontage of the Property generally as shown on the Amended Master Plan. The buffer shall contain enhanced (defined as 125% of Ordinance size requirements) landscaping as shown on the Conceptual Landscape Plan for Route 60 Buffer made by AES Consulting Engineers dated March 19, 2007 submitted herewith and

on file with the County Planning Department and a fence at least 42 inches in height in the approximate locations shown on the Amended Master Plan and approved by the Director of Planning. A detailed landscape plan for the entire buffer shall be submitted to the Director of Planning with the initial site plan for development on the Property for his review and approval for consistency with this proffer. The buffer shall be planted or the planting bonded in a form satisfactory to the County Attorney prior to the County being obligated to issue building permits for buildings located on the Property.

6. Environmental. (a) Stormwater from the Property will be directed away from the Yarmouth Creek watershed to reduce existing negative impacts to that watershed; provided, however, drainage from the community character corridor buffer area adjacent to the VDOT right-of-way and up to 15,000 square feet of impervious cover associated with entrances, sidewalks or similar features may drain to the VDOT right-of-way and thus will continue to drain to the Yarmouth Creek watershed.

(b) Owner shall upgrade the existing farm pond shown on the Amended Master Plan as "Proposed Regional SWM Facility for the Williamsburg Pottery Factory Complex" to County standards to function as a Group A wet pond generally consistent with the provisions contained in the James City County Guidelines for the Design and Construction of Stormwater Management BMP's, including any necessary channel improvements leading into the pond or bond the upgrade in form satisfactory to the County Attorney prior to the County being obligated to issue any building permits for building on the Property . The pond shall receive the redirected stormwater flows from the Property in addition to the existing flows from the Williamsburg Pottery Factory complex.

(c) Owner shall install six standard size tree box filters capable of treating stormwater from approximately one and one-half acres of impervious cover in the parking lots on the Property.

7. Architectural Review. (a) Owner has submitted to the County conceptual architectural renderings and Design Standards for the entire Property (the "Guidelines") prepared by Dayton & Thompson, PC and dated January 26, 2007, revised February 23, 2007, March 16, 2007 and March 23, 2007. All buildings, landscaping and site design on the Property shall be consistent with the Guidelines. No building on the property shall exceed thirty-five (35) feet in height as defined in the Zoning Ordinance.

(b) Prior to the County being obligated to grant final site plan approval for development of the Property, Owner shall submit to the Director of Planning conceptual architectural plans, including architectural elevations, for the buildings and any associated structures for the Director of Planning to review and approve for consistency with the Guidelines and this Proffer. Decisions of the Director of Planning may be appealed to the Development Review Committee, whose decision shall be final. Completed buildings shall be consistent with the approved plans.

8. WAT Stop. Owner shall retain the Williamsburg Area Transit ("WAT") bus stop on the Property with a pull-off per VDOT standards in a location approved by Owner, WAT, the Director of Planning and VDOT. The location shall be shown on the site plan for the Property and approved prior to final site plan approval.

9. Existing Railroad Crossing and Pedestrian Tunnel. The existing surface railroad crossing and pedestrian tunnel under the railroad tracks shall be retained subject to the provisions of this Proffer. Since the purpose of the tunnel is to provide a way for

pedestrians to safely cross the railroad tracks, if there is no need for pedestrians to cross the tracks given the use of the property on the north side of the tracks, with prior written notice to the Director of Planning, the tunnel may be temporarily blocked and taken out of service. If the tunnel remains continuously out of service for a period of six years, with prior written notice to the Director of Planning, the tunnel may be permanently closed.

10. Route 60 Median Planting. Subject to VDOT approval, Owner shall install landscaping in the portion of the Route 60 median along the frontage of the Property not already landscaped by the Colonial Heritage project consistent with the landscaping provided by Colonial Heritage. A landscape plan for the median shall be submitted to the Director of Planning with the initial site plan for development on the Property for his review and approval for consistency with this proffer. The median shall be planted or the planting bonded in a form satisfactory to the County Attorney prior to the County being obligated to issue building permits for buildings located on the Property.

11. Landscape Maintenance. The Owner, or its agents or assigns, shall be responsible for the maintenance, repair and replacement of all landscaping materials, fences and barriers proffered hereby in accordance with standards set forth in Section 24-87(e) of the Zoning Ordinance.

Witness the following signatures.

WILLIAMSBURG POTTERY*LLC *PROPERTIES

By: [Signature]

Title: Ex. V.P.

STATE OF VIRGINIA

CITY/COUNTY OF James City

The foregoing instrument was acknowledged before me this 28th day of January 2011, by Peter Kao as Executive Vice President of Williamsburg Pottery*LLC on behalf of the company.

*Properties

My commission expires:
Registration No.:

7350525



Anne E. W. Monaghan
Notary Public

Exhibit A
Property Description

All those two (2) certain pieces or parcels of land situate in James City County, Virginia, as shown and set forth on plat of survey entitled "Lot Line Extinguishment Between Various Parcels of Land Standing In The Name of Maloney Family Trust" dated January 25, 1986, made by Paul C. Small. C.L.S., of record in the James City County Circuit Court Clerk's Office in Deed Book 298, page 664, which plat is herein incorporated by reference; BEING a portion of the same property conveyed to the Grantor herein named by deed dated December 1, 1986, from Frederick C. Maloney, Trustee, Maloney Family Trust which deed is of record in the Clerk's Office of the Circuit Court of James City County, Virginia in Deed Book 324, page 810.

This tract is identified on the current tax records of James City County, Virginia as Parcel No. 2430100024 and is said to contain 18.860 acres.

VIRGINIA: CITY OF WILLIAMSBURG & COUNTY OF JAMES CITY
This document was admitted to record on 29 May 2011
at 2:51 AM/PM. The taxes imposed by Virginia Code
Section 58.1-801, 58.1-802 & 58.1-814 have been paid.

STATE TAX

LOCAL TAX

ADDITIONAL TAX

\$ _____ \$ _____ \$ _____

TESTE: BETSY B. WOOLRIDGE, CLERK

BY: Betsy B. Woolridge Clerk

MASTER PLAN AND REZONING AMENDMENT

FOR

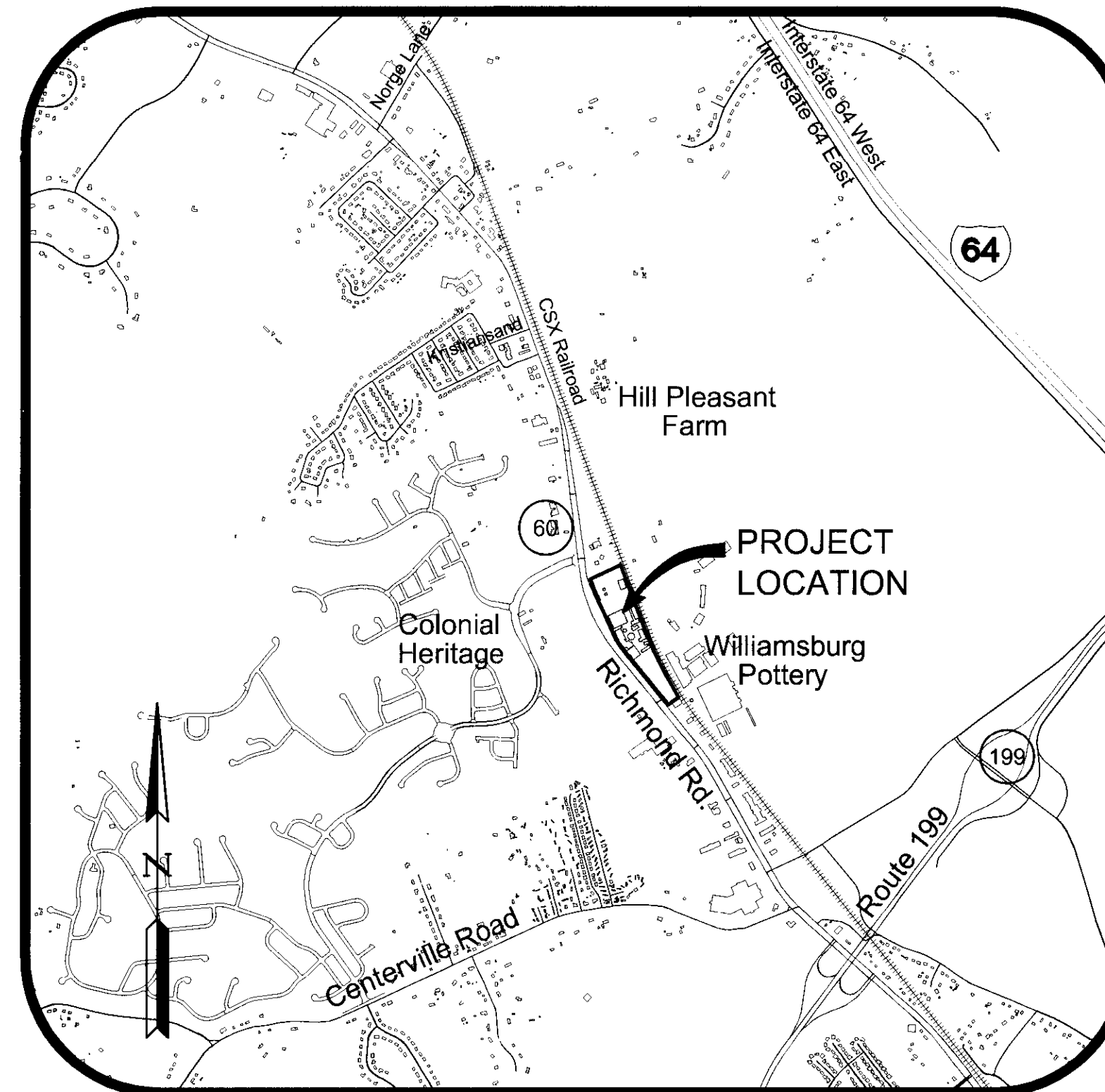
THE WILLIAMSBURG POTTERY

FOR

WILLIAMSBURG POTTERY, LLC

MP. 0001-2010
Z-0002-2010
SUP. 0029-2010

STONEHOUSE DISTRICT
JAMES CITY COUNTY, VIRGINIA



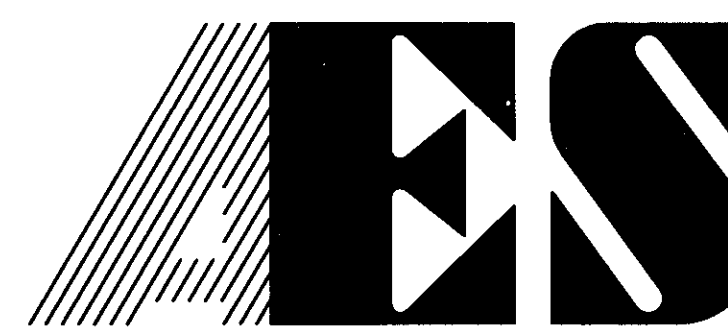
Copyright ADC The Map People
permitted use number 20403119 (APPROX. SCALE 1"=2000')

INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	COVER SHEET
2	EXISTING CONDITIONS MAP
3	BINDING MASTER PLAN
4	NON-BINDING ILLUSTRATIVE PLAN
5	MASTER UTILITY PLAN
6	MASTER STORM WATER MANAGEMENT PLAN

NOVEMBER 24, 2010
CURRENT REVISION: JANUARY 27, 2010

JAMES CITY COUNTY ID NUMBER: Z-0002-2010
AES PROJECT NO.: 9510-03
SHEET 1 OF 6



CONSULTING ENGINEERS

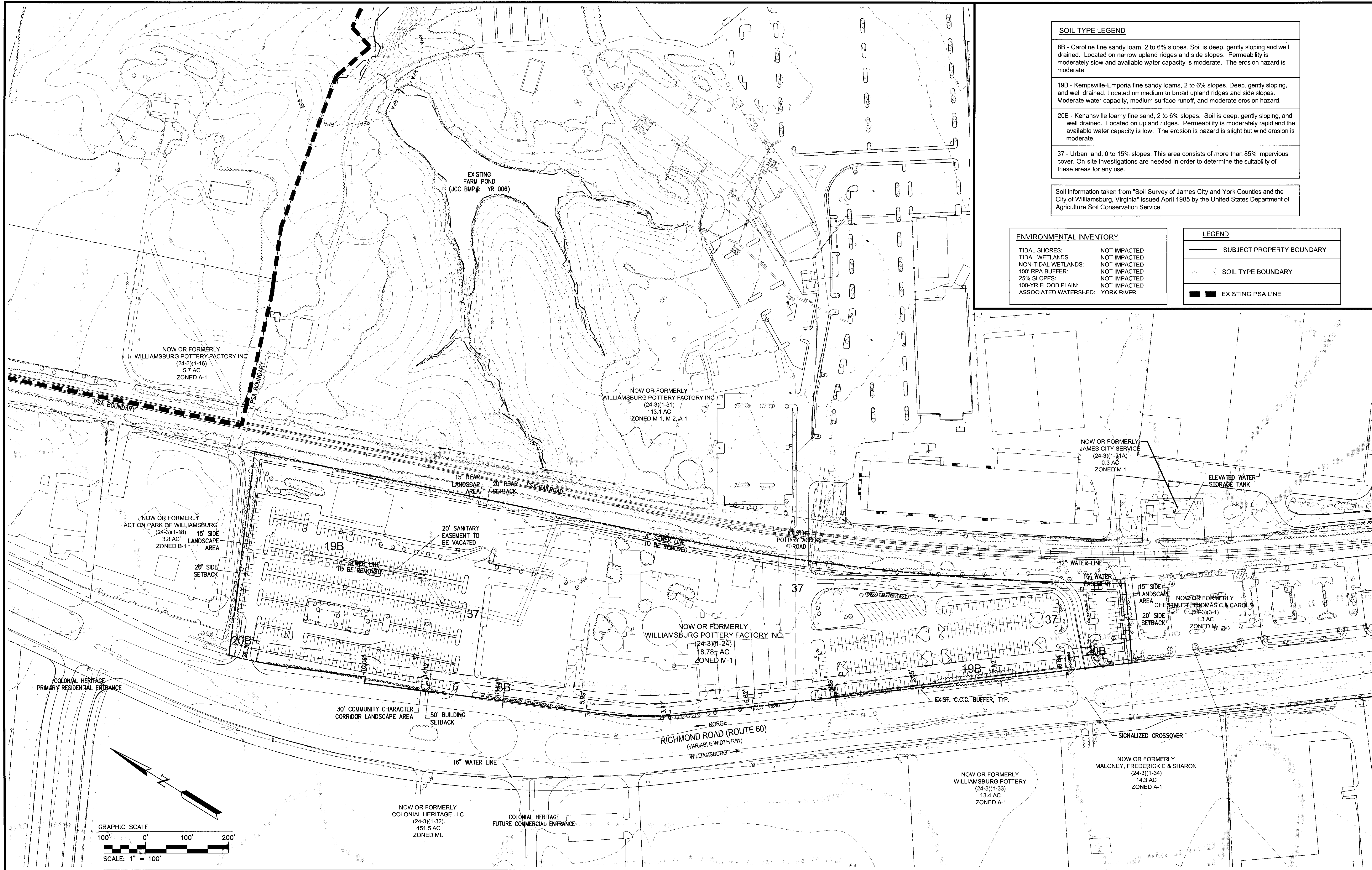
WILLIAMSBURG • RICHMOND • GLOUCESTER

5248 Olde Towne Road, Suite 1 • Williamsburg, Virginia 23188
(757) 253-0040 • Fax (757) 220-8994

PARCEL ADDRESS: 6692 RICHMOND ROAD
PARCEL ID NUMBER: 2430100024

PREVIOUS REZONING JAMES CITY COUNTY ID NUMBER: Z-8-06
ORIGINAL SUBMITTAL DATE: NOVEMBER 29, 2006
PREVIOUSLY APPROVED: MAY 8, 2007

APPROVAL	DATE	No.	DATE	REVISION / COMMENT / NOTE	REVIEWED BY	REVIEWED DATE
	07	1/27/11		REVISED MASTER PLAN	MJR	MJR
	06	11/24/10		2010 REVISION OF APPROVED MASTER PLAN	MJR	MJR
	05	4/30/07		REV. PER P.C. COMMENTS / SUBMIT TO B.O.S.	CMB	CMB
	04	3/26/07		PER JAMES CITY COUNTY STAFF COMMENTS	CMB	CMB
	03	3/19/07		PER JAMES CITY COUNTY STAFF COMMENTS	CMB	CMB
	02	2/26/07		PER JAMES CITY COUNTY STAFF COMMENTS	CMB	CMB
	01	1/25/07		PER JAMES CITY COUNTY STAFF COMMENTS	GRP	CMB



SOIL TYPE LEGEND

8B - Caroline fine sandy loam, 2 to 6% slopes. Soil is deep, gently sloping and well drained. Located on narrow upland ridges and side slopes. Permeability is moderately slow and available water capacity is moderate. The erosion hazard is moderate.

19B - Kempsville-Emporia fine sandy loams, 2 to 6% slopes. Deep, gently sloping, and well drained. Located on medium to broad upland ridges and side slopes. Moderate water capacity, medium surface runoff, and moderate erosion hazard.

20B - Kenansville loamy fine sand, 2 to 6% slopes. Soil is deep, gently sloping, and well drained. Located on upland ridges. Permeability is moderately rapid and the available water capacity is low. The erosion is hazard is slight but wind erosion is moderate.

37 - Urban land, 0 to 15% slopes. This area consists of more than 85% impervious cover. On-site investigations are needed in order to determine the suitability of these areas for any use.

Soil information taken from "Soil Survey of James City and York Counties and the City of Williamsburg, Virginia" issued April 1985 by the United States Department of Agriculture Soil Conservation Service.

ENVIRONMENTAL INVENTORY

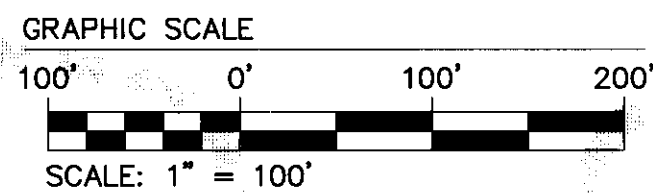
TIDAL SHORES: NOT IMPACTED
TIDAL WETLANDS: NOT IMPACTED
NON-TIDAL WETLANDS: NOT IMPACTED
100' RPA BUFFER: NOT IMPACTED
25% SLOPES: NOT IMPACTED
100-YR FLOOD PLAIN: NOT IMPACTED
ASSOCIATED WATERSHED: YORK RIVER

LEGEND

SUBJECT PROPERTY BOUNDARY

SOIL TYPE BOUNDARY

EXISTING PSA LINE



07	1/27/11	REVISED MASTER PLAN	MJR	MJR
06	11/24/10	2010 REVISION OF APPROVED MASTER PLAN	MJR	MJR
05	4/30/07	REV. PER P.C. COMMENTS / SUBMIT TO B.O.S.	CMB	CMB
04	3/26/07	PER JAMES CITY COUNTY STAFF COMMENTS	CMB	CMB
03	3/19/07	PER JAMES CITY COUNTY STAFF COMMENTS	CMB	CMB
02	2/26/07	PER JAMES CITY COUNTY STAFF COMMENTS	CMB	CMB
01	1/25/07	PER JAMES CITY COUNTY STAFF COMMENTS	GRR	CMB
No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY

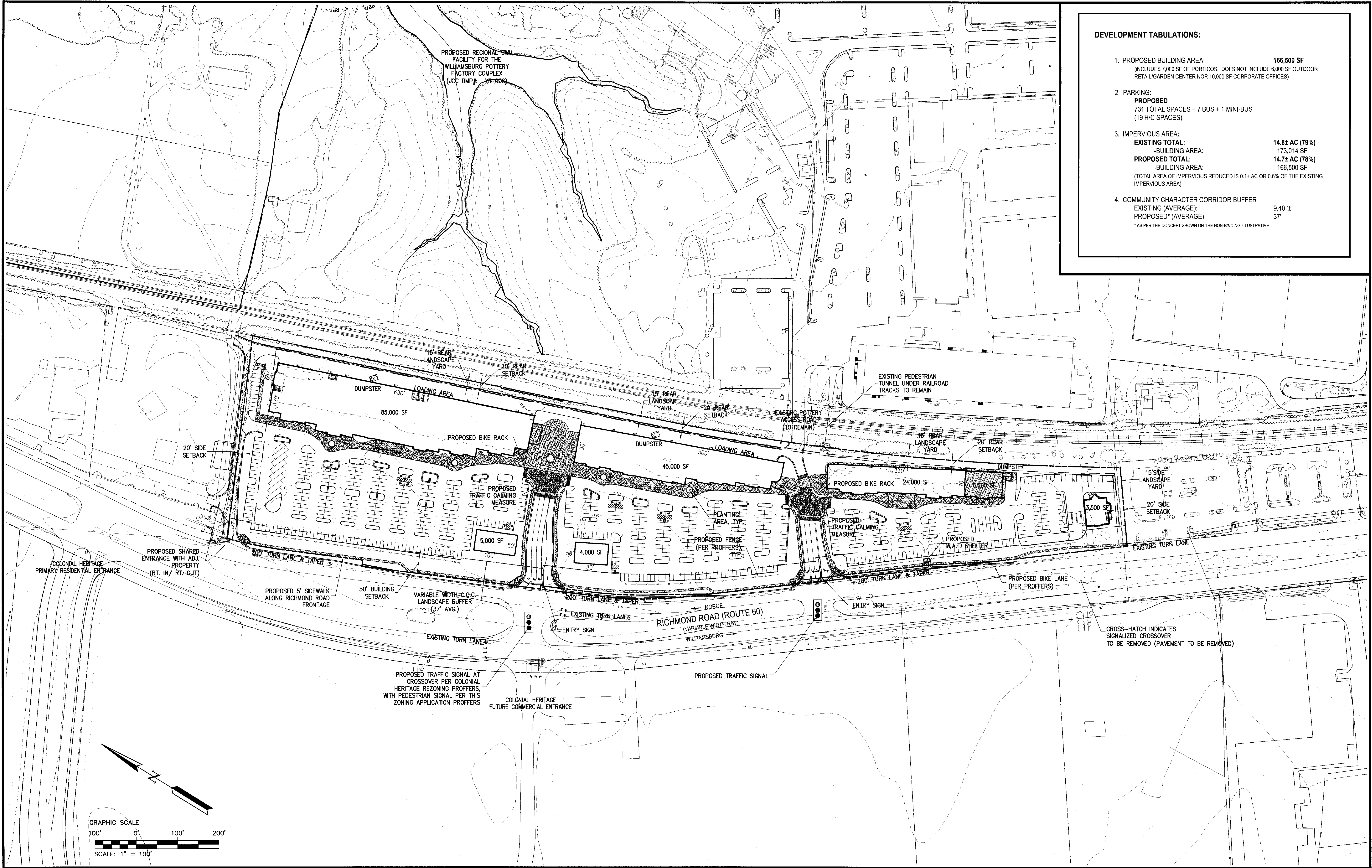


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EXISTING CONDITIONS MAP
THE WILLIAMSBURG POTTERY
RETAIL REDEVELOPMENT
for
WILLIAMSBURG POTTERY, LLC

STONEHOUSE JAMES CITY COUNTY VIRGINIA

Designed GRR	Drawn GRR
Scale 1"=100'	Date 11/29/06
Project No. 9510-03	
Drawing No. 2	



DEVELOPMENT TABULATIONS:

1. PROPOSED BUILDING AREA:

(INCLUDES 7,000 SF OF PORTICOS. DOES NOT INCLUDE 6,000 SF OUTDOOR RETAIL/GARDEN CENTER NOR 10,000 SF CORPORATE OFFICES)

166,500 SF
2. PARKING:

PROPOSED

731 TOTAL SPACES + 7 BUS + 1 MINI-BUS

(19 H/C SPACES)
3. IMPERVIOUS AREA:

EXISTING TOTAL:

-BUILDING AREA:

PROPOSED TOTAL:

-BUILDING AREA:

(TOTAL AREA OF IMPERVIOUS REDUCED IS 0.1± AC OR 0.6% OF THE EXISTING IMPERVIOUS AREA)

14.8± AC (79%)

173,014 SF

14.7± AC (78%)

166,500 SF
4. COMMUNITY CHARACTER CORRIDOR BUFFER

EXISTING (AVERAGE):

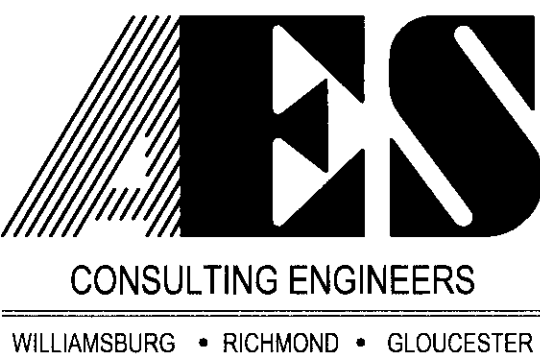
PROPOSED* (AVERAGE):

* AS PER THE CONCEPT SHOWN ON THE NON-BINDING ILLUSTRATIVE

9.40' ±

37'

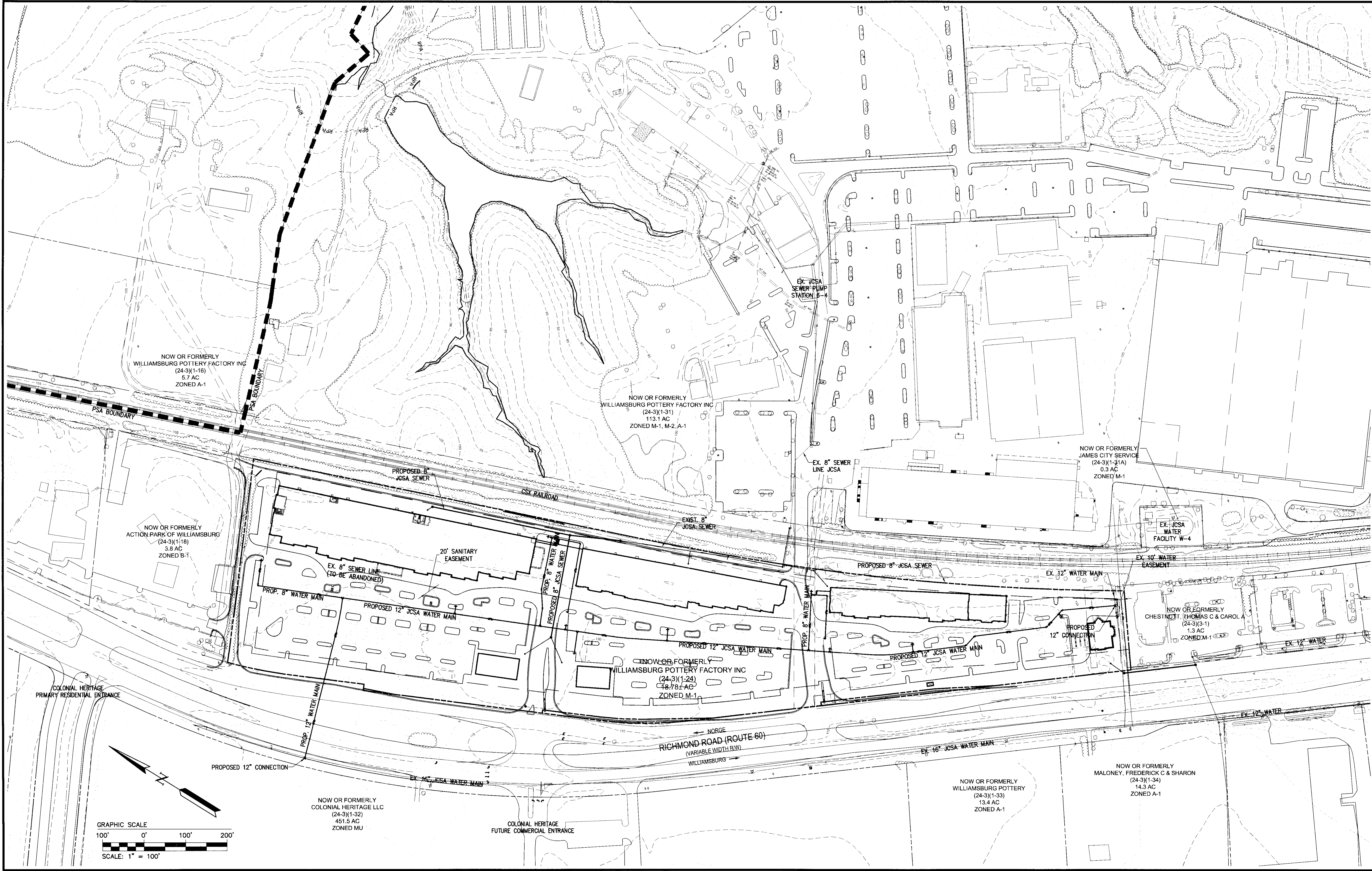
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06	11/24/10	2010 REVISION OF APPROVED MASTER PLAN	MJR	MJR
05	4/30/07	REV. PER P.C. COMMENTS / SUBMIT TO B.O.S	CMB	CMB
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03	3/19/07	PER JAMES CITY COUNTY STAFF COMMENTS	CMB	CMB
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01	1/25/07	PER JAMES CITY COUNTY STAFF COMMENTS	GRR	CMB
No.	DATE	REVISION / COMMENT / NOTE	REVIEWED BY	REVIEWED BY



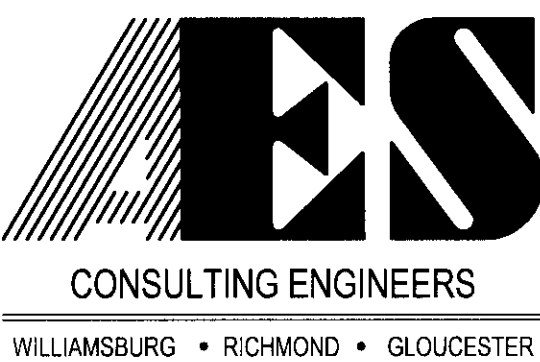
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NON-BINDING ILLUSTRATIVE PLAN	
THE WILLIAMSBURG POTTERY	
RETAIL REDEVELOPMENT	
for	
WILLIAMSBURG POTTERY, LLC	
STONEHOUSE	JAMES CITY COUNTY VIRGINIA

Designed	Drawn
RAC/MJR	MJR
Scale	Date
1"=100'	11/29/06
Project No.	
9510-01	
Drawing No.	
4	



07	1/27/11	REVISED MASTER PLAN	MJR	MJR
06	11/24/10	2010 REVISION OF APPROVED MASTER PLAN	MJR	MJR
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01	1/25/07	PER JAMES CITY COUNTY STAFF COMMENTS	GRR	CMB
No.	DATE	REVISION / COMMENT / NOTE	REVISED BY	REVIEWED BY



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MASTER UTILITY PLAN	
THE WILLIAMSBURG POTTERY	
RETAIL REDEVELOPMENT	
for	
WILLIAMSBURG POTTERY, LLC	
Designed RAC/MJR	Drawn MJR
Scale 1"=100'	Date 10/23/06
Project No. 9510-01	
Drawing No. 5	
STONEHOUSE	JAMES CITY COUNTY
VIRGINIA	



Project: The Promenade
Project No: 9510-01
Subject: Water Quality Calculations
Date: 10/26/2016
Calculated By: MJR

Performance-Based Water Quality Calculations - Situation 3 (Appendix 5D - Virginia Stormwater Management Handbook Volume II)

STEP 1
18.78 Acres: Application Area
14.80 Acres: Post-development Impervious Cover
78.3 %: I_{avg} (Total Post-development Impervious Cover / A x 100)

STEP 2
16 %: I_{existing}
14.80 Acres: Existing Impervious Cover
78.3 %: I_{avg} (Total Existing Impervious Cover / A x 100)

STEP 3
 $L_{\text{existing}} = \frac{L_{\text{avg}}}{I_{\text{avg}}} \times I_{\text{existing}}$
 $L_{\text{existing}} = \frac{32.6}{78.3} \times 16 = 6.7$ pounds per year
 $L_{\text{development}} = \frac{L_{\text{avg}}}{I_{\text{avg}}} \times (I_{\text{avg}} - I_{\text{existing}})$
 $L_{\text{development}} = \frac{32.6}{78.3} \times (78.3 - 16) = 25.9$ pounds per year
 $L_{\text{total}} = L_{\text{existing}} + L_{\text{development}} = 6.7 + 25.9 = 32.6$ pounds per year

STEP 4
 $L_{\text{avg}} = \frac{L_{\text{total}}}{I_{\text{avg}}}$
 $L_{\text{avg}} = \frac{32.6}{78.3} = 0.417$ pounds per year per percent imperviousness
 $L_{\text{avg}} = 0.417$ pounds per year per percent imperviousness

Page 1 of 3

STEP 5
RR = relative pollutant removal requirements
 $RR = \frac{L_{\text{avg}}}{L_{\text{total}}} \times 100$
 $RR = \frac{0.417}{32.6} \times 100 = 1.28$
or
 $RR = \frac{L_{\text{avg}}}{L_{\text{total}}} \times 100$
 $RR = \frac{0.417}{32.6} \times 100 = 1.28$
Use lesser of two values - RR = 1.28

STEP 6
EFF = required pollutant removal efficiency
 $EFF = \frac{RR}{100} \times 100$
 $EFF = \frac{1.28}{100} \times 100 = 1.28$
EFF = 1.28 %

BMP #1 Modified A-1 Wet Pond (50% Efficient)
60.60 Acres: Drainage Area of proposed BMP
26.72 Acres: Post-development Impervious Cover for BMP Drainage Area
44.1 %: I_{avg} (Total Post dev Impervious Cover of BMP Drainage Area / A_{BMP} x 100)
 $L_{\text{avg}} = \frac{L_{\text{total}}}{I_{\text{avg}}}$
 $L_{\text{avg}} = \frac{32.6}{44.1} = 0.74$ pounds per year per percent imperviousness
 $L_{\text{avg}} = 0.74$ pounds per year per percent imperviousness
 $L_{\text{avg}} = 0.74$ pounds per year per percent imperviousness
EFF = 50.0 %
 $L_{\text{avg}} = 0.74$ pounds per year per percent imperviousness

Page 2 of 3

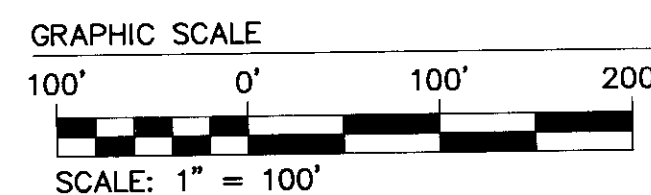
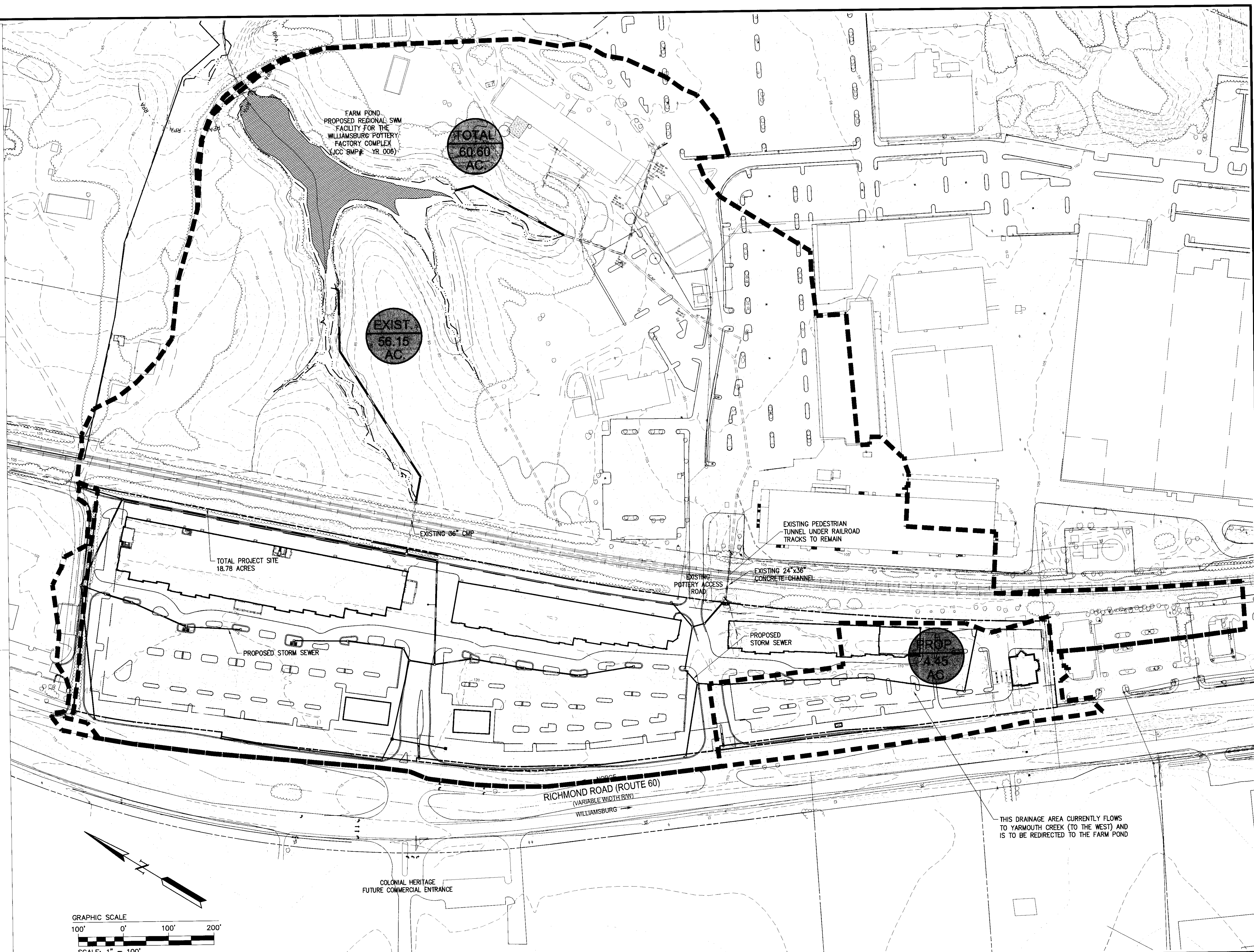
BMP #2 _____
BMP #3 _____
BMP #4 _____
BMP #5 _____
BMP #6 _____

$L_{\text{total}} = L_{\text{BMP1}} + L_{\text{BMP2}} + L_{\text{BMP3}} + L_{\text{BMP4}} + L_{\text{BMP5}} + L_{\text{BMP6}}$
 $L_{\text{total}} = 32.6 + 0.0 + 0.0 + 0.0 + 0.0 + 0.0 = 32.6$ pounds per year

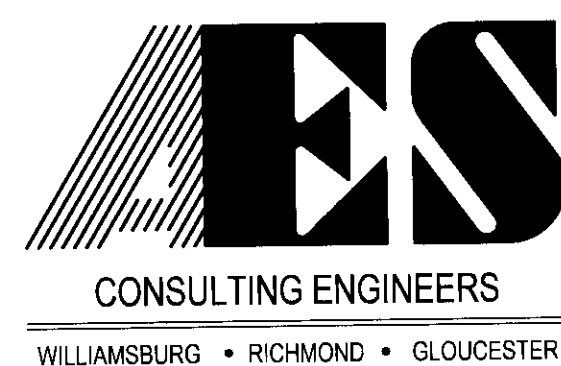
Compliance Check

$L_{\text{total}} \leq RR$
 $32.6 \leq 1.28$

Page 3 of 3



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MASTER STORMWATER PLAN
THE WILLIAMSBURG POTTERY
RETAIL REDEVELOPMENT
for
WILLIAMSBURG POTTERY, LLC

STONEHOUSE

JAMES CITY COUNTY

VIRGINIA

Designed RAC/MJR	Drawn MJR
Scale 1"=100'	Date 11/29/06
Project No. 9510-01	Drawing No. 6

Unapproved Minutes of December 3, 2025 Planning Commission Regular Meeting

1. Z-25-0007/MP-25-0005, 6810 Richmond Road The Williamsburg Pottery Proffer and Master Plan Amendment

Mr. Kyle Sirico addressed the Commission, stating that Ms. Dawn Griggs of Thalhimer Commercial Real Estate had applied for a Proffer and Master Plan Amendment to allow for the inclusion of institutional uses on the previously adopted Master Plan. Mr. Sirico noted that the property is zoned M-1, Limited Business/Industrial with proffers, and is designated as Mixed Use in the Comprehensive Plan.

Mr. Sirico explained that a Master Plan amendment change is needed to allow Coastal Community Church, an institutional use, to occupy Building B, the structure on future Parcel A-2 as shown on the proposed Master Plan. Mr. Sirico noted that institutional uses are not permitted under the current Master Plan.

Mr. Sirico stated that the church has a proposed seating capacity of 1,000 people with 208 parking spaces available. Mr. Sirico explained that the Zoning Ordinance requires 200 parking spaces for the proposed capacity and the applicant had proffered a parking agreement, to be recorded prior to Certificate of Occupancy, that provided an additional 50 parking spaces through a parking easement.

Mr. Sirico explained how the traffic management and hours of operation stated in the proposed proffers would mitigate negative traffic impacts on the property.

Mr. Sirico stated that Staff found the proposed Rezoning and Master Plan Amendment to be compatible with surrounding development and consistent with the recommendations of the Comprehensive Plan and the Zoning Ordinance.

Mr. Everson asked for clarification of the differences between what Proffer No. 3 states and what is written in the narrative.

Mr. Sirico explained that the one-hour time increment was proposed in the previous proffers and has now been amended to 30 minutes.

Discussion ensued.

Mr. Shawn Brown, 3 Page Place Poquoson, VA, representing Coastal Community Church, gave a presentation to the Commission about the proposed project.

Mr. Haldeman asked about the meals that Coastal Community Church provides to the community.

Mr. Brown explained that different locations serve either hot or cold food depending on the facility.

Mr. Polster asked if the proposed location would do the same.

Mr. Brown stated they would be willing to do so.

Discussion continued.

Mr. Andrew Oates, 14 Poquoson Ave Poquoson, VA, addressed the Commission and stated he was available for questions.

Mr. Scott Myers, 5007 Victory Blvd York, VA, addressed the Commission, speaking in favor of the proposed project.

Mr. Polster made a motion to recommend approval of Z-25-0007/MP-25-0005, 6810 Richmond Road The Williamsburg Pottery Proffer and Master Plan Amendment

On a voice vote, the Commission voted to recommend approval. (6-0)

**SPECIAL USE PERMIT-25-0014. 4300 John Tyler Highway, Williamsburg School for the Arts & Innovation
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing**

SUMMARY FACTS

Applicant: Ms. Krista John of Williamsburg School of Arts & Innovation

Landowner: 4300 John Tyler LLC

Proposal: To allow for a school within an existing building.

Location: 4300 John Tyler Highway

Tax Map/Parcel No.: 4620100035

Property Acreage: ± 5.67 acres

Zoning: R-8, Rural Residential

Comprehensive Plan: Low Density Residential

Primary Service Area: Inside

Staff Contact: Allison Jackura, Planner III

PUBLIC HEARING DATES

Planning Commission: December 3, 2025, 6:00 p.m.

Board of Supervisors: January 13, 2026, 5:00 p.m.

FACTORS FAVORABLE

1. There is adequate off-street parking provided.
2. Staff finds the proposal to be compatible with the surrounding zoning and development.
3. Impacts: See Impact Analysis on Pages 4-5.
4. See Comprehensive Plan Analysis on Page 6.

FACTORS UNFAVORABLE

1. Staff does not identify any unfavorable factors.
2. Impacts: See Impact Analysis on Pages 4-5.

PLANNING COMMISSION RECOMMENDATION

At its December 3, 2025, Regular Meeting, the Planning Commission recommended approval of this application with staff-proposed conditions by a vote of 6-0.

PROPOSED CHANGES MADE SINCE THE PLANNING COMMISSION MEETING

There have been no proposed changes since the Planning Commission meeting.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

**SPECIAL USE PERMIT-25-0014. 4300 John Tyler Highway, Williamsburg School for the Arts & Innovation
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing**

SUMMARY STAFF RECOMMENDATION

Staff recommends the Board of Supervisors approve this application, subject to the proposed conditions.

PROJECT DESCRIPTION

Ms. Krista John of Williamsburg School for the Arts & Innovation (WSA) has applied for a Special Use Permit (SUP) to allow for a school within the existing buildings at 4300 John Tyler Highway, providing arts-centered, flexible, part-time daytime programs for homeschool students. Summer camps would also occur each year. An SUP is required for schools in the R-8 Zoning District.

During the daytime, the school will have part-time classes for homeschool students, with class sizes of 10 to 15 students, each. The classes are staggered for start time and days of the week to maintain a low traffic impact.

Classes will be offered between 9 a.m. and 4 p.m. on select weekdays. After school, the WSA would offer arts, music, dance, and theater workshops with occasional student showcases. These activities are proposed between 4 p.m. and 8 p.m. on weekdays. WSA is not currently planning to operate on weekends; however, the applicant has requested the option to host special rehearsals, student showcases, or the occasional community workshop.

WSA anticipates having between two to five staff members on-site while operating, with typical afternoon rehearsals involving 25-30 students. The applicant anticipates managing traffic during evening student showcases to ensure sufficient parking.

Due to the nature of the activities on-site and the time they occur, staff finds there is adequate parking for the staff and parents.

PLANNING AND ZONING HISTORY

- In 1989, the then-owners applied for an SUP (SUP-0017-1989) for Bright Horizon's Day Care Center, which included fill to establish the building area on the western half of the property. A 145-foot scenic easement along the frontage is noted as extending from the centerline of John Tyler Highway. The easement preserves the vegetation at the front of the property.
- An SUP (SUP-00197-1994) was approved in June 1995 for an additional building to house infant and toddler classrooms, approximately 2,500 square feet.
- Bright Horizon's Day Care Center has since ceased operation, and the two buildings are currently vacant.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

**SPECIAL USE PERMIT-25-0014. 4300 John Tyler Highway, Williamsburg School for the Arts & Innovation
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing**

SURROUNDING ZONING AND DEVELOPMENT

- The following table lists the information on the adjacent parcels:

	ZONING DESIGNATION	EXISTING LAND USE	FUTURE LAND USE DESIGNATION
NORTH	PUD-R, Planned Unit Development - Residential and R-2, General Residential	The Settlement at Powhatan Creek and The Villas at Five Forks	Low Density Residential
SOUTH	R-8, Rural Residential and R-1, Limited Residential	Single-Family Dwellings	Low Density Residential
EAST	MU, Mixed Use and PL, Public Lands	Governors Grove at Five Forks, James City Service Authority (JCSA) Desalination Treatment Plant, and Clara Byrd Baker Elementary School	Moderate Density Residential and Federal, State, or County Land
WEST	R-1, Limited Residential and R-8, Rural Residential	Vacant Land and Single-Family Dwellings	Low Density Residential

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

SPECIAL USE PERMIT-25-0014. 4300 John Tyler Highway, Williamsburg School for the Arts & Innovation
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

Impacts/Potentially Unfavorable Conditions	Status <i>(No Mitigation Required/Mitigated/Not Fully Mitigated)</i>	Considerations/Proposed Mitigation of Potentially Unfavorable Conditions
<u>Public Transportation: Vehicular</u>	<u>No Mitigation Required</u>	- The proposed use is not anticipated to exceed 100 peak hour trips as the school will have small and staggered classes starting after the typical morning peak hour and before the evening peak hour. - The subject property is located on a minor arterial road. Staff finds the road is adequate for this use. - No changes are anticipated to the Level of Service (LOS) on John Tyler Highway. According to the Comprehensive Plan, the LOS is at Level A-C, and projects it to remain the same in 2045.
<u>Public Transportation: Bicycle/Pedestrian</u>	<u>No Mitigation Required</u>	- There are no changes to the existing footprint of the building, and bicycle and pedestrian accommodations are not required per Section 24-35(c)(2) of the Zoning Ordinance. - This location is not within walking distance of a Williamsburg Area Transit Authority bus stop.
<u>Public Safety</u>	<u>No Mitigation Required</u>	- Fire Station 3 on John Tyler Highway serves this area of the County and is 1.9 miles from the property. - Staff finds this project does not generate impacts that require mitigation to the County's Fire Department facilities or services.
<u>Public Schools</u>	<u>No Mitigation Required</u>	- N/A since no residential dwelling units are proposed.
<u>Public Parks and Recreation</u>	<u>No Mitigation Required</u>	- N/A since no residential dwelling units are proposed.
<u>Public Libraries and Cultural Centers</u>	<u>No Mitigation Required</u>	- Staff finds this project does not generate impacts that require mitigation.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

SPECIAL USE PERMIT-25-0014. 4300 John Tyler Highway, Williamsburg School for the Arts & Innovation
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

Impacts/Potentially Unfavorable Conditions	Status <i>(No Mitigation Required/Mitigated/Not Fully Mitigated)</i>	Considerations/Proposed Mitigation of Potentially Unfavorable Conditions
<u>Groundwater and Drinking Water Resources</u>	<u>Mitigated</u>	- The property is served by public water and sewer. - Staff recommends Condition No. 5 which would require the applicant to provide for review and approval by the James City Service Authority Water Conservation Standards prior to beginning operation pursuant to adopted Board of Supervisors policy, “Water Conservation Guidelines”.
<u>Watersheds, Streams, and Reservoirs</u> Project is located in the Powhatan Creek Watershed.	<u>No Mitigation Required</u>	- The Stormwater and Resource Protection Division has reviewed this application and had no objections. No new impervious surface is proposed as part of this SUP request. Should exterior site improvements be made in the future, those improvements will be subject to site plan approval and additional environmental review at that time.
<u>Cultural/Historic</u>	<u>No Mitigation Required</u>	- The subject property has been previously disturbed and has no known cultural resources on-site.
<u>Nearby and Surrounding Properties</u>	<u>No Mitigation Required</u>	- The subject property is located near residential and other uses. - The proposal includes no new associated development. Future expansions of the use will require an SUP amendment.
<u>Community Character</u>	<u>No Mitigation Required</u>	- John Tyler Highway is designated as a wooded Community Character Corridor and this parcel is located just outside of the Five Forks Community Character Area.
<u>Covenants and Restrictions</u>	<u>No Mitigation Required</u>	- There are no covenants associated with the property.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

SPECIAL USE PERMIT-25-0014. 4300 John Tyler Highway, Williamsburg School for the Arts & Innovation
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

COMPREHENSIVE PLAN

The site is designated Low Density Residential on the Comprehensive Plan Land Use Map. Properties to the north, south, and west are designated Low Density Residential. Mixed Use is located east of the site. For Low Density Residential, appropriate primary uses recommended by the Comprehensive Plan include single-family homes, multifamily units, accessory units, and cluster housing. Other uses including schools, places of public assembly, very limited commercial, and community-oriented facilities may also be considered appropriate should the proposal meet the following standards:

- Complements the residential character of the area.

Staff finds the proposal consistent with the residential character of the area, as no exterior changes to the building or property are proposed.

- Have traffic, noise, lighting, and other impacts similar to surrounding residential uses.

Traffic is anticipated to be typical of a community facility, and the traffic generated should not coincide with the peak traffic hours as the school will operate with staggered part-time classes. Outdoor activities will be minimal because the school is focused on arts and performances located within the buildings. The subject property must adhere to the County's Noise Ordinance, and there is no new lighting proposed. Existing signage would be updated but remain in the same location and size as it currently exists.

- Generally, be located on collector or arterial roads at intersections.

This property is located on, and is accessed from, John Tyler Highway. The Virginia Department of Transportation classifies John Tyler Highway as a minor arterial road.

- Provide adequate screening and buffering to protect the character of nearby residential areas.

Staff finds that existing vegetation provides adequate screening of the property from adjacent properties. There is a 145-foot scenic easement along the right-of-way, and along the rear and westward side of the property are wetlands in the floodplain which will remain in natural vegetated state.

STAFF RECOMMENDATION

Per the Impact Analysis noted above, staff finds the proposed use will not negatively impact surrounding property or development nor is it expected to negatively impact LOS for roads or other public services. Staff finds the proposal consistent with the Zoning Ordinance and Comprehensive Plan. Staff recommends the Board of Supervisors approve this application, subject to the attached proposed conditions.

AJ/ap
SUP25-14_4300JhnTylrHwy

Attachments:

1. Resolution
2. Location Map
3. Master Plan
4. Applicant Narrative
5. Citizens' Comments
6. Unapproved Minutes of the December 3, 2025 Planning Commission Regular Meeting

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

RESOLUTION

CASE NO. SUP-25-0014. 4300 JOHN TYLER HIGHWAY

WILLIAMSBURG SCHOOL FOR THE ARTS & INNOVATION

WHEREAS, the Board of Supervisors of James City County, Virginia (the “Board”), has adopted by Ordinance specific land uses that shall be subjected to a Special Use Permit (“SUP”) process; and

WHEREAS, Ms. Krista John of Williamsburg School of Arts & Innovation has applied for an SUP to allow for a school at 4300 John Tyler Highway and further identified as James City County Real Estate Tax Map Parcel No. 4620100035 (the “Property”); and

WHEREAS, the Planning Commission, following its public hearing on December 3, 2025, recommended approval of Case No. SUP-25-0014 by a vote of 6-0; and

WHEREAS, a public hearing was advertised, adjoining property owners notified, and a hearing conducted on Case No. SUP-25-0014; and

WHEREAS, the Board of Supervisors of James City County, Virginia, finds this use to be consistent with good zoning practices and the 2045 Comprehensive Plan Land Use Map designation for the Property.

NOW, THEREFORE, BE IT RESOLVED that the Board of Supervisors of James City County, Virginia, after consideration of the factors in Section 24-9 of the James City County Code (the “County Code”), does hereby approve the issuance of Case No. SUP-25-0014 as described herein with the following conditions:

1. Master Plan. This SUP shall permit a School on property located at 4300 John Tyler Highway, further identified as James City County Real Estate Tax Map Parcel No. 4620100035 (the “Property”). The use and layout of the Property shall be generally as shown on the document entitled “Plat Showing 5.67+ Acres 4300 John Tyler Highway Proposed Use For Williamsburg School for the Arts & Innovation” and date stamped October 27, 2025 (the “Master Plan”), with any deviations considered per Section 24-23(a)(2) of the Zoning Ordinance, as amended.
2. Location. The School shall be operated within the existing two buildings on the Property. Outdoor activities shall be limited to the fenced areas shown on the Master Plan.
3. Hours of Operation. The School (including any summer programs) shall be limited to hours of operation, which include drop-off and pick-up times, from 8 a.m.-8 p.m., Monday through Sunday.

4. Water Conservation Standards. Prior to any final building inspection, water conservation standards shall be submitted to, and approved by, the James City Service Authority. The standards may include, but shall not be limited to, such water conservation measures as limitations on the installation and use of irrigation systems and irrigation wells, the use of approved landscaping materials including the use of drought-tolerant plants where appropriate, and the use of water-conserving fixtures and appliances to promote water conservation and minimize the use of public water resources. The standards shall also include enforcement measures and responsibilities.
5. Maintenance of Parking Lot. Prior to any final building inspection, all parking spaces shall be clearly painted and appropriately signed where required within the existing parking lot.
6. Class Capacity. There shall be no more than thirty (30) students on-site at any one time. On or before July 1 of each year, school enrollment data for the previous calendar year and projected enrollment for the upcoming calendar year shall be provided to the Zoning Administrator, or designee. The enrollment numbers shall include the total number of children enrolled and the number of staff employed.
7. Commencement of Use. A final building inspection shall be obtained within eighteen (18) months from the date of approval of this SUP, or this SUP shall automatically be void.
8. Discontinuance of Use. Should the use permitted by this SUP be discontinued for a period of two (2) years, the SUP shall become void.
9. Severance Clause. This SUP is not severable, invalidation of any word, phrase, clause, sentence, or paragraph shall invalidate the remainder.

?????

Chair, Board of Supervisors

ATTEST:

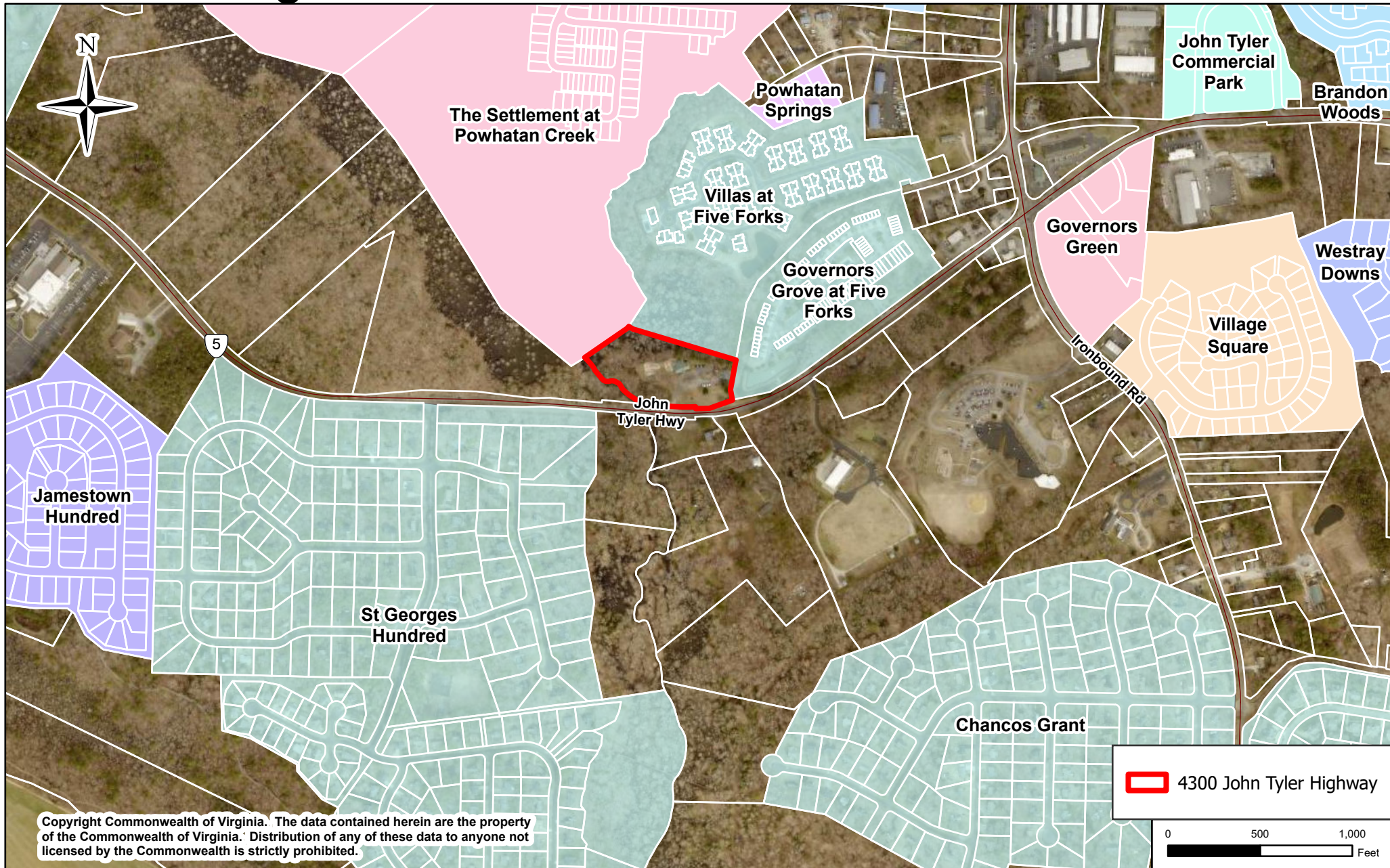
Teresa J. Saeed
Deputy Clerk to the Board

	VOTES			
	<u>AYE</u>	<u>NAY</u>	<u>ABSTAIN</u>	<u>ABSENT</u>
WAINWRIGHT	_____	_____	_____	_____
NULL	_____	_____	_____	_____
LARSON	_____	_____	_____	_____
MCGLENNON	_____	_____	_____	_____
ICENHOUR	_____	_____	_____	_____

Adopted by the Board of Supervisors of James City County, Virginia, this 13th day of January, 2026.

SUP25-14_4300JhnTylrHwy-res

SUP-25-0014, 4300 John Tyler Hwy Williamsburg School for the Arts & Innovation



N OR F
HIDEN ESTATE
W.B. 14, PG. 675
P.B. 28, PG. 29
TAX PARCEL: (46-2)(1-1)

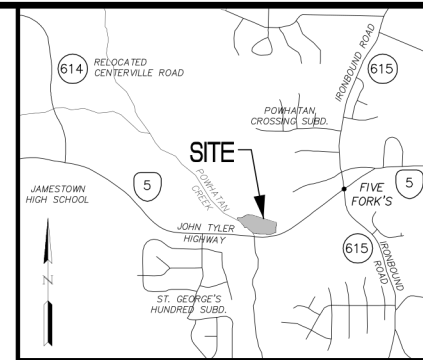
GRAPHIC SCALE

50' 0' 50' 100'

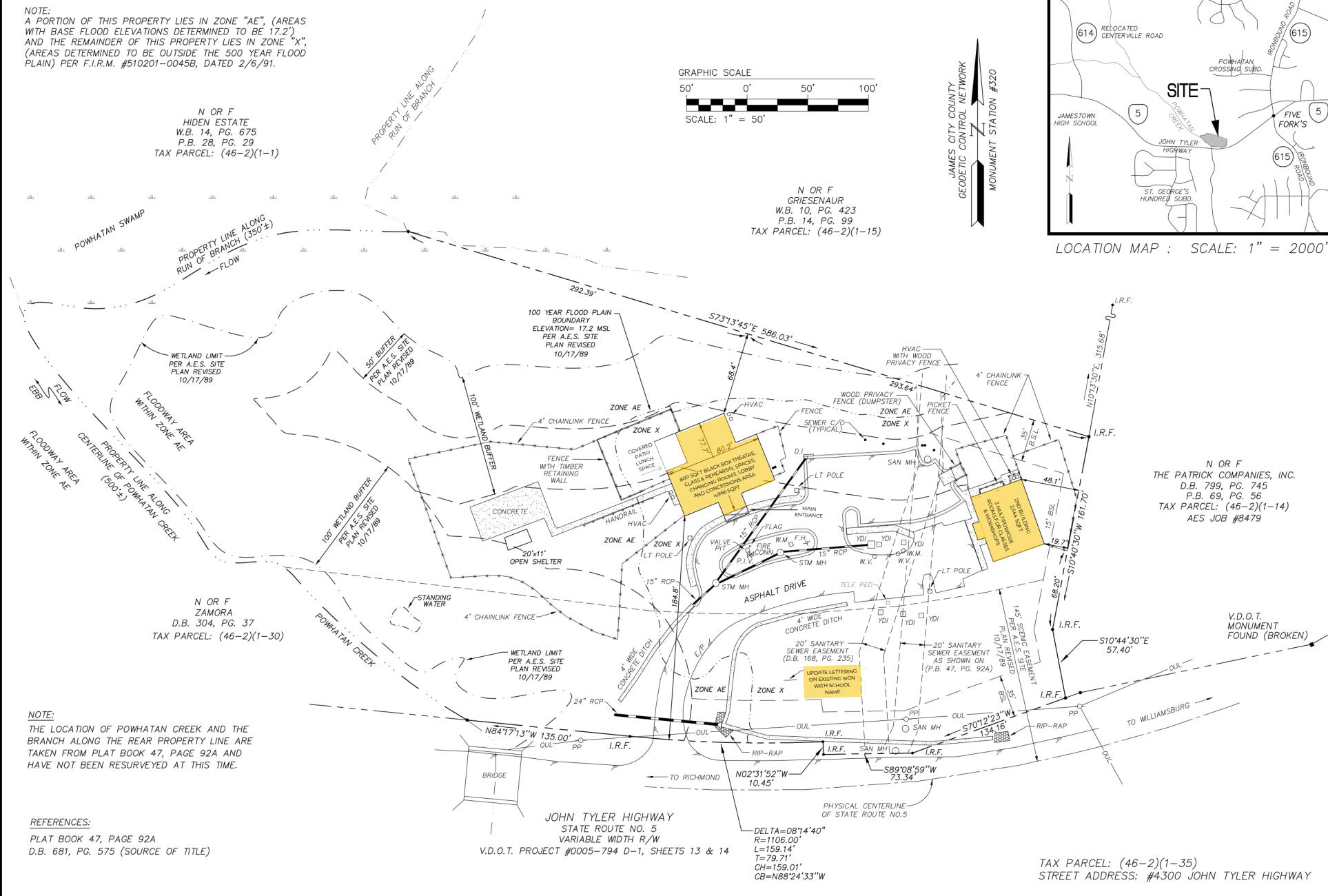
SCALE: 1" = 50'

N OR F
GRIESENUR
W.B. 10, PG. 423
P.B. 14, PG. 99
TAX PARCEL: (46-2)(1-15)

JAMES CITY COUNTY
GEODETIC CONTROL NETWORK
MONUMENT STATION #320

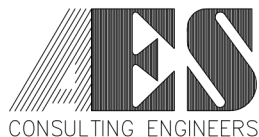


LOCATION MAP : SCALE: 1" = 2000'



06.30.99-10:57 730901P1.DWG

JFS



PLAT SHOWING 5.67+ ACRES
4300 JOHN TYLER HIGHWAY PROPOSED USE
FOR WILLIAMSBURG SCHOOL FOR THE ARTS &
INNOVATION

BERKELEY DISTRICT JAMES CITY COUNTY VIRGINIA

	10/20/25	MARKUPS ADDED FOR SPECIAL USE PERMIT	
No.	DATE	REVISION / COMMENT / NOTE	B

Designed CMA	Drawn JFS
Scale 1"=50'	Date 6/23/99
Project No. 7039-1	
Drawing No. 1 OF 1	

Community Impact Statement



4300 & 4336 John Tyler Highway
Williamsburg, Virginia

Prepared by Krista John

Community Impact Statement

Williamsburg School for the Arts & Innovation (WSA) seeks approval of a Special Use Permit to repurpose 4300 John Tyler Highway into a small, community-based arts education campus. Building on the property's long history as a licensed childcare and educational facility, WSA will offer flexible, part-time daytime programs for homeschool students and limited summer camps, as well as afterschool arts and theatre workshops with occasional small-scale performances. The proposed use preserves the site's educational character, and introduces arts programming that enriches local youth and families.

Property Overview

Williamsburg School for the Arts & Innovation (WSA) respectfully requests approval of a Special Use Permit (SUP) for the property located at 4300 John Tyler Highway (Parcel ID 4620100035) in James City County. The 5.7-acre property lies within the Primary Service Area (PSA) and is zoned R-8, Rural Residential. The site includes two existing buildings, a paved parking lot with approximately 32 parking spaces, a playground, and open green space.

This property has served the community as a licensed childcare and preschool facility continuously since 1990. WSA's proposed use builds upon this long-standing educational legacy, repurposing the site as a community-based arts education center. The project retains the property's educational character while enhancing its community value through youth theatre, performing arts, design, and creative learning opportunities for local students and families.

Purpose and Educational Vision

The mission of WSA is to create a welcoming, creative environment where children and families can explore the arts through performance and collaboration. The campus will serve as a permanent home for arts education and youth theatre in Williamsburg, offering meaningful enrichment experiences that complement public, private, and homeschool education.

The larger of the two buildings will be transformed into a multiuse instructional and performance facility featuring an 800 sqft flexible black box theatre with space for 70 non-fixed seats, a classroom and rehearsal space, a small lobby,, concession space, restrooms, and backstage dressing rooms. The theatre will primarily host rehearsals, creative arts classes, workshops, student showcases, and small-scale community performances.

The smaller building will contain three multiuse rooms used for classes, workshops, and rehearsals. Both spaces are designed for low-traffic educational use and community engagement.

Operations and Schedule

WSA operates on a flexible, part-time daily schedule designed to meet the needs of homeschool families and community participants, ensuring minimal traffic impact and maintaining a quiet neighborhood presence.

- **Daytime educational and enrichment programs:** Offered between 9:00 a.m. and 4:00 p.m. on select weekdays. These programs are part-time classes for homeschool students, who attend on rotating or customized schedules (typically 1–3 days per

week). Enrollment is session-based, with small class sizes (10-15 students) and naturally staggered arrivals and departures. During June through August, WSA will offer a number of arts and theatre camps that follow similar hours and group sizes.

- **Afterschool arts and theatre programs:** Offered on weekday afternoons and evenings (approximately 4:00–8:00 p.m.), these programs focus on theatre rehearsals, visual arts, music, dance, and creative workshops. Occasional student showcases or small-scale performances will be held in the black box theatre.
- **Occasional weekend use:** The property may be used for special rehearsals, student showcases, or community workshops. There are no regular weekend operating hours planned.

At any given time, 2–5 staff members will be on site. Typical afternoon rehearsals involve 25–30 students, maintaining a low and manageable site occupancy.

Traffic, Parking, and Site Impact

Because WSA operates on a session-based and staggered schedule, there are no concentrated drop-off or pick-up periods. Students and families arrive and depart throughout the day, minimizing peak traffic. The program does not utilize school buses or vans; all transportation is via family vehicle.

The existing parking lot, with 32 paved spaces, is sufficient for daily operations. For occasional evening showcases or community events, WSA will manage on-site parking through staff direction and scheduled attendance windows.

Parking guidelines typically recommend one space per three seats for fixed-seating venues, with fewer spaces needed when seating is flexible. Because WSA's theatre will feature adaptable, non-fixed seating within an 800–900 sq. ft. area, the space will serve multiple functions, including classroom instruction, rehearsals, and small performances, resulting in a substantially lower parking demand than a traditional fixed-seat venue.

See Table A below for more parking details.

Community Benefits

The proposed use maintains the educational and community-serving nature of the property while introducing vibrant, arts-centered programming that strengthens James City County's cultural and educational landscape.

Through this project, WSA will:

- Support homeschool families with creative, part-time learning options during daytime hours;
- Provide after-school enrichment in the performing and visual arts for local students;
- Offer small, family-friendly performances and workshops that foster community connection; and
- Revitalize an existing educational property through a low-impact, sustainable reuse consistent with the site's history and the county's vision for community enrichment.

WSA's presence at 4300 John Tyler Highway will create a welcoming hub for creativity and collaboration, nurturing the next generation of artists, innovators, and community leaders while maintaining harmony with the neighborhood's character and infrastructure.

Summary of Operations and Site Use

Category	Details
Property Address	4300 John Tyler Highway, Williamsburg, VA 23188
Zoning	R-8, Rural Residential
Parcel Size	5.7 acres
Existing Facilities	Two buildings, 32-space paved parking lot, playground, open green space
Primary Use	Educational and arts programming for youth (part-time)
Daytime Programs	9:00 a.m. – 4:00 p.m., select weekdays; homeschool enrichment and summer camps
Afterschool Programs	4:00 p.m. – 8:00 p.m., select weekdays; theatre, art, and music workshops
Weekend Use	Occasional workshops or small events
Average Class Size (Daytime)	10-15

Average Group Size (Afterschool)	25–30 students
Staff on Site	2-5 personnel at any given time
Traffic and Parking	Staggered drop-off/pick-up; no buses; 32-space lot sufficient for daily use
Performance Space	Flexible, non-permanent seating (up to 70 seats); multiuse for classes and performances
Summer Operations	Limited June–August arts and theatre camps (same hours and scale as daytime programs)

A. Traffic Impact Analysis

Based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition, Land Use Code 534 (Private School, K–12) and adjusted for occasional theatre use, the proposed operations at Williamsburg School for the Arts & Innovation (WSA) are expected to generate fewer than 100 peak-hour trips, remaining below the threshold that would trigger a formal traffic impact study. The black box theatre will feature 70 flexible, non-permanent seats and will be used for occasional small-scale performances rather than daily operations. Audience arrivals and departures will be staggered and actively managed through advance ticketing, scheduled call times, and on-site staff direction. All access will occur via the existing single driveway and internal one-way loop, with 32 on-site parking spaces sufficient to accommodate daily use and managed event attendance. No changes to the driveway, circulation pattern, or parking layout are proposed. The project is expected to have a minimal traffic impact and remain well within the capacity of the surrounding roadway network.

B. Adequate Public Facilities – Water and Sewer

The school's anticipated daily water and sewer usage will not exceed existing capacity. Based on enrollment projections and standard calculations of gallons per student per day, total daily flow will remain well below the 15,500 gallons/day threshold that would require a formal water and sewer impact study. All water conservation guidelines of the James City Service Authority (JCSA) will be followed.

See attached letter with waiver requests as outlined below.

- C. Environmental Information** - Requesting waiver.
- D. Adequate Public Facilities Report (Schools, Fire, Libraries, etc.)** Requesting waiver.
- E. Additional On-Site/Off-Site Public Facilities or Services** - Requesting waiver.
- F. Phase IA Archaeological Study** - Requesting waiver.
- G. Preliminary Natural Resource Inventory** - Requesting waiver.
- H. Fiscal Impact Analysis** - Requesting waiver.
- I. Parks and Recreation Information** - Requesting waiver.

Summary

Williamsburg School for the Arts & Innovation (WSA) seeks to establish a permanent home for youth theatre and arts education in Williamsburg—a long-standing community need that has, until now, lacked a dedicated space. Designed as a creative, part-time learning campus, WSA will offer daytime arts and enrichment programs for homeschool students, after-school theatre and arts workshops, and occasional small-scale performances in a flexible, non-fixed 70-seat black box theatre. These programs will provide local students with opportunities to learn collaboratively, think critically, and express themselves creatively while engaging deeply with their community through the performing and visual arts. The project has already generated strong enthusiasm and support from families, educators, and local organizations who recognize the importance of cultivating arts experiences for young people. Importantly, WSA will operate entirely within the property's existing footprint, reusing current buildings and preserving open space. The flexible schedule—featuring small class sizes and staggered arrivals and departures—ensures a minimal impact on traffic, utilities, and neighborhood character.

By repurposing this former educational facility as a vibrant center for creativity and performance, WSA will become a lasting community asset that supports James City County's goals for educational excellence, cultural vitality, and sustainable development. This initiative will ensure that Williamsburg's youth have a dedicated place to create, perform, and grow for generations to come.

Table A

Description	Parking Spots
Existing Parking Spaces	32 (single paved lot)
Daily Staff Parking Need	2-4 spaces
Estimated Daily Parent/Visitor Parking Need	14-18 spaces
Total Estimated Daily Use	+/- 20 spaces
Bus/Van Parking	None required

Allison Jackura

From: Jessica Weber <thewebers11@gmail.com>
Sent: Wednesday, November 19, 2025 8:10 PM
To: Allison Jackura
Subject: [External]Support for Permit Approval – Williamsburg School for the Arts & Innovation

Dear James City County Planning Staff,

My name is Jessica Weber, and I live in Skipwith Farms here in the City of Williamsburg. I am writing to express my strong support for the permit approval for Williamsburg School for the Arts & Innovation (WSA).

WSA provides tremendous value to local families by offering high-quality alternative education options, homeschool enrichment, and expanded youth arts programming—needs that are growing rapidly in our community. Programs like WSA fill an important gap by giving students access to creative, innovative, and academically meaningful opportunities beyond what traditional settings can always provide.

As a parent/local resident, I have seen firsthand how impactful this type of program can be for students. It supports diverse learning styles, nurtures creativity, and strengthens community engagement. Families in our area deeply benefit from having educational choices that honor both academic excellence and the arts.

I respectfully ask the County to approve WSA's permit so that this vital resource can continue serving the children and families of James City County.

Thank you for your consideration and for your ongoing commitment to our community.

Warm regards,

Jessica Weber

City of Williamsburg Resident but impacted by James City County

Allison Jackura

From: Valerie Kinkad <valkinkad@gmail.com>
Sent: Sunday, November 23, 2025 12:55 PM
To: Allison Jackura
Cc: Krista John
Subject: [External]Letter in Support of Williamsburg School of Arts and Innovation

Dear Allison,

I am writing this letter to voice my support for the Williamsburg School of Arts and Innovation whose special use permit is coming up for review in December.

As our world and society changes in response to advances in technology, our education system needs to change with it. Traditional public schools are consistently falling behind in providing quality, individualized education, especially for students who struggle with the traditional school model of large class sizes and "one size fits all" curriculum. Parents need more individualized options to help meet the needs of their students and WSA is making strides to help fill that need.

As I have been a teacher at WSA over the last 4 months, and as two of my own children have attended classes there, I have seen the dedication and professionalism of Krista and Garry John as they have overcome many obstacles to pursue their dream of creating an educational space for children in the Williamsburg Community. I have been so impressed with how they have multiplied the gifts and talents of community members to help create a rich educational option for families in our community. Their production of the Wizard of Oz was phenomenal and provided an amazing theater experience for everyone involved. I have no doubts that as their special use permit is approved, they will continue to build upon and improve their program that will be a treasured asset to the Williamsburg Area.

Please approve the Special Use application for Williamsburg School of Arts and Innovation so that this program can continue to grow and provide needed alternative educational and cultural opportunities for students in our community.

Sincerely,

Valerie Kinkad
James City County Resident
9400 Ottoway Ct.
Toano, VA 23168

Allison Jackura

From: Fiona Heller <Fiona.welsh.90@hotmail.co.uk>
Sent: Sunday, November 23, 2025 5:56 PM
To: Allison Jackura
Subject: [External]Williamsburg School of the arts

Good evening Allison,

My name is Fiona Heller and I am writing in connection with WSA (Williamsburg School of the arts). I live in Lake Powell neighborhood, just off of Jamestown Road in Williamsburg. We moved here from the UK almost 2 years ago for my husbands job within the UK government. At home I am a qualified psychiatric nurse but my nursing degree isn't recognized here so I have been unable to practice. I am currently employed as the costume and Fiber arts teacher at WSA.

I have been supporting Krista and her dream for WSA from near the beginning. I was teaching her daughter Izzy to sew in a 1:1 capacity and she asked me to come on board with the vision to sew/make/repurpose all of the costumes needed for the Page to Stage shows from the classroom. This idea is beneficial to the students learning to sew/repurpose items as well as to the Page to Stage team who already have a huge workload!

Since being in the USA I have been surprised by how many families choose home school and use other educational options in comparison to the UK. An establishment such as WSA offers those families who want to home school some enrichment activities which maybe they wouldn't be exposed to otherwise, it also gives families other options than home schooling or the local authority schooling. The fees are set that it is affordable to most and the team here are very open and approachable if there was any need for financial help, this could be organized easily.

Due to the flexibility of WSA, both in what's available and how much or little the students can attend, in my opinion, would fit in with most families needs!

The first semester didn't go, in some areas, quite as expected but in others it excelled! In the first few weeks of our class students were able to thread a sewing machine independently, wind a bobbin, trouble shoot basic glitches on the machines, do some basic hand sewing, follow a sewing pattern and much more! In the areas that didn't quite go to plan the team have taken a step back, reflected and dealt with this in a professional way whilst always keeping the students at the center of all decisions and changes so they are only ever positively impacted!

In summary, there is nothing quite like WSA in Williamsburg, I am in full support of this, in time I really believe it will continue to develop into something really amazing and sought after!

Thanks for taking the time to read. Happy to answer any further questions if any arise.

Many thanks

Fi Heller

Sent from [Outlook for Android](#)

Allison Jackura

From: Amber B <amberfbray@gmail.com>
Sent: Thursday, November 27, 2025 4:07 PM
To: Allison Jackura
Subject: [External]WSA/PageToStage Permit

Dear Ms. Jackura,

My name is Amber Bray and I am writing to share about my family's recent experience with WSA/Page to Stage. Our family has resided in the Hampton Roads area for 15 years and most recently in Yorktown for the last 3 years. Our oldest daughter has been involved in music, singing, and theater in a variety of avenues for the last 7 years. The reason for the variety is the lack of opportunities available to youth in this area that want to perform. There are several places that offer lessons,, but not many that put it together into a production.

In September, our daughter auditioned and landed a role with Page to Stage. As a family that has worked with a variety of local theater groups, we couldn't have been more impressed with their kindness, organization and overall presentation of the production. This amazing group of adults went above and beyond for the kids in this production. My daughter was eager to attend rehearsals, mentor younger students, learn from new instructors and perform at the Kimball. Finding a group like Page to Stage was such a blessing and we are so excited and hopeful they will continue to grow and provide more opportunities for the local theater children. It is very difficult to find opportunities that don't require a yearly commitment and lock children into one show a year.

We are also a homeschooling family and have been for 6 years. I am hopeful Williamsburg School for the Arts will expand to high school so that my oldest can attend. They do an amazing job providing an alternative option for homeschool families with so many enrichment opportunities. Each year, I talk to so many new homeschool families that are looking for options and having a place like WSA that can provide for homeschoolers, as well as youth arts programming, would be such an asset to the local area.

Thank you for taking the time to read through my email. I do hope WSA will be allowed to continue their growth and expand the options available to families like my own. The individuals in charge are top notch and I have so much respect for them because of what they've already accomplished and the positive impact they're making on our youth!

Sincerely,
Amber Bray
137 Mill Lane
Yorktown VA 23692

Allison Jackura

From: Megan_Ochoa <Megan_Ochoa@proton.me>
Sent: Monday, December 1, 2025 10:29 AM
To: Allison Jackura
Subject: [External]Letter of Support for Williamsburg School for the Arts & Innovation

To the County Planning Commission,

I am writing in support of Williamsburg School for the Arts & Innovation and the tremendous value it provides to local families and students. Programs like WSA are increasingly important as our community continues to see a growing need for alternative education options, homeschool enrichment, and greater access to high-quality youth arts programming.

My experience with WSA has been extremely positive. The school offers a creative, supportive environment where my children can learn in ways that truly fit their needs. Opportunities like this are vital for families seeking flexible, enriching educational pathways that may not be available through traditional models.

I strongly encourage James City County to support WSA in its efforts to expand access and continue serving the many families who depend on programs like this.

Sincerely,

Megan Ochoa

Wellington Estates

Sent with [Proton Mail](#) secure email.

Allison Jackura

From: Kathy Williams <willfam7plus@gmail.com>
Sent: Tuesday, December 2, 2025 6:57 PM
To: Allison Jackura
Subject: [External]Special Use Permit for Williamsburg School of the Arts

Good evening Ms. Jackura,

My name is Kathy Williams and I am a special education teacher in the Williamsburg-James City County Public School system. I am writing to express my strong support for approving the Special Use Permit for Williamsburg School of the Arts & Innovation (WSA).

As a public school educator, I deeply value the essential role that our public schools play in our community. My support for WSA is *not* a statement against public education, nor do I see programs like WSA as a replacement for the vital services public schools provide. Rather, I support WSA because I recognize that there are students for whom the traditional public school environment is not a good fit. These students still deserve meaningful opportunities for social-emotional growth and community connection during the school day.

My youngest daughter is one of those students. She is autistic, ADHD, and struggles with dyslexia. Earlier this year, on the recommendation of her psychiatrist, we made the difficult decision to withdraw her from public school due to severe anxiety and depression. As parents, we did not take this step lightly. Unfortunately, there are very few daytime options in our area that can provide safe, supportive, and enriching environments for students like her.

WSA has filled that gap for us. The program provides social interaction as well as educational enrichment in a small-group, relaxed setting that meets her unique needs. Attending WSA has been invaluable for her mental health and overall well-being. Quite honestly, I do not know what we would do without this resource in the Williamsburg area.

Approving the Special Use Permit would not only support families like ours, but would also broaden the range of educational and enrichment opportunities available to children in our community—especially for those who require flexible, alternative environments to thrive.

Thank you for considering this request and for your commitment to the well-being of all children in Williamsburg-James City County. I respectfully urge you to approve the Special Use Permit for Williamsburg School of the Arts.

Sincerely,

Kathy Williams
103 Wake Robin Road
Williamsburg, VA 23185
willfam7plus@gmail.com
757-927-4266

Unapproved Minutes of December 3, 2025 Planning Commission Regular Meeting

1. SUP-25-0014. Williamsburg School for the Arts & Innovation

Ms. Allison Jackura, Senior Planner, gave a presentation to the Commission stating that Williamsburg School for the Arts & Innovation had applied for an SUP to occupy the existing building at 4300 John Tyler Hwy. Ms. Jackura noted that the land is currently zoned R-8, Rural Residential, and is designated as low density residential on the comprehensive plan.

Ms. Jackura explained that the school is primarily geared towards homeschool students, focused on art and theater. Ms. Jackura noted that parking is to be in the existing lot, and there are no exterior changes proposed. Ms. Jackura stated that staff recommends that the Planning Commission recommend approval.

Mr. Haldeman opened the Public Hearing.

Ms. Krista John, 4 Sheffield Road, gave a presentation to the Commission about the proposed project.

Mr. Logan John, 4 Sheffield Road, addressed the Commission, speaking in favor of the proposed project.

Mr. Haldeman asked for all in attendance who were in support of the proposed project to stand.

Ms. Sylvie Berquist, 126 Crown Point Road, addressed the Commission in support of the project.

Ms. Mabel Thorpe, 2668 Sir Thomas Way, addressed the Commission in support of the proposed project.

Ms. Izzy John, 4 Sheffield Road, spoke in support of the proposed project.

Mr. Haldeman closed the Public Hearing.

Mr. Polster made a motion to approve SUP-25-0014. Williamsburg School for the Arts & Innovation with conditions.

On a roll call vote, the Commission voted to recommend approval. (6-0)

SPECIAL USE PERMIT-25-0007. 4797 Fenton Mill Road Contractor's Office
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

SUMMARY FACTS

Applicant:	Mr. Pedro Fuster, Heavy Duty Brothers, LLC
Landowner:	Heavy Duty Brothers, LLC
Proposal:	To allow for the construction of an approximately 3,500-square-foot building with a potential future 2,000-square-foot addition to be used as a contractor's office.
Location:	4797 Fenton Mill Road
Tax Map/Parcel No.:	2410100002A
Property Acreage:	± 2 acres
Zoning:	A-1, General Agricultural
Comprehensive Plan:	Rural Lands
Primary Service Area (PSA):	Outside
Staff Contact:	Will Albiston, Planner

PUBLIC HEARING DATES

Planning Commission:	December 3, 2025, 6:00 p.m.
Board of Supervisors:	January 13, 2026, 5:00 p.m.

FACTORS FAVORABLE

1. With the proposed conditions (Attachment No. 1), staff finds the proposal compatible with surrounding zoning and development and consistent with the *Our County, Our Shared Future: James City County 2045 Comprehensive Plan*.
2. This proposal is significantly less impactful than a typical contractor's business, due to the very limited outdoor operations.
3. Impacts: See Impact Analysis on Pages 4-6.

FACTORS UNFAVORABLE

1. Impacts: See Impact Analysis on Pages 4-6.

PLANNING COMMISSION RECOMMENDATION

At its December 3, 2025, Regular Meeting, the Planning Commission recommended approval of this application, subject to the proposed conditions by a vote of 5-1.

PROPOSED CHANGES MADE SINCE THE PLANNING COMMISSION MEETING

There have been no proposed changes since the Planning Commission meeting.

SUMMARY STAFF RECOMMENDATION

Staff recommends the Board of Supervisors approve this application, subject to the proposed conditions.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

PROJECT DESCRIPTION

Mr. Fuster has applied for a Special Use Permit (SUP) to allow for the construction of an approximately 3,500-square-foot building with a potential future addition of no larger than 2,000 square feet to be used as a contractor's office to accommodate current business plans with anticipated growth. In the A-1, General Agricultural Zoning District contractors' warehouses, sheds, and offices require an SUP. Should this SUP be approved by the Board of Supervisors, any development on the site associated with this proposal would be required to be consistent with the Master Plan, SUP conditions, and Zoning Ordinance. The existing dilapidated shop building will be torn down and the new building is proposed to be built within its existing footprint. Based on information provided by the applicant, Heavy Duty Brothers, LLC, is a licensed Class A contractor specializing in residential new construction, remodeling, concrete work, and light excavation with three to five full-time employees.

As shown on the floor plan (Attachment No. 5), the building will consist of a shop area, a storage area, an office, and a bathroom. The applicant has provided the following information regarding expected on-site operations related to the contractor's office:

- The hours of operation will be Monday through Saturday, 7 a.m. to 7 p.m.
- No outdoor storage or operations are expected beyond one trash can or dumpster, use of the parking area identified on the Master Plan, and material deliveries that would occur approximately twice a week. Proposed Condition No. 4 has been included to prohibit further outdoor storage or operations at the site.

- The applicant has indicated he expects to store a skid steer, dump trailer, scissor lift, man lift, lumber, drywall, and other various construction materials inside the building. If the listed equipment is needed at a job site, it would stay at the job site until the job is completed.
- The applicant has stated that his employees typically spend their days at job sites. Mr. Fuster expects to be the only person to frequently use this building. Occasional visits from subcontractors, inspectors, and material deliveries are expected.
- The office space will be used for administrative tasks, customers are not expected to visit the site.
- The applicant anticipates future growth of his business would lead to a future addition of no more than 2,000 square feet to the building for a possible showroom, additional office space, or additional storage.

The building will continue to be served by the existing driveway. The driveway will be widened to 20 feet to conform to Fire Department's commercial access standards. This driveway also serves the adjacent house located at 4803 Fenton Mill Road and the two mobile homes on the subject property. The applicant is proposing a new fence around the contractor's office building and parking area to better separate it from the adjacent residential uses and manage access to the parking area and building with a swing gate.

PLANNING AND ZONING HISTORY

- An SUP was approved in 2001 to allow for a family subdivision of a parcel generally 3.0 acres in size to be subdivided into the subject 2-acre parcel and the adjacent 1-acre parcel at 4803 Fenton Mill Road.

SPECIAL USE PERMIT-25-0007. 4797 Fenton Mill Road Contractor's Office
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

- The existing two manufactured homes on the site were installed and permitted in 2003. They are currently nonconforming and must adhere to Article VII of the Zoning Ordinance.

SURROUNDING ZONING AND DEVELOPMENT

- All surrounding parcels are zoned A-1, General Agricultural.
- All surrounding parcels are designated Rural Lands on the Comprehensive Plan.

	ZONING DESIGNATION	EXISTING LAND USE	FUTURE LAND USE DESIGNATION
NORTH	A-1, General Agricultural	Forested Land	Rural Lands
SOUTH	A-1, General Agricultural	Single- Family Residential	Rural Lands
EAST	A-1, General Agricultural	Single- Family Residential	Rural Lands
WEST	A-1, General Agricultural	Single- Family Residential	Rural Lands

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

SPECIAL USE PERMIT-25-0007, 4797 Fenton Mill Road Contractor's Office Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

Impacts/Potentially Unfavorable Conditions	Status <i>(No Mitigation Required/Mitigated/Not Fully Mitigated)</i>	Considerations/Proposed Mitigation of Potentially Unfavorable Conditions
<u>Public Transportation: Vehicular</u>	<u>No Mitigation Required</u>	- The contractor's office/warehouse will not exceed 100 peak hour trips. - The building will continue to be served by the existing driveway with improvements. - The Virginia Department of Transportation will require the entrance of the driveway onto Fenton Mill Road to be paved from the road to the right-of-way line.
<u>Public Transportation: Bicycle/Pedestrian</u>	<u>No Mitigation Required</u>	- Per the Adopted Regional Bikeways Map and Pedestrian Accommodations Master Plan, neither a bike lane nor pedestrian accommodations are required. - This location is not within walking distance of a Williamsburg Area Transit Authority bus stop.
<u>Public Safety</u>	<u>No Mitigation Required</u>	- Fire Station 1 on Forge Road serves this area of the County and is approximately five miles from the property. - The Fire Department has reviewed the proposal and does not have concerns with the Master Plan.
<u>Public Schools</u>	<u>No Mitigation Required</u>	- Staff finds this project does not generate impacts that require mitigation.
<u>Public Parks and Recreation</u>	<u>No Mitigation Required</u>	- Staff finds this project does not generate impacts that require mitigation.
<u>Public Libraries and Cultural Centers</u>	<u>No Mitigation Required</u>	- Staff finds this project does not generate impacts that require mitigation.
<u>Groundwater and Drinking Water Resources</u>	<u>No Mitigation Required</u>	- The property is on a private well and septic. - The Virginia Department of Health has reviewed the proposal and does not have concerns with the Master Plan.

Impacts/Potentially Unfavorable Conditions	Status (No Mitigation Required/Mitigated/Not Fully Mitigated)	Considerations/Proposed Mitigation of Potentially Unfavorable Conditions
<u>Watersheds, Streams, and Receptors</u> Project is located in the Skim Creek Watershed.	<u>Mitigated</u> County Planning and Development has reviewed this application and commented that analysis of stormwater needs will be required during site plan review.	The Stormwater and Resource Protection Division has reviewed this application and commented that analysis of stormwater needs will be required during site plan review. - Stormwater management including adherence to the Special Stormwater Policy will be ensured during site plan review. - Condition Nos. 9 and 10 prevent the purchase of offsite nutrient credits and limit the use of Forested Open Space to address water quality standards respectively.

SPECIAL USE PERMIT-25-0007. 4797 Fenton Mill Road Contractor's Office
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

Impacts/Potentially Unfavorable Conditions	Status <i>(No Mitigation Required/Mitigated/Not Fully Mitigated)</i>	Considerations/Proposed Mitigation of Potentially Unfavorable Conditions
<u>Watersheds, Streams, and Reservoirs</u> Project is located in the Skimino Creek Watershed.	<u>Mitigated</u>	- The Stormwater and Resource Protection Division has reviewed this application and commented that analysis of stormwater needs will be required during site plan review. - Stormwater management including adherence to the Special Stormwater Criteria Policy will be ensured during site plan review. - Condition Nos. 9 and 10 prevent the purchase of offsite nutrient credits and limit the use of Forested Open Space to address water quality standards respectively.
<u>Cultural/Historic</u>	<u>No Mitigation Required</u>	- The subject property has been previously disturbed and has no known cultural resources on-site.
<u>Nearby and Surrounding Properties</u>	<u>Mitigated</u>	- The project will need to demonstrate full compliance with lighting and landscaping regulations in the Zoning Ordinance at the site plan stage. - The Landscape Ordinance requires transitional buffers between properties with conflicting land uses. This requirement will mitigate impacts to the adjacent properties with single-family residences. - Proposed Condition No. 3 requires a similar transitional buffer for the two manufactured homes on the subject property. - Proposed Condition No. 4 restricts outdoor operations and storage of equipment and material. - Proposed Condition No. 5 requires the screening of trash cans, dumpsters, HVAC, and mechanical units. - Proposed Condition No. 6 provides for lighting standards for the project to minimize impacts to adjacent properties. - Proposed Condition No. 7 prohibits retail sales on the property and limits hours of operation from 7 a.m. to 7 p.m., Monday through Saturday. - Proposed Condition No. 8 limits deliveries to the site from 8 a.m. to 5 p.m., Monday through Friday.
<u>Community Character</u>	<u>No Mitigation Required</u>	- Fenton Mill Road is not a Community Character Corridor and this parcel is not located within a Community Character Area.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

SPECIAL USE PERMIT-25-0007. 4797 Fenton Mill Road Contractor's Office
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

Impacts/Potentially Unfavorable Conditions	Status <i>(No Mitigation Required/Mitigated/Not Fully Mitigated)</i>	Considerations/Proposed Mitigation of Potentially Unfavorable Conditions
<u>Covenants and Restrictions</u>	<u>No Mitigation Required</u>	- The applicant has verified that he is not aware of any covenants or restrictions on the property that prohibit the proposed use.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

COMPREHENSIVE PLAN

The site is designated Rural Lands on the Comprehensive Plan Land Use Map.

Per the Comprehensive Plan, appropriate primary uses include traditional agricultural and forestal activities, but also innovative agriculture, horticulture, silviculture, specialty or niche farming, commercial and noncommercial equine opportunities, agri-tourism, rural-based public or commercial recreation, rural-support businesses, and certain public or semi-public and institutional uses that require a spacious site and are compatible with the natural and rural surroundings.

Staff Analysis: This proposal is not consistent with the primary recommended uses for Rural Lands.

Retail and other commercial uses serving Rural Lands are encouraged to be located at planned commercial locations on major thoroughfares inside the PSA. However, appropriately scaled and located direct agricultural or forestal-support uses (including agri-business and eco-tourism), home-based occupations, or certain uses which require very low-intensity settings relative to the site in which it will be located may be considered on a case-by-case review, provided such uses are compatible with the natural and rural character of the area and are in accordance with the Rural Lands Development Standards.

Staff Analysis: This proposal consists of very limited outdoor operations and storage, minimal anticipated traffic impacts, and landscaping and screening requirements set forth in the proposed conditions and the Landscape Ordinance. While it is not an agricultural or forestal use, staff finds the proposed scale of the business would be a very low-intensity operation which would not negatively impact the natural and rural character of the area.

According to the Rural Lands Development Standards for Use and Character Compatibility, uses should reflect and enhance the rural character of the County. Particular attention should be given to the following:

- i. Locating structures and uses outside of sensitive areas.

Staff Analysis: This standard is met as no sensitive areas have been identified on the site.

- ii. Maintaining existing topography, vegetation, trees, and tree lines to the maximum extent possible, especially along roads and between uses.

Staff Analysis: This standard is met as no regrading or vegetation clearing is proposed.

- iii. Discouraging development on farmland, open fields, scenic roadside vistas, and other important agricultural/forestal soils and resources.

Staff Analysis: This standard is met as this development is not located in any of the areas described above and is within the footprint of an existing structure.

- iv. Encouraging enhanced landscaping to screen structures located in open fields using a natural appearance or one that resembles traditional hedgerows and windbreaks.

Staff Analysis: This standard does not directly apply as this project is not within an open field. However, the transitional buffers achieve similar results, although on a smaller scale than noted in this standard.

SPECIAL USE PERMIT-25-0007. 4797 Fenton Mill Road Contractor's Office
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

- v. Locating new driveways or service roads so that they follow existing contours and old roadway corridors whenever feasible.

Staff Analysis: This standard does not apply as no new driveways are proposed.

- vi. Generally limiting the height of structures to an elevation below the height of surrounding mature trees and scaling buildings to be compatible with the character of the existing community.

Staff Analysis: This standard is met as the height of the proposed structure is lower than most of the surrounding mature trees.

- vii. Minimizing the number of street and driveway intersections along the main road by providing common driveways.

Staff Analysis: This standard is met by maintaining use of the existing shared driveway.

- viii. Utilizing lighting only where necessary and in a manner that eliminates glare and brightness.

Staff Analysis: This standard is satisfied by the requirements in Proposed Condition No. 6, which prohibit light trespass of 0.1-foot candle or greater across property lines and limits the height of light fixtures.

The preservation and reuse of existing structures and ensuring the existing road network is suitable to proposed developments are recommendations for developments in Rural Lands. This proposal is consistent with both of these recommendations.

STAFF RECOMMENDATION

Per the Impact Analysis noted above, staff finds the proposed use does not negatively impact surrounding property or development nor is it expected to negatively impact roads or other public services. Staff finds that this proposal is consistent with the Zoning Ordinance and generally consistent with the Rural Lands designation of the Comprehensive Plan.

Staff recommends the Board of Supervisors approve this application, subject to the proposed conditions.

WA/ap
SUP25-7_4797FentonMll

Attachments:

1. Resolution
2. Location Map
3. Master Plan
4. Applicant's Narrative
5. Building Elevations and Floor Plan
6. Citizen Correspondence
7. Unapproved Minutes of the December 3, 2025, Planning Commission Regular Meeting

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

RESOLUTION

CASE NO. SUP-25-0007. 4797 FENTON MILL ROAD CONTRACTOR'S OFFICE

WHEREAS, the Board of Supervisors of James City County, Virginia (the "Board"), has adopted by Ordinance specific land uses that shall be subjected to a Special Use Permit ("SUP") process; and

WHEREAS, Mr. Pedro Fuster of Heavy Duty Brothers, LLC, has applied for an SUP to allow for the construction of an approximately 3,500-square-foot building with a potential future 2,000-square-foot addition to be used as a contractor's office at 4797 Fenton Mill Road and further identified as James City County Real Estate Tax Map Parcel No. 2410100002A (the "Property"); and

WHEREAS, the Planning Commission, following its public hearing on December 3, 2025, recommended approval of Case No. SUP-25-0007 by a vote of 5-1; and

WHEREAS, a public hearing was advertised, adjoining property owners notified, and a hearing conducted on Case No. SUP-25-0007; and

WHEREAS, the Board of Supervisors of James City County, Virginia, finds this use to be consistent with good zoning practices and the 2045 Comprehensive Plan Land Use Map designation for the Property.

NOW, THEREFORE, BE IT RESOLVED that the Board of Supervisors of James City County, Virginia, after consideration of the factors in Section 24-9 of the James City County Code (the "County Code"), does hereby approve the issuance of Case No. SUP-25-0007 as described herein with the following conditions:

1. Master Plan. This SUP shall be valid for the construction and operation of a contractor's office and accessory uses thereto (the "Project") on the Property. The Project shall be developed and constructed substantially in accordance with the Master Plan titled "SUP-25-0007 Master Plan" dated November 19, 2025 (the "Master Plan"), with any deviations considered per Section 24-23(a)(2) of the James City County Zoning Ordinance, as amended.
2. Architectural Review. All building elevations, locations, and future expansions shall be generally consistent with the Master Plan and the building elevations shown on the document entitled "Pedro Fuster Office Building 4757 Fenton Mill Rd," dated May 16, 2025. The building shall have a neutral color scheme. The colors and building materials shall be submitted to the Director of Planning or designee for review and approval prior to final site plan approval.
3. Transitional Buffer and Fencing. A transitional buffer consisting of landscaping and fencing as generally shown on the Master Plan shall be required between the two manufactured homes and the Contractor's Office building and parking area. The perimeter fencing shown on the Master Plan shall be wooden fencing. Privacy fencing shall not be permitted facing Fenton Mill Road. The side and rear perimeter fencing shown on the Master Plan shall be wooden fencing with a height between 6 feet and 8 feet from grade. All fencing shall be shown on the site plan for the Project to include, but not limited to, a detail showing the proposed height, building material, and color. The proposed fencing shall be reviewed and approved by the Director of Planning or designee for consistency with this condition and the Master Plan prior to final site plan approval.

4. Outdoor Operations and Storage. With the exception of one (1) trash can or dumpster and the parking of vehicles, defined as passenger vehicles, pickup trucks, and vans, no outdoor operations or storage of equipment or materials including soil stockpiles defined by Section 24-46 of the Zoning Ordinance shall be permitted on the Property.
5. Screening of Site Features. All trash cans, dumpsters, and HVAC, and mechanical units serving the Project shall be screened by landscaping, an enclosure composed of wood, masonry, closed-cell PVC, prefinished metal, or cementitious panels, in detail and colors to blend with adjacent construction materials. Such features and enclosures shall be shown on the site plan and shall be reviewed and approved by the Director of Planning or designee for consistency with this condition prior to final site plan approval.
6. Lighting. All light poles and building-mounted fixtures shall not exceed 20 feet in height from finished grade. No light trespass, defined as 0.1 foot-candle or higher, shall extend across any property line as a component of or result of this Project. Lights shall be operated by a motion detector or be able to be turned on as needed. Lights shall not be routinely illuminated from dusk until dawn.
7. Limitations. No retail sales shall occur on the Property. The hours of operation shall be limited to 7 a.m. to 7 p.m., Monday through Saturday.
8. Deliveries. Deliveries, including trash pickup, shall be limited from 8 a.m.-5 p.m., Monday through Friday.
9. Offsite Nutrient Credit Purchase Prohibited. The purchase of offsite nutrient credits for the treatment of water quality for the Contractor's Office shall be prohibited.
10. Forested Open Space. The use of Forested Open Space is limited to 25% of the required water quality required for the Contractor's Office.
11. Site Plan. A site plan shall be required for this Project. Final approval of the site plan shall be obtained within 24 months of issuance of this SUP, or the SUP shall become void.
12. Severance Clause. This SUP is not severable. Invalidation of any word, phrase, clause, sentence, or paragraph shall invalidate the remainder.

??????

Chair, Board of Supervisors

ATTEST:

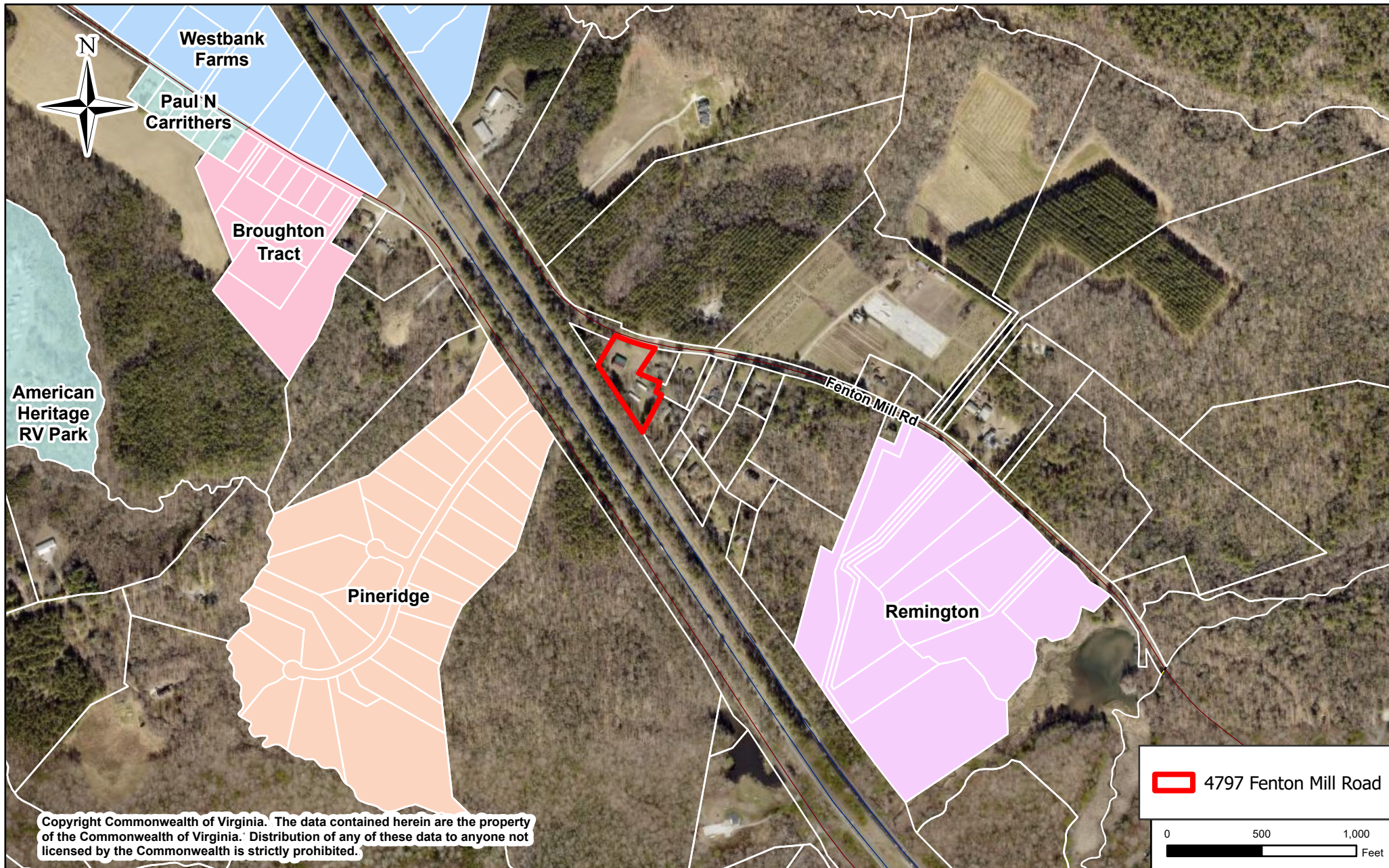
Teresa J. Saeed
Deputy Clerk to the Board

	VOTES			
	AYE	NAY	ABSTAIN	ABSENT
WAINWRIGHT	_____	_____	_____	_____
NULL	_____	_____	_____	_____
LARSON	_____	_____	_____	_____
MCGLENNON	_____	_____	_____	_____
ICENHOUR	_____	_____	_____	_____

Adopted by the Board of Supervisors of James City County, Virginia, this 13th day of January, 2026.

SUP25-7_4797FentonMll-res

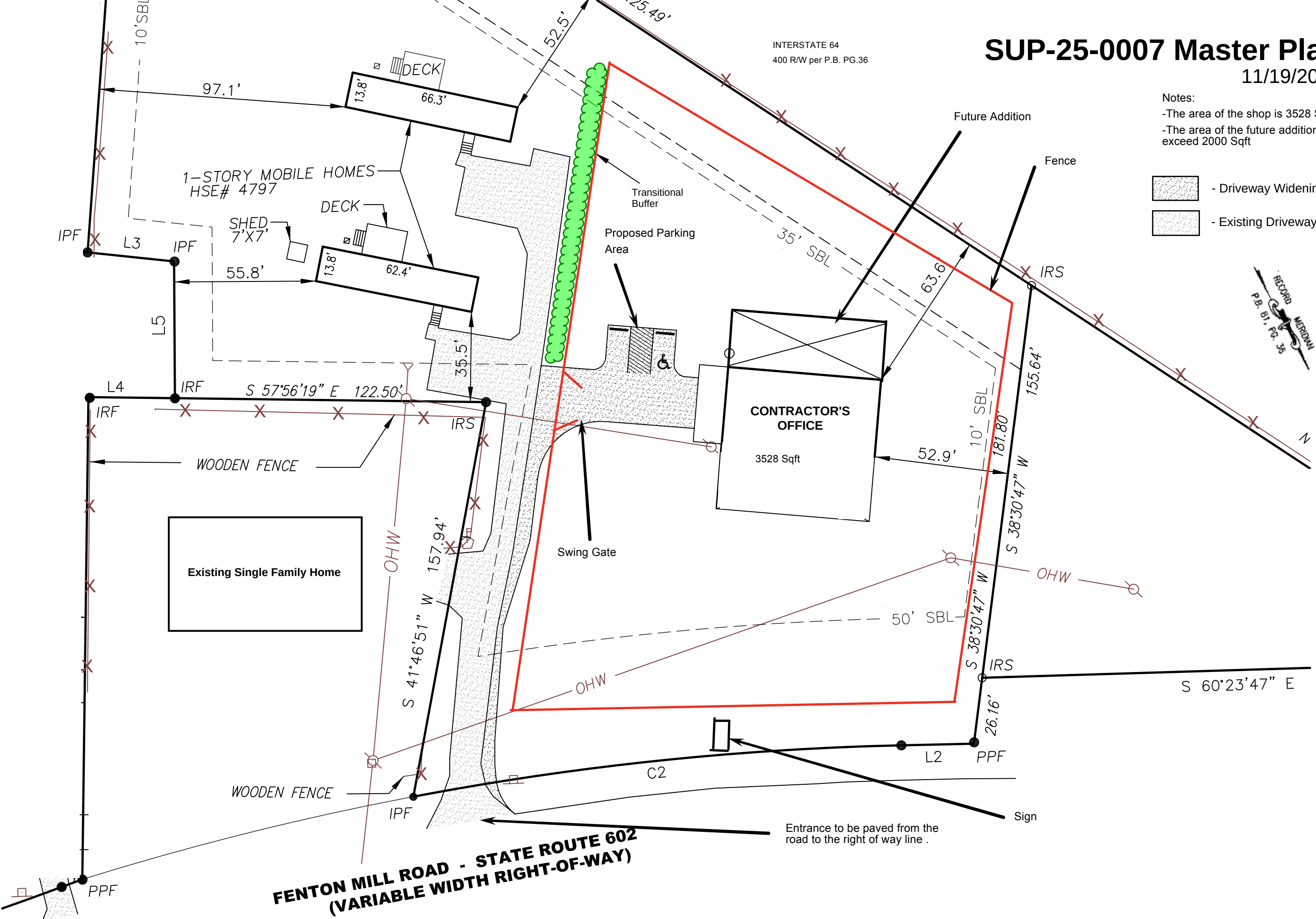
SUP-25-0007, 4797 Fenton Mill Road Contractor's Office



SUP-25-0007 Master Plan
11/19/2025

Notes:
-The area of the shop is 3528 Sqft
-The area of the future addition not exceed 2000 Sqft

- Driveway Widening
- Existing Driveway



Heavy Duty Brothers LLC

Overview:

Heavy Duty Brothers LLC is a licensed Class A contractor business specializing in residential and commercial construction. Our company provides general contracting services for new builds, renovations, remodeling, and commercial work. We pride ourselves on delivering high-quality, code-compliant construction with a focus on safety, efficiency, and customer satisfaction.

Weekly Operating Hours:

- Monday to Saturday: 7:00 AM – 7:00 PM
- Closed on Sundays (except for emergency calls or special projects)

Services Offered:

- Residential new construction (homes, additions, garages)
- Interior and exterior remodeling
- Commercial tenant improvements
- Concrete work (driveways, sidewalks, pads)
- Framing, drywall, painting, and finish carpentry
- Light excavation and site preparation

Number of Employees:

- The business currently operates with a small crew of 3–5 full-time employees, including field workers and a project manager.

Site Traffic – Who Comes and Goes:

- Employees start day at the job site, they normally don't come to the the shop .
- Company manager is the person that normally come to the shop to perform paper work .
- Occasional visits from subcontractors, inspectors, or material delivery drivers.
- Material deliveries (e.g., lumber, drywall, are typically scheduled during morning hours and occur about 2 times per week.
- In case of meeting the employees will be directed to park inside of the building if there is more of one person.

Equipment & Outdoor Storage:

- Approximately 4 pieces of equipment are stored on-site at the shop. This includes:
 - Skid steer
 - Dump trailer

- Scissor lift
- Man lift

- All equipment is parked in a designated area inside of the building and does not interfere with public or residential access.

Future Plans:

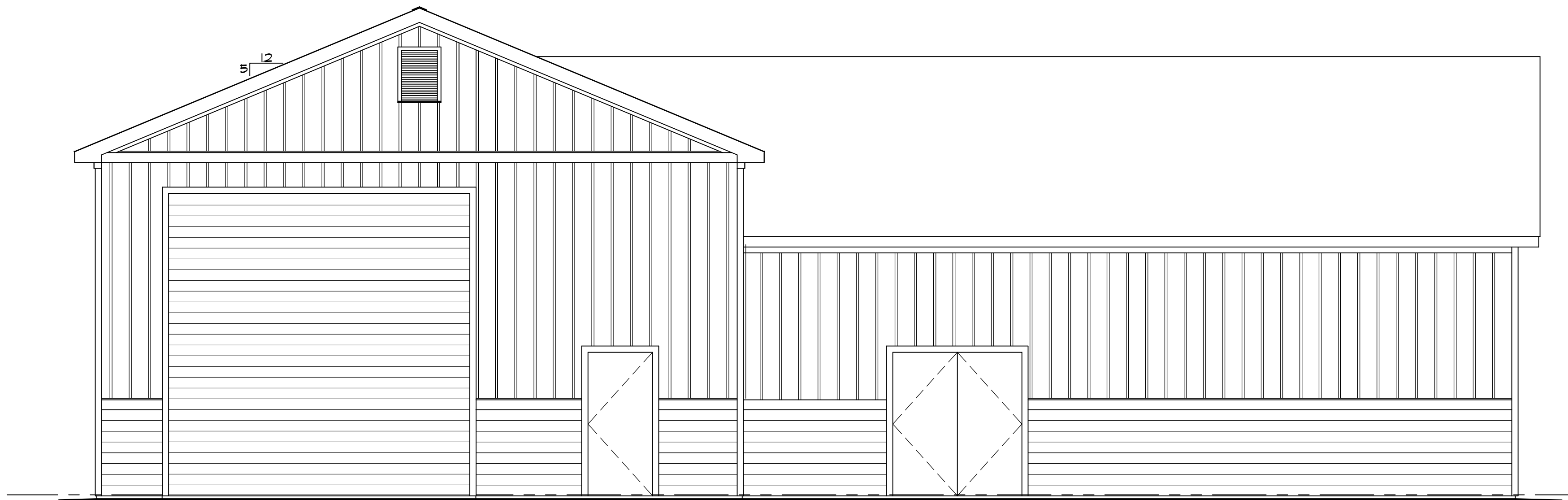
- The business may expand operations to include a small showroom or office for client meetings and material displays.
- As project volume increases, the company may add an additional employee and purchase 1–2 more pieces of equipment.
- The site is expected to remain sufficient for future needs with only minor modifications (e.g., adding a small shed or carport for covered storage).

Mobile Home Operations:

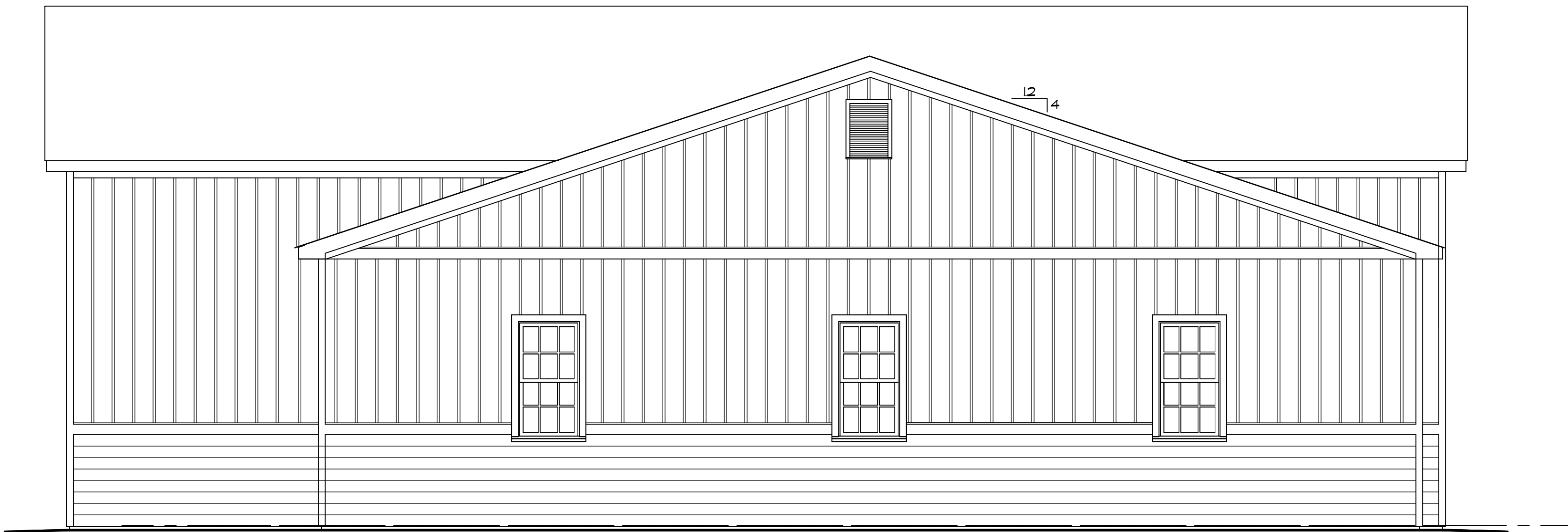
The existing mobile home use on the property will remain unchanged. The current operation consists of long-term monthly rentals only. No changes to the number of units, layout, or usage are planned at this time. There are no short-term or transient rentals, and all tenants are on month-to-month lease agreements.

Building Elevation Description (Proposed Shop/Structure):

The building will be a single-story structure with an approximate height of 20 feet and will not exceed a maximum height of 25 feet. The design will include a pitched roof, overhead garage doors, and side access entry. Exterior finishes will be consistent with light commercial use, such as metal siding or vinyl, with a neutral color scheme. The elevation will be appropriate for the surrounding area and designed to comply with local zoning and height restrictions.



FRONT ELEVATION
SCALE: 1/4"=1'-0"



RIGHT SIDE ELEVATION
SCALE: 1/4"=1'-0"

Pedro Fuster Office Building

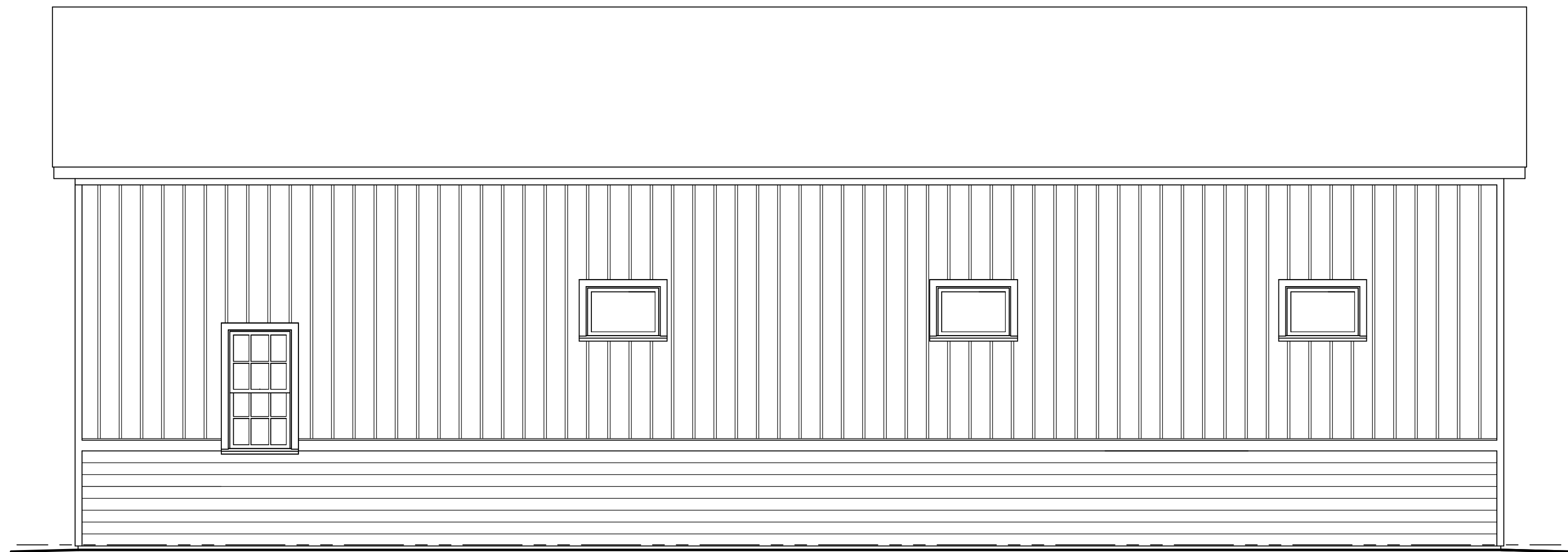
4797 Fenton Mill Rd

James City County, Va

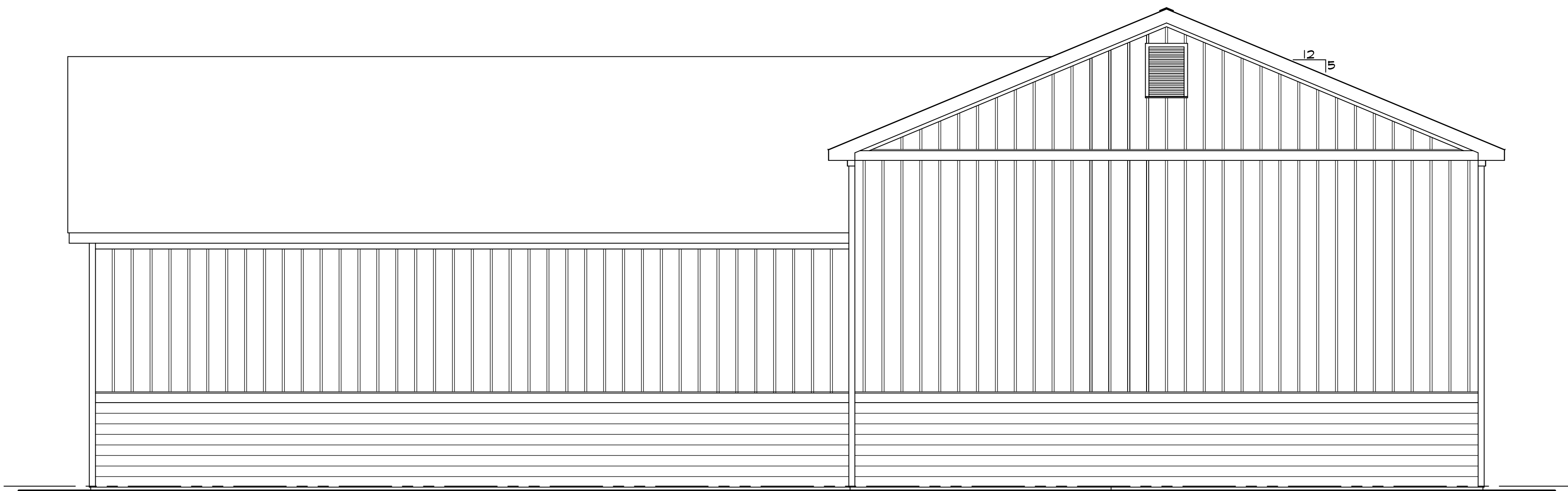
Exterior Elevations

Date	05-16-2025
Drawn	GAQ
Checked	GAQ
Project	202525

A-3



LEFT SIDE ELEVATION
SCALE: 3/8"=1'-0"



REAR ELEVATION
SCALE: 3/8"=1'-0"

Pedro Fuster Office Building

4797 Fenton Mill Rd

James City County, Va

Exterior
Elevations

Date	05-16-2025
Drawn	GAQ
Checked	GAQ
Project	202525

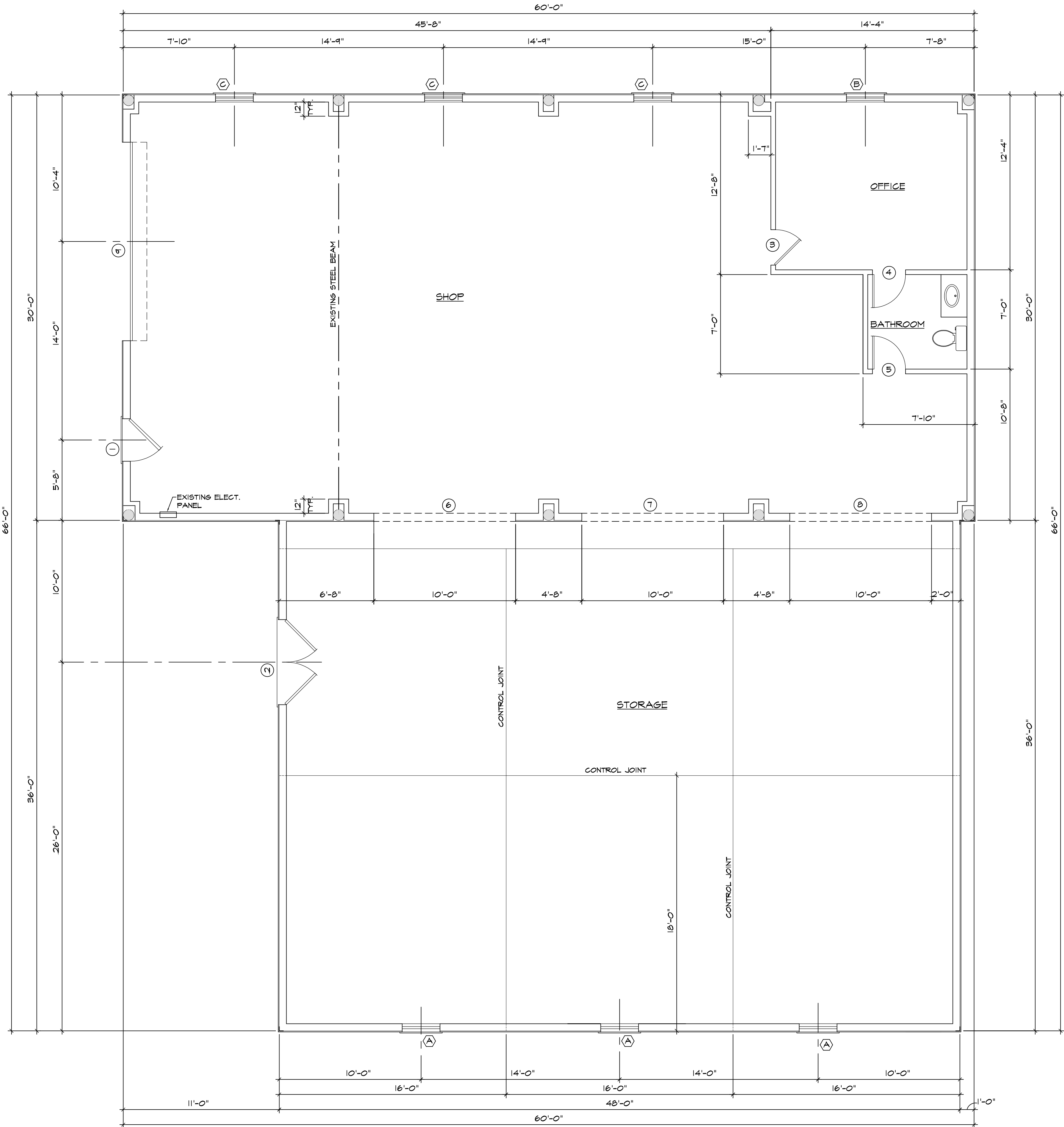
A-4

WINDOW SCHEDULE				
MK.	SIZE (SASH)		TYPE	DESCRIPTION
	WIDTH	HEIGHT		
A	2'-8"	5'-2"	VINYL CLAD	DOUBLE HUNG
B	3'-0"	5'-2"	VINYL CLAD	DOUBLE HUNG
C	3'-0"	2'-0"	VINYL CLAD	AWNING (FIXED)

DOOR SCHEDULE				
MK.	SIZE		THK.	DESCRIPTION
	WIDTH	HEIGHT		
1	3'-0"	6'-8"	1 3/4"	FIBERGLAS CLAD ENTRY SYSTEM
2	6'-0"	6'-8"	1 3/4"	FIBERGLAS CLAD ENTRY SYSTEM
3	2'-6"	6'-8"	1 3/4"	INTERIOR SOLID CORE, AS SELECTED
4	2'-4"	6'-8"	1 3/8"	INTERIOR HOLLOW CORE, AS SELECTED
5	2'-4"	6'-8"	1 3/8"	INTERIOR HOLLOW CORE, AS SELECTED
6	10'-0"	8'-0"	--	CASED OPENING
7	10'-0"	8'-0"	--	CASED OPENING
8	10'-0"	8'-0"	--	CASED OPENING
9	14'-0"	14'-0"	1 3/4"	OVERHEAD ROLL-UP GARAGE DOOR

NOTE:
WINDOW ROUGH OPENING HEAD HEIGHTS
(A) 9'-2"
(B) 7'-10"
(C) 9'-2"

GENERAL NOTES
ALL CONSTRUCTION AND FABRICATION WILL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE I.R.CODE AND THE VIRGINIA STATEWIDE BUILDING CODE.



FLOOR PLAN
SCALE: 1/4"=1'-0"

Pedro Fuster Office Building
4797 Fenton Mill Rd
James City County, Va

Floor Plan

Date 05-16-2025
Drawn GAQ
Checked GAQ
Project 202525

Concerning the Special Use Permit for a Contractor's Office at 4797 Fenton Mill Road

Elizabeth Boley

4803 Fenton Mill Road
Williamsburg, VA 23188

Planning Commission of James City County, Virginia

101-A Mounts Bay Road
Williamsburg, VA 23187

11/30/2025

Dear Members of the James City County Planning Commission,

I am writing to respectfully express my concerns regarding my new neighbor's request for a special use permit to build and operate a Contractor's Office next to my property. While I wish to maintain a civil and amicable relationship with my neighbors and I do not want to create any conflict, I would like my concerns to be considered during your review process.

I am concerned about the potential increase in traffic and noise. The presence of additional vehicles, including large work trucks coming and going, could impact the quiet enjoyment of our properties. Residents in this area purchased homes with the understanding that the surrounding parcels were zoned for agricultural purposes, which offers a peaceful environment and limited industrial/commercial activities.

I have lived on my property for 45 years and have already witnessed a significant increase in noise coming from the interstate since my new neighbor has taken ownership of the adjacent property. Many of the trees that acted as a sound barrier were removed and have already diminished the peaceful environment to some extent. A business would continue to add traffic and operational noise.

Another important consideration is the effect this new business would have on the value of our properties. Many of us invested in our homes expecting the continuation of the agricultural zoning. It contributes to the appeal and value. A commercial contractor operation adjacent to us raises concerns about the marketability and desirability of our properties, both now and in the future.

I again would like to emphasize my intention is not to foster any ill will with my new neighbors. I am simply asking that my concerns, as well as those of other residents who share them, be thoughtfully addressed before a decision on the SUP is made.

Thank you for your attention to this matter. I trust that the Planning Commission will carefully weigh the interests of all parties and make a decision that preserves the quality of life and property values in our community.

Sincerely,

Elizabeth Boley

4803 Fenton Mill Road
Williamsburg, VA 23188
757-903-8689
m.boleyn@live.com

Will Albiston

Subject: [External]SUP-25-0007 4797 Fenton Mill Road

From: Matt Gerike <mattgerike@gmail.com>

Sent: Monday, December 1, 2025 3:04 PM

To: Community Development <community.development@jamescitycountyva.gov>

Cc: Jay Everson <Jay.Everson@jamescitycountyva.gov>; Will Albiston <Will.Albiston@jamescitycountyva.gov>; Shannon White <shannonhwhite@gmail.com>

Subject: [External]SUP-25-0007 4797 Fenton Mill Road

Dear James City County Planning Commission,

We recently received a letter about a public hearing for a Special Use Permit (SUP-25-0007) at 4797 Fenton Mill Road to be held the evening of Wednesday December 3, 2025. We are unable to attend due to work commitments.

In reviewing the Master Plan, reports, and other permit documents online, we have two comments.

1. What considerations are there for lighting the new sign along Fenton Mill Rd? Will the sign be internally or indirectly lit? Will lighting be consistent 24-7, or dimmed or turned off after hours or at night? We are not opposed to a sign, but note that if lit, this would be the only stand-alone lit commercial sign on Fenton Mill Rd in James City County between the Old Mill Pond and Croaker Road. The Nice building is not signed and the MillFarm Christmas Trees & Berry Farm sign is not lit. We ask that consideration be given to methods of lighting that would allow people to see the sign during business hours but would not change the lighting character of the road after hours or especially at night (perhaps between 9pm and 7am or the dusk to dawn condition for the commercial building) by turning it off or using automated sensors to adjust LED brightness.

2. A transitional vegetation buffer is shown on the Master Plan between the contractor's office and the mobile homes on site. No vegetation buffer is shown between the home at 4803 Fenton Mill Rd and the driveway that may carry increased traffic to the contractor's office. There is a new fence shown on the Master Plan on the contractor's office side of the driveway, but this would only screen the contractor's office and not traffic to or from it. The driveway access to 4803 is from the shared driveway and there is a short wooden fence that separates the backyard at 4803 from the driveway. It may be equitable to consider a vegetative buffer between the existing wooden fence at 4803 and the shared driveway, and possibly between part of the front yard of 4803 and the driveway, as a buffer to increased traffic on the shared drive. The property owner at 4803 should be given consideration as the ask for special use may negatively impact their property.

Thank you for making the permit documents openly available and allowing us to participate in this public process.

Matthew J. Gerike and Shannon H. White
4809 Fenton Mill Rd
785-341-3895

Unapproved Minutes of December 3, 2025 Planning Commission Regular Meeting

1. SUP-25-0007. 4797 Fenton Mill Road Contractor's Office

Mr. Will Albiston, Planner, presented to the Commission stating that Mr. Pedro Fuster, of Heavy Duty Brothers LLC, had applied for a Special Use Permit (SUP) to allow for the construction of an approximately 3,500 square-foot building with a potential future addition of no larger than 2,000 square feet to be used as a contractor's office at 4797 Fenton Mill Road. Mr. Albiston noted that the property is approximately 2 acres in size, zoned A-1, General Agricultural, designated Rural Lands on the 2045 Comprehensive Plan Land Use Map, and located outside of the Primary Service Area. Mr. Albiston explained that in the A-1 Zoning District, contractors' warehouses, sheds, and offices require an SUP.

Mr. Albiston stated that should this SUP be approved by the Board of Supervisors, any development on the site associated with this proposal would be required to be consistent with the Master Plan, SUP conditions, and Zoning Ordinance. Mr. Albiston noted that as part of the applicant's proposal, the existing dilapidated shop building on the property would be torn down and a new building is proposed to be built within its existing footprint.

Mr. Albiston explained to the Commission the proffers and conditions the applicant proposed for lighting, traffic, design, and hours of operation.

Mr. Albiston explained that the Landscape section of the Zoning Ordinance would require transitional buffers between properties with conflicting land uses. Mr. Albiston noted that these buffers were not shown on the Master Plan, but Proposed Condition No. 3 required a similar transitional buffer for the two manufactured homes on the subject property as shown on the Master Plan.

Mr. Albiston stated that given the Proposed Conditions, Master Plan, and Code requirements, staff finds the proposal compatible with surrounding zoning and development. Mr. Albiston explained that staff finds that this proposal is consistent with the Zoning Ordinance and generally consistent with the Rural Lands designation of the Comprehensive Plan.

Mr. Albiston stated that Staff recommends the Planning Commission recommend approval of this application to the Board of Supervisors, subject to the proposed conditions.

Mr. Polster stated that he did not find the condition for landscape buffering in the staff report.

Mr. Albiston explained that Condition No. 3 in effect ensures that the buffer shown on the master plan is in place but does not speak to the other transitional buffers.

Discussion ensued.

Mr. Everson asked if the proposed sign would be illuminated.

Mr. Albiston stated that the sign would not be illuminated.

Mr. Everson asked if the proposed 20-foot light poles would be around the office building.

Mr. Albiston explained that the 20-foot requirement for any light poles or mounted fixtures does not apply to any lighting around or inside of the proposed sign.

Discussion ensued.

Mr. Rodgers asked about the neighboring mobile homes that are non-conforming.

Mr. Albiston stated that because the SUP is not related to mobile homes, they could not be addressed in the conditions. Mr. Albiston explained that mobile homes are grandfathered into the current Zoning Ordinance, and if no significant changes are made, they will remain legally non-conforming.

Mr. Haldeman asked if the proposed future addition would be approved if this SUP were to be granted.

Mr. Albiston stated that was correct.

Mr. Everson disclosed that he spoke with an adjacent property owner.

Mr. Haldeman opened the Public Hearing.

Ms. Elizabeth Bowley, 4803 Fenton Mill Road, stated she was an adjacent property owner and addressed the Commission with concerns about the proposed project.

Ms. Felicia Manley, 4807 Fenton Mill Road, stated she was also an adjacent property owner and had concerns about the proposed project.

Mr. Haldeman closed the Public Hearing.

Mr. Rodgers asked what had previously operated out of the dilapidated shop building currently on the property.

Mr. Albiston explained that it was labeled as a metal shop on the most recent plat, but staff were not aware of a current use.

Mr. Polster asked for clarification on whether the use list for properties zoned A-1, General Agricultural, prohibits a contractor's office.

Mr. Albiston stated that a contractor's office in A-1 is a specially permitted use that requires two public hearings and is permitted with an SUP.

Mr. Haldeman asked if storage of petroleum products is permitted at the proposed site.

Mr. Albiston stated that it is permitted indoors per the conditions.

Mr. Everson stated he was not in support of the project and expressed concerns about approving the proposed expansion. Mr. Everson explained that he did not find it

compatible with the surrounding area and shared concerns with the adjacent property owners.

Mr. Everson made a motion to deny SUP-25-0007. 4797 Fenton Mill Road Contractor's Office.

On a roll call vote, the Commission voted to not recommend denial. (5-1)

Mr. Polster made a motion to approve SUP-25-0007. 4797 Fenton Mill Road Contractor's Office.

On a roll call vote, the Commission voted to recommend approval. (5-1)

**SPECIAL USE PERMIT-25-0013. 5255 Riverview Road Family Subdivision
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing**

SUMMARY FACTS

Applicant: Mr. Chase Grogg, Landtech Resources Inc.

Landowner: Ms. Hazel Richardson

Proposal: Family subdivision to create one new parcel of $\pm$ 3.01 acres with one remainder parcel of $\pm$ 36.76 acres inside the Croaker Agricultural and Forestal District (AFD).

Location: 5255 Riverview Road

Tax Map/Parcel No.: 1530100034

Current Zoning: A-1, General Agricultural

Project Acreage: $\pm$ 39.77 acres

Comprehensive Plan: Rural Lands

Primary Service Area: (PSA) Outside

Staff Contact: Will Albiston, Planner

PUBLIC HEARING DATES

AFD Advisory Committee: November 20, 2025, 4:00 p.m.

Board of Supervisors: January 13, 2026, 5:00 p.m.

FACTORS FAVORABLE

1. With the proposed conditions, staff finds the proposal compatible with the surrounding zoning and development.
2. Impacts: See Impact Analysis on Page 3.

FACTORS UNFAVORABLE

1. Impacts: See Impact Analysis on Page 3.

AGRICULTURAL AND FORESTAL DISTRICT ADVISORY COMMITTEE RECOMMENDATION

At its November 20, 2025, meeting, the AFD Advisory Committee voted 6-0 to recommend approval of the application to the Board of Supervisors.

PROPOSED CHANGES MADE SINCE THE AGRICULTURAL AND FORESTAL DISTRICT ADVISORY COMMITTEE MEETING

None.

SUMMARY STAFF RECOMMENDATION

Staff recommends the Board of Supervisors approve this application, subject to the attached conditions.

PROJECT DESCRIPTION

Mr. Chase Grogg, Landtech Resources Inc., has applied for a Special Use Permit (SUP) on behalf of Ms. Hazel Richardson, for a family subdivision creating one new parcel of $\pm$ 3.01 acres. The remainder parcel will be $\pm$ 36.76 acres. The new parcel will be owned by Ms. Christy Sechrist and Mr. Jacob Sechrist, grandchildren of Ms. Hazel Richardson, in accordance with Family Subdivision

**SPECIAL USE PERMIT-25-0013. 5255 Riverview Road Family Subdivision
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing**

regulations. An SUP is required because the new parcel is less than the by-right minimum lot size in the A-1, General Agricultural District.

Staff has reviewed a preliminary plat and found that the proposal can meet Ordinance requirements. The property is located outside of the PSA and will require private well and septic systems. The Virginia Department of Health (VDH) has confirmed that the soils can adequately accommodate these systems. Should this application be approved, the applicant will need to complete the subdivision plat process. A family subdivision affidavit and draft family subdivision agreement have already been received.

The parcel is currently within the Croaker AFD and per the adopted Croaker AFD Ordinance, the parcel may remain in the AFD with an approved SUP for a family subdivision.

PLANNING AND ZONING HISTORY

Based on records for the Croaker AFD, it appears this parcel has been in the Croaker AFD since its creation in 1986.

On September 13, 2022, the Board of Supervisors approved the renewal of the Croaker AFD with an expiration date of October 31, 2026.

SURROUNDING ZONING AND DEVELOPMENT

- The following table lists the information on the adjacent parcels:

	ZONING DESIGNATION	EXISTING LAND USE	FUTURE LAND USE DESIGNATION
NORTH	A-1, General Agricultural	Residential/ Agricultural	Rural Lands
SOUTH	A-1, General Agricultural	Residential	Rural Lands
EAST	A-1, General Agricultural	Residential	Rural Lands
WEST	A-1, General Agricultural	Residential	Rural Lands

SPECIAL USE PERMIT-25-0013. 5255 Riverview Road Family Subdivision
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

Impacts/Potentially Unfavorable Conditions	Status <i>(No Mitigation Required/Mitigated/Not Fully Mitigated)</i>	Considerations/Proposed Mitigation of Potentially Unfavorable Conditions
<u>Public Transportation: Vehicular</u>	<u>No Mitigation Required</u>	- The proposal is not anticipated to generate traffic exceeding a typical residential use. - This portion of Riverview Road is classified as a local road, no changes to the Level of Service is anticipated.
<u>Public Transportation: Pedestrian/Bicycle</u>	<u>No Mitigation Required</u>	- The proposal does not generate impacts that require mitigation for pedestrian/bicycle accommodations.
<u>Public Safety</u>	<u>No Mitigation Required</u>	- The proposal does not generate impacts that require mitigation for emergency services or facilities.
<u>Public Schools</u>	<u>No Mitigation Required</u>	- The proposal does not generate impacts that require mitigation for public schools.
<u>Public Parks and Recreation</u>	<u>No Mitigation Required</u>	- The proposal does not generate impacts that require mitigation for parks and recreation services or facilities.
<u>Public Libraries and Cultural Centers</u>	<u>No Mitigation Required</u>	- The proposal does not generate impacts that require mitigation for public libraries or cultural centers.
<u>Groundwater and Drinking Water Resources</u>	<u>No Mitigation Required</u>	- The proposal does not generate impacts that require mitigation for groundwater and drinking water resources. - VDH has confirmed that the on-site soils can adequately accommodate private well and septic systems.
<u>Watersheds, Streams, and Reservoirs</u> Located in the Skimino Creek Watershed.	<u>No Mitigation Required</u>	- The proposal does not generate impacts that require mitigation to watersheds, streams, and reservoirs. - Erosion and sediment control measures and/or stormwater mitigation would be reviewed as part of the building permit for residential dwellings.
<u>Cultural/Historic Resources</u>	<u>No Mitigation Required</u>	- The proposal does not generate impacts that require mitigation for cultural or historic resources.
<u>Nearby and Surrounding Properties</u>	<u>No Mitigation Required</u>	- The proposal does not generate impacts that are anticipated to negatively affect adjacent properties.
<u>Community Character</u>	<u>No Mitigation Required</u>	- The proposal does not generate impacts that require mitigation for community character.
<u>Covenants and Restrictions</u>	<u>No Mitigation Required</u>	- The applicant has verified that he is not aware of any covenants or restrictions on the property that prohibit the proposed use.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

**SPECIAL USE PERMIT-25-0013. 5255 Riverview Road Family Subdivision
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing**

COMPREHENSIVE PLAN

The property is designated Rural Lands in the 2045 Comprehensive Plan. Recommended uses for Rural Lands include traditional agricultural and forestal activities, residences associated with agricultural and forestal activities, and certain uses which require very low intensity settings located in a manner that minimizes effects on agricultural and forestal activities. Recommended density is one unit per 20 acres.

This proposal has a gross density of approximately one unit per 19.89 acres, which exceeds the recommended density; however, staff finds that the difference between the proposed gross density and the recommended density is negligible and that this family subdivision is not intensive enough to negatively impact the rural character of the street and is in conformance with Ordinance requirements for family subdivisions in the A-1, General Agricultural Zoning District.

PROPOSED SUP CONDITIONS

Proposed conditions are provided as Attachment No. 1.

STAFF RECOMMENDATION

Staff finds that the proposed family subdivision is compatible with the surrounding development and consistent with the intent of the 2045 Comprehensive Plan. Staff recommends the Board of Supervisors approve this application, subject to the attached conditions.

WA/tm
SUP25-13_5255RiverRd

Attachments:

1. Resolution
2. Location Map
3. Croaker AFD Adopted Resolution
4. Master Plan (Preliminary Subdivision Plat)
5. Unapproved Minutes of the November 20, 2025, Agricultural and Forestal District Advisory Committee Special Meeting

RESOLUTION

CASE NO. SUP-25-0013. 5255 RIVERVIEW ROAD FAMILY SUBDIVISION

WHEREAS, the Board of Supervisors of James City County, Virginia (the “Board”), has adopted by Ordinance specific land uses that shall be subjected to a Special Use Permit (“SUP”) process; and

WHEREAS, Mr. Chase Grogg, on behalf of Ms. Hazel Richardson, has requested an SUP to allow for a family subdivision with lots less than the minimum sizes specified in Section 24-214(a)(2) and Section 24-(a)(2)(i), provided no lot is less than one acre on a piece of property located at 5255 Riverview Road, further identified as James City County Real Estate Tax Map Parcel No. 1530100034 (the “Property”); and

WHEREAS, the Agricultural and Forestal District Advisory Committee, following its meeting on November 20, 2025, recommended approval of Case No. SUP-25-0013 by a vote of 6-0; and

WHEREAS, a public hearing was advertised, adjoining property owners notified, and a hearing conducted on Case No. SUP-25-0013.

NOW, THEREFORE, BE IT RESOLVED that the Board of Supervisors of James City County, Virginia, after consideration of the factors in Section 24-9 of the James City County Code (the “County Code”), does hereby approve the issuance of Case No. SUP-25-0013 as described herein with the following conditions:

1. Master Plan. This SUP shall be valid for a family subdivision for the creation of no more than one new parcel of approximately 3.01 acres and one remainder parcel of approximately 36.76 acres (the “Subdivision”) on the Property. Development of the Property shall occur generally as shown on the Master Plan entitled, “FAMILY SUBDIVISION PLAT of PIN#1530100034 - HAZEL RICHARDSON PROPERTY located at 5255 RIVERVIEW ROAD”, dated November 4, 2025 (the “Master Plan”), with any deviations considered pursuant to Section 24-23(a)(2) of the County Code, as amended.
2. Commencement. Final subdivision approval must be received from the County within 24 months from the issuance of the SUP or the SUP shall become void. The final subdivision shall be recorded within 180 days of final subdivision approval.
3. Severance Clause. The SUP is not severable. Invalidation of any word, phrase, clause, sentence, or paragraph shall invalidate the remainder.

????

Chair, Board of Supervisors

ATTEST:

Teresa J. Saeed
Deputy Clerk to the Board

WAINWRIGHT
NULL
LARSON
MCLENNON
ICENHOUR

VOTES

AYE

NAY

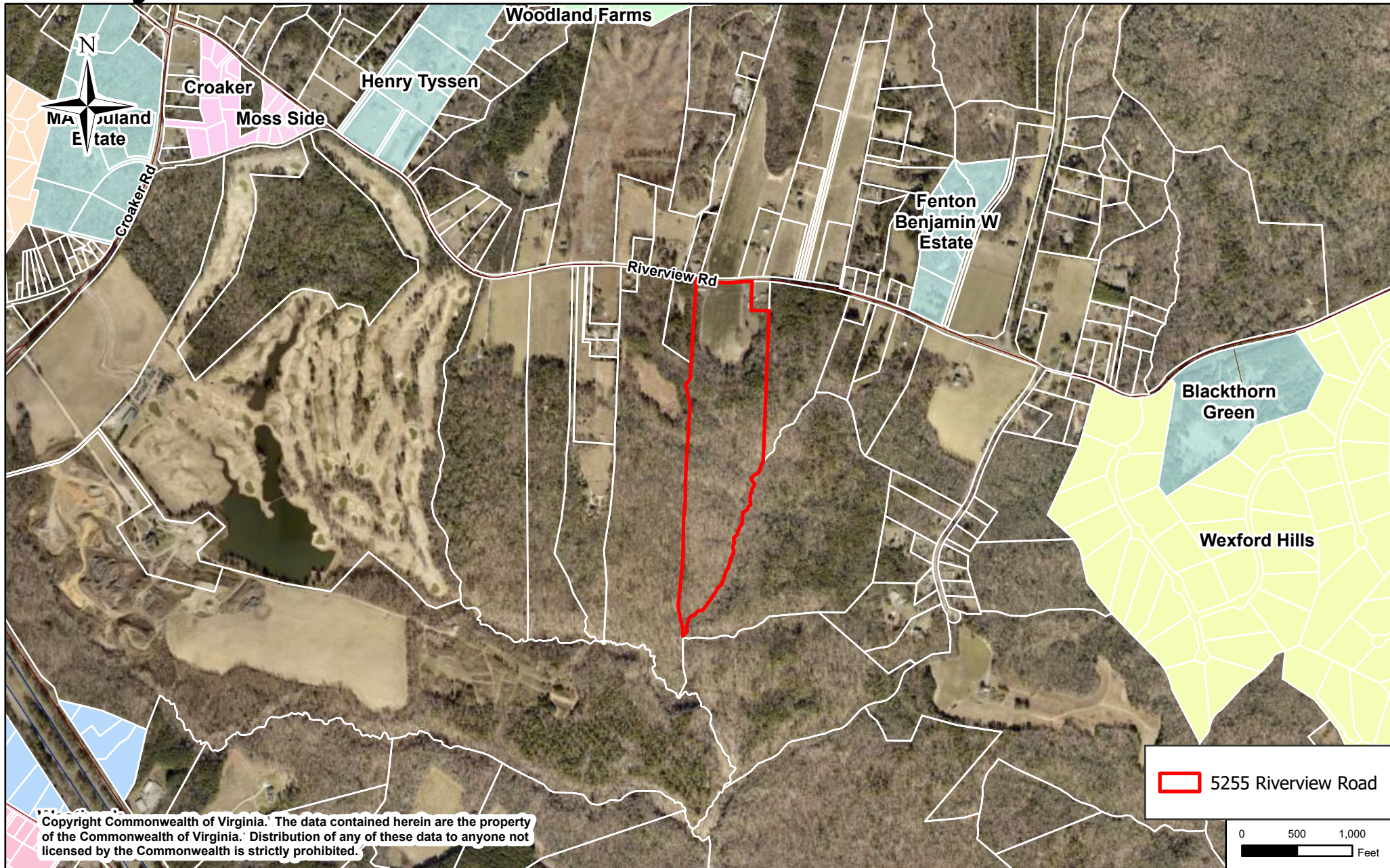
ABSTAIN

ABSENT

Adopted by the Board of Supervisors of James City County, Virginia, this 13th day of
January, 2026.

SUP25-13_5255RiverRd-res

SUP-25-0013, 5255 Riverview Road Family Subdivision



ADOPTED

SEP 13 2022

ORDINANCE NO. 164A-22

Board of Supervisors
James City County, VA

AGRICULTURAL AND FORESTAL DISTRICT-22-0007

CROAKER 2022 RENEWAL

WHEREAS, James City County has completed a review of the Croaker Agricultural and Forestal District (the "District"); and

WHEREAS, in accordance with Section 15.2-4311 of the Code of Virginia, 1950, as amended (the "Virginia Code"), property owners have been notified, public notices have been filed, public hearings have been advertised, and public hearings have been held on the continuation of the District; and

WHEREAS, the Agricultural and Forestal District (AFD) Advisory Committee at its meeting on July 21, 2022, voted 6-0 to recommend renewal of the District; and

WHEREAS, the Planning Commission following its public hearing on August 3, 2022, concurred with the recommendation of staff and the AFD Advisory Committee and voted 7-0 to recommend renewal of the District with the conditions listed below.

NOW, THEREFORE, BE IT ORDAINED by the Board of Supervisors of James City County, Virginia, that:

1. The Croaker Agricultural and Forestal District (the "District") is hereby continued to October 31, 2026, in accordance with the provisions of the Virginia Agricultural and Forestal District Act, Virginia Code Section 15.2-4300 et. seq. (the "Act").
2. That the District shall include the following parcels, provided, however, that all land within 25 feet of road right-of-ways is excluded from the District:

<u>Owner</u>	<u>Parcel No.</u>	<u>Acres</u>
Charles E. Apperson, Trustee & Patricia A. Russo, Trustee	2420100035	52.28
Hankins Land Trust	1530100044	119.00
William and Mary M. Apperson	1440100015	26.05
William and Mary M. Apperson	1440100015A	26.23
Ronald McManus, et al.	1530100043	119.85
Ronald McManus, et al.	1530100042	10.10
Ronald McManus, et al.	1530100036	40.40
Hazel M. Richardson & LA Richardson	1530100002	39.76
Hazel M. Richardson	1530100034	39.78
J. Rosalie Will, Trustee	1440100010	40.00
Stephanie L. Billon-Wolfe, Trustee	1440100009	49.08
Wenger Farms LLC	1320100018	95.30
Wenger Farms LLC	1410100001	120.00
Wenger Farms LLC	1410100002	30.00
Wenger Farms LLC	1440100014	143.50
Jonathan C. Kinney, Trustee	1410100046	14.18
Thomas B. Ballard	1530100035	53.17

Sharpe Family Properties, LLC	1530100018	16.05
William R. Atkins, Jr.	1530100019	16.40
William R. Atkins, Jr	1530100029	30.94
Milly Wallis	1540100004	40.00
Thomas B. Ballard	1530100035A	4.91
Thomas B. Ballard	1530100032	16.22
Wenger Farms, LLC	1410100007	7.00
Katherine G. & William Mann	1510400003	50.00
Thomas W. Dana III, Trustee	0720100006	62.35
Thomas W. Dana III, Trustee	0720100006A	3.85
Mitchell Family Ltd. Partnership	0740100002	<u>48.49</u>
Total:		<u>1,314.89</u>

3. That pursuant to Sections 15.2-4309 of the Act, the Board of Supervisors requires that any parcel in the District shall not, without the prior approval of the Board of Supervisors, be developed to any more intensive use, other than uses resulting in more intensive agricultural or forestal production. Specifically, the following restrictions shall apply:
- The subdivision of land is limited to 25 acres or more, except where the Board of Supervisors authorizes smaller lots to be created for residential use by members of the owner's immediate family, as defined in the James City County Subdivision Ordinance. Parcels of up to five acres, including necessary access roads, may be subdivided for the siting of Wireless Communications Facilities (WCFs), provided: a) The subdivision does not result in the total acreage of the District to drop below 200 acres; and b) the subdivision does not result in a remnant parcel of less than 25 acres.
 - Land within the District may be withdrawn from the District in accordance with the Board of Supervisors' Policy Governing the Withdrawal of Properties from Agricultural and Forestal Districts, adopted September 28, 2010.
 - No Special Use Permit (SUP) shall be issued except for agricultural, forestal, or other activities and uses consistent with the Act, which are not in conflict with the policies of this District. The Board of Supervisors, at its discretion, may issue SUPs for WCFs on properties in the District that are in accordance with the County's policies and Ordinances regulating such facilities.


John J. McGlennon
Chairman, Board of Supervisors

ATTEST:


Teresa J. Saeed
Deputy Clerk to the Board

ICENHOUR
HIPPLE
LARSON
SADLER
MCGLENNON

VOTES

<u>AYE</u>	<u>NAY</u>	<u>ABSTAIN</u>	<u>ABSENT</u>
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Adopted by the Board of Supervisors of James City County, Virginia, this 13th day of September, 2022.



VICINITY MAP 1"= 2000'

PROPERTY INFO.

PIN#1530100034
ADDRESS: 5255 RIVERVIEW ROAD
OWNER: HAZEL M. RICHARDSON
ZONING: A1 (GENERAL AGRICULTURE)

REFERENCES:

INST#020008334
PB. 85 PG. 60
PB. 90 PG. 29
PB. 56 PG. 68

FAMILY SUBDIVISION PLAT
of
PIN#1530100034 - HAZEL RICHARDSON PROPERTY
located at
5255 RIVERVIEW ROAD
STONEHOUSE DISTRICT JAMES CITY COUNTY VIRGINIA
DATE: 11/4/2025 JOB # 25-241

S-25-0024

LandTech
Resources, Inc.
Surveying • Engineering • GPS
205 Bulifants Boulevard, Suite E, Williamsburg, Virginia 23188
Phone: (757) 565-1677 Fax: (757) 565-0782
web: landtechresources.com

SHEET 1 OF 3

GENERAL NOTES:

1. THIS SUBDIVISION PLAT IS BASED ON A CURRENT FIELD SURVEY COMPLETED JULY 2025 AND WAS PRODUCED WITHOUT THE BENEFIT OF A TITLE REPORT. THE PLAT REFLECTS ONLY THOSE ENCUMBRANCES AND EASEMENTS SHOWN ON PREVIOUSLY RECORDED PLAT FOR THE PARCEL.
2. THE PROPERTY SHOWN ON THIS PLAT APPEARS TO FALL IN FIRM ZONE "X" ACCORDING TO FLOOD INSURANCE RATE MAP COMMUNITY PANEL NUMBER 51095C0063D DATED DECEMBER 16, 2015.
3. LOTS SERVED BY PRIVATE WATER AND ALTERNATIVE SEWER SYSTEM. ALL PERMITTING AND REQUIREMENTS FOR WELLS AND SEPTIC SYSTEMS SHALL BE IN ACCORDANCE WITH STATE HEALTH DEPARTMENT REGULATIONS.
4. ANY UNUSED WELL(S) SHALL BE ABANDONED IN ACCORDANCE WITH STATE AND PRIVATE WELL REGULATIONS AND JAMES CITY COUNTY CODE.
5. UNDERGROUND UTILITIES WERE NOT LOCATED.
6. ALL UTILITIES ARE TO BE PLACED UNDERGROUND.
7. WETLANDS WERE NOT LOCATED AS PART OF THE SURVEY.
8. IN ACCORDANCE WITH SECTION 19-29(G) OF THE JAMES CITY COUNTY SUBDIVISION ORDINANCE, WETLANDS AND LAND WITHIN RESOURCE PROTECTION AREAS SHALL REMAIN IN A NATURAL UNDISTURBED STATE EXCEPT FOR THOSE ACTIVITIES PERMITTED BY SECTION 23-7 OF THE JAMES CITY COUNTY CODE. MONUMENTS SHALL BE SET IN ACCORDANCE WITH SECTIONS 19-34 THROUGH 19-36 OF THE COUNTY CODE.
9. ON-SITE SEWAGE DISPOSAL SYSTEM INFORMATION AND SOILS INFORMATION SHOULD BE VERIFIED AND RE-EVALUATED BY THE HEALTH DEPARTMENT PRIOR TO ANY NEW CONSTRUCTION.
10. ON-SITE SEWAGE DISPOSAL SYSTEMS SHALL BE PUMPED OUT AT LEAST ONCE EVERY FIVE YEARS PER SECTION 23-9(B)(6) OF THE JAMES CITY COUNTY CODE.
11. UNLESS OTHERWISE NOTED, ALL DRAINAGE EASEMENTS DESIGNATED ON THIS PLAT SHALL REMAIN PRIVATE.
12. SUP CASE NO. _____ APPROVED BY THE JCC BOARD OF SUPERVISORS ON _____, 2025.

AREA TABULATION

LOT	OLD AREA	NEW AREA
PIN:1530100034	1,732,607 SF. / 39.77 AC.	1,601,512 SF. / 36.76 AC.
NEW PARCEL	-	131,095 SF. / 3.01 AC.

VDH SUBDIVISION APPROVAL STATEMENT

THIS SUBDIVISION IS APPROVED FOR INDIVIDUAL ONSITE SEWAGE SYSTEMS IN ACCORDANCE WITH THE PROVISIONS OF THE CODE OF VIRGINIA, AND THE SEWAGE HANDLING REGULATIONS (12 VAC 5-620-20 et seq., THE "REGULATIONS") THIS SUBDIVISION WAS SUBMITTED TO THE HEALTH DEPARTMENT FOR REVIEW PURSUANT TO SEC. 32.1-163.5 OF THE CODE OF VIRGINIA WHICH REQUIRES THE HEALTH DEPARTMENT TO ACCEPT PRIVATE SOIL EVALUATIONS AND DESIGNS FROM AN AUTHORIZED ONSITE SOIL EVALUATOR (AOSE) OR A PROFESSIONAL ENGINEER WORKING IN CONSULTATION WITH AN AOSE FOR RESIDENTIAL DEVELOPMENT. THE DEPARTMENT IS NOT REQUIRED TO PERFORM A FIELD CHECK OF SUCH EVALUATIONS. THIS SUBDIVISION WAS CERTIFIED AS BEING IN COMPLIANCE WITH THE BOARD OF HEALTH'S REGULATIONS BY: ADAM HERMAN, AOSE NO. 1940001109, PHONE NO. 757-344-6270 ADDRESS: 4516 MISTY CT., WILLIAMSBURG, VA 23185. THIS SUBDIVISION APPROVAL IS ISSUED IN RELIANCE UPON THAT CERTIFICATION. PURSUANT TO SEC. 360 OF THE REGULATIONS THIS APPROVAL IS NOT AN ASSURANCE THAT SEWAGE DISPOSAL SYSTEM CONSTRUCTION PERMITS WILL BE ISSUED FOR ANY LOT IN THE SUBDIVISION UNLESS THAT LOT IS SPECIFICALLY IDENTIFIED AS HAVING AN APPROVED SITE FOR AN ONSITE SEWAGE DISPOSAL SYSTEM, AND UNLESS ALL CONDITIONS AND CIRCUMSTANCES ARE PRESENT AT THE TIME OF APPLICATION FOR A PERMIT AS ARE PRESENT AT THE TIME OF THIS APPROVAL. THIS SUBDIVISION MAY CONTAIN LOTS THAT DO NOT HAVE APPROVED SITES FOR ONSITE SEWAGE SYSTEMS. THIS SUBDIVISION APPROVAL IS ISSUED IN RELIANCE UPON THE CERTIFICATION THAT APPROVED LOTS ARE SUITABLE FOR "TRADITIONAL SYSTEMS", HOWEVER ACTUAL SYSTEM DESIGN MAY BE DIFFERENT AT THE TIME CONSTRUCTION PERMITS ARE ISSUED.

CERTIFICATE OF SOURCE OF TITLE (PIN#4410100001A)

THIS IS TO CERTIFY THAT THE LAND EMBRACED IN THIS SUBDIVISION PLAT IS IN THE NAME OF HAZEL M. RICHARDSON AND WAS ACQUIRED FROM CLARENCE D. RICHARDSON ON DECEMBER 4, 2014 BY THAT CERTAIN DEED DULY RECORDED IN THE CLERK'S OFFICE OF THE CIRCUIT COURT FOR JAMES CITY COUNTY, VIRGINIA AS INST#140019890.

CONSENT OF OWNER

THIS SUBDIVISION AS IT APPEARS ON THIS PLAT IS WITH THE FREE CONSENT AND IN ACCORDANCE WITH THE DESIRES OF THE OWNERS, PROPRIETORS AND TRUSTEES

HAZEL M. RICHARDSON DATE

CERTIFICATE OF NOTARIZATION

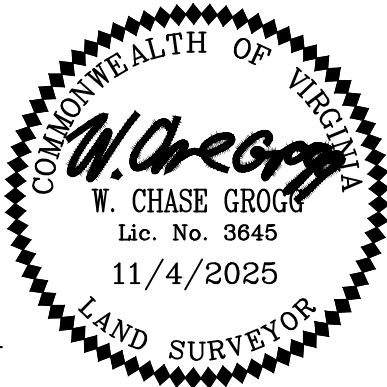
STATE OF VIRGINIA
CITY/COUNTY OF _____ I, _____, A NOTARY PUBLIC
IN AND FOR THE CITY/COUNTY AND STATE AFORESAID, DO HEREBY CERTIFY
THAT THE PERSON(S) WHOSE NAME(S) IS SIGNED TO THE FOREGOING WRITING HAS
ACKNOWLEDGED THE SAME BEFORE ME IN THE CITY/COUNTY AFORESAID.
GIVEN UNDER MY HAND THIS _____ DAY OF _____, 2025
MY COMMISSION EXPIRES _____.

NOTARY PUBLIC NOTARY REGISTRATION NUMBER

SURVEYORS CERTIFICATE

TO THE BEST OF MY KNOWLEDGE OR BELIEF, THIS PLAT COMPLIES WITH ALL OF THE REQUIREMENTS OF THE BOARD OF SUPERVISORS AND ORDINANCES OF THE COUNTY OF JAMES CITY, VIRGINIA, REGARDING THE PLATTING OF SUBDIVISIONS WITHIN THE COUNTY.

W. Chase Grogg 11/4/2025
W. CHASE GROGG, L.S. 3645 DATE



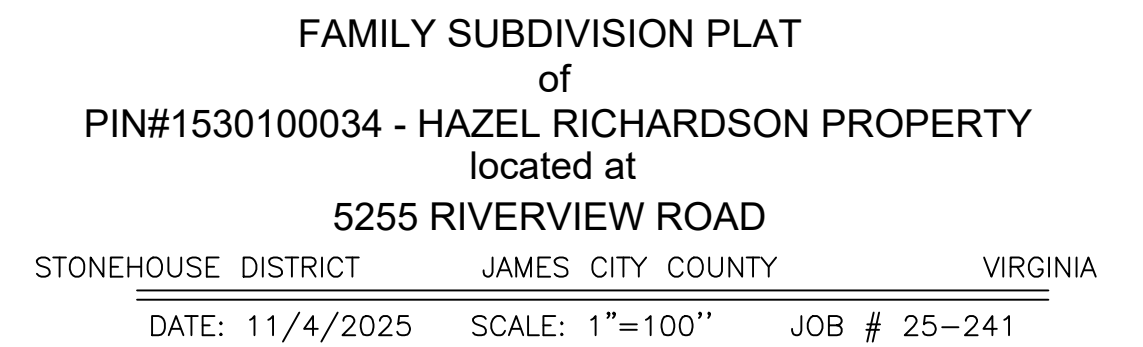
CERTIFICATE OF APPROVAL

THIS SUBDIVISION IS APPROVED BY THE UNDERSIGNED IN ACCORDANCE WITH WITH EXISTING SUBDIVISION REGULATIONS AND MAY BE ADMITTED TO RECORD.

DATE VA DEPARTMENT OF HEALTH
DATE VA DEPARTMENT OF TRANSPORTATION
DATE SUBDIVISION AGENT OF JAMES CITY COUNTY

STATE OF VIRGINIA. JAMES CITY COUNTY

IN THE CLERKS OFFICE OF THE CIRCUIT COURT FOR JAMES CITY COUNTY THIS _____ DAY OF _____, 2025. THIS PLAT WAS PRESENTED AND ADMITTED TO RECORD AS THE LAW DIRECTS AT _____ INSTRUMENT # _____ TESTE _____

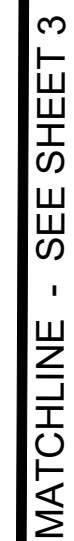


LandTech
Resources, Inc.

205 Bulifants Boulevard, Suite E, Williamsburg, Virginia 23188
Phone: (757) 565-1677 Fax: (757) 565-0782
web: landtechresources.com

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Scale: 1" = 100'





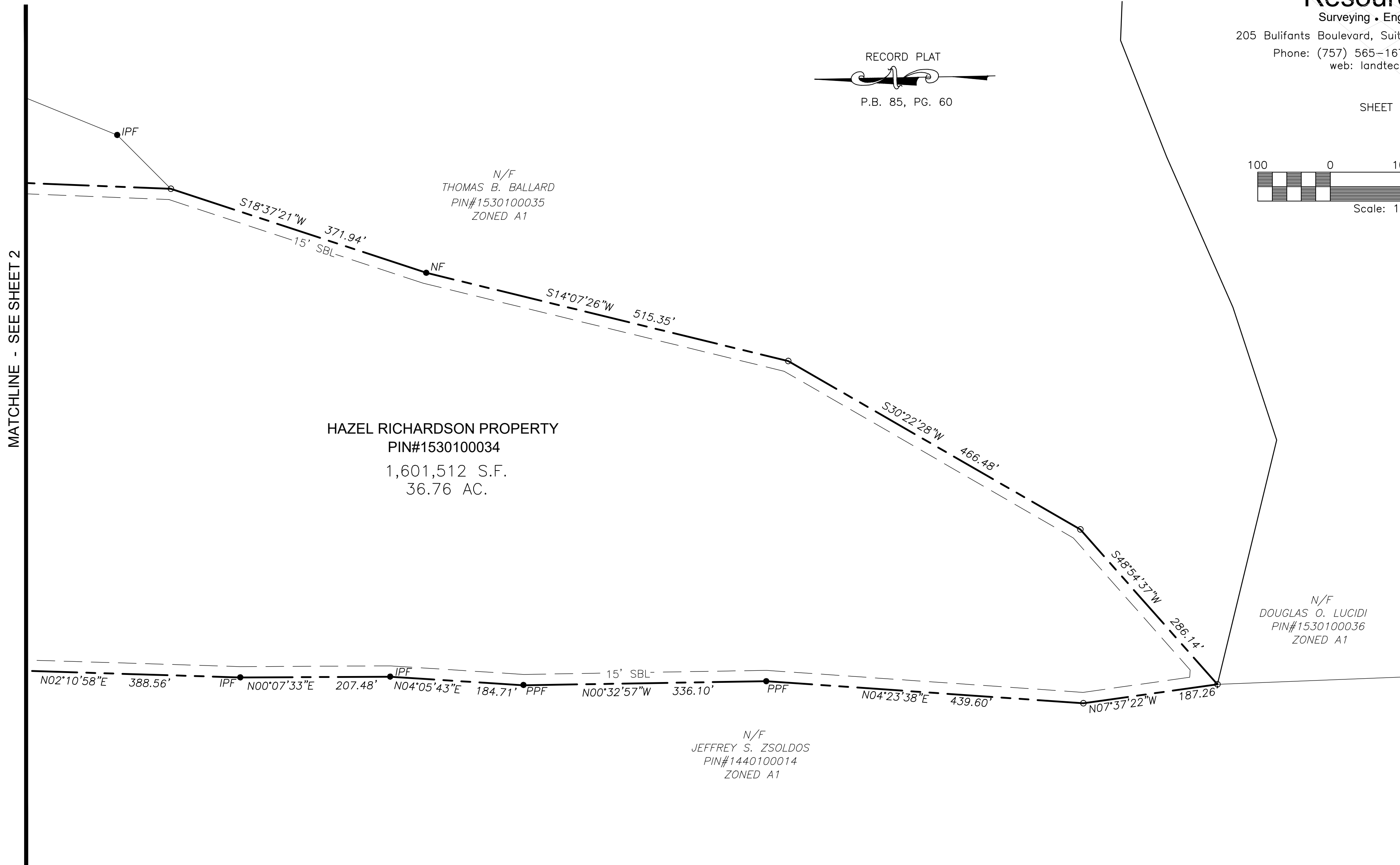
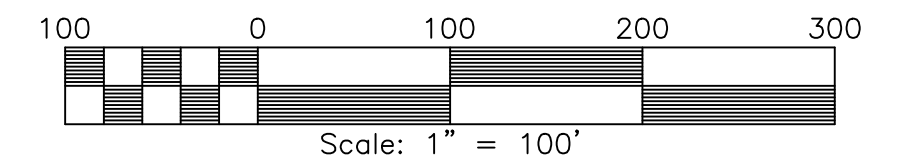
FAMILY SUBDIVISION PLAT
of
PIN#1530100034 - HAZEL RICHARDSON PROPERTY
located at
5255 RIVERVIEW ROAD
STONEHOUSE DISTRICT JAMES CITY COUNTY VIRGINIA
DATE: 11/4/2025 SCALE: 1"=100' JOB # 25-241
S-25-0024

LandTech
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205 Bulifants Boulevard, Suite E, Williamsburg, Virginia 23188
Phone: (757) 565-1677 Fax: (757) 565-0782
web: landtechresources.com

RECORD PLAT

P.B. 85, PG. 60

SHEET 3 OF 3



LEGEND

- ☐ = MAILBOX
- ⊗ = SOIL BORING LOCATION
- ⊙ = POWER POLE
- /H = OVERHEAD POWER LINE
- IRF = IRON ROD FOUND
- IPF = IRON PIPE FOUND
- NF = NAIL FOUND
- PPF = PINCHED PIPE FOUND
- IRS = IRON ROD SET

**Unapproved Minutes of the November 20, 2025
Agricultural and Forestal District Advisory Committee Regular Meeting**

SUP-25-0013. 5255 Riverview Road Family Subdivision

Mr. Albiston provided an overview of the family subdivision request.

Mr. Albiston noted that the case was brought to the AFD Advisory Committee because it requires a Special Use Permit and it was customary to bring these matters to the AFD Advisory Committee.

Mr. Harcum questioned whether an SUP would be required in this instance.

Mr. Albiston confirmed that an SUP is definitely required since the proposed lot size is under the minimum lot size. Mr. Albiston further noted that no acreage would be removed from the AFD.

The Committee discussed the tax implications for the parcel and whether roll back taxes would apply.

The Committee further discussed the implications of creating further family subdivisions from the parent parcel.

Ms. Garrett inquired about the acreage is set aside for the family cemetery.

Mr. Grogg noted that it was approximately 100 feet by 100 feet.

Mr. Wanner made a motion to recommend approval of the family subdivision.

Mr. Harcum seconded the motion.

On a voice vote the committee voted to recommend approval of SUP-25-0013. 5255 Riverview Road Family Subdivision (6-0)

SPECIAL USE PERMIT-25-0015. 4900 Stadium Road and 4620 Opportunity Way - General Services Headquarters
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

SUMMARY FACTS

Applicant: Mr. Andrew McKinley, AIA, VIA design architects, pc

Landowner: James City County

Proposal: A Special Use Permit (SUP) to construct a governmental institution/office building exceeding 30,000 square feet of floor area with accessory storage and uses.

Locations: 4900 Stadium Road
4620 Opportunity Way

Tax Map/Parcel Nos.: 3210100012
3210100017

Project Acreage: ± 37.28 acres

Zoning: PL, Public Lands

Comprehensive Plan: Federal, State, or County Lands

Primary Service Area (PSA): Inside

Staff Contact: Sarah Propst, AICP, PMP, Principal Planner

PUBLIC HEARING DATES

Planning Commission: December 3, 2025, 6:00 p.m.

Board of Supervisors: January 13, 2026, 5:00 p.m.

FACTORS FAVORABLE

1. Staff finds the proposal to be consistent with the Zoning Ordinance and adopted policies.
2. Staff finds the proposal generally consistent with the Comprehensive Plan.
3. Subject to the proposed conditions, staff finds the proposal will not negatively impact surrounding development.
4. Subject to the proposed conditions, the application passes the Adequate Transportation Facilities Test.
5. Subject to the proposed conditions, the application is consistent with the County's Sustainable Building Policy.
6. Impacts: See Impact Analysis on Pages 11-12.

FACTORS UNFAVORABLE

1. Impacts: See Impact Analysis on Pages 11-12.

PLANNING COMMISSION RECOMMENDATION

At its December 3, 2025, meeting, the Planning Commission voted 6-0, with one member absent, to recommend approval of the SUP to the Board of Supervisors, subject to the proposed conditions with one additional condition discussed during the meeting.

The Planning Commission also voted 6-0, with one member absent, to find this application consistent with the Comprehensive Plan and applicable parts thereof, as required by § 15.2-2232 of the Code of Virginia.

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CHANGES MADE SINCE THE PLANNING COMMISSION MEETING

At the Planning Commission meeting, a Commission member noted that the General Services project site is located in the Powhatan sub-watershed 205 and has an impervious area of 7.98 acres and that the project site would be designated as a SSC Class 3 (1 to 10 acres) requiring 3 unit measures from the menu of options from the Board's adopted list of Special Stormwater Criteria (SSC's). The Commission member asked which of the SSC options the staff intended to implement as a condition to reflect the spirit of building a stormwater facility designed to withstand increasing rainfall levels.

Staff responded that selection and implementation of specific Special Stormwater Criteria at this phase in the development process via adopted SUP conditions is not typical. As part of the site plan process, the county code requires developers, including the County, to meet the state stormwater minimum and then do something additional for stormwater from the Board's adopted list of Special Stormwater Criteria (SSC's). Requiring specific SSC's at the public hearing phase, prior to these detailed studies and analysis and plan development may result in conditions that are either not implementable, are cost-prohibitive, or that do not provide a substantive stormwater improvement. The only way to change adopted SUP conditions is by requiring the applicant to go back through the public hearing process.

The Commission member asked staff to consider adding a SUP condition to address the spirit of building a stormwater facility designed to withstand increasing rainfall levels by an additional 20% above the code minimums for post-development calculations. Following the PC meeting, staff conducted a high-level analysis with information known at this time, and should such a calculation be required as part of the SUP, it may require either a structural change to the Warhill dam or it may require additional on-site stormwater

storage. The Department of General Services asks that the SUP condition regarding water quantity analysis not specify a specific rainfall multiplier (i.e., 20% above code minimums), but rather state that the General Services Headquarters site development utilize the concepts of the NOAA MARISA study for increased rainfall intensities. This language allows the design team and the SRP Division to best address the stormwater needs of the site and existing infrastructure (systems and pond) while addressing anticipated increasing rainfall events. Accordingly, County staff coordinated on developing a condition that reflects the spirit of the Planning Commission request to accommodate higher levels of stormwater runoff from the General Services site. This requested condition is included as new Condition No. 11.

There have been no other changes made to the application since the Planning Commission meeting.

STAFF RECOMMENDATION

Staff finds that the proposal is compatible with surrounding zoning and development and is generally consistent with the Comprehensive Plan. Staff recommends that the Board of Supervisors approve this application, subject to the proposed conditions.

PROJECT DESCRIPTION

Mr. Andrew McKinley, AIA, with Via design architects, pc, has applied for an SUP on behalf of James City County to allow a governmental institution complex/governmental office building exceeding 30,000 square feet of floor area on a portion of 4900 Stadium Road and 4620 Opportunity Way. The proposed General Services Headquarters will include approximately 60,540 square feet of floor area in three buildings that will accommodate administrative, management, and technical staff of the Grounds, Facilities, Capital

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Projects, Sustainability, and Solid Waste Divisions of General Services. Fleet Services will remain at Tewning Road.

The administrative building will be two-stories tall, providing office space and workstations. There will be a training/conference room large enough for all General Services staff, that can also be used by committees and community groups, as available. Two single-story non-administrative buildings will provide workshop space for maintenance and needed storage as well as seven pull-through bays with adequate space for trucks and trailers. This facility will provide a secure and screened parking lot for various County vehicles and trailers and a gas pump facility with canopy for fueling County vehicles.

A Space Needs Assessment for County facilities was developed by Moseley Architects in 2020 and further updated in 2024 studying the amount of office space necessary to provide County services currently as well as into the future. The 2020 Census population count indicated that 78,254 residents lived in the County. The County's population has continued to grow and is projected to increase to over 100,000 residents by 2040. In order to continue to provide the same services currently offered by the County, the Space Needs Assessment projected that approximately 60,000 gross square feet of space would be required to accommodate the estimated 165-person General Services Department staff (excluding the Fleet Division). At the time of the Space Needs Analysis, these departments staffed 111 people in approximately 21,000 square feet of building space.

Beginning in the County's Fiscal Year (FY) 2023 Adopted Budget, the Board of Supervisors approved design funds for the General Services Headquarters as part of the Capital Improvement Program (CIP). The Board of Supervisors approved the initial construction funds in FY2024. Throughout the design process, opportunities to leverage efficiencies between the departments and shared spaces were

explored which resulted in an increase in the proposed size, primarily for Grounds Maintenance storage, to approximately 61,000 square feet. This building size will accommodate the County's staffing and storage needs for the foreseeable future.

Sustainable Building Policy

The goal of the County's Sustainable Building Policy is for new facilities to be designed to meet requirements for the Leadership in Energy and Environmental Design (LEED) Silver Certification as well as Energy Star or comparable performance targets. Proposed Condition No. 2 requires that the Director of General Services review the project for consistency with the Sustainable Building Policy prior to the issuance of a building permit for the project.

Stormwater Management

As shown on the conceptual drainage plan, stormwater management facilities will include underground stormwater chambers as well as a bioretention areas. The full engineering of these facilities will be reviewed by the Stormwater and Resource Protection Division during the site plan stage.

Public Utilities

As shown on the conceptual utility plan, existing public water and sewer mains located in the Stadium Road rights-of-way are anticipated to be adequate for the project. Proposed utilities in the project area will be reviewed by the James City Service Authority (JCSA) during the site plan review stage. Proposed Condition No. 6 will require Water Conservation Standards to be developed for the project.

Vehicular Parking

The proposed Master Plan includes a total of 221 parking spaces, with

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160 parking spaces open to the public/employees in front of the complex, with an additional 61 spaces available for offsite/overflow parking, south of the complex. The site also includes 74 private parking spaces for fleet vehicles and trailers within a gated area. The Zoning Ordinance includes the following parking requirements: one parking space per five seats in a place of assembly, which equals 50 spaces required for the meeting room with a capacity of 249 people; one parking space per 250 square feet of office space which equals 145 spaces required for the office and workshop areas. The required number of parking spaces for the General Services Headquarters is 195 parking spaces. The Master Plan proposes 221 public parking spaces, which is less than the maximum allowed 120% of the required number. The final amount of parking spaces will be reviewed by the Director of Planning during the site plan stage.

Public Transportation: Vehicular

The scale of this proposal requires the submittal of a Traffic Impact Analysis (TIA). The TIA examines the existing conditions of vehicular traffic, including Level of Service (LOS), with a focus on the roads and intersections serving and impacted by the proposed development. The submitted TIA includes the Warhill Sports Complex as well as the proposed 60,000 square foot General Services Headquarters.

There are two entrances to the Warhill Sports Complex/General Services Headquarters. To the north, the entrance is on Opportunity Way which intersects with Centerville Road. The south entrance is at the intersection of Warhill Trail and Longhill Road.

The TIA recommends considering the installation of a traffic signal at the intersection of Longhill Road and Warhill Trail. No improvements are recommended or proposed on Stadium Road at this time. The intersection of Opportunity Way and Centerville Road is already signalized and no additional improvements are recommended.

Staff has included Proposed Condition No. 4 requiring a Turn Lane Analysis when the site plan is submitted, to determine if a dedicated turn lane will be needed for entering the proposed Headquarters site.

Proposed Condition No. 3 requires the installation of any required improvements to take place before the issuance of a Certificate of Occupancy for the project or as determined by the funding appropriated by the Board of Supervisors.

The Longhill Road and Warhill Trail intersection, without additional improvements, shows a LOS of D or worse for both north and south approach for build or no-build scenarios in 2040 and 2046. This intersection; however, is proposed for a traffic signal and other improvements to lengthen the southbound right-turn lane to accommodate queuing traffic, and sidewalk and crosswalk additions leading to improved bus stops. These intersection improvements are consistent with the 2014 Longhill Road Corridor Study. An additional column has been provided in the Longhill Road/Warhill Trail table to show the LOS for this intersection with the proposed signal. The signal and intersection improvements mitigate traffic congestion, improving the overall LOS to B during all peak hours.

Staff notes that Condition No. 4 of existing SUP-23-0007, for the development of Warhill Sports Complex, requires submittal of an annual Traffic Management Plan (TMP), until such time as the intersection at Longhill Road and Warhill Trail achieves a LOS D, or better. Any required future TMPs will include the traffic generated by the General Services Headquarters until such time as a traffic signal is installed at the intersection of Longhill Road and Warhill Trail.

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Longhill Gate Road/Warhill Trail and Longhill Road (unsignalized)												
	Existing		2040		2040 Build		2040 Build (with signal & improvements)		2046		2046 Build	
			No-Build		(no signal)				No-Build			
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
EBL	A	A	A	B	A	B	A	B	A	B	A	B
EBT/R	A	A	A	A	A	A	B	B	A	A	A	A
EB approach	A	A	A	A	A	A	B	B	A	A	A	A
WBL	A	A	A	A	A	A	B	B	A	A	A	A
WBT	A	A	A	A	A	A	B	C	A	A	A	A
WBR	A	A	A	A	A	A	B	B	A	A	A	A
WB approach	A	A	A	A	A	A	B	C	A	A	A	A
NBL/T/R	B	C	C	E	C	E	C	C	C	E	C	E
NB approach	B	C	C	E	C	E	C	C	C	E	C	E
SBL	C	F	D	F	D	F	C	C	C	F	E	F
SBT/R	B	B	B	C	B	C	B	C	B	C	B	C
SB approach	C	F	D	F	D	F	C	C	D	F	D	F
Overall							B	B				

Eastbound (EB) traffic on Longhill Road is traveling towards Route 199.

Westbound (WB) traffic on Longhill Road is traveling towards Ford's Colony.

Southbound (SB) traffic is exiting the Warhill Sports Complex.

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Opportunity Way and Centerville Road										
	Existing		2040 No-Build		2040 Build		2046 No-Build		2046 Build	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
EBL	E	E	E	E	E	E	E	E	E	E
EBTH	D	C	C	C	D	C	D	C	D	C
EBR	C	B	C	B	C	C	C	B	C	C
EB approach	D	C	D	C	D	D	D	C	D	D
WBL	D	E	E	E	E	E	E	E	E	E
WBTH	B	A	A	B	A	B	A	B	A	B
WBR	B	B	B	B	B	B	B	B	B	B
WB approach	C	C	D	C	D	D	D	C	D	D
NBL/T	E	E	E	E	E	E	E	E	E	E
NBR	E	A	E	E	E	E	E	E	E	E
NB approach	E	E	E	E	E	E	E	E	E	E
SBL	D	E	E	E	E	E	E	E	E	E
SBL/T	E	E	E	E	E	E	E	E	E	E
SBR	D	E	E	E	E	E	E	E	E	E
SB approach	E	E	E	E	E	E	E	E	E	E
Overall	D	D	D	D	D	D	D	D	D	D

Eastbound (EB) traffic on Centerville Road is traveling toward Richmond Road.

Westbound (WB) traffic on Centerville Road is traveling toward Jolly Pond Road.

Northbound (NB) is exiting the Warhill Complex toward Centerville Road.

Southbound (SB) is exiting Lightfoot Marketplace.

Centerville Road and Route 60 (Richmond Road)										
	Existing		2040 No-Build		2040 Build		2046 No-Build		2046 Build	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
EBL	E	E	E	E	E	E	E	E	E	E
EBT	C	D	D	D	D	D	D	D	D	D
EBR	C	C	C	C	C	C	C	C	C	C
EB approach	C	D	C	C	C	C	D	C	D	C
WBL	D	F	E	F	E	C	E	F	F	C
WBT	C	C	C	B	C	F	C	B	C	F
WBR	B	C	C	B	C	B	C	B	C	B
WB approach	C	F	D	F	D	F	D	F	D	F
NBL	D	E	D	F	D	F	D	F	D	F
NBT	D	E	D	F	D	F	D	F	D	F
NBR	E	F	F	F	F	F	F	F	F	F
NB approach	D	F	E	F	E	F	F	F	F	F
SBL/T	E	F	F	F	F	F	F	F	F	F
SBR	D	D	D	D	D	D	D	D	D	D
SB approach	E	F	F	F	F	F	F	F	F	F
Overall	D	E	D	F	D	F	D	F	D	F

Eastbound (EB) traffic on Route 60 is traveling toward the Williamsburg Pottery.

Westbound (WB) traffic on Route 60 is traveling toward Route 199.

Northbound (NB) traffic on Centerville Road is traveling toward Route 60.

Southbound (SB) traffic is exiting the commercial strip center and gas station.

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Route 60 (E/W) Route 199 EB Ramps (N)										
	Existing		2040 No-Build		2040 Build		2046 No-Build		2046 Build	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
EBTH	A	B	A	B	A	B	A	B	A	B
EBR	A	A	A	A	A	A	A	A	A	A
EB approach	A	B	A	B	A	B	A	A	A	B
WBL	E	E	E	E	E	E	E	E	E	E
WBTH	A	B	A	B	A	B	A	B	A	B
WB approach	A	B	A	B	A	B	A	B	A	B
NBL	E	D	E	E	E	F	E	F	E	F
NBR	D	C	D	C	D	C	D	D	D	D
NB approach	E	D	E	D	E	E	B	C	E	F
Overall	B	B	B	C	B	C	B	C	B	C

Eastbound (EB) traffic on Route 60 is traveling towards the Williamsburg Pottery.

Westbound (WB) traffic on Route 60 is traveling towards the Premium Outlets.

Northbound (NB) traffic is utilizing the Route 199 eastbound ramps.

Route 60 (E/W) Route 199 WB Ramps (N)										
	Existing		2040 No-Build		2040 Build		2046 No-Build		2046 Build	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
EBTH	A	B	A	B	A	B	A	B	B	B
EBR	B	B	B	B	B	B	B	B	C	B
EB approach	B	B	B	B	B	B	B	B	B	B
WBL	E	E	E	E	E	E	E	E	E	E
WBTH	A	B	A	B	A	B	A	B	A	B
WB approach	B	C	B	C	B	C	B	C	B	C
NBL	E	E	E	E	E	F	E	F	E	F
NBR	D	C	D	C	D	C	D	C	D	C
NB approach	E	D	E	E	E	F	E	F	E	F
Overall	C	C	C	C	C	C	C	C	C	D

Eastbound (EB) traffic on Route 60 is traveling towards the Williamsburg Pottery.

Westbound (WB) traffic on Route 60 is traveling towards the Premium Outlets.

Northbound (NB) traffic is utilizing the Route 199 westbound ramps.

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The County adopted the Adequate Transportation Facilities Test by resolution on August 14, 2018. This policy requires a proposed SUP or Rezoning to be tested during the application process to ensure that transportation facilities are adequate to mitigate traffic impacts.

A proposed Rezoning or SUP application will be tested for Adequate Transportation Facilities and will pass the test if:

- No off-site improvements are required by the TIA that is approved by both the Director of Planning and the Virginia Department of Transportation (VDOT); or
- All off-site improvements recommended by a TIA that are approved by both the Director of Planning and VDOT are guaranteed in a form approved by the Director of Planning and the County Attorney.

Proposed Condition No. 3 requires the installation of any required improvements to take place before the issuance of a Certificate of Occupancy for the project or as determined by the funding and implementation plan adopted by the Board of Supervisors. As such, this proposal passes the Adequate Transportation Facilities Test.

PLANNING AND ZONING HISTORY

- 1998: The Board of Supervisors approved Z-0001-1998/SUP-0004-1998 on April 28, 1998. This allowed development of the site as a recreational complex.
- 2004: The Board of Supervisors approved MP-0005-2003/SUP-0017-2003 for the amendment of the Warhill Sports Complex Master Plan on July 13, 2004. The amended Master Plan proposed a multipurpose field complex, an indoor sports facility, picnic areas, greenway access to Centerville Road, paved multiuse trails, a controlled secondary park access to Centerville Road, a BMX park, and an unprogrammed open space.

- 2009: North of this site, the Board of Supervisors approved SUP-0016-2009 to allow the development of the Law Enforcement Center.
- 2016: The Board of Supervisors approved SUP-0014-2016 for additional recreation-focused development and a Williamsburg Area Transit Authority (WATA) bus transfer station in the Warhill Sports Complex.
- 2023: The Board of Supervisors approved SUP-23-0007, amending SUP-0014-2016. This SUP includes conditions which do apply to this property. The proposed resolutions will remove the requirement for the 150-foot undisturbed buffer in the location of the General Services Headquarters.

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SURROUNDING ZONING AND DEVELOPMENT

- The following table lists information on the parcels adjacent to the property:

	ZONING DESIGNATION	EXISTING LAND USE	FUTURE LAND USE DESIGNATION
NORTH	PL, Public Lands and R-8, Rural Residential	James City County Law Enforcement Center and Single-Family Residences	Federal, State, or County Lands and Low Density Residential
SOUTH	PL, Public Lands	Warhill Sports Complex	Community Character Conservation, Open Space or Recreation
EAST	PL, Public Lands	Warhill High School	Federal, State, or County Lands
WEST	PL, Public Lands and R-8, Rural Residential	Warhill Sports Complex and Single-Family Residences	Federal, State, or County Lands and Low Density Residential

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Impacts/Potentially Unfavorable Conditions	Status <i>(No Mitigation Required/Mitigated/Not Fully Mitigated)</i>	Considerations/Proposed Mitigation of Potentially Unfavorable Conditions
<u>Public Transportation: Vehicular</u>	<u>Mitigated</u>	- The intersection with Longhill Road and Warhill Trail will require a traffic signal to be installed prior to issuance of any Certificate of Occupancy or at another time be approved by the Director of Community Development per Proposed Condition No. 3. - The TIA did not recommend any additional traffic control measures. - Staff has proposed a condition to require a Turn Lane Analysis to determine whether a designated turn lane into the site should be required at the time of site plan review.
<u>Public Transportation: Bicycle/Pedestrian</u>	<u>No Mitigation Required</u>	- Bicycle and pedestrian connections will be provided from building entrances and parking areas to the existing multiuse path along Opportunity Way and improved Stadium Road. - A WATA bus stop is currently located at the intersection of Opportunity Way and Centerville Road and at Warhill Trail and Longhill Road.
<u>Public Safety</u>	<u>No Mitigation Required</u>	- Fire Station 4 on Olde Towne Road serves this area of the County and is located approximately 3.25 miles from the property. - The Fire Department will review the site plan for the project to ensure needed fire protection and safety measures are provided.
<u>Public Schools</u>	<u>No Mitigation Required</u>	- The proposal is not expected to generate impacts to public schools.
<u>Public Parks and Recreation</u>	<u>No Mitigation Required</u>	- The proposal is not expected to generate impacts to public parks and recreation.

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<u>Public Libraries and Cultural Centers</u>	<u>No Mitigation Required</u>	- The proposal is not expected to generate impacts to public libraries and cultural centers.
<u>Groundwater and Drinking Water Resources</u>	<u>Mitigated</u>	- The property will be connected to the JCSA public water system and the Hampton Roads Sanitation District sanitary sewer system. - Proposed Condition No. 6 requires the development of Water Conservation Standards for the project.
<u>Watersheds, Streams, and Reservoirs</u> Project is located in the Powhatan Creek Watershed.	<u>No Mitigation Required</u>	- The project will be reviewed by the Stormwater and Resource Protection Division during the site plan stage to ensure full compliance with environmental regulations. - The project will be required to adhere to the County's updated Special Stormwater Criteria.
<u>Cultural/Historic</u>	<u>No Mitigation Required</u>	- A Phase I Archaeological Survey of the project identified no archaeological sites and found that no further investigations are warranted. - A Natural Resource Inventory will be required during the site plan stage to identify any habitats for threatened and endangered species. - The proposed development has been modified to remove impacts from an area of the site that had been identified as potential small-whorled pogonia habitat.
<u>Nearby and Surrounding Properties</u>	<u>Mitigated</u>	- Proposed Condition No. 5 restricts exterior pole-mounted light fixtures to a height of 20 feet from finished grade. - Proposed Condition No. 7 requires a vegetated buffer along Stadium Road, with an average width of 30 feet. - The final architectural design will be approved by the Director of Planning, utilizing the County's Character Design Guidelines.

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NATURAL AND CULTURAL ASSETS

The site is identified as having natural and cultural assets on the Natural and Cultural Assets Plan maps (and/or other supplemental resources such as the United States Department of Agriculture's Natural Resources Conservation Service Web Soil Survey) as follows (see table below):

ASSET	PRESENCE	IMPACT
Habitat Core	-None present on-site	-Not Applicable
Corridors	-None present on-site	-Not Applicable
Agricultural Assets	-None present on-site	-Not Applicable

COMPREHENSIVE PLAN

The project site is designated as Federal, State, or County Lands on the Comprehensive Plan Land Use Map. The following general guidance is stated for the Federal, State, or County Lands Designation:

“Publicly owned lands included in this category are Eastern State Hospital, military installations, County offices and facilities, and larger utility sites such as the Hampton Roads Sanitation District treatment plant. Development in these areas should follow applicable development standards listed in the charts.”

The proposed General Services Headquarters is consistent with the recommended uses for the Federal, State, or County Lands designation.

As stated in the designation, development standards which are applicable to the proposed project should be considered. Staff finds that the proposed development is most consistent with the Community Commercial designation and the following commercial development standards are pertinent for the development.

- Locate proposed commercial and industrial developments adjacent to compatible uses (public or other similar uses, etc.). Where a commercial or industrial development is proposed at a location near a sensitive area, the site should be designed so that transitional uses such as offices and/or buffers are located between conflicting uses. Emphasis should be placed on ensuring the provision of open space; protection of the environment, historical and archaeological resources; and adjoining land uses; sufficient capacities of public facilities and services; quality and effectiveness of pedestrian circulation systems and facilities; and ability to meet the public needs of the development.

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The proposed General Services Headquarters is located adjacent to the Law Enforcement Center, across Stadium Road from Warhill High School and north of the Warhill Sports Complex. These are compatible uses and provides connections with existing pedestrian facilities.

- Commercial uses, and particularly Neighborhood Commercial areas, will have a limited impact on adjacent residential areas, especially in terms of visible parking areas, lighting, signage, traffic, odor, noise, and hours of operation.

The proposed General Services Headquarters will be screened from adjacent residential neighborhoods, by mature vegetation which will remain undisturbed. Additionally, this proposed use will have limited hours of operation, with the majority of activity occurring between 7 a.m. and 5 p.m. Public meetings or community events may occur after 5 p.m. The proposed conditions include mitigations for exterior lighting and ensuring the required traffic improvements are installed.

- Each Community Commercial area should be clearly separated from other Community Commercial areas to retain the small town and rural character of the County, provide a sense of place, and promote transportation mobility.

The proposed General Services Headquarters is not located adjacent to commercial development. Should commercial development occur in the future, the design of the project will ensure that it remains distinct.

- Permit the location of new uses only where public services, utilities, and facilities are adequate to support such uses. The need for public services (police, fire, education, recreation, etc.) and facilities generated by a development should be met or mitigated by that development.

The proposed General Services Headquarters does not generate a need for new public utilities or fire stations.

- While a variety of market forces influence commercial and industrial development proposals, the maintenance of an acceptable LOS of roads and other public services and the availability and capacity of public utilities should be primary considerations.

The TIA recommends consideration of traffic improvements to ensure that the intersection of Longhill Road and Warhill Trail will maintain acceptable LOS. The proposed traffic signal at this intersection is currently under review with VDOT for funding.

- Protect environmentally sensitive resources including high-ranking Natural Areas and significant natural heritage resources, watersheds, historic and archaeological resources, designated Community Character Corridors (CCCs) and Community Character Areas (CCAs), and other sensitive resources by locating conflicting uses away from such resources and utilizing design features, including building and site design, buffers, and screening to adequately protect the resource.

The proposed development is located out of any CCCs or CCAs. The Phase I Archaeological Survey found no sites in this area. This site is also located out of sensitive natural heritage resource areas. The Stormwater and Resource Protection Division will review the site plan for the project to ensure that environmentally sensitive areas are protected.

- Industrial and commercial areas should be planned and located to avoid traffic through residential and agricultural areas except in special circumstances where residential and nonresidential areas are both part of an overall master plan and special measures are taken to ensure that the residential or agricultural uses are adequately protected.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

SPECIAL USE PERMIT-25-0015. 4900 Stadium Road and 4620 Opportunity Way - General Services Headquarters
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

The project will not direct traffic through any residential neighborhoods.

Goals, Strategies, and Actions

Staff reviewed the application to determine if the proposal aligns with the Comprehensive Plan's Goals, Strategies, and Actions (GSAs). The analysis is as follows.

Public Facilities

- GSA PF 1.1 - Encourage full utilization of all public facilities, including joint use by different County agencies, to support local community objectives and activities.

The proposed General Services Headquarters will consolidate work and training space for most General Services Divisions. The proposed location is adjacent to the Law Enforcement Center and Warhill Sports Complex and will provide needed storage and training space in a cohesive, coordinated design, resulting in a facility that provides a range of services and support for community activities.

- GSA PF 1.2 - Acquire land for, efficiently locate and design, and construct new public facilities in a manner that facilitates future expansion and promotes the maximum utility of resources to meet future capacity needs.

The proposed General Services Headquarters is designed to meet the County's future capacity needs identified in the Space Needs Assessment. Additionally, the site has been designed to provide for future expansion, if needed.

- GSA PF 1.3 - Design facilities and services for efficient and cost-effective operations over their expected lives.

The proposed General Services Headquarters will be designed to meet LEED Silver requirements and Energy Star or appropriate similar criteria. The current General Services complex, largely built in the 1970s and 1980s, is neither cohesively designed for use nor energy efficiency. Additionally, aging structures are likely to incur repair expenses that newer buildings will not. The proposed General Services Headquarters will likely reduce operational costs, as well as provide needed storage and work space.

- GSA PF 1.5.5 - Design and construct County facilities consistent with the Space Needs Assessment for County Administration, Williamsburg-James City County (WJCC) Courts, and WJCC School Administration for 5-year, 10-year, and 20-year (2040) population growth projections.

The proposed General Services Headquarters is designed to meet the County's future capacity needs identified in the Space Needs Assessment.

- GSA PF 1.12 - Locate new public facilities and the provision of public services near existing and planned population centers, within the existing Primary Service Area (PSA), as defined on the Comprehensive Plan Future Land Use Map so as to provide convenient service to the greatest number of County residents or service consumers.

The proposed General Services Headquarters will be located near the center of the County's residents and other County facilities.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

SPECIAL USE PERMIT-25-0015. 4900 Stadium Road and 4620 Opportunity Way - General Services Headquarters
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

- GSA PF 3.1 - Evaluate the accessibility, capacity and adequacy of new facilities to absorb new development and ensure that development recommendations take this information into account.

The proposed General Services Headquarters is designed to accommodate staffing needs based on the County's population projections for the future.

- GSA PF 4.2.1 - Construct new County facilities in accordance with the County's Sustainable Building Policy.

The proposed General Services Headquarters will be reviewed for consistency with the Sustainable Building Policy.

- GSA PF 4.5 - Evaluate all proposed public facilities for potential impacts and provide buffering and mitigation equal to, or greater than (when practical), that required under County Ordinances.

The proposed General Services Headquarters has been reviewed to address potential impacts and ensure consistency with County Ordinances.

- GSA PF 4.6 - Incorporate architectural design features in buildings and structures erected by the County, which support quality design and appearance that enhances local community character.

The Director of Planning will approve the final architectural design in accordance with the James City County Character Design Guidelines to ensure a quality design is provided.

FINDING OF CONSISTENCY

§ 15.2-2232 of the Code of Virginia states, in part, that unless a public building or public structure is shown on the adopted Comprehensive Plan or part thereof, the local Planning Commission shall review the facility to determine whether the location, character, and extent of the facility is substantially in accord with the adopted Comprehensive Plan.

The proposed governmental office building with workshop, storage, and training space is not currently shown on the County's Comprehensive Plan; therefore, this additional level of review is required.

As previously noted, staff finds the proposal consistent with the adopted Comprehensive Plan and Land Use Map. The property is designated as Federal, State, or County Lands on the Land Use Map. The General Services Headquarters building will serve the County's growing population needs. For the Commission's consideration, a consistency determination resolution is included as Attachment No. 6.

STAFF RECOMMENDATION

Staff finds that the proposal is compatible with surrounding zoning and development and is generally consistent with the Comprehensive Plan. Staff recommends that the Board of Supervisors approve this application subject to the proposed conditions.

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

SPECIAL USE PERMIT-25-0015. 4900 Stadium Road and 4620 Opportunity Way - General Services Headquarters
Staff Report for the January 13, 2026, Board of Supervisors Public Hearing

SP/tm

SUP25-15-4900Std-4620 Opp

Attachments:

1. Resolution
2. Location Map
3. Master Plan
4. Architectural Elevations and Renderings
5. Traffic Impact Study
6. Signed Resolution Finding the Application Consistent with the Comprehensive Plan, per § 15.2-2232 of the Code of Virginia
7. Approved Resolution for SUP-23-0007 Warhill Sports Complex
8. Longhill Rd and Warhill Trail Signal Justification Report
9. Unapproved Minutes from the December 3, 2025, Planning Commission Regular Meeting

This staff report is prepared by the James City County Planning Division to provide information to the Planning Commission and Board of Supervisors to assist them in making a recommendation on this application. It may be useful to members of the general public interested in this application.

RESOLUTION

CASE NO. SUP-25-0015. 4900 STADIUM ROAD AND 4620 OPPORTUNITY WAY

GENERAL SERVICES HEADQUARTERS

WHEREAS, the Board of Supervisors of James City County, Virginia (the “Board”), has adopted by Ordinance specific land uses that shall be subjected to a Special Use Permit (“SUP”) process; and

WHEREAS, Mr. Andrew McKinley of VIA design architects, pc, has applied for an SUP to allow for the construction of an approximately 60,500-square-foot General Services building located at 4900 Stadium Road and 4620 Opportunity Way and further identified, respectively, as James City County Real Estate Tax Map Parcel Nos. 3210100012 and 3210100017 (the “Property”); and

WHEREAS, the Planning Commission, following its public hearing on December 3, 2025, recommended approval of Case No. SUP-25-0015 by a vote of 6-0; and

WHEREAS, a public hearing was advertised, adjoining property owners notified, and a hearing conducted on Case No. SUP-25-0015; and

WHEREAS, the Board of Supervisors of James City County, Virginia, finds this use to be consistent with good zoning practices and the 2045 Comprehensive Plan Land Use Map designation for the Property.

NOW, THEREFORE, BE IT RESOLVED that the Board of Supervisors of James City County, Virginia, after consideration of the factors in Section 24-9 of the James City County Code (the “County Code”), does hereby approve the issuance of Case No. SUP-25-0015 as described herein with the following conditions:

1. *Master Plan.* This SUP shall be valid for the construction of a governmental office building exceeding 30,000 square feet of floor area with accessory storage and uses (the “Project”) on property located at 4620 Opportunity Way and on approximately 27.45 acres of 4900 Stadium Road, further identified as James City County Real Estate Tax Map Parcel Nos. 3210100017 and 3210100012, respectively (collectively, the “Properties”). The Properties shall be developed substantially in accordance with the Master Plan titled “JCC General Services Site Master Plan,” prepared by VIA Design Architects, PC, and Eskew Dumez Ripple, and date-stamp received November 10, 2025 (the “Master Plan”), with any deviations considered per Section 24-23(a)(2) of the James City County Zoning Ordinance, as amended.
2. *Sustainable Building Policy.* Prior to the issuance of a building permit for the Project, the Director of General Services or designee shall review the Project for consistency with the County’s Sustainable Building Policy.

3. Traffic Improvements. All recommended improvements and mitigation measures listed within the Traffic Impact Analysis titled “Warhill Sports Complex Traffic Impact Analysis” prepared by Timmons Group, and sealed July 25, 2025 (the “TIA”), shall be installed prior to the issuance of any Certificate of Occupancy for the Project, provided; however, the Director of Community Development shall have the authority to modify the completion date of the road improvements based on funding appropriated by the Board of Supervisors. The intersection improvements shall consist, at a minimum as approved by the Virginia Department of Transportation, a traffic signal and other improvements to lengthen the southbound right-turn lane to accommodate queuing traffic, and sidewalk and crosswalk additions leading to improved bus stops.
4. Turn Lane Analysis. A Turn Lane Analysis shall be completed at the time of the initial site plan submittal for the Project, to determine the need for dedicated turn lanes into the Project entrances.
5. Exterior Lighting. All new exterior pole-mounted light fixtures for the Project shall not exceed 20 feet in height from finished grade. A Lighting Plan shall be approved by the Director of Planning or designee prior to final site plan approval.
6. Water Conservation. Water Conservation Standards shall be enforced for the Project through an agreement with the James City Service Authority (JCSA). The standards shall be approved by the JCSA General Manager prior to site plan approval for the Project as shown on the Master Plan and may include, but shall not be limited to, such water conservation measures as limitations on the installation and use of irrigation systems and irrigation wells, the use of approved landscaping materials including the use of drought-tolerant plants where appropriate, and the use of water-conserving fixtures and appliances to promote water conservation and minimize the use of public water resources. Any changes shall be submitted to and approved by the JCSA.
7. Vegetated Buffer. A vegetated buffer with an average width of 30 feet will be provided along the improved Stadium Road frontage.
8. Virginia Runoff Reduction Method. All water quality needs of the Project must be met within the limits of disturbance delineated for the project. The Forested Open Space and Mixed Open Space Land Use categories may be used to account for a maximum of 25% of the required water quality associated with the Project. The purchase of offsite nutrient credits toward needed water quality associated with the Project will not be allowed.
9. Best Management Practice (BMP) Access Roads. Wet or Extended detention ponds, if used, must provide BMP access roads. Such roads shall be paved or gravel surfaces and shall be a minimum of 12 feet wide with ingress and egress at each BMP with access to the downstream BMP areas. Access must include the outfall structure(s) and outfall barrel(s) discharge areas.
10. BMP PC105, Western Pond Dam. Use of this existing pond facility for water quantity purposes must meet the channel and flood protection regulations current at the time of site plan submittal.

11. Additional Water Quantity Analysis. The General Services Headquarters project site will develop water quantity calculations for the post-development conditions utilizing the concepts of the NOAA MARISA study for increased rainfall intensities.
12. Commencement. If construction of the Project has not commenced within 36 months from the date of adoption of this SUP, the SUP shall become void. Construction shall be defined as obtaining building permits and approved footing inspections and/or foundation inspections for the Project.
13. Severance Clause. This SUP is not severable. Invalidation of any word, phrase, clause, sentence, or paragraph shall invalidate the remainder.

BE IT FURTHER RESOLVED that Condition No. 2 of SUP-23-0007, requiring a 150-foot undisturbed perimeter buffer for Lot No. 3210100012, is not applicable to the area of the General Services Headquarters building.

??????

Chair, Board of Supervisors

ATTEST:

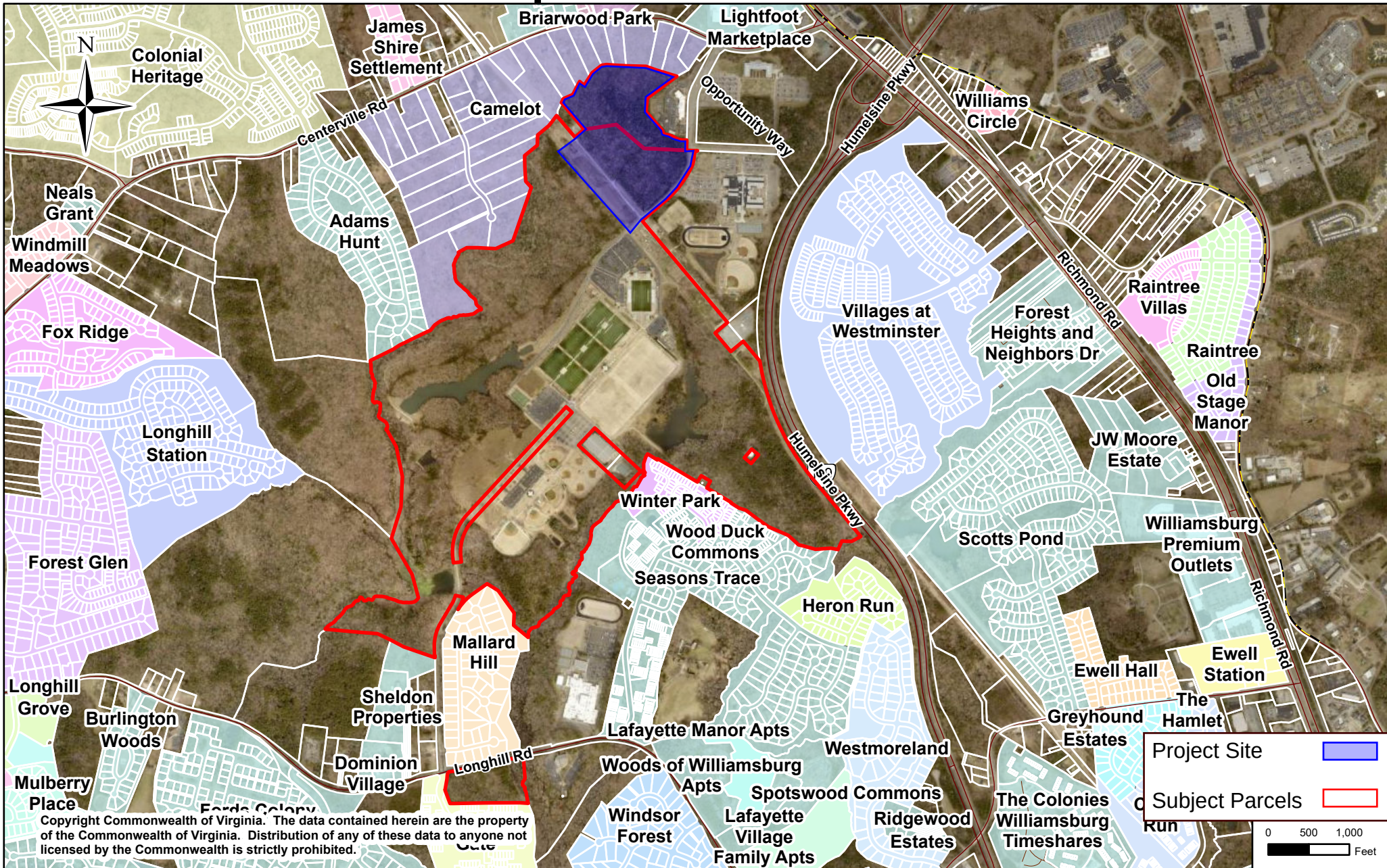
Teresa J. Saeed
Deputy Clerk to the Board

	VOTES			
	<u>AYE</u>	<u>NAY</u>	<u>ABSTAIN</u>	<u>ABSENT</u>
WAINWRIGHT	_____	_____	_____	_____
NULL	_____	_____	_____	_____
LARSON	_____	_____	_____	_____
MCGLENNON	_____	_____	_____	_____
ICENHOUR	_____	_____	_____	_____

Adopted by the Board of Supervisors of James City County, Virginia, this 13th day of January, 2026.

SUP25-15-4900Std-4620Opp-res

SUP-25-0015, 4900 Stadium Road General Services Headquarters





JCC General Services Headquarters

Aerial from Stadium Road

Eskew Dumez Ripple⁺





JCC General Services Headquarters

Aerial from Warhill High School

Eskew Dumez Ripple⁺ +





JCC General Services Headquarters

Entry Plaza



JCC General Services Headquarters

Approach, Drop Off, and Entry Plaza

Eskew Dumez Ripple⁺ +





JCC General Services Headquarters

Approach, Drop Off, and Entry Plaza

Eskew Dumez Ripple⁺ +





JCC General Services Headquarters

Drop Off and Entry Plaza



JCC General Services Headquarters

Courtyard with Drainage Garden

Eskew Dumez Ripple⁺ +





JCC General Services Headquarters

Courtyard Approach

Eskew Dumez Ripple⁺ +





JCC General Services Headquarters

Woodland Terrace

Eskew Dumez Ripple⁺ +





JCC General Services Headquarters

Woodland Terrace

Eskew Dumez Ripple⁺ +





JCC General Services Headquarters

Biofilter Grove with Walkway

Eskew Dumez Ripple⁺ +





JCC General Services Headquarters

Facilities Shop Approach

Eskew Dumez Ripple⁺ +





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Norfolk, VA 23510
757 627 1489
viadesignarchitects.com

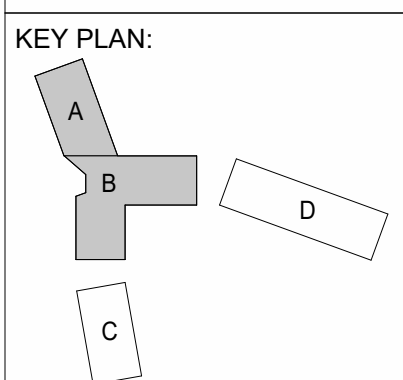
Eskew Dumez Ripple
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Washington, DC 20036
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DESIGN DEVELOPMENT
SET
NOT FOR CONSTRUCTION

JAMES CITY COUNTY
GENERAL SERVICES HEADQUARTERS
4900 STADIUM ROAD, WILLIAMSBURG, VA 23188

#	DATE	DESCRIPTION

VIA PROJ #: 23049
DATE: 10/30/2025
CHECKED BY: Checker
SHEET STATUS:
DESIGN DEVELOPMENT



SHEET TITLE:
WORK AREA:
BUILDING ELEVATIONS -
SUP SUBMITTAL

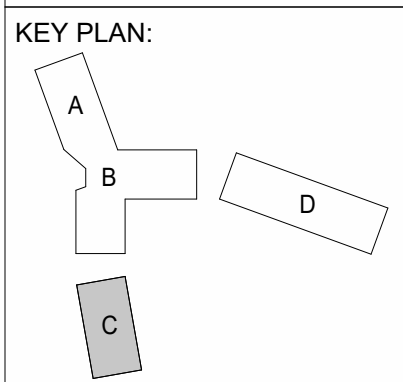
SHEET NUMBER:

REVISED 11/07/2025
EXHIBIT H
SUP03



#	DATE	DESCRIPTION

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DATE: 10/30/2025
CHECKED BY: Checker
SHEET STATUS: DESIGN DEVELOPMENT



SHEET TITLE:
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BUILDING ELEVATIONS -
SUP SUBMITTAL

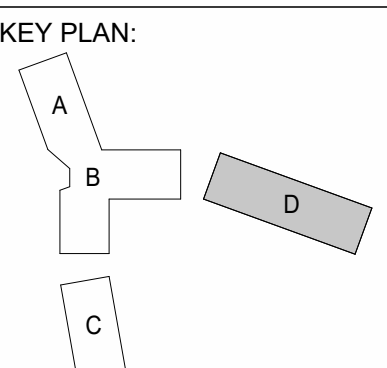
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REVISED 11/07/2025
EXHIBIT H
SUP04



REVISIONS	DESCRIPTION	
	DATE	
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DATE: 10/30/2025
CHECKED BY: Checker
SHEET STATUS: DESIGN DEVELOPMENT



SHEET TITLE:
WORK AREA:
BUILDING ELEVATIONS -
SUP SUBMITTAL

SHEET NUMBER:

REVISED 11/07/2025
EXHIBIT H
SUP05

Warhill Sports Complex Traffic Impact Analysis

**Submitted to:
James City County,
Virginia**

Steve Schmidt, PE, PTOE, AICP
Project Manager

804.200.6502
Steve.schmidt@timmons.com

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Suite 300
Richmond, VA 23225



Warhill Sports Complex Traffic Impact Analysis

Prepared For:

James City County

Prepared By:

Timmons Group
7053 Celebration Park Ave, Suite 300
Richmond, Virginia 23225

July 2025
Revised November 2025

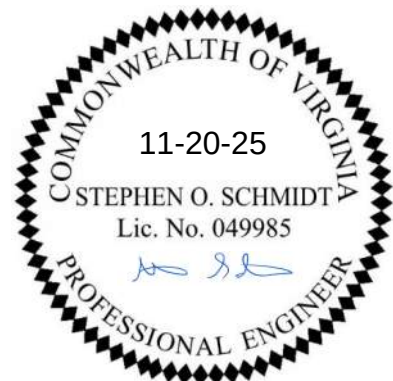


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1 EXECUTIVE SUMMARY

This report presents the findings of the traffic impact analysis (TIA) prepared for the proposed Warhill Athletic Complex Master Plan expansion located in James City County, Virginia. This report was originally submitted in July of 2025 and after receiving comments from VDOT was revised to reflect those comments. Responses to the comments are included in Appendix A.

1.1 PROJECT OVERVIEW

The existing Warhill Sports Complex is located south of Centerville Road, north of Longhill Road, and west of Route 199 as shown in Figure 1-1 (all figures are located at the end of their respective chapter).

The project is a proposed expansion of the existing Warhill Athletic Complex and will consist of 12 sports fields, 87.7 acres of public park space, and a 60,000 SF general services building.

Access to the site will be provided via two existing entrances, Opportunity Way off Centerville Road and Warhill Trail off Longhill Road. The Master Plan is shown on Figure 1-2.

For the purposes of this analysis, the expansion was assumed to be complete by 2040.

When complete, the proposed expansion will generate a total of 1,754 daily trips, 92 AM peak hour trips (72 in and 20 out), 282 PM peak hour trips (148 in and 135 out) and 489 Saturday peak trips (235 in and 253 out).

The purpose of this analysis is to determine the impact of the proposed expansion on the surrounding roadway network. The scope of this study was developed in conjunction with James City County. A copy of the scoping documents is included in Appendix A.

1.2 STUDY LIMITS

As agreed upon in the scoping between the County and Timmons Group, the study limits include the following five (5) existing intersections:

1. Longhill Gate Road/Warhill Trail and Longhill Road (Unsignalized);
2. Opportunity Way and Centerville Road (Signalized);
3. Centerville Road and Route 60 (Signalized);
4. Route 199 EB Ramps and Route 60 (Richmond Highway) (Signalized); and
5. Route 199 WB Ramps and Route 60 (Richmond Highway) (Signalized).

In accordance with the scoping agreement, analyses were completed for the following scenarios:

1. 2025 Existing Traffic Conditions;
2. 2040 Background Traffic Conditions (without development of the site);
3. 2040 Future Traffic Conditions (with development of the site);
4. 2046 Background Traffic Conditions (without development of the site); and
5. 2046 Future Traffic Conditions (with development of the site).

The following steps were taken to determine the potential traffic impacts associated with this project:

1. Data Collection – Weekday and Saturday traffic counts were provided when public schools were in session.
2. Traffic Growth – As agreed upon in scoping, a 1% annual growth rate was applied to existing traffic volumes to account for development growth outside of the study area.
3. Trip Generation – Traffic generated by the proposed development was estimated using the 11th edition of the Institute of Transportation Engineers' *Trip Generation Manual*.
4. Traffic Distributions – The distribution of trips generated by the proposed developed was based on the existing traffic volumes, the nature of the use, and local knowledge.
5. Site Traffic Projections – Future traffic volumes were determined by combining the total background traffic volumes with proposed new trips generated by the site to create the total future traffic volumes used in the analysis.
6. Traffic Capacity Analysis – Level of service calculations for existing, background, and future conditions were performed using Synchro Version 11 with SimTraffic for signalized and unsignalized intersections.
7. Queuing Analysis – The 95th percentile queue lengths (Synchro) and maximum queues (SimTraffic) were reviewed at the intersections listed above.

1.3 PRINCIPAL FINDINGS

Under 2025 existing conditions, all signalized intersections operate at LOS D or better during all three peak periods. The unsignalized intersection of Longhill Road and Warhill Trail operates at LOS C during the AM and Saturday peak and LOS F during the PM peak.

Under 2040 total background conditions, including growth in existing traffic and the approved background development, the signalized intersections operate at LOS E or better during all peaks with the exception of the Route 60/Centerville Road intersection, which operates at LOS F. The unsignalized intersection of Longhill Road and Warhill Trail operates at LOS D during the AM and Saturday peaks and LOS F during the PM peak.

Under 2040 total future conditions, including the growth in existing traffic, background development, and site trips, the intersections continue to perform in similar conditions to 2040 background in terms of delay. Queues are considerably increased for traffic entering the network from Opportunity Way.

Under 2046 total background conditions, including the growth in existing traffic and the approved background development, all intersections continue to perform in similar conditions to 2040 background.

Under 2046 total future conditions, including the growth in existing traffic, background development and site trips, the intersections continue to perform in similar conditions to 2046 background with increased queueing from vehicles entering the network from Opportunity Way.

A traffic signal is warranted at the Longhill Road/Longhill Gate Road/Warhill Trail intersection. The intersections meets Warrant 1A and 1B (70% threshold) under 2025 existing conditions and meets Warrant 1 (Combination Warrant – 100% threshold) under 2040 background conditions. Installation of a traffic signal should be considered at the intersection.

1.4 RECOMMENDATIONS

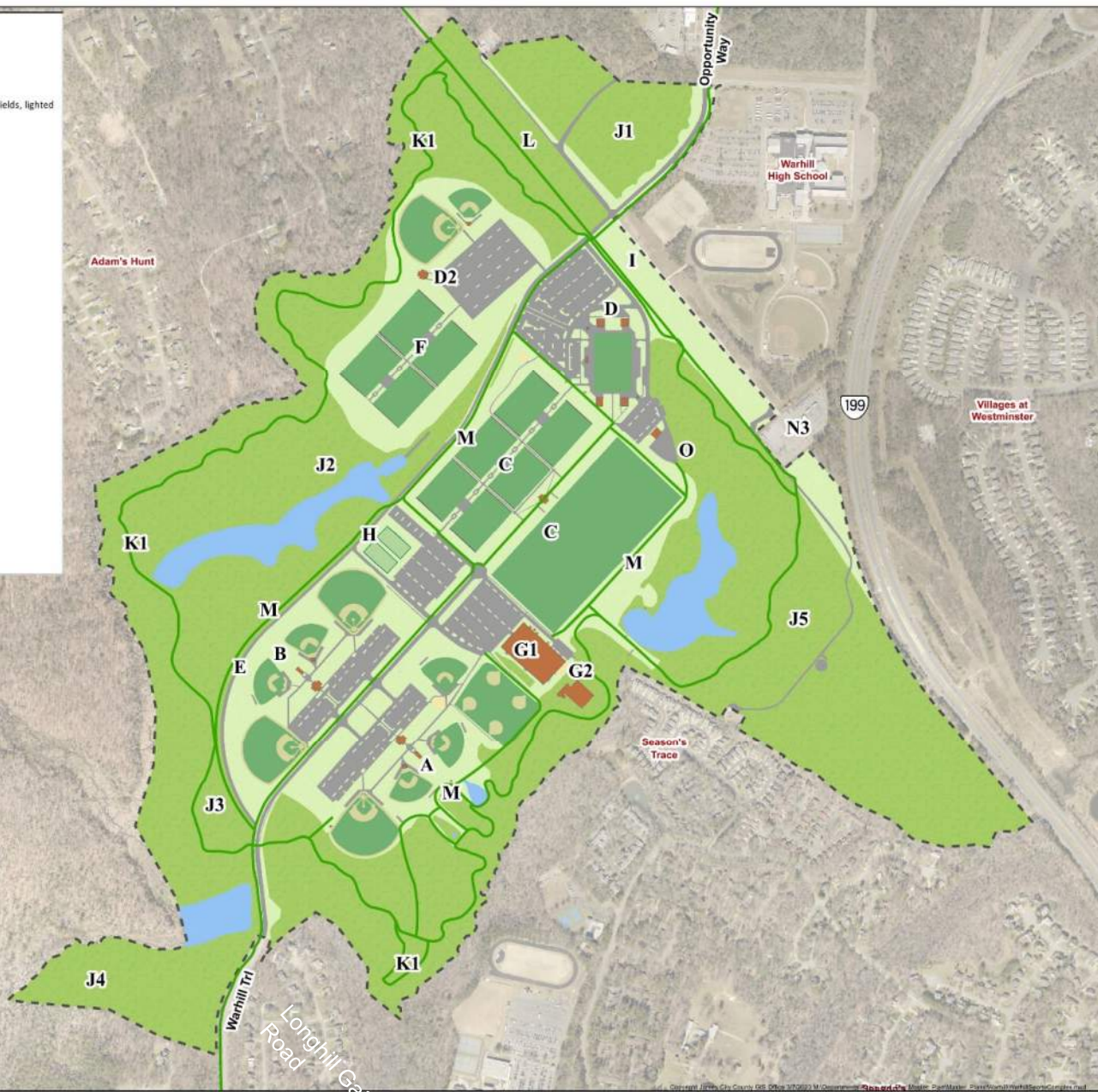
Installation of a traffic signal should be considered at the Longhill Road/Longhill Gate Road/Warhill Trail intersection. The southbound approach operates at LOS F and the intersection warrants the installation of a traffic signal under existing and future traffic conditions.



Surrounding Roadway Network and Site Location
Warhill Athletic Complex
James City County, Virginia

Figure
1- 1

- A- Baseball Complex**
4 Baseball Fields, lighted
1 Multiuse Field for T-ball
Parking- 260-400 Spaces
Concession/Rest Room Building
- B- Softball/Baseball Complex**
2 Large synthetic turf baseball fields, 2 synthetic turf softball/multiuse fields, lighted
Parking- 260-400 Spaces
Concession/Rest Room Building
- C- Multiuse field Complex**
8 Grass Fields, adjustable orientation
6 Multiuse Fields with Synthetic Turf, lighted
Parking- 440 Spaces
Concession/Rest Room Building
- D- Stadium Complex**
Football, Soccer, lighted
600-1000 Stadium parking, some shared,
some available in the utility corridor
- D2- Baseball/Softball Stadium Complex**
Baseball, softball, lighted
Parking- 400-600 Spaces
- E- Connector Road**
- F- Multipurpose Field Complex**
4 Multipurpose Fields, adjustable orientation, lighted
Parking - 200 Spaces
Concession/Rest Room Building
- G1- Existing WISC Building**
- G2 - Existing Indoor pool facility**
- H- Athletic Courts**
Basketball, Pickleball, Tennis, lighted
Parking- 75 spaces
- I- Community Garden**
- J1, J2, J3, J4, J5 - Unprogrammed Open Space**
- K1- Multiuse Nature Trail**
Soft surface 3.5 Mile s around park perimeter
- L- Paved Multiuse Trail in utility corridor**
- M- Paved Multiuse Trails**
around Soccer Complex 1 mile and Baseball/Softball Complex- 1-mile
- N3- Dominion Power Sub station**
- O - Grounds Maintenance Facility**



Master Plan

Warhill Sports Complex
Feb 2023



- Property Lines
- Trail
- Water
- Field
- Trees
- Grass
- Athletic Courts
- Pavement
- Public Building



0 300 600 1,200 Feet

2 BACKGROUND INFORMATION

2.1 DESCRIPTION OF ON-SITE DEVELOPMENT

The existing Warhill Sports Complex is located south of Centerville Road, north of Longhill Road, and west of Route 199 as shown in Figure 1-1 (all figures are located at the end of their respective chapter).

The project is a proposed expansion of the existing Warhill Athletic Complex and will consist of 12 sports fields, 87.7 acres of public park space, and a 60,000 SF general services building.

Access to the site will be provided via two existing entrances, Opportunity Way off Centerville Road and Warhill Trail off Longhill Road. The Master Plan is shown on Figure 1-2.

For the purposes of this analysis, the expansion was assumed to be complete by 2040.

When complete, the proposed expansion will generate a total of 1,754 daily trips, 92 AM peak hour trips (72 in and 20 out), 282 PM peak hour trips (148 in and 135 out) and 489 Saturday peak trips (235 in and 253 out).

The purpose of this analysis is to determine the impact of the proposed expansion on the surrounding roadway network. The scope of this study was developed in conjunction with James City County. A copy of the scoping documents is included in Appendix A.

2.2 STUDY LIMITS

As agreed upon in the scoping documents, the study limits include the following five (5) existing intersections:

1. Longhill Gate Road/Warhill Trail and Longhill Road (Unsignalized);
2. Opportunity Way and Centerville Road (Signalized);
3. Centerville Road and Route 60 (Richmond Highway) (Signalized);
4. Route 199 SB Ramps and Route 60 (Richmond Highway) (Signalized); and
5. Route 199 NB Ramps and Route 60 (Richmond Highway) (Signalized).

The existing intersection geometry for the study intersections can be found in Figure 2-1.

2.3 EXISTING ROADWAY NETWORK

Longhill Gate Road is a two lane, undivided local road with a posted speed limit of 25 mph.

Warhill Trail is a two-lane, undivided local road with a posted speed limit of 30 mph. Warhill Trail serves as a connector from Longhill Road to the existing Warhill Athletic Complex. According to 2023 VDOT AADT data, Warhill Trail services 260 vehicles per day.

Longhill Road is a two-lane, undivided minor arterial roadway with a posted speed limit of 45 mph. According to 2023 VDOT AADT data, Longhill Road services 6,800 vehicles per day from Centerville Road to Seasons Trace.

Opportunity Way is a two-lane, undivided local road with a posted speed limit of 35 mph. Opportunity Way serves as a connector from the existing Warhill Athletic Complex and Centerville Road. According to 2023 VDOT AADT data, Opportunity Way services 70 vehicles per day.

Centerville Road is a four-lane, undivided minor arterial roadway with a posted speed limit of 45 mph. According to 2023 VDOT AADT data, Centerville Road services 11,000 vehicles per day from Adams Hunt Road to US 60 (Richmond Highway).

Route 60 (Richmond Highway) is a four lane, divided, principal arterial roadway with a posted speed limit of 45 mph. According to 2023 VDOT AADT data, Route 60 services 26,000 vehicles per day from Centerville Road to the Route 199 Eastbound ramps.

2.4 FUTURE IMPROVEMENTS AND BACKGROUND DEVELOPMENTS

There are no planned or funded future improvements in the study area to be considered within the timeframe of the analysis.

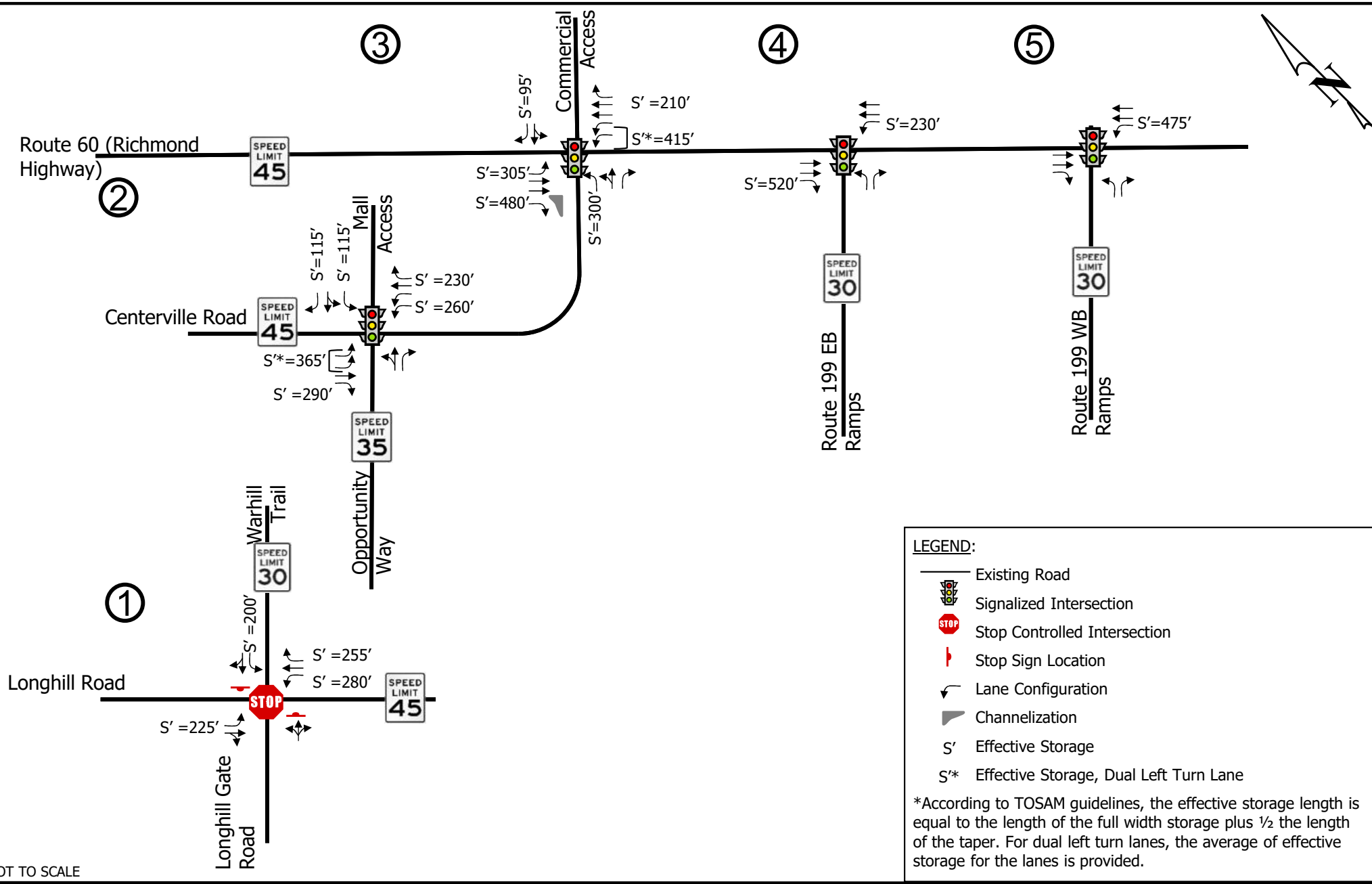
There is one development planned in the study area, the James City County Municipal Office Building. The trips associated with the background development can be found in 4-1.

2.5 OTHER MODES OF TRANSPORTATION

Currently, there is a shared use path present along Longhill Road that extends throughout the Warhill Athletic Complex. There is a shared use path along the north side of Centerville Road and a shared use path along Opportunity Way approaching the sports complex.

The area is served by the WATA Longhill Road Bus Line with stops at the intersections of Longhill Road/Warhill Trail and Centerville Road/Opportunity Way.

To be conservative, all site generated traffic was assumed to be vehicular based, and no reductions were applied for other modes of transportation.



3 2025 EXISTING CONDITIONS

3.1 EXISTING TRAFFIC VOLUMES

Existing peak hour turning movement counts were conducted at each of the study intersections on Thursday, March 6, 2025 and Saturday, March 8, 2025. The counts included heavy vehicles by movement, pedestrians, and bikes.

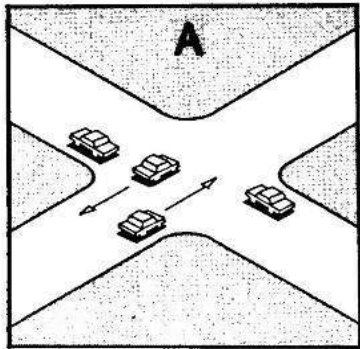
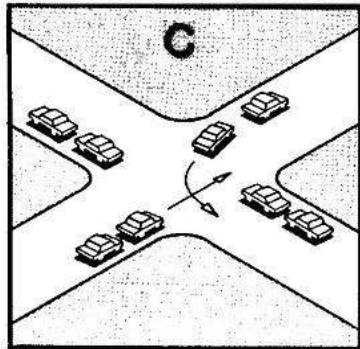
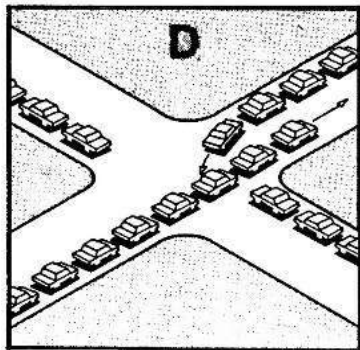
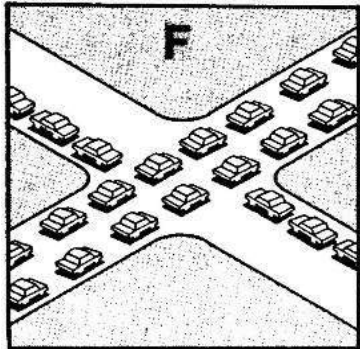
The common AM peak hour was found to be 7:00 AM – 8:00 AM and the common PM peak hour was found to be 4:30 PM – 5:30 PM. The Saturday peak was found to be 12:00 PM – 1:00 PM. The existing vehicle traffic counts are shown on Figure 3-1; The complete traffic data is included in Appendix B.

Existing signal timings for the signalized intersections were provided by VDOT and are included in Appendix C.

3.2 CAPACITY ANALYSIS

Capacity analysis allows traffic engineers to determine the impacts of traffic on the surrounding roadway network. The Transportation Research Board's (TRB) *Highway Capacity Manual* (HCM) methodologies govern how the capacity analyses are conducted and how the results are interpreted. There are six letter grades of Levels of Service (LOS) from A to F, with LOS A representing the best operating conditions and LOS F the worst operating conditions. Table 3-1 shows in detail how each of these levels of service are interpreted.

Table 3-1: Level of Service Definitions

Level of Service	Roadway Segments or Controlled Access Highways	Intersections	
A	Free flow, low traffic density.	No vehicle waits longer than one signal indication.	
B	Delay is not unreasonable, stable traffic flow.	On a rare occasion motorists wait through more than one signal indication.	
C	Stable condition, movements somewhat restricted due to higher volumes, but not objectionable for motorists.	Intermittently drivers wait through more than one signal indication, and occasionally backups may develop behind left turning vehicles, traffic flow still stable and acceptable.	
D	Movements more restricted, queues and delays may occur during short peaks, but lower demands occur often enough to permit clearing, thus preventing excessive backups.	Delays at intersections may become extensive with some, especially left-turning vehicles waiting two or more signal indications, but enough cycles with lower demand occur to permit periodic clearance, thus preventing excessive backups.	
E	Actual capacity of the roadway involves delay to all motorists due to congestion.	Very long queues may create lengthy delays, especially for left-turning vehicles.	
F	Forced flow with demand volumes greater than capacity resulting in complete congestion. Volumes drop to zero in extreme cases.	Backups from locations downstream restrict or prevent movement of vehicles out of approach creating a storage area during part or all of an hour.	

SOURCE: "A Policy on Design of Design of Urban Highways and Arterial Streets" - AASHTO, 1973 based upon material published in "Highway Capacity Manual", National Academy of Sciences, 1965.

For signalized and unsignalized intersections, level of service is defined in terms of **delay**, a measure of driver discomfort, frustration, fuel consumption and lost travel time. Table 3-2 summarizes the delay associated with each LOS category:

Table 3-2: Signalized and Unsignalized Intersection Level of Service Criteria

Signalized Intersections		Unsignalized Intersections	
Level of Service	Control Delay per Vehicle (sec/veh)	Level of Service	Average Control Delay (sec/veh)
A	≤ 10	A	0 to 10
B	> 10 to ≤ 20	B	> 10 to ≤ 15
C	> 20 to ≤ 35	C	> 15 to ≤ 25
D	> 35 to ≤ 55	D	> 25 to ≤ 35
E	> 55 to ≤ 80	E	> 35 to ≤ 50
F	> 80	F	> 50

Source: Exhibit 16-2 and Exhibit 17-2 from TRB's "Highway Capacity Manual 2000"

Capacity analyses were performed to assess existing (2025), total background (2040 and 2046), and total future (2040 and 2046) operational conditions. The signalized and unsignalized intersections were analyzed using SYNCHRO Version 11 based on HCM 2000 methodologies with the following assumptions:

- Level terrain;
- 12-foot lane widths;
- Existing peak hour factor as determined by the traffic counts (by intersection) for existing scenario;
- The higher of the existing peak hour factor as determined by traffic counts (by intersection) or a peak hour factor of 0.92 for the background and total future scenarios.
- Heavy vehicle percentage as determined by the traffic counts (by movement); and
- Traffic signals timing data provided by VDOT.

Queuing analyses were conducted using the HCM 2000 Edition methodology (as calculated by SYNCHRO) and SimTraffic simulations. The Synchro 95th percentile queue is the maximum back of queue for a particular lane within a lane group considering 95th percentile traffic volumes. The SimTraffic maximum queues are the average maximum queues after 10 runs of 60 minutes each.

Note that it is possible for the 95th percentile queue to be higher than the SimTraffic maximum queue due to the method in which each software calculates its respective value. The 95th percentile queue is based on an HCM formula while the SimTraffic maximum queue varies based on simulation results.

3.3 EXISTING CONDITIONS CAPACITY ANALYSIS RESULTS

Table 3-3 summarizes the 2025 existing intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the 2025 existing roadway geometry (Figure 2-1), peak hour traffic volumes shown on Figure 3-1 and the existing signal timings as provided by VDOT.

The corresponding SYNCHRO and SimTraffic reports are included in Appendix D. Note that the intersection numbers shown on the LOS, delay, and queue length summary tables correspond with the intersection node numbers used in the Synchro models and report figures.

As shown in Table 3-3, under 2025 existing conditions:

At the unsignalized intersection of Longhill Road and Longhill Gate Road/Warhill Trail, all approaches operate at LOS C or better during all peaks with the exception of the southbound approach of Warhill Trail which operates at LOS F during the PM peak. All queues are contained within the existing provided storage. This intersection is the subject of a traffic signal warrant analysis below.

The signalized intersection of Centerville Road and Opportunity Way operates at an overall LOS D during all three peaks. The mainline eastbound and westbound approaches of Centerville Road operate at LOS C or better during all three peaks. The northbound and southbound approaches of Opportunity Way and the Mall Access operate at LOS E during all three peaks. All queues are contained within the existing provided storage, with the exception of the westbound left which slightly extends beyond the provided storage.

The signalized intersection of Centerville Road and Route 60 operates at overall LOS D during the AM and Saturday peaks and LOS E during the PM peak. The mainline eastbound and westbound approaches of Route 60 operate at LOS D or better during all peaks with the exception of the westbound approach in the PM peak which operates at LOS F and experiences left turn queues that extend beyond the provided storage. The northbound approach of Centerville Road operates at LOS D during the AM peak and LOS F during the PM and Saturday peaks. The southbound approach of the Commercial Access operates at LOS E during the AM peak and LOS F during the PM and Saturday peaks.

The signalized intersection of Route 60 and the Route 199 Eastbound ramps operate at LOS B during all three peaks. The mainline eastbound and westbound approaches of Route 60 operate at LOS A during all three peaks. The northbound approach of the Route 199 EB ramp operates at LOS E during the AM peak and LOS D during the PM and Saturday peaks. All queues are contained within the existing storage with significant northbound queueing present during the PM peak.

The signalized intersection of Route 60 and the Route 199 Westbound ramps operates at LOS C during the AM and PM peaks and LOS B during the Saturday peak. The mainline eastbound and westbound approaches of Route 60 operate at LOS C or better during all three peaks. The northbound approach operates at LOS E during the AM and Saturday peaks and LOS D during the PM peak. All queues are contained within the existing provided storage.

**Table 3-3: 2025 Existing Traffic
Intersection Level of Service and Delay Summary**

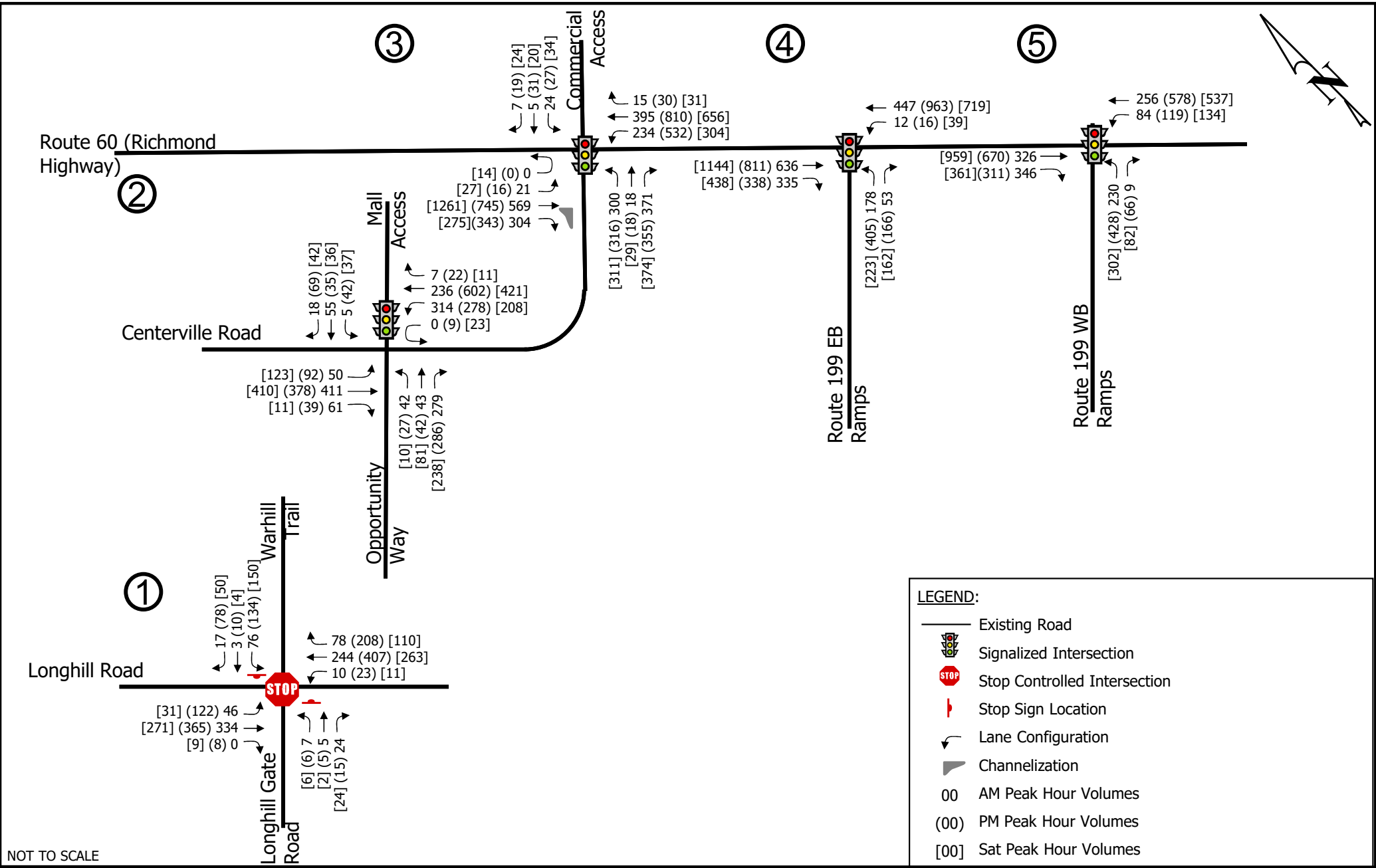
Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR				SATURDAY PEAK HOUR			
			Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Unsignalized	EB Left	225	8.1	A	3	38	9.6	A	13	74	8.2	A	2	30
	EB Thru-Right		0.0	A	0	0	0.0	A	0	0	0.0	A	0	2
	EB Approach		1.0	A	--	--	2.4	A	--	--	0.8	A	--	--
	WB Left	280	8.2	A	1	33	8.2	A	2	29	7.9	A	1	25
	WB Thru		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	WB Right	225	0.0	A	0	11	0.0	A	0	41	0.0	A	0	10
	WB Approach		0.2	A	--	--	0.3	A	--	--	0.2	A	--	--
	NB L-T-R		13.7	B	7	60	24.7	C	11	46	12.2	B	5	46
	NB Approach		13.7	B	--	--	24.7	C	--	--	12.2	B	--	--
	SB Left	200	23.4	C	31	75	157.3	F	200	203	26.1	D	65	106
	SB Thru-Right		10.8	B	3	51	14.7	B	19	74	10.6	B	7	48
	SB Approach		20.8	C	--	--	100.6	F	--	--	21.9	C	--	--
	Overall		47.2	D	--	--	36.4	D	--	--	36.4	D	--	--
	Overall		47.2	D	--	--	36.4	D	--	--	36.4	D	--	--
2. Centerville Road (E-W) and Opportunity Way (N) and Mall Access (S) Signalized	EB Dual Left ²	365	61.0	E	41	212	59.3	E	69	136	58.9	E	86	134
	EB Thru		54.8	D	384	546	20.4	C	314	278	19.0	B	351	266
	EB Right	290	25.1	C	0	223	15.3	B	0	89	13.7	B	0	81
	EB Approach		51.9	D	--	--	27.0	C	--	--	27.9	C	--	--
	WB Dual Left ²	260	45.0	D	191	277	72.9	E	m136	207	68.8	E	m151	145
	WB Thru		12.1	B	95	188	9.6	A	m145	433	8.0	A	m141	317
	WB Right	230	12.5	B	m0	32	10.9	B	m0	148	12.1	B	m0	66
	WB Approach		30.7	C	--	--	29.6	C	--	--	29.2	C	--	--
	NB Left-Thru	200	88.3	F	127	208	61.9	E	110	117	61.7	E	134	127
	NB Right		55.4	E	0	279	57.3	E	93	136	55.3	E	81	121
	NB Approach		63.1	E	--	--	58.2	E	--	--	57.1	E	--	--
	SB Left	115	55.0	D	15	10	59.9	E	74	38	59.6	E	67	22
	SB Left-Thru		61.3	E	91	102	59.6	E	74	82	60.0	E	76	63
	SB Right	115	54.8	D	0	31	57.7	E	0	47	57.8	E	0	16
	SB Approach		59.5	E	--	--	58.8	E	--	--	59.1	E	--	--
	Overall		47.2	D	--	--	36.4	D	--	--	36.4	D	--	--
	Overall		47.2	D	--	--	36.4	D	--	--	36.4	D	--	--
	Overall		47.2	D	--	--	36.4	D	--	--	36.4	D	--	--
3. Route 60 (E-W) and Centerville Road (N) and Commercial Access (S) Signalized	EB Left	305	60.3	E	49	84	60.4	E	40	88	60.4	E	75	282
	EB Thru		28.4	C	285	349	42.5	D	332	479	36.4	D	#667	674
	EB Right	480	25.3	C	62	137	33.6	C	61	249	22.0	C	54	447
	EB Approach		28.1	C	--	--	40.0	D	--	--	34.5	C	--	--
	WB Dual Left ²	415	44.3	D	110	199	204.1	F	#457	415	62.0	E	176	252
	WB Thru		25.2	C	235	174	27.1	C	304	692	18.1	B	253	227
	WB Right	210	18.5	B	m0	48	24.1	C	m0	66	15.5	B	m0	36
	WB Approach		32.0	C	--	--	95.7	F	--	--	31.5	C	--	--
	NB Left	300	39.5	D	m192	243	79.0	E	m#265	204	90.0	F	#292	223
	NB Left-Thru		39.1	D	m191	276	77.7	E	m#264	218	86.6	F	#282	249
	NB Right		64.8	E	m253	283	104.4	F	#251	309	134.9	F	#242	389
	NB Approach		53.1	D	--	--	91.8	F	--	--	112.7	F	--	--
	SB Left-Thru		74.9	E	62	71	152.1	F	#166	132	260.2	F	#151	105
	SB Right	95	53.6	D	0	16	40.9	D	0	73	55.5	E	0	40
	SB Approach		70.7	E	--	--	124.7	F	--	--	197.8	F	--	--
	Overall		37.5	D	--	--	76.6	E	--	--	54.0	D	--	--
	Overall		37.5	D	--	--	76.6	E	--	--	54.0	D	--	--
	Overall		37.5	D	--	--	76.6	E	--	--	54.0	D	--	--
4. Route 60 (E-W) Route 199 EB Ramps (N) Signalized	EB Thru		7.3	A	135	183	13.7	B	m125	188	8.3	A	m167	393
	EB Right	520	2.9	A	16	112	6.1	A	m11	95	1.7	A	m0	176
	EB Approach		5.8	A	--	--	11.4	B	--	--	6.5	A	--	--
	WB Left	230	65.1	E	m29	64	64.8	E	m28	229	61.3	E	m62	93
	WB Thru		6.9	A	146	147	14.1	B	282	693	6.7	A	187	153
	WB Approach		8.4	A	--	--	14.9	B	--	--	9.4	A	--	--
	NB Left		59.0	E	225	265	50.3	D	#542	1115	58.3	E	264	311
	NB Right		44.7	D	34	75	33.0	C	65	1123	43.9	D	58	135
	NB Approach		55.7	E	--	--	45.3	D	--	--	52.2	D	--	--
	Overall		13.4	B	--	--	19.9	B	--	--	13.8	B	--	--
	Overall		13.4	B	--	--	19.9	B	--	--	13.8	B	--	--
	Overall		13.4	B	--	--	19.9	B	--	--	13.8	B	--	--
5. Route 60 (E-W) Route 199 WB Ramps (N) Signalized	EB Thru		8.0	A	51	112	11.1	B	163	160	9.9	A	225	349
	EB Right		20.0	B	35	136	16.8	B	17	100	6.3	A	12	214
	EB Approach		14.2	B	--	--	12.9	B	--	--	8.9	A	--	--
	WB Left	475	61.6	E	129	174	61.9	E	161	192	64.0	E	180	242
	WB Thru		6.2	A	62	129	13.1	B	155	266	8.2	A	133	172
	WB Approach		19.9	B	--	--	21.5	C	--	--	19.4	B	--	--
	NB Left		62.3	E	279	355	57.1	E	#544	702	62.6	E	342	370
	NB Right		43.4	D	15	20	33.0	C	39	387	40.9	D	38	100
	NB Approach		61.6	E	--	--	53.9	D	--	--	58.5	E	--	--
	Overall		24.8	C	--	--	25.0	C	--	--	19.7	B	--	--
	Overall		24.8	C	--	--	25.0	C	--	--	19.7	B	--	--
	Overall		24.8	C	--	--	25.0	C	--	--	19.7	B	--	--

¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.

² Dual left turn lanes; average storage is provided.

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.



2025 Existing Volumes
Warhill Athletic Complex
James City County, Virginia

Figure
3-1

4 2040 BACKGROUND CONDITIONS

The background 2040 volumes were analyzed assuming the proposed roadway geometry in conjunction with projected background traffic volumes, which consists of general traffic growth and the approved neighboring development.

4.1 GENERAL TRAFFIC GROWTH

The background volumes were based on a 1.0% annual growth rate. The growth rate was compounded annually for the 15-year period from 2025 to 2040 and was applied to all movements at the study intersections.

4.2 APPROVED BACKGROUND DEVELOPMENTS

Per scoping with the County, there is one background development in the surrounding area, the James City County Municipal Complex located east of the Warhill Athletics Complex. The background development trips were distributed along the roadway network based on the distributions from the Municipal Complex study and is shown on Figure 4-1.

Given the nature of the uses, the background development trips were only applied to the AM and PM peak hours.

4.3 TOTAL BACKGROUND TRAFFIC VOLUMES

The 2040 background (existing + growth) volumes were added to the background development trips (Figure 4-1) to yield the 2040 total background traffic volumes shown in Figure 4-2.

4.4 BACKGROUND 2040 CAPACITY ANALYSIS RESULTS

Table 4-1 summarizes the 2040 background intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the existing roadway geometry (Figure 2-2) and the total background peak hour traffic volumes shown on Figure 4-2.

The corresponding Synchro and SimTraffic reports are included in Appendix E. Note that the intersection numbers shown on the LOS, delay, and queue length summary tables correspond with the intersection node numbers used in the Synchro models and report figures.

As shown in Table 4-1, under 2040 background conditions,

At the unsignalized intersection of Longhill Road and Longhill Gate Road/Warhill Trail, all approaches operate at LOS D or better during all peaks with the exception of the southbound approach of Warhill Trail which operates at LOS F during the PM peak. All queues are contained within the existing provided storage. This intersection is the subject of a traffic signal warrant analysis below.

The signalized intersection of Centerville Road and Opportunity Way continues to operate at an overall LOS D during all three peaks. The mainline eastbound and westbound approaches of Centerville Road continue to operate at acceptable LOS during all three peaks. The northbound and southbound approaches of Opportunity Way and the Mall Access continue to operate at LOS E during all three peaks.

The signalized intersection of Centerville Road and Route 60 operates at overall LOS D during the AM peak, LOS F during the PM peak and LOS E during the Saturday peak. The mainline eastbound and westbound approaches of Route 60 operate at LOS D or better during all peaks with the exception of the westbound approach in the PM peak which operates at LOS F and experiences left turn queues that fill the provided storage. The northbound approach of Centerville Road operates at LOS E during the AM peak and LOS F during the PM and Saturday peaks. The southbound approach of the Commercial Access operates at LOS F during all three peaks.

The signalized intersection of Route 60 and the Route 199 Eastbound ramps operates at LOS B the AM and Saturday peaks and LOS C during the PM peak. The mainline eastbound and westbound approaches of Route 60 operate at LOS B or better during all three peaks. The northbound approach of the Route 199 EB ramp continues to operate at LOS E during the AM peak and LOS D during the PM and Saturday peaks. All queues are contained within the existing storage with significant northbound queueing present during the PM peak.

The signalized intersection of Route 60 and the Route 199 Westbound ramps operates at LOS C during all three peaks. The mainline eastbound and westbound approaches of Route 60 operate at LOS C or better during all three peaks. The northbound approach operates at LOS E during the all three peaks. All queues are contained within the existing provided storage.

**Table 4-1: 2040 Total Background Conditions
Intersection Level of Service and Delay Summary**

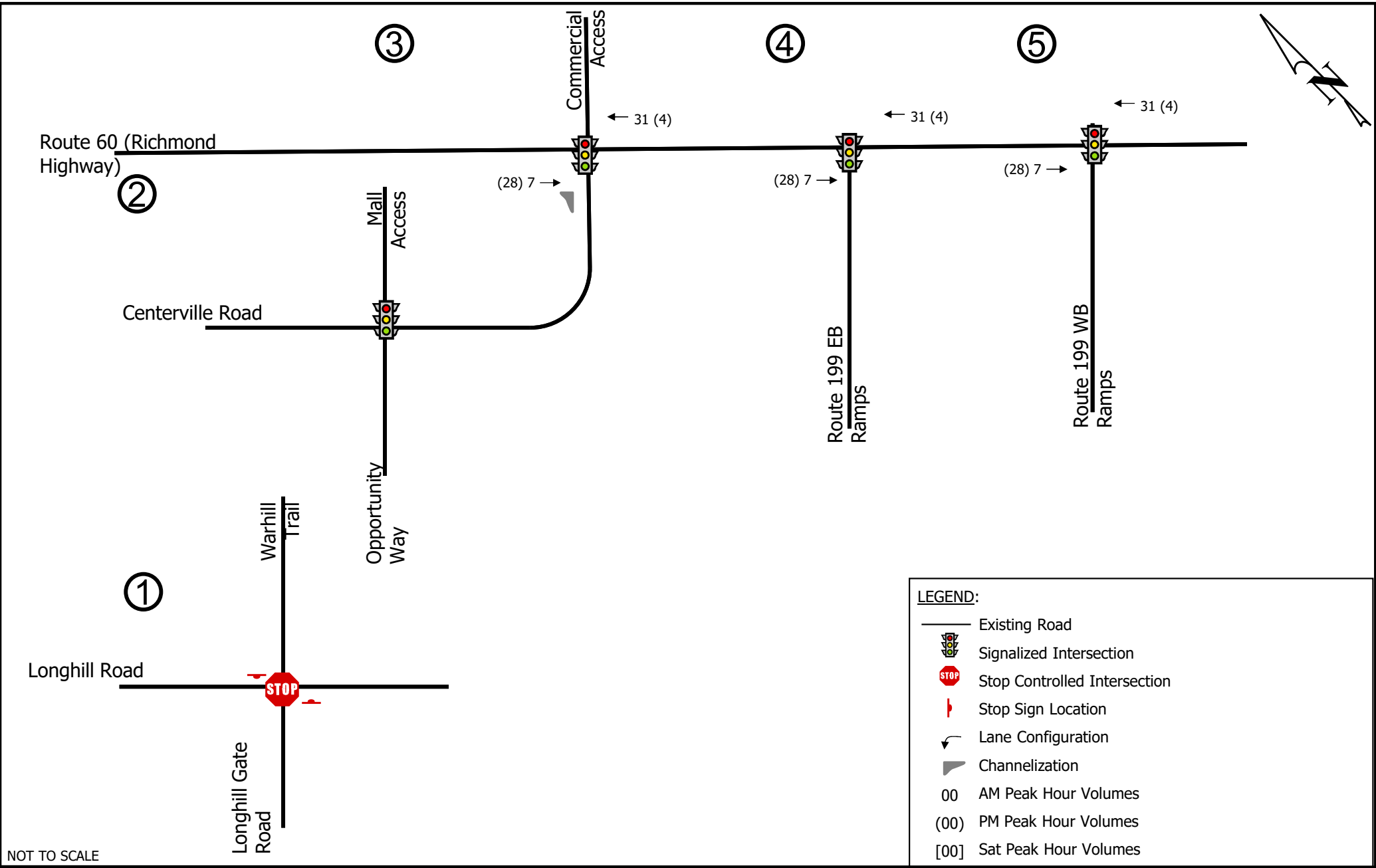
Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR				SATURDAY PEAK HOUR			
			Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Unsignalized	EB Left	225	8.3	A	4	40	10.2	B	16	95	8.4	A	3	42
	EB Thru-Right		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	EB Approach		1.0	A	--	--	2.5	A	--	--	0.8	A	--	--
	WB Left	280	8.3	A	1	29	8.4	A	2	31	8.0	A	1	26
	WB Thru		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	WB Right	225	0.0	A	0	4	0.0	A	0	43	0.0	A	0	6
	WB Approach		0.3	A	--	--	0.3	A	--	--	0.2	A	--	--
	NB L-T-R		15.3	C	10	52	36.9	E	21	58	13.2	B	7	54
	NB Approach		15.3	C	--	--	36.9	E	--	--	13.2	B	--	--
	SB Left	200	31.4	D	48	76	451.3	F	344	280	41.4	E	111	140
	SB Thru-Right		11.2	B	3	53	17.6	C	29	277	11.2	B	9	53
	SB Approach		27.2	D	--	--	279.1	F	--	--	33.3	D	--	--
2. Centerville Road (E-W) and Opportunity Way (N) and Mall Access (S) Signalized	EB Dual Left ²	365	61.1	E	50	201	59.1	E	78	152	58.9	E	97	189
	EB Thru		34.3	C	484	385	25.6	C	392	329	23.0	C	427	342
	EB Right	290	21.9	C	0	131	17.9	B	0	138	15.5	B	0	83
	EB Approach		35.4	D	--	--	31.1	C	--	--	31.0	C	--	--
	WB Dual Left ²	260	66.0	E	228	196	74.6	E	m138	196	68.9	E	m170	190
	WB Thru		7.0	A	m83	252	12.1	B	m153	375	9.5	A	m159	350
	WB Right	230	11.6	B	m0	34	11.5	B	m0	151	12.9	B	m0	148
	WB Approach		40.3	D	--	--	31.8	C	--	--	30.2	C	--	--
	NB Left-Thru	200	68.2	E	#177	152	64.9	E	127	122	64.5	E	156	148
	NB Right		55.4	E	#123	194	57.0	E	#102	166	54.9	D	89	150
	NB Approach		58.4	E	--	--	58.6	E	--	--	57.5	E	--	--
	SB Left	115	56.1	E	20	10	59.8	E	83	47	59.5	E	74	32
	SB Left-Thru		60.6	E	112	87	59.7	E	86	93	59.9	E	86	74
	SB Right	115	55.9	E	0	18	57.3	E	7	77	57.4	E	0	17
	SB Approach		59.3	E	--	--	58.6	E	--	--	58.9	E	--	--
	Overall		43.9	D	--	--	38.6	D	--	--	37.9	D	--	--
3. Route 60 (E-W) and Centerville Road (N) and Commercial Access (S) Signalized	EB Left	305	60.3	E	52	70	60.4	E	44	95	60.5	E	84	304
	EB Thru		33.3	C	320	398	37.9	D	362	428	62.3	E	#917	1552
	EB Right	480	28.2	C	63	152	29.6	C	57	262	24.1	C	60	480
	EB Approach		32.2	C	--	--	35.6	D	--	--	55.6	E	--	--
	WB Dual Left ²	415	54.5	D	#170	206	375.7	F	#546	415	64.6	E	192	279
	WB Thru		28.6	C	258	189	20.0	B	363	691	18.0	B	288	269
	WB Right	210	20.4	C	m0	50	21.0	C	m0	64	16.0	B	m0	126
	WB Approach		37.8	D	--	--	155.4	F	--	--	32.2	C	--	--
	NB Left	300	53.2	D	m#330	261	89.4	F	m#326	248	209.3	F	m#398	253
	NB Left-Thru		52.9	D	m#239	289	85.4	F	m#318	282	102.2	F	#352	269
	NB Right		93.3	F	#413	385	130.1	F	#402	380	128.6	F	#361	573
	NB Approach		74.7	E	--	--	109.4	F	--	--	141.3	F	--	--
	SB Left-Thru		91.4	F	#77	58	448.2	F	#209	137	323.0	F	#172	90
	SB Right	95	52.7	D	0	20	46.0	D	0	52	55.5	E	0	63
	SB Approach		83.9	F	--	--	349.8	F	--	--	240.5	F	--	--
	Overall		47.4	D	--	--	109.7	F	--	--	71.2	E	--	--
4. Route 60 (E-W) Route 199 EB Ramps (N) Signalized	EB Thru		7.6	A	m137	204	13.7	B	m148	199	9.8	A	m178	446
	EB Right	520	4.1	A	m20	117	5.0	A	m11	104	3.2	A	m0	216
	EB Approach		6.4	A	--	--	11.2	B	--	--	8.0	A	--	--
	WB Left	230	65.8	E	m30	52	69.3	E	m31	230	63.1	E	m68	93
	WB Thru		7.8	A	163	174	18.0	B	323	723	7.6	A	206	185
	WB Approach		9.3	A	--	--	18.9	B	--	--	10.5	B	--	--
	NB Left		58.9	E	253	308	48.6	D	#715	1115	59.5	E	310	353
	NB Right		43.7	D	38	97	30.3	C	95	1109	43.5	D	90	153
	NB Approach		55.4	E	--	--	43.3	D	--	--	52.8	D	--	--
	Overall		13.9	B	--	--	20.7	C	--	--	15.0	B	--	--
5. Route 60 (E-W) Route 199 WB Ramps (N) Signalized	EB Thru		9.6	A	46	133	13.9	B	228	165	13.3	B	284	360
	EB Right		20.0	B	10	179	21.7	C	26	105	6.0	A	11	222
	EB Approach		14.8	B	--	--	16.4	B	--	--	11.3	B	--	--
	WB Left	475	62.4	E	145	211	64.5	E	185	263	66.1	E	208	253
	WB Thru		7.3	A	78	123	17.0	B	180	351	9.7	A	157	195
	WB Approach		20.9	C	--	--	24.8	C	--	--	21.0	C	--	--
	NB Left		61.7	E	314	385	53.2	D	#716	1045	65.6	E	405	435
	NB Right		41.1	D	16	22	29.3	C	50	1038	38.8	D	41	95
	NB Approach		61.0	E	--	--	50.0	D	--	--	60.5	E	--	--
	Overall		25.1	C	--	--	26.7	C	--	--	21.9	C	--	--

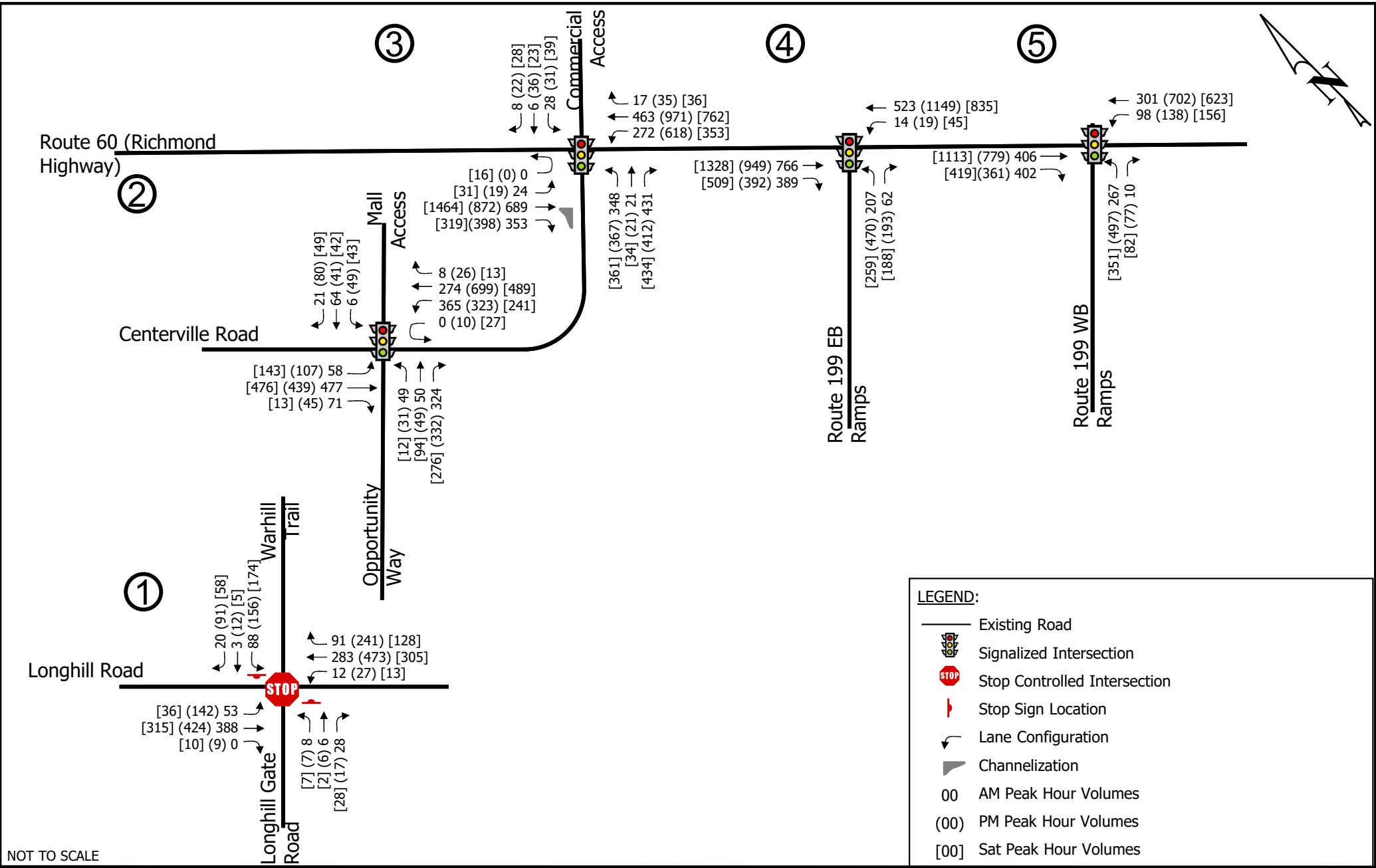
¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.

² Dual left turn lanes; average storage is provided.

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.





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5 TRIP GENERATION

The project is a proposed expansion of the existing Warhill Athletic Complex and will consist of 12 sports fields, 87.7 acres of public park space, a 60,000 SF general services building.

Access to the site will be provided via two existing entrances, Opportunity Way off Centerville Road and Warhill Trail off Longhill Road. of A site plan is shown on Figure 1-2.

For the purposes of this analysis, the development was assumed to be complete and occupied by 2040.

5.1 SITE TRIP GENERATION

The site-generated traffic volumes shown in Table 5-1 were estimated using the 11th Edition of the Institute of Transportation Engineers' (ITE) *Trip Generation Manual* and were calculated using the number of square feet as the independent variable.

ITE does not have data for a general services building. For trip generation purposes, the building was assumed to be a "research and development center" as that is the closest available fit.

Table 5-1: Trip Generation Summary

Buildout				Table 3-11 Trip Generation Summary												
				Weekday						Weekend				Average Daily Trips		
				AM Peak Hour			PM Peak Hour			SAT PEAK						
Land Use	Size	Units	Land Use Code	In	Out	Total	In	Out	Total	In	Out	Total				
1. ITE Trip Generation ⁽¹⁾																
<u>Warhill Athletics Complex</u>																
B. Softball/Baseball Complex ⁽²⁾				4	Fields	488	2	2	4	43	22	66	72	78	150	285
D. Stadium Complex ⁽³⁾				4	Fields	488	2	2	4	43	22	66	72	78	150	285
F. Multipurpose Field Complex ⁽⁴⁾				4	Fields	488	2	2	4	43	22	66	72	78	150	285
Warhill Athletics Complex Subtotal				12	Fields		7	5	12	130	67	197	216	234	450	856
<u>Public Park⁽⁵⁾</u>																
Outdoor Fitness Court				0.033	Acre	411	0	0	0	0	0	0	0	0	0	0
Skate Park				0.413	Acre	411	0	0	0	0	0	0	0	0	0	0
Pool				0.308	Acre	411	0	0	0	0	0	0	0	0	0	0
Unassigned Green Space				86.90	Acre	411	1	1	2	5	4	10	12	12	24	68
Public Park Subtotal				87.654	Acre		1	1	2	5	4	10	12	12	25	68
<u>James City County General Services Department</u>																
Research and Development Center ⁽⁶⁾				60,000	S.F.	760	64	14	78	12	63	75	7	7	14	830
James City County General Services Department Subtotal							64	14	78	12	63	75	7	7	14	830
Total ITE Generated Trips							72	19	92	148	135	282	235	253	489	1,754

Notes: (1) Based on the Institute of Transportation Engineers Trip Generation, 11th Edition. Assumes General Urban/Suburban land use category.

(2) 2 synthetic turf baseball fields, 2 synthetic turf softball fields. For trip generation purposes, considered a 4 field soccer complex (LU 488)

(3) Lighted Football Soccer Complex For trip generation purposes, considered a 4 field soccer complex due to size relative to number of parking spaces (LU 488)

(4) 4 multipurpose fields For trip generation purposes, considered a 4 field soccer complex (LU 488)

(5) Public Park consists of the proposed fitness court, County Skate Park, 50 meter pool, and unassigned green space with multiuse trails throughout

(6) Research and Development Center consists may consist offices and light fabrication areas, a similar use to the general service department which will consist of warehouse, a fuel island and a fleet building

As shown in Table 5-1, the proposed development will generate a total of 1,754 daily trips, 92 AM peak hour trips (72 in and 19 out), 282 PM peak hour trips (148 in and 135 out) and 489 Saturday peak trips (235 in and 253 out).

5.2 EXTERNAL TRIP DISTRIBUTIONS

The distribution of trips generated by the proposed developed was based on the existing traffic volumes, the nature of the use, and local knowledge. Different distributions were used for the weekday traffic and weekend traffic to account for the difference in traffic patterns for visitors to the Warhill Athletic Complex.

The following weekday directional distributions were assumed for the site and are shown on Figure 5-1:

- 10% to/from the west on Longhill Road;
- 15% to/from the west on Centerville Road;
- 15% to/from the north on Route 60;
- 25% to/from the south on Route 60;
- 20% to/from the south on Route 199; and
- 15% to/from the north on Route 199.

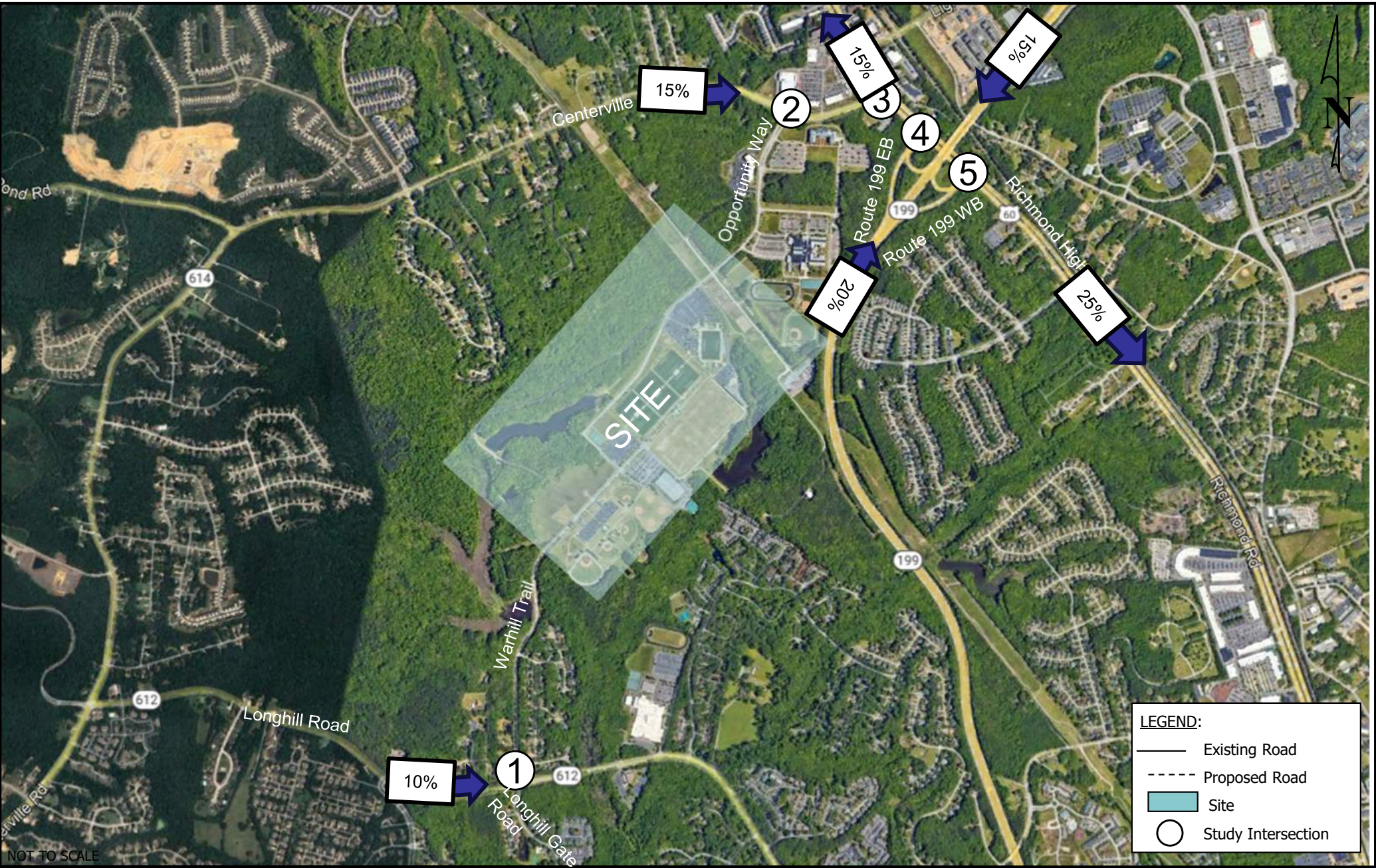
The following weekend directional distributions were assumed for the site and are shown on Figure 5-2:

- 5% to/from the west on Centerville Road;
- 10% to/from the north on Route 60;
- 20% to/from the south on Route 60;
- 50% to/from the south on Route 199; and
- 15% to/from the north on Route 199.

The intersection trip distributions can be found in Figure 5-3 and 5-4.

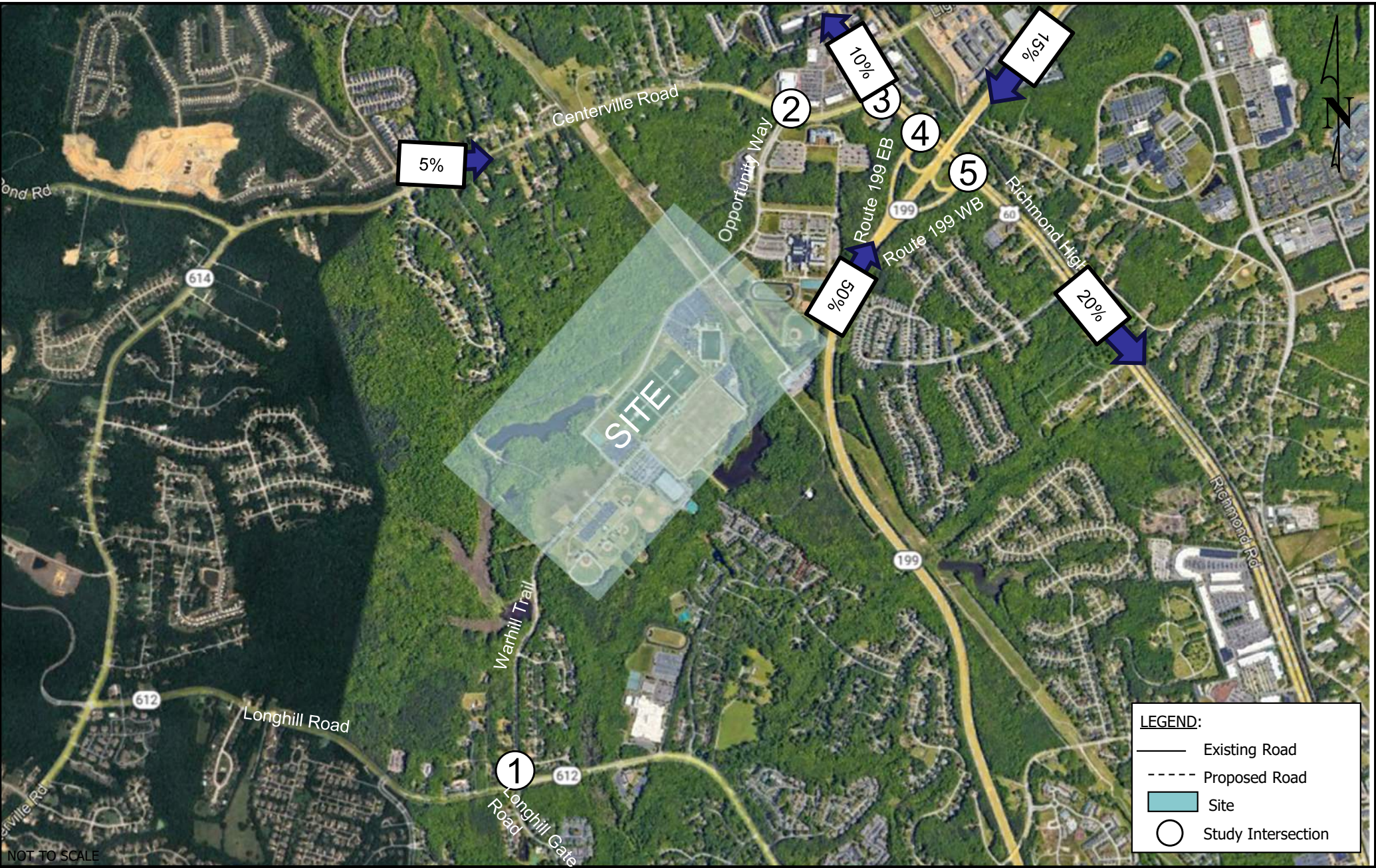
5.3 TRAFFIC ASSIGNMENT

The trip distribution percentages for the external trips from Figure 5-3 and 5-4 were applied to the trip generation table (Table 5-1) to distribute the external trips to the surrounding roadway network. The peak hour site trips can be found in Figure 5-5.

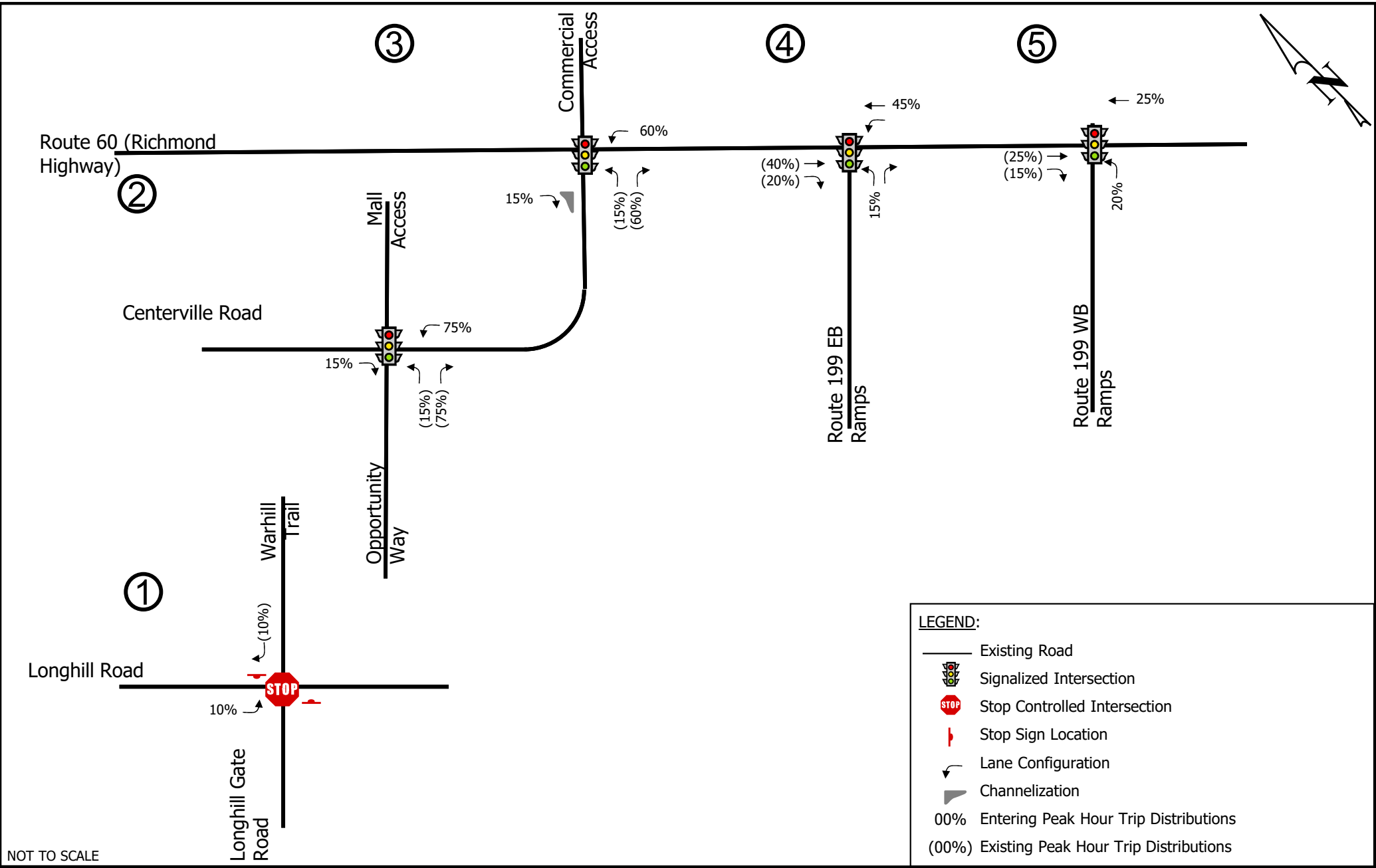


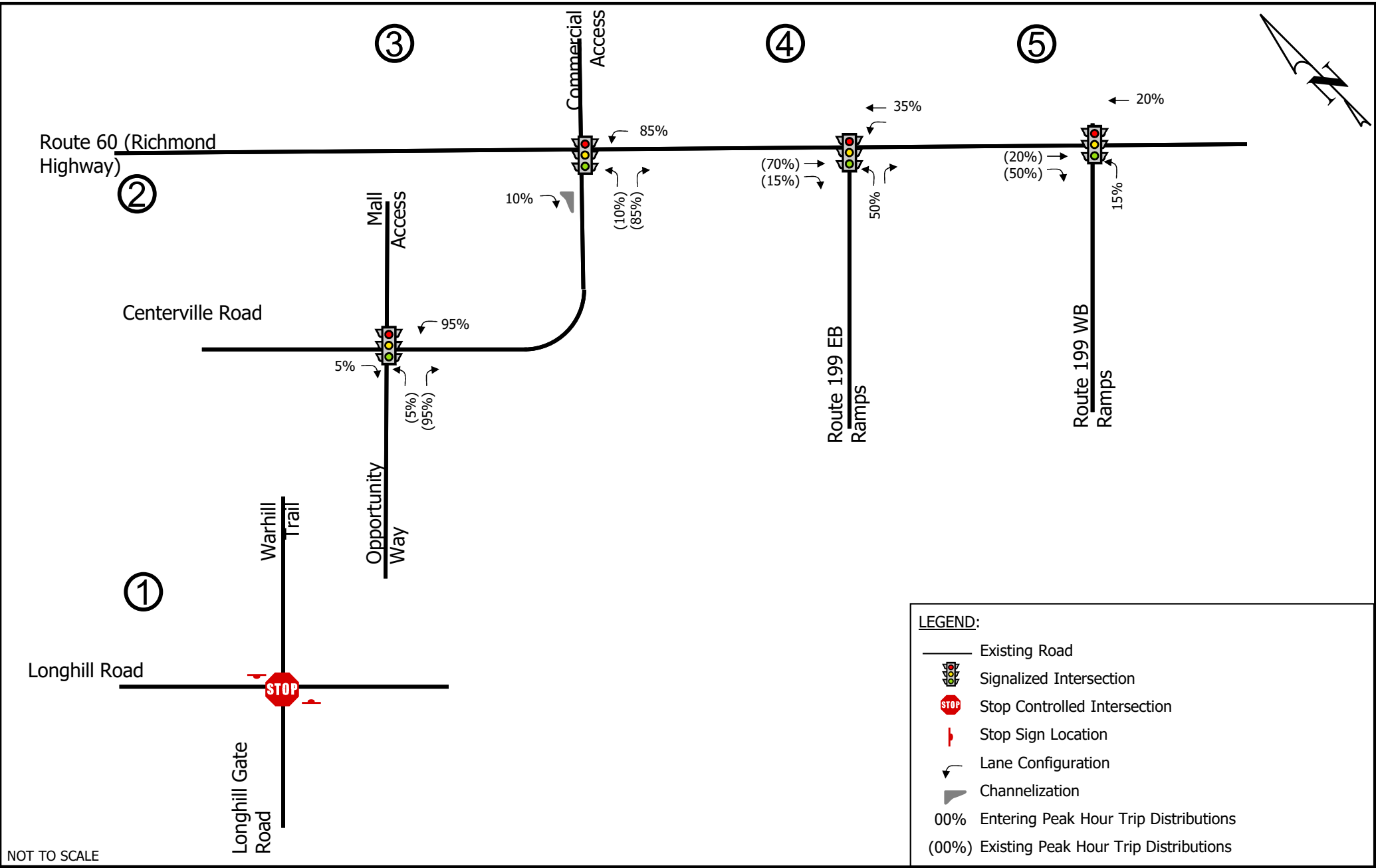
Overall Weekday Trip Distributions
Warhill Athletic Complex
James City County, Virginia

Figure
5-1

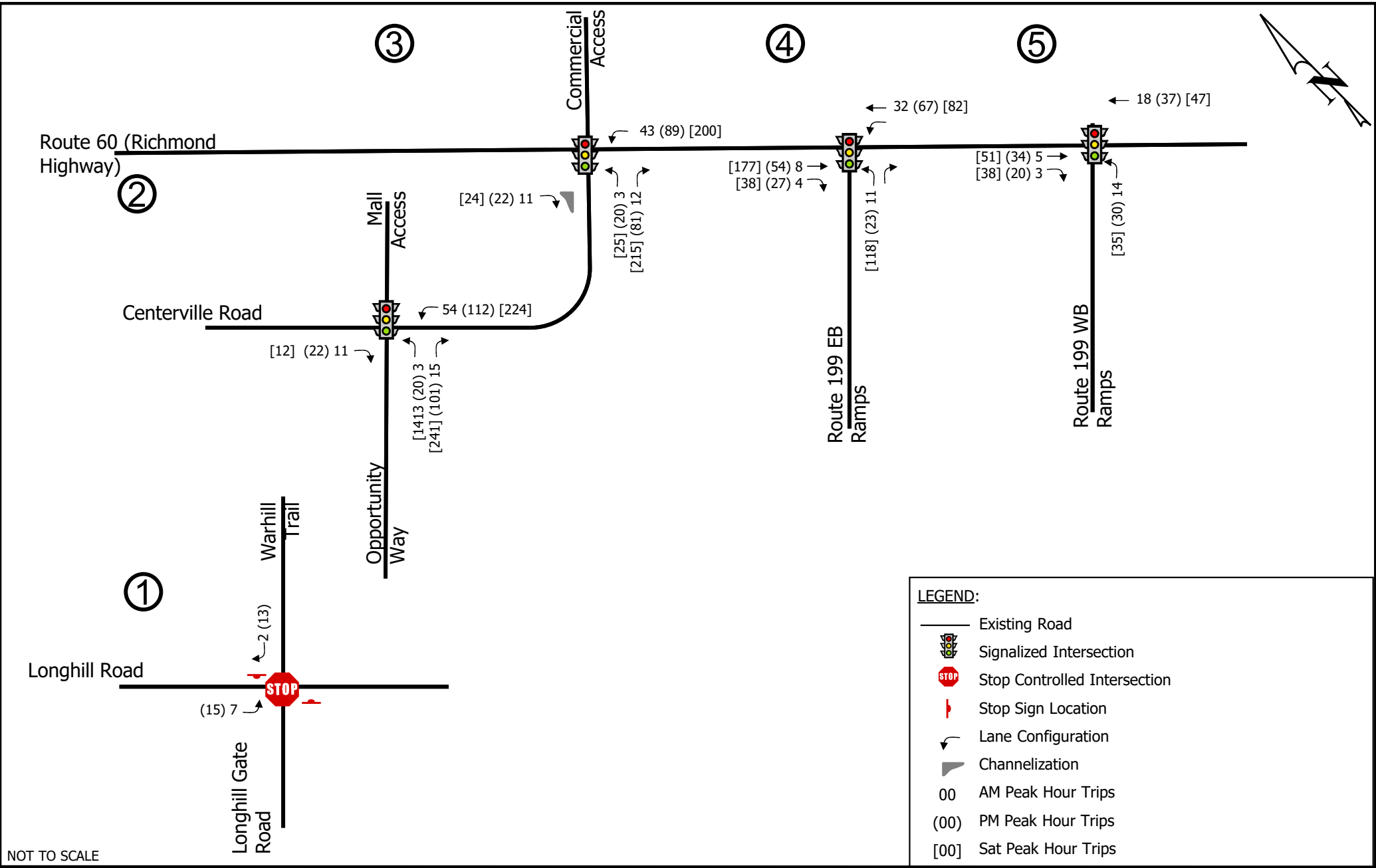


Overall Weekend Trip Distributions
Warhill Athletic Complex
James City County, Virginia





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6 2040 TOTAL FUTURE CONDITIONS

To complete the analysis of 2040 total future conditions (total background volumes with the proposed development), the estimated site trips were added to the 2040 total background traffic volumes. The projected volumes were then used to complete the capacity analysis.

6.1 TOTAL FUTURE TRAFFIC VOLUMES

The site generated trips shown on Figure 5-5 were added to the 2040 background traffic volumes (Figure 4-2) to yield the 2040 total future traffic volumes shown in Figure 6-1.

6.2 2040 FUTURE CONDITIONS ANALYSIS RESULTS

Table 6-1 summarizes the 2040 total future intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the proposed roadway geometry (Figure 2-2), 2040 total future peak hour traffic volumes (Figure 6-1), and the existing signal timings as provided by VDOT.

The corresponding Synchro and SimTraffic reports are included in Appendix G. Note that the intersection numbers shown on the LOS, delay, and queue length summary tables correspond with the intersection node numbers used in the Synchro models and report figures.

As shown in Table 6-1, under 2040 total future conditions with development of the site:

At the unsignalized intersection of Longhill Road and Longhill Gate Road/Warhill Trail, all approaches operate at LOS D or better during all peaks with the exception of the southbound approach of Warhill Trail which operates at LOS F during the PM peak. All queues are contained within the existing provided storage. This intersection is the subject of a traffic signal warrant analysis below.

The signalized intersection of Centerville Road and Opportunity Way continues to operate at an overall LOS D during all three peaks. The mainline eastbound and westbound approaches of Centerville Road operate at LOS D during all three peaks with the exception of the eastbound approach which operates at LOS E during the Saturday peak. The northbound and southbound approaches of Opportunity Way and the Mall Access operate at LOS E during all three peaks. Significant northbound queues are present during the Saturday peak.

The signalized intersection of Centerville Road and Route 60 operates at overall LOS D during the AM peak and LOS F during the PM and Saturday peaks. The mainline eastbound and westbound approaches of Route 60 operate at LOS D or better during all peaks with the exception of the westbound approach in the PM peak which operates at LOS F. The northbound and southbound approaches of Centerville Road and the Commercial Access operate at LOS F during all three peaks with the exception of the northbound approach in the AM peak which operates at LOS E. Significant northbound and eastbound queues are present during the Saturday peak.

The signalized intersection of Route 60 and the Route 199 Eastbound ramps operates at LOS B the AM peak and LOS C during the PM and Saturday peak. The mainline eastbound and westbound approaches of Route 60 operate at LOS B or better during all three peaks. The northbound approach of the Route 199 EB ramp operates at LOS E during all three peaks. All queues are contained within the existing storage with significant northbound queueing present during the PM peak.

The signalized intersection of Route 60 and the Route 199 Westbound ramps operates at LOS C during all three peaks. The mainline eastbound and westbound approaches of Route 60 operate at LOS C or better during all three peaks. The northbound approach operates at LOS E during the all three peaks. All queues are contained within the existing provided storage.

**Table 6-1: 2040 Total Future Conditions
Intersection Level of Service and Delay Summary**

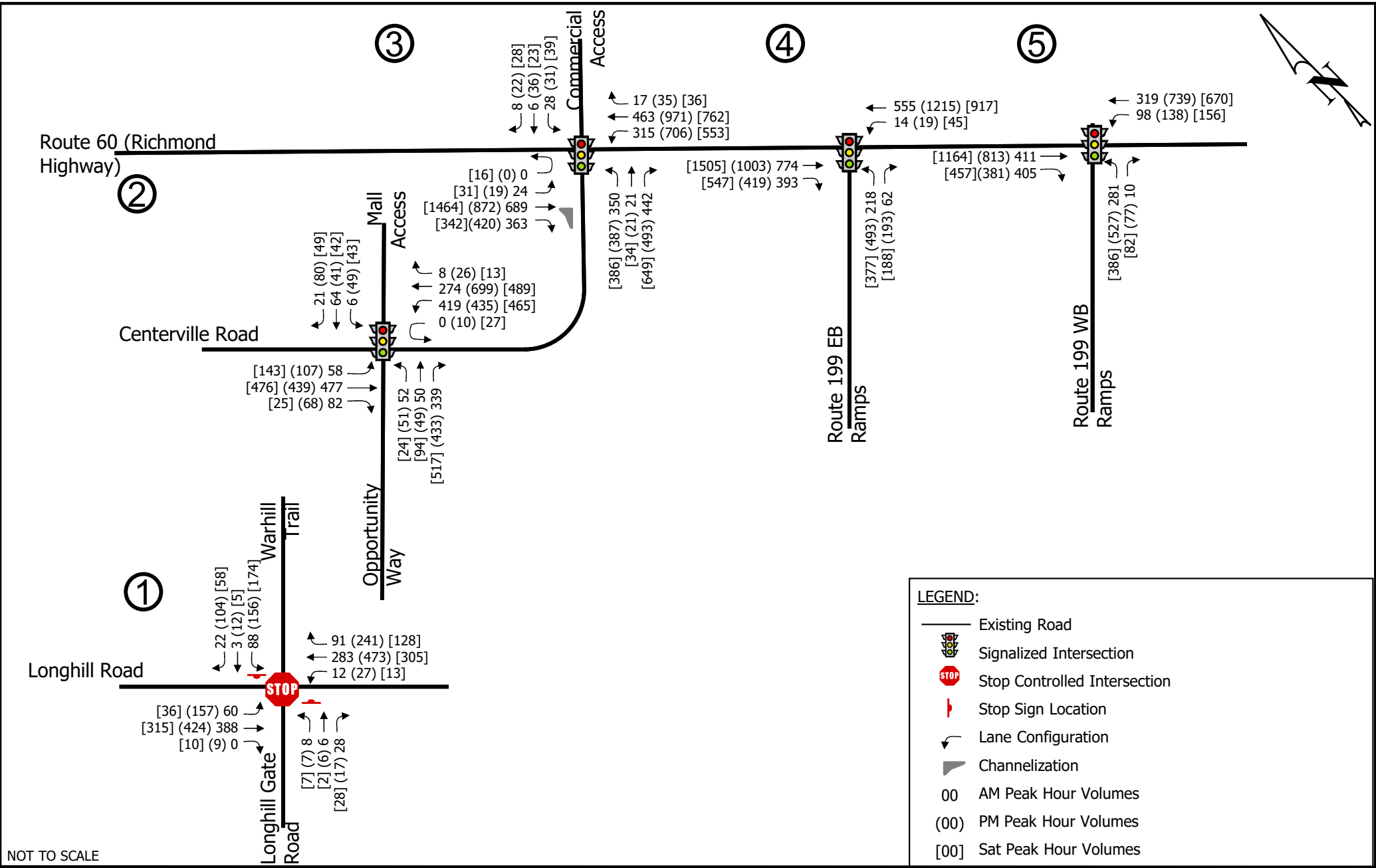
Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR				SATURDAY PEAK HOUR			
			Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Unsignalized	EB Left	225	8.3	A	4	41	10.3	B	19	89	8.4	A	3	32
	EB Thru-Right		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	EB Approach		1.0	A	--	--	2.7	A	--	--	0.8	A	--	--
	WB Left	280	8.3	A	1	27	8.4	A	2	26	8.0	A	1	24
	WB Thru		0.0	A	0	0	0.0	A	0	2	0.0	A	0	0
	WB Right	225	0.0	A	0	18	0.0	A	0	42	0.0	A	0	--
	WB Approach		0.3	A	--	--	0.3	A	--	--	0.2	A	--	--
	NB L-T-R		15.5	C	10	61	40.8	E	23	61	13.2	B	7	49
	NB Approach		15.5	C	--	--	40.8	E	--	--	13.2	B	--	--
	SB Left	200	32.6	D	50	84	513.9	F	360	277	41.4	E	111	142
	SB Thru-Right		11.2	B	3	44	18.1	C	33	212	11.2	B	9	56
	SB Approach		27.9	D	--	--	302.9	F	--	--	33.3	D	--	--
2. Centerville Road (E-W) and Opportunity Way (N) and Mall Access (S) Signalized	EB Dual Left ²	365	61.1	E	50	200	59.1	E	78	225	58.9	E	97	365
	EB Thru		40.1	D	484	443	32.9	C	415	368	60.2	E	474	697
	EB Right	290	24.9	C	1	248	22.7	C	0	223	31.7	C	0	290
	EB Approach		40.0	D	--	--	36.3	D	--	--	58.7	E	--	--
	WB Dual Left ²	260	64.3	E	m247	231	74.8	E	m168	177	67.3	E	m293	615
	WB Thru		6.8	A	m76	201	12.3	B	m138	389	8.6	A	m100	364
	WB Right	230	11.7	B	m0	36	11.8	B	m0	211	16.8	B	m0	27
	WB Approach		41.2	D	--	--	36.1	D	--	--	38.6	D	--	--
	NB Left-Thru	200	69.4	E	#186	154	73.4	E	#168	135	50.4	D	171	1118
	NB Right		55.2	E	#129	201	56.8	E	#148	232	57.5	E	#316	1117
	NB Approach		58.5	E	--	--	59.9	E	--	--	56.2	E	--	--
	SB Left	115	56.1	E	20	28	59.8	E	83	38	59.5	E	74	56
	SB Left-Thru		60.6	E	112	103	59.7	E	86	93	59.9	E	86	117
	SB Right	115	55.9	E	0	39	57.3	E	7	64	57.4	E	0	75
	SB Approach		59.3	E	--	--	58.6	E	--	--	58.9	E	--	--
	Overall		45.8	D	--	--	42.8	D	--	--	49.7	D	--	--
3. Route 60 (E-W) and Centerville Road (N) and Commercial Access (S) Signalized	EB Left	305	60.3	E	52	75	60.4	E	44	142	60.5	E	84	565
	EB Thru		38.4	D	358	450	35.8	D	437	427	116.8	F	#952	1593
	EB Right	480	29.6	C	57	122	26.6	C	60	294	30.8	C	162	1585
	EB Approach		36.2	D	--	--	33.4	C	--	--	99.4	F	--	--
	WB Dual Left ²	415	76.3	E	#241	218	476.5	F	m#603	415	68.1	E	m#300	360
	WB Thru		29.6	C	219	196	18.0	B	m355	690	16.1	B	m271	250
	WB Right	210	21.2	C	m0	30	18.2	B	m0	45	16.0	B	m0	34
	WB Approach		45.0	D	--	--	195.6	F	--	--	38.0	D	--	--
	NB Left	300	49.3	D	m#332	272	97.1	F	m#331	245	226.8	F	m#374	222
	NB Left-Thru		49.2	D	m#332	295	92.1	F	m#321	264	99.9	F	m#323	1150
	NB Right		86.7	F	#490	468	294.9	F	m#566	642	535.9	F	m#769	1223
	NB Approach		69.6	E	--	--	204.3	F	--	--	391.9	F	--	--
	SB Left-Thru		92.4	F	#100	71	450.7	F	#204	132	323.0	F	#172	96
	SB Right	95	54.1	D	0	26	50.3	D	0	87	55.5	E	0	68
	SB Approach		84.9	F	--	--	352.7	F	--	--	240.5	F	--	--
	Overall		48.7	D	--	--	145.6	F	--	--	155.4	F	--	--
4. Route 60 (E-W) Route 199 EB Ramps (N) Signalized	EB Thru		9.0	A	m156	205	12.1	B	m171	208	14.2	B	m200	461
	EB Right	520	6.5	A	m18	112	5.4	A	m12	96	5.8	A	m0	285
	EB Approach		8.2	A	--	--	10.3	B	--	--	12.0	B	--	--
	WB Left	230	70.5	E	m30	50	69.8	E	m29	230	63.4	E	m66	108
	WB Thru		7.5	A	184	178	16.2	B	m328	720	10.6	B	244	223
	WB Approach		8.7	A	--	--	16.9	B	--	--	13.0	B	--	--
	NB Left		59.4	E	266	290	84.5	F	#759	1105	89.5	F	#567	550
	NB Right		43.1	D	38	88	34.9	C	102	1046	39.9	D	97	225
	NB Approach		55.8	E	--	--	70.5	E	--	--	73.5	E	--	--
	Overall		14.2	B	--	--	24.3	C	--	--	22.1	C	--	--
5. Route 60 (E-W) Route 199 WB Ramps (N) Signalized	EB Thru		9.8	A	56	160	13.4	B	313	160	15.0	B	378	291
	EB Right		17.7	B	1	156	16.3	B	19	106	6.5	A	m8	148
	EB Approach		13.1	B	--	--	14.2	B	--	--	12.6	B	--	--
	WB Left	475	62.4	E	145	202	64.5	E	185	268	66.1	E	208	237
	WB Thru		8.2	A	125	170	14.9	B	227	434	10.8	B	172	218
	WB Approach		17.7	B	--	--	21.9	C	--	--	21.2	C	--	--
	NB Left		61.5	E	327	391	99.5	F	#774	1046	70.0	E	#498	485
	NB Right		40.2	D	16	23	33.1	C	53	1043	37.3	D	41	73
	NB Approach		60.7	E	--	--	91.0	F	--	--	64.4	E	--	--
	Overall		22.2	C	--	--	32.7	C	--	--	23.3	C	--	--

¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.

² Dual left turn lanes; average storage is provided.

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.



NOT TO SCALE

7 2046 BACKGROUND CONDITIONS

In accordance with VDOT standards, a buildout plus six years (2046) analysis scenario was completed.

The 2046 background volumes were based on a 1.0% annual growth rate. The growth rate was compounded annually for the 21 year period from 2025 to 2046 and was applied to all movements at the study intersections.

7.1 TOTAL BACKGROUND TRAFFIC VOLUMES

The 2046 background (existing + growth) volumes were added to the background development trips on Figure 4-1 to yield the 2046 total background traffic volumes shown in Figure 7-1.

7.2 BACKGROUND 2046 CAPACITY ANALYSIS RESULTS

Table 7-1 summarizes the 2046 background intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the existing roadway geometry, 2046 total background peak hour traffic volumes shown on Figure 4-4, and the existing signal timings as provided by VDOT.

The corresponding Synchro and SimTraffic reports are included in Appendix F. Note that the intersection numbers shown on the LOS, delay, and queue length summary tables correspond with the intersection node numbers used in the Synchro models and report figures.

As shown in Table 7-1, under 2046 total background conditions,

At the unsignalized intersection of Longhill Road and Longhill Gate Road/Warhill Trail, the mainline eastbound and westbound approaches of Longhill Road operate at LOS A during all three peaks. The northbound approach of Longhill Gate Road operates at LOS C during the AM peak, LOS E during the PM peak and LOS B during the Saturday peak. The southbound approach of Warhill Trail operates at LOS D during the AM peak, LOS F during the PM peak and LOS E during the Saturday peak.

The signalized intersection of Centerville Road and Opportunity Way continues to operate at an overall LOS D during all three peaks. The mainline eastbound and westbound approaches of Centerville Road continue to operate at acceptable LOS during all three peaks. The northbound and southbound approaches of Opportunity Way and the Mall Access continue to operate at LOS E during all three peaks.

The signalized intersection of Centerville Road and Route 60 operates at overall LOS D during the AM peak, LOS F during the PM peak and LOS F during the Saturday peak. The mainline eastbound approach of Route 60 operates at LOS D during the AM peak, LOS C during the PM peak and LOS E during the Saturday peak with significant queues during the Saturday peak. The mainline westbound approach of Route 60 operates at LOS D during the AM peak, LOS F during the PM peak and LOS C during the Saturday peak. The northbound approach of Centerville Road operates at LOS E during the AM peak and LOS F during the PM and Saturday peaks. The southbound approach of the Commercial Access operates at LOS F during all three peaks.

The signalized intersection of Route 60 and the Route 199 Eastbound ramps operates at LOS B the AM and Saturday peaks and LOS C during the PM peak. The mainline eastbound and westbound approaches of Route 60 operate at LOS B or better during all three peaks. The northbound approach of the Route 199 EB ramp operates at LOS E during the AM and PM peaks and LOS D during the Saturday peak. All queues are contained within the existing storage with significant northbound queueing present during the PM peak.

The signalized intersection of Route 60 and the Route 199 Westbound ramps operates at LOS C during all three peaks. The mainline eastbound and westbound approaches of Route 60 operate at LOS C or better during all three peaks. The northbound approach operates at LOS E during all three peaks. A significant northbound queue is present during the PM peak.

**Table 7-1: 2046 Total Background Conditions
Intersection Level of Service and Delay Summary**

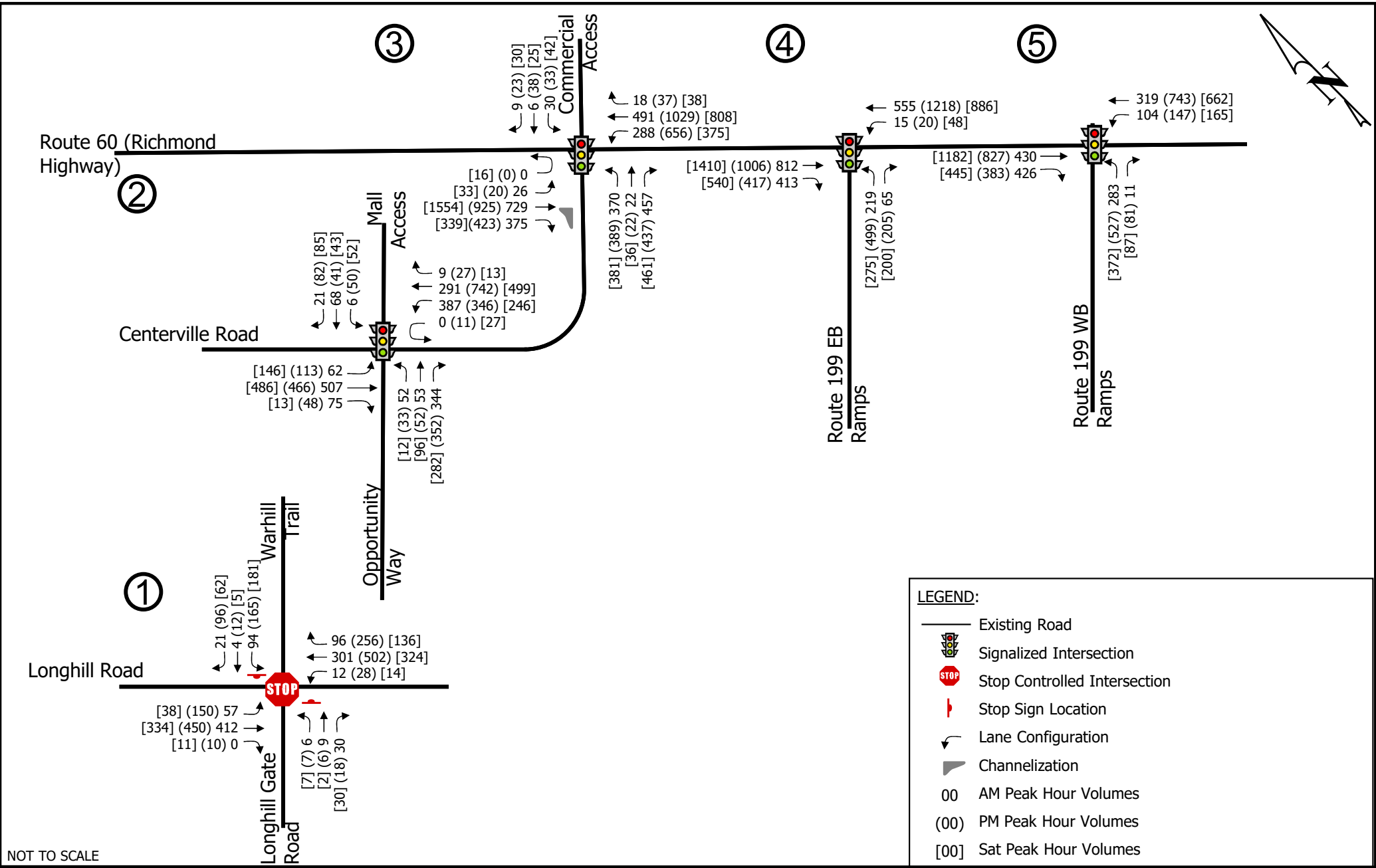
Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR				SATURDAY PEAK HOUR			
			Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Unsignalized	EB Left	225	8.3	A	4	41	10.5	B	19	96	8.5	A	3	44
	EB Thru-Right		0.0	A	0	0	0.0	A	0	6	0.0	A	0	0
	EB Approach		1.0	A	--	--	2.6	A	--	--	0.8	A	--	--
	WB Left	280	8.4	A	1	26	8.4	A	2	33	8.1	A	1	27
	WB Thru		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	WB Right	225	0.0	A	0	2	0.0	A	0	47	0.0	A	0	6
	WB Approach		0.2	A	--	--	0.3	A	--	--	0.2	A	--	--
	NB L-T-R		16.1	C	11	61	42.6	E	25	66	13.5	B	8	49
	NB Approach		16.1	C	--	--	42.6	E	--	--	13.5	B	--	--
	SB Left	200	37.8	E	61	96	648.2	F	405	312	56.0	F	145	138
	SB Thru-Right		11.8	B	4	49	19.1	C	33	591	11.4	B	10	50
	SB Approach		32.3	D	--	--	399.5	F	--	--	44.1	E	--	--
	Overall		45.3	D	--	--	39.5	D	--	--	38.7	D	--	--
	Overall		45.3	D	--	--	39.5	D	--	--	38.7	D	--	--
2. Centerville Road (E-W) and Opportunity Way (N) and Mall Access (S) Signalized	EB Dual Left ²	365	61.1	E	52	233	59.0	E	81	136	59.1	E	102	216
	EB Thru		39.0	D	526	455	28.3	C	431	327	25.0	C	450	356
	EB Right	290	23.4	C	0	205	19.2	B	0	138	16.2	B	0	113
	EB Approach		39.3	D	--	--	33.2	C	--	--	32.5	C	--	--
	WB Dual Left ²	260	65.6	E	m238	213	74.1	E	m142	208	68.5	E	m178	182
	WB Thru		7.3	A	m88	257	13.3	B	m165	427	10.1	B	m459	340
	WB Right	230	11.9	B	m0	25	11.8	B	m0	132	13.1	B	m0	148
	WB Approach		40.2	D	--	--	32.4	C	--	--	30.4	C	--	--
	NB Left-Thru	200	70.6	E	#194	170	66.6	E	132	130	67.8	E	#190	156
	NB Right		55.2	E	#130	222	56.9	E	#110	211	55.0	D	94	159
	NB Approach		58.8	E	--	--	58.8	E	--	--	58.5	E	--	--
	SB Left	115	55.8	E	20	10	59.8	E	86	58	59.4	E	77	44
	SB Left-Thru		60.8	E	116	91	57.2	E	88	107	59.8	E	88	78
	SB Right	115	55.7	E	0	14	58.5	E	13	67	57.2	E	0	36
	SB Approach		59.3	E	--	--	58.5	E	--	--	58.7	E	--	--
	Overall		45.3	D	--	--	39.5	D	--	--	38.7	D	--	--
	Overall		45.3	D	--	--	39.5	D	--	--	38.7	D	--	--
	Overall		45.3	D	--	--	39.5	D	--	--	38.7	D	--	--
3. Route 60 (E-W) and Centerville Road (N) and Commercial Access (S) Signalized	EB Left	305	60.2	E	56	78	60.3	E	46	115	60.6	E	87	304
	EB Thru		39.9	D	329	463	36.8	D	388	444	88.9	F	#1015	1597
	EB Right	480	32.2	C	62	309	28.4	C	59	314	24.8	C	62	480
	EB Approach		37.8	D	--	--	34.5	C	--	--	77.0	E	--	--
	WB Dual Left ²	415	62.6	E	#211	214	417.8	F	m#559	415	64.9	E	201	255
	WB Thru		33.8	C	201	176	19.7	B	m368	590	17.5	B	305	250
	WB Right	210	23.7	C	m0	30	19.8	B	m0	82	16.1	B	m0	71
	WB Approach		43.9	D	--	--	171.4	F	--	--	32.0	C	--	--
	NB Left	300	46.1	D	m#345	265	100.8	F	m#348	262	237.5	F	m#426	287
	NB Left-Thru		46.0	D	m#343	295	95.7	F	m#344	294	114.5	F	m#382	365
	NB Right		79.7	E	#489	467	175.4	F	#468	456	152.7	F	#409	658
	NB Approach		64.2	E	--	--	138.1	F	--	--	163.6	F	--	--
	SB Left-Thru		100.4	F	#95	66	488.8	F	#216	126	364.5	F	#182	112
	SB Right	95	52.7	D	0	27	47.9	D	0	66	55.5	E	0	80
	SB Approach		90.9	F	--	--	381.9	F	--	--	267.6	F	--	--
	Overall		48.3	D	--	--	122.9	F	--	--	86.6	F	--	--
	Overall		48.3	D	--	--	122.9	F	--	--	86.6	F	--	--
	Overall		48.3	D	--	--	122.9	F	--	--	86.6	F	--	--
4. Route 60 (E-W) Route 199 EB Ramps (N) Signalized	EB Thru		8.7	A	141	199	12.8	B	m155	212	10.7	B	m177	428
	EB Right	520	6.8	A	m24	122	5.1	A	m12	99	3.5	A	m0	231
	EB Approach		8.0	A	--	--	10.6	B	--	--	8.7	A	--	--
	WB Left	230	64.1	E	m30	59	63.7	E	m31	230	63.5	E	m71	120
	WB Thru		8.9	A	181	172	16.9	B	m330	724	8.1	A	226	190
	WB Approach		10.3	B	--	--	17.6	B	--	--	10.9	B	--	--
	NB Left		59.6	E	268	307	70.7	E	#771	1111	60.7	E	330	401
	NB Right		43.1	D	40	83	33.4	C	108	1109	43.5	D	107	168
	NB Approach		55.8	E	--	--	59.8	E	--	--	53.5	D	--	--
	Overall		15.2	B	--	--	23.5	C	--	--	15.7	B	--	--
5. Route 60 (E-W) Route 199 WB Ramps (N) Signalized	EB Thru		11.3	B	52	147	14.1	B	254	164	15.4	B	377	369
	EB Right		22.0	C	10	178	17.2	B	23	118	5.7	A	9	222
	EB Approach		16.7	B	--	--	15.1	B	--	--	12.8	B	--	--
	WB Left	475	62.5	E	151	212	65.4	E	195	283	68.0	E	218	260
	WB Thru		7.8	A	85	138	16.1	B	193	462	10.3	B	167	215
	WB Approach		21.3	C	--	--	24.2	C	--	--	21.8	C	--	--
	NB Left		61.4	E	331	384	73.0	E	#774	1050	67.6	E	#461	434
	NB Right		40.1	D	16	29	30.8	C	55	1037	38.0	D	43	104
	NB Approach		60.6	E	--	--	67.4	E	--	--	62.0	E	--	--
	Overall		26.1	C	--	--	29.8	C	--	--	23.1	C	--	--
	Overall		26.1	C	--	--	29.8	C	--	--	23.1	C	--	--
	Overall		26.1	C	--	--	29.8	C	--	--	23.1	C	--	--

¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.

² Dual left turn lanes; average storage is provided.

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.



2046 Background Volumes
 Warhill Athletic Complex
 James City County, Virginia

Figure
 7-1



8 2046 TOTAL FUTURE CONDITIONS

To complete the analysis of 2046 total conditions (with the proposed development), the estimated site trips were added to the total background 2046 traffic volumes. The projected volumes were then used to complete the capacity analysis.

8.1 TOTAL FUTURE TRAFFIC VOLUMES

The site generated trips shown on Figure 5-5 were added to the 2046 total background traffic volumes (Figure 7-1) to yield the 2046 total future traffic volumes shown in Figure 8-1.

8.2 2046 FUTURE CONDITIONS ANALYSIS RESULTS

Table 8-1 summarizes the 2046 total future intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the existing roadway geometry, 2046 total future peak hour traffic volumes (Figure 8-1), and the existing signal timings as provided by VDOT.

The corresponding Synchro and SimTraffic reports are included in Appendix H. Note that the intersection numbers shown on the LOS, delay, and queue length summary tables correspond with the intersection node numbers used in the Synchro models and report figures.

From existing conditions, the unsignalized intersection of Longhill Road and Warhill Trail, the mainline eastbound and westbound approaches of Longhill Road operate at LOS A during all three peaks. The northbound approach of Longhill Gate Road continues to operate at LOS E or better during all three peaks. The southbound approach of Warhill Trail worsens from LOS C to LOS D in the AM peak, continues to operate at LOS F during the PM peak and worsens from LOS C to LOS E during the Saturday peak.

From existing conditions, the intersection of Centerville Road and Opportunity Way continues to operate at LOS D during all three peaks. The northbound approach continues to operate at LOS E during all peaks with increased queues during the Saturday peak.

From existing conditions, the intersection of Route 60 and the Route 199 EB ramps continues to operate at LOS B during the AM peak and worsens from LOS B to LOS C in the PM and Saturday peaks. All queueing and approach delays continue to operate similar to existing.

From existing conditions, the intersection of Route 60 and the Route 199 WB ramps continues to operate at LOS C during the AM and PM peaks and worsens to LOS C from LOS B during the Saturday peak. All queueing and approach delays continue to operate similar to existing.

**Table 8-1: 2046 Total Future Conditions
Intersection Level of Service and Delay Summary**

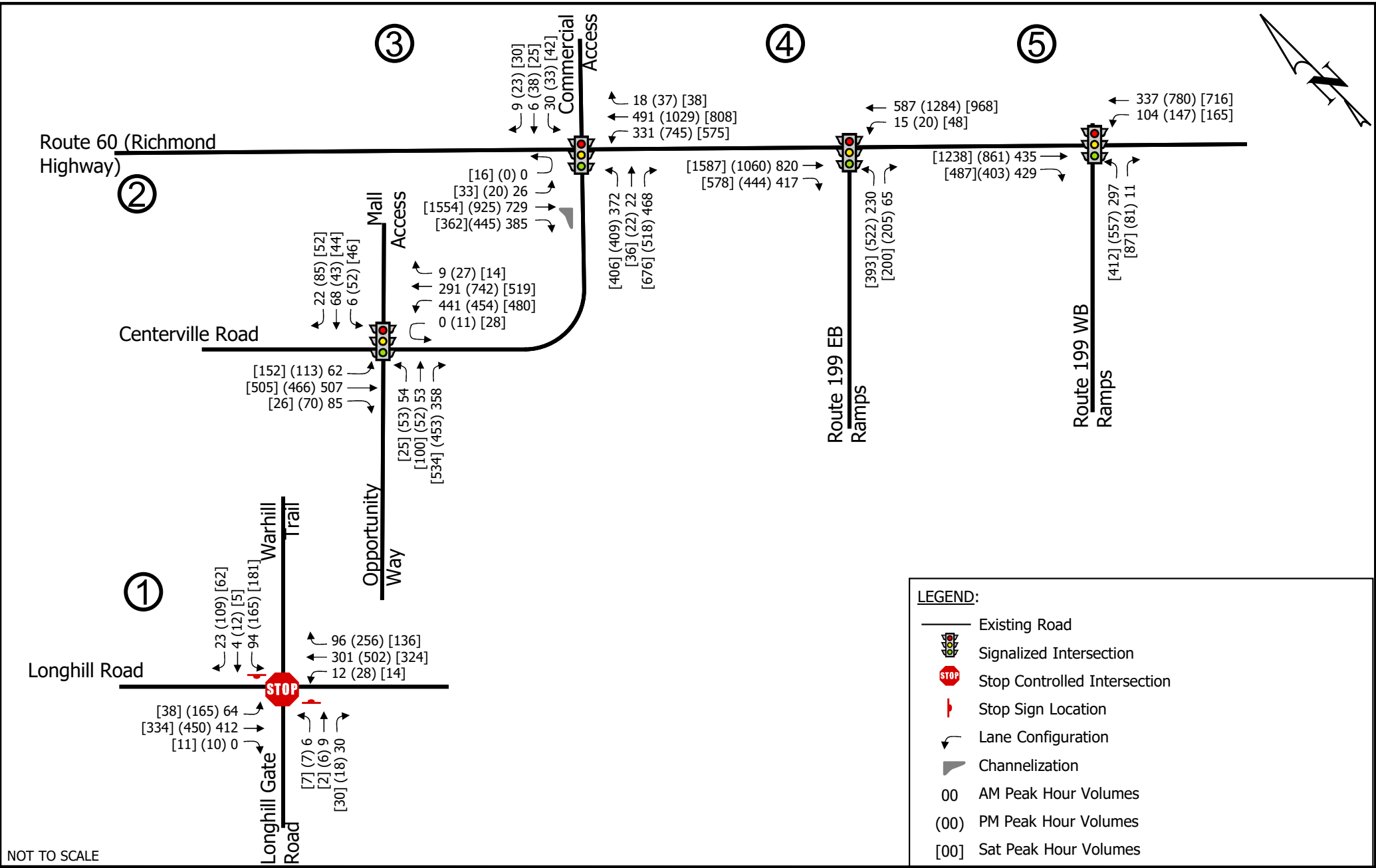
Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR				SATURDAY PEAK HOUR			
			Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Unsignalized	EB Left	225	8.4	A	5	43	10.7	B	21	74	8.5	A	3	39
	EB Thru-Right		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	EB Approach		1.1	A	--	--	2.8	A	--	--	0.8	A	--	--
	WB Left	280	8.4	A	1	33	8.4	A	2	17	8.1	A	1	27
	WB Thru		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	WB Right	225	0.0	A	0	11	0.0	A	0	22	0.0	A	0	6
	WB Approach		0.2	A	--	--	0.3	A	--	--	0.2	A	--	--
	NB L-T-R		16.4	C	12	57	47.7	E	28	43	13.5	B	8	47
	NB Approach		16.4	C	--	--	47.7	E	--	--	13.5	B	--	--
	SB Left	200	39.7	E	64	77	729.4	F	420	244	56.0	F	145	168
	SB Thru-Right		11.8	B	4	50	19.7	C	38	180	11.4	B	10	70
	SB Approach		33.5	D	--	--	429.5	F	--	--	44.1	E	--	--
2. Centerville Road (E-W) and Opportunity Way (N) and Mall Access (S) Signalized	EB Dual Left ²	365	61.1	E	52	364	59.0	E	81	107	59.1	E	102	364
	EB Thru		46.2	D	526	510	34.5	C	449	297	29.5	C	493	861
	EB Right	290	26.2	C	3	268	23.0	C	0	104	30.3	C	0	290
	EB Approach		45.0	D	--	--	37.5	D	--	--	58.3	E	--	--
	WB Dual Left ²	260	64.5	E	m253	234	75.3	E	m171	144	68.1	E	m284	435
	WB Thru		7.0	A	m78	253	13.5	B	m150	300	10.1	B	m125	308
	WB Right	230	12.0	B	m0	74	12.1	B	m0	20	17.1	B	m0	83
	WB Approach		41.3	D	--	--	36.8	D	--	--	38.5	D	--	--
	NB Left-Thru	200	71.5	E	#200	173	75.5	E	#178	144	50.5	D	#220	3120
	NB Right		55.1	E	#135	285	56.7	E	#152	234	59.2	E	#343	3115
	NB Approach		58.9	E	--	--	60.2	E	--	--	57.6	E	--	--
	SB Left	115	55.8	E	20	6	59.8	E	86	31	59.4	E	77	35
	SB Left-Thru		60.8	E	116	106	59.5	E	88	79	59.8	E	88	108
	SB Right	115	55.7	E	0	38	57.2	E	13	24	57.2	E	0	78
	SB Approach		59.3	E	--	--	58.5	E	--	--	58.7	E	--	--
	Overall		47.6	D	--	--	43.5	D	--	--	50.0	D	--	--
3. Route 60 (E-W) and Centerville Road (N) and Commercial Access (S) Signalized	EB Left	305	60.2	E	56	100	60.3	E	46	46	60.6	E	87	304
	EB Thru		41.3	D	329	507	36.7	D	388	317	144.1	F	#1038	1599
	EB Right	480	33.1	C	62	360	28.6	C	60	175	28.6	C	65	480
	EB Approach		38.9	D	--	--	34.4	C	--	--	120.7	F	--	--
	WB Dual Left ²	415	78.4	E	#260	302	521.0	F	m#630	415	68.9	E	m#295	408
	WB Thru		33.7	C	192	286	19.1	B	m333	680	16.3	B	m292	546
	WB Right	210	24.2	C	m0	28	19.8	B	m0	56	16.1	B	m0	71
	WB Approach		51.1	D	--	--	225.5	F	--	--	37.6	D	--	--
	NB Left	300	43.2	D	m#345	275	110.4	F	m#354	204	255.9	F	m#401	296
	NB Left-Thru		43.1	D	m#343	307	106.6	F	m#348	219	112.5	F	m#345	1163
	NB Right		73.5	E	#512	509	332.3	F	m#602	427	555.2	F	m#784	1222
	NB Approach		59.6	E	--	--	230.6	F	--	--	408.2	F	--	--
	SB Left-Thru		100.4	F	#95	78	488.8	F	#216	100	364.5	F	#182	114
	SB Right	95	52.7	D	0	44	47.9	D	0	20	55.5	E	0	58
	SB Approach		90.9	F	--	--	382.0	F	--	--	267.6	F	--	--
	Overall		49.5	D	--	--	167.5	F	--	--	168.1	F	--	--
4. Route 60 (E-W) Route 199 EB Ramps (N) Signalized	EB Thru		10.0	A	m143	257	12.7	B	m168	200	15.2	B	m195	485
	EB Right	520	10.9	B	m25	129	8.0	A	m16	70	5.7	A	m0	291
	EB Approach		10.3	B	--	--	11.3	B	--	--	12.7	B	--	--
	WB Left	230	66.4	E	m31	69	63.2	E	m30	77	64.1	E	m69	121
	WB Thru		8.9	A	177	170	17.0	B	m337	459	10.1	B	m252	238
	WB Approach		10.3	B	--	--	17.7	B	--	--	12.7	B	--	--
	NB Left		59.8	E	281	291	93.8	F	#817	1045	88.9	F	#567	563
	NB Right		42.6	D	40	96	34.7	C	114	644	40.4	D	113	181
	NB Approach		56.0	E	--	--	77.1	E	--	--	72.6	E	--	--
	Overall		16.6	B	--	--	27.2	C	--	--	22.1	C	--	--
	EB Thru		11.5	B	50	147	14.3	B	278	173	16.0	B	447	338
5. Route 60 (E-W) Route 199 WB Ramps (N) Signalized	EB Right		25.9	C	11	187	17.7	B	21	104	4.8	A	m10	160
	EB Approach		18.7	B	--	--	15.3	B	--	--	12.9	B	--	--
	WB Left	475	62.5	E	151	224	65.4	E	195	209	68.0	E	218	249
	WB Thru		8.3	A	92	140	15.6	B	204	239	11.2	B	182	243
	WB Approach		21.1	C	--	--	23.5	C	--	--	22.0	C	--	--
	NB Left		61.6	E	344	405	97.7	F	#830	875	72.7	E	#530	528
	NB Right		39.3	D	16	23	31.7	C	57	633	36.9	D	44	115
	NB Approach		60.8	E	--	--	89.3	F	--	--	66.4	E	--	--
	Overall		27.4	C	--	--	34.7	C	--	--	24.0	C	--	--

¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.

² Dual left turn lanes; average storage is provided.

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.



NOT TO SCALE

9 SIGNAL WARRANTS AT LONGHILL ROAD/LONGHILL GATE ROAD/WARHILL TRAIL

Signal warrant analyses were completed for 2025 existing conditions, 2040 background conditions and 2040 future conditions. The warrant analyses were conducted following procedures from the 2009 edition of the *Manual on Uniform Traffic Control Devices* (MUTCD) and the hourly volumes from 7:00 AM to 7:00 PM. In accordance with VDOT standards, Warrant 1 (Eight-Hour) and Warrant 2 (Four-Hour) outlined in the 2009 MUTCD was considered for the analyses and are described in detail below.

The following seven (7) warrants were not included in this analysis because they are not applicable to the nature/context of the development and/or adjacent roadway infrastructure. A review of the last five years of crash data indicated a total of six crashes at the intersection which does not meet the baseline threshold for Warrant 7.

- Warrant 3 – Peak Hour Volume
- Warrant 4 – Pedestrian Volume
- Warrant 5 – School Crossing
- Warrant 6 – Coordinated Signal System
- Warrant 7- Crash Experience
- Warrant 8 – Roadway Network
- Warrant 9 – Intersection Near a Grade Crossing

The MUTCD contains both 100% and 70% volume thresholds that can be used in the signal warrant analysis with 70% volume thresholds being considered when "...major street speed exceeds 40 mph or in an isolated community with a population of less than 10,000). As the posted speed limit is 45 mph on Longhill Road, the 70% volume thresholds were also considered.

As shown in Figure 2-1, the major street (Longhill Road) has two lanes for moving traffic on the eastbound approach, one left turn lane and one through lane, and three lanes for moving traffic on the westbound approach, one left turn lane, one through lane, and one right turn lane. The minor street (Warhill Trail) has one lane in each direction.

The lane geometry used in the traffic signal warrant analysis for the major street is assumed to be two (2) lanes and the minor street one (1) lane.

The full results tables for the signal warrant analyses can be found in Appendix I.

9.1 WARRANT 1 (EIGHT-HOUR VEHICULAR VOLUME)

According to the MUTCD, "the need for a traffic control signal shall be considered if an engineering study finds that **one** of the following conditions exist for each of any 8 hours of an average day":

Condition A (100% Volume Threshold):

This warrant is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Volume Thresholds: The volume thresholds for a two-lane major street approach and a one-lane minor street approach from the 2009 MUTCD Table 4C-1 indicate the need for a traffic control signal is considered when, for each of any eight (8) hours of an average day, a minimum of **600** vehicles per

hour exist on the major street approaches and **150** vehicles per hour are present on the higher-volume minor street approach.

2025 Existing Conditions Under 2025 existing conditions, the required vehicle volume on the minor street approach was present for three (3) of the eight (8) required hours based on the volume thresholds for the one-lane minor street approach on Saturday and two (2) of the eight (8) required hours on a weekday. Therefore, this warrant is **not** considered met under 2025 existing conditions.

2040 Background Conditions: Under 2040 background conditions, the required vehicle volume on the minor street approach was present for six (6) of the eight (8) required hours based on the volume thresholds for the one-lane minor street approach on Saturday and three (3) of the eight (8) required hours on a weekday. Therefore, this warrant is **not** considered met under 2040 background conditions.

2040 Future Conditions: Under 2040 future conditions, the required vehicle volume on the minor street approach was present for six (6) of the eight (8) required hours based on the volume thresholds for the one-lane minor street approach on Saturday and four (4) of the eight (8) required hours on a weekday. Therefore, this warrant is **not** considered met under 2040 future conditions.

Summary: A traffic signal is **not warranted** at the intersection under any scenario using Warrant 1A 100% thresholds.

Condition A (70% Volume Threshold):

This warrant is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Volume Thresholds: The volume thresholds for a two-lane major street approach and a one-lane minor street approach from the 2009 MUTCD Table 4C-1 indicate the need for a traffic control signal for 70% volume thresholds is considered when, for each of any eight (8) hours of an average day, a minimum of **420** vehicles per hour exist on the major street approaches and **105** vehicles per hour are present on the higher-volume minor street approach.

2025 Existing Conditions Under 2025 existing conditions, the required vehicle volume on the minor street approach was present for eight (8) of the eight (8) required hours based on the 70% volume thresholds for the one-lane minor street approach on Saturday and four (4) of the eight (8) required hours on a weekday. Therefore, this warrant **is** considered met under 2025 existing conditions for 70% volume thresholds.

2040 Background Conditions: Under 2040 background conditions, the required vehicle volume on the minor street approach was present for eight (8) of the eight (8) required hours based on the 70% volume thresholds for the one-lane minor street approach on Saturday and five (5) of the eight (8) required hours on a weekday. Therefore, this warrant **is** considered met under 2040 background conditions for 70% volume thresholds.

2040 Future Conditions: Under 2040 future conditions, the required vehicle volume on the minor street approach was present for eight (8) of the eight (8) required hours based on the 70% volume thresholds for the one-lane minor street approach on Saturday and eight (8) of the eight (8) required hours on a weekday. Therefore, this warrant **is** considered met under 2040 future conditions for 70% volume thresholds.

Summary: A traffic signal **is warranted** at the intersection using Warrant 1A 70% thresholds. The signal is warranted under 2025 existing conditions.

Condition B (100% Threshold):

This warrant is intended for application at locations where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Volume Thresholds: The volume thresholds for a two-lane major street approach and a one-lane minor street approach from the 2009 MUTCD Table 4C-1 indicate the need for a traffic control signal is considered when, for each of any eight (8) hours of an average day, a minimum of **900** vehicles per hour exist on the major street approaches and **75** vehicles are present on the higher-volume minor street approach.

2025 Existing Conditions Under 2025 existing conditions, the required vehicle volume on the minor street approach was present for zero (0) of the eight (8) required hours based on the volume thresholds for the one-lane minor street approach on Saturday and two (2) of the eight (8) required hours on a weekday. Therefore, this warrant is **not** considered met under 2025 existing conditions.

2040 Background Conditions: Under 2040 background conditions, the required vehicle volume on the minor street approach was present for zero (0) of the eight (8) required hours based on the volume thresholds for the one-lane minor street approach on Saturday and five (5) of the eight (8) required hours on a weekday. Therefore, this warrant is **not** considered met under 2040 background conditions.

2040 Future Conditions: Under 2040 future conditions, the required vehicle volume on the minor street approach was present for zero (0) of the eight (8) required hours based on the volume thresholds for the one-lane minor street approach on Saturday and five (5) of the eight (8) required hours on a weekday. Therefore, this warrant is **not** considered met under 2040 future conditions.

Summary: A traffic signal **is not warranted** at the intersection under existing, background, and future scenarios using Warrant 1B 100% thresholds.

Condition B (70% Threshold):

This warrant is intended for application at locations where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Volume Thresholds: The volume thresholds for a two-lane major street approach and a one-lane minor street approach from the 2009 MUTCD Table 4C-1 indicate the need for a traffic control signal is considered for 70% volume thresholds when, for each of any eight (8) hours of an average day, a minimum of **630** vehicles per hour exist on the major street approaches and **53** vehicles are present on the higher-volume minor street approach.

2025 Existing Conditions Under 2025 existing conditions, the required vehicle volume on the minor street approach was present for eight (8) of the eight (8) required hours based on the 70% volume thresholds for the one-lane minor street approach on Saturday and 10 of the eight (8) required hours on a weekday. Therefore, this warrant **is** considered met under 2025 existing conditions for 70% volume thresholds.

2040 Background Conditions: Under 2040 background conditions, the required vehicle volume on the minor street approach was present for nine (9) of the eight (8) required hours based on the 70% volume thresholds for the one-lane minor street approach on Saturday and 12 of the eight (8) required hours on a weekday. Therefore, this warrant **is** considered met under 2040 background conditions for 70% volume thresholds.

2040 Future Conditions: Under 2040 future conditions, the required vehicle volume on the minor street approach was present for nine (9) of the eight (8) required hours based on the 70% volume thresholds for the one-lane minor street approach on Saturday and 12 of the eight (8) required hours on a weekday. Therefore, this warrant **is** considered met under 2040 future conditions for 70% volume thresholds.

*Summary: A traffic signal **is warranted** at the intersection using Warrant 1B 70% thresholds. The signal is warranted under 2025 existing conditions.*

Combination of Conditions A and B (100% Threshold):

This warrant reduces the volume thresholds found in Conditions A and B by 20% and considers both conditions simultaneously.

Volume Thresholds: The volume thresholds for a two-lane major street approach and a one-lane minor street approach from the 2009 MUTCD Table 4C-1 indicate the need for a traffic control signal is considered when, for each of any eight (8) hours of an average day, a minimum of **480** vehicles are present on the major street approaches and **120** vehicles are present on the higher volumes minor street approach (Condition A) and a minimum of **720** vehicles are present on the major street approaches and **60** vehicles are present on the higher volumes minor street approach (Condition B).

2025 Existing Conditions: Under 2025 existing conditions, the required vehicle volume on the minor street approach was present for seven (7) of the eight (8) required hours for Condition A and one (1) of the eight (8) required hours for Condition B on Saturday. The required vehicle volume on the minor street approach was present for three (3) of the eight (8) required hours for Condition A and seven (7) of the eight (8) required hours for Condition B on a weekday. Therefore, this warrant is **not** considered met under 2025 existing conditions.

2040 Background Conditions: Under 2040 background volumes, the required vehicle volume on the minor street approach was present for eight (8) of the eight (8) required hours for Condition A and eight (8) of the eight (8) required hours for Condition B on Saturday. The required vehicle volume on the minor street approach was present for four (4) of the eight (8) required hours for Condition A and 10 of the eight (8) required hours for Condition B on a weekday. Therefore, this warrant **is** considered met under 2040 background conditions.

2040 Future Conditions: Under 2040 future volumes, the required vehicle volume on the minor street approach was present for eight (8) of the eight (8) required hours for Condition A and eight (8) of the eight (8) required hours for Condition B on Saturday. The required vehicle volume on the minor street approach was present for four (4) of the eight (8) required hours for Condition A and 10 of the eight (8) required hours for Condition B on a weekday. Therefore, this warrant **is** considered met under 2040 future conditions.

Summary: A traffic signal **is warranted** at the intersection using the Combination of Conditions A and B 100% volume thresholds. The signal is warranted under 2040 background conditions (without the development of the site).

Combination of Conditions A and B (70% Threshold):

This warrant reduces the volume thresholds found in Conditions A and B to 56% and considers both conditions simultaneously.

Volume Thresholds: The volume thresholds for a two-lane major street approach and a one-lane minor street approach from the 2009 MUTCD Table 4C-1 under 70% thresholds indicate the need for a traffic control signal is considered when, for each of any eight (8) hours of an average day, a minimum of **336** vehicles are present on the major street approaches and **84** vehicles are present on the higher volumes minor street approach (Condition A) and a minimum of **504** vehicles are present on the major street approaches and **42** vehicles are present on the higher volumes minor street approach (Condition B).

2025 Existing Conditions: Under 2025 existing conditions, the required vehicle volume on the minor street approach was present for nine (9) of the eight (8) required hours for Condition A and 11 of the eight (8) required hours for Condition B on Saturday. The required vehicle volume on the minor street approach was present for six (6) of the eight (8) required hours for Condition A and 12 of the eight (8) required hours for Condition B on a weekday. Therefore, this warrant **is** considered met under 2025 existing conditions for the 70% volume threshold.

2040 Background Conditions: Under 2040 background volumes, the required vehicle volume on the minor street approach was present for nine (9) of the eight (8) required hours for Condition A and 11 of the eight (8) required hours for Condition B on Saturday. The required vehicle volume on the minor street approach was present for nine (9) of the eight (8) required hours for Condition A and 12 of the eight (8) required hours for Condition B on a weekday. Therefore, this warrant **is** considered met under 2040 background conditions for the 70% volume threshold.

2040 Future Conditions: Under 2040 future volumes, the required vehicle volume on the minor street approach was present for nine (9) of the eight (8) required hours for Condition A and 11 of the eight (8) required hours for Condition B on Saturday. The required vehicle volume on the minor street approach was present for 12 of the eight (8) required hours for Condition A and 12 of the eight (8) required hours for Condition B on a weekday. Therefore, this warrant **is** considered met under 2040 future conditions for the 70% volume threshold.

Summary: A traffic signal **is warranted** at the intersection using the Combination of Conditions A and B 70% volume thresholds. The signal is warranted under 2025 existing conditions.

Warrant 1 Summary

A traffic signal is warranted at the Longhill Road/Longhill Gate Road/Warhill Trail intersection. The intersections meets Warrant 1A and 1B (70% threshold) under 2025 existing conditions and meets Warrant 1 (Combination Warrant – 100% threshold) under 2040 background conditions. Installation of a traffic signal should be considered at the intersection.

9.2 WARRANT 2 (FOUR-HOUR VEHICULAR VOLUME)

According to the MUTCD, this warrant is intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic signal. The need for a traffic control signal can be considered when, for each of any four (4) hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the minor street approach all fall above the applicable curve on MUTCD Figure 4C-1 for the 100% volume threshold and Figure 4C-2 for 70% volume threshold and combination of approach lanes.

As detailed above, the intersection is characterized by the “2 or more lanes & 1 lane” line. The graphs can be found in Appendix I.

Warrant 2 Summary

A traffic signal is not warranted at the intersection using Warrant 2 under any scenario.

10 CONCLUSIONS

Analyses were performed for the 2025 existing volumes, the (2040 and 2046) total background volumes (including the approved background development and growth), and the (2040 and 2046) total future volumes, which includes site traffic generated by Warhill Athletics Complex expansion.

10.1 PRINCIPAL FINDINGS

Under 2025 existing conditions, all signalized intersections operate at LOS D or better during all three peak periods. The unsignalized intersection of Longhill Road and Warhill Trail operates at LOS C during the AM and Saturday peak and LOS F during the PM peak.

Under 2040 total background conditions, including growth in existing traffic and the approved background development, the signalized intersections operate at LOS E or better during all peaks with the exception of the Route 60/Centerville Road intersection which operates at LOS F. The unsignalized intersection of Longhill Road and Warhill Trail operates at LOS D during the AM and Saturday peaks and LOS F during the PM peak.

Under 2040 total future conditions, including the growth in existing traffic, background development and site trips, the intersections continue to perform in similar conditions to 2040 background in terms of delay. Queues are considerably increased for traffic entering the network from Opportunity Way.

Under 2046 total background conditions, including the growth in existing traffic and the approved background development, all intersections continue to perform in similar conditions to 2040 background.

Under 2046 total future conditions, including the growth in existing traffic, background development and site trips, the intersections continue to perform in similar conditions to 2046 background with increased queueing from vehicles entering the network from Opportunity Way.

A traffic signal is warranted at the Longhill Road/Longhill Gate Road/Warhill Trail intersection. The intersection meets Warrant 1A and 1B (70% threshold) under 2025 existing conditions and meets Warrant 1 (Combination Warrant – 100% threshold) under 2040 background conditions. Installation of a traffic signal should be considered at the intersection.

10.2 RECOMMENDATIONS

Installation of a traffic signal should be considered at the Longhill Road/Longhill Gate Road/Warhill Trail intersection. The southbound approach operates at LOS F and the intersection warrants the installation of a traffic signal under existing and future traffic conditions.

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Appendix A

Response to Comments/Scoping

To: Sarah Propst, James City County
From: Steve Schmidt, PE, PTOE., Timmons Group
RE: Warhill Sports Park TIA Comment Responses
Date: November 2025

Timmons Group (TG) prepared a Traffic Impact Analysis (TIA) dated July 2025 for the proposed Warhill Sports Complex expansion located in James City County, Virginia. Virginia Department of Transportation (VDOT) provided comments on the TIA on October 28, 2025.

TG reviewed VDOT's comments (**in bold below**) and prepared the responses below. As a result of the comments and responses, a revised TIA has been prepared and is submitted with these responses.

TG responses to VDOT's comments are as follows:

1. The report notes that the scoping documents were agreed upon. Who agreed to these assumptions?

RESPONSE: As the study is a non Chapter 527 study, the scope was agreed to in discussions between the County and Timmons Group. The text has been revised to reflect this.

2. This study notes multiple intersections that have Level of Service E and F and worsening conditions as a result of this development but doesn't propose any improvements to mitigate those conditions. This is unacceptable; but that being said, due to the ongoing Project Pipeline study HR-04 that includes many of the same intersections there is a mechanism for determining what those improvements should be. We recommend essentially putting this study on hold until that Pipeline study concludes so as to not duplicate that effort. The Pipeline study can be designed to include this development's traffic once we agree on trip generation and distribution patterns.

RESPONSE: The study offers mitigation for the Longhill Road/Warhill Trail intersection and identifies other intersections that may need improvements in the future.

This study was completed to aid the County in a land use decision and due to the likely extended horizon year of Project Pipeline HR-04, it is unreasonable to delay the Warhill Athletic Complex Expansion until the project is completed.

3. There are multiple issues with the trip generation that was assumed.
 - a) The Saturday peak trips for the Warhill Athletics Complex are incorrect.
RESPONSE: The trip has been corrected where applicable.
 - b) The Saturday peak trips for the General Services building are incorrect.
RESPONSE: The trip has been corrected where applicable.

- c) The Saturday peak trips for the Unassigned Green Space are incorrect.

RESPONSE: The trip has been corrected where applicable.

- d) The public park land use is not appropriate for the outdoor fitness court, skate park, or pool. Either a different, more appropriate land use code should be used or counts of similar existing facilities should be conducted instead.

RESPONSE: The land uses and trip generation were agreed upon in scoping.

- e) Is the proposed General Service building being relocated from an existing facility? If so, the existing facility's driveway should be counted to determine the trip generation for this use as this facility does not seem intended as "a facility or group of facilities devoted almost exclusively to research and development activities."

RESPONSE: The land uses and trip generation were agreed upon in scoping.

4. As part of the assessment of signal warrants at the Longhill Road / Warhill Trail / Longhill Gate Road intersection, include a breakdown of the 5 most recent years of crash data.

RESPONSE: The crash data is included.

5. In line with IIM-TE-387.1, Signal Justification Reports must include the analysis of innovative intersections through the use of VDOT's Junction Screening Tool (VJuST). Complete a VJuST analysis of the Longhill Road / Warhill Trail / Longhill Gate Road intersection. It is our opinion that this would be an ideal location for a roundabout. Initial analysis on our part shows that this is a viable solution, meaning a conventional traffic signal would not be justified

RESPONSE: A roundabout was included as an option in the Signal Justification Report which includes VJuST analysis.

6. The assessment of warrants at the Longhill Road / Warhill Trail / Longhill Gate Road intersection should utilize the warrants for 1 lane on each of the major and minor streets.

RESPONSE: The warrants used for multiple lanes on the major street and one lane on the minor street are more conservative than those for 1 lane on major and minor approaches. In the PM and Saturday peaks, the westbound right turn traffic onto Warhill Trail from Longhill Road is approximately 50% of the through volume which indicates the suitability of the approach to be considered two or more lanes.

7. Because of the closely spaced nature of traffic signals on US Route 60 and the need for them to be coordinated, the study area should also include the US Route 60 / Lightfoot Road intersection.

RESPONSE: The study area includes the intersections that were scoped.

8. It seems possible that the peak hour on Saturday was not captured. The highest hour of data is consistently the last one that was counted, and the highest 15-minute volumes are also at the

end of the hour. Additional counts should be collected on a Saturday from 12-6 PM to ensure that the peak hour is captured within the data and is then analyzed.

RESPONSE: Saturday counts were completed as scoped and per standards for the midday Saturday peak.

9. Why is the second paragraph in Section 1.1 highlighted?

RESPONSE: This has been revised.

10. On page 1-1 and throughout the report, note that there is no intersection of Opportunity Way and US Route 60.

RESPONSE: Report text has been revised.

11. Page 1-2 states that Level of Service E is acceptable. It is not. Revise this text.

RESPONSE: Report text has been revised.

12. Page 2-1 states that Longhill Gate Road has no posted speed limit, but it does have a posted speed limit.

RESPONSE: Report text has been revised.

13. On page 2-1 revise "Seasons Tree" to "Seasons Trace."

RESPONSE: Report text has been revised.

14. We are open to including some portion of the James City County Municipal Office Building's trips in this study; however, it should not be as high as what is shown in Figure 4-1. Let's discuss what exactly that is. Cardinal Ridge is an unapproved development and should not be included as a background condition.

RESPONSE: The Cardinal Ridge trips have been removed from the analysis and the Municipal Building trips verified.

15. In Figure 2-1 and the Synchro models revise the following turn lane lengths:

- a. Southbound left-turn lane at Intersection #3 should be 305'.
- b. Southbound right-turn lane at Intersection #3 should be 480'.
- c. Southbound right-turn lane at Intersection #4 in continuous so no value should be listed or modeled.

RESPONSE: At Intersection #3 the southbound turn lane lengths were determined using the pavement striping found in aerial imagery. There is no southbound right turn lane at Intersection #4. The *eastbound* right turn lane at Intersection #4 is not continuous.

16. Revise Figure 2-1 to show the northbound approach of Opportunity Way with a shared thru-left and dedicated right-turn lane.

RESPONSE: Figure has been revised.

17. Revise the Synchro analysis to use the HCM6 module whenever possible and the HCM 2000 module only when the HCM6 module cannot be used.

RESPONSE: Noted.

18. Revise the queuing analysis to output the maximum queue length from SimTraffic.

RESPONSE: Maximum queue length from SimTraffic is included in the LOS tables.

19. Has the master plan included as Figure 1-2 been updated either since or as a result of this TIA? The reason we ask is that the trip generation included as Table 5-1 lists "D. Stadium Complex" and notes that this is equivalent to 4 soccer fields, but the master plan seems to show that location as the site of 1 baseball and 1 softball field. Ensure that the trip generation for this portion of the site is accurate.

RESPONSE: Noted.

20. Add text to explain why the trip distribution patterns are different for weekdays and weekends.

RESPONSE: As in accordance with the 2016 Warhill Athletic Complex Study, the makeup of traffic visiting the athletic complex on a weekend differs from the makeup of weekday peak hour traffic to account for visitors from outside the area coming in for athletic tournaments and similar events.

PRE-SCOPE OF WORK MEETING FORM

Information on the Project Traffic Impact Analysis Base Assumptions

The applicant is responsible for entering the relevant information and submitting the form to VDOT and the locality no less than three (3) business days prior to the meeting. If a form is not received by this deadline, the scope of work meeting may be postponed.

Contact Information

Consultant Name: Steve Schmidt
Tele: 804.200.6502
E-mail: steve.schmidt@timmons.com

Developer/Owner Name:
Tele:
E-mail:

Project Information

Project Name: Warhill Athletic Complex Locality/County: James City County

Project Location: (Attach regional and site specific location map) The site is generally located south of Centerville Road, north of Longhill Road and west of Route 199 as shown in Figure 1.

Submission Type Comp Plan ☐ Rezoning ☐ Site Plan ☒ Subd Plat ☐

Project Description: (Including details on the land use, acreage, phasing, access location, etc. Attach additional sheet if necessary) The site is an expansion of the current Warhill Sports Complex as per the February 2023 Master Plan by James City County.

Proposed Use(s): (Check all that apply; attach additional pages as necessary) Residential ☐ Commercial ☐ Mixed Use ☒ Other ☐

Residential Uses(s)

Number of Units: _____
ITE LU Code(s): _____

Commercial Use(s)

ITE LU Code(s): _____

Square Ft or Other Variable: _____

Other Use(s)

ITE LU Code(s): 760
488
411
Independent Variable(s): Fields
Acres
S.F.

Total Peak Hour Trip Projection: Less than 100 ☐ 100 – 499 ☐ 500 – 999 ☒ 1,000 or more ☐

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

Appendix B

Traffic Counts

Appendix C

Traffic Signal Timings

Appendix D
SYNCHRO & SimTraffic Analysis
Of 2025 Existing Conditions

Appendix E
SYNCHRO & SimTraffic Analysis
Of 2040 Background Conditions

Traffic Impact Analysis Assumptions				
Study Period	Existing Year: 2024	Build-out Year: 2040		Design Year: 2042
Study Area Boundaries (Attach map)	North: Centerville Road		South: Longhill Road	
	East: SR 199		West: Centerville Road	
External Factors That Could Affect Project (Planned road improvements, other nearby developments)	Future James City County Municipal Complex and Cardinal Ridge Development			
Consistency With Comprehensive Plan (Land use, transportation plan)	Consistent with Comprehensive Plan			
Available Traffic Data (Historical, forecasts)	VDOT AADT Data, new traffic counts to be conducted, monthly park attendance volumes			
Trip Distribution (Attach sketch)	Road Name:		Road Name:	
	Road Name: see notes		Road Name:	
Annual Vehicle Trip Growth Rate:	1% consistent with other studies	Peak Period for Study (check all that apply)	☒ AM ☒ PM ☒ SAT	
		Peak Hour of the Generator		
Study Intersections and/or Road Segments (Attach additional sheets as necessary)	1.Route 612 (Longhill Road) and Warhill Trail/Longhill Gate Road		6.	
	2.Route 614 (Centerville Road) and Opportunity Way		7.	
	3.US Route 60 (Richmond Road) and Route 614 (Centerville Road)		8.	
	4.US Route 60 (Richmond Road) and Route 199 SB Ramps		9.	
	5.US Route 60 (Richmond Road) and Route 199 NB Ramps		10.	
Trip Adjustment Factors	Internal allowance: ☐ Yes ☒ No Reduction: ____% trips		Pass-by allowance: ☐ Yes ☒ No Reduction: ____% trips	
Software Methodology	☒ Synchro ☒ HCS (v.2000/+) ☐ aaSIDRA ☐ CORSIM ☐ Other ____			
Traffic Signal Proposed or Affected (Analysis software to be used, progression speed, cycle length)	2. Opportunity Way and Route 614 (Centerville Road) 3. Route 614 (Centerville Road) and Route 60 (Richmond Road) 4.Route 60 (Richmond Road) and Route 199 SB Ramps 5. Route 60 (Richmond Road) and Route 199 NB Ramps			

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

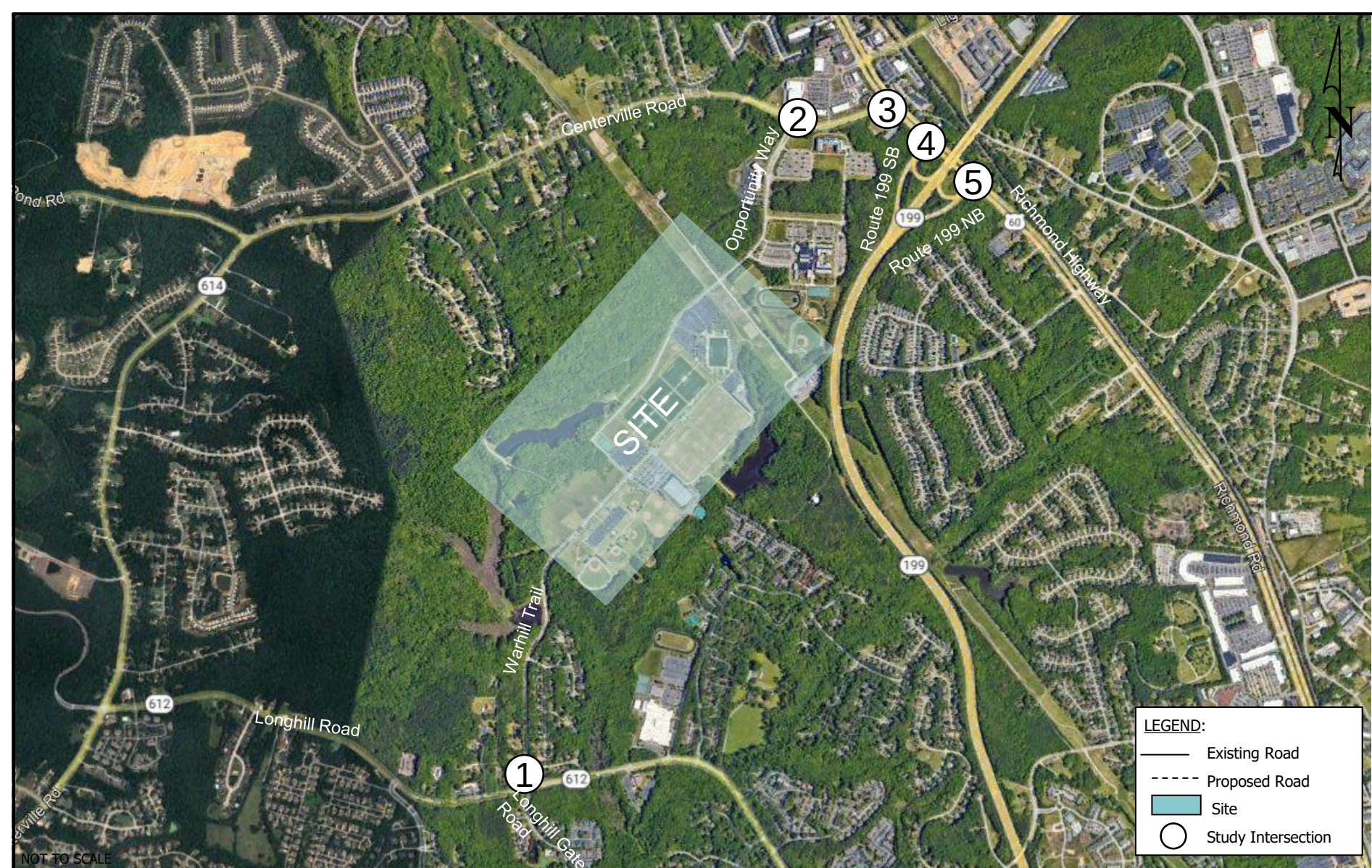
Improvement(s) Assumed or to be Considered	
Background Traffic Studies Considered	JCC Municipal Complex TIA, Cardinal Ridge TIA
Plan Submission	☒ Master Development Plan (MDP) ☐ Generalized Development Plan (GDP) ☐ Preliminary/Sketch Plan ☐ Other Plan type (Final Site, Subd. Plan)
Additional Issues to be Addressed	☒ Queuing analysis ☐ Actuation/Coordination ☐ Weaving analysis ☐ Merge analysis ☒ Bike/Ped Accommodations ☒ Intersection(s) ☐ TDM Measures ☒ Other Signal Warrant at Route 612/Warhill Trl intersection

NOTES on ASSUMPTIONS: 1. See attached for distributions and trip generation

SIGNED: _____ DATE: _____
Applicant or Consultant

PRINT NAME: _____
Applicant or Consultant

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.





Weekday Distribution

Figure
2



Buildout				Weekday						Weekend			Average Daily Trips
Land Use	Size	Units	Land Use Code	AM Peak Hour			PM Peak Hour			SAT PEAK			
				In	Out	Total	In	Out	Total	In	Out	Total	
1. ITE Trip Generation ⁽¹⁾													
<u>Warhill Athletics Complex</u>													
B. Softball/Baseball Complex ⁽²⁾	4	Fields	488	2	2	4	43	22	66	43	47	91	285
D. Stadium Complex ⁽³⁾	4	Fields	488	2	2	4	43	22	66	43	47	91	285
F. Multipurpose Field Complex ⁽⁴⁾	4	Fields	488	2	2	4	43	22	66	43	47	91	285
Warhill Athletics Complex Subtotal	12	Fields		7	5	12	130	67	197	130	141	272	856
<u>Public Park⁽⁵⁾</u>													
Outdoor Fitness Court	0.033	Acre	411	0	0	0	0	0	0	0	0	0	0
Skate Park	0.413	Acre	411	0	0	0	0	0	0	0	0	1	0
Pool	0.308	Acre	411	0	0	0	0	0	0	0	0	1	0
Unassigned Green Space	86.90	Acre	411	1	1	2	5	4	10	85	85	170	68
Public Park Subtotal	87.654	Acre		1	1	2	5	4	10	86	86	172	68
<u>James City County General Services Department</u>													
Research and Development Center ⁽⁵⁾	50,000	S.F.	760	57	12	69	11	56	67	48	48	96	733
Fire Station	20,000	S.F.	575	7	2	10	3	7	10	5	5	10	96
James City County General Services Department Subtotal				64	15	79	14	63	77	53	53	105	829
Total ITE Generated Trips				72	20	92	149	135	283	269	280	549	1,753

Notes: (1) Based on the Institute of Transportation Engineers Trip Generation, 11th Edition. Assumes General Urban/Suburban land use category.

(2) 2 synthetic turf baseball fields, 2 synthetic turf softball fields. For trip generation purposes, considered a 4 field soccer complex (LU 488)

(3) Lighted Football Soccer Complex For trip generation purposes, considered a 4 field soccer complex due to size relative to number of parking spaces (LU 488)

(4) 4 multipurpose fields For trip generation purposes, considered a 4 field soccer complex (LU 488)

(5) Public Park consists of the proposed fitness court, County Skate Park, 50 meter pool, and unassigned green space with multiuse trails throughout

(6) Research and Development Center consists may consist offices and light fabrication areas, a similar use to the general service department which will consist of warehouse, a fuel island and a fleet building

NOT TO SCALE

Appendix B

Traffic Counts

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

Full Length (7 AM-7 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 7:00AM	2	0	30	0	32	0	15	51	5	0	71	0	6	1	1	0	8	0	0	112	11	0	123	0	234
7:15AM	8	1	11	0	20	0	26	72	2	0	100	0	6	2	1	0	9	0	0	56	14	0	70	0	199
7:30AM	6	1	14	0	21	0	19	58	1	0	78	0	10	1	1	0	12	0	0	73	15	0	88	0	199
7:45AM	1	1	21	0	23	0	18	63	2	0	83	0	2	1	4	0	7	0	0	93	6	0	99	0	212
Hourly Total	17	3	76	0	96	0	78	244	10	0	332	0	24	5	7	0	36	0	0	334	46	0	380	0	844
8:00AM	5	0	5	0	10	0	14	86	1	0	101	0	5	1	0	0	6	0	1	91	6	0	98	0	215
8:15AM	11	0	14	0	25	0	15	74	0	0	89	0	2	0	4	0	6	0	0	83	7	0	90	0	210
8:30AM	7	0	13	0	20	0	18	83	0	0	101	0	5	0	1	0	6	0	1	106	7	0	114	0	241
8:45AM	12	0	22	0	34	0	25	73	3	0	101	0	11	0	0	0	11	0	0	94	7	0	101	0	247
Hourly Total	35	0	54	0	89	0	72	316	4	0	392	0	23	1	5	0	29	0	2	374	27	0	403	0	913
9:00AM	12	0	11	0	23	0	11	75	0	0	86	0	1	2	0	0	3	0	0	61	5	0	66	0	178
9:15AM	3	0	7	0	10	0	16	96	0	0	112	0	2	1	0	0	3	0	2	74	10	0	86	0	211
9:30AM	5	1	9	0	15	0	15	62	3	0	80	0	6	2	1	0	9	0	2	126	8	0	136	0	240
9:45AM	5	2	11	0	18	0	14	60	3	0	77	0	1	1	1	0	3	0	2	86	5	0	93	0	191
Hourly Total	25	3	38	0	66	0	56	293	6	0	355	0	10	6	2	0	18	0	6	347	28	0	381	0	820
10:00AM	7	0	10	0	17	0	11	59	3	0	73	0	5	0	0	0	5	0	0	74	6	0	80	1	175
10:15AM	5	0	4	0	9	0	19	58	1	0	78	0	4	2	0	0	6	0	1	70	5	0	76	1	169
10:30AM	11	3	20	0	34	0	15	47	3	0	65	0	3	3	1	0	7	0	0	67	4	0	71	0	177
10:45AM	4	0	13	0	17	0	14	45	4	0	63	0	2	2	0	0	4	0	0	87	5	0	92	0	176
Hourly Total	27	3	47	0	77	0	59	209	11	0	279	0	14	7	1	0	22	0	1	298	20	0	319	2	697
11:00AM	5	0	6	1	12	0	5	65	5	0	75	0	3	0	1	0	4	0	1	53	0	0	54	0	145
11:15AM	3	1	12	0	16	0	11	66	3	0	80	0	5	1	1	0	7	0	1	71	4	0	76	2	179
11:30AM	6	2	9	0	17	0	9	67	6	0	82	0	5	2	0	0	7	0	1	72	5	0	78	0	184
11:45AM	5	2	7	0	14	0	18	54	3	0	75	0	4	0	2	0	6	0	0	69	6	0	75	0	170
Hourly Total	19	5	34	1	59	0	43	252	17	0	312	0	17	3	4	0	24	0	3	265	15	0	283	2	678
12:00PM	5	0	14	0	19	0	11	65	4	0	80	0	5	1	1	0	7	0	1	73	3	0	77	0	183
12:15PM	7	1	18	0	26	0	8	70	3	0	81	0	4	0	0	0	4	0	0	66	4	0	70	0	181
12:30PM	8	1	13	0	22	0	11	80	7	0	98	0	4	2	0	0	6	0	0	67	1	0	68	0	194
12:45PM	5	2	6	0	13	0	14	72	5	0	91	0	2	0	3	0	5	0	1	66	3	0	70	0	179
Hourly Total	25	4	51	0	80	0	44	287	19	0	350	0	15	3	4	0	22	0	2	272	11	0	285	0	737
1:00PM	3	1	15	0	19	0	9	70	2	0	81	0	2	2	2	0	6	0	0	65	3	0	68	1	174
1:15PM	6	0	7	0	13	0	16	65	6	0	87	0	3	0	0	0	3	0	0	68	5	0	73	0	176
1:30PM	2	2	14	0	18	0	14	75	5	0	94	0	1	1	1	0	3	0	2	75	2	0	79	0	194
1:45PM	3	1	12	0	16	0	11	70	5	0	86	0	4	0	3	0	7	0	0	92	4	0	96	1	205
Hourly Total	14	4	48	0	66	0	50	280	18	0	348	0	10	3	6	0	19	0	2	300	14	0	316	2	749
2:00PM	4	1	19	0	24	0	18	75	7	0	100	0	4	1	2	0	7	0	0	64	7	0	71	0	202
2:15PM	7	0	14	0	21	0	16	105	2	0	123	0	4	0	1	0	5	0	0	70	9	0	79	0	228
2:30PM	7	0	8	0	15	2	20	92	6	0	118	0	2	0	4	0	6	0	1	72	11	0	84	1	223
2:45PM	8	1	10	0	19	0	28	86	3	0	117	0	3	0	1	0	4	0	2	83	18	0	103	0	243
Hourly Total	26	2	51	0	79	2	82	358	18	0	458	0	13	1	8	0	22	0	3	289	45	0	337	1	896
3:00PM	14	0	20	0	34	1	25	99	3	0	127	0	1	0	0	0	1	0	0	96	24	0	120	0	282
3:15PM	12	0	16	0	28	0	27	99	4	0	130	0	7	3	1	0	11	0	6	77	21	0	104	0	273
3:30PM	10	1	19	0	30	0	29	97	4	0	130	0	3	2	0	0	5	0	2	65	10	0	77	0	242
3:45PM	7	0	19	0	26	0	29	91	5	0	125	0	3	0	0	0	3	0	0	59	15	0	74	0	228
Hourly Total	43	1	74	0	118	1	110	386	16	0	512	0	14	5	1	0	20	0	8	297	70	0	375	0	1025
4:00PM	4	0	11	0	15	0	8	98	4	0	110	0	5	1	0	0	6	0	2	97	7	0	106	0	237
4:15PM	4	1	15	0	20	0	39	85	6	0	130	0	5	1	1	0	7	0	5	137	19	0	161	0	318
4:30PM	30	1	27	0	58	0	43	97	5	0	145	0	2	0	0	0	2	0	3	110	21	0	134	0	339
4:45PM	12	3	33	0	48	0	37	95	3	0	135	0	5	1	4	0	10	0	1	102	13	0	116	0	309
Hourly Total	50	5	86	0	141	0	127	375	18	0	520	0	17	3	5	0	25	0	11	446	60	0	517	0	1203
5:00PM	21	3	40	0	64	0	52	99	5	0	156	0	4	2	0	0	6	0	3	89	36	0	128	0	354
5:15PM	15	3	34	0	52	0	76	116	10	0	202	0	4	2	2	0	8	0	1	64	52	0	117	0	379
5:30PM	33	2	44	0	79	0	30	86	8	0	124	0	4	1	1	0	6	0	1	88	13	0	102	0	311
5:45PM	12	1	34	0	47	0	35	84	4	0	123	0	2	0	0	0	2	0	1	77	17	0	95	0	267
Hourly Total	81	9	152	0	242	0	193	385	27	0	605	0	14	5	3	0	22	0	6	318	118	0	442	0	1311
6:00PM	18	2	29	0	49	0	26	74	3	0	103	0	3	3	1	0	7	0	1	69	21	0	91	1	250
6:15PM	14	0	32	0	46	0	39	70	6	0	115	0	2	1	1	0	4	0	1	47	29	0	77	0	242
6:30PM	27	2	42	1	72	0	42	63	3	0	108	0	4	1	0	0	5	0	0	47	16	0	63	0	248
6:45PM	21	0	41	0	62	0	40	57	6	0	103	0	4	0	1	0	5	0	0	44	18	0	62	0	232

Leg Direction	Warhill Trl Southbound							Longhill Rd Westbound							Longhill Gate Rd Northbound							Longhill Rd Eastbound							
Time	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		Int
Hourly Total	80	4	144	1	229	0		147	264	18	0	429	0		13	5	3	0	21	0		2	207	84	0	293	1		972
Total	442	43	855	2	1342	3		1061	3649	182	0	4892	0		184	47	49	0	280	0		46	3747	538	0	4331	8		10845
% Approach	32.9%	3.2%	63.7%	0.1%	-	-		21.7%	74.6%	3.7%	0%	-	-		65.7%	16.8%	17.5%	0%	-	-		1.1%	86.5%	12.4%	0%	-	-		-
% Total	4.1%	0.4%	7.9%	0%	12.4%	-		9.8%	33.6%	1.7%	0%	45.1%	-		1.7%	0.4%	0.5%	0%	2.6%	-		0.4%	34.6%	5.0%	0%	39.9%	-		-
Lights and Motorcycles	424	43	846	2	1315	-		1048	3495	175	0	4718	-		180	46	45	0	271	-		44	3602	524	0	4170	-		10474
% Lights and Motorcycles	95.9%	100%	98.9%	100%	98.0%	-		98.8%	95.8%	96.2%	0%	96.4%	-		97.8%	97.9%	91.8%	0%	96.8%	-		95.7%	96.1%	97.4%	0%	96.3%	-		96.6%
Heavy	18	0	9	0	27	-		13	154	7	0	174	-		4	1	4	0	9	-		2	145	14	0	161	-		371
% Heavy	4.1%	0%	1.1%	0%	2.0%	-		1.2%	4.2%	3.8%	0%	3.6%	-		2.2%	2.1%	8.2%	0%	3.2%	-		4.3%	3.9%	2.6%	0%	3.7%	-		3.4%
Pedestrians	-	-	-	-	-	3		-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	8		
% Pedestrians	-	-	-	-	-	100%		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	100%		-
Bicycles on Crosswalk	-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	0		
% Bicycles on Crosswalk	-	-	-	-	-	0%		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	0%		-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

Full Length (7 AM-7 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Warhill Trl

Total: 2990

In: 1342 Out: 1648

442
43
855
2

2 1

[W] Longhill Rd

Total: 8471

In: 4331 Out: 4140

538

3747

46

4

1061

3649

182

Out: 4786 In: 4892

Total: 9678

[E] Longhill Rd

49
47
184

Out: 271 In: 280

Total: 551

[S] Longhill Gate Rd

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

AM Peak (8 AM - 9 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 8:00AM	5	0	5	0	10	0	14	86	1	0	101	0	5	1	0	0	6	0	1	91	6	0	98	0	215
8:15AM	11	0	14	0	25	0	15	74	0	0	89	0	2	0	4	0	6	0	0	83	7	0	90	0	210
8:30AM	7	0	13	0	20	0	18	83	0	0	101	0	5	0	1	0	6	0	1	106	7	0	114	0	241
8:45AM	12	0	22	0	34	0	25	73	3	0	101	0	11	0	0	0	11	0	0	94	7	0	101	0	247
Total	35	0	54	0	89	0	72	316	4	0	392	0	23	1	5	0	29	0	2	374	27	0	403	0	913
% Approach	39.3%	0%	60.7%	0%	-	-	18.4%	80.6%	1.0%	0%	-	-	79.3%	3.4%	17.2%	0%	-	-	0.5%	92.8%	6.7%	0%	-	-	-
% Total	3.8%	0%	5.9%	0%	9.7%	-	7.9%	34.6%	0.4%	0%	42.9%	-	2.5%	0.1%	0.5%	0%	3.2%	-	0.2%	41.0%	3.0%	0%	44.1%	-	-
PHF	0.729	-	0.614	-	0.654	-	0.720	0.919	0.333	-	0.970	-	0.523	0.250	0.313	-	0.659	-	0.500	0.882	0.964	-	0.884	-	0.924
Lights and Motorcycles	34	0	51	0	85	-	69	299	4	0	372	-	23	1	5	0	29	-	2	363	26	0	391	-	877
% Lights and Motorcycles	97.1%	0%	94.4%	0%	95.5%	-	95.8%	94.6%	100%	0%	94.9%	-	100%	100%	100%	0%	100%	-	100%	97.1%	96.3%	0%	97.0%	-	96.1%
Heavy	1	0	3	0	4	-	3	17	0	0	20	-	0	0	0	0	0	-	0	11	1	0	12	-	36
% Heavy	2.9%	0%	5.6%	0%	4.5%	-	4.2%	5.4%	0%	0%	5.1%	-	0%	0%	0%	0%	0%	-	0%	2.9%	3.7%	0%	3.0%	-	3.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

AM Peak (8 AM - 9 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Warhill Trl

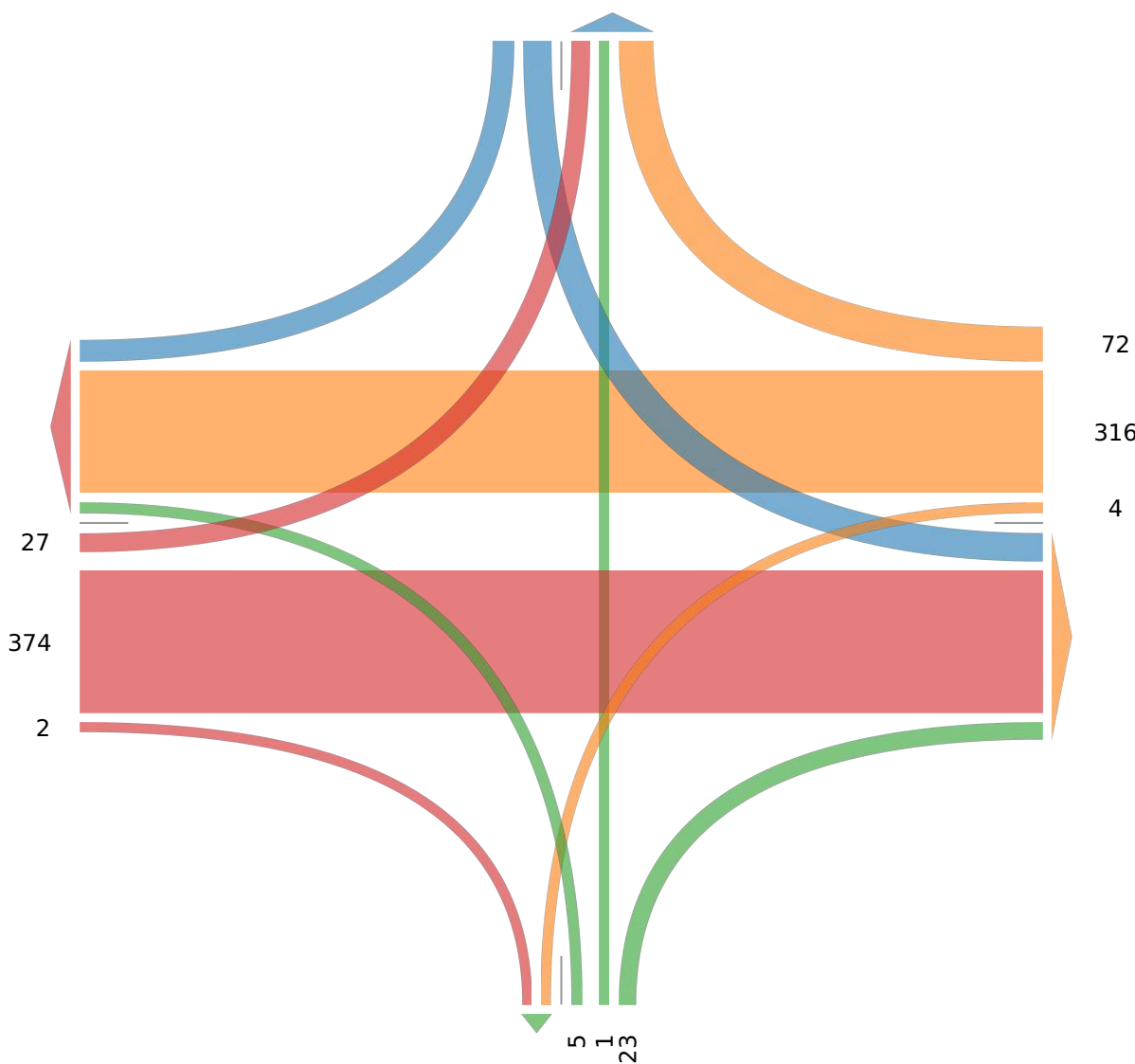
Total: 189

In: 89 Out: 100

35 54

[W] Longhill Rd

Total: 759
In: 403 Out: 356



Out: 451 In: 392

Total: 843

[E] Longhill Rd

Out: 6 In: 29

Total: 35

[S] Longhill Gate Rd

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

Midday Peak (1 PM - 2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345,

Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 1:00PM	3	1	15	0	19	0	9	70	2	0	81	0	2	2	2	0	6	0	0	65	3	0	68	1	174
1:15PM	6	0	7	0	13	0	16	65	6	0	87	0	3	0	0	0	3	0	0	68	5	0	73	0	176
1:30PM	2	2	14	0	18	0	14	75	5	0	94	0	1	1	1	0	3	0	2	75	2	0	79	0	194
1:45PM	3	1	12	0	16	0	11	70	5	0	86	0	4	0	3	0	7	0	0	92	4	0	96	1	205
Total	14	4	48	0	66	0	50	280	18	0	348	0	10	3	6	0	19	0	2	300	14	0	316	2	749
% Approach	21.2%	6.1%	72.7%	0%	-	-	14.4%	80.5%	5.2%	0%	-	-	52.6%	15.8%	31.6%	0%	-	-	0.6%	94.9%	4.4%	0%	-	-	-
% Total	1.9%	0.5%	6.4%	0%	8.8%	-	6.7%	37.4%	2.4%	0%	46.5%	-	1.3%	0.4%	0.8%	0%	2.5%	-	0.3%	40.1%	1.9%	0%	42.2%	-	-
PHF	0.583	0.500	0.800	-	0.868	-	0.781	0.933	0.750	-	0.926	-	0.625	0.375	0.500	-	0.679	-	0.250	0.815	0.700	-	0.823	-	0.913
Lights and Motorcycles	12	4	47	0	63	-	50	268	15	0	333	-	10	3	5	0	18	-	2	285	12	0	299	-	713
% Lights and Motorcycles	85.7%	100%	97.9%	0%	95.5%	-	100%	95.7%	83.3%	0%	95.7%	-	100%	100%	83.3%	0%	94.7%	-	100%	95.0%	85.7%	0%	94.6%	-	95.2%
Heavy	2	0	1	0	3	-	0	12	3	0	15	-	0	0	1	0	1	-	0	15	2	0	17	-	36
% Heavy	14.3%	0%	2.1%	0%	4.5%	-	0%	4.3%	16.7%	0%	4.3%	-	0%	0%	16.7%	0%	5.3%	-	0%	5.0%	14.3%	0%	5.4%	-	4.8%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

Midday Peak (1 PM - 2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Warhill Trl

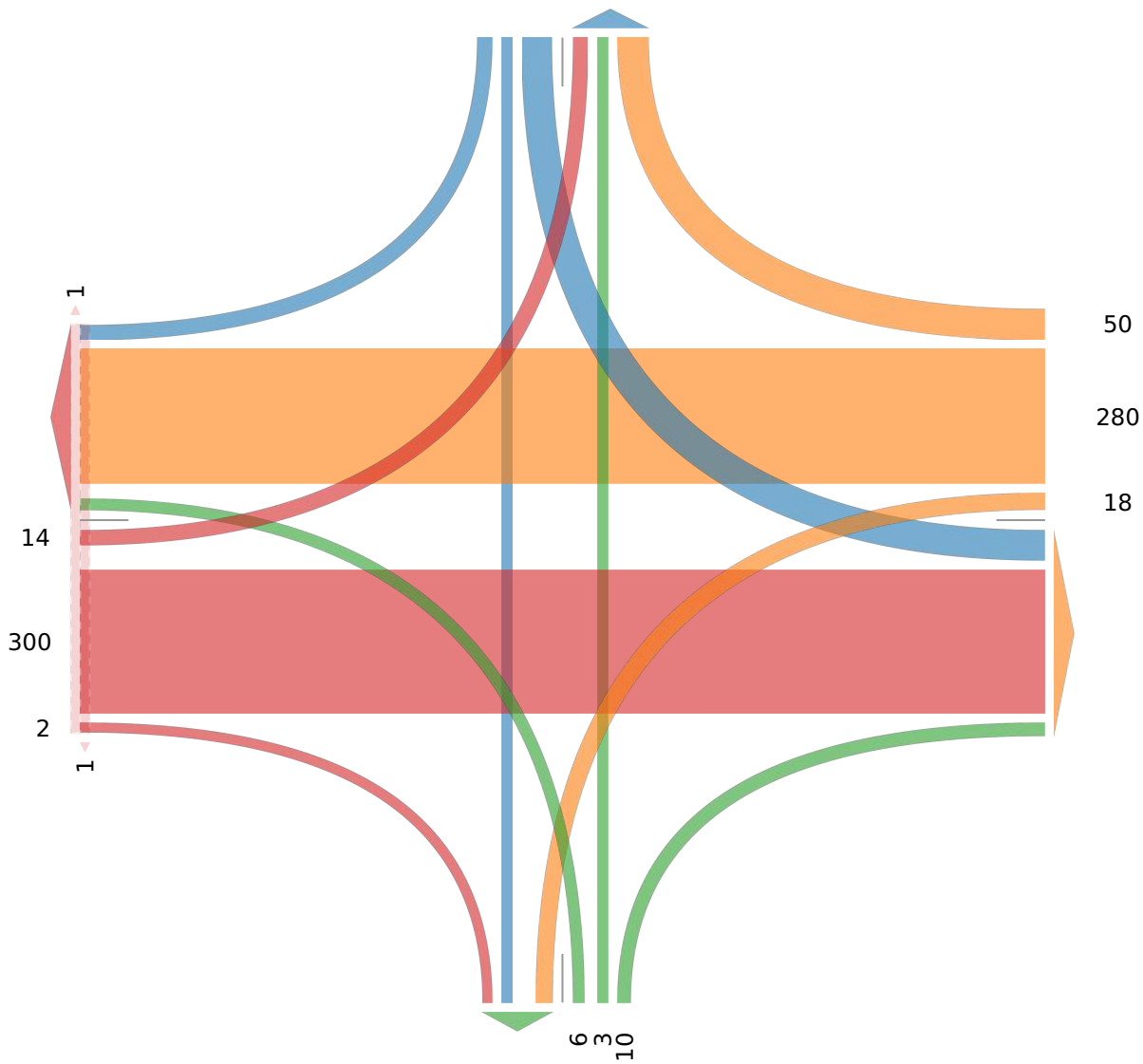
Total: 133

In: 66 Out: 67

14 4 48

[W] Longhill Rd

Total: 616
In: 316 Out: 300



Out: 358 In: 348
Total: 706
[E] Longhill Rd

Out: 24 In: 19
Total: 43
[S] Longhill Gate Rd

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 4:30PM	30	1	27	0	58	0	43	97	5	0	145	0	2	0	0	0	2	0	3	110	21	0	134	0	339
4:45PM	12	3	33	0	48	0	37	95	3	0	135	0	5	1	4	0	10	0	1	102	13	0	116	0	309
5:00PM	21	3	40	0	64	0	52	99	5	0	156	0	4	2	0	0	6	0	3	89	36	0	128	0	354
5:15PM	15	3	34	0	52	0	76	116	10	0	202	0	4	2	2	0	8	0	1	64	52	0	117	0	379
Total	78	10	134	0	222	0	208	407	23	0	638	0	15	5	6	0	26	0	8	365	122	0	495	0	1381
% Approach	35.1%	4.5%	60.4%	0%	-	-	32.6%	63.8%	3.6%	0%	-	-	57.7%	19.2%	23.1%	0%	-	-	1.6%	73.7%	24.6%	0%	-	-	-
% Total	5.6%	0.7%	9.7%	0%	16.1%	-	15.1%	29.5%	1.7%	0%	46.2%	-	1.1%	0.4%	0.4%	0%	1.9%	-	0.6%	26.4%	8.8%	0%	35.8%	-	-
PHF	0.650	0.833	0.838	-	0.867	-	0.684	0.877	0.575	-	0.790	-	0.750	0.625	0.375	-	0.650	-	0.667	0.830	0.587	-	0.924	-	0.911
Lights and Motorcycles	77	10	133	0	220	-	206	393	23	0	622	-	15	5	6	0	26	-	8	351	122	0	481	-	1349
% Lights and Motorcycles	98.7%	100%	99.3%	0%	99.1%	-	99.0%	96.6%	100%	0%	97.5%	-	100%	100%	100%	0%	100%	-	100%	96.2%	100%	0%	97.2%	-	97.7%
Heavy	1	0	1	0	2	-	2	14	0	0	16	-	0	0	0	0	0	-	0	14	0	0	14	-	32
% Heavy	1.3%	0%	0.7%	0%	0.9%	-	1.0%	3.4%	0%	0%	2.5%	-	0%	0%	0%	0%	0%	-	0%	3.8%	0%	0%	2.8%	-	2.3%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Warhill Trl

Total: 557

In: 222 Out: 335

78
10
134

[W] Longhill Rd

Total: 986
In: 495 Out: 491

122
365
8

208
407
23

Out: 514 In: 638

Total: 1152

[E] Longhill Rd

Out: 41 In: 26
Total: 67

[S] Longhill Gate Rd



1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

Full Length (7 AM-7 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound							Longhill Rd Westbound							Longhill Gate Rd Northbound							Longhill Rd Eastbound							
Time	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*	Int	
2025-03-08 7:00AM	2	0	7	0	9	1		9	19	0	0	28	0		1	0	0	0	1	0		0	24	2	0	26	0		64
7:15AM	3	0	7	0	10	0		11	23	1	0	35	0		1	1	0	0	2	0		1	30	6	0	37	0		84
7:30AM	4	0	5	0	9	0		14	18	0	0	32	0		1	2	1	0	4	0		0	48	4	0	52	0		97
7:45AM	2	0	7	0	9	0		45	35	0	0	80	0		4	0	0	0	4	0		0	24	11	0	35	0		128
Hourly Total	11	0	26	0	37	1		79	95	1	0	175	0		7	3	1	0	11	0		1	126	23	0	150	0		373
8:00AM	3	1	5	0	9	0		55	27	0	0	82	0		3	1	0	0	4	0		1	32	12	0	45	0		140
8:15AM	2	1	5	0	8	0		32	31	0	0	63	0		5	1	1	0	7	0		1	46	16	0	63	0		141
8:30AM	3	0	8	0	11	0		25	32	1	0	58	0		4	2	2	0	8	0		0	52	13	0	65	0		142
8:45AM	10	0	22	0	32	0		25	37	3	0	65	0		3	0	1	0	4	0		0	65	22	0	87	0		188
Hourly Total	18	2	40	0	60	0		137	127	4	0	268	0		15	4	4	0	23	0		2	195	63	0	260	0		611
9:00AM	4	0	13	0	17	0		24	38	3	0	65	0		3	5	0	0	8	0		1	47	9	0	57	0		147
9:15AM	7	0	12	0	19	0		47	35	2	0	84	0		3	1	1	0	5	0		0	42	12	0	54	0		162
9:30AM	14	0	22	0	36	0		74	47	1	0	122	0		4	0	0	0	4	0		1	60	14	0	75	0		237
9:45AM	11	1	25	0	37	0		52	52	3	0	107	0		8	1	2	0	11	0		1	67	39	0	107	0		262
Hourly Total	36	1	72	0	109	0		197	172	9	0	378	0		18	7	3	0	28	0		3	216	74	0	293	0		808
10:00AM	17	2	18	0	37	0		24	62	0	0	86	0		6	2	0	0	8	0		0	50	11	0	61	0		192
10:15AM	9	0	26	0	35	0		27	48	1	0	76	0		3	0	0	0	3	0		2	78	11	0	91	0		205
10:30AM	8	1	67	1	77	0		30	48	2	0	80	0		7	2	1	0	10	0		3	72	16	0	91	2		258
10:45AM	9	1	35	0	45	0		88	70	6	0	164	0		6	0	0	0	6	0		0	70	30	0	100	0		315
Hourly Total	43	4	146	1	194	0		169	228	9	0	406	0		22	4	1	0	27	0		5	270	68	0	343	2		970
11:00AM	16	0	26	0	42	0		35	55	8	0	98	0		6	1	1	0	8	0		2	70	10	0	82	0		230
11:15AM	15	3	35	0	53	0		26	71	7	0	104	0		9	2	3	0	14	0		0	76	13	0	89	2		260
11:30AM	10	0	41	0	51	0		17	71	3	0	91	0		3	0	1	0	4	0		2	68	3	0	73	0		219
11:45AM	7	0	23	0	30	0		23	77	2	0	102	0		4	1	0	0	5	0		3	83	10	0	96	0		233
Hourly Total	48	3	125	0	176	0		101	274	20	0	395	0		22	4	5	0	31	0		7	297	36	0	340	2		942
12:00PM	18	0	73	3	94	0		13	77	3	0	93	0		5	0	1	0	6	0		2	70	8	0	80	0		273
12:15PM	12	1	22	0	35	0		24	60	2	0	86	0		7	0	2	0	9	0		2	70	6	0	78	0		208
12:30PM	12	2	24	0	38	0		33	62	3	0	98	0		4	2	1	0	7	0		3	68	9	0	80	0		223
12:45PM	8	1	28	0	37	0		40	64	3	0	107	0		8	0	2	0	10	0		2	63	8	0	73	0		227
Hourly Total	50	4	147	3	204	0		110	263	11	0	384	0		24	2	6	0	32	0		9	271	31	0	311	0		931
1:00PM	6	1	16	0	23	0		25	64	2	0	91	0		3	1	1	0	5	0		1	64	2	0	67	0		186
1:15PM	9	1	12	0	22	0		20	70	2	0	92	0		5	0	2	0	7	0		2	60	5	0	67	0		188
1:30PM	11	3	63	0	77	0		21	79	1	0	101	0		2	5	0	0	7	0		1	73	4	0	78	0		263
1:45PM	4	2	14	0	20	0		26	77	4	0	107	0		2	2	1	0	5	0		1	83	7	0	91	0		223
Hourly Total	30	7	105	0	142	0		92	290	9	0	391	0		12	8	4	0	24	0		5	280	18	0	303	0		860
2:00PM	7	1	16	0	24	0		51	73	5	0	129	0		5	0	1	0	6	0		3	87	11	0	101	0		260
2:15PM	2	0	8	0	10	0		35	69	6	0	110	0		1	0	1	0	2	0		0	65	6	0	71	0		193
2:30PM	5	2	14	0	21	0		18	56	7	0	81	0		1	3	1	0	5	0		2	72	3	0	77	0		184
2:45PM	5	2	26	0	33	0		20	55	4	0	79	0		1	1	3	0	5	0		0	62	5	0	67	1		184
Hourly Total	19	5	64	0	88	0		124	253	22	0	399	0		8	4	6	0	18	0		5	286	25	0	316	1		821
3:00PM	3	0	64	0	67	0		13	76	1	0	90	0		2	1	0	0	3	0		1	71	3	0	75	0		235
3:15PM	2	1	23	1	27	0		21	58	6	0	85	0		3	0	2	0	5	0		1	82	6	0	89	0		206
3:30PM	8	1	19	0	28	0		18	66	4	0	88	0		4	0	1	0	5	0		1	69	2	0	72	0		193
3:45PM	1	2	17	0	20	0		22	64	4	0	90	0		2	2	2	0	6	0		1	64	6	0	71	2		187
Hourly Total	14	4	123	1	142	0		74	264	15	0	353	0		11	3	5	0	19	0		4	286	17	0	307	2		821
4:00PM	6	0	16	0	22	0		30	63	6	0	99	0		2	1	2	0	5	0		1	64	4	0	69	0		195
4:15PM	9	0	21	0	30	0		20	64	7	0	91	0		3	3	1	0	7	0		1	57	1	0	59	1		187
4:30PM	8	0	68	0	76	0		11	70	3	0	84	0		5	1	0	0	6	0		1	64	4	0	69	0		235
4:45PM	5	2	8	0	15	0		15	60	4	0	79	0		5	0	3	0	8	1		1	88	0	0	89	0		191
Hourly Total	28	2	113	0	143	0		76	257	20	0	353	0		15	5	6	0	26	1		4	273	9	0	286	1		808
5:00PM	3	0	11	0	14	0		15	65	4	0	84	0		7	0	1	0	8	0		0	74	3	0	77	1		183
5:15PM	4	0	18	0	22	0		9	58	4	0	71	0		3	2	1	0	6	0		1	77	3	0	81	0		180
5:30PM	1	0	4	0	5	0		5	65	5	0	75	0		1	5	2	0	8	0		0	58	1	0	59	0		

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
Hourly Total	19	2	104	0	125	0	34	280	18	0	332	0	8	1	4	0	13	0	5	195	10	0	210	0	680
Total	328	34	1109	5	1476	1	1230	2762	155	0	4147	0	175	53	49	0	277	1	52	2961	385	0	3398	9	9298
% Approach	22.2%	2.3%	75.1%	0.3%	-	-	29.7%	66.6%	3.7%	0%	-	-	63.2%	19.1%	17.7%	0%	-	-	1.5%	87.1%	11.3%	0%	-	-	-
% Total	3.5%	0.4%	11.9%	0.1%	15.9%	-	13.2%	29.7%	1.7%	0%	44.6%	-	1.9%	0.6%	0.5%	0%	3.0%	-	0.6%	31.8%	4.1%	0%	36.5%	-	-
Lights and Motorcycles	328	33	1106	5	1472	-	1229	2727	155	0	4111	-	174	53	49	0	276	-	52	2931	384	0	3367	-	9226
% Lights and Motorcycles	100%	97.1%	99.7%	100%	99.7%	-	99.9%	98.7%	100%	0%	99.1%	-	99.4%	100%	100%	0%	99.6%	-	100%	99.0%	99.7%	0%	99.1%	-	99.2%
Heavy	0	1	3	0	4	-	1	35	0	0	36	-	1	0	0	0	1	-	0	30	1	0	31	-	72
% Heavy	0%	2.9%	0.3%	0%	0.3%	-	0.1%	1.3%	0%	0%	0.9%	-	0.6%	0%	0%	0%	0.4%	-	0%	1.0%	0.3%	0%	0.9%	-	0.8%
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	9	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

Full Length (7 AM-7 PM)

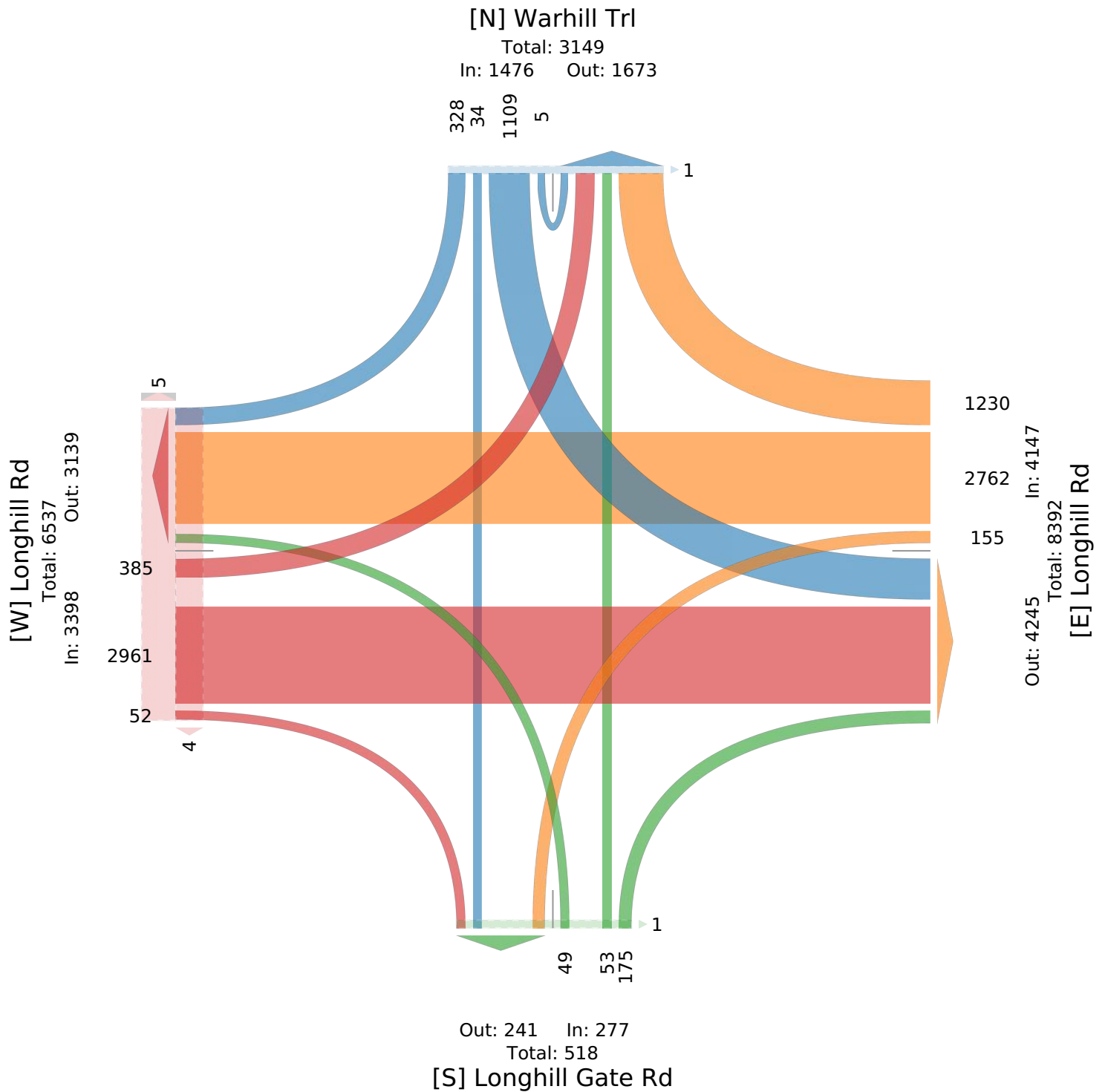
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 10:00AM	17	2	18	0	37	0	24	62	0	0	86	0	6	2	0	0	8	0	0	50	11	0	61	0	192
10:15AM	9	0	26	0	35	0	27	48	1	0	76	0	3	0	0	0	3	0	2	78	11	0	91	0	205
10:30AM	8	1	67	1	77	0	30	48	2	0	80	0	7	2	1	0	10	0	3	72	16	0	91	2	258
10:45AM	9	1	35	0	45	0	88	70	6	0	164	0	6	0	0	0	6	0	0	70	30	0	100	0	315
Total	43	4	146	1	194	0	169	228	9	0	406	0	22	4	1	0	27	0	5	270	68	0	343	2	970
% Approach	22.2%	2.1%	75.3%	0.5%	-	-	41.6%	56.2%	2.2%	0%	-	-	81.5%	14.8%	3.7%	0%	-	-	1.5%	78.7%	19.8%	0%	-	-	-
% Total	4.4%	0.4%	15.1%	0.1%	20.0%	-	17.4%	23.5%	0.9%	0%	41.9%	-	2.3%	0.4%	0.1%	0%	2.8%	-	0.5%	27.8%	7.0%	0%	35.4%	-	-
PHF	0.632	0.500	0.545	0.250	0.630	-	0.480	0.814	0.375	-	0.619	-	0.786	0.500	0.250	-	0.675	-	0.417	0.865	0.567	-	0.858	-	0.770
Lights and Motorcycles	43	3	146	1	193	-	169	227	9	0	405	-	22	4	1	0	27	-	5	268	67	0	340	-	965
% Lights and Motorcycles	100%	75.0%	100%	100%	99.5%	-	100%	99.6%	100%	0%	99.8%	-	100%	100%	100%	0%	100%	-	100%	99.3%	98.5%	0%	99.1%	-	99.5%
Heavy	0	1	0	0	1	-	0	1	0	0	1	-	0	0	0	0	0	-	0	2	1	0	3	-	5
% Heavy	0%	25.0%	0%	0%	0.5%	-	0%	0.4%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0%	0.7%	1.5%	0%	0.9%	-	0.5%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Warhill Trl

Total: 436

In: 194

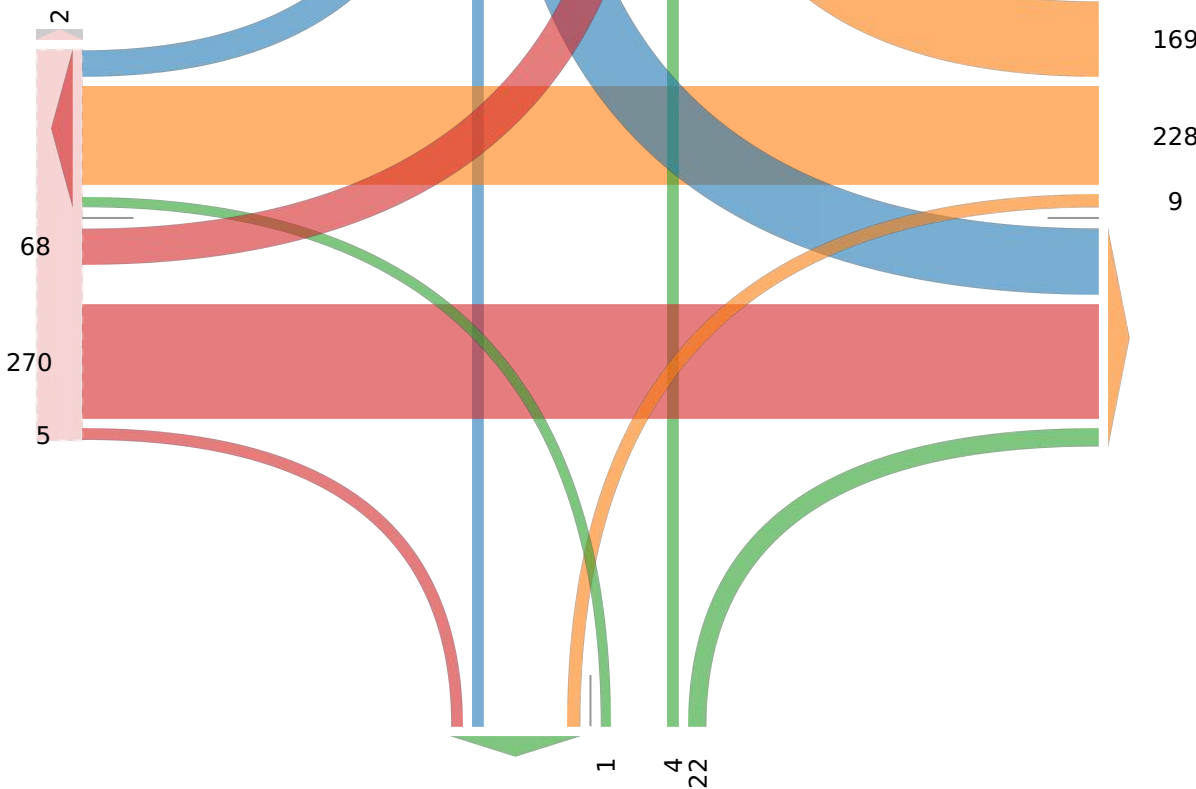
Out: 242

43
4
146
1

[W] Longhill Rd

Total: 615

In: 343 Out: 272



Out: 18 In: 27
Total: 45
[S] Longhill Gate Rd

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

Midday Peak (WKND) (11:15 AM - 12:15 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345,

Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 11:15AM	15	3	35	0	53	0	26	71	7	0	104	0	9	2	3	0	14	0	0	76	13	0	89	2	260
11:30AM	10	0	41	0	51	0	17	71	3	0	91	0	3	0	1	0	4	0	2	68	3	0	73	0	219
11:45AM	7	0	23	0	30	0	23	77	2	0	102	0	4	1	0	0	5	0	3	83	10	0	96	0	233
12:00PM	18	0	73	3	94	0	13	77	3	0	93	0	5	0	1	0	6	0	2	70	8	0	80	0	273
Total	50	3	172	3	228	0	79	296	15	0	390	0	21	3	5	0	29	0	7	297	34	0	338	2	985
% Approach	21.9%	1.3%	75.4%	1.3%	-	-	20.3%	75.9%	3.8%	0%	-	-	72.4%	10.3%	17.2%	0%	-	-	2.1%	87.9%	10.1%	0%	-	-	-
% Total	5.1%	0.3%	17.5%	0.3%	23.1%	-	8.0%	30.1%	1.5%	0%	39.6%	-	2.1%	0.3%	0.5%	0%	2.9%	-	0.7%	30.2%	3.5%	0%	34.3%	-	-
PHF	0.694	0.250	0.589	0.250	0.606	-	0.760	0.961	0.536	-	0.938	-	0.583	0.375	0.417	-	0.518	-	0.583	0.895	0.654	-	0.880	-	0.902
Lights and Motorcycles	50	3	171	3	227	-	79	295	15	0	389	-	21	3	5	0	29	-	7	296	34	0	337	-	982
% Lights and Motorcycles	100%	100%	99.4%	100%	99.6%	-	100%	99.7%	100%	0%	99.7%	-	100%	100%	100%	0%	100%	-	100%	99.7%	100%	0%	99.7%	-	99.7%
Heavy	0	0	1	0	1	-	0	1	0	0	1	-	0	0	0	0	0	-	0	1	0	0	1	-	3
% Heavy	0%	0%	0.6%	0%	0.4%	-	0%	0.3%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.3%	-	0.3%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

Midday Peak (WKND) (11:15 AM - 12:15 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Warhill Trl

Total: 347

In: 228 Out: 119

50 3 172 3

[W] Longhill Rd
Total: 689
In: 338 Out: 351

34
297
7

2

79

296

15

Out: 490 In: 390

Total: 880

[E] Longhill Rd

Out: 25 In: 29

Total: 54

[S] Longhill Gate Rd

5 3 21

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

PM Peak (WKND) (1:30 PM - 2:30 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 1:30PM	11	3	63	0	77	0	21	79	1	0	101	0	2	5	0	0	7	0	1	73	4	0	78	0	263
1:45PM	4	2	14	0	20	0	26	77	4	0	107	0	2	2	1	0	5	0	1	83	7	0	91	0	223
2:00PM	7	1	16	0	24	0	51	73	5	0	129	0	5	0	1	0	6	0	3	87	11	0	101	0	260
2:15PM	2	0	8	0	10	0	35	69	6	0	110	0	1	0	1	0	2	0	0	65	6	0	71	0	193
Total	24	6	101	0	131	0	133	298	16	0	447	0	10	7	3	0	20	0	5	308	28	0	341	0	939
% Approach	18.3%	4.6%	77.1%	0%	-	-	29.8%	66.7%	3.6%	0%	-	-	50.0%	35.0%	15.0%	0%	-	-	1.5%	90.3%	8.2%	0%	-	-	-
% Total	2.6%	0.6%	10.8%	0%	14.0%	-	14.2%	31.7%	1.7%	0%	47.6%	-	1.1%	0.7%	0.3%	0%	2.1%	-	0.5%	32.8%	3.0%	0%	36.3%	-	-
PHF	0.545	0.500	0.401	-	0.425	-	0.652	0.943	0.667	-	0.866	-	0.500	0.350	0.750	-	0.714	-	0.417	0.885	0.636	-	0.844	-	0.893
Lights and Motorcycles	24	6	101	0	131	-	132	293	16	0	441	-	10	7	3	0	20	-	5	304	28	0	337	-	929
% Lights and Motorcycles	100%	100%	100%	0%	100%	-	99.2%	98.3%	100%	0%	98.7%	-	100%	100%	100%	0%	100%	-	100%	98.7%	100%	0%	98.8%	-	98.9%
Heavy	0	0	0	0	0	-	1	5	0	0	6	-	0	0	0	0	0	-	0	4	0	0	4	-	10
% Heavy	0%	0%	0%	0%	0%	-	0.8%	1.7%	0%	0%	1.3%	-	0%	0%	0%	0%	0%	-	0%	1.3%	0%	0%	1.2%	-	1.1%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

PM Peak (WKND) (1:30 PM - 2:30 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Warhill Trl

Total: 299

In: 131 Out: 168

24
6
101

[W] Longhill Rd

Total: 666
In: 341 Out: 325

28

308

5

133

298

16

Out: 419 In: 447

Total: 866

[E] Longhill Rd

Out: 27 In: 20
Total: 47

[S] Longhill Gate Rd

3
7
10

2-Centerville Rd & Opportunity War (VA25-002... - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275069, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345, Jacksonville Beach, FL, 32250, US

Leg Direction	Shopping Center Ent Southbound						Centerville Rd Westbound						Opportunity Way Northbound						Centerville Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 7:00AM	3	44	0	0	47	0	0	44	207	0	251	2	125	19	20	0	164	0	44	80	12	0	136	0	598
7:15AM	7	6	2	0	15	0	2	47	56	0	105	0	105	10	17	0	132	0	8	106	17	0	131	0	383
7:30AM	6	2	1	0	9	0	2	64	24	0	90	0	39	10	5	0	54	0	8	105	12	0	125	0	278
7:45AM	2	3	2	0	7	0	3	81	27	0	111	0	10	4	0	0	14	0	1	120	9	0	130	0	262
Hourly Total	18	55	5	0	78	0	7	236	314	0	557	2	279	43	42	0	364	0	61	411	50	0	522	0	1521
8:00AM	1	1	2	0	4	0	1	70	32	1	104	0	14	6	2	0	22	0	2	127	18	0	147	0	277
8:15AM	4	2	1	0	7	0	0	82	32	0	114	0	16	4	3	0	23	0	5	110	21	0	136	0	280
8:30AM	6	2	4	0	12	0	3	77	37	1	118	0	17	4	2	0	23	0	5	104	10	0	119	0	272
8:45AM	7	2	5	0	14	0	2	76	65	0	143	0	31	7	3	0	41	0	4	93	21	0	118	0	316
Hourly Total	18	7	12	0	37	0	6	305	166	2	479	0	78	21	10	0	109	0	16	434	70	0	520	0	1145
4:00PM	16	5	1	0	22	0	8	126	60	3	197	13	66	14	2	0	82	0	6	88	24	0	118	0	419
4:15PM	12	6	15	0	33	0	2	131	52	2	187	5	45	5	6	0	56	0	6	99	18	0	123	0	399
4:30PM	21	10	11	0	42	0	7	141	61	1	210	8	79	19	9	0	107	0	11	98	35	0	144	0	503
4:45PM	19	8	7	0	34	0	6	149	63	0	218	6	66	7	4	0	77	0	7	103	19	0	129	0	458
Hourly Total	68	29	34	0	131	0	23	547	236	6	812	32	256	45	21	0	322	0	30	388	96	0	514	0	1779
5:00PM	13	8	14	0	35	0	6	161	76	3	246	7	87	8	9	0	104	0	11	88	18	0	117	0	502
5:15PM	16	9	10	0	35	0	3	151	78	5	237	5	54	8	5	0	67	0	10	89	20	0	119	0	458
5:30PM	16	5	7	0	28	0	5	137	48	3	193	3	47	11	5	0	63	0	5	82	29	0	116	0	400
5:45PM	19	7	9	0	35	0	6	137	76	0	219	0	52	12	7	0	71	0	9	87	13	0	109	0	434
Hourly Total	64	29	40	0	133	0	20	586	278	11	895	15	240	39	26	0	305	0	35	346	80	0	461	0	1794
Total	168	120	91	0	379	0	56	1674	994	19	2743	49	853	148	99	0	1100	0	142	1579	296	0	2017	0	6239
% Approach	44.3%	31.7%	24.0%	0%	-	-	2.0%	61.0%	36.2%	0.7%	-	-	77.5%	13.5%	9.0%	0%	-	-	7.0%	78.3%	14.7%	0%	-	-	-
% Total	2.7%	1.9%	1.5%	0%	6.1%	-	0.9%	26.8%	15.9%	0.3%	44.0%	-	13.7%	2.4%	1.6%	0%	17.6%	-	2.3%	25.3%	4.7%	0%	32.3%	-	-
Lights and Motorcycles	166	120	87	0	373	-	53	1619	977	19	2668	-	826	147	91	0	1064	-	129	1526	295	0	1950	-	6055
% Lights and Motorcycles	98.8%	100%	95.6%	0%	98.4%	-	94.6%	96.7%	98.3%	100%	97.3%	-	96.8%	99.3%	91.9%	0%	96.7%	-	90.8%	96.6%	99.7%	0%	96.7%	-	97.1%
Heavy	2	0	4	0	6	-	3	55	17	0	75	-	27	1	8	0	36	-	13	53	1	0	67	-	184
% Heavy	1.2%	0%	4.4%	0%	1.6%	-	5.4%	3.3%	1.7%	0%	2.7%	-	3.2%	0.7%	8.1%	0%	3.3%	-	9.2%	3.4%	0.3%	0%	3.3%	-	2.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	47	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	95.9%	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	4.1%	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Centerville Rd & Opportunity War (VA25-002... - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275069, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Shopping Center Ent

Total: 879

In: 379 Out: 500

168
120
91

[W] Centerville Rd
Total: 3958
In: 2017 Out: 1941

296
1579
142

Out: 2542 In: 2743
Total: 5285
[E] Centerville Rd

18
56
1674
994
19

31

99
148
853

Out: 1256 In: 1100
Total: 2356

[S] Opportunity Way

2-Centerville Rd & Opportunity War (VA25-002... - TMC

Thu Mar 6, 2025

AM Peak (7 AM - 8 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275069, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345,

Jacksonville Beach, FL, 32250, US

Leg Direction	Shopping Center Ent Southbound						Centerville Rd Westbound						Opportunity Way Northbound						Centerville Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 7:00AM	3	44	0	0	47	0	0	44	207	0	251	2	125	19	20	0	164	0	44	80	12	0	136	0	598
7:15AM	7	6	2	0	15	0	2	47	56	0	105	0	105	10	17	0	132	0	8	106	17	0	131	0	383
7:30AM	6	2	1	0	9	0	2	64	24	0	90	0	39	10	5	0	54	0	8	105	12	0	125	0	278
7:45AM	2	3	2	0	7	0	3	81	27	0	111	0	10	4	0	0	14	0	1	120	9	0	130	0	262
Total	18	55	5	0	78	0	7	236	314	0	557	2	279	43	42	0	364	0	61	411	50	0	522	0	1521
% Approach	23.1%	70.5%	6.4%	0%	-	-	1.3%	42.4%	56.4%	0%	-	-	76.6%	11.8%	11.5%	0%	-	-	11.7%	78.7%	9.6%	0%	-	-	-
% Total	1.2%	3.6%	0.3%	0%	5.1%	-	0.5%	15.5%	20.6%	0%	36.6%	-	18.3%	2.8%	2.8%	0%	23.9%	-	4.0%	27.0%	3.3%	0%	34.3%	-	-
PHF	0.643	0.313	0.625	-	0.415	-	0.583	0.728	0.379	-	0.555	-	0.558	0.566	0.525	-	0.555	-	0.347	0.856	0.735	-	0.960	-	0.636
Lights and Motorcycles	17	55	5	0	77	-	6	220	312	0	538	-	260	42	36	0	338	-	59	396	50	0	505	-	1458
% Lights and Motorcycles	94.4%	100%	100%	0%	98.7%	-	85.7%	93.2%	99.4%	0%	96.6%	-	93.2%	97.7%	85.7%	0%	92.9%	-	96.7%	96.4%	100%	0%	96.7%	-	95.9%
Heavy	1	0	0	0	1	-	1	16	2	0	19	-	19	1	6	0	26	-	2	15	0	0	17	-	63
% Heavy	5.6%	0%	0%	0%	1.3%	-	14.3%	6.8%	0.6%	0%	3.4%	-	6.8%	2.3%	14.3%	0%	7.1%	-	3.3%	3.6%	0%	0%	3.3%	-	4.1%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Centerville Rd & Opportunity War (VA25-002... - TMC

Thu Mar 6, 2025

AM Peak (7 AM - 8 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275069, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

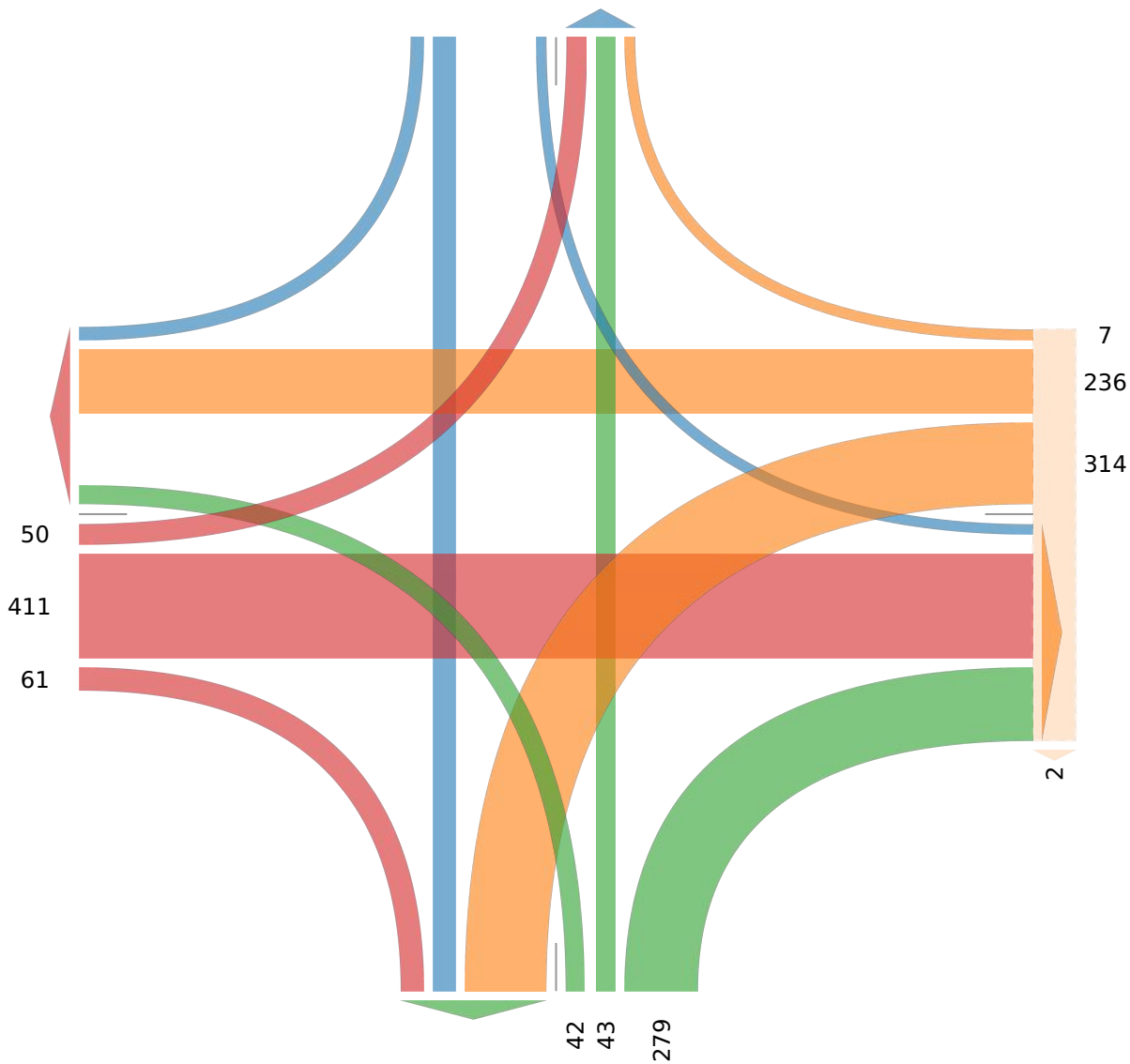
[N] Shopping Center Ent

Total: 178
In: 78 Out: 100

18 55 5

[W] Centerville Rd

Total: 818
In: 522 Out: 296



Out: 430 In: 364
Total: 794
[S] Opportunity Way

2-Centerville Rd & Opportunity War (VA25-002... - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275069, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Shopping Center Ent Southbound						Centerville Rd Westbound						Opportunity Way Northbound						Centerville Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 4:30PM	21	10	11	0	42	0	7	141	61	1	210	8	79	19	9	0	107	0	11	98	35	0	144	0	503
4:45PM	19	8	7	0	34	0	6	149	63	0	218	6	66	7	4	0	77	0	7	103	19	0	129	0	458
5:00PM	13	8	14	0	35	0	6	161	76	3	246	7	87	8	9	0	104	0	11	88	18	0	117	0	502
5:15PM	16	9	10	0	35	0	3	151	78	5	237	5	54	8	5	0	67	0	10	89	20	0	119	0	458
Total	69	35	42	0	146	0	22	602	278	9	911	26	286	42	27	0	355	0	39	378	92	0	509	0	1921
% Approach	47.3%	24.0%	28.8%	0%	-	-	2.4%	66.1%	30.5%	1.0%	-	-	80.6%	11.8%	7.6%	0%	-	-	7.7%	74.3%	18.1%	0%	-	-	-
% Total	3.6%	1.8%	2.2%	0%	7.6%	-	1.1%	31.3%	14.5%	0.5%	47.4%	-	14.9%	2.2%	1.4%	0%	18.5%	-	2.0%	19.7%	4.8%	0%	26.5%	-	-
PHF	0.821	0.875	0.750	-	0.869	-	0.786	0.935	0.891	0.450	0.926	-	0.822	0.553	0.750	-	0.829	-	0.886	0.917	0.657	-	0.884	-	0.955
Lights and Motorcycles	69	35	40	0	144	-	21	596	273	9	899	-	283	42	26	0	351	-	30	368	92	0	490	-	1884
% Lights and Motorcycles	100%	100%	95.2%	0%	98.6%	-	95.5%	99.0%	98.2%	100%	98.7%	-	99.0%	100%	96.3%	0%	98.9%	-	76.9%	97.4%	100%	0%	96.3%	-	98.1%
Heavy	0	0	2	0	2	-	1	6	5	0	12	-	3	0	1	0	4	-	9	10	0	0	19	-	37
% Heavy	0%	0%	4.8%	0%	1.4%	-	4.5%	1.0%	1.8%	0%	1.3%	-	1.0%	0%	3.7%	0%	1.1%	-	23.1%	2.6%	0%	0%	3.7%	-	1.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	26	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Centerville Rd & Opportunity War (VA25-002... - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275069, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

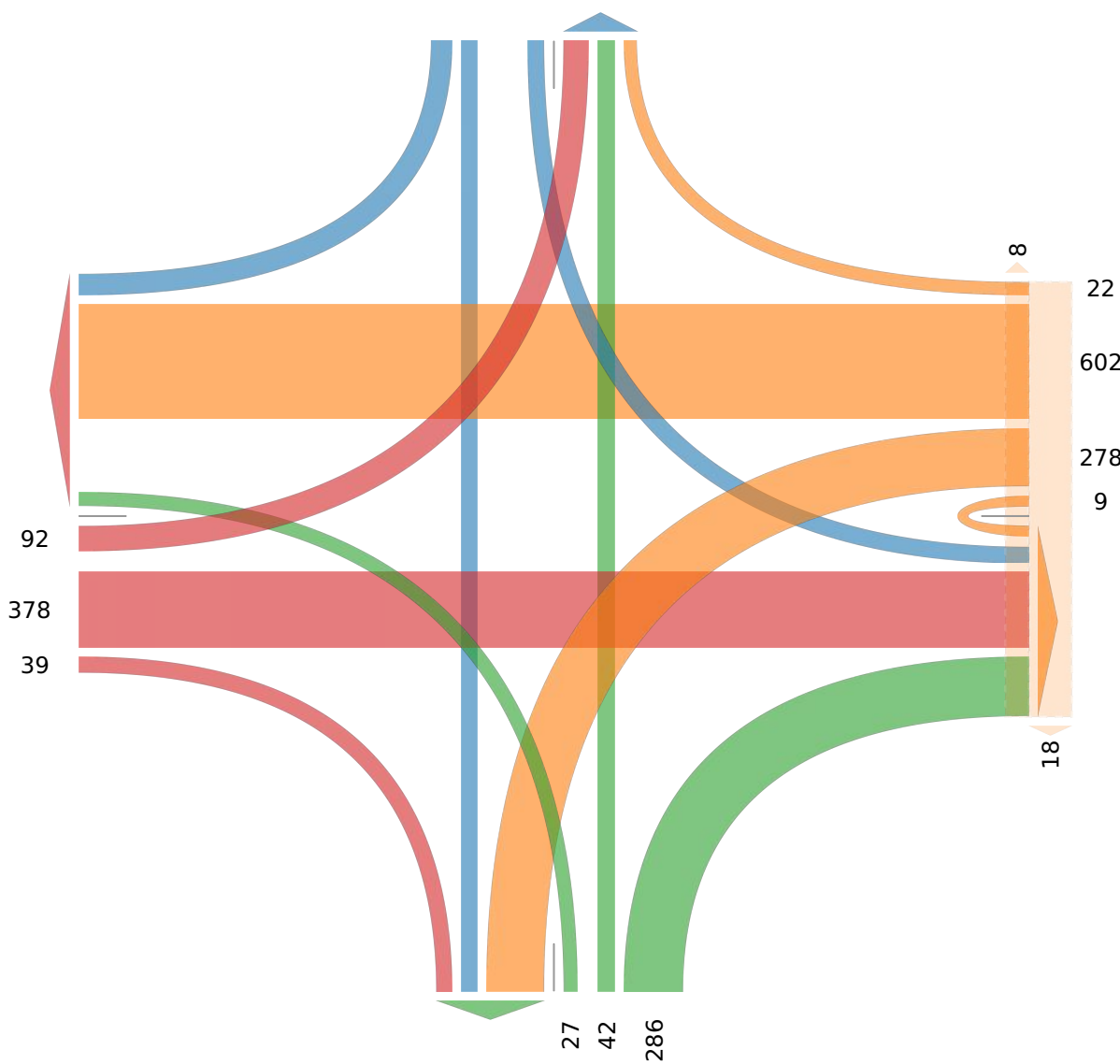
[N] Shopping Center Ent

Total: 302

In: 146 Out: 156

69 35 42

[W] Centerville Rd
Total: 1207
In: 509 Out: 698



[E] Centerville Rd
Total: 1626
In: 911 Out: 715

[S] Opportunity Way
Total: 707
In: 355 Out: 352

2-Centerville Rd & Opportunity Way-SAT (VA25... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Shopping Center Ent Southbound						Centerville Rd Westbound						Opportunity Way Northbound						Centerville Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 10:00AM	11	8	5	0	24	0	4	84	33	6	127	0	28	8	1	0	37	0	1	83	21	0	105	0	293
10:15AM	6	0	4	0	10	0	5	65	31	6	107	0	29	8	3	0	40	0	2	87	19	0	108	0	265
10:30AM	8	3	9	0	20	0	6	73	52	4	135	0	75	22	3	0	100	0	4	79	23	0	106	0	361
10:45AM	15	4	10	0	29	0	2	85	63	6	156	0	42	6	8	0	56	0	9	100	14	0	123	0	364
Hourly Total	40	15	28	0	83	0	17	307	179	22	525	0	174	44	15	0	233	0	16	349	77	0	442	0	1283
11:00AM	6	3	8	0	17	0	4	97	57	2	160	0	39	8	13	0	60	0	3	117	26	0	146	0	383
11:15AM	13	3	7	0	23	0	1	82	46	3	132	0	44	13	4	0	61	0	2	133	25	0	160	0	376
11:30AM	17	3	10	0	30	0	4	87	28	6	125	0	36	11	1	0	48	0	3	97	23	1	124	0	327
11:45AM	14	2	8	0	24	0	2	103	34	3	142	0	61	12	2	0	75	0	7	95	13	0	115	0	356
Hourly Total	50	11	33	0	94	0	11	369	165	14	559	0	180	44	20	0	244	0	15	442	87	1	545	0	1442
12:00PM	9	6	9	0	24	0	1	94	29	7	131	0	96	33	5	0	134	0	2	108	33	0	143	0	432
12:15PM	11	12	12	0	35	0	1	105	46	6	158	0	46	17	2	0	65	0	3	105	36	0	144	0	402
12:30PM	8	10	11	0	29	0	3	106	62	6	177	0	34	15	0	0	49	0	3	90	22	0	115	0	370
12:45PM	14	8	5	0	27	0	6	116	71	4	197	0	62	16	3	0	81	0	3	107	32	0	142	0	447
Hourly Total	42	36	37	0	115	0	11	421	208	23	663	0	238	81	10	0	329	0	11	410	123	0	544	0	1651
1:00PM	14	7	3	0	24	0	2	93	30	2	127	0	30	9	2	0	41	0	5	96	21	0	122	0	314
1:15PM	14	3	13	0	30	0	3	133	27	4	167	0	35	14	0	0	49	0	0	80	28	1	109	0	355
1:30PM	9	4	8	0	21	0	2	148	28	8	186	0	96	12	4	0	112	0	8	112	20	0	140	0	459
1:45PM	23	5	4	0	32	0	6	127	38	3	174	0	23	9	4	0	36	0	1	87	22	0	110	0	352
Hourly Total	60	19	28	0	107	0	13	501	123	17	654	0	184	44	10	0	238	0	14	375	91	1	481	0	1480
2:00PM	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Hourly Total	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	192	81	126	0	399	0	52	1599	675	76	2402	0	776	213	55	0	1044	0	56	1576	378	2	2012	0	5857
% Approach	48.1%	20.3%	31.6%	0%	-	-	2.2%	66.6%	28.1%	3.2%	-	-	74.3%	20.4%	5.3%	0%	-	-	2.8%	78.3%	18.8%	0.1%	-	-	-
% Total	3.3%	1.4%	2.2%	0%	6.8%	-	0.9%	27.3%	11.5%	1.3%	41.0%	-	13.2%	3.6%	0.9%	0%	17.8%	-	1.0%	26.9%	6.5%	0%	34.4%	-	-
Lights and Motorcycles	192	81	125	0	398	-	52	1580	666	76	2374	-	773	213	54	0	1040	-	56	1557	378	2	1993	-	5805
% Lights and Motorcycles	100%	100%	99.2%	0%	99.7%	-	100%	98.8%	98.7%	100%	98.8%	-	99.6%	100%	98.2%	0%	99.6%	-	100%	98.8%	100%	100%	99.1%	-	99.1%
Heavy	0	0	1	0	1	-	0	19	9	0	28	-	3	0	1	0	4	-	0	19	0	0	19	-	52
% Heavy	0%	0%	0.8%	0%	0.3%	-	0%	1.2%	1.3%	0%	1.2%	-	0.4%	0%	1.8%	0%	0.4%	-	0%	1.2%	0%	0%	0.9%	-	0.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Centerville Rd & Opportunity War-SAT (VA25... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Shopping Center Ent

Total: 1042

In: 399 Out: 643

192

81

126

[W] Centerville Rd

Total: 3860

In: 2012

Out: 1848

2

378

1576

56

52

1599

675

76

In: 2402

Total: 4956

Out: 2554

[E] Centerville Rd

Out: 812 In: 1044

Total: 1856

[S] Opportunity Way

55

213

776

2-Centerville Rd & Opportunity War-SAT (VA25... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Shopping Center Ent Southbound						Centerville Rd Westbound						Opportunity Way Northbound						Centerville Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 10:00AM	11	8	5	0	24	0	4	84	33	6	127	0	28	8	1	0	37	0	1	83	21	0	105	0	293
10:15AM	6	0	4	0	10	0	5	65	31	6	107	0	29	8	3	0	40	0	2	87	19	0	108	0	265
10:30AM	8	3	9	0	20	0	6	73	52	4	135	0	75	22	3	0	100	0	4	79	23	0	106	0	361
10:45AM	15	4	10	0	29	0	2	85	63	6	156	0	42	6	8	0	56	0	9	100	14	0	123	0	364
Total	40	15	28	0	83	0	17	307	179	22	525	0	174	44	15	0	233	0	16	349	77	0	442	0	1283
% Approach	48.2%	18.1%	33.7%	0%	-	-	3.2%	58.5%	34.1%	4.2%	-	-	74.7%	18.9%	6.4%	0%	-	-	3.6%	79.0%	17.4%	0%	-	-	-
% Total	3.1%	1.2%	2.2%	0%	6.5%	-	1.3%	23.9%	14.0%	1.7%	40.9%	-	13.6%	3.4%	1.2%	0%	18.2%	-	1.2%	27.2%	6.0%	0%	34.5%	-	-
PHF	0.667	0.469	0.700	-	0.716	-	0.708	0.903	0.710	0.917	0.841	-	0.580	0.500	0.469	-	0.583	-	0.444	0.873	0.837	-	0.898	-	0.881
Lights and Motorcycles	40	15	27	0	82	-	17	302	178	22	519	-	173	44	15	0	232	-	16	346	77	0	439	-	1272
% Lights and Motorcycles	100%	100%	96.4%	0%	98.8%	-	100%	98.4%	99.4%	100%	98.9%	-	99.4%	100%	100%	0%	99.6%	-	100%	99.1%	100%	0%	99.3%	-	99.1%
Heavy	0	0	1	0	1	-	0	5	1	0	6	-	1	0	0	0	1	-	0	3	0	0	3	-	11
% Heavy	0%	0%	3.6%	0%	1.2%	-	0%	1.6%	0.6%	0%	1.1%	-	0.6%	0%	0%	0%	0.4%	-	0%	0.9%	0%	0%	0.7%	-	0.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Centerville Rd & Opportunity War-SAT (VA25... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Shopping Center Ent

Total: 221

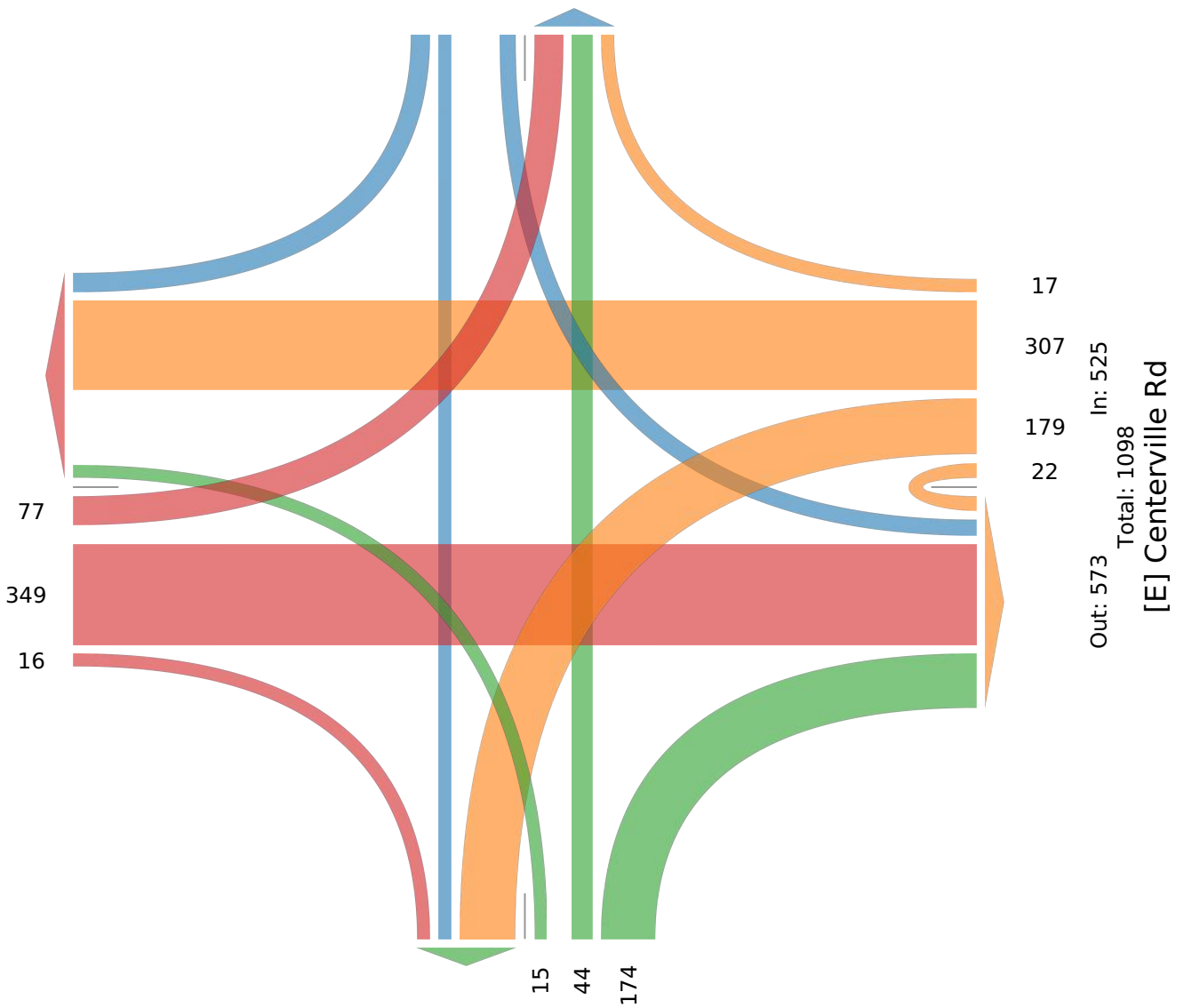
In: 83 Out: 138

40 15 28

[W] Centerville Rd

Total: 804

In: 442 Out: 362



2-Centerville Rd & Opportunity War-SAT (VA25... - TMC

Sat Mar 8, 2025

Midday Peak (WKND) (12 PM - 1 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345,

Jacksonville Beach, FL, 32250, US

Leg Direction	Shopping Center Ent Southbound						Centerville Rd Westbound						Opportunity Way Northbound						Centerville Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 12:00PM	9	6	9	0	24	0	1	94	29	7	131	0	96	33	5	0	134	0	2	108	33	0	143	0	432
12:15PM	11	12	12	0	35	0	1	105	46	6	158	0	46	17	2	0	65	0	3	105	36	0	144	0	402
12:30PM	8	10	11	0	29	0	3	106	62	6	177	0	34	15	0	0	49	0	3	90	22	0	115	0	370
12:45PM	14	8	5	0	27	0	6	116	71	4	197	0	62	16	3	0	81	0	3	107	32	0	142	0	447
Total	42	36	37	0	115	0	11	421	208	23	663	0	238	81	10	0	329	0	11	410	123	0	544	0	1651
% Approach	36.5%	31.3%	32.2%	0%	-	-	1.7%	63.5%	31.4%	3.5%	-	-	72.3%	24.6%	3.0%	0%	-	-	2.0%	75.4%	22.6%	0%	-	-	-
% Total	2.5%	2.2%	2.2%	0%	7.0%	-	0.7%	25.5%	12.6%	1.4%	40.2%	-	14.4%	4.9%	0.6%	0%	19.9%	-	0.7%	24.8%	7.5%	0%	32.9%	-	-
PHF	0.750	0.750	0.771	-	0.821	-	0.458	0.907	0.732	0.821	0.841	-	0.620	0.614	0.500	-	0.614	-	0.917	0.949	0.854	-	0.944	-	0.923
Lights and Motorcycles	42	36	37	0	115	-	11	416	204	23	654	-	237	81	9	0	327	-	11	407	123	0	541	-	1637
% Lights and Motorcycles	100%	100%	100%	0%	100%	-	100%	98.8%	98.1%	100%	98.6%	-	99.6%	100%	90.0%	0%	99.4%	-	100%	99.3%	100%	0%	99.4%	-	99.2%
Heavy	0	0	0	0	0	-	0	5	4	0	9	-	1	0	1	0	2	-	0	3	0	0	3	-	14
% Heavy	0%	0%	0%	0%	0%	-	0%	1.2%	1.9%	0%	1.4%	-	0.4%	0%	10.0%	0%	0.6%	-	0%	0.7%	0%	0%	0.6%	-	0.8%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Centerville Rd & Opportunity War-SAT (VA25... - TMC

Sat Mar 8, 2025

Midday Peak (WKND) (12 PM - 1 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Shopping Center Ent

Total: 330

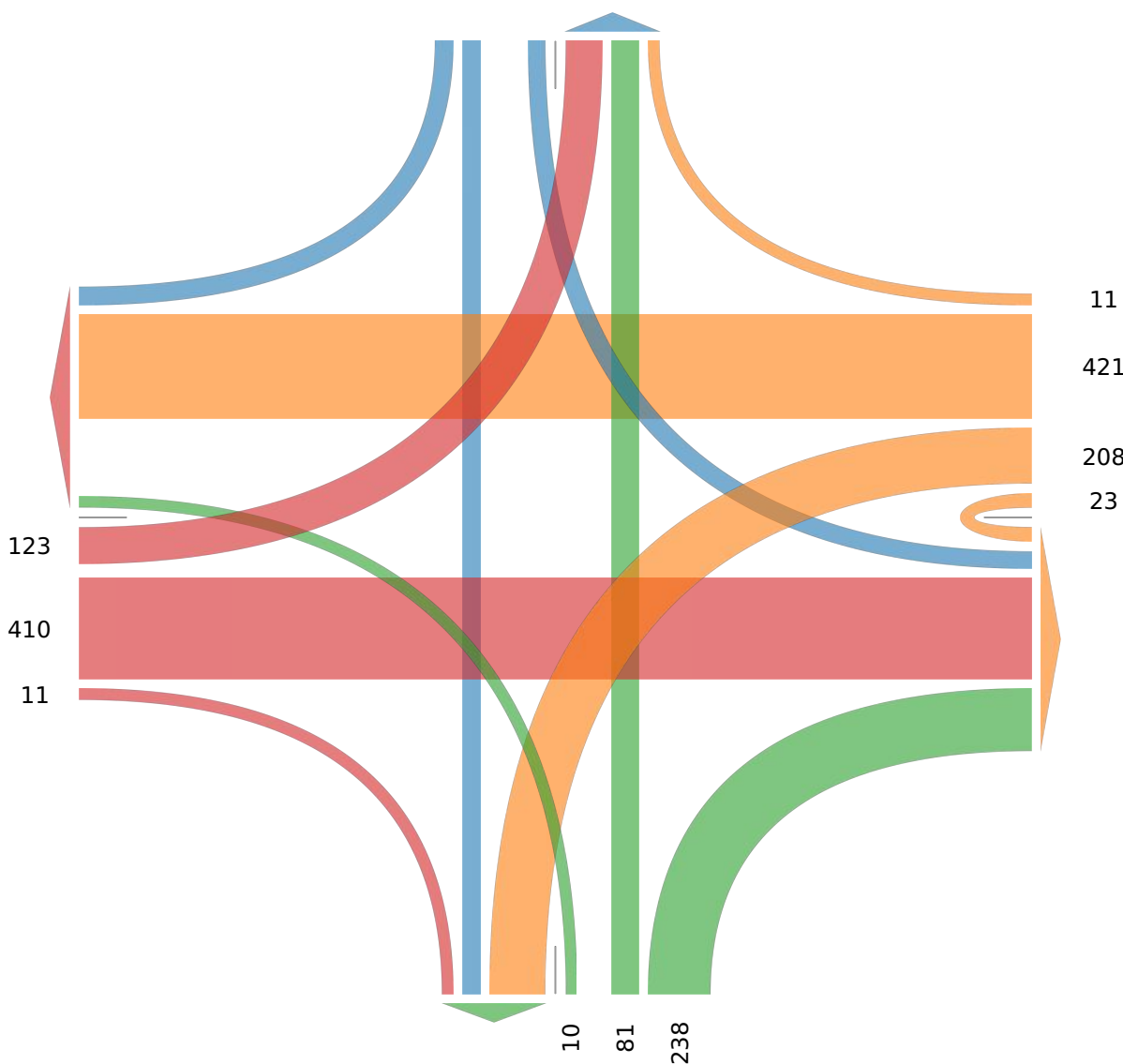
In: 115 Out: 215

42 36 37

[W] Centerville Rd

Total: 1017

In: 544 Out: 473



Out: 708 In: 663

Total: 1371

[E] Centerville Rd

Out: 255 In: 329
Total: 584
[S] Opportunity Way

2-Centerville Rd & Opportunity War-SAT (VA25... - TMC

Sat Mar 8, 2025

PM Peak (WKND) (1 PM - 2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Shopping Center Ent Southbound							Centerville Rd Westbound							Opportunity Way Northbound							Centerville Rd Eastbound							
Time	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		Int
2025-03-08 1:00PM	14	7	3	0	24	0		2	93	30	2	127	0		30	9	2	0	41	0		5	96	21	0	122	0		314
1:15PM	14	3	13	0	30	0		3	133	27	4	167	0		35	14	0	0	49	0		0	80	28	1	109	0		355
1:30PM	9	4	8	0	21	0		2	148	28	8	186	0		96	12	4	0	112	0		8	112	20	0	140	0		459
1:45PM	23	5	4	0	32	0		6	127	38	3	174	0		23	9	4	0	36	0		1	87	22	0	110	0		352
Total	60	19	28	0	107	0		13	501	123	17	654	0		184	44	10	0	238	0		14	375	91	1	481	0		1480
% Approach	56.1%	17.8%	26.2%	0%	-	-		2.0%	76.6%	18.8%	2.6%	-	-		77.3%	18.5%	4.2%	0%	-	-		2.9%	78.0%	18.9%	0.2%	-	-		-
% Total	4.1%	1.3%	1.9%	0%	7.2%	-		0.9%	33.9%	8.3%	1.1%	44.2%	-		12.4%	3.0%	0.7%	0%	16.1%	-		0.9%	25.3%	6.1%	0.1%	32.5%	-		-
PHF	0.652	0.679	0.538	-	0.836	-		0.542	0.846	0.809	0.531	0.879	-		0.479	0.786	0.625	-	0.531	-		0.438	0.837	0.813	0.250	0.859	-		0.806
Lights and Motorcycles	60	19	28	0	107	-		13	496	122	17	648	-		184	44	10	0	238	-		14	368	91	1	474	-		1467
% Lights and Motorcycles	100%	100%	100%	0%	100%	-		100%	99.0%	99.2%	100%	99.1%	-		100%	100%	100%	0%	100%	-		100%	98.1%	100%	100%	98.5%	-		99.1%
Heavy	0	0	0	0	0	-		0	5	1	0	6	-		0	0	0	0	0	-		0	7	0	0	7	-		13
% Heavy	0%	0%	0%	0%	0%	-		0%	1.0%	0.8%	0%	0.9%	-		0%	0%	0%	0%	0%	-		0%	1.9%	0%	0%	1.5%	-		0.9%
Pedestrians	-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	-		0
% Pedestrians	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-
Bicycles on Crosswalk	-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	-		0
% Bicycles on Crosswalk	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Centerville Rd & Opportunity War-SAT (VA25... - TMC

Sat Mar 8, 2025

PM Peak (WKND) (1 PM - 2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

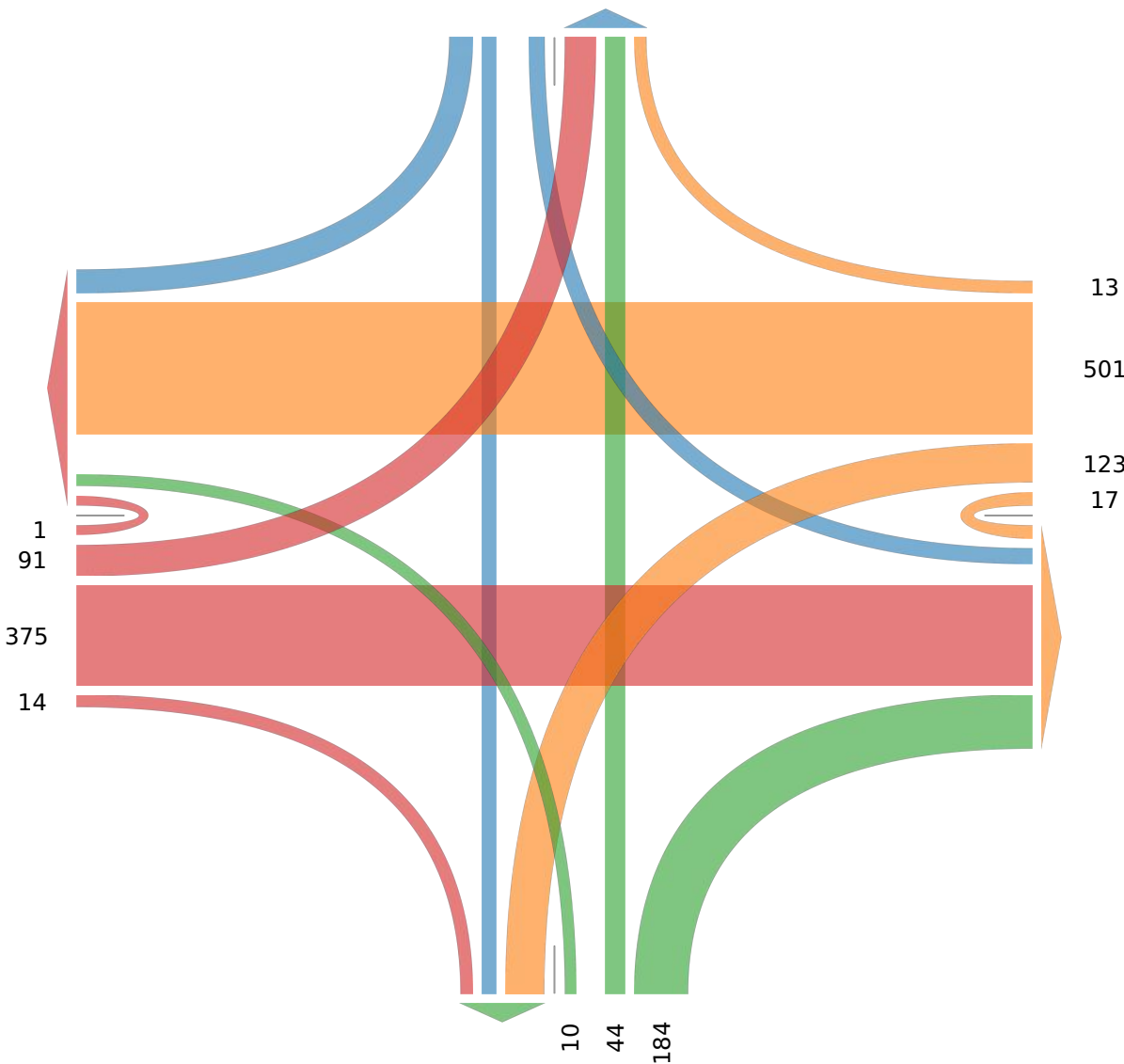
[N] Shopping Center Ent

Total: 255

In: 107 Out: 148

60 19 28

[W] Centerville Rd
Total: 1053
In: 481 Out: 572



[E] Centerville Rd
Total: 1258
In: 654 Out: 604

[S] Opportunity Way
Total: 394
In: 238 Out: 156

3-Richmond Rd & Centerville Rd (VA25-0027) - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275070, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345, Jacksonville Beach, FL, 32250, US

Leg Direction	Business Driveway Southbound						Richmond Rd Westbound						Centerville Rd Northbound						Richmond Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 7:00AM	4	2	3	0	9	0	4	73	72	0	149	0	82	6	94	0	182	0	170	125	4	0	299	0	639
7:15AM	1	0	7	0	8	0	3	92	50	1	146	0	130	5	99	0	234	0	36	129	6	0	171	0	559
7:30AM	2	3	8	0	13	0	5	101	37	0	143	0	80	5	60	0	145	0	48	154	6	0	208	0	509
7:45AM	0	0	6	0	6	0	3	129	74	0	206	0	79	2	47	0	128	0	50	161	5	0	216	0	556
Hourly Total	7	5	24	0	36	0	15	395	233	1	644	0	371	18	300	0	689	0	304	569	21	0	894	0	2263
8:00AM	2	0	4	0	6	1	2	82	44	0	128	0	77	6	63	0	146	0	67	185	7	2	261	0	541
8:15AM	5	1	7	0	13	0	0	121	49	0	170	0	77	4	50	0	131	0	56	162	5	0	223	0	537
8:30AM	2	1	6	0	9	0	3	109	53	0	165	0	67	5	52	0	124	0	58	160	6	0	224	0	522
8:45AM	8	2	8	0	18	0	6	93	71	0	170	0	60	8	53	0	121	0	77	155	9	0	241	0	550
Hourly Total	17	4	25	0	46	1	11	405	217	0	633	0	281	23	218	0	522	0	258	662	27	2	949	0	2150
4:00PM	6	3	12	0	21	0	6	174	106	0	286	0	84	4	66	0	154	0	89	176	5	0	270	0	731
4:15PM	6	5	5	0	16	0	11	194	116	0	321	0	72	6	84	0	162	0	83	178	2	0	263	0	762
4:30PM	6	5	4	0	15	0	9	195	135	0	339	0	83	1	75	0	159	0	81	199	4	0	284	0	797
4:45PM	5	7	6	0	18	0	7	186	117	0	310	0	83	7	91	0	181	0	84	176	6	0	266	0	775
Hourly Total	23	20	27	0	70	0	33	749	474	0	1256	0	322	18	316	0	656	0	337	729	17	0	1083	0	3065
5:00PM	4	10	10	0	24	0	6	231	141	1	379	0	103	2	81	1	187	0	89	177	2	0	268	0	858
5:15PM	4	9	7	0	20	0	8	198	139	0	345	0	86	8	69	0	163	0	89	193	4	0	286	0	814
5:30PM	4	5	4	0	13	0	4	169	108	0	281	0	72	1	68	0	141	0	71	157	3	2	233	0	668
5:45PM	2	7	3	0	12	0	4	174	128	0	306	0	82	3	56	0	141	0	78	145	4	1	228	0	687
Hourly Total	14	31	24	0	69	0	22	772	516	1	1311	0	343	14	274	1	632	0	327	672	13	3	1015	0	3027
6:00PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1
Total	61	60	100	0	221	1	81	2321	1440	2	3844	0	1317	73	1108	1	2499	0	1227	2632	78	5	3942	0	10506
% Approach	27.6%	27.1%	45.2%	0%	-	-	2.1%	60.4%	37.5%	0.1%	-	-	52.7%	2.9%	44.3%	0%	-	-	31.1%	66.8%	2.0%	0.1%	-	-	-
% Total	0.6%	0.6%	1.0%	0%	2.1%	-	0.8%	22.1%	13.7%	0%	36.6%	-	12.5%	0.7%	10.5%	0%	23.8%	-	11.7%	25.1%	0.7%	0%	37.5%	-	-
Lights and Motorcycles	59	60	100	0	219	-	80	2267	1399	1	3747	-	1275	72	1067	1	2415	-	1186	2570	76	5	3837	-	10218
% Lights and Motorcycles	96.7%	100%	100%	0%	99.1%	-	98.8%	97.7%	97.2%	50.0%	97.5%	-	96.8%	98.6%	96.3%	100%	96.6%	-	96.7%	97.6%	97.4%	100%	97.3%	-	97.3%
Heavy	2	0	0	0	2	-	1	54	41	1	97	-	42	1	41	0	84	-	41	62	2	0	105	-	288
% Heavy	3.3%	0%	0%	0%	0.9%	-	1.2%	2.3%	2.8%	50.0%	2.5%	-	3.2%	1.4%	3.7%	0%	3.4%	-	3.3%	2.4%	2.6%	0%	2.7%	-	2.7%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3-Richmond Rd & Centerville Rd (VA25-0027) - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275070, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Business Driveway

Total: 453

In: 221 Out: 232

61 60 100

1

[W] Richmond Rd
Total: 7437
In: 3942 Out: 3495

578

2632

1227

81

2321

1440

2

Out: 4051 In: 3844

Total: 7895

[E] Richmond Rd

1

1108

73

1317

Out: 2728

In: 2499

Total: 5227

[S] Centerville Rd

3-Richmond Rd & Centerville Rd (VA25-0027) - TMC

Thu Mar 6, 2025

AM Peak (7 AM - 8 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275070, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Business Driveway Southbound						Richmond Rd Westbound						Centerville Rd Northbound						Richmond Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 7:00AM	4	2	3	0	9	0	4	73	72	0	149	0	82	6	94	0	182	0	170	125	4	0	299	0	639
7:15AM	1	0	7	0	8	0	3	92	50	1	146	0	130	5	99	0	234	0	36	129	6	0	171	0	559
7:30AM	2	3	8	0	13	0	5	101	37	0	143	0	80	5	60	0	145	0	48	154	6	0	208	0	509
7:45AM	0	0	6	0	6	0	3	129	74	0	206	0	79	2	47	0	128	0	50	161	5	0	216	0	556
Total	7	5	24	0	36	0	15	395	233	1	644	0	371	18	300	0	689	0	304	569	21	0	894	0	2263
% Approach	19.4%	13.9%	66.7%	0%	-	-	2.3%	61.3%	36.2%	0.2%	-	-	53.8%	2.6%	43.5%	0%	-	-	34.0%	63.6%	2.3%	0%	-	-	-
% Total	0.3%	0.2%	1.1%	0%	1.6%	-	0.7%	17.5%	10.3%	0%	28.5%	-	16.4%	0.8%	13.3%	0%	30.4%	-	13.4%	25.1%	0.9%	0%	39.5%	-	-
PHF	0.438	0.417	0.750	-	0.692	-	0.750	0.766	0.787	0.250	0.782	-	0.713	0.750	0.758	-	0.736	-	0.447	0.884	0.875	-	0.747	-	0.885
Lights and Motorcycles	6	5	24	0	35	-	15	385	222	1	623	-	360	17	277	0	654	-	295	542	21	0	858	-	2170
% Lights and Motorcycles	85.7%	100%	100%	0%	97.2%	-	100%	97.5%	95.3%	100%	96.7%	-	97.0%	94.4%	92.3%	0%	94.9%	-	97.0%	95.3%	100%	0%	96.0%	-	95.9%
Heavy	1	0	0	0	1	-	0	10	11	0	21	-	11	1	23	0	35	-	9	27	0	0	36	-	93
% Heavy	14.3%	0%	0%	0%	2.8%	-	0%	2.5%	4.7%	0%	3.3%	-	3.0%	5.6%	7.7%	0%	5.1%	-	3.0%	4.7%	0%	0%	4.0%	-	4.1%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3-Richmond Rd & Centerville Rd (VA25-0027) - TMC

Thu Mar 6, 2025

AM Peak (7 AM - 8 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275070, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Business Driveway

Total: 90

In: 36 Out: 54

7 5 24

[W] Richmond Rd

Total: 1596

In: 894 Out: 702

21
569
304

15
395
233
1

Out: 965 In: 644

Total: 1609

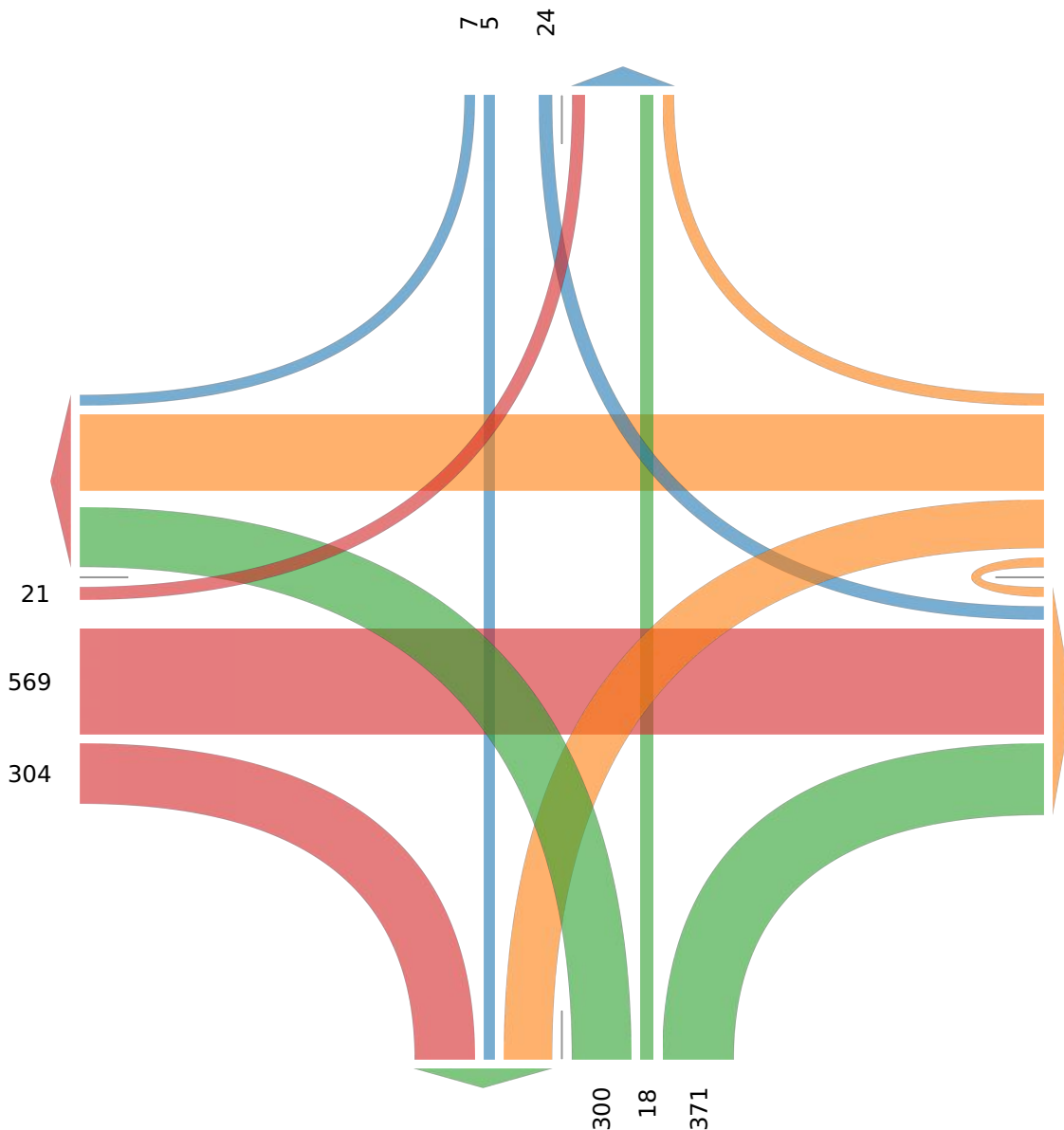
[E] Richmond Rd

Out: 542 In: 689

Total: 1231

[S] Centerville Rd

300
18
371



3-Richmond Rd & Centerville Rd (VA25-0027) - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275070, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Business Driveway Southbound						Richmond Rd Westbound						Centerville Rd Northbound						Richmond Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 4:30PM	6	5	4	0	15	0	9	195	135	0	339	0	83	1	75	0	159	0	81	199	4	0	284	0	797
4:45PM	5	7	6	0	18	0	7	186	117	0	310	0	83	7	91	0	181	0	84	176	6	0	266	0	775
5:00PM	4	10	10	0	24	0	6	231	141	1	379	0	103	2	81	1	187	0	89	177	2	0	268	0	858
5:15PM	4	9	7	0	20	0	8	198	139	0	345	0	86	8	69	0	163	0	89	193	4	0	286	0	814
Total	19	31	27	0	77	0	30	810	532	1	1373	0	355	18	316	1	690	0	343	745	16	0	1104	0	3244
% Approach	24.7%	40.3%	35.1%	0%	-	-	2.2%	59.0%	38.7%	0.1%	-	-	51.4%	2.6%	45.8%	0.1%	-	-	31.1%	67.5%	1.4%	0%	-	-	-
% Total	0.6%	1.0%	0.8%	0%	2.4%	-	0.9%	25.0%	16.4%	0%	42.3%	-	10.9%	0.6%	9.7%	0%	21.3%	-	10.6%	23.0%	0.5%	0%	34.0%	-	-
PHF	0.792	0.775	0.675	-	0.802	-	0.833	0.877	0.943	0.250	0.906	-	0.862	0.563	0.868	0.250	0.922	-	0.963	0.936	0.667	-	0.965	-	0.945
Lights and Motorcycles	18	31	27	0	76	-	30	798	523	0	1351	-	346	18	312	1	677	-	341	733	15	0	1089	-	3193
% Lights and Motorcycles	94.7%	100%	100%	0%	98.7%	-	100%	98.5%	98.3%	0%	98.4%	-	97.5%	100%	98.7%	100%	98.1%	-	99.4%	98.4%	93.8%	0%	98.6%	-	98.4%
Heavy	1	0	0	0	1	-	0	12	9	1	22	-	9	0	4	0	13	-	2	12	1	0	15	-	51
% Heavy	5.3%	0%	0%	0%	1.3%	-	0%	1.5%	1.7%	100%	1.6%	-	2.5%	0%	1.3%	0%	1.9%	-	0.6%	1.6%	6.3%	0%	1.4%	-	1.6%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3-Richmond Rd & Centerville Rd (VA25-0027) - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275070, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Business Driveway

Total: 141

In: 77 Out: 64

19
31

27

[W] Richmond Rd

Total: 2249

In: 1104 Out: 1145

16

745

343

30

810

532

1

Out: 1128 In: 1373

Total: 2501

[E] Richmond Rd

1

316

18

355

Out: 907

In: 690

Total: 1597

[S] Centerville Rd

3-Richmond Rd & Centerville Rd-SAT (VA25-002... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275075, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345, Jacksonville Beach, FL, 32250, US

Leg Direction	Business Driveway Southbound						Richmond Rd Westbound						Centerville Rd Northbound						Richmond Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 10:00AM	3	5	5	0	13	0	6	133	75	0	214	0	67	4	54	0	125	0	42	151	7	0	200	0	552
10:15AM	4	3	8	0	15	0	9	122	70	1	202	0	74	7	47	0	128	0	46	153	6	0	205	0	550
10:30AM	7	5	8	0	20	0	8	131	89	0	228	0	86	6	61	0	153	1	45	191	5	0	241	0	642
10:45AM	9	3	12	0	24	0	6	140	83	2	231	0	97	3	69	0	169	0	64	202	3	0	269	0	693
Hourly Total	23	16	33	0	72	0	29	526	317	3	875	0	324	20	231	0	575	1	197	697	21	0	915	0	2437
11:00AM	4	6	6	0	16	0	6	134	92	0	232	0	84	8	71	0	163	0	64	184	8	1	257	0	668
11:15AM	7	4	4	0	15	1	4	128	74	3	209	0	118	8	65	0	191	0	67	207	5	3	282	0	697
11:30AM	14	4	6	0	24	0	5	162	76	0	243	0	80	8	57	0	145	0	52	232	4	2	290	0	702
11:45AM	7	6	11	0	24	0	12	155	46	1	214	0	89	8	71	0	168	0	49	322	6	2	379	0	785
Hourly Total	32	20	27	0	79	1	27	579	288	4	898	0	371	32	264	0	667	0	232	945	23	8	1208	0	2852
12:00PM	7	7	13	0	27	0	12	148	71	0	231	0	135	8	82	2	227	0	59	282	6	6	353	0	838
12:15PM	7	5	5	0	17	0	6	164	63	0	233	0	96	8	74	0	178	0	62	336	7	1	406	0	834
12:30PM	4	5	6	0	15	0	6	170	79	0	255	0	67	9	62	0	138	0	72	322	7	6	407	0	815
12:45PM	6	3	10	0	19	0	7	174	90	1	272	0	76	4	91	0	171	0	82	321	7	1	411	0	873
Hourly Total	24	20	34	0	78	0	31	656	303	1	991	0	374	29	309	2	714	0	275	1261	27	14	1577	0	3360
1:00PM	5	0	9	0	14	0	7	207	91	0	305	0	55	5	63	0	123	0	55	347	9	7	418	0	860
1:15PM	5	6	6	0	17	1	12	162	78	1	253	0	78	2	50	0	130	0	63	365	12	2	442	0	842
1:30PM	11	7	8	0	26	0	15	182	102	2	301	0	128	10	73	0	211	0	53	302	2	4	361	0	899
1:45PM	9	7	9	0	25	0	10	181	97	1	289	0	66	5	59	0	130	0	63	375	9	1	448	0	892
Hourly Total	30	20	32	0	82	1	44	732	368	4	1148	0	327	22	245	0	594	0	234	1389	32	14	1669	0	3493
2:00PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	109	76	126	0	311	2	131	2493	1276	12	3912	0	1396	103	1049	2	2550	1	938	4292	103	36	5369	0	12142
% Approach	35.0%	24.4%	40.5%	0%	-	-	3.3%	63.7%	32.6%	0.3%	-	-	54.7%	4.0%	41.1%	0.1%	-	-	17.5%	79.9%	1.9%	0.7%	-	-	-
% Total	0.9%	0.6%	1.0%	0%	2.6%	-	1.1%	20.5%	10.5%	0.1%	32.2%	-	11.5%	0.8%	8.6%	0%	21.0%	-	7.7%	35.3%	0.8%	0.3%	44.2%	-	-
Lights and Motorcycles	109	76	126	0	311	-	131	2472	1257	12	3872	-	1383	103	1037	2	2525	-	934	4261	103	36	5334	-	12042
% Lights and Motorcycles	100%	100%	100%	0%	100%	-	100%	99.2%	98.5%	100%	99.0%	-	99.1%	100%	98.9%	100%	99.0%	-	99.6%	99.3%	100%	100%	99.3%	-	99.2%
Heavy	0	0	0	0	0	-	0	21	19	0	40	-	13	0	12	0	25	-	4	31	0	0	35	-	100
% Heavy	0%	0%	0%	0%	0%	-	0%	0.8%	1.5%	0%	1.0%	-	0.9%	0%	1.1%	0%	1.0%	-	0.4%	0.7%	0%	0%	0.7%	-	0.8%
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	50.0%	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	50.0%	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Thru, U: U-Turn

3-Richmond Rd & Centerville Rd-SAT (VA25-002... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275075, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Business Driveway

Total: 648

In: 311 Out: 337

109
76

126

1

1

[W] Richmond Rd

Total: 9056
In: 5369 Out: 3687

36
103

4292

938

131

2493

1276

12

Out: 5826 In: 3912

Total: 9738

[E] Richmond Rd

1

2

1049

103

1396

Out: 2292 In: 2550

Total: 4842

[S] Centerville Rd

3-Richmond Rd & Centerville Rd-SAT (VA25-002... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275075, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Business Driveway Southbound						Richmond Rd Westbound						Centerville Rd Northbound						Richmond Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 10:00AM	3	5	5	0	13	0	6	133	75	0	214	0	67	4	54	0	125	0	42	151	7	0	200	0	552
10:15AM	4	3	8	0	15	0	9	122	70	1	202	0	74	7	47	0	128	0	46	153	6	0	205	0	550
10:30AM	7	5	8	0	20	0	8	131	89	0	228	0	86	6	61	0	153	1	45	191	5	0	241	0	642
10:45AM	9	3	12	0	24	0	6	140	83	2	231	0	97	3	69	0	169	0	64	202	3	0	269	0	693
Total	23	16	33	0	72	0	29	526	317	3	875	0	324	20	231	0	575	1	197	697	21	0	915	0	2437
% Approach	31.9%	22.2%	45.8%	0%	-	-	3.3%	60.1%	36.2%	0.3%	-	-	56.3%	3.5%	40.2%	0%	-	-	21.5%	76.2%	2.3%	0%	-	-	-
% Total	0.9%	0.7%	1.4%	0%	3.0%	-	1.2%	21.6%	13.0%	0.1%	35.9%	-	13.3%	0.8%	9.5%	0%	23.6%	-	8.1%	28.6%	0.9%	0%	37.5%	-	-
PHF	0.639	0.800	0.688	-	0.750	-	0.806	0.939	0.890	0.375	0.947	-	0.835	0.714	0.837	-	0.851	-	0.770	0.863	0.750	-	0.850	-	0.879
Lights and Motorcycles	23	16	33	0	72	-	29	517	311	3	860	-	321	20	228	0	569	-	197	689	21	0	907	-	2408
% Lights and Motorcycles	100%	100%	100%	0%	100%	-	100%	98.3%	98.1%	100%	98.3%	-	99.1%	100%	98.7%	0%	99.0%	-	100%	98.9%	100%	0%	99.1%	-	98.8%
Heavy	0	0	0	0	0	-	0	9	6	0	15	-	3	0	3	0	6	-	0	8	0	0	8	-	29
% Heavy	0%	0%	0%	0%	0%	-	0%	1.7%	1.9%	0%	1.7%	-	0.9%	0%	1.3%	0%	1.0%	-	0%	1.1%	0%	0%	0.9%	-	1.2%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3-Richmond Rd & Centerville Rd-SAT (VA25-002... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275075, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Business Driveway

Total: 142

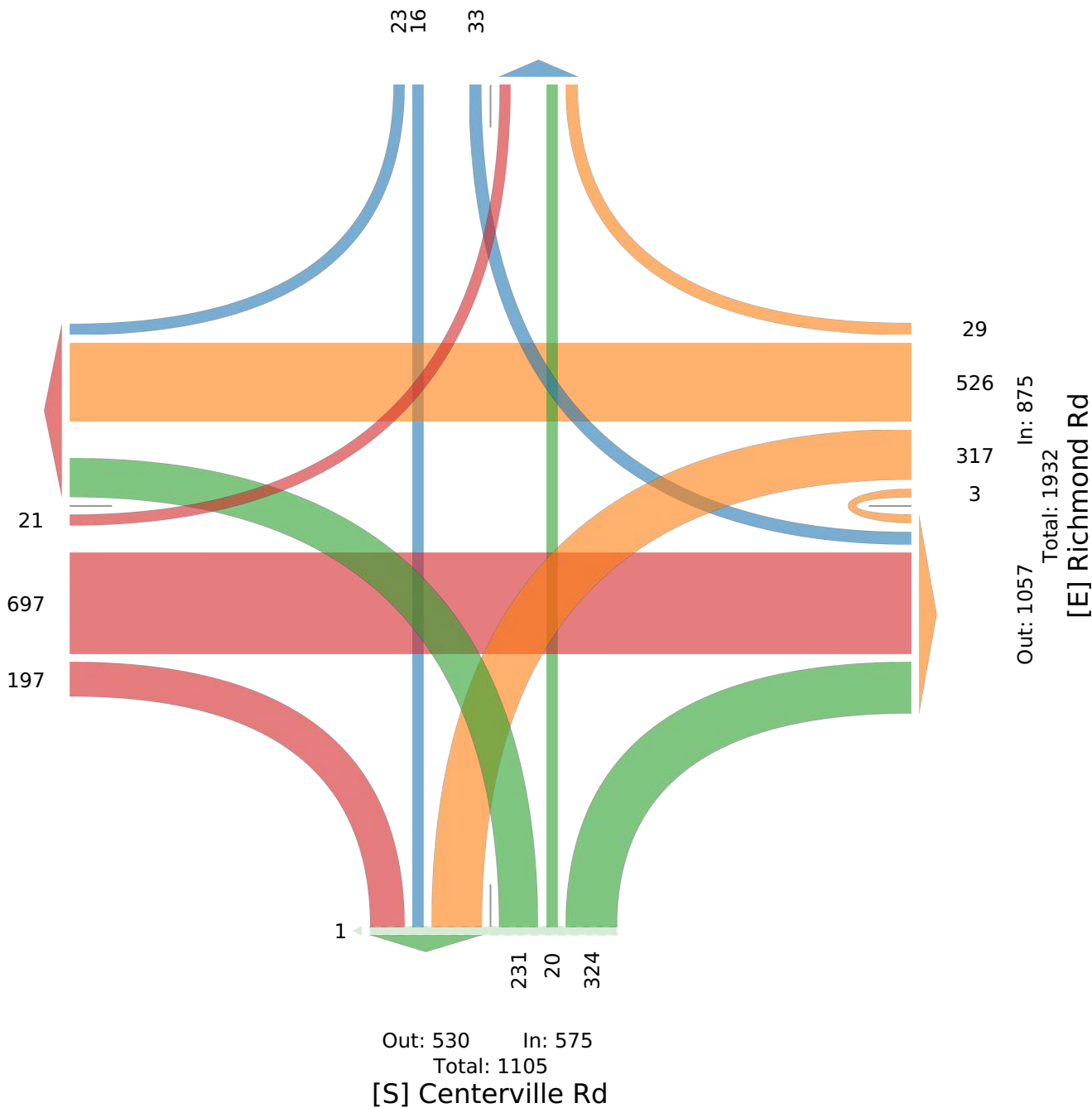
In: 72 Out: 70

23 16 33

[W] Richmond Rd

Total: 1695

In: 915 Out: 780



3-Richmond Rd & Centerville Rd-SAT (VA25-002... - TMC

Sat Mar 8, 2025

Midday Peak (WKND), PM Peak (WKND) (1 PM - 2 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on

Crosswalk)

All Movements

ID: 1275075, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345,

Jacksonville Beach, FL, 32250, US

Leg Direction	Business Driveway Southbound							Richmond Rd Westbound							Centerville Rd Northbound							Richmond Rd Eastbound							
Time	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		Int
2025-03-08 1:00PM	5	0	9	0	14	0		7	207	91	0	305	0		55	5	63	0	123	0		55	347	9	7	418	0		860
1:15PM	5	6	6	0	17	1		12	162	78	1	253	0		78	2	50	0	130	0		63	365	12	2	442	0		842
1:30PM	11	7	8	0	26	0		15	182	102	2	301	0		128	10	73	0	211	0		53	302	2	4	361	0		899
1:45PM	9	7	9	0	25	0		10	181	97	1	289	0		66	5	59	0	130	0		63	375	9	1	448	0		892
Total	30	20	32	0	82	1		44	732	368	4	1148	0		327	22	245	0	594	0		234	1389	32	14	1669	0		3493
% Approach	36.6%	24.4%	39.0%	0%	-	-		3.8%	63.8%	32.1%	0.3%	-	-		55.1%	3.7%	41.2%	0%	-	-		14.0%	83.2%	1.9%	0.8%	-	-		-
% Total	0.9%	0.6%	0.9%	0%	2.3%	-		1.3%	21.0%	10.5%	0.1%	32.9%	-		9.4%	0.6%	7.0%	0%	17.0%	-		6.7%	39.8%	0.9%	0.4%	47.8%	-		-
PHF	0.682	0.714	0.889	-	0.788	-		0.733	0.884	0.902	0.500	0.941	-		0.639	0.550	0.839	-	0.704	-		0.929	0.926	0.667	0.500	0.931	-		0.971
Lights and Motorcycles	30	20	32	0	82	-		44	727	365	4	1140	-		324	22	240	0	586	-		232	1385	32	14	1663	-		3471
% Lights and Motorcycles	100%	100%	100%	0%	100%	-		100%	99.3%	99.2%	100%	99.3%	-		99.1%	100%	98.0%	0%	98.7%	-		99.1%	99.7%	100%	100%	99.6%	-		99.4%
Heavy	0	0	0	0	0	-		0	5	3	0	8	-		3	0	5	0	8	-		2	4	0	0	6	-		22
% Heavy	0%	0%	0%	0%	0%	-		0%	0.7%	0.8%	0%	0.7%	-		0.9%	0%	2.0%	0%	1.3%	-		0.9%	0.3%	0%	0%	0.4%	-		0.6%
Pedestrians	-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	-		0
% Pedestrians	-	-	-	-	-	0%		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-
Bicycles on Crosswalk	-	-	-	-	-	1		-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	-		0
% Bicycles on Crosswalk	-	-	-	-	-	100%		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3-Richmond Rd & Centerville Rd-SAT (VA25-002... - TMC

Sat Mar 8, 2025

Midday Peak (WKND), PM Peak (WKND) (1 PM - 2 PM) - Overall Peak

Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275075, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Business Driveway

Total: 180
In: 82 Out: 98

30 20 32

1

[W] Richmond Rd

Total: 2690
In: 1669 Out: 1021

14 32

1389

234

44

732

368

4

Out: 1752 In: 1148
Total: 2900

[E] Richmond Rd

245 22 327

Out: 622 In: 594
Total: 1216

[S] Centerville Rd

4-Richmond Rd & Rte 199 SB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275071, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 SB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-06 7:00AM	123	2	0	125	0	11	41	0	52	0	55	140	1	196	0	373
7:15AM	98	3	0	101	0	12	41	0	53	0	83	186	0	269	0	423
7:30AM	93	4	0	97	0	11	34	0	45	0	88	152	0	240	0	382
7:45AM	133	3	0	136	0	19	62	0	81	0	109	158	0	267	0	484
Hourly Total	447	12	0	459	0	53	178	0	231	0	335	636	1	972	0	1662
8:00AM	106	9	2	117	0	13	34	0	47	0	97	166	0	263	0	427
8:15AM	122	9	0	131	0	12	37	0	49	0	107	154	0	261	0	441
8:30AM	130	7	0	137	0	14	38	0	52	0	99	124	1	224	0	413
8:45AM	123	7	0	130	0	21	39	0	60	0	97	134	2	233	0	423
Hourly Total	481	32	2	515	0	60	148	0	208	0	400	578	3	981	0	1704
9:00AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00PM	212	2	0	214	0	37	80	0	117	0	85	165	0	250	0	581
4:15PM	238	5	0	243	0	47	85	0	132	0	82	195	0	277	0	652
4:30PM	231	2	0	233	0	37	97	0	134	0	86	181	0	267	0	634
4:45PM	215	6	0	221	1	47	97	0	144	0	81	194	0	275	0	640
Hourly Total	896	15	0	911	1	168	359	0	527	0	334	735	0	1069	0	2507
5:00PM	260	4	1	265	0	47	106	0	153	0	89	208	0	297	0	715
5:15PM	257	3	0	260	0	35	105	0	140	0	82	228	0	310	0	710
5:30PM	224	1	0	225	0	49	62	0	111	0	81	183	0	264	0	600
5:45PM	206	5	1	212	0	44	99	0	143	0	75	179	0	254	0	609
Hourly Total	947	13	2	962	0	175	372	0	547	0	327	798	0	1125	0	2634
Total	2771	72	4	2847	1	456	1057	0	1513	0	1396	2747	4	4147	0	8507
% Approach	97.3%	2.5%	0.1%	-	-	30.1%	69.9%	0%	-	-	33.7%	66.2%	0.1%	-	-	-
% Total	32.6%	0.8%	0%	33.5%	-	5.4%	12.4%	0%	17.8%	-	16.4%	32.3%	0%	48.7%	-	-
Lights and Motorcycles	2719	71	4	2794	-	434	1024	0	1458	-	1360	2673	4	4037	-	8289
% Lights and Motorcycles	98.1%	98.6%	100%	98.1%	-	95.2%	96.9%	0%	96.4%	-	97.4%	97.3%	100%	97.3%	-	97.4%
Heavy	52	1	0	53	-	22	33	0	55	-	36	74	0	110	-	218
% Heavy	1.9%	1.4%	0%	1.9%	-	4.8%	3.1%	0%	3.6%	-	2.6%	2.7%	0%	2.7%	-	2.6%
Pedestrians	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4-Richmond Rd & Rte 199 SB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

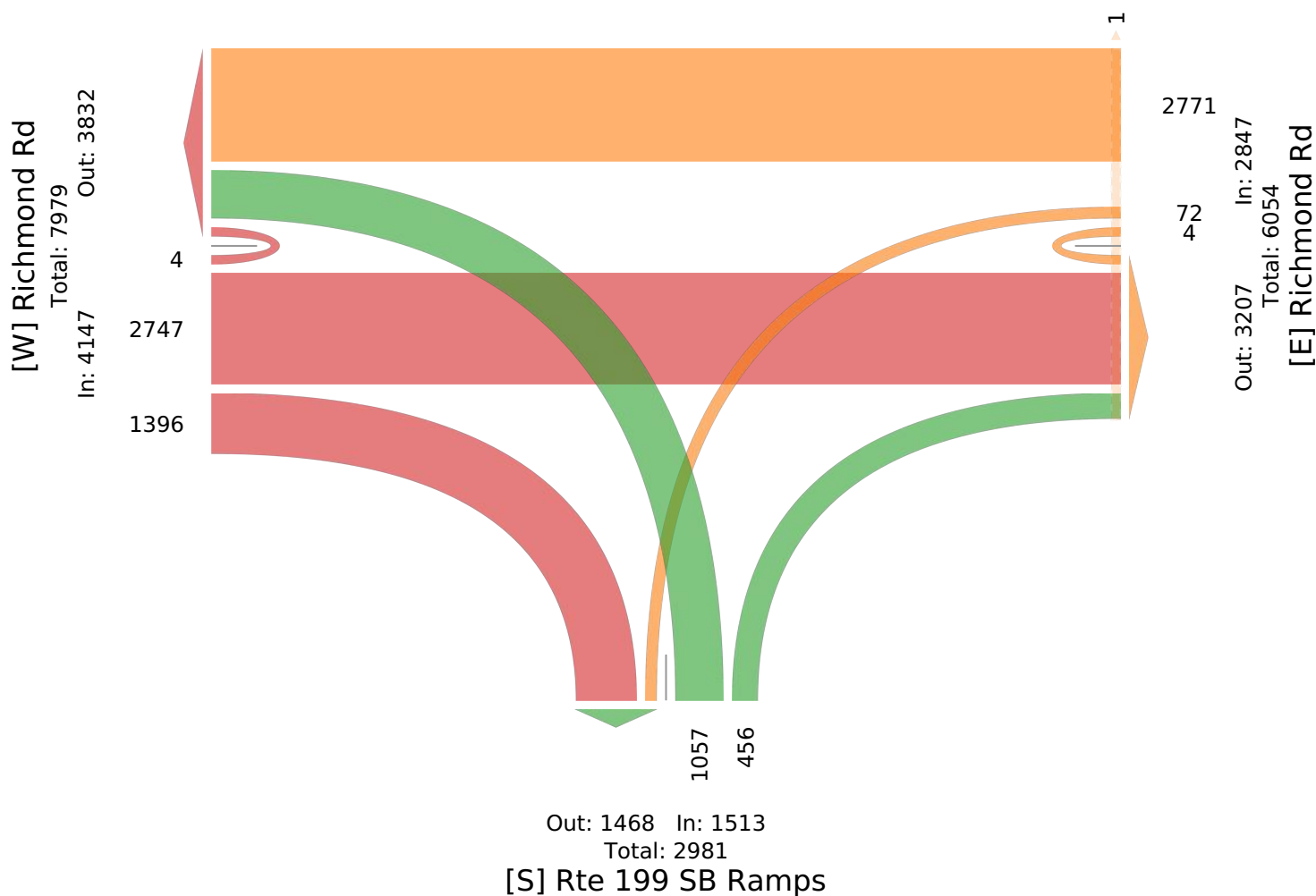
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275071, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



4-Richmond Rd & Rte 199 SB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275071, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 SB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-06 7:45AM	133	3	0	136	0	19	62	0	81	0	109	158	0	267	0	484
8:00AM	106	9	2	117	0	13	34	0	47	0	97	166	0	263	0	427
8:15AM	122	9	0	131	0	12	37	0	49	0	107	154	0	261	0	441
8:30AM	130	7	0	137	0	14	38	0	52	0	99	124	1	224	0	413
Total	491	28	2	521	0	58	171	0	229	0	412	602	1	1015	0	1765
% Approach	94.2%	5.4%	0.4%	-	-	25.3%	74.7%	0%	-	-	40.6%	59.3%	0.1%	-	-	-
% Total	27.8%	1.6%	0.1%	29.5%	-	3.3%	9.7%	0%	13.0%	-	23.3%	34.1%	0.1%	57.5%	-	-
PHF	0.923	0.778	0.250	0.951	-	0.763	0.690	-	0.707	-	0.945	0.907	0.250	0.950	-	0.912
Lights and Motorcycles	472	28	2	502	-	52	160	0	212	-	394	578	1	973	-	1687
% Lights and Motorcycles	96.1%	100%	100%	96.4%	-	89.7%	93.6%	0%	92.6%	-	95.6%	96.0%	100%	95.9%	-	95.6%
Heavy	19	0	0	19	-	6	11	0	17	-	18	24	0	42	-	78
% Heavy	3.9%	0%	0%	3.6%	-	10.3%	6.4%	0%	7.4%	-	4.4%	4.0%	0%	4.1%	-	4.4%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4-Richmond Rd & Rte 199 SB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

AM Peak (7:45 AM - 8:45 AM)

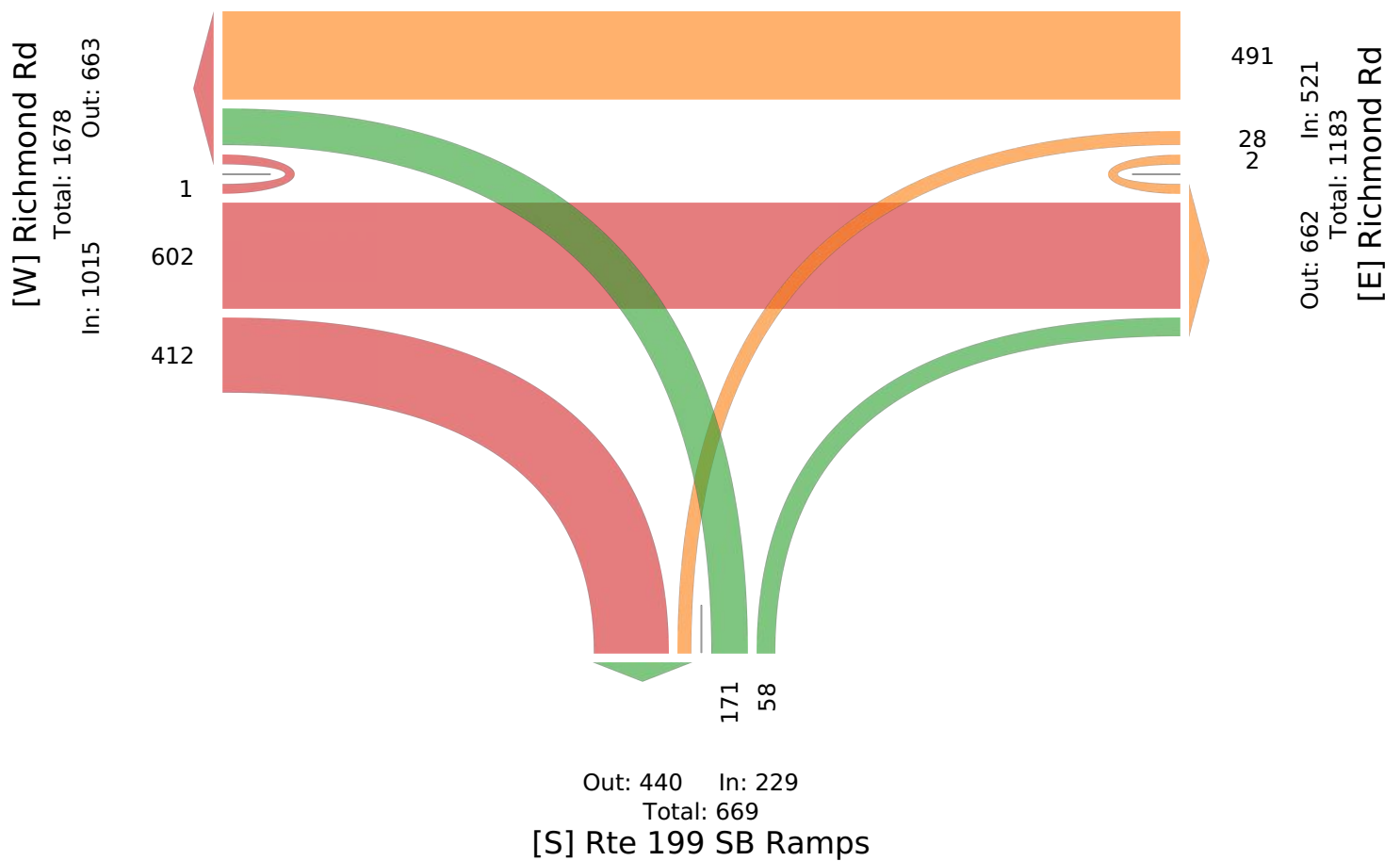
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275071, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



4-Richmond Rd & Rte 199 SB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275071, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 SB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-06 4:30PM	231	2	0	233	0	37	97	0	134	0	86	181	0	267	0	634
4:45PM	215	6	0	221	1	47	97	0	144	0	81	194	0	275	0	640
5:00PM	260	4	1	265	0	47	106	0	153	0	89	208	0	297	0	715
5:15PM	257	3	0	260	0	35	105	0	140	0	82	228	0	310	0	710
Total	963	15	1	979	1	166	405	0	571	0	338	811	0	1149	0	2699
% Approach	98.4%	1.5%	0.1%	-	-	29.1%	70.9%	0%	-	-	29.4%	70.6%	0%	-	-	-
% Total	35.7%	0.6%	0%	36.3%	-	6.2%	15.0%	0%	21.2%	-	12.5%	30.0%	0%	42.6%	-	-
PHF	0.926	0.625	0.250	0.924	-	0.883	0.955	-	0.933	-	0.949	0.889	-	0.927	-	0.944
Lights and Motorcycles	950	14	1	965	-	162	399	0	561	-	336	791	0	1127	-	2653
% Lights and Motorcycles	98.7%	93.3%	100%	98.6%	-	97.6%	98.5%	0%	98.2%	-	99.4%	97.5%	0%	98.1%	-	98.3%
Heavy	13	1	0	14	-	4	6	0	10	-	2	20	0	22	-	46
% Heavy	1.3%	6.7%	0%	1.4%	-	2.4%	1.5%	0%	1.8%	-	0.6%	2.5%	0%	1.9%	-	1.7%
Pedestrians	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4-Richmond Rd & Rte 199 SB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

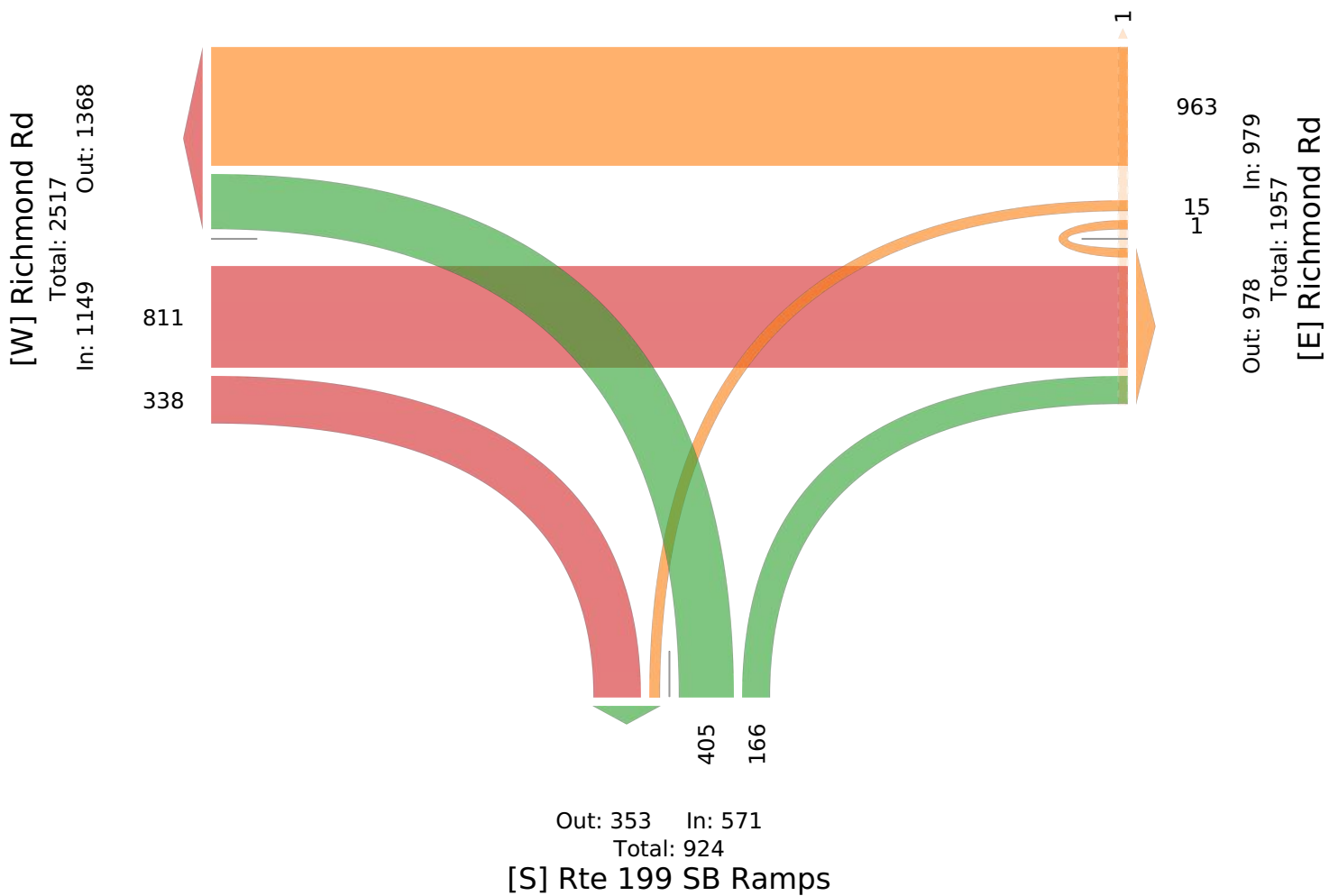
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275071, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



4-Richmond Rd & Rte 199 SB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275076, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 SB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-08 10:00AM	161	7	0	168	0	43	58	0	101	0	72	163	0	235	0	504
10:15AM	141	5	1	147	0	31	62	0	93	0	70	170	0	240	0	480
10:30AM	146	4	0	150	0	54	70	0	124	1	72	194	0	266	0	540
10:45AM	158	6	0	164	0	54	72	0	126	0	91	212	1	304	0	594
Hourly Total	606	22	1	629	0	182	262	0	444	1	305	739	1	1045	0	2118
11:00AM	164	7	0	171	0	37	65	0	102	0	69	215	1	285	0	558
11:15AM	176	5	1	182	0	32	36	0	68	0	95	242	0	337	0	587
11:30AM	199	7	1	207	0	31	51	0	82	0	73	232	0	305	0	594
11:45AM	194	9	0	203	0	43	50	0	93	0	115	288	0	403	0	699
Hourly Total	733	28	2	763	0	143	202	0	345	0	352	977	1	1330	0	2438
12:00PM	193	12	1	206	0	47	53	0	100	0	109	296	3	408	0	714
12:15PM	156	5	0	161	0	37	42	0	79	0	110	292	1	403	0	643
12:30PM	182	7	0	189	0	44	61	0	105	0	108	289	0	397	0	691
12:45PM	188	14	0	202	0	34	67	0	101	0	111	267	2	380	0	683
Hourly Total	719	38	1	758	0	162	223	0	385	0	438	1144	6	1588	0	2731
1:00PM	210	10	1	221	0	43	59	0	102	0	101	273	0	374	0	697
1:15PM	185	11	0	196	0	32	62	0	94	0	100	267	3	370	0	660
1:30PM	220	4	0	224	0	53	70	0	123	0	101	287	0	388	0	735
1:45PM	212	8	0	220	0	59	66	0	125	0	118	273	3	394	0	739
Hourly Total	827	33	1	861	0	187	257	0	444	0	420	1100	6	1526	0	2831
2:00PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2885	121	5	3011	0	674	944	0	1618	1	1515	3960	14	5489	0	10118
% Approach	95.8%	4.0%	0.2%	-	-	41.7%	58.3%	0%	-	-	27.6%	72.1%	0.3%	-	-	-
% Total	28.5%	1.2%	0%	29.8%	-	6.7%	9.3%	0%	16.0%	-	15.0%	39.1%	0.1%	54.2%	-	-
Lights and Motorcycles	2871	120	5	2996	-	666	919	0	1585	-	1506	3926	14	5446	-	10027
% Lights and Motorcycles	99.5%	99.2%	100%	99.5%	-	98.8%	97.4%	0%	98.0%	-	99.4%	99.1%	100%	99.2%	-	99.1%
Heavy	14	1	0	15	-	8	25	0	33	-	9	34	0	43	-	91
% Heavy	0.5%	0.8%	0%	0.5%	-	1.2%	2.6%	0%	2.0%	-	0.6%	0.9%	0%	0.8%	-	0.9%
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4-Richmond Rd & Rte 199 SB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

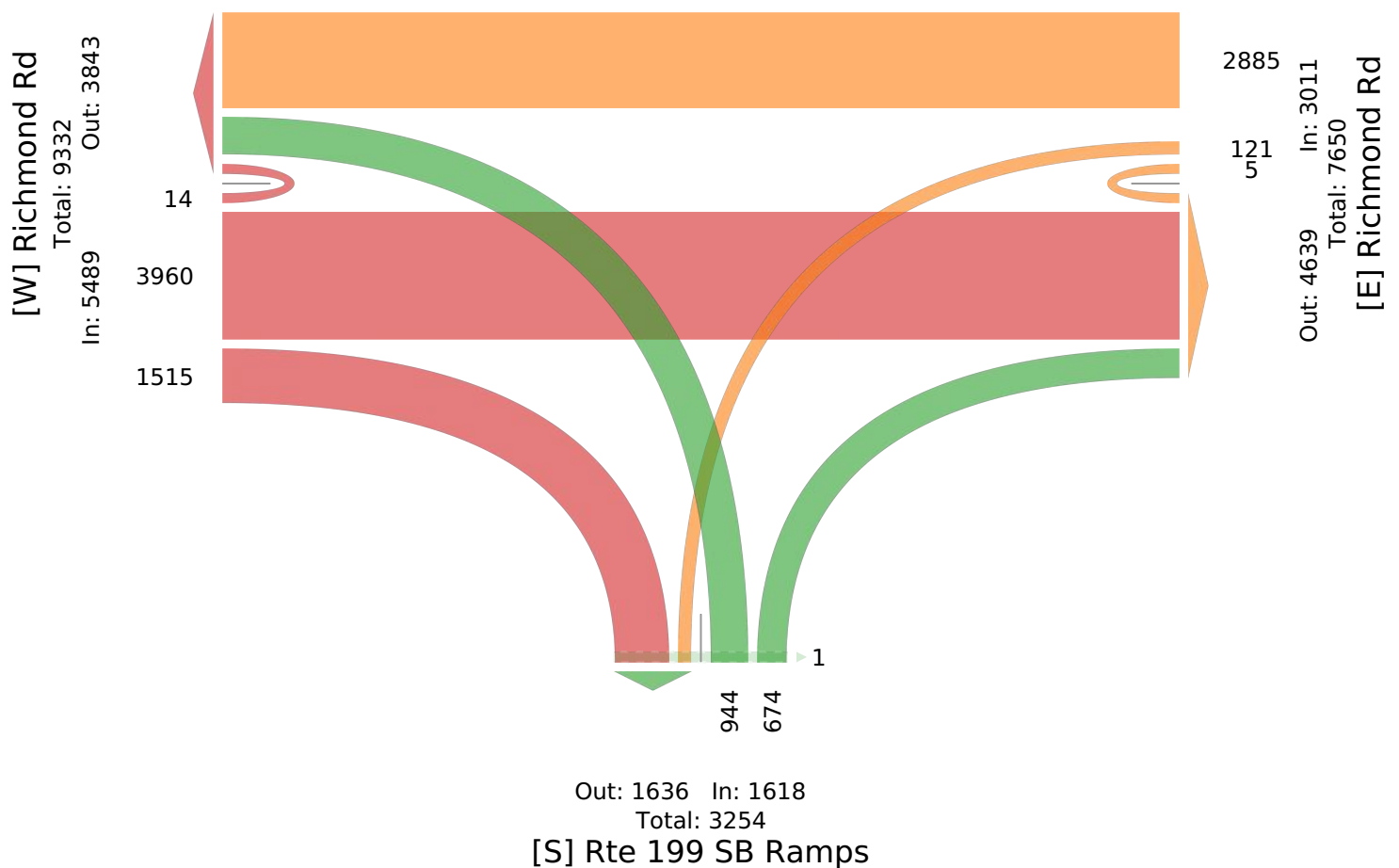
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275076, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



4-Richmond Rd & Rte 199 SB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275076, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 SB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-08 10:00AM	161	7	0	168	0	43	58	0	101	0	72	163	0	235	0	504
10:15AM	141	5	1	147	0	31	62	0	93	0	70	170	0	240	0	480
10:30AM	146	4	0	150	0	54	70	0	124	1	72	194	0	266	0	540
10:45AM	158	6	0	164	0	54	72	0	126	0	91	212	1	304	0	594
Total	606	22	1	629	0	182	262	0	444	1	305	739	1	1045	0	2118
% Approach	96.3%	3.5%	0.2%	-	-	41.0%	59.0%	0%	-	-	29.2%	70.7%	0.1%	-	-	-
% Total	28.6%	1.0%	0%	29.7%	-	8.6%	12.4%	0%	21.0%	-	14.4%	34.9%	0%	49.3%	-	-
PHF	0.941	0.786	0.250	0.936	-	0.843	0.910	-	0.881	-	0.838	0.871	0.250	0.859	-	0.891
Lights and Motorcycles	599	22	1	622	-	180	255	0	435	-	301	734	1	1036	-	2093
% Lights and Motorcycles	98.8%	100%	100%	98.9%	-	98.9%	97.3%	0%	98.0%	-	98.7%	99.3%	100%	99.1%	-	98.8%
Heavy	7	0	0	7	-	2	7	0	9	-	4	5	0	9	-	25
% Heavy	1.2%	0%	0%	1.1%	-	1.1%	2.7%	0%	2.0%	-	1.3%	0.7%	0%	0.9%	-	1.2%
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4-Richmond Rd & Rte 199 SB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

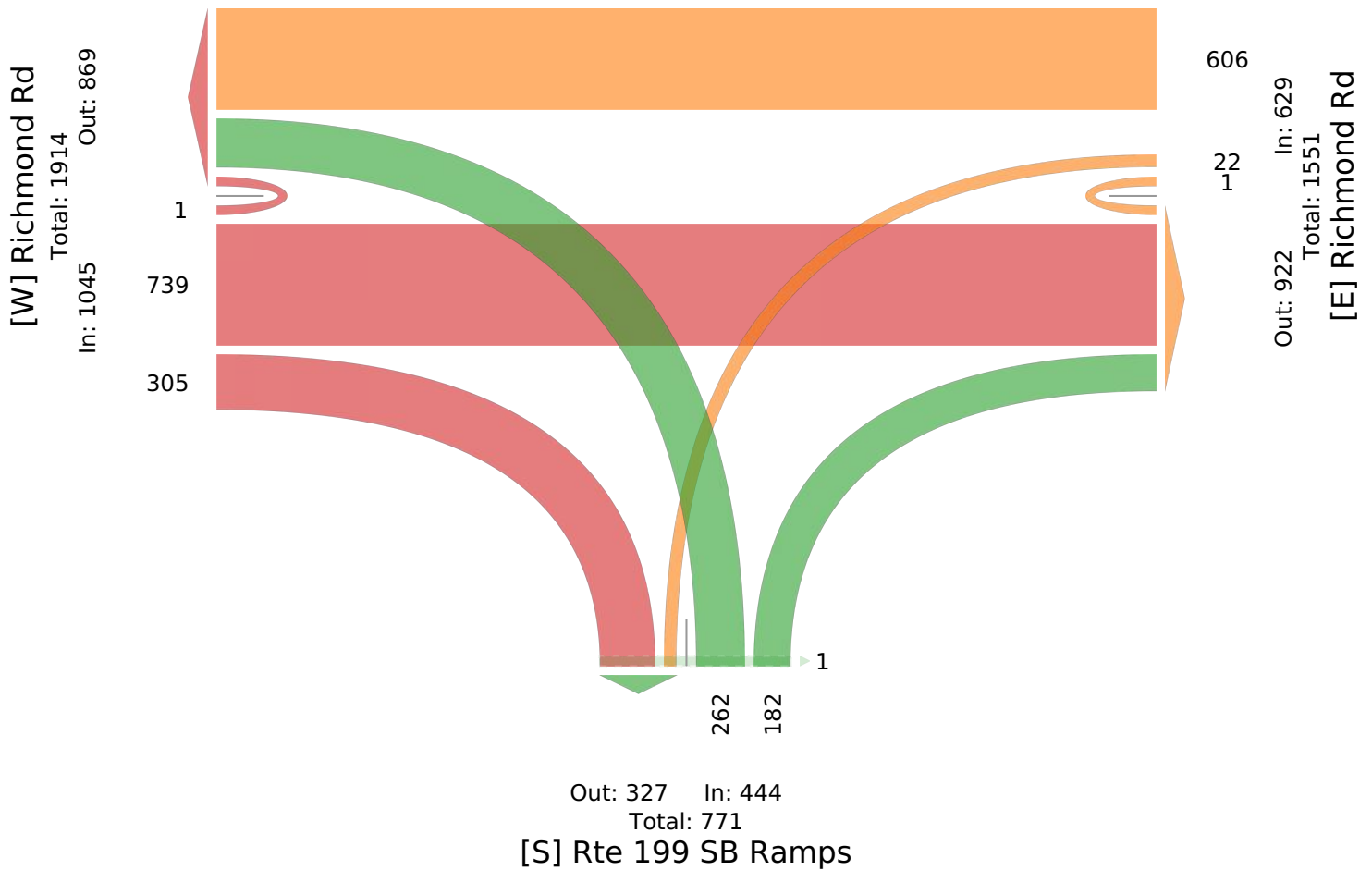
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275076, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



4-Richmond Rd & Rte 199 SB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Midday Peak (WKND), PM Peak (WKND) (1 PM - 2 PM) - Overall Peak

Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275076, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 SB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-08 1:00PM	210	10	1	221	0	43	59	0	102	0	101	273	0	374	0	697
1:15PM	185	11	0	196	0	32	62	0	94	0	100	267	3	370	0	660
1:30PM	220	4	0	224	0	53	70	0	123	0	101	287	0	388	0	735
1:45PM	212	8	0	220	0	59	66	0	125	0	118	273	3	394	0	739
Total	827	33	1	861	0	187	257	0	444	0	420	1100	6	1526	0	2831
% Approach	96.1%	3.8%	0.1%	-	-	42.1%	57.9%	0%	-	-	27.5%	72.1%	0.4%	-	-	-
% Total	29.2%	1.2%	0%	30.4%	-	6.6%	9.1%	0%	15.7%	-	14.8%	38.9%	0.2%	53.9%	-	-
PHF	0.940	0.750	0.250	0.961	-	0.792	0.918	-	0.888	-	0.890	0.958	0.500	0.968	-	0.958
Lights and Motorcycles	824	33	1	858	-	186	251	0	437	-	417	1096	6	1519	-	2814
% Lights and Motorcycles	99.6%	100%	100%	99.7%	-	99.5%	97.7%	0%	98.4%	-	99.3%	99.6%	100%	99.5%	-	99.4%
Heavy	3	0	0	3	-	1	6	0	7	-	3	4	0	7	-	17
% Heavy	0.4%	0%	0%	0.3%	-	0.5%	2.3%	0%	1.6%	-	0.7%	0.4%	0%	0.5%	-	0.6%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4-Richmond Rd & Rte 199 SB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Midday Peak (WKND), PM Peak (WKND) (1 PM - 2 PM) - Overall Peak Hour

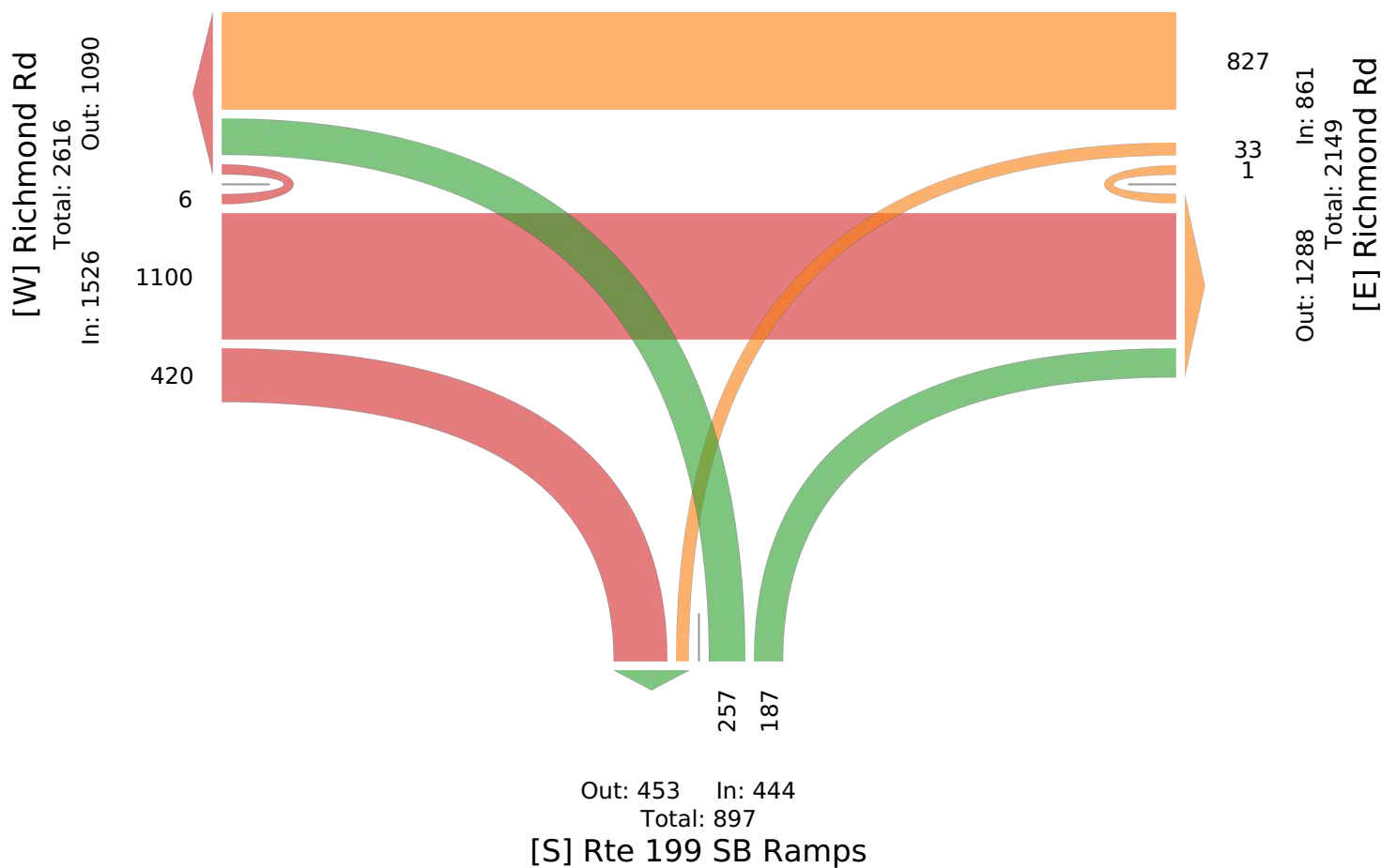
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275076, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



5-Richmond Rd & Rte 199 NB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275072, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 NB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-06 7:00AM	60	18	0	78	0	4	60	0	64	0	81	68	1	150	0	292
7:15AM	49	23	0	72	0	2	51	0	53	0	110	76	2	188	0	313
7:30AM	70	18	0	88	0	0	50	0	50	0	78	92	0	170	0	308
7:45AM	77	25	0	102	0	3	69	0	72	0	77	90	0	167	0	341
Hourly Total	256	84	0	340	0	9	230	0	239	0	346	326	3	675	0	1254
8:00AM	53	24	1	78	0	5	45	0	50	0	77	102	0	179	0	307
8:15AM	81	16	0	97	0	4	62	0	66	0	68	101	0	169	0	332
8:30AM	72	14	0	86	0	5	66	0	71	0	63	85	0	148	0	305
8:45AM	78	11	0	89	0	6	61	0	67	0	52	96	0	148	0	304
Hourly Total	284	65	1	350	0	20	234	0	254	0	260	384	0	644	0	1248
4:00PM	134	23	0	157	0	13	82	0	95	0	67	144	1	212	0	464
4:15PM	145	28	1	174	0	16	106	0	122	0	67	163	0	230	0	526
4:30PM	141	38	2	181	0	22	109	0	131	0	68	163	1	232	0	544
4:45PM	137	23	1	161	0	15	104	0	119	0	76	161	2	239	0	519
Hourly Total	557	112	4	673	0	66	401	0	467	0	278	631	4	913	0	2053
5:00PM	164	25	0	189	0	9	106	0	115	0	81	161	0	242	0	546
5:15PM	136	30	0	166	0	20	109	0	129	0	86	180	2	268	0	563
5:30PM	124	24	2	150	0	15	90	0	105	0	63	151	0	214	0	469
5:45PM	139	17	2	158	0	12	86	0	98	0	64	153	1	218	0	474
Hourly Total	563	96	4	663	0	56	391	0	447	0	294	645	3	942	0	2052
Total	1660	357	9	2026	0	151	1256	0	1407	0	1178	1986	10	3174	0	6607
% Approach	81.9%	17.6%	0.4%	-	-	10.7%	89.3%	0%	-	-	37.1%	62.6%	0.3%	-	-	-
% Total	25.1%	5.4%	0.1%	30.7%	-	2.3%	19.0%	0%	21.3%	-	17.8%	30.1%	0.2%	48.0%	-	-
Lights and Motorcycles	1631	337	8	1976	-	151	1224	0	1375	-	1139	1930	10	3079	-	6430
% Lights and Motorcycles	98.3%	94.4%	88.9%	97.5%	-	100%	97.5%	0%	97.7%	-	96.7%	97.2%	100%	97.0%	-	97.3%
Heavy	29	20	1	50	-	0	32	0	32	-	39	56	0	95	-	177
% Heavy	1.7%	5.6%	11.1%	2.5%	-	0%	2.5%	0%	2.3%	-	3.3%	2.8%	0%	3.0%	-	2.7%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5-Richmond Rd & Rte 199 NB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

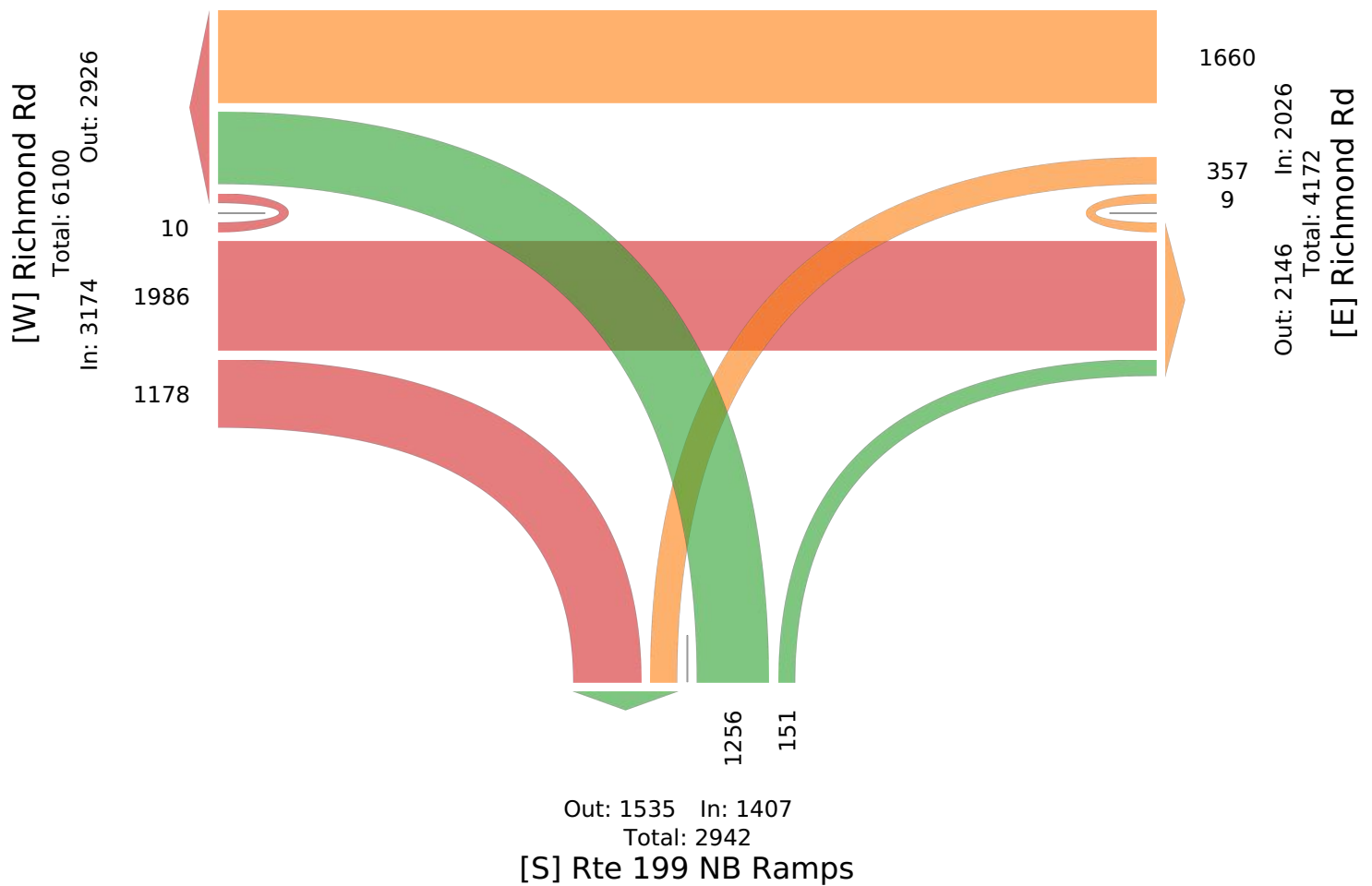
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275072, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



5-Richmond Rd & Rte 199 NB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275072, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 NB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-06 7:30AM	70	18	0	88	0	0	50	0	50	0	78	92	0	170	0	308
7:45AM	77	25	0	102	0	3	69	0	72	0	77	90	0	167	0	341
8:00AM	53	24	1	78	0	5	45	0	50	0	77	102	0	179	0	307
8:15AM	81	16	0	97	0	4	62	0	66	0	68	101	0	169	0	332
Total	281	83	1	365	0	12	226	0	238	0	300	385	0	685	0	1288
% Approach	77.0%	22.7%	0.3%	-	-	5.0%	95.0%	0%	-	-	43.8%	56.2%	0%	-	-	-
% Total	21.8%	6.4%	0.1%	28.3%	-	0.9%	17.5%	0%	18.5%	-	23.3%	29.9%	0%	53.2%	-	-
PHF	0.867	0.830	0.250	0.895	-	0.600	0.819	-	0.826	-	0.962	0.944	-	0.957	-	0.944
Lights and Motorcycles	272	76	1	349	-	12	212	0	224	-	290	364	0	654	-	1227
% Lights and Motorcycles	96.8%	91.6%	100%	95.6%	-	100%	93.8%	0%	94.1%	-	96.7%	94.5%	0%	95.5%	-	95.3%
Heavy	9	7	0	16	-	0	14	0	14	-	10	21	0	31	-	61
% Heavy	3.2%	8.4%	0%	4.4%	-	0%	6.2%	0%	5.9%	-	3.3%	5.5%	0%	4.5%	-	4.7%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5-Richmond Rd & Rte 199 NB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

AM Peak (7:30 AM - 8:30 AM)

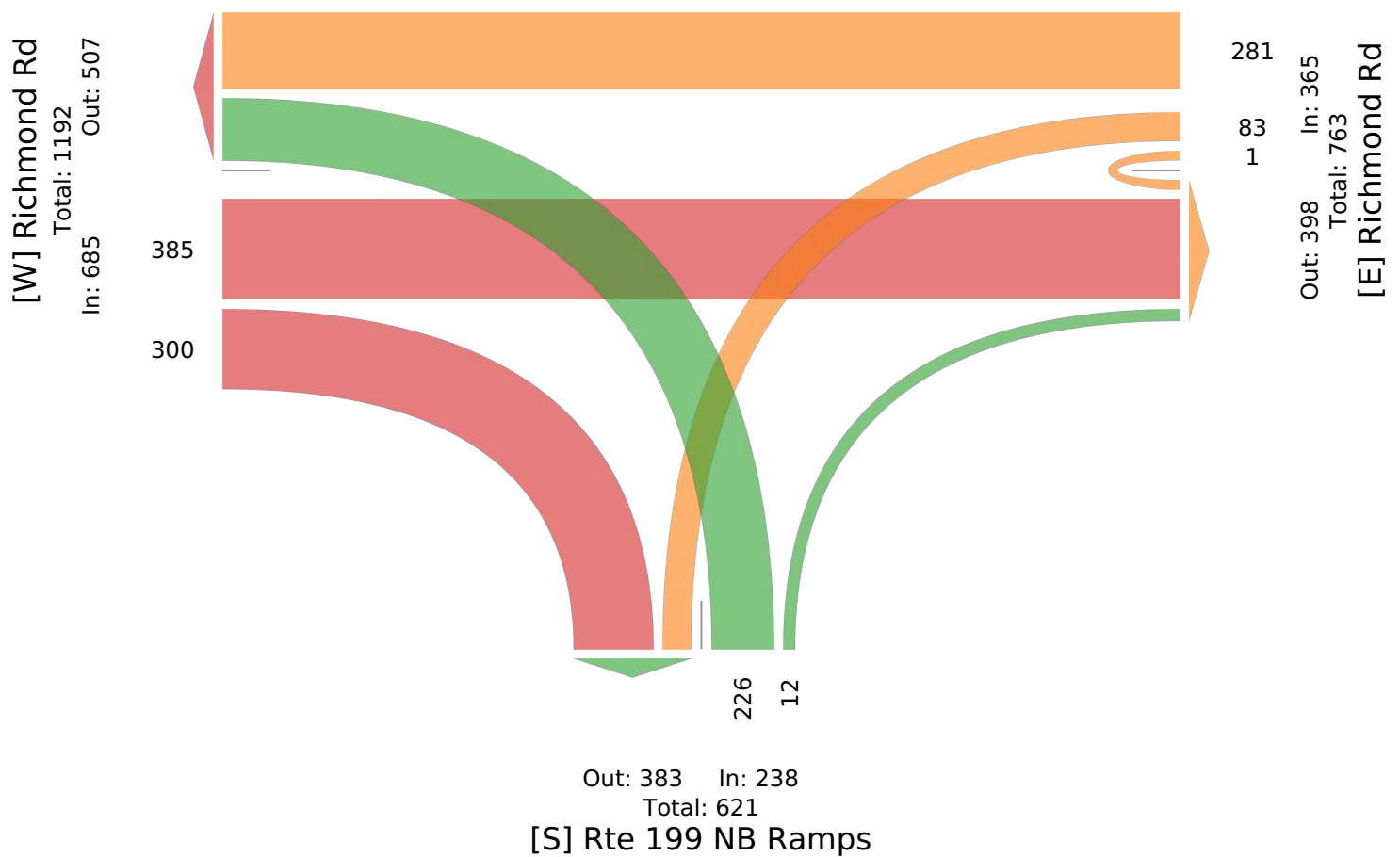
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275072, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



5-Richmond Rd & Rte 199 NB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275072, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 NB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-06 4:30PM	141	38	2	181	0	22	109	0	131	0	68	163	1	232	0	544
4:45PM	137	23	1	161	0	15	104	0	119	0	76	161	2	239	0	519
5:00PM	164	25	0	189	0	9	106	0	115	0	81	161	0	242	0	546
5:15PM	136	30	0	166	0	20	109	0	129	0	86	180	2	268	0	563
Total	578	116	3	697	0	66	428	0	494	0	311	665	5	981	0	2172
% Approach	82.9%	16.6%	0.4%	-	-	13.4%	86.6%	0%	-	-	31.7%	67.8%	0.5%	-	-	-
% Total	26.6%	5.3%	0.1%	32.1%	-	3.0%	19.7%	0%	22.7%	-	14.3%	30.6%	0.2%	45.2%	-	-
PHF	0.881	0.763	0.375	0.922	-	0.750	0.982	-	0.943	-	0.904	0.924	0.625	0.915	-	0.964
Lights and Motorcycles	570	112	2	684	-	66	420	0	486	-	300	651	5	956	-	2126
% Lights and Motorcycles	98.6%	96.6%	66.7%	98.1%	-	100%	98.1%	0%	98.4%	-	96.5%	97.9%	100%	97.5%	-	97.9%
Heavy	8	4	1	13	-	0	8	0	8	-	11	14	0	25	-	46
% Heavy	1.4%	3.4%	33.3%	1.9%	-	0%	1.9%	0%	1.6%	-	3.5%	2.1%	0%	2.5%	-	2.1%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5-Richmond Rd & Rte 199 NB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

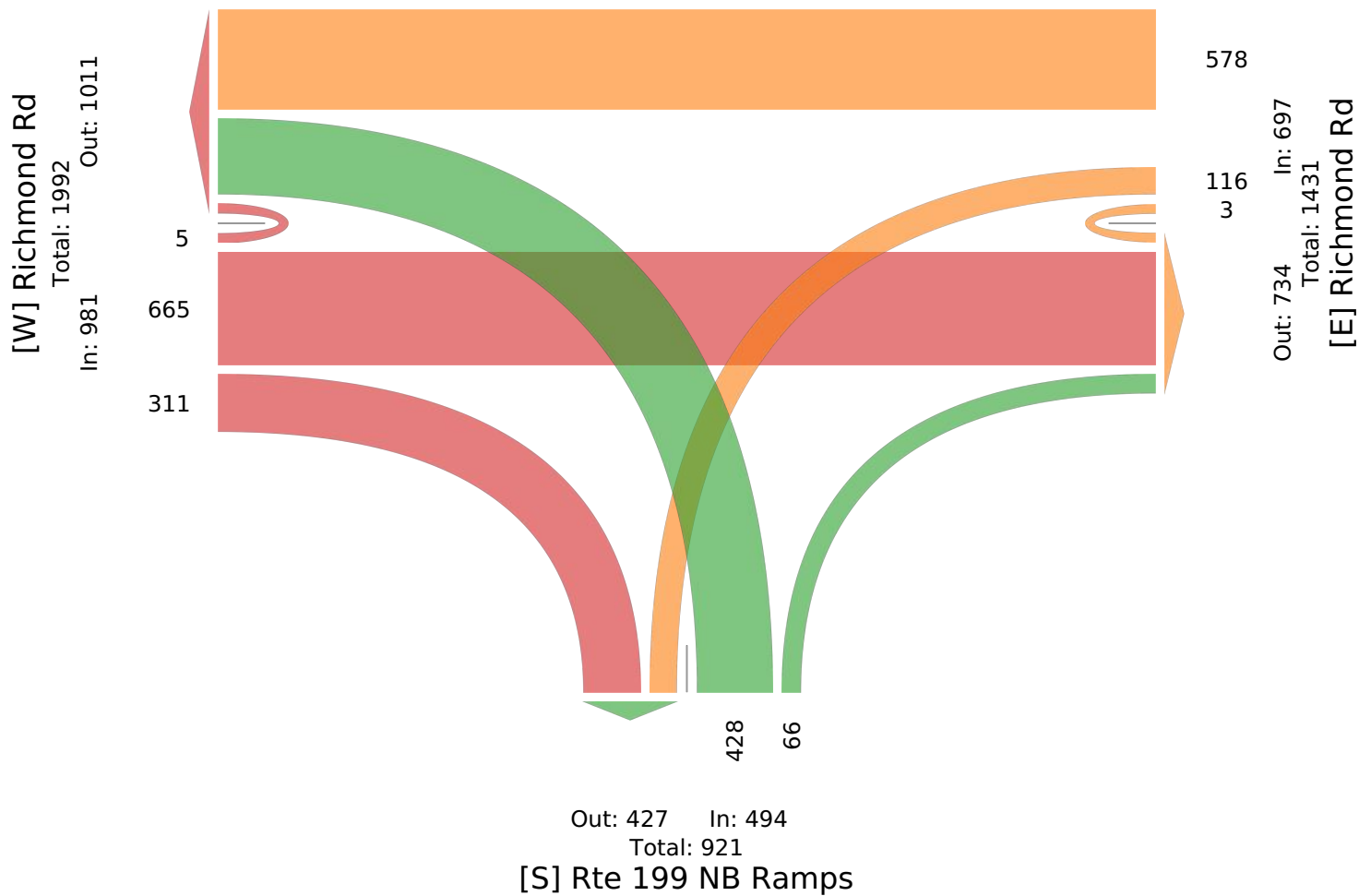
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275072, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



5-Richmond Rd & Rte 199 NB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275077, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 NB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-08 10:00AM	106	23	1	130	0	15	62	0	77	0	70	139	0	209	0	416
10:15AM	100	21	0	121	0	10	61	0	71	0	61	151	0	212	0	404
10:30AM	84	29	1	114	0	13	70	0	83	1	71	162	0	233	0	430
10:45AM	114	26	1	141	0	17	62	0	79	0	75	204	2	281	0	501
Hourly Total	404	99	3	506	0	55	255	0	310	1	277	656	2	935	0	1751
11:00AM	113	26	0	139	0	19	64	0	83	0	66	182	0	248	0	470
11:15AM	123	43	0	166	0	21	68	0	89	0	97	190	1	288	0	543
11:30AM	120	37	1	158	0	21	79	0	100	0	72	191	0	263	0	521
11:45AM	147	30	0	177	0	24	69	0	93	0	83	252	0	335	0	605
Hourly Total	503	136	1	640	0	85	280	0	365	0	318	815	1	1134	0	2139
12:00PM	121	25	1	147	0	23	78	1	102	0	115	245	1	361	0	610
12:15PM	129	36	0	165	0	14	73	1	88	0	72	255	1	328	0	581
12:30PM	129	34	1	164	0	20	75	0	95	0	87	227	1	315	0	574
12:45PM	158	36	1	195	0	14	72	1	87	0	87	232	2	321	0	603
Hourly Total	537	131	3	671	0	71	298	3	372	0	361	959	5	1325	0	2368
1:00PM	164	27	0	191	0	27	83	0	110	0	83	216	0	299	0	600
1:15PM	139	38	0	177	0	18	56	0	74	0	86	224	2	312	0	563
1:30PM	153	41	1	195	0	22	82	2	106	0	101	238	3	342	0	643
1:45PM	164	40	1	205	0	31	76	0	107	1	86	223	3	312	0	624
Hourly Total	620	146	2	768	0	98	297	2	397	1	356	901	8	1265	0	2430
2:00PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2064	512	9	2585	0	309	1130	5	1444	2	1312	3331	16	4659	0	8688
% Approach	79.8%	19.8%	0.3%	-	-	21.4%	78.3%	0.3%	-	-	28.2%	71.5%	0.3%	-	-	-
% Total	23.8%	5.9%	0.1%	29.8%	-	3.6%	13.0%	0.1%	16.6%	-	15.1%	38.3%	0.2%	53.6%	-	-
Lights and Motorcycles	2052	496	9	2557	-	307	1123	5	1435	-	1291	3307	16	4614	-	8606
% Lights and Motorcycles	99.4%	96.9%	100%	98.9%	-	99.4%	99.4%	100%	99.4%	-	98.4%	99.3%	100%	99.0%	-	99.1%
Heavy	12	16	0	28	-	2	7	0	9	-	21	24	0	45	-	82
% Heavy	0.6%	3.1%	0%	1.1%	-	0.6%	0.6%	0%	0.6%	-	1.6%	0.7%	0%	1.0%	-	0.9%
Pedestrians	-	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5-Richmond Rd & Rte 199 NB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

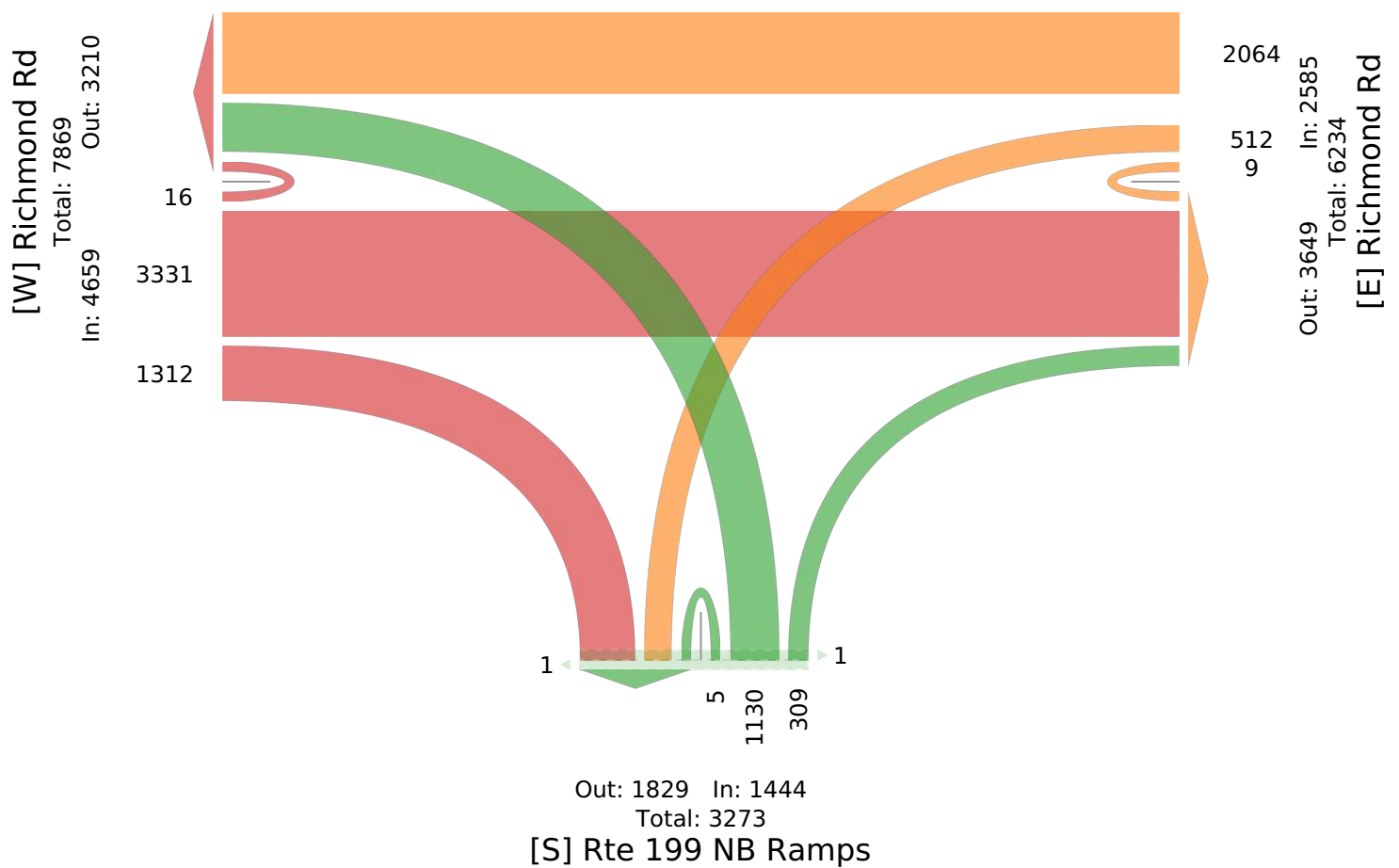
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275077, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



5-Richmond Rd & Rte 199 NB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275077, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 NB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-08 10:00AM	106	23	1	130	0	15	62	0	77	0	70	139	0	209	0	416
10:15AM	100	21	0	121	0	10	61	0	71	0	61	151	0	212	0	404
10:30AM	84	29	1	114	0	13	70	0	83	1	71	162	0	233	0	430
10:45AM	114	26	1	141	0	17	62	0	79	0	75	204	2	281	0	501
Total	404	99	3	506	0	55	255	0	310	1	277	656	2	935	0	1751
% Approach	79.8%	19.6%	0.6%	-	-	17.7%	82.3%	0%	-	-	29.6%	70.2%	0.2%	-	-	-
% Total	23.1%	5.7%	0.2%	28.9%	-	3.1%	14.6%	0%	17.7%	-	15.8%	37.5%	0.1%	53.4%	-	-
PHF	0.886	0.853	0.750	0.897	-	0.809	0.911	-	0.934	-	0.923	0.804	0.250	0.832	-	0.874
Lights and Motorcycles	398	95	3	496	-	54	254	0	308	-	275	649	2	926	-	1730
% Lights and Motorcycles	98.5%	96.0%	100%	98.0%	-	98.2%	99.6%	0%	99.4%	-	99.3%	98.9%	100%	99.0%	-	98.8%
Heavy	6	4	0	10	-	1	1	0	2	-	2	7	0	9	-	21
% Heavy	1.5%	4.0%	0%	2.0%	-	1.8%	0.4%	0%	0.6%	-	0.7%	1.1%	0%	1.0%	-	1.2%
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5-Richmond Rd & Rte 199 NB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

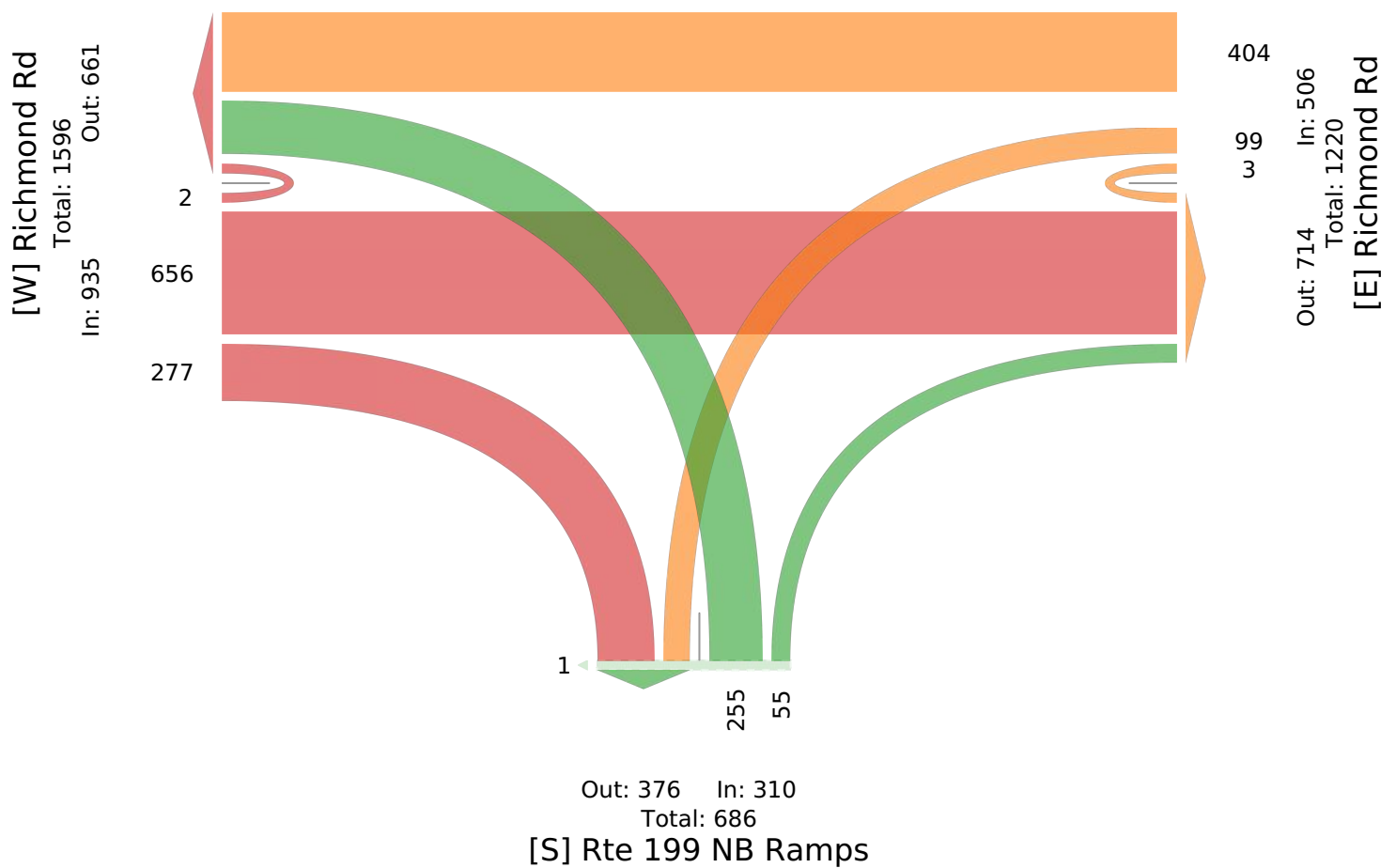
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275077, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



5-Richmond Rd & Rte 199 NB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Midday Peak (WKND), PM Peak (WKND) (1 PM - 2 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275077, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 NB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-08 1:00PM	164	27	0	191	0	27	83	0	110	0	83	216	0	299	0	600
1:15PM	139	38	0	177	0	18	56	0	74	0	86	224	2	312	0	563
1:30PM	153	41	1	195	0	22	82	2	106	0	101	238	3	342	0	643
1:45PM	164	40	1	205	0	31	76	0	107	1	86	223	3	312	0	624
Total	620	146	2	768	0	98	297	2	397	1	356	901	8	1265	0	2430
% Approach	80.7%	19.0%	0.3%	-	-	24.7%	74.8%	0.5%	-	-	28.1%	71.2%	0.6%	-	-	-
% Total	25.5%	6.0%	0.1%	31.6%	-	4.0%	12.2%	0.1%	16.3%	-	14.7%	37.1%	0.3%	52.1%	-	-
PHF	0.945	0.890	0.500	0.937	-	0.790	0.895	0.250	0.902	-	0.881	0.946	0.667	0.925	-	0.945
Lights and Motorcycles	619	143	2	764	-	97	295	2	394	-	352	899	8	1259	-	2417
% Lights and Motorcycles	99.8%	97.9%	100%	99.5%	-	99.0%	99.3%	100%	99.2%	-	98.9%	99.8%	100%	99.5%	-	99.5%
Heavy	1	3	0	4	-	1	2	0	3	-	4	2	0	6	-	13
% Heavy	0.2%	2.1%	0%	0.5%	-	1.0%	0.7%	0%	0.8%	-	1.1%	0.2%	0%	0.5%	-	0.5%
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5-Richmond Rd & Rte 199 NB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Midday Peak (WKND), PM Peak (WKND) (1 PM - 2 PM) - Overall Peak Hour

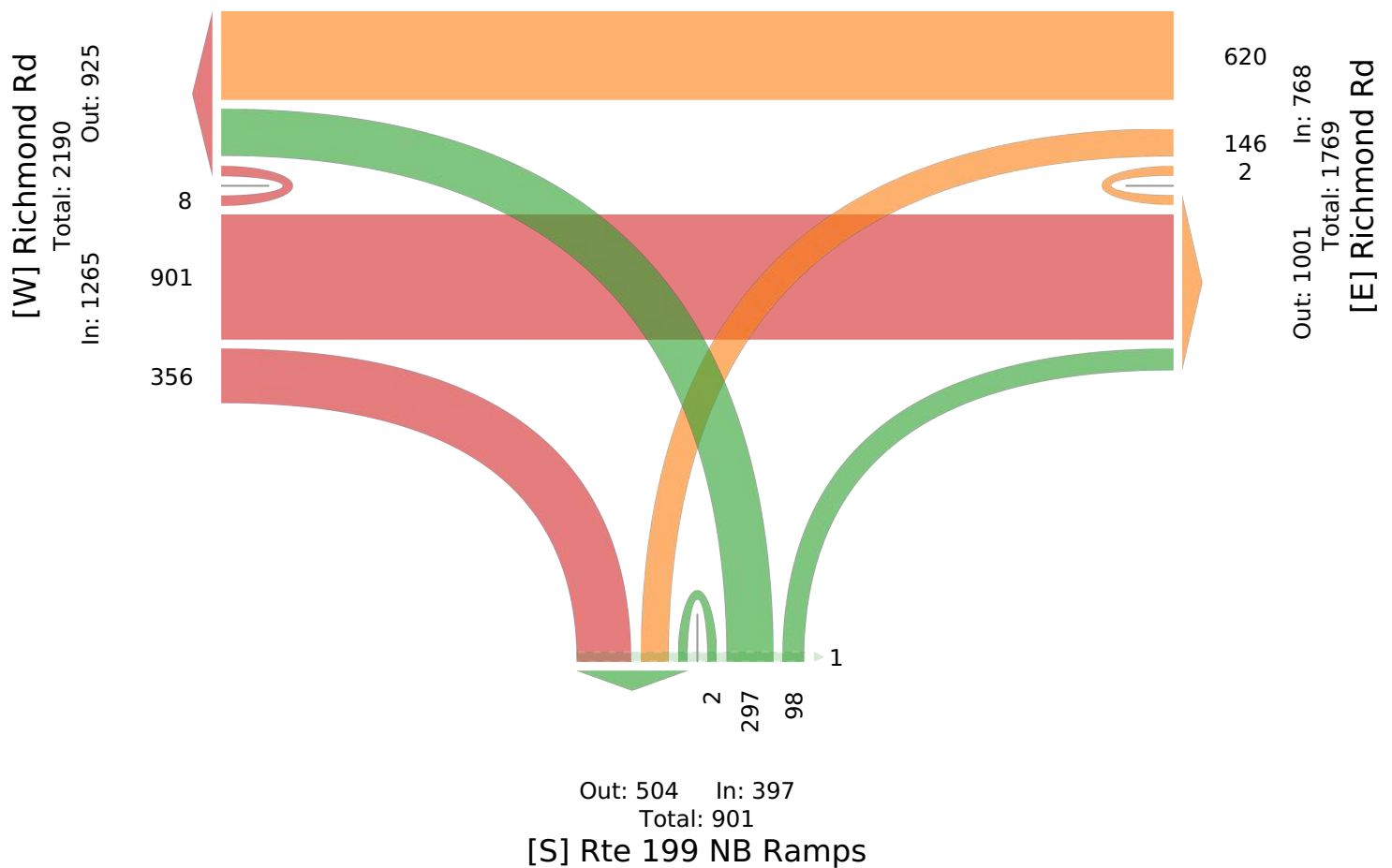
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275077, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



Appendix C

Traffic Signal Timings

Rt 614 & Warhill

Phase Timing

3/4/2025 8:34:58 AM

[illegible]

Rt 614 & Warhill

Phase Options

3/4/2025 8:34:58 AM

[illegible]

Rt 614 & Warhill

Phase Startup Options

3/4/2025 8:34:58 AM

Startup Flash

Mode

Startup All Red

Yellow

Phases	1-8								9-16							
Startup Phases		2				6										
Startup Yellow		2				6										
Startup Red																
Startup No Walk																
Startup Next																
Startup Yel Fls																
Startup FYA																
No Veh Call	1	2	3	4	5	6	7	8								
No Ped Call		2		4		6		8								

Phase Startup Timing

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Start Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Max Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Unit

Red Revert

Ped Protect

AdvFls in Flash

Rt 614 & Warhill

MCE Options

3/4/2025 8:34:58 AM

Phases	1-8						9-16					
MCE Ped Protect												
MCE Veh Call												
MCE Ped Call												
MCE Veh Omit												
MCE Ped Omit												
MCE Veh Sync												
MCE Ped Sync												
MCE Halt Don't Walk												

LRV Phases 1-8

MCE LRV Term Early

--	--	--	--	--	--	--	--

Rt 614 & Warhill

FYA/FRA

3/4/2025 8:34:58 AM

FYA	1	2	3	4	5	6	7	8
Prot Phs	0	0	0	0	0	0	0	0
Opp Thru	0	0	0	0	0	0	0	0
Start Phs	0	0	0	0	0	0	0	0
Opp Ped	0	0	0	0	0	0	0	0
Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min FYA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skip Prot Red	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Head Mode	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1

Ped Hawk 1

Veh Phase	0		
Ped Phase	0		
Flash Yel	0.0	Dark Signal	Yes
Flash Delay	0.0	Flash Carryover	0.0
Green Mode	Normal		

Ped Hawk 2

Veh Phase	0		
Ped Phase	0		
Flash Yel	0.0	Dark Signal	Yes
Flash Delay	0.0	Flash Carryover	0.0
Green Mode	Normal		

Ped Hawk 3

Veh Phase	0		
Ped Phase	0		
Flash Yel	0.0	Dark Signal	Yes
Flash Delay	0.0	Flash Carryover	0.0
Green Mode	Normal		

Ped Hawk 4

Veh Phase	0		
Ped Phase	0		
Flash Yel	0.0	Dark Signal	Yes
Flash Delay	0.0	Flash Carryover	0.0
Green Mode	Normal		

Rt 614 & Warhill

Overlap Startup Options

3/4/2025 8:34:58 AM

Overlaps

1-8

9-16

Startup Overlap Green

Startup Overlap Yellow

Overlap Startup Timing

[illegible]

Overlap Unit Options

Overlaps

1-8

9-16

[illegible]

Rt 614 & Warhill

Coordination Options

3/4/2025 8:34:58 AM

Sync Time	00:00	RTC Set Time	00:00
Transition Mode	Best 2	Ped Adjust	None
Trans Short %	20	Trans Long %	35
Offset Reference	Lag FO	Short Cycles	0
Dual Entry	Normal	Overlap F/O	Disabled
Master Sync Mode	RTC	Master Sync Length	0
Adapt Thresh	0	Adapt Step	0
External Plan Max	0		
Hardwire No Match	Sched	Hardwire Sync Fail	0
Override Omit/Recall	No		
Phases	1-8	9-16	
No Trans Recall	☐	☐	☐
Trans Ped Recall	☐	☐	☐
Trans Phases	☐	☐	☐

Rt 614 & Warhill

Hardwire Plans

3/4/2025 8:34:58 AM

Hardwire	Plan Select							Pattern	Offset	Mode
Plan 1								0	0	Hardwire
Plan 2								0	0	Hardwire
Plan 3								0	0	Hardwire
Plan 4								0	0	Hardwire
Plan 5								0	0	Hardwire
Plan 6								0	0	Hardwire
Plan 7								0	0	Hardwire
Plan 8								0	0	Hardwire
Plan 9								0	0	Hardwire
Plan 10								0	0	Hardwire
Plan 11								0	0	Hardwire
Plan 12								0	0	Hardwire
Plan 13								0	0	Hardwire
Plan 14								0	0	Hardwire
Plan 15								0	0	Hardwire
Plan 16								0	0	Hardwire
Plan 17								0	0	Hardwire
Plan 18								0	0	Hardwire
Plan 19								0	0	Hardwire
Plan 20								0	0	Hardwire
Plan 21								0	0	Hardwire
Plan 22								0	0	Hardwire
Plan 23								0	0	Hardwire
Plan 24								0	0	Hardwire
Plan 25								0	0	Hardwire
Plan 26								0	0	Hardwire
Plan 27								0	0	Hardwire
Plan 28								0	0	Hardwire
Plan 29								0	0	Hardwire
Plan 30								0	0	Hardwire
Plan 31								0	0	Hardwire
Plan 32								0	0	Hardwire

Rt 614 & Warhill

Soft Interconnect

3/4/2025 8:34:58 AM

Mode

Slave

Remote Int Number

0

Yield Delay

0

Yield Duration

0

Permissive

0

Local Hold Limit

0

Phases

1-8

9-16

Local Control Phases

Local Hold Phases

Local Perm Phases

Local Call Phases

Remote Perm Phases

Remote Hold Phases

Rt 614 & Warhill

Coordination Pattern 1

3/4/2025 8:34:58 AM

[illegible]

[illegible]

Rt 614 & Warhill

Coordination Pattern 2

3/4/2025 8:34:58 AM

[illegible][illegible]

[illegible]

Rt 614 & Warhill

Coordination Pattern 3

3/4/2025 8:34:58 AM

[illegible]

[illegible]

Rt 614 & Warhill

Coordination Pattern 4

3/4/2025 8:34:58 AM

[illegible]

[illegible]

Rt 614 & Warhill

Coordination Pattern 5

3/4/2025 8:34:58 AM

[illegible]

Rt 614 & Warhill

Preempt Inputs

3/4/2025 8:34:58 AM

Preempt Input	1	2	3	4	5	6	7	8	9	10
Delay	0	0	0	0	0	0	0	0	0	0
Checkout Limit	0	0	0	0	0	0	0	0	0	0
Locked	No	No	No	No	No	No	No	No	No	No
Interlock	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Input Number	0	0	0	0	0	0	0	0	0	0
Input Priority	All	All	All	All	All	All	All	All	All	All
Delay Mode	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp

Preempt Priority

Preempt	1	2	3	4	5	6	7	8	9	10
Priority	0	0	0	0	0	0	0	0	0	0

Remote Preemption

Remote Preempt	RM 1	RM 2	RM 3	RM 4	RM 5	RM 6	RM 7	RM 8
Int Number	0	0	0	0	0	0	0	0
PE Number	0	0	0	0	0	0	0	0
Mode	Dis	Dis	Dis	Dis	Dis	Dis	Dis	Dis
Slack	0	0	0	0	0	0	0	0
Travel Time	0	0	0	0	0	0	0	0
Alt TT 1	0	0	0	0	0	0	0	0
Alt TT 2	0	0	0	0	0	0	0	0
Alt TT 3	0	0	0	0	0	0	0	0
Alt TT 4	0	0	0	0	0	0	0	0
Alt TT 5	0	0	0	0	0	0	0	0
Alt TT 6	0	0	0	0	0	0	0	0
Alt TT 7	0	0	0	0	0	0	0	0

Rt 614 & Warhill

Preempt 1 (Configuration)

3/4/2025 8:34:58 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8								9-16																1-8									
Enable Phases	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐									LVR Disable	☐	☐	☐	☐	☐	☐	☐	Max	0
Preempt Inputs	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐									LVR Dwell Flash	☐	☐	☐	☐	☐	☐	☐		
																	LVR Omit	☐	☐	☐	☐	☐	☐	☐	☐	Delay	0							
																	LVR No Yel	☐	☐	☐	☐	☐	☐	☐	☐									

Preempt 1 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8						9-16					
Omit Olap Grn Clr												
Phs EWlk to Grn												
TClr 1 Veh Phases												
TClr 1 Ped Phases												
TClr 1 Olap												
TClr 1 Olap Ped												
TClr 2 Veh Phases												
TClr 2 Ped Phases												
TClr 2 Olap												
TClr 2 Olap Ped												
Init Dwell Phases												
Dwell Veh Phases	1					6						
Dwell Ped Phases												
Dwell Olap												
Dwell Olap Ped												
Exit Veh Phases	2					6						
Exit Ped Phases												
Exit Olap												
Exit Olap Ped												
Zero Phase Walk	2		4									
Zero Phase Ped Clr	2		4									
Zero Phase Green	1	2	3	4	5	6						
Zero Olap Walk												
Zero Olap Ped Clr												
Zero Olap Green												
Dwell-Phase Red												
Dwell-Phase Red Flash												
Dwell-Phase Yel Flash												
Dwell-Olap Red Flash												
Dwell-Olap Yel Flash												
Dwell-Ped Dark												
Dwell-Olap Ped Dark												

Start Green

0

Start Walk

0

Start Ped Clr

0

Track Clear 1

0

Track Clear 2

0

TC1 Extend

0

TC1 Max

0

Exit Ped Clr

0

Exit Yellow

0.0

Exit Red

0.0

Min Dwell

0

Min Duration

0

Dwell Extend

0

Max Dwell

0

Max Call

180

Reserve Inh Same

0

Reserve Inh All

0

Delay

0

Phases/Overlaps

TClr 1 FR Olap

TClr 2 FR Olap

Dwell FR Olap

TClr 1 FYA

TClr 2 FYA

Dwell FYA

1-8

9-16

Rt 614 & Warhill

Preempt 2 (Configuration)

3/4/2025 8:34:58 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	2		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 2 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	0	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	0	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	2	5				
Dwell Ped Phases						
Dwell Olap						
Dwell Olap Ped						
Exit Veh Phases	2	6				
Exit Ped Phases						
Exit Olap						
Exit Olap Ped						
Zero Phase Walk	2	4				
Zero Phase Ped Clr	2	4				
Zero Phase Green	1	2				
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Rt 614 & Warhill

Preempt 3 (Configuration)

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Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8																																										
Enable Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>										3							<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	LRV Disable	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Max	0
	3																																													
Preempt Inputs								LRV Dwell Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																					
								LRV Omit	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Delay	0																											
								LRV No Yel	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																					

Preempt 3 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0																
Omit Olap Grn Clr	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>											Start Ped Clr	0
Phs EWlk to Grn	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Exit Red	0.0		
TClr 1 Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Min Dwell	0	Min Duration	0
TClr 2 Veh Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Dwell Extend	0		
TClr 2 Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Max Dwell	0	Max Call	180
TClr 2 Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Reserve Inh Same	0		
TClr 2 Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Reserve Inh All	0		
Init Dwell Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Delay	0		
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Rt 614 & Warhill

Preempt 4 (Configuration)

3/4/2025 8:34:58 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8																																										
Enable Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>4</td><td></td><td></td><td></td><td></td><td></td></tr></table>											4						<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	LRV Disable	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Max	0
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Preempt 4 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0																
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TClr 1 Veh Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									TC1 Extend	0	TC1 Max	0
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TClr 1 Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Exit Red	0.0		
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Rt 614 & Warhill

Preempt 5 (Configuration)

3/4/2025 8:34:58 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	In Step
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8																																																		
Enable Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	LRV Disable	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	Max	0
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Preempt 5 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16																																																																							
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Rt 614 & Warhill

TOD Pattern Events

3/4/2025 8:34:58 AM

[illegible]

Rt 614 & Warhill

Holidays

3/4/2025 8:34:58 AM

	Active Holidays							Month	Day	DOW							WOM
Date 1								0	0								0
Date 2								0	0								0
Date 3								0	0								0
Date 4								0	0								0
Date 5								0	0								0
Date 6								0	0								0
Date 7								0	0								0
Date 8								0	0								0
Date 9								0	0								0
Date 10								0	0								0
Date 11								0	0								0
Date 12								0	0								0
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Date 22								0	0								0
Date 23								0	0								0
Date 24								0	0								0
Date 25								0	0								0
Date 26								0	0								0
Date 27								0	0								0
Date 28								0	0								0
Date 29								0	0								0
Date 30								0	0								0
Date 31								0	0								0
Date 32								0	0								0

Rt 614 & Warhill

Vehicle Detector 1

3/4/2025 8:34:58 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 2

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

1							
---	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

1							
---	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 614 & Warhill

Vehicle Detector 5

3/4/2025 8:34:58 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 6

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 614 & Warhill

Vehicle Detector 7

3/4/2025 8:34:58 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

	2						
--	---	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

	2						
--	---	--	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 8

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

			5				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

		5					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 614 & Warhill

Vehicle Detector 9

3/4/2025 8:34:58 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

			5				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

			5				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 10

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

		4					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

		4					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 614 & Warhill

Vehicle Detector 11

3/4/2025 8:34:58 AM

Delay 0.0

Extend

0.0

Carryover 0.0

Queue Limit

0

Mode	No Disc
------	---------

Added	Enabled
-------	---------

System	Enabled
--------	---------

Fail Mode	None
-----------	------

Max Pres

No Act	0
--------	---

Erratic	0
---------	---

Fail Time 0

Delay 2

0.0

Phases

1-8

9-16

Call Phases

Yellow Lock Phases

Red Lock Phases

Extend Phases

XSwitch Phases

Bike Call Phases

			4			
		4				

Pedestrian Detector 5

No Act	0
--------	---

Max Pres

Erratic	0
---------	---

Fail Mode	None
-----------	------

1-8

5

Call Walk2

No Act	0
--------	---

Max Pres	0
----------	---

Erratic	0
---------	---

Fail Mode	None
-----------	------

1-8

6

Call Walk2

No Act	0
--------	---

Max Pres	0
----------	---

Erratic	0
---------	---

Fail Mode	None
-----------	------

1-8

7

Call Walk2

No Act	0
--------	---

Max Pres	0
----------	---

Erratic	0
---------	---

Fail Mode	None
-----------	------

1-8

8

Call Walk2

Rt 614 & Warhill

Transit/LRV Startup/Options

3/4/2025 8:34:58 AM

No Startup Call

LRV 1-8

--	--	--	--	--	--	--	--

Warn Flash Rate

1 Hz

Rsrv Inh Mode

Seconds

Rt 614 & Warhill

Control / Config

3/4/2025 8:34:58 AM

Pattern Mode

Free

Manual Pattern

0

Manual Offset

0

Stop Time Input

Enabled

Aux Switch

None

0

DLS Mode

Auto

Time Zone

Est (UTC-5)

GPS Thresh

0

Password Timeout

5

Maint Phs Recalls

1-8

9-16

Maint Ped Recalls

Serial 1 Port Configuration

Broadcast Plan/Sync

Disabled

Broadcast Time

00:00

Serial Rebroadcast

Disabled

Response

None

Serial 2 Port Configuration

Broadcast Plan/Sync

Disabled

Broadcast Time

00:00

Ethernet Port Configuration

Broadcast Plan/Sync

Disabled

Broadcast Time

00:00

Serial Rebroadcast

Disabled

Peer Configuration

Peer 1

0

Peer 2

0

Peer 3

0

Peer 4

0

Peer 5

0

Peer 6

0

Peer 7

0

Peer 8

0

Rt 60 & 614

Phase Timing

3/4/2025 8:30:37 AM

[illegible]

Rt 60 & 614

Phase Options

3/4/2025 8:30:37 AM

[illegible]

Rt 60 & 614

Phase Startup Options

3/4/2025 8:30:37 AM

Startup Flash	0	Mode	Yel->Red																																																																																																																																
Startup All Red	0	Yellow	0.0																																																																																																																																
Phases	1-8	9-16																																																																																																																																	
Startup Phases	<table><tr><td></td><td>2</td><td></td><td></td><td></td><td>6</td><td></td><td></td></tr><tr><td></td><td>2</td><td></td><td></td><td></td><td>6</td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>		2				6				2				6																																																			<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																																																	
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No Veh Call	1	2	3	4	5	6	7	8																																																																																																																											
No Ped Call		2		4		6		8																																																																																																																											

Phase Startup Timing

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Start Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Max Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Unit

Red Revert	0.0	Ped Protect	No	AdvFls in Flash	No
------------	----------------------------------	-------------	---------------------------------	-----------------	---------------------------------

Rt 60 & 614

Ring Sequence / Conflicting Phases

3/4/2025 8:30:37 AM

Ringgroup 1

[illegible]

Ringgroup 2

Custom Sequences

[illegible]

Conflicting Phases

1-8

9-16

Phase 1			5				
Phase 2							
Phase 3							
Phase 4							
Phase 5							
Phase 6							
Phase 7							
Phase 8							
Phase 9							
Phase 10							
Phase 11							
Phase 12							
Phase 13							
Phase 14							
Phase 15							
Phase 16							

Rt 60 & 614

MCE Options

3/4/2025 8:30:37 AM

Phases	1-8					9-16				
MCE Ped Protect										
MCE Veh Call										
MCE Ped Call										
MCE Veh Omit										
MCE Ped Omit										
MCE Veh Sync										
MCE Ped Sync										
MCE Halt Don't Walk										

LRV Phases 1-8
MCE LRV Term Early

--	--	--	--	--	--	--	--

Rt 60 & 614

FYA/FRA

3/4/2025 8:30:37 AM

FYA	1	2	3	4	5	6	7	8
Prot Phs	0	0	0	0	0	0	0	0
Opp Thru	0	0	0	0	0	0	0	0
Start Phs	0	0	0	0	0	0	0	0
Opp Ped	0	0	0	0	0	0	0	0
Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min FYA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skip Prot Red	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Head Mode	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1

Ped Hawk 1

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 2

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 3

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 4

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Rt 60 & 614

Overlap Startup Options

3/4/2025 8:30:37 AM

Overlaps

1-8

9-16

Overlap Startup Timing

[illegible]

Overlap Unit Options

Overlaps

1-8

9-16

Rt 60 & 614

Coordination Options

3/4/2025 8:30:37 AM

Sync Time 00:00

RTC Set Time 00:00

Transition Mode	Best 2
-----------------	--------

Ped Adjust	None
------------	------

Trans Short % Trans Long % 35

Offset Reference

Lag FO

Short Cycles

0

Dual Entry

Normal

Overlap F/O	Disabled
-------------	----------

Master Sync Mode	RTC
------------------	-----

Master Sync Length	0
--------------------	---

Adapt Thresh	0
--------------	---

Adapt Step	0
------------	---

External Plan Max	0
-------------------	---

Hardwire No Match	Sched
-------------------	-------

Hardwire Sync Fail	0
--------------------	---

Override Omit/Recall	No
----------------------	----

Phases 1-8

9-16

No Trans Recall							

--	--	--	--	--	--	--	--

Trans Ped Recall							
------------------	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Trans Phases							
--------------	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 60 & 614

Hardwire Plans

3/4/2025 8:30:37 AM

Hardwire	Plan Select							Pattern	Offset	Mode
Plan 1								0	0	Hardwire
Plan 2								0	0	Hardwire
Plan 3								0	0	Hardwire
Plan 4								0	0	Hardwire
Plan 5								0	0	Hardwire
Plan 6								0	0	Hardwire
Plan 7								0	0	Hardwire
Plan 8								0	0	Hardwire
Plan 9								0	0	Hardwire
Plan 10								0	0	Hardwire
Plan 11								0	0	Hardwire
Plan 12								0	0	Hardwire
Plan 13								0	0	Hardwire
Plan 14								0	0	Hardwire
Plan 15								0	0	Hardwire
Plan 16								0	0	Hardwire
Plan 17								0	0	Hardwire
Plan 18								0	0	Hardwire
Plan 19								0	0	Hardwire
Plan 20								0	0	Hardwire
Plan 21								0	0	Hardwire
Plan 22								0	0	Hardwire
Plan 23								0	0	Hardwire
Plan 24								0	0	Hardwire
Plan 25								0	0	Hardwire
Plan 26								0	0	Hardwire
Plan 27								0	0	Hardwire
Plan 28								0	0	Hardwire
Plan 29								0	0	Hardwire
Plan 30								0	0	Hardwire
Plan 31								0	0	Hardwire
Plan 32								0	0	Hardwire

Rt 60 & 614

Soft Interconnect

3/4/2025 8:30:37 AM

Mode

Slave

Remote Int Number

0

Yield Delay

0

Yield Duration

0

Permissive

0

Local Hold Limit

0

Phases

1-8

9-16

Local Control Phases

Local Hold Phases

Local Perm Phases

Local Call Phases

Remote Perm Phases

Remote Hold Phases

Rt 60 & 614

Coordination Pattern 4

3/4/2025 8:30:37 AM

Cycle 130 Ringgroup 1 - Offset 1 118 Offset 2 0 Offset 3 0

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max 2	Walk Rest	Yield
-----------------	-----------	----------	-------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit Perm 2 Start Perm 2 End

Alt Sequence	1		3					TOD Link	0
--------------	---	--	---	--	--	--	--	----------	---

[illegible]

Trans Mode	Default
------------	---------

Offset Ref	Default
------------	---------

Adaptive Mode ☐ Disabled

Disable Priority							
------------------	--	--	--	--	--	--	--

[illegible]

Priority Alt Seq

--	--	--	--	--	--	--	--

Reserve Extend							
----------------	--	--	--	--	--	--	--

[illegible]

Rt 60 & 614

Coordination Pattern 4

3/4/2025 8:30:37 AM

[illegible]

Rt 60 & 614

Coordination Pattern 5

3/4/2025 8:30:37 AM

Cycle Ringgroup 1 - Offset 1 Offset 2 Offset 3

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max 2	Walk Rest	Yield
-----------------	-----------	----------	-------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit	15
------------------	----

Perm 2 Start Perm 2 End

Alt Sequence 1 3

TOD Link

0

[illegible]

Trans Mode	Default
------------	---------

Offset Ref	Default
------------	---------

Adaptive Mode	Disabled
---------------	----------

Disable Priority							
------------------	--	--	--	--	--	--	--

Progression Phases														
--------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Priority Alt Seq

Reserve Extend							
----------------	--	--	--	--	--	--	--

[illegible]

Rt 60 & 614

Coordination Pattern 5

3/4/2025 8:30:37 AM

[illegible]

Rt 60 & 614

Preempt Inputs

3/4/2025 8:30:37 AM

Preempt Input	1	2	3	4	5	6	7	8	9	10
Delay	0	0	0	0	0	0	0	0	0	0
Checkout Limit	0	0	0	0	0	0	0	0	0	0
Locked	No	No	No	No	No	No	No	No	No	No
Interlock	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Input Number	0	0	0	0	0	0	0	0	0	0
Input Priority	All	All	All	All	All	All	All	All	All	All
Delay Mode	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp

Preempt Priority

Preempt	1	2	3	4	5	6	7	8	9	10
Priority	0	0	0	0	0	0	0	0	0	0

Remote Preemption

Remote Preempt	RM 1	RM 2	RM 3	RM 4	RM 5	RM 6	RM 7	RM 8
Int Number	0	0	0	0	0	0	0	0
PE Number	0	0	0	0	0	0	0	0
Mode	Dis	Dis	Dis	Dis	Dis	Dis	Dis	Dis
Slack	0	0	0	0	0	0	0	0
Travel Time	0	0	0	0	0	0	0	0
Alt TT 1	0	0	0	0	0	0	0	0
Alt TT 2	0	0	0	0	0	0	0	0
Alt TT 3	0	0	0	0	0	0	0	0
Alt TT 4	0	0	0	0	0	0	0	0
Alt TT 5	0	0	0	0	0	0	0	0
Alt TT 6	0	0	0	0	0	0	0	0
Alt TT 7	0	0	0	0	0	0	0	0

Rt 60 & 614

Preempt 1 (Configuration)

3/4/2025 8:30:37 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

[illegible]

Preempt 1 (Timing/Phases/Overlaps)

[illegible]

Rt 60 & 614

Preempt 2 (Configuration)

3/4/2025 8:30:37 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	2		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 2 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	0	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	0	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	2	5				
Dwell Ped Phases						
Dwell Olap						
Dwell Olap Ped						
Exit Veh Phases	2	6				
Exit Ped Phases						
Exit Olap						
Exit Olap Ped						
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green	1	2				
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Phases/Overlaps	1-8	9-16
TClr 1 FR Olap		
TClr 2 FR Olap		
Dwell FR Olap		
TClr 1 FYA		
TClr 2 FYA		
Dwell FYA		

Rt 60 & 614

Preempt 3 (Configuration)

3/4/2025 8:30:37 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8																																										
Enable Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>										3							<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	LRV Disable	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Max	0
	3																																													
Preempt Inputs								LRV Dwell Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																					
								LRV Omit	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Delay	0																											
								LRV No Yel	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																					

Preempt 3 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0																
Omit Olap Grn Clr	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>											Start Ped Clr	0
Phs EWlk to Grn	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Exit Red	0.0		
TClr 1 Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Min Dwell	0	Min Duration	0
TClr 2 Veh Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Dwell Extend	0		
TClr 2 Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Max Dwell	0	Max Call	180
TClr 2 Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Reserve Inh Same	0		
TClr 2 Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Reserve Inh All	0		
Init Dwell Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Delay	0		
Dwell Veh Phases	<table><tr><td></td><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>		3							<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
	3																					
Dwell Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Exit Veh Phases	<table><tr><td></td><td>2</td><td></td><td></td><td>6</td><td></td><td></td><td></td></tr></table>		2			6				<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
	2			6																		
Exit Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Exit Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Exit Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Zero Phase Walk	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Zero Phase Ped Clr	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Zero Phase Green	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td></td><td></td></tr></table>	1	2	3	4	5	6			<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
1	2	3	4	5	6																	
Zero Olap Walk	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Zero Olap Ped Clr	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Zero Olap Green	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Phase Red	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Phase Red Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Phase Yel Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Olap Red Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Olap Yel Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Ped Dark	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Olap Ped Dark	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												

Rt 60 & 614

Preempt 4 (Configuration)

3/4/2025 8:30:37 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	4		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 4 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	0	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	0	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	4					
Dwell Ped Phases						
Dwell Olap						
Dwell Olap Ped						
Exit Veh Phases	2	6				
Exit Ped Phases						
Exit Olap						
Exit Olap Ped						
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green	1	2				
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Phases/Overlaps	1-8	9-16
TClr 1 FR Olap		
TClr 2 FR Olap		
Dwell FR Olap		
TClr 1 FYA		
TClr 2 FYA		
Dwell FYA		

Rt 60 & 614

Preempt 5 (Configuration)

3/4/2025 8:30:37 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	In Step
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	5		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 5 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	0	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	0	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases						
Dwell Ped Phases			Phases/Overlaps	1-8	9-16	
Dwell Olap			TClr 1 FR Olap			
Dwell Olap Ped			TClr 2 FR Olap			
Exit Veh Phases			Dwell FR Olap			
Exit Ped Phases			TClr 1 FYA			
Exit Olap			TClr 2 FYA			
Exit Olap Ped			Dwell FYA			
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green						
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Rt 60 & 614

TOD Pattern Events

3/4/2025 8:30:37 AM

	Time	DOW							Holidays							Mode	Pattern	Offset
Event 1	07:00		M	T	W	T	F									Sched	5	0
Event 2	09:00		M	T	W	T	F									Sched	5	0
Event 3	15:30		M	T	W	T	F									Sched	5	0
Event 4	20:00		M	T	W	T	F									Sched	0	0
Event 5	08:00	S						S								Sched	5	0
Event 6	20:00	S						S								Sched	0	0
Event 7	00:00															Sched	0	0
Event 8	00:00															Sched	0	0
Event 9	00:00															Sched	0	0
Event 10	00:00															Sched	0	0
Event 11	00:00															Sched	0	0
Event 12	00:00															Sched	0	0
Event 13	00:00															Sched	0	0
Event 14	00:00															Sched	0	0
Event 15	00:00															Sched	0	0
Event 16	00:00															Sched	0	0
Event 17	00:00															Sched	0	0
Event 18	00:00															Sched	0	0
Event 19	00:00															Sched	0	0
Event 20	00:00															Sched	0	0
Event 21	00:00															Sched	0	0
Event 22	00:00															Sched	0	0
Event 23	00:00															Sched	0	0
Event 24	00:00															Sched	0	0
Event 25	00:00															Sched	0	0
Event 26	00:00															Sched	0	0
Event 27	00:00															Sched	0	0
Event 28	00:00															Sched	0	0
Event 29	00:00															Sched	0	0
Event 30	00:00															Sched	0	0
Event 31	00:00															Sched	0	0
Event 32	00:00															Sched	0	0

Rt 60 & 614

Holidays

3/4/2025 8:30:37 AM

	Active Holidays							Month	Day	DOW							WOM
Date 1								0	0								0
Date 2								0	0								0
Date 3								0	0								0
Date 4								0	0								0
Date 5								0	0								0
Date 6								0	0								0
Date 7								0	0								0
Date 8								0	0								0
Date 9								0	0								0
Date 10								0	0								0
Date 11								0	0								0
Date 12								0	0								0
Date 13								0	0								0
Date 14								0	0								0
Date 15								0	0								0
Date 16								0	0								0
Date 17								0	0								0
Date 18								0	0								0
Date 19								0	0								0
Date 20								0	0								0
Date 21								0	0								0
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Date 24								0	0								0
Date 25								0	0								0
Date 26								0	0								0
Date 27								0	0								0
Date 28								0	0								0
Date 29								0	0								0
Date 30								0	0								0
Date 31								0	0								0
Date 32								0	0								0

Rt 60 & 614

Vehicle Detector 1

3/4/2025 8:30:37 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

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--	--	--	--	--	--	--	--

Extend Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

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Bike Call Phases

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--	--	--	--	--	--	--	--

Vehicle Detector 2

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

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Bike Call Phases

--	--	--	--	--	--	--	--

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Rt 60 & 614

Vehicle Detector 3

3/4/2025 8:30:37 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

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Extend Phases

					6		
--	--	--	--	--	---	--	--

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XSwitch Phases

--	--	--	--	--	--	--	--

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Bike Call Phases

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Vehicle Detector 4

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

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--	--	--	--	--	--	--	--

Red Lock Phases

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Extend Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

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Bike Call Phases

--	--	--	--	--	--	--	--

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Rt 60 & 614

Vehicle Detector 5

3/4/2025 8:30:37 AM

Delay Extend Carryover Queue Limit

Mode	No Disc	Added	Enabled	System	Enabled
------	---------	-------	---------	--------	---------

Fail Mode

None

 Max Pres

0

 No Act

0

 Erratic

0

 Fail Time

0

Delay 2

Phases	1-8	9-16
--------	-----	------

[illegible]

Vehicle Detector 6

Delay Extend Carryover Queue Limit

Mode	No Disc	Added	Enabled	System	Enabled
------	---------	-------	---------	--------	---------

Fail Mode	None	Max Pres	0	No Act	0	Erratic	0	Fail Time	0
-----------	------	----------	---	--------	---	---------	---	-----------	---

Delay 2	0.0
---------	-----

Phases	1-8	9-16
--------	-----	------

[illegible]

Rt 60 & 614

Vehicle Detector 7

3/4/2025 8:30:37 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

			4				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

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Red Lock Phases

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--	--	--	--	--	--	--	--

Extend Phases

			4				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 8

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

			4				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

			4				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 60 & 614

Vehicle Detector 9

3/4/2025 8:30:37 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

		4					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

		4					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 10

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

	2						
--	---	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

	2						
--	---	--	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 60 & 614

Vehicle Detector 11

3/4/2025 8:30:37 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

2															
2															

Yellow Lock Phases

Red Lock Phases

Extend Phases

XSwitch Phases

Bike Call Phases

Vehicle Detector 12

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

			5												
		5													

Yellow Lock Phases

Red Lock Phases

Extend Phases

XSwitch Phases

Bike Call Phases

Rt 60 & 614

Pedestrian Detector 5

3/4/2025 8:30:37 AM

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

5

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Pedestrian Detector 6

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

6

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Pedestrian Detector 7

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

7

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Pedestrian Detector 8

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

8

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Rt 60 & 614

Transit/LRV Startup/Options

3/4/2025 8:30:37 AM

No Startup Call

LRV 1-8

--	--	--	--	--	--	--	--

Warn Flash Rate

1 Hz

Rsrv Inh Mode

Seconds

Rt 60 & 614

Control / Config

3/4/2025 8:30:37 AM

Pattern Mode

Central

Manual Pattern

0

Manual Offset

0

Stop Time Input

Enabled

Aux Switch

None

0

DLS Mode

D4

Time Zone

Est (UTC-5)

GPS Thresh

0

Password Timeout

5

Maint Phs Recalls

1-8

9-16

Maint Ped Recalls

Serial 1 Port Configuration

Broadcast Plan/Sync

Disabled

Broadcast Time

00:00

Serial Rebroadcast

Disabled

Response

None

Serial 2 Port Configuration

Broadcast Plan/Sync

Disabled

Broadcast Time

00:00

Ethernet Port Configuration

Broadcast Plan/Sync

Disabled

Broadcast Time

00:00

Serial Rebroadcast

Disabled

Peer Configuration

Peer 1

0

Peer 2

0

Peer 3

0

Peer 4

0

Peer 5

0

Peer 6

0

Peer 7

0

Peer 8

0

Rt. 199 WB off ramp & 60

Phase Timing

3/4/2025 8:22:33 AM

[illegible]

Rt. 199 WB off ramp & 60

Phase Options

3/4/2025 8:22:33 AM

[illegible]

Rt. 199 WB off ramp & 60

Ring Sequence / Conflicting Phases

3/4/2025 8:22:33 AM

Ringgroup 1

[illegible]

Ringgroup 2

Custom Sequences

[illegible]

Conflicting Phases

1-8

9-16

[illegible]

Rt. 199 WB off ramp & 60

MCE Options

3/4/2025 8:22:33 AM

Phases

1-8

9-16

MCE Ped Protect		2		4		6		8									
MCE Veh Call	1	2	3	4	5	6	7	8									
MCE Ped Call		2		4		6		8									
MCE Veh Omit																	
MCE Ped Omit																	
MCE Veh Sync																	
MCE Ped Sync																	
MCE Halt Don't Walk																	

LRV Phases

1-8

MCE LRV Term Early								
--------------------	--	--	--	--	--	--	--	--

Rt. 199 WB off ramp & 60

FYA/FRA

3/4/2025 8:22:33 AM

FYA	1	2	3	4	5	6	7	8
Prot Phs	0	0	0	0	0	0	0	0
Opp Thru	0	0	0	0	0	0	0	0
Start Phs	0	0	0	0	0	0	0	0
Opp Ped	0	0	0	0	0	0	0	0
Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min FYA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skip Prot Red	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Head Mode	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1

Ped Hawk 1

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 2

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 3

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 4

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Rt. 199 WB off ramp & 60

Coordination Options

3/4/2025 8:22:33 AM

Sync Time 00:00

RTC Set Time 00:00

Transition Mode	Best 2
-----------------	--------

Ped Adjust	None
------------	------

Trans Short % Trans Long % 35

Offset Reference	Lag FO
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
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41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
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50	50
51	51
52	52
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54	54
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56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
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67	67
68	68
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70	70
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72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99

Short Cycles

0

Dual Entry

Normal

Overlap F/O Disabled

Master Sync Mode	RTC
------------------	-----

Master Sync Length	0
--------------------	---

Adapt Thresh	0
--------------	---

Adapt Step	0
------------	---

External Plan Max	0
-------------------	---

Hardwire No Match	Sched
-------------------	-------

Hardwire Sync Fail	0
--------------------	---

Override Omit/Recall	No
----------------------	----

Phases 1-8

9-16

No Trans Recall							

--	--	--	--	--	--	--	--

Trans Ped Recall							
------------------	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Trans Phases							
--------------	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt. 199 WB off ramp & 60

Hardwire Plans

3/4/2025 8:22:33 AM

Hardwire	Plan Select							Pattern	Offset	Mode
Plan 1								0	0	Hardwire
Plan 2								0	0	Hardwire
Plan 3								0	0	Hardwire
Plan 4								0	0	Hardwire
Plan 5								0	0	Hardwire
Plan 6								0	0	Hardwire
Plan 7								0	0	Hardwire
Plan 8								0	0	Hardwire
Plan 9								0	0	Hardwire
Plan 10								0	0	Hardwire
Plan 11								0	0	Hardwire
Plan 12								0	0	Hardwire
Plan 13								0	0	Hardwire
Plan 14								0	0	Hardwire
Plan 15								0	0	Hardwire
Plan 16								0	0	Hardwire
Plan 17								0	0	Hardwire
Plan 18								0	0	Hardwire
Plan 19								0	0	Hardwire
Plan 20								0	0	Hardwire
Plan 21								0	0	Hardwire
Plan 22								0	0	Hardwire
Plan 23								0	0	Hardwire
Plan 24								0	0	Hardwire
Plan 25								0	0	Hardwire
Plan 26								0	0	Hardwire
Plan 27								0	0	Hardwire
Plan 28								0	0	Hardwire
Plan 29								0	0	Hardwire
Plan 30								0	0	Hardwire
Plan 31								0	0	Hardwire
Plan 32								0	0	Hardwire

Rt. 199 WB off ramp & 60

Soft Interconnect

3/4/2025 8:22:33 AM

Mode	Slave
------	-------

Remote Int Number	0
-------------------	---

Yield Delay	0
-------------	---

Yield Duration

Permissive	0
------------	---

Local Hold Limit	0
------------------	---

Phases

1-8

9-16

Local Control Phases

Local Hold Phases

Local Perm Phases

Local Call Phases

Remote Perm Phases

Remote Hold Phases

Rt. 199 WB off ramp & 60

Coordination Pattern 1

3/4/2025 8:22:33 AM

Cycle 110 Ringgroup 1 - Offset 1 36 Offset 2 0 Offset 3 0

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max Inh	Walk Rest	Yield
-----------------	-----------	----------	---------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit	0
------------------	---

Perm 2 Start

0

Perm 2 End

0

Alt Sequence	1						
--------------	---	--	--	--	--	--	--

TOD Link

0

[illegible]

Trans Mode	Default
------------	---------

Offset Ref	Default
------------	---------

Adaptive Mode	Disabled
---------------	----------

Disable Priority							
------------------	--	--	--	--	--	--	--

Progression Phases	Phase 1: Initial Assessment & Planning							Phase 2: Data Collection & Analysis						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Initial Assessment														
2. Data Collection														
3. Data Analysis														
4. Interpretation														
5. Reporting														
6. Review														
7. Final Report														

[illegible]

Reserve Extend							
----------------	--	--	--	--	--	--	--

[illegible]

Rt. 199 WB off ramp & 60

Coordination Pattern 1

3/4/2025 8:22:33 AM

[illegible]

Rt. 199 WB off ramp & 60

Coordination Pattern 2

3/4/2025 8:22:33 AM

Cycle 130 Ringgroup 1 - Offset 1 120 Offset 2 0 Offset 3 0

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max Inh	Walk Rest	Yield
-----------------	-----------	----------	---------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit	0
------------------	---

Perm 2 Start

0

Perm 2 End

0

Alt Sequence	1						
--------------	---	--	--	--	--	--	--

TOD Link

0

Phases/Overlaps

1-8

9-16

Trans Mode	Default
------------	---------

[illegible]

No Extend												
-----------	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Veh = Ped Perm										
----------------	--	--	--	--	--	--	--	--	--	--

Walk											
Rest											

Ped Recall												
------------	--	--	--	--	--	--	--	--	--	--	--	--

Cond Ped Call															
---------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Olap Ped Recall															
-----------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Min Recall												
------------	--	--	--	--	--	--	--	--	--	--	--	--

Max Recall															
------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Cond Serv															
-----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Veh Omit															
----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Ped Omit															
----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Olap	Omit

Term Reserve												
--------------	--	--	--	--	--	--	--	--	--	--	--	--

Perm 1 Phases												
---------------	--	--	--	--	--	--	--	--	--	--	--	--

Max Inhibit												
-------------	--	--	--	--	--	--	--	--	--	--	--	--

FYA Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

Adapt Phases															
--------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Offset Ref	Default
------------	---------

Offset Ref	Default
------------	---------

Adaptive Mode	Disabled
---------------	----------

Disable Priority							
------------------	--	--	--	--	--	--	--

Progression Phases	Phase 1: Initial Assessment						Phase 2: Core Skill Development						Phase 3: Advanced Application					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
1. Initial Assessment																		
2. Core Skill Development																		
3. Advanced Application																		
4. Final Evaluation																		

Priority	Alt	Seq

Reserve Extend							
----------------	--	--	--	--	--	--	--

[illegible]

Priority Timing-Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
-----------------------	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----

[illegible][illegible]

Rt. 199 WB off ramp & 60

Coordination Pattern 2

3/4/2025 8:22:33 AM

[illegible]

Rt. 199 WB off ramp & 60

Coordination Pattern 3

3/4/2025 8:22:33 AM

Cycle 140 Ringgroup 1 - Offset 1 8 Offset 2 0 Offset 3 0

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max Inh	Walk Rest	Yield
-----------------	-----------	----------	---------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit	0
------------------	---

Perm 2 Start

0

Perm 2 End

0

Alt Sequence	1						
--------------	---	--	--	--	--	--	--

TOD Link

0

Phases/Overlaps

1-8

9-16

Trans Mode	Default
------------	---------

[illegible][illegible][illegible]

Veh = Ped Perm												
----------------	--	--	--	--	--	--	--	--	--	--	--	--

Walk Rest												
-----------	--	--	--	--	--	--	--	--	--	--	--	--

Ped Recall												
------------	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Olap Ped Recall															
-----------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Min Recall												
------------	--	--	--	--	--	--	--	--	--	--	--	--

Max Recall															
------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Cond Serv															
-----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Veh Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

[illegible][illegible]

Term Reserve										
--------------	--	--	--	--	--	--	--	--	--	--

Perm 1 Phases												
---------------	--	--	--	--	--	--	--	--	--	--	--	--

Max Inhibit												
-------------	--	--	--	--	--	--	--	--	--	--	--	--

FYA Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

Adapt Phases												
--------------	--	--	--	--	--	--	--	--	--	--	--	--

Offset Ref	Default
------------	---------

Offset Ref	Default
------------	---------

Adaptive Mode	Disabled
---------------	----------

Adaptive Mode	Disabled
---------------	----------

Disable Priority							
------------------	--	--	--	--	--	--	--

[illegible][illegible]

Reserve Extend									
----------------	--	--	--	--	--	--	--	--	--

[illegible]

Rt. 199 WB off ramp & 60

Coordination Pattern 3

3/4/2025 8:22:33 AM

[illegible]

Rt. 199 WB off ramp & 60

Coordination Pattern 4

3/4/2025 8:22:33 AM

Cycle 130 Ringgroup 1 - Offset 1 0 Offset 2 0 Offset 3 0

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max Inh	Walk Rest	Yield
-----------------	-----------	----------	---------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit	0
------------------	---

Perm 2 Start

0

Perm 2 End

0

Alt Sequence

--	--	--	--	--	--	--	--

TOD Link

0

Phases/Overlaps

1-8

9-16

Trans Mode	Default
------------	---------

[illegible][illegible][illegible]

Veh = Ped Perm												
----------------	--	--	--	--	--	--	--	--	--	--	--	--

Walk Rest												
-----------	--	--	--	--	--	--	--	--	--	--	--	--

Ped Recall												
------------	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Olap Ped Recall												
-----------------	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Min Recall												
------------	--	--	--	--	--	--	--	--	--	--	--	--

Max Recall															
------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Cond Serv															
-----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Veh Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

Ped Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Term Reserve										
--------------	--	--	--	--	--	--	--	--	--	--

Perm 1 Phases												
---------------	--	--	--	--	--	--	--	--	--	--	--	--

Max Inhibit												
-------------	--	--	--	--	--	--	--	--	--	--	--	--

FYA Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Offset Ref	Default
------------	---------

Offset Ref	Default
------------	---------

Adaptive Mode	Disabled
---------------	----------

[illegible]

Progression Phases	Phase 1: Initial Assessment						Phase 2: Core Skill Development						Phase 3: Advanced Application					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
1. Initial Assessment																		
2. Core Skill Development																		
3. Advanced Application																		
4. Final Review																		

	Seq	Alt	Priority
Priority Alt Seq			

Reserve Extend							
----------------	--	--	--	--	--	--	--

[illegible]

Priority Timing-Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
-----------------------	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----

[illegible][illegible]

Rt. 199 WB off ramp & 60

Coordination Pattern 4

3/4/2025 8:22:33 AM

[illegible]

Rt. 199 WB off ramp & 60

Preempt Inputs

3/4/2025 8:22:33 AM

Preempt Input	1	2	3	4	5	6	7	8	9	10
Delay	0	0	0	0	0	0	0	0	0	0
Checkout Limit	0	0	0	0	0	0	0	0	0	0
Locked	No	No	No	No	No	No	No	No	No	No
Interlock	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Input Number	0	0	0	0	0	0	0	0	0	0
Input Priority	All	All	All	All	All	All	All	All	All	All
Delay Mode	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp

Preempt Priority

Preempt	1	2	3	4	5	6	7	8	9	10
Priority	0	0	0	0	0	0	0	0	0	0

Remote Preemption

Remote Preempt	RM 1	RM 2	RM 3	RM 4	RM 5	RM 6	RM 7	RM 8
Int Number	0	0	0	0	0	0	0	0
PE Number	0	0	0	0	0	0	0	0
Mode	Dis	Dis	Dis	Dis	Dis	Dis	Dis	Dis
Slack	0	0	0	0	0	0	0	0
Travel Time	0	0	0	0	0	0	0	0
Alt TT 1	0	0	0	0	0	0	0	0
Alt TT 2	0	0	0	0	0	0	0	0
Alt TT 3	0	0	0	0	0	0	0	0
Alt TT 4	0	0	0	0	0	0	0	0
Alt TT 5	0	0	0	0	0	0	0	0
Alt TT 6	0	0	0	0	0	0	0	0
Alt TT 7	0	0	0	0	0	0	0	0

Rt. 199 WB off ramp & 60

Preempt 1 (Configuration)

3/4/2025 8:22:33 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8																						
Enable Phases	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	LRV Disable	☐	☐	☐	☐	☐	☐	☐	Max	0
Preempt Inputs	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	LRV Dwell Flash	☐	☐	☐	☐	☐	☐	☐		
																	LRV Omit	☐	☐	☐	☐	☐	☐	☐	Delay	0
																	LRV No Yel	☐	☐	☐	☐	☐	☐	☐		

Preempt 1 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8						9-16					
Omit Olap Grn Clr												
Phs EWlk to Grn												
TClr 1 Veh Phases												
TClr 1 Ped Phases												
TClr 1 Olap												
TClr 1 Olap Ped												
TClr 2 Veh Phases												
TClr 2 Ped Phases												
TClr 2 Olap												
TClr 2 Olap Ped												
Init Dwell Phases												
Dwell Veh Phases	1					6						
Dwell Ped Phases												
Dwell Olap												
Dwell Olap Ped												
Exit Veh Phases	2					6						
Exit Ped Phases												
Exit Olap												
Exit Olap Ped												
Zero Phase Walk												
Zero Phase Ped Clr												
Zero Phase Green	1	2	3	4	5	6						
Zero Olap Walk												
Zero Olap Ped Clr												
Zero Olap Green												
Dwell-Phase Red												
Dwell-Phase Red Flash												
Dwell-Phase Yel Flash												
Dwell-Olap Red Flash												
Dwell-Olap Yel Flash												
Dwell-Ped Dark												
Dwell-Olap Ped Dark												

Start Green

0

Start Walk

0

Start Ped Clr

0

Track Clear 1

0

Track Clear 2

0

TC1 Extend

0

TC1 Max

0

Exit Ped Clr

0

Exit Yellow

0.0

Exit Red

0.0

Min Dwell

0

Min Duration

0

Dwell Extend

0

Max Dwell

0

Max Call

180

Reserve Inh Same

0

Reserve Inh All

0

Delay

0

Phases/Overlaps

TClr 1 FR Olap

TClr 2 FR Olap

Dwell FR Olap

TClr 1 FYA

TClr 2 FYA

Dwell FYA

1-8

9-16

Rt. 199 WB off ramp & 60

Preempt 2 (Configuration)

3/4/2025 8:22:33 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	2		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 2 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	0	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	0	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	2					
Dwell Ped Phases						
Dwell Olap						
Dwell Olap Ped						
Exit Veh Phases	2	6				
Exit Ped Phases						
Exit Olap						
Exit Olap Ped						
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green	1	2				
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Phases/Overlaps	1-8	9-16
TClr 1 FR Olap		
TClr 2 FR Olap		
Dwell FR Olap		
TClr 1 FYA		
TClr 2 FYA		
Dwell FYA		

Rt. 199 WB off ramp & 60

Preempt 4 (Configuration)

3/4/2025 8:22:33 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8																																										
Enable Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>4</td><td></td><td></td><td></td><td></td><td></td></tr></table>											4						<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	LRV Disable	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Max	0
		4																																												
Preempt Inputs								LRV Dwell Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																					
								LRV Omit	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Delay	0																											
								LRV No Yel	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																					

Preempt 4 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0																
Omit Olap Grn Clr	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>											Start Ped Clr	0
Phs EWlk to Grn	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Exit Red	0.0		
TClr 1 Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Min Dwell	10	Min Duration	0
TClr 2 Veh Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Dwell Extend	0		
TClr 2 Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Max Dwell	0	Max Call	180
TClr 2 Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Reserve Inh Same	0		
TClr 2 Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Reserve Inh All	0		
Init Dwell Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Delay	0		
Dwell Veh Phases	<table><tr><td></td><td></td><td>4</td><td></td><td></td><td></td><td></td><td></td></tr></table>			4						<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
		4																				
Dwell Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Exit Veh Phases	<table><tr><td></td><td>2</td><td></td><td></td><td>6</td><td></td><td></td><td></td></tr></table>		2			6				<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
	2			6																		
Exit Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Exit Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Exit Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Zero Phase Walk	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Zero Phase Ped Clr	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Zero Phase Green	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td></td><td></td></tr></table>	1	2	3	4	5	6			<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
1	2	3	4	5	6																	
Zero Olap Walk	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Zero Olap Ped Clr	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Zero Olap Green	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Phase Red	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Phase Red Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Phase Yel Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Olap Red Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Olap Yel Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Ped Dark	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Olap Ped Dark	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												

Rt. 199 WB off ramp & 60

Preempt 6 (Configuration)

3/4/2025 8:22:33 AM

Enabled	Yes	Dwell Mode	Flash	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	6		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 6 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	10	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	180	Max Call	0
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	1	6				
Dwell Ped Phases			Phases/Overlaps	1-8	9-16	
Dwell Olap			TClr 1 FR Olap			
Dwell Olap Ped			TClr 2 FR Olap			
Exit Veh Phases			Dwell FR Olap			
Exit Ped Phases			TClr 1 FYA			
Exit Olap			TClr 2 FYA			
Exit Olap Ped			Dwell FYA	5		
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green						
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Rt. 199 WB off ramp & 60

TOD Pattern Events

3/4/2025 8:22:33 AM

	Time	DOW							Holidays							Mode	Pattern	Offset
Event 1	07:00		M	T	W	T	F									Sched	4	1
Event 2	09:00		M	T	W	T	F									Sched	4	1
Event 3	15:30		M	T	W	T	F									Sched	4	1
Event 4	20:00		M	T	W	T	F									Free	0	0
Event 5	08:00	S						S								Sched	4	1
Event 6	20:00	S						S								Free	0	0
Event 7	00:00															Sched	0	0
Event 8	00:00															Sched	0	0
Event 9	00:00															Sched	0	0
Event 10	00:00															Sched	0	0
Event 11	00:00															Sched	0	0
Event 12	00:00															Sched	0	0
Event 13	00:00															Sched	0	0
Event 14	00:00															Sched	0	0
Event 15	00:00															Sched	0	0
Event 16	00:00															Sched	0	0
Event 17	00:00															Sched	0	0
Event 18	00:00															Sched	0	0
Event 19	00:00															Sched	0	0
Event 20	00:00															Sched	0	0
Event 21	00:00															Sched	0	0
Event 22	00:00															Sched	0	0
Event 23	00:00															Sched	0	0
Event 24	00:00															Sched	0	0
Event 25	00:00															Sched	0	0
Event 26	00:00															Sched	0	0
Event 27	00:00															Sched	0	0
Event 28	00:00															Sched	0	0
Event 29	00:00															Sched	0	0
Event 30	00:00															Sched	0	0
Event 31	00:00															Sched	0	0
Event 32	00:00															Sched	0	0

Rt. 199 WB off ramp & 60

Holidays

3/4/2025 8:22:33 AM

	Active Holidays							Month	Day	DOW							WOM
Date 1								0	0								0
Date 2								0	0								0
Date 3								0	0								0
Date 4								0	0								0
Date 5								0	0								0
Date 6								0	0								0
Date 7								0	0								0
Date 8								0	0								0
Date 9								0	0								0
Date 10								0	0								0
Date 11								0	0								0
Date 12								0	0								0
Date 13								0	0								0
Date 14								0	0								0
Date 15								0	0								0
Date 16								0	0								0
Date 17								0	0								0
Date 18								0	0								0
Date 19								0	0								0
Date 20								0	0								0
Date 21								0	0								0
Date 22								0	0								0
Date 23								0	0								0
Date 24								0	0								0
Date 25								0	0								0
Date 26								0	0								0
Date 27								0	0								0
Date 28								0	0								0
Date 29								0	0								0
Date 30								0	0								0
Date 31								0	0								0
Date 32								0	0								0

Rt. 199 WB off ramp & 60

Vehicle Detector 1

3/4/2025 8:22:33 AM

Delay Extend Carryover Queue Limit

Mode	No Disc	Added	Disabled	System	Enabled
------	---------	-------	----------	--------	---------

Fail Mode	None	Max Pres	0	No Act	0	Erratic	0	Fail Time	0
-----------	------	----------	---	--------	---	---------	---	-----------	---

Delay 2	0.0
---------	-----

Phases	1-8	9-16
--------	-----	------

[illegible]

Vehicle Detector 2

Delay Extend Carryover Queue Limit

Mode	No Disc	Added	Disabled	System	Disabled
------	---------	-------	----------	--------	----------

Fail Mode	None	Max Pres	0	No Act	0	Erratic	0	Fail Time	0
-----------	------	----------	---	--------	---	---------	---	-----------	---

Delay 2	0.0
---------	-----

Phases	1-8	9-16
--------	-----	------

[illegible]

Rt. 199 WB off ramp & 60

Vehicle Detector 4

3/4/2025 8:22:33 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

			4				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

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Extend Phases

			4				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

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Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 6

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

				6			
--	--	--	--	---	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

				6			
--	--	--	--	---	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

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Bike Call Phases

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--	--	--	--	--	--	--	--

Rt. 199 WB off ramp & 60

Vehicle Detector 7

3/4/2025 8:22:33 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

						7	
--	--	--	--	--	--	---	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

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--	--	--	--	--	--	--	--

Extend Phases

						7	
--	--	--	--	--	--	---	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

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--	--	--	--	--	--	--	--

Vehicle Detector 8

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

							8
--	--	--	--	--	--	--	---

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

							8
--	--	--	--	--	--	--	---

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

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--	--	--	--	--	--	--	--

Rt. 199 WB off ramp & 60

Pedestrian Detector 2

3/4/2025 8:22:33 AM

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Pedestrian Detector 4

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Pedestrian Detector 6

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Pedestrian Detector 8

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Rt. 199 WB off ramp & 60

Transit/LRV Startup/Options

3/4/2025 8:22:33 AM

No Startup Call

--	--	--	--	--	--	--	--

LRV 1-8

Warn Flash Rate

1 Hz

Rsrv Inh Mode

Seconds

Rt. 199 WB off ramp & 60

Control / Config

3/4/2025 8:22:33 AM

Pattern Mode

Manual Pattern Manual Offset

Stop Time Input

Aux Switch

DLS Mode Time Zone

GPS Thresh

Password Timeout

Maint Phs Recalls

1-8								9-16							

Maint Ped Recalls

----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------

Serial 1 Port Configuration

Broadcast Plan/Sync

Broadcast Time

Serial Rebroadcast

Response

Serial 2 Port Configuration

Broadcast Plan/Sync

Broadcast Time

Ethernet Port Configuration

Broadcast Plan/Sync

Broadcast Time

Serial Rebroadcast

Peer Configuration

Peer 1

Peer 2

Peer 3

Peer 4

Peer 5

Peer 6

Peer 7

Peer 8

Rt. 199 EB off ramp & 60 Piano

Phase Timing

3/4/2025 8:27:43 AM

[illegible]

Rt. 199 EB off ramp & 60 Piano

Phase Options

3/4/2025 8:27:43 AM

[illegible]

Rt. 199 EB off ramp & 60 Piano

Phase Startup Options

3/4/2025 8:27:43 AM

[illegible]

Phase Startup Timing

[illegible]

Unit

Red Revert	0.0	Ped Protect	No	AdvFls in Flash	No
------------	-----	-------------	----	-----------------	----

Rt. 199 EB off ramp & 60 Piano

Ring Sequence / Conflicting Phases

3/4/2025 8:27:43 AM

Ringgroup 1

[illegible]

Ringgroup 2

Custom Sequences

[illegible]

Conflicting Phases

1-8

9-16

[illegible]

Rt. 199 EB off ramp & 60 Piano

MCE Options

3/4/2025 8:27:43 AM

Phases

1-8

9-16

MCE Ped Protect		2		4		6		8								
MCE Veh Call	1	2	3	4	5	6	7	8								
MCE Ped Call		2		4		6		8								
MCE Veh Omit																
MCE Ped Omit																
MCE Veh Sync																
MCE Ped Sync																
MCE Halt Don't Walk																

LRV Phases

1-8

MCE LRV Term Early								
--------------------	--	--	--	--	--	--	--	--

Rt. 199 EB off ramp & 60 Piano

FYA/FRA

3/4/2025 8:27:43 AM

FYA	1	2	3	4	5	6	7	8
Prot Phs	0	0	0	0	0	0	0	0
Opp Thru	0	0	0	0	0	0	0	0
Start Phs	0	0	0	0	0	0	0	0
Opp Ped	0	0	0	0	0	0	0	0
Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min FYA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skip Prot Red	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Head Mode	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1

Ped Hawk 1

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 2

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 3

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 4

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Rt. 199 EB off ramp & 60 Piano

Coordination Options

3/4/2025 8:27:43 AM

Sync Time	00:00	RTC Set Time	00:00	
Transition Mode	Best 2	Ped Adjust	None	
Trans Short %	20	Trans Long %	35	
Offset Reference	Lag FO	Short Cycles	0	
Dual Entry	Normal	Overlap F/O	Disabled	
Master Sync Mode	RTC	Master Sync Length	0	
Adapt Thresh	0	Adapt Step	0	
External Plan Max	0			
Hardwire No Match	Sched	Hardwire Sync Fail	0	
Override Omit/Recall	No			
Phases	1-8	9-16		
No Trans Recall	☐	☐	☐	☐
Trans Ped Recall	☐	☐	☐	☐
Trans Phases	☐	☐	☐	☐

Rt. 199 EB off ramp & 60 Piano

Hardwire Plans

3/4/2025 8:27:43 AM

Hardwire	Plan Select								Pattern	Offset	Mode
Plan 1									0	0	Hardwire
Plan 2									0	0	Hardwire
Plan 3									0	0	Hardwire
Plan 4									0	0	Hardwire
Plan 5									0	0	Hardwire
Plan 6									0	0	Hardwire
Plan 7									0	0	Hardwire
Plan 8									0	0	Hardwire
Plan 9									0	0	Hardwire
Plan 10									0	0	Hardwire
Plan 11									0	0	Hardwire
Plan 12									0	0	Hardwire
Plan 13									0	0	Hardwire
Plan 14									0	0	Hardwire
Plan 15									0	0	Hardwire
Plan 16									0	0	Hardwire
Plan 17									0	0	Hardwire
Plan 18									0	0	Hardwire
Plan 19									0	0	Hardwire
Plan 20									0	0	Hardwire
Plan 21									0	0	Hardwire
Plan 22									0	0	Hardwire
Plan 23									0	0	Hardwire
Plan 24									0	0	Hardwire
Plan 25									0	0	Hardwire
Plan 26									0	0	Hardwire
Plan 27									0	0	Hardwire
Plan 28									0	0	Hardwire
Plan 29									0	0	Hardwire
Plan 30									0	0	Hardwire
Plan 31									0	0	Hardwire
Plan 32									0	0	Hardwire

Rt. 199 EB off ramp & 60 Piano

Soft Interconnect

3/4/2025 8:27:43 AM

Mode	Slave
------	-------

Remote Int Number 0

Yield Delay Yield Duration

Permissive	0
------------	---

Local Hold Limit	0
------------------	---

Phases

1-8

9-16

Local Control Phases

Local Hold Phases

Local Perm Phases

Local Call Phases

Remote Perm Phases

Remote Hold Phases

Rt. 199 EB off ramp & 60 Piano

Coordination Pattern 4

3/4/2025 8:27:43 AM

Cycle 130 Ringgroup 1 - Offset 1 124 Offset 2 0 Offset 3 0

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max 2	Walk Rest	Yield
-----------------	-----------	----------	-------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit	15	Perm 2 Start	0	Perm 2 End	0
------------------	----	--------------	---	------------	---

Alt Sequence		TOD Link	0
--------------	---	----------	------------------------------------

Phases/Overlaps	1-8	9-16
-----------------	-----	------

Trans Mode	Default
------------	---------

Offset Ref	Default
------------	---------

Adaptive Mode	Disabled
---------------	----------

Disable Priority							
------------------	--	--	--	--	--	--	--

Progression Phases	Phase 1: Initial Assessment						Phase 2: Core Skill Development						Phase 3: Advanced Application					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
1. Initial Assessment																		
2. Core Skill Development																		
3. Advanced Application																		

Priority	Alt	Seq

Reserve Extend							
----------------	--	--	--	--	--	--	--

[illegible][illegible]

Rt. 199 EB off ramp & 60 Piano

Coordination Pattern 4

3/4/2025 8:27:43 AM

[illegible]

Rt. 199 EB off ramp & 60 Piano

Coordination Pattern 5

3/4/2025 8:27:43 AM

Cycle 130 Ringgroup 1 - Offset 1 0 Offset 2 0 Offset 3 0

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max 2	Walk Rest	Yield
-----------------	-----------	----------	-------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit	15
------------------	----

Perm 2 Start

0

Perm 2 End

0

Alt Sequence

--	--	--	--	--	--	--	--

TOD Link

0

Phases/Overlaps

1-8

9-16

Trans Mode	Default
------------	---------

[illegible]

Offset Ref	Default
------------	---------

[illegible]

Adaptive Mode	Disabled
---------------	----------

Float Enable												
--------------	--	--	--	--	--	--	--	--	--	--	--	--

Veh = Ped Perm												
----------------	--	--	--	--	--	--	--	--	--	--	--	--

Walk Rest															
-----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Ped Recall															
------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Cond Ped Call												
---------------	--	--	--	--	--	--	--	--	--	--	--	--

Olap Ped Recall												
-----------------	--	--	--	--	--	--	--	--	--	--	--	--

Ped Recycle															
-------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Min Recall															
------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Max Recall														
------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Cond Serv												
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[illegible]

Veh Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

Ped Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Term Reserve												
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Perm 1 Phases												
---------------	--	--	--	--	--	--	--	--	--	--	--	--

Max Inhibit												
-------------	--	--	--	--	--	--	--	--	--	--	--	--

FYA Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

Adapt Phases												
--------------	--	--	--	--	--	--	--	--	--	--	--	--

Priority Timing-Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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[illegible][illegible]

Rt. 199 EB off ramp & 60 Piano

Coordination Pattern 5

3/4/2025 8:27:43 AM

[illegible]

Rt. 199 EB off ramp & 60 Piano

Preempt Inputs

3/4/2025 8:27:43 AM

Preempt Input	1	2	3	4	5	6	7	8	9	10
Delay	0	0	0	0	0	0	0	0	0	0
Checkout Limit	0	0	0	0	0	0	0	0	0	0
Locked	No	No	No	No	No	No	No	No	No	No
Interlock	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Input Number	0	0	0	0	0	0	0	0	0	0
Input Priority	All	All	All	All	All	All	All	All	All	All
Delay Mode	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp

Preempt Priority

Preempt	1	2	3	4	5	6	7	8	9	10
Priority	0	0	0	0	0	0	0	0	0	0

Remote Preemption

Remote Preempt	RM 1	RM 2	RM 3	RM 4	RM 5	RM 6	RM 7	RM 8
Int Number	0	0	0	0	0	0	0	0
PE Number	0	0	0	0	0	0	0	0
Mode	Dis	Dis	Dis	Dis	Dis	Dis	Dis	Dis
Slack	0	0	0	0	0	0	0	0
Travel Time	0	0	0	0	0	0	0	0
Alt TT 1	0	0	0	0	0	0	0	0
Alt TT 2	0	0	0	0	0	0	0	0
Alt TT 3	0	0	0	0	0	0	0	0
Alt TT 4	0	0	0	0	0	0	0	0
Alt TT 5	0	0	0	0	0	0	0	0
Alt TT 6	0	0	0	0	0	0	0	0
Alt TT 7	0	0	0	0	0	0	0	0

Rt. 199 EB off ramp & 60 Piano

Preempt 1 (Configuration)

3/4/2025 8:27:43 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

[illegible]

Preempt 1 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8						9-16					
Omit Olap Grn Clr												
Phs EWlk to Grn												
TClr 1 Veh Phases												
TClr 1 Ped Phases												
TClr 1 Olap												
TClr 1 Olap Ped												
TClr 2 Veh Phases												
TClr 2 Ped Phases												
TClr 2 Olap												
TClr 2 Olap Ped												
Init Dwell Phases												
Dwell Veh Phases	1					6						
Dwell Ped Phases												
Dwell Olap												
Dwell Olap Ped												
Exit Veh Phases	2					6						
Exit Ped Phases												
Exit Olap												
Exit Olap Ped												
Zero Phase Walk												
Zero Phase Ped Clr												
Zero Phase Green	1	2	3	4	5	6						
Zero Olap Walk												
Zero Olap Ped Clr												
Zero Olap Green												
Dwell-Phase Red												
Dwell-Phase Red Flash												
Dwell-Phase Yel Flash												
Dwell-Olap Red Flash												
Dwell-Olap Yel Flash												
Dwell-Ped Dark												
Dwell-Olap Ped Dark												

Start Green

0

Start Walk

0

Start Ped Clr

0

Track Clear 1

0

Track Clear 2

0

TC1 Extend

0

TC1 Max

0

Exit Ped Clr

0

Exit Yellow

0.0

Exit Red

0.0

Min Dwell

0

Min Duration

0

Dwell Extend

0

Max Dwell

0

Max Call

180

Reserve Inh Same

0

Reserve Inh All

0

Delay

0

Phases/Overlaps

TClr 1 FR Olap

TClr 2 FR Olap

Dwell FR Olap

TClr 1 FYA

TClr 2 FYA

Dwell FYA

1-8

9-16

Rt. 199 EB off ramp & 60 Piano

Preempt 2 (Configuration)

3/4/2025 8:27:43 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	2		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 2 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	0	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	0	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	2		Phases/Overlaps	1-8	9-16	
Dwell Ped Phases			TClr 1 FR Olap			
Dwell Olap			TClr 2 FR Olap			
Dwell Olap Ped			Dwell FR Olap			
Exit Veh Phases	2	6	TClr 1 FYA			
Exit Ped Phases			TClr 2 FYA			
Exit Olap			Dwell FYA			
Exit Olap Ped						
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green	1	2				
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Rt. 199 EB off ramp & 60 Piano

Preempt 4 (Configuration)

3/4/2025 8:27:43 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	4		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 4 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	10	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	180	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	4					
Dwell Ped Phases						
Dwell Olap						
Dwell Olap Ped						
Exit Veh Phases	2	6				
Exit Ped Phases						
Exit Olap						
Exit Olap Ped						
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green	1	2				
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Rt. 199 EB off ramp & 60 Piano

Preempt 6 (Configuration)

3/4/2025 8:27:43 AM

Enabled	Yes	Dwell Mode	Flash	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8																																																		
Enable Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	LRV Disable	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	Max	0
Preempt Inputs	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	LRV Dwell Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																		
								LRV Omit	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	Delay	0																											
								LRV No Yel	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																													

Preempt 6 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0																																																																																																																																																																																																																																														
Omit Olap Grn Clr	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																			Start Ped Clr	0																																																																																																																																																																																																														
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Rt. 199 EB off ramp & 60 Piano

TOD Pattern Events

3/4/2025 8:27:43 AM

	Time	DOW							Holidays							Mode	Pattern	Offset
Event 1	07:00		M	T	W	T	F									Sched	5	0
Event 2	09:00		M	T	W	T	F									Sched	5	0
Event 3	15:30		M	T	W	T	F									Sched	5	0
Event 4	20:00		M	T	W	T	F									Sched	0	0
Event 5	08:00	S						S								Sched	5	0
Event 6	20:00	S						S								Sched	0	0
Event 7	00:00															Sched	0	0
Event 8	00:00															Sched	0	0
Event 9	00:00															Sched	0	0
Event 10	00:00															Sched	0	0
Event 11	00:00															Sched	0	0
Event 12	00:00															Sched	0	0
Event 13	00:00															Sched	0	0
Event 14	00:00															Sched	0	0
Event 15	00:00															Sched	0	0
Event 16	00:00															Sched	0	0
Event 17	00:00															Sched	0	0
Event 18	00:00															Sched	0	0
Event 19	00:00															Sched	0	0
Event 20	00:00															Sched	0	0
Event 21	00:00															Sched	0	0
Event 22	00:00															Sched	0	0
Event 23	00:00															Sched	0	0
Event 24	00:00															Sched	0	0
Event 25	00:00															Sched	0	0
Event 26	00:00															Sched	0	0
Event 27	00:00															Sched	0	0
Event 28	00:00															Sched	0	0
Event 29	00:00															Sched	0	0
Event 30	00:00															Sched	0	0
Event 31	00:00															Sched	0	0
Event 32	00:00															Sched	0	0

Rt. 199 EB off ramp & 60 Piano

Holidays

3/4/2025 8:27:43 AM

	Active Holidays	Month	Day	DOW	WOM
Date 1		0	0		0
Date 2		0	0		0
Date 3		0	0		0
Date 4		0	0		0
Date 5		0	0		0
Date 6		0	0		0
Date 7		0	0		0
Date 8		0	0		0
Date 9		0	0		0
Date 10		0	0		0
Date 11		0	0		0
Date 12		0	0		0
Date 13		0	0		0
Date 14		0	0		0
Date 15		0	0		0
Date 16		0	0		0
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Date 18		0	0		0
Date 19		0	0		0
Date 20		0	0		0
Date 21		0	0		0
Date 22		0	0		0
Date 23		0	0		0
Date 24		0	0		0
Date 25		0	0		0
Date 26		0	0		0
Date 27		0	0		0
Date 28		0	0		0
Date 29		0	0		0
Date 30		0	0		0
Date 31		0	0		0
Date 32		0	0		0

Rt. 199 EB off ramp & 60 Piano

Vehicle Detector 1

3/4/2025 8:27:43 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

					6		
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Yellow Lock Phases

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Red Lock Phases

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Extend Phases

					6		
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XSwitch Phases

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Bike Call Phases

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Vehicle Detector 2

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

					6		
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Yellow Lock Phases

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Red Lock Phases

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Extend Phases

					6		
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XSwitch Phases

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Bike Call Phases

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--	--	--	--	--	--	--	--

Rt. 199 EB off ramp & 60 Piano

Vehicle Detector 3

3/4/2025 8:27:43 AM

Delay Extend Carryover Queue Limit

Mode	No Disc	Added	Enabled	System	Enabled
------	---------	-------	---------	--------	---------

Fail Mode None Max Pres 0 No Act 0 Erratic 0 Fail Time 0

Delay 2

Phases	1-8	9-16
--------	-----	------

[illegible]

Vehicle Detector 4

Delay Extend Carryover Queue Limit

Mode	No Disc	Added	Enabled	System	Enabled
------	---------	-------	---------	--------	---------

Fail Mode	None	Max Pres	0	No Act	0	Erratic	0	Fail Time	0
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Delay 2	0.0
---------	-----

Phases	1-8	9-16
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Call Phases			4									
Yellow Lock Phases												
Red Lock Phases												
Extend Phases			4									
XSwitch Phases												
Bike Call Phases												

Rt. 199 EB off ramp & 60 Piano

Vehicle Detector 5

3/4/2025 8:27:43 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

		4					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

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--	--	--	--	--	--	--	--

Red Lock Phases

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Extend Phases

		4					
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XSwitch Phases

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Bike Call Phases

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Vehicle Detector 6

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

	2						
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Yellow Lock Phases

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Red Lock Phases

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Extend Phases

	2						
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XSwitch Phases

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Bike Call Phases

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Rt. 199 EB off ramp & 60 Piano

Vehicle Detector 7

3/4/2025 8:27:43 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

2							
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Yellow Lock Phases

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Red Lock Phases

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Extend Phases

2							
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XSwitch Phases

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Bike Call Phases

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Vehicle Detector 8

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

							8
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Yellow Lock Phases

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Red Lock Phases

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Extend Phases

							8
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XSwitch Phases

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Bike Call Phases

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Rt. 199 EB off ramp & 60 Piano

Transit/LRV Startup/Options

3/4/2025 8:27:43 AM

No Startup Call

LRV 1-8

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Warn Flash Rate

1 Hz

Rsrv Inh Mode

Seconds

Rt. 199 EB off ramp & 60 Piano

Control / Config

3/4/2025 8:27:43 AM

Pattern Mode	Central																		
Manual Pattern	0	Manual Offset	0																
Stop Time Input	Enabled																		
Aux Switch	None	0																	
DLS Mode	D4	Time Zone	Est (UTC-5)																
		GPS Thresh	0																
Password Timeout	5																		
Maint Phs Recalls	1-8 <table><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										9-16 <table><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>								
Maint Ped Recalls	<table><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										<table><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>								

Serial 1 Port Configuration

Broadcast Plan/Sync	Disabled	Broadcast Time	00:00
Serial Rebroadcast	Disabled	Response	None

Serial 2 Port Configuration

Broadcast Plan/Sync	Disabled	Broadcast Time	00:00
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Ethernet Port Configuration

Broadcast Plan/Sync	Disabled	Broadcast Time	00:00
Serial Rebroadcast	Disabled		

Peer Configuration

Peer 1	0
Peer 2	0
Peer 3	0
Peer 4	0
Peer 5	0
Peer 6	0
Peer 7	0
Peer 8	0

Appendix D
SYNCHRO & SimTraffic Analysis
Of 2025 Existing Conditions

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	334	0	10	244	78	7	5	24	76	3	17
Future Volume (Veh/h)	46	334	0	10	244	78	7	5	24	76	3	17
Sign Control	Free				Free		Stop				Stop	
Grade	0%				0%		0%				0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	51	371	0	11	271	87	8	6	27	84	3	19
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	358			371			786	853	371	796	766	271
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	358			371			786	853	371	796	766	271
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.0	3.4
p0 queue free %	96			99			97	98	96	70	99	97
cM capacity (veh/h)	1212			1145			275	283	679	279	318	758
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	51	371	11	271	87	41	84	22				
Volume Left	51	0	11	0	0	8	84	0				
Volume Right	0	0	0	0	87	27	0	19				
cSH	1212	1700	1145	1700	1700	455	279	638				
Volume to Capacity	0.04	0.22	0.01	0.16	0.05	0.09	0.30	0.03				
Queue Length 95th (ft)	3	0	1	0	0	7	31	3				
Control Delay (s)	8.1	0.0	8.2	0.0	0.0	13.7	23.4	10.8				
Lane LOS	A	A				B	C	B				
Approach Delay (s)	1.0	0.2				13.7	20.8					
Approach LOS					B		C					
Intersection Summary												
Average Delay			3.5									
Intersection Capacity Utilization			41.8%		ICU Level of Service			A				
Analysis Period (min)			15									

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	78	642	95	491	369	11	133	436	7	87	28
v/c Ratio	0.37	0.91	0.14	0.62	0.36	0.01	0.84	0.82	0.05	0.59	0.11
Control Delay	63.3	54.7	0.9	49.4	13.6	0.0	97.2	18.3	53.2	72.9	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	54.7	0.9	49.4	13.6	0.0	97.2	18.3	53.2	72.9	0.9
Queue Length 50th (ft)	32	486	0	132	227	0	112	0	6	75	0
Queue Length 95th (ft)	41	384	0	191	95	m0	127	0	15	91	0
Internal Link Dist (ft)	1290				1222		1066		438		
Turn Bay Length (ft)	365	290		260	230		115		115		
Base Capacity (vph)	471	758	739	795	1019	877	160	536	349	367	420
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.85	0.13	0.62	0.36	0.01	0.83	0.81	0.02	0.24	0.07

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	411	61	314	236	7	42	43	279	5	55	18
Future Volume (vph)	50	411	61	314	236	7	42	43	279	5	55	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	1827	1568	3467	1776	1417		1717	1509	1715	1804	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3502	1827	1568	3467	1776	1417		1717	1509	1715	1804	1524
Peak-hour factor, PHF	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Adj. Flow (vph)	78	642	95	491	369	11	66	67	436	8	86	28
RTOR Reduction (vph)	0	0	58	0	0	5	0	0	396	0	0	26
Lane Group Flow (vph)	78	642	37	491	369	6	0	133	40	7	87	2
Heavy Vehicles (%)	0%	4%	3%	1%	7%	14%	14%	2%	7%	0%	0%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	6.7	50.5	50.5	29.8	73.1	73.1		12.0	12.0	10.7	10.7	10.7
Effective Green, g (s)	6.7	50.5	50.5	29.8	73.1	73.1		12.0	12.0	10.7	10.7	10.7
Actuated g/C Ratio	0.05	0.39	0.39	0.23	0.56	0.56		0.09	0.09	0.08	0.08	0.08
Clearance Time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0	2.0	4.0	4.0		2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	180	709	609	794	998	796		158	139	141	148	125
v/s Ratio Prot	0.02	c0.35		c0.14	0.21			c0.08		0.00	c0.05	
v/s Ratio Perm			0.02			0.00			0.03			0.00
v/c Ratio	0.43	0.91	0.06	0.62	0.37	0.01		0.84	0.29	0.05	0.59	0.02
Uniform Delay, d1	59.8	37.5	24.9	45.0	15.7	12.5		58.1	55.0	55.0	57.5	54.8
Progression Factor	1.00	1.00	1.00	0.98	0.75	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	17.3	0.2	1.0	0.3	0.0		30.3	0.4	0.1	3.8	0.0
Delay (s)	61.0	54.8	25.1	45.0	12.1	12.5		88.3	55.4	55.0	61.3	54.8
Level of Service	E	D	C	D	B	B		F	E	E	E	D
Approach Delay (s)		51.9			30.7			63.1			59.5	
Approach LOS		D			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			47.2				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		27.5			
Intersection Capacity Utilization			59.7%				ICU Level of Service		B			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	24	639	342	263	444	17	179	178	417	33	8
v/c Ratio	0.28	0.45	0.40	0.74	0.27	0.02	0.69	0.68	0.76	0.62	0.03
Control Delay	66.8	30.5	4.6	50.1	27.3	0.1	43.1	42.6	17.8	101.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.8	30.5	4.6	50.1	27.3	0.1	43.1	42.6	17.8	101.2	0.1
Queue Length 50th (ft)	20	209	0	116	179	0	154	152	179	27	0
Queue Length 95th (ft)	49	285	62	110	235	m0	m192	m191	m253	62	0
Internal Link Dist (ft)	1533				702				1222		432
Turn Bay Length (ft)	305			480	415			210	300		
Base Capacity (vph)	131	1622	920	391	1802	914	265	268	554	57	289
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.39	0.37	0.67	0.25	0.02	0.68	0.66	0.75	0.58	0.03

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	569	304	234	395	15	300	18	371	24	5	7
Future Volume (vph)	21	569	304	234	395	15	300	18	371	24	5	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1805	3438	1568	3335	3505	1615	1588	1604	1568		1825	1417
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.30	1.00
Satd. Flow (perm)	1805	3438	1568	3335	3505	1615	1588	1604	1568		576	1417
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	24	639	342	263	444	17	337	20	417	27	6	8
RTOR Reduction (vph)	0	0	200	0	0	9	0	0	293	0	0	7
Lane Group Flow (vph)	24	639	142	263	444	8	179	178	124	0	33	1
Heavy Vehicles (%)	0%	5%	3%	5%	3%	0%	8%	6%	3%	0%	0%	14%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.3	53.9	53.9	13.8	60.9	60.9	21.3	21.3	21.3		12.0	12.0
Effective Green, g (s)	6.3	53.9	53.9	13.8	60.9	60.9	21.3	21.3	21.3		12.0	12.0
Actuated g/C Ratio	0.05	0.41	0.41	0.11	0.47	0.47	0.16	0.16	0.16		0.09	0.09
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	87	1425	650	354	1641	756	260	262	256		53	130
v/s Ratio Prot	0.01	c0.19		c0.08	c0.13		c0.11	0.11				
v/s Ratio Perm			0.09			0.00			0.08		c0.06	0.00
v/c Ratio	0.28	0.45	0.22	0.74	0.27	0.01	0.69	0.68	0.49		0.62	0.01
Uniform Delay, d1	59.7	27.4	24.5	56.4	21.0	18.5	51.2	51.1	49.4		56.8	53.6
Progression Factor	1.00	1.00	1.00	0.66	1.18	1.00	0.69	0.69	1.30		1.00	1.00
Incremental Delay, d2	0.6	1.0	0.8	7.0	0.4	0.0	4.0	3.7	0.8		18.0	0.0
Delay (s)	60.3	28.4	25.3	44.3	25.2	18.5	39.5	39.1	64.8		74.9	53.6
Level of Service	E	C	C	D	C	B	D	D	E		E	D
Approach Delay (s)		28.1			32.0			53.1			70.7	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			37.5				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)			29.5		
Intersection Capacity Utilization			60.4%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	740	390	14	520	207	62
v/c Ratio	0.32	0.34	0.15	0.21	0.69	0.21
Control Delay	7.1	1.0	60.7	7.5	62.1	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	1.0	60.7	7.5	62.1	11.4
Queue Length 50th (ft)	65	0	9	73	166	0
Queue Length 95th (ft)	135	16	m29	146	225	34
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2330	1143	138	2523	412	393
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.34	0.10	0.21	0.50	0.16

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	636	335	12	447	178	53
Future Volume (vph)	636	335	12	447	178	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1524	1805	3539	1703	1429
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1524	1805	3539	1703	1429
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	740	390	14	520	207	62
RTOR Reduction (vph)	0	145	0	0	0	51
Lane Group Flow (vph)	740	245	14	520	207	11
Heavy Vehicles (%)	3%	6%	0%	2%	6%	13%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	81.6	81.6	3.1	92.7	22.8	22.8
Effective Green, g (s)	81.6	81.6	3.1	92.7	22.8	22.8
Actuated g/C Ratio	0.63	0.63	0.02	0.71	0.18	0.18
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	2200	956	43	2523	298	250
v/s Ratio Prot	c0.21		0.01	c0.15	c0.12	
v/s Ratio Perm		0.16				0.01
v/c Ratio	0.34	0.26	0.33	0.21	0.69	0.04
Uniform Delay, d1	11.4	10.7	62.4	6.3	50.3	44.5
Progression Factor	0.61	0.22	0.97	1.07	1.00	1.00
Incremental Delay, d2	0.4	0.6	4.2	0.2	8.6	0.2
Delay (s)	7.3	2.9	65.1	6.9	59.0	44.7
Level of Service	A	A	E	A	E	D
Approach Delay (s)	5.8			8.4	55.7	
Approach LOS	A			A	E	
Intersection Summary						
HCM 2000 Control Delay			13.4		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.42			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			39.5%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	354	376	91	278	250	10
v/c Ratio	0.19	0.37	0.58	0.11	0.78	0.03
Control Delay	8.9	3.5	70.2	6.9	66.7	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	3.5	70.2	6.9	66.7	19.2
Queue Length 50th (ft)	66	73	75	35	203	0
Queue Length 95th (ft)	51	35	129	62	279	15
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1878	1027	248	2495	464	435
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.37	0.37	0.11	0.54	0.02
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	326	346	84	256	230	9
Future Volume (vph)	326	346	84	256	230	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1568	1612	3539	1752	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1568	1612	3539	1752	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	354	376	91	278	250	10
RTOR Reduction (vph)	0	170	0	0	0	8
Lane Group Flow (vph)	354	206	91	278	250	2
Heavy Vehicles (%)	5%	3%	12%	2%	3%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	71.1	71.1	12.6	91.7	23.8	23.8
Effective Green, g (s)	71.1	71.1	12.6	91.7	23.8	23.8
Actuated g/C Ratio	0.55	0.55	0.10	0.71	0.18	0.18
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1880	857	156	2496	320	295
v/s Ratio Prot	0.10		c0.06	0.08	c0.14	
v/s Ratio Perm		c0.13				0.00
v/c Ratio	0.19	0.24	0.58	0.11	0.78	0.01
Uniform Delay, d1	14.9	15.4	56.2	6.1	50.6	43.4
Progression Factor	0.53	1.26	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.6	5.5	0.1	11.7	0.0
Delay (s)	8.0	20.0	61.6	6.2	62.3	43.4
Level of Service	A	C	E	A	E	D
Approach Delay (s)	14.2			19.9	61.6	
Approach LOS	B			B	E	
Intersection Summary						
HCM 2000 Control Delay			24.8		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.40			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			52.8%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queuing and Blocking Report

Baseline

11/17/2025

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	38	33	11	60	75	51
Average Queue (ft)	10	3	0	20	34	15
95th Queue (ft)	33	17	6	46	59	39
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	L	L	T	R	LT	R	L	LT
Maximum Queue (ft)	41	224	546	223	237	277	188	32	208	279	10	102
Average Queue (ft)	5	38	182	39	71	103	61	2	59	81	1	20
95th Queue (ft)	25	119	385	150	178	207	141	15	141	187	5	66
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	3	0	0	0	0					0
Queuing Penalty (veh)		0	5	0	0	1	0					0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	1
95th Queue (ft)	15
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

Baseline

11/17/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	84	275	394	137	187	199	168	174	48	243	276	283
Average Queue (ft)	20	90	196	5	80	84	62	74	6	107	137	143
95th Queue (ft)	59	193	321	66	150	160	136	148	33	190	223	248
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)			0	0				0	0	0	0	
Queuing Penalty (veh)			0	0				0	0	0	0	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	71	16
Average Queue (ft)	12	1
95th Queue (ft)	43	7
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	111	183	112	64	147	142	265	75
Average Queue (ft)	34	82	38	16	50	38	139	28
95th Queue (ft)	88	157	78	47	121	105	234	62
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Queuing and Blocking Report Baseline

11/17/2025

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	99	112	136	174	129	75	355	20
Average Queue (ft)	28	39	45	86	46	10	178	4
95th Queue (ft)	74	93	101	156	104	42	305	17
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 7

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	365	8	23	407	208	6	5	15	134	10	78
Future Volume (Veh/h)	122	365	8	23	407	208	6	5	15	134	10	78
Sign Control	Free				Free		Stop				Stop	
Grade	0%				0%		0%				0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	134	401	9	25	447	229	7	5	16	147	11	86
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	676			410			1262	1400	406	1184	1175	447
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	676			410			1262	1400	406	1184	1175	447
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			98			93	96	98	0	93	86
cM capacity (veh/h)	925			1160			106	119	650	138	162	616
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	134	410	25	447	229	28	147	97				
Volume Left	134	0	25	0	0	7	147	0				
Volume Right	0	9	0	0	229	16	0	86				
cSH	925	1700	1160	1700	1700	211	138	467				
Volume to Capacity	0.14	0.24	0.02	0.26	0.13	0.13	1.06	0.21				
Queue Length 95th (ft)	13	0	2	0	0	11	200	19				
Control Delay (s)	9.6	0.0	8.2	0.0	0.0	24.7	157.3	14.7				
Lane LOS	A	A				C	F	B				
Approach Delay (s)	2.4	0.3				24.7	100.6					
Approach LOS				C			F					
Intersection Summary												
Average Delay			17.6									
Intersection Capacity Utilization			52.3%		ICU Level of Service				A			
Analysis Period (min)			15									

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	97	398	41	302	634	23	72	301	40	41	73
v/c Ratio	0.43	0.41	0.05	0.62	0.57	0.02	0.56	0.77	0.41	0.39	0.32
Control Delay	63.7	21.7	0.1	74.6	11.0	0.0	74.7	20.0	70.7	68.4	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.7	21.7	0.1	74.6	11.0	0.0	74.7	20.0	70.7	68.4	3.8
Queue Length 50th (ft)	41	198	0	134	178	0	60	0	34	35	0
Queue Length 95th (ft)	69	314	0	m136	m145	m0	110	93	74	74	0
Internal Link Dist (ft)	1290				1222		1066		438		
Turn Bay Length (ft)	365	290		260	230		115		115		
Base Capacity (vph)	471	962	756	485	1116	974	162	415	332	364	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.41	0.05	0.62	0.57	0.02	0.44	0.73	0.12	0.11	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	92	378	39	9	278	602	22	27	42	286	42	35
Future Volume (vph)	92	378	39	9	278	602	22	27	42	286	42	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00
Satd. Flow (prot)	3502	1845	1313		3435	1881	1538		1835	1599	1633	1788
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00
Satd. Flow (perm)	3502	1845	1313		3435	1881	1538		1835	1599	1633	1788
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	398	41	9	293	634	23	28	44	301	44	37
RTOR Reduction (vph)	0	0	20	0	0	0	9	0	0	280	0	0
Lane Group Flow (vph)	97	398	21	0	302	634	14	0	72	21	40	41
Heavy Vehicles (%)	0%	3%	23%	0%	2%	1%	5%	4%	0%	1%	5%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2				6			3		
Actuated Green, G (s)	8.5	67.7	67.7		18.4	77.1	77.1		9.1	9.1	7.8	7.8
Effective Green, g (s)	8.5	67.7	67.7		18.4	77.1	77.1		9.1	9.1	7.8	7.8
Actuated g/C Ratio	0.07	0.52	0.52		0.14	0.59	0.59		0.07	0.07	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	228	960	683		486	1115	912		128	111	97	107
v/s Ratio Prot	0.03	0.22			c0.09	c0.34			c0.04		c0.02	0.02
v/s Ratio Perm			0.02				0.01			0.01		
v/c Ratio	0.43	0.41	0.03		0.62	0.57	0.01		0.56	0.19	0.41	0.38
Uniform Delay, d1	58.4	19.0	15.2		52.5	16.2	10.9		58.5	57.0	58.9	58.8
Progression Factor	1.00	1.00	1.00		1.38	0.58	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	1.3	0.1		0.6	0.3	0.0		3.3	0.3	1.0	0.8
Delay (s)	59.3	20.4	15.3		72.9	9.6	10.9		61.9	57.3	59.9	59.6
Level of Service	E	C	B		E	A	B		E	E	E	E
Approach Delay (s)		27.0				29.6			58.2			58.8
Approach LOS		C				C			E			E
Intersection Summary												
HCM 2000 Control Delay			36.4	HCM 2000 Level of Service					D			
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			130.0	Sum of lost time (s)					27.5			
Intersection Capacity Utilization			72.5%	ICU Level of Service					C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	69
Future Volume (vph)	69
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	73
RTOR Reduction (vph)	69
Lane Group Flow (vph)	4
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	7.8
Effective Green, g (s)	7.8
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	96
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.05
Uniform Delay, d1	57.6
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	57.7
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	17	784	361	560	853	32	176	176	374	61	20
v/c Ratio	0.22	0.70	0.48	1.30	0.61	0.04	0.83	0.82	0.81	0.97	0.04
Control Delay	65.9	41.8	4.9	192.5	27.0	0.1	84.4	83.6	34.9	157.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.9	41.8	4.9	192.5	27.0	0.1	84.4	83.6	34.9	157.3	0.2
Queue Length 50th (ft)	14	304	0	~318	370	0	152	152	112	51	0
Queue Length 95th (ft)	40	332	61	#457	304	m0	m#265	m#264	#251	#166	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	305		480	415		210	300				95
Base Capacity (vph)	124	1606	922	432	1759	882	224	225	469	63	449
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.49	0.39	1.30	0.48	0.04	0.79	0.78	0.80	0.97	0.04

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	745	343	532	810	30	316	18	355	27	31	19
Future Volume (vph)	16	745	343	532	810	30	316	18	355	27	31	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1703	3539	1599	3433	3574	1615	1698	1713	1568		1857	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.16	1.00
Satd. Flow (perm)	1703	3539	1599	3433	3574	1615	1698	1713	1568		307	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	784	361	560	853	32	333	19	374	28	33	20
RTOR Reduction (vph)	0	0	246	0	0	19	0	0	264	0	0	16
Lane Group Flow (vph)	17	784	115	560	853	13	176	176	110	0	61	4
Heavy Vehicles (%)	6%	2%	1%	2%	1%	0%	1%	0%	3%	0%	0%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	5.9	41.3	41.3	16.4	51.3	51.3	16.3	16.3	16.3		27.0	27.0
Effective Green, g (s)	5.9	41.3	41.3	16.4	51.3	51.3	16.3	16.3	16.3		27.0	27.0
Actuated g/C Ratio	0.05	0.32	0.32	0.13	0.39	0.39	0.13	0.13	0.13		0.21	0.21
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	77	1124	507	433	1410	637	212	214	196		63	319
v/s Ratio Prot	0.01	c0.22		c0.16	0.24		c0.10	0.10				
v/s Ratio Perm			0.07			0.01			0.07		c0.20	0.00
v/c Ratio	0.22	0.70	0.23	1.29	0.60	0.02	0.83	0.82	0.56		0.97	0.01
Uniform Delay, d1	59.8	38.9	32.6	56.8	31.3	24.0	55.5	55.4	53.5		51.1	40.9
Progression Factor	1.00	1.00	1.00	1.02	0.82	1.00	1.05	1.05	1.89		1.00	1.00
Incremental Delay, d2	0.5	3.6	1.0	146.0	1.6	0.0	20.6	19.3	3.1		101.0	0.0
Delay (s)	60.4	42.5	33.6	204.1	27.1	24.1	79.0	77.7	104.4		152.1	40.9
Level of Service	E	D	C	F	C	C	E	E	F		F	D
Approach Delay (s)		40.0			95.7			91.8			124.7	
Approach LOS		D			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			76.6									
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			130.0						29.5			
Intersection Capacity Utilization			70.0%									
Analysis Period (min)			15									
c Critical Lane Group												

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	863	360	17	1024	431	177
v/c Ratio	0.46	0.36	0.15	0.49	0.79	0.30
Control Delay	12.6	1.4	59.6	14.3	53.3	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	1.4	59.6	14.3	53.3	7.6
Queue Length 50th (ft)	101	0	13	260	324	7
Queue Length 95th (ft)	m125	m11	m28	282	#542	65
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	1952	1043	137	2309	544	596
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.35	0.12	0.44	0.79	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	811	338	1	15	963	405	166
Future Volume (vph)	811	338	1	15	963	405	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00		1.00	0.95	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1599		1693	3574	1787	1583
Flt Permitted	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	3539	1599		1783	3574	1787	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	863	360	1	16	1024	431	177
RTOR Reduction (vph)	0	183	0	0	0	0	115
Lane Group Flow (vph)	863	177	0	17	1024	431	62
Heavy Vehicles (%)	2%	1%	0%	7%	1%	1%	2%
Turn Type	NA	Perm	custom	Prot	NA	Prot	Perm
Protected Phases	2			1	6	4	
Permitted Phases		2	1				4
Actuated Green, G (s)	63.9	63.9		4.0	75.9	39.6	39.6
Effective Green, g (s)	63.9	63.9		4.0	75.9	39.6	39.6
Actuated g/C Ratio	0.49	0.49		0.03	0.58	0.30	0.30
Clearance Time (s)	6.0	6.0		8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0		3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1739	785		54	2086	544	482
v/s Ratio Prot	0.24				c0.29	c0.24	
v/s Ratio Perm		0.11		0.01			0.04
v/c Ratio	0.50	0.23		0.31	0.49	0.79	0.13
Uniform Delay, d1	22.2	18.9		61.7	15.8	41.4	32.7
Progression Factor	0.58	0.30		1.00	0.85	1.00	1.00
Incremental Delay, d2	0.8	0.5		2.9	0.7	8.9	0.3
Delay (s)	13.7	6.1		64.8	14.1	50.3	33.0
Level of Service	B	A		E	B	D	C
Approach Delay (s)	11.4				14.9	45.3	
Approach LOS	B				B	D	
Intersection Summary							
HCM 2000 Control Delay			19.9		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.64				
Actuated Cycle Length (s)			130.0		Sum of lost time (s)		22.5
Intersection Capacity Utilization			61.1%		ICU Level of Service		B
Analysis Period (min)			15				
c Critical Lane Group							

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	698	324	124	602	446	69
v/c Ratio	0.47	0.38	0.64	0.28	0.86	0.13
Control Delay	11.6	3.2	69.4	13.5	60.6	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	3.2	69.4	13.5	60.6	9.5
Queue Length 50th (ft)	132	53	102	129	346	3
Queue Length 95th (ft)	163	17	161	155	#544	39
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1539	858	269	2239	524	523
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.38	0.46	0.27	0.85	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	670	311	119	578	428	66
Future Volume (vph)	670	311	119	578	428	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1553	1752	3574	1770	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1553	1752	3574	1770	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	698	324	124	602	446	69
RTOR Reduction (vph)	0	187	0	0	0	45
Lane Group Flow (vph)	698	137	124	602	446	24
Heavy Vehicles (%)	2%	4%	3%	1%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	54.9	54.9	14.5	77.4	38.1	38.1
Effective Green, g (s)	54.9	54.9	14.5	77.4	38.1	38.1
Actuated g/C Ratio	0.42	0.42	0.11	0.60	0.29	0.29
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1494	655	195	2127	518	473
v/s Ratio Prot	c0.20		c0.07	0.17	c0.25	
v/s Ratio Perm		0.09				0.01
v/c Ratio	0.47	0.21	0.64	0.28	0.86	0.05
Uniform Delay, d1	27.0	23.8	55.2	12.8	43.4	33.0
Progression Factor	0.38	0.68	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.7	6.6	0.3	13.7	0.0
Delay (s)	11.1	16.8	61.9	13.1	57.1	33.0
Level of Service	B	B	E	B	E	C
Approach Delay (s)	12.9			21.5	53.9	
Approach LOS	B			C	D	
Intersection Summary						
HCM 2000 Control Delay			25.0		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			67.6%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	74	29	41	46	203	74
Average Queue (ft)	31	6	4	18	86	34
95th Queue (ft)	58	24	23	41	169	62
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)					0	
Queuing Penalty (veh)					0	

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	77	136	278	89	151	207	433	148	117	136	38	82
Average Queue (ft)	14	57	149	19	47	79	183	12	43	63	5	21
95th Queue (ft)	51	107	239	55	106	149	360	71	90	110	20	60
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260		230				115	
Storage Blk Time (%)			0	0		0	5	0				0
Queuing Penalty (veh)			0	0		0	1	0				0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	47
Average Queue (ft)	6
95th Queue (ft)	26
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

11/17/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	88	424	479	249	410	415	692	686	66	204	218	309
Average Queue (ft)	18	169	221	27	382	407	641	270	7	115	132	156
95th Queue (ft)	60	305	360	140	475	461	846	707	49	180	196	272
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)							44	0				
Queuing Penalty (veh)							314	2				
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)		1	0	0	8	56	63	3	0			
Queuing Penalty (veh)		0	1	0	34	233	348	1	0			

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	132	73
Average Queue (ft)	36	6
95th Queue (ft)	91	38
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	3	0
Queuing Penalty (veh)	1	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	UL	T	T	L	R
Maximum Queue (ft)	145	188	95	229	693	657	1115	1123
Average Queue (ft)	73	109	40	47	345	268	971	868
95th Queue (ft)	133	168	72	173	664	579	1435	1547
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)					2	0	78	64
Queuing Penalty (veh)					12	0	0	0
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)				0	36			
Queuing Penalty (veh)				0	6			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	158	160	100	192	266	212	702	387
Average Queue (ft)	58	63	38	103	127	67	414	76
95th Queue (ft)	133	140	78	172	222	161	751	412
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)							3	2
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)				475				
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Network Summary

Network wide Queuing Penalty: 956

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	31	271	9	11	263	110	6	2	24	3	147	4
Future Volume (Veh/h)	31	271	9	11	263	110	6	2	24	3	147	4
Sign Control	Free				Free		Stop				Stop	
Grade	0%				0%		0%				0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	34	298	10	12	289	121	7	2	26	0	162	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked										0.00		
vC, conflicting volume	410			308			741	805	303	0	706	689
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	410			308			741	805	303	0	706	689
tC, single (s)	4.1			4.1			7.1	6.5	6.2	0.0	7.1	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	0.0	3.5	4.0
p0 queue free %	97			99			98	99	96	0	51	99
cM capacity (veh/h)	1160			1264			299	306	741	0	329	357
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	34	308	12	289	121	35	162	59				
Volume Left	34	0	12	0	0	7	162	0				
Volume Right	0	10	0	0	121	26	0	55				
cSH	1160	1700	1264	1700	1700	538	329	702				
Volume to Capacity	0.03	0.18	0.01	0.17	0.07	0.07	0.49	0.08				
Queue Length 95th (ft)	2	0	1	0	0	5	65	7				
Control Delay (s)	8.2	0.0	7.9	0.0	0.0	12.2	26.1	10.6				
Lane LOS	A	A				B	D	B				
Approach Delay (s)	0.8	0.2				12.2	21.9					
Approach LOS							B	C				
Intersection Summary												
Average Delay			5.5									
Intersection Capacity Utilization			43.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	50
Future Volume (Veh/h)	50
Sign Control	
Grade	
Peak Hour Factor	0.91
Hourly flow rate (vph)	55
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	289
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	289
tC, single (s)	6.2
tC, 2 stage (s)	
tF (s)	3.3
p0 queue free %	93
cM capacity (veh/h)	755
Direction, Lane #	

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	129	432	12	243	443	12	96	251	35	42	44
v/c Ratio	0.50	0.42	0.01	0.66	0.41	0.01	0.60	0.68	0.35	0.40	0.20
Control Delay	64.1	21.0	0.0	73.5	9.6	0.0	72.4	16.5	67.7	69.5	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	21.0	0.0	73.5	9.6	0.0	72.4	16.5	67.7	69.5	2.0
Queue Length 50th (ft)	54	209	0	108	92	0	80	0	30	36	0
Queue Length 95th (ft)	86	351	0	m151	m141	m0	134	81	67	76	0
Internal Link Dist (ft)		1290			1222		1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	1018	943	373	1072	986	182	383	349	366	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.42	0.01	0.65	0.41	0.01	0.53	0.66	0.10	0.11	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	123	410	11	23	208	421	11	10	81	238	37	36
Future Volume (vph)	123	410	11	23	208	421	11	10	81	238	37	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00
Satd. Flow (prot)	3502	1881	1615		3440	1881	1615		1868	1615	1715	1796
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00
Satd. Flow (perm)	3502	1881	1615		3440	1881	1615		1868	1615	1715	1796
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	129	432	12	24	219	443	12	11	85	251	39	38
RTOR Reduction (vph)	0	0	6	0	0	0	5	0	0	230	0	0
Lane Group Flow (vph)	129	432	6	0	243	443	7	0	96	21	35	42
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	10%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2			6				3		
Actuated Green, G (s)	9.7	70.4	70.4		13.9	74.1	74.1		11.1	11.1	7.6	7.6
Effective Green, g (s)	9.7	70.4	70.4		13.9	74.1	74.1		11.1	11.1	7.6	7.6
Actuated g/C Ratio	0.07	0.54	0.54		0.11	0.57	0.57		0.09	0.09	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	261	1018	874		367	1072	920		159	137	100	104
v/s Ratio Prot	0.04	0.23			c0.07	c0.24			c0.05		0.02	c0.02
v/s Ratio Perm			0.00				0.00			0.01		
v/c Ratio	0.49	0.42	0.01		0.66	0.41	0.01		0.60	0.16	0.35	0.40
Uniform Delay, d1	57.8	17.7	13.7		55.8	15.7	12.1		57.3	55.1	58.8	59.0
Progression Factor	1.00	1.00	1.00		1.17	0.49	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	1.3	0.0		3.3	0.3	0.0		4.4	0.2	0.8	0.9
Delay (s)	58.9	19.0	13.7		68.8	8.0	12.1		61.7	55.3	59.6	60.0
Level of Service	E	B	B		E	A	B		E	E	E	E
Approach Delay (s)		27.9				29.2			57.1			59.1
Approach LOS		C				C			E			E
Intersection Summary												
HCM 2000 Control Delay			36.4			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			27.5			
Intersection Capacity Utilization			69.6%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	42
Future Volume (vph)	42
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	44
RTOR Reduction (vph)	41
Lane Group Flow (vph)	3
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	7.6
Effective Green, g (s)	7.6
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	94
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.03
Uniform Delay, d1	57.7
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	57.8
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	43	1327	289	319	691	33	179	177	394	57	25
v/c Ratio	0.43	0.83	0.33	0.74	0.37	0.04	0.84	0.83	0.80	1.21	0.07
Control Delay	71.4	37.6	3.7	66.5	18.6	0.1	94.9	92.5	35.8	249.4	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.4	37.6	3.7	66.5	18.6	0.1	94.9	92.5	35.8	249.4	0.4
Queue Length 50th (ft)	36	512	0	118	207	0	161	158	111	~58	0
Queue Length 95th (ft)	75	#667	54	176	253	m0	#292	#282	#242	#151	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	305		480	415		210	300				95
Base Capacity (vph)	131	1603	884	686	1859	915	222	224	501	47	337
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.83	0.33	0.47	0.37	0.04	0.81	0.79	0.79	1.21	0.07

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	14	27	1261	275	303	656	31	309	29	374	34	20
Future Volume (vph)	14	27	1261	275	303	656	31	309	29	374	34	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00
Frt		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97
Satd. Flow (prot)		1805	3574	1615	3433	3610	1615	1698	1719	1599		1842
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.33
Satd. Flow (perm)		1805	3574	1615	3433	3610	1615	1698	1719	1599		620
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	15	28	1327	289	319	691	33	325	31	394	36	21
RTOR Reduction (vph)	0	0	0	159	0	0	16	0	0	294	0	0
Lane Group Flow (vph)	0	43	1327	130	319	691	17	179	177	100	0	57
Heavy Vehicles (%)	0%	0%	1%	0%	2%	0%	0%	1%	0%	1%	0%	0%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA
Protected Phases	5	5	2		1	6		4	4			3
Permitted Phases				2			6			4	3	
Actuated Green, G (s)		7.3	58.4	58.4	16.4	67.0	67.0	16.2	16.2	16.2		10.0
Effective Green, g (s)		7.3	58.4	58.4	16.4	67.0	67.0	16.2	16.2	16.2		10.0
Actuated g/C Ratio		0.06	0.45	0.45	0.13	0.52	0.52	0.12	0.12	0.12		0.08
Clearance Time (s)		8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0
Vehicle Extension (s)		2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5
Lane Grp Cap (vph)		101	1605	725	433	1860	832	211	214	199		47
v/s Ratio Prot		0.02	c0.37		c0.09	0.19		c0.11	0.10			
v/s Ratio Perm				0.08			0.01			0.06		c0.09
v/c Ratio		0.43	0.83	0.18	0.74	0.37	0.02	0.85	0.83	0.50		1.21
Uniform Delay, d1		59.3	31.4	21.4	54.7	18.9	15.4	55.7	55.5	53.1		60.0
Progression Factor		1.00	1.00	1.00	1.04	0.93	1.00	1.20	1.20	2.50		1.00
Incremental Delay, d2		1.1	5.0	0.5	5.3	0.5	0.0	23.4	20.2	1.8		200.2
Delay (s)		60.4	36.4	22.0	62.0	18.1	15.5	90.0	86.6	134.9		260.2
Level of Service		E	D	C	E	B	B	F	F	F		F
Approach Delay (s)			34.5			31.5			112.8			197.8
Approach LOS			C			C			F			F
Intersection Summary												
HCM 2000 Control Delay			54.0									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			130.0							29.5		
Intersection Capacity Utilization			79.7%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	24
Future Volume (vph)	24
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	25
RTOR Reduction (vph)	23
Lane Group Flow (vph)	2
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	3
Actuated Green, G (s)	10.0
Effective Green, g (s)	10.0
Actuated g/C Ratio	0.08
Clearance Time (s)	7.0
Vehicle Extension (s)	2.5
Lane Grp Cap (vph)	124
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.02
Uniform Delay, d1	55.5
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	55.5
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1217	466	40	765	237	172
v/c Ratio	0.57	0.40	0.36	0.30	0.72	0.39
Control Delay	8.8	0.7	65.4	7.2	61.2	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	0.7	65.4	7.2	61.2	8.4
Queue Length 50th (ft)	98	0	32	153	190	0
Queue Length 95th (ft)	m167	m0	m62	187	264	58
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2131	1151	138	2524	424	517
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.40	0.29	0.30	0.56	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1144	438	38	719	223	162
Future Volume (vph)	1144	438	38	719	223	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1615	1805	3610	1752	1599
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1615	1805	3610	1752	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1217	466	40	765	237	172
RTOR Reduction (vph)	0	194	0	0	0	139
Lane Group Flow (vph)	1217	272	40	765	237	33
Heavy Vehicles (%)	1%	0%	0%	0%	3%	1%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	75.9	75.9	7.0	90.9	24.6	24.6
Effective Green, g (s)	75.9	75.9	7.0	90.9	24.6	24.6
Actuated g/C Ratio	0.58	0.58	0.05	0.70	0.19	0.19
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	2086	942	97	2524	331	302
v/s Ratio Prot	c0.34		0.02	c0.21	c0.14	
v/s Ratio Perm		0.17				0.02
v/c Ratio	0.58	0.29	0.41	0.30	0.72	0.11
Uniform Delay, d1	17.1	13.5	59.5	7.5	49.4	43.6
Progression Factor	0.45	0.10	0.99	0.86	1.00	1.00
Incremental Delay, d2	0.6	0.4	2.7	0.3	8.8	0.3
Delay (s)	8.3	1.7	61.3	6.7	58.3	43.9
Level of Service	A	A	E	A	E	D
Approach Delay (s)	6.5			9.4	52.2	
Approach LOS	A			A	D	
Intersection Summary						
HCM 2000 Control Delay			13.8		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.61			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			56.1%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	999	376	140	559	315	74
v/c Ratio	0.56	0.39	0.68	0.23	0.82	0.18
Control Delay	10.6	1.8	71.2	8.9	66.4	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	1.8	71.2	8.9	66.4	9.2
Queue Length 50th (ft)	73	0	115	87	255	0
Queue Length 95th (ft)	225	12	180	133	342	38
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1775	971	267	2443	479	482
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.39	0.52	0.23	0.66	0.15
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	959	361	134	537	302	71
Future Volume (vph)	959	361	134	537	302	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1583	1736	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1583	1736	3610	1805	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	999	376	140	559	315	74
RTOR Reduction (vph)	0	185	0	0	0	58
Lane Group Flow (vph)	999	191	140	559	315	16
Heavy Vehicles (%)	1%	2%	4%	0%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	64.6	64.6	15.4	88.0	27.5	27.5
Effective Green, g (s)	64.6	64.6	15.4	88.0	27.5	27.5
Actuated g/C Ratio	0.50	0.50	0.12	0.68	0.21	0.21
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1776	786	205	2443	381	341
v/s Ratio Prot	c0.28		c0.08	0.15	c0.17	
v/s Ratio Perm		0.12				0.01
v/c Ratio	0.56	0.24	0.68	0.23	0.83	0.05
Uniform Delay, d1	22.8	18.7	55.0	8.0	49.0	40.8
Progression Factor	0.38	0.30	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.6	9.0	0.2	13.7	0.1
Delay (s)	9.9	6.3	64.0	8.2	62.6	40.9
Level of Service	A	A	E	A	E	D
Approach Delay (s)	8.9			19.4	58.5	
Approach LOS	A			B	E	
Intersection Summary						
HCM 2000 Control Delay			19.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.65			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			69.4%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	R	LTR	UL	TR
Maximum Queue (ft)	30	2	25	10	46	106	48
Average Queue (ft)	7	0	2	0	18	50	23
95th Queue (ft)	25	2	14	5	41	82	44
Link Distance (ft)	1920				701	1590	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	225		280	255		315	
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	100	134	266	81	118	145	317	66	127	121	22	63
Average Queue (ft)	19	68	144	8	37	66	142	4	52	53	4	15
95th Queue (ft)	61	117	233	51	91	119	277	30	102	93	14	46
Link Distance (ft)			1322			1150	1150			1094	1094	426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365	290		260			230			115	
Storage Blk Time (%)			0	0			2	0				0
Queuing Penalty (veh)			0	0			0	0				0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	16
Average Queue (ft)	1
95th Queue (ft)	8
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

11/17/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	282	593	674	447	211	252	227	195	36	223	249	389
Average Queue (ft)	66	320	375	70	91	115	102	108	8	118	143	214
95th Queue (ft)	201	517	595	344	170	196	185	175	29	190	215	344
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)	0	8	3	0				0		0	0	
Queuing Penalty (veh)	0	3	8	1				0		0	0	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	105	40
Average Queue (ft)	33	1
95th Queue (ft)	83	15
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	2	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	358	393	176	93	153	141	311	135
Average Queue (ft)	145	180	70	37	63	49	172	61
95th Queue (ft)	295	330	137	80	129	114	288	113
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	346	349	214	242	172	118	370	100
Average Queue (ft)	105	118	58	123	79	36	219	25
95th Queue (ft)	245	255	136	215	150	89	343	61
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				475				
Storage Blk Time (%)				0				
Queuing Penalty (veh)				0				

Network Summary

Network wide Queuing Penalty: 14

Appendix E
SYNCHRO & SimTraffic Analysis
Of 2040 Background Conditions

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	388	0	12	283	91	8	6	28	88	3	20
Future Volume (Veh/h)	53	388	0	12	283	91	8	6	28	88	3	20
Sign Control	Free				Free		Stop				Stop	
Grade	0%				0%		0%				0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	58	422	0	13	308	99	9	7	30	96	3	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	407			422			896	971	422	906	872	308
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	407			422			896	971	422	906	872	308
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.0	3.4
p0 queue free %	95			99			96	97	95	58	99	97
cM capacity (veh/h)	1163			1096			228	239	636	230	273	723
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	58	422	13	308	99	46	96	25				
Volume Left	58	0	13	0	0	9	96	0				
Volume Right	0	0	0	0	99	30	0	22				
cSH	1163	1700	1096	1700	1700	397	230	604				
Volume to Capacity	0.05	0.25	0.01	0.18	0.06	0.12	0.42	0.04				
Queue Length 95th (ft)	4	0	1	0	0	10	48	3				
Control Delay (s)	8.3	0.0	8.3	0.0	0.0	15.3	31.4	11.2				
Lane LOS	A	A				C	D	B				
Approach Delay (s)	1.0	0.3				15.3	27.2					
Approach LOS	C						D					
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			45.3%		ICU Level of Service				A			
Analysis Period (min)			15									

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	63	518	77	397	298	9	107	352	6	71	23
v/c Ratio	0.32	0.66	0.10	0.56	0.28	0.01	0.70	0.77	0.05	0.54	0.10
Control Delay	63.0	35.1	0.3	70.0	8.0	0.0	80.8	18.0	54.5	72.3	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	35.1	0.3	70.0	8.0	0.0	80.8	18.0	54.5	72.3	0.8
Queue Length 50th (ft)	26	338	0	171	68	0	88	0	5	62	0
Queue Length 95th (ft)	50	484	0	228	m83	m0	#177	#123	20	112	0
Internal Link Dist (ft)		1290			1222		1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	781	757	703	1047	897	164	463	349	367	420
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.66	0.10	0.56	0.28	0.01	0.65	0.76	0.02	0.19	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	477	71	365	274	8	49	50	324	6	64	21
Future Volume (vph)	58	477	71	365	274	8	49	50	324	6	64	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	1827	1568	3467	1776	1417		1718	1509	1715	1804	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3502	1827	1568	3467	1776	1417		1718	1509	1715	1804	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	518	77	397	298	9	53	54	352	7	70	23
RTOR Reduction (vph)	0	0	44	0	0	4	0	0	321	0	0	21
Lane Group Flow (vph)	63	518	33	397	298	5	0	107	31	6	71	2
Heavy Vehicles (%)	0%	4%	3%	1%	7%	14%	14%	2%	7%	0%	0%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	6.2	55.5	55.5	26.4	75.2	75.2		11.6	11.6	9.5	9.5	9.5
Effective Green, g (s)	6.2	55.5	55.5	26.4	75.2	75.2		11.6	11.6	9.5	9.5	9.5
Actuated g/C Ratio	0.05	0.43	0.43	0.20	0.58	0.58		0.09	0.09	0.07	0.07	0.07
Clearance Time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0	2.0	4.0	4.0		2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	167	779	669	704	1027	819		153	134	125	131	111
v/s Ratio Prot	0.02	c0.28		c0.11	0.17			c0.06		0.00	c0.04	
v/s Ratio Perm			0.02			0.00			0.02			0.00
v/c Ratio	0.38	0.66	0.05	0.56	0.29	0.01		0.70	0.23	0.05	0.54	0.02
Uniform Delay, d1	60.0	29.8	21.8	46.6	13.9	11.6		57.5	55.1	56.0	58.2	55.9
Progression Factor	1.00	1.00	1.00	1.40	0.49	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	4.5	0.1	0.5	0.2	0.0		10.7	0.3	0.1	2.4	0.0
Delay (s)	61.1	34.3	21.9	66.0	7.0	11.6		68.2	55.4	56.1	60.6	55.9
Level of Service	E	C	C	E	A	B		E	E	E	E	E
Approach Delay (s)		35.4			40.3			58.4			59.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			43.9				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		27.5			
Intersection Capacity Utilization			66.0%				ICU Level of Service		C			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	26	749	384	296	503	18	200	201	468	37	9
v/c Ratio	0.29	0.57	0.46	0.80	0.33	0.02	0.69	0.69	0.87	0.70	0.03
Control Delay	67.3	34.4	4.5	60.2	29.8	0.1	58.2	58.0	40.5	112.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.3	34.4	4.5	60.2	29.8	0.1	58.2	58.0	40.5	112.9	0.2
Queue Length 50th (ft)	22	288	0	128	210	0	177	180	224	31	0
Queue Length 95th (ft)	52	320	63	#170	258	m0	m#330	m#329	#413	#77	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	305		480	415		210	300				95
Base Capacity (vph)	131	1578	927	390	1752	893	289	292	537	55	295
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.47	0.41	0.76	0.29	0.02	0.69	0.69	0.87	0.67	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	689	353	272	463	17	348	21	431	28	6	8
Future Volume (vph)	24	689	353	272	463	17	348	21	431	28	6	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1805	3438	1568	3335	3505	1615	1588	1604	1568		1826	1417
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.28	1.00
Satd. Flow (perm)	1805	3438	1568	3335	3505	1615	1588	1604	1568		529	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	749	384	296	503	18	378	23	468	30	7	9
RTOR Reduction (vph)	0	0	237	0	0	10	0	0	252	0	0	8
Lane Group Flow (vph)	26	749	147	296	503	8	200	201	216	0	37	1
Heavy Vehicles (%)	0%	5%	3%	5%	3%	0%	8%	6%	3%	0%	0%	14%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.4	49.9	49.9	14.4	57.4	57.4	23.7	23.7	23.7		13.0	13.0
Effective Green, g (s)	6.4	49.9	49.9	14.4	57.4	57.4	23.7	23.7	23.7		13.0	13.0
Actuated g/C Ratio	0.05	0.38	0.38	0.11	0.44	0.44	0.18	0.18	0.18		0.10	0.10
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	88	1319	601	369	1547	713	289	292	285		52	141
v/s Ratio Prot	0.01	c0.22		c0.09	c0.14		0.13	0.13				
v/s Ratio Perm			0.09			0.00			c0.14		c0.07	0.00
v/c Ratio	0.30	0.57	0.25	0.80	0.33	0.01	0.69	0.69	0.76		0.71	0.01
Uniform Delay, d1	59.6	31.6	27.2	56.4	23.7	20.4	49.7	49.7	50.4		56.7	52.7
Progression Factor	1.00	1.00	1.00	0.77	1.19	1.00	0.97	0.97	1.69		1.00	1.00
Incremental Delay, d2	0.7	1.8	1.0	10.9	0.5	0.0	5.0	4.7	7.9		34.8	0.0
Delay (s)	60.3	33.3	28.2	54.5	28.6	20.4	53.2	52.9	93.3		91.4	52.7
Level of Service	E	C	C	D	C	C	D	D	F		F	D
Approach Delay (s)		32.2			37.8			74.7			83.9	
Approach LOS		C			D			E			F	
Intersection Summary												
HCM 2000 Control Delay			47.4									
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			130.0						29.5			
Intersection Capacity Utilization			67.4%									
Analysis Period (min)			15									
c Critical Lane Group												

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	833	423	15	568	225	67
v/c Ratio	0.36	0.37	0.16	0.23	0.71	0.21
Control Delay	7.4	1.2	60.9	8.4	62.0	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	1.2	60.9	8.4	62.0	10.7
Queue Length 50th (ft)	92	0	10	106	180	0
Queue Length 95th (ft)	m137	m20	m30	163	253	38
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2294	1144	138	2489	412	397
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.37	0.11	0.23	0.55	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	766	389	14	523	207	62
Future Volume (vph)	766	389	14	523	207	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1524	1805	3539	1703	1429
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1524	1805	3539	1703	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	833	423	15	568	225	67
RTOR Reduction (vph)	0	162	0	0	0	55
Lane Group Flow (vph)	833	261	15	568	225	12
Heavy Vehicles (%)	3%	6%	0%	2%	6%	13%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	80.3	80.3	3.1	91.4	24.1	24.1
Effective Green, g (s)	80.3	80.3	3.1	91.4	24.1	24.1
Actuated g/C Ratio	0.62	0.62	0.02	0.70	0.19	0.19
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	2165	941	43	2488	315	264
v/s Ratio Prot	c0.24		0.01	c0.16	c0.13	
v/s Ratio Perm		0.17				0.01
v/c Ratio	0.38	0.28	0.35	0.23	0.71	0.05
Uniform Delay, d1	12.5	11.5	62.5	6.8	49.7	43.5
Progression Factor	0.58	0.31	0.98	1.11	1.00	1.00
Incremental Delay, d2	0.4	0.6	4.6	0.2	9.2	0.2
Delay (s)	7.6	4.1	65.8	7.8	58.9	43.7
Level of Service	A	A	E	A	E	D
Approach Delay (s)	6.4			9.3	55.4	
Approach LOS	A			A	E	
Intersection Summary						
HCM 2000 Control Delay			13.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.47			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			44.7%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	441	437	107	327	290	11
v/c Ratio	0.25	0.43	0.62	0.14	0.81	0.03
Control Delay	10.6	3.6	70.5	8.0	66.0	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	3.6	70.5	8.0	66.0	17.2
Queue Length 50th (ft)	98	86	88	46	235	0
Queue Length 95th (ft)	46	10	145	78	314	16
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1769	1019	248	2419	465	437
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.43	0.43	0.14	0.62	0.03
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	406	402	98	301	267	10
Future Volume (vph)	406	402	98	301	267	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1568	1612	3539	1752	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1568	1612	3539	1752	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	441	437	107	327	290	11
RTOR Reduction (vph)	0	212	0	0	0	9
Lane Group Flow (vph)	441	225	107	327	290	2
Heavy Vehicles (%)	5%	3%	12%	2%	3%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	66.9	66.9	13.9	88.8	26.7	26.7
Effective Green, g (s)	66.9	66.9	13.9	88.8	26.7	26.7
Actuated g/C Ratio	0.51	0.51	0.11	0.68	0.21	0.21
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1769	806	172	2417	359	331
v/s Ratio Prot	0.13		c0.07	0.09	c0.17	
v/s Ratio Perm		c0.14				0.00
v/c Ratio	0.25	0.28	0.62	0.14	0.81	0.01
Uniform Delay, d1	17.6	17.9	55.5	7.2	49.2	41.1
Progression Factor	0.53	1.07	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.8	6.8	0.1	12.5	0.0
Delay (s)	9.6	20.0	62.4	7.3	61.7	41.1
Level of Service	A	C	E	A	E	D
Approach Delay (s)	14.8			20.9	61.0	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			25.1		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.45			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			55.6%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Queuing and Blocking Report

Baseline

11/17/2025

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	40	29	4	52	76	53
Average Queue (ft)	12	3	0	23	37	14
95th Queue (ft)	35	16	3	47	64	39
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	L	L	T	R	LT	R	L	LT
Maximum Queue (ft)	41	201	385	131	176	196	252	34	152	194	10	87
Average Queue (ft)	6	45	201	28	86	113	87	3	63	82	1	25
95th Queue (ft)	27	112	325	86	157	179	190	19	130	158	5	67
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	2	0			1					0
Queuing Penalty (veh)		0	3	0			0					0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	18
Average Queue (ft)	1
95th Queue (ft)	12
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

Baseline

11/17/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	70	304	398	152	182	206	189	183	50	261	289	385
Average Queue (ft)	23	130	235	11	91	98	75	85	6	130	155	211
95th Queue (ft)	58	244	364	86	156	173	149	153	32	217	244	362
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)		0						0	0	0	0	
Queuing Penalty (veh)		0						0	0	0	1	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	58	20
Average Queue (ft)	12	1
95th Queue (ft)	40	12
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	0	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	133	204	117	52	174	148	308	97
Average Queue (ft)	48	102	46	17	63	47	164	33
95th Queue (ft)	107	179	91	44	139	113	264	70
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Queuing and Blocking Report Baseline

11/17/2025

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	115	133	179	211	123	68	385	22
Average Queue (ft)	38	49	56	97	48	13	200	5
95th Queue (ft)	97	113	124	177	104	45	324	19
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 4

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	424	9	27	473	241	7	6	17	156	12	91
Future Volume (Veh/h)	142	424	9	27	473	241	7	6	17	156	12	91
Sign Control	Free				Free		Stop				Stop	
Grade	0%				0%		0%				0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	154	461	10	29	514	262	8	7	18	170	13	99
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	776			471			1452	1608	466	1362	1351	514
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	776			471			1452	1608	466	1362	1351	514
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	82			97			89	92	97	0	89	82
cM capacity (veh/h)	849			1101			70	84	601	97	121	564
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	154	471	29	514	262	33	170	112				
Volume Left	154	0	29	0	0	8	170	0				
Volume Right	0	10	0	0	262	18	0	99				
cSH	849	1700	1101	1700	1700	146	97	396				
Volume to Capacity	0.18	0.28	0.03	0.30	0.15	0.23	1.75	0.28				
Queue Length 95th (ft)	16	0	2	0	0	21	344	29				
Control Delay (s)	10.2	0.0	8.4	0.0	0.0	36.9	451.3	17.6				
Lane LOS	B	A				E	F	C				
Approach Delay (s)	2.5	0.3				36.9	279.1					
Approach LOS												
E												
F												
Intersection Summary												
Average Delay			46.8									
Intersection Capacity Utilization			58.1%		ICU Level of Service				B			
Analysis Period (min)			15									

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	462	47	351	736	27	85	349	46	49	84
v/c Ratio	0.46	0.52	0.07	0.59	0.67	0.03	0.63	0.79	0.45	0.44	0.36
Control Delay	63.9	26.6	0.2	76.1	13.5	0.0	78.2	19.5	71.6	69.8	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.9	26.6	0.2	76.1	13.5	0.0	78.2	19.5	71.6	69.8	5.4
Queue Length 50th (ft)	47	260	0	156	247	0	70	0	40	43	0
Queue Length 95th (ft)	78	392	0	m138	m153	m0	127	#102	83	86	7
Internal Link Dist (ft)	1290				1222		1066		438		
Turn Bay Length (ft)	365	290		260	230		115		115		
Base Capacity (vph)	471	887	709	598	1094	957	162	459	332	363	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.52	0.07	0.59	0.67	0.03	0.52	0.76	0.14	0.13	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	107	439	45	10	323	699	26	31	49	332	49	41
Future Volume (vph)	107	439	45	10	323	699	26	31	49	332	49	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (prot)	3502	1845	1313		3435	1881	1538		1835	1599	1633	1783
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (perm)	3502	1845	1313		3435	1881	1538		1835	1599	1633	1783
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	113	462	47	11	340	736	27	33	52	349	52	43
RTOR Reduction (vph)	0	0	24	0	0	0	11	0	0	323	0	0
Lane Group Flow (vph)	113	462	23	0	351	736	16	0	85	26	46	49
Heavy Vehicles (%)	0%	3%	23%	0%	2%	1%	5%	4%	0%	1%	5%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2				6			3		
Actuated Green, G (s)	9.1	62.5	62.5		22.7	75.6	75.6		9.6	9.6	8.2	8.2
Effective Green, g (s)	9.1	62.5	62.5		22.7	75.6	75.6		9.6	9.6	8.2	8.2
Actuated g/C Ratio	0.07	0.48	0.48		0.17	0.58	0.58		0.07	0.07	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	245	887	631		599	1093	894		135	118	103	112
v/s Ratio Prot	0.03	0.25			c0.10	c0.39			c0.05		c0.03	0.03
v/s Ratio Perm			0.02				0.01			0.02		
v/c Ratio	0.46	0.52	0.04		0.59	0.67	0.02		0.63	0.22	0.45	0.44
Uniform Delay, d1	58.1	23.4	17.8		49.3	18.7	11.5		58.5	56.7	58.7	58.7
Progression Factor	1.00	1.00	1.00		1.51	0.64	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	2.2	0.1		0.1	0.2	0.0		6.5	0.3	1.1	1.0
Delay (s)	59.1	25.6	17.9		74.6	12.1	11.5		64.9	57.0	59.8	59.7
Level of Service	E	C	B		E	B	B		E	E	E	E
Approach Delay (s)		31.1				31.8			58.6			58.6
Approach LOS		C				C			E			E
Intersection Summary												
HCM 2000 Control Delay			38.6			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			27.5			
Intersection Capacity Utilization			79.8%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	80
Future Volume (vph)	80
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	84
RTOR Reduction (vph)	79
Lane Group Flow (vph)	5
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.2
Effective Green, g (s)	8.2
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	101
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.05
Uniform Delay, d1	57.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	57.3
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	20	918	419	651	1022	37	205	203	434	71	23
v/c Ratio	0.25	0.70	0.49	1.64	0.66	0.05	0.92	0.91	1.00	1.65	0.06
Control Delay	66.6	37.3	4.1	341.4	19.8	0.1	92.9	90.3	65.7	417.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.6	37.3	4.1	341.4	19.8	0.1	92.9	90.3	65.7	417.0	0.3
Queue Length 50th (ft)	17	343	0	~421	260	0	180	177	181	~87	0
Queue Length 95th (ft)	44	362	57	#546	363	m0	m#326	m#318	#402	#209	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	305		480	415		210	300				95
Base Capacity (vph)	124	1606	954	396	1765	884	222	223	436	43	384
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.57	0.44	1.64	0.58	0.04	0.92	0.91	1.00	1.65	0.06

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	872	398	618	971	35	367	21	412	31	36	22
Future Volume (vph)	19	872	398	618	971	35	367	21	412	31	36	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1703	3539	1599	3433	3574	1615	1698	1713	1568		1857	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.14	1.00
Satd. Flow (perm)	1703	3539	1599	3433	3574	1615	1698	1713	1568		268	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	918	419	651	1022	37	386	22	434	33	38	23
RTOR Reduction (vph)	0	0	264	0	0	21	0	0	231	0	0	19
Lane Group Flow (vph)	20	918	155	651	1022	16	205	203	203	0	71	4
Heavy Vehicles (%)	6%	2%	1%	2%	1%	0%	1%	0%	3%	0%	0%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.1	48.2	48.2	15.0	56.6	56.6	17.0	17.0	17.0		20.8	20.8
Effective Green, g (s)	6.1	48.2	48.2	15.0	56.6	56.6	17.0	17.0	17.0		20.8	20.8
Actuated g/C Ratio	0.05	0.37	0.37	0.12	0.44	0.44	0.13	0.13	0.13		0.16	0.16
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	79	1312	592	396	1556	703	222	224	205		42	246
v/s Ratio Prot	0.01	c0.26		c0.19	0.29		0.12	0.12				
v/s Ratio Perm			0.10			0.01			c0.13		c0.27	0.00
v/c Ratio	0.25	0.70	0.26	1.64	0.66	0.02	0.92	0.91	0.99		1.69	0.01
Uniform Delay, d1	59.8	34.8	28.5	57.5	29.0	20.9	55.9	55.7	56.4		54.6	46.0
Progression Factor	1.00	1.00	1.00	1.34	0.63	1.00	0.98	0.98	1.37		1.00	1.00
Incremental Delay, d2	0.6	3.1	1.1	298.7	1.7	0.0	34.5	30.6	52.9		393.6	0.0
Delay (s)	60.4	37.9	29.6	375.7	20.0	21.0	89.4	85.4	130.1		448.2	46.0
Level of Service	E	D	C	F	C	C	F	F	F		F	D
Approach Delay (s)		35.6			155.4			109.4			349.8	
Approach LOS		D			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			109.7									F
HCM 2000 Volume to Capacity ratio			1.09									
Actuated Cycle Length (s)			130.0						29.5			
Intersection Capacity Utilization			77.5%									D
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1010	417	20	1222	500	205
v/c Ratio	0.58	0.42	0.22	0.63	0.82	0.32
Control Delay	11.8	1.2	63.5	17.7	53.0	10.8
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	11.8	1.2	63.5	17.7	53.0	10.8
Queue Length 50th (ft)	144	4	16	303	374	22
Queue Length 95th (ft)	m148	m11	m31	323	#715	95
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	1817	1024	129	2309	611	649
Starvation Cap Reductn	0	0	0	178	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.41	0.16	0.57	0.82	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	949	392	19	1149	470	193
Future Volume (vph)	949	392	19	1149	470	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1599	1687	3574	1787	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1599	1687	3574	1787	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1010	417	20	1222	500	205
RTOR Reduction (vph)	0	226	0	0	0	109
Lane Group Flow (vph)	1010	191	20	1222	500	96
Heavy Vehicles (%)	2%	1%	7%	1%	1%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	59.7	59.7	3.4	71.1	44.4	44.4
Effective Green, g (s)	59.7	59.7	3.4	71.1	44.4	44.4
Actuated g/C Ratio	0.46	0.46	0.03	0.55	0.34	0.34
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1625	734	44	1954	610	540
v/s Ratio Prot	0.29		0.01	c0.34	c0.28	
v/s Ratio Perm		0.12				0.06
v/c Ratio	0.62	0.26	0.45	0.63	0.82	0.18
Uniform Delay, d1	26.6	21.6	62.4	20.3	39.1	30.0
Progression Factor	0.47	0.20	1.01	0.83	1.00	1.00
Incremental Delay, d2	1.2	0.6	6.2	1.3	9.5	0.3
Delay (s)	13.7	5.0	69.3	18.0	48.6	30.3
Level of Service	B	A	E	B	D	C
Approach Delay (s)	11.2			18.9	43.3	
Approach LOS	B			B	D	
Intersection Summary						
HCM 2000 Control Delay			20.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.75			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			69.9%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	811	376	144	731	518	80
v/c Ratio	0.62	0.46	0.69	0.37	0.87	0.14
Control Delay	13.8	3.5	71.4	16.5	57.9	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.8	3.5	71.4	16.5	57.9	12.1
Queue Length 50th (ft)	156	58	118	174	409	9
Queue Length 95th (ft)	228	26	185	180	#716	50
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1442	855	269	2226	596	586
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.44	0.54	0.33	0.87	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	779	361	138	702	497	77
Future Volume (vph)	779	361	138	702	497	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1553	1752	3574	1770	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1553	1752	3574	1770	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	811	376	144	731	518	80
RTOR Reduction (vph)	0	237	0	0	0	42
Lane Group Flow (vph)	811	139	144	731	518	38
Heavy Vehicles (%)	2%	4%	3%	1%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	48.2	48.2	15.5	71.7	43.8	43.8
Effective Green, g (s)	48.2	48.2	15.5	71.7	43.8	43.8
Actuated g/C Ratio	0.37	0.37	0.12	0.55	0.34	0.34
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1312	575	208	1971	596	544
v/s Ratio Prot	c0.23		c0.08	0.20	c0.29	
v/s Ratio Perm		0.09				0.02
v/c Ratio	0.62	0.24	0.69	0.37	0.87	0.07
Uniform Delay, d1	33.4	28.3	55.0	16.4	40.4	29.3
Progression Factor	0.36	0.74	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.9	9.5	0.5	12.8	0.1
Delay (s)	13.9	21.7	64.5	17.0	53.2	29.3
Level of Service	B	C	E	B	D	C
Approach Delay (s)	16.4			24.8	50.0	
Approach LOS	B			C	D	
Intersection Summary						
HCM 2000 Control Delay			26.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.73			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			75.5%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	95	31	43	58	280	277
Average Queue (ft)	39	7	6	21	152	105
95th Queue (ft)	76	26	25	48	306	395
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)					10	5
Queuing Penalty (veh)					10	8

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	70	152	329	138	155	196	375	151	122	166	47	93
Average Queue (ft)	16	69	173	20	56	89	178	12	50	76	6	21
95th Queue (ft)	50	123	286	79	119	153	346	72	100	130	26	63
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)			1	0	0	0	6	0			0	0
Queuing Penalty (veh)			1	0	0	0	1	0			0	0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	77
Average Queue (ft)	9
95th Queue (ft)	41
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

11/17/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	95	351	428	262	411	415	691	663	64	248	282	380
Average Queue (ft)	21	178	244	31	389	414	680	134	4	142	161	202
95th Queue (ft)	65	292	362	152	471	416	687	412	35	221	253	334
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)							60	0				
Queuing Penalty (veh)							483	1				
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)		1	0	0	7	62	74	3	0	0	1	
Queuing Penalty (veh)		0	1	0	35	299	454	1	0	0	1	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	137	52
Average Queue (ft)	43	4
95th Queue (ft)	105	27
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	3	0
Queuing Penalty (veh)	1	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	166	199	104	230	721	723	1115	1109
Average Queue (ft)	77	120	45	71	578	493	1081	928
95th Queue (ft)	140	180	81	227	867	854	1209	1576
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)					18	1	91	83
Queuing Penalty (veh)					110	4	0	0
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)				0	75			
Queuing Penalty (veh)				1	15			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	165	165	105	263	351	330	1045	1038
Average Queue (ft)	60	62	45	122	183	124	899	687
95th Queue (ft)	132	137	87	209	311	270	1264	1414
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)							54	48
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)				475				
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Network Summary

Network wide Queuing Penalty: 1427

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	36	315	10	13	305	128	7	2	28	3	171	5
Future Volume (Veh/h)	36	315	10	13	305	128	7	2	28	3	171	5
Sign Control	Free				Free				Stop			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	342	11	14	332	139	8	2	30	0	186	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked										0.00		
vC, conflicting volume	471			353			851	924	348	0	811	791
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	471			353			851	924	348	0	811	791
tC, single (s)	4.1			4.1			7.1	6.5	6.2	0.0	7.1	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	0.0	3.5	4.0
p0 queue free %	96			99			97	99	96	0	33	98
cM capacity (veh/h)	1101			1217			245	259	700	0	276	309
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	39	353	14	332	139	40	186	68				
Volume Left	39	0	14	0	0	8	186	0				
Volume Right	0	11	0	0	139	30	0	63				
cSH	1101	1700	1217	1700	1700	481	276	652				
Volume to Capacity	0.04	0.21	0.01	0.20	0.08	0.08	0.67	0.10				
Queue Length 95th (ft)	3	0	1	0	0	7	111	9				
Control Delay (s)	8.4	0.0	8.0	0.0	0.0	13.2	41.4	11.2				
Lane LOS	A			A			B	E	B			
Approach Delay (s)	0.8			0.2			13.2	33.3				
Approach LOS							B	D				
Intersection Summary												
Average Delay			8.1									
Intersection Capacity Utilization			46.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	58
Future Volume (Veh/h)	58
Sign Control	
Grade	
Peak Hour Factor	0.92
Hourly flow rate (vph)	63
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	332
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	332
tC, single (s)	6.2
tC, 2 stage (s)	
tF (s)	3.3
p0 queue free %	91
cM capacity (veh/h)	714
Direction, Lane #	

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	151	501	14	282	515	14	112	291	40	49	52
v/c Ratio	0.54	0.52	0.02	0.65	0.49	0.01	0.66	0.71	0.38	0.44	0.23
Control Delay	64.2	24.9	0.0	73.1	11.5	0.0	75.2	16.1	67.8	70.4	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	24.9	0.0	73.1	11.5	0.0	75.2	16.1	67.8	70.4	2.3
Queue Length 50th (ft)	63	276	0	121	128	0	92	0	34	43	0
Queue Length 95th (ft)	97	427	0	m170	m159	m0	156	89	74	86	0
Internal Link Dist (ft)		1290			1222		1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	963	900	436	1043	963	184	421	349	366	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.52	0.02	0.65	0.49	0.01	0.61	0.69	0.11	0.13	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	143	476	13	27	241	489	13	12	94	276	43	42
Future Volume (vph)	143	476	13	27	241	489	13	12	94	276	43	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.99
Satd. Flow (prot)	3502	1881	1615		3440	1881	1615		1867	1615	1715	1796
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.99
Satd. Flow (perm)	3502	1881	1615		3440	1881	1615		1867	1615	1715	1796
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	151	501	14	28	254	515	14	13	99	291	45	44
RTOR Reduction (vph)	0	0	7	0	0	0	6	0	0	265	0	0
Lane Group Flow (vph)	151	501	7	0	282	515	8	0	112	26	40	49
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	10%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2			6				3		
Actuated Green, G (s)	10.5	66.7	66.7		16.5	72.2	72.2		11.8	11.8	8.0	8.0
Effective Green, g (s)	10.5	66.7	66.7		16.5	72.2	72.2		11.8	11.8	8.0	8.0
Actuated g/C Ratio	0.08	0.51	0.51		0.13	0.56	0.56		0.09	0.09	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	282	965	828		436	1044	896		169	146	105	110
v/s Ratio Prot	0.04	c0.27			c0.08	c0.27			c0.06		0.02	c0.03
v/s Ratio Perm			0.00				0.00			0.02		
v/c Ratio	0.54	0.52	0.01		0.65	0.49	0.01		0.66	0.18	0.38	0.45
Uniform Delay, d1	57.4	21.0	15.5		54.0	17.7	12.9		57.2	54.6	58.6	58.9
Progression Factor	1.00	1.00	1.00		1.23	0.51	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	2.0	0.0		2.3	0.5	0.0		7.3	0.2	0.8	1.0
Delay (s)	58.9	23.0	15.5		68.9	9.5	12.9		64.5	54.9	59.5	59.9
Level of Service	E	C	B		E	A	B		E	D	E	E
Approach Delay (s)		31.0				30.2			57.5			58.9
Approach LOS		C				C			E			E
Intersection Summary												
HCM 2000 Control Delay			37.9			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			27.5			
Intersection Capacity Utilization			76.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	49
Future Volume (vph)	49
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	52
RTOR Reduction (vph)	49
Lane Group Flow (vph)	3
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.0
Effective Green, g (s)	8.0
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	99
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.03
Uniform Delay, d1	57.4
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	57.4
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	50	1541	336	372	802	38	206	210	457	65	29
v/c Ratio	0.48	1.01	0.38	0.77	0.44	0.04	1.23	0.94	0.93	1.38	0.09
Control Delay	73.4	62.5	3.9	68.3	18.4	0.1	192.5	104.3	52.0	306.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	62.5	3.9	68.3	18.4	0.1	192.5	104.3	52.0	306.2	0.5
Queue Length 50th (ft)	41	~687	0	148	245	0	~229	193	170	~72	0
Queue Length 95th (ft)	84	#917	60	192	288	m0	#398	#352	#361	#172	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	305		480	415		210	300				95
Base Capacity (vph)	131	1527	882	686	1829	903	167	224	493	47	337
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	1.01	0.38	0.54	0.44	0.04	1.23	0.94	0.93	1.38	0.09

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	16	31	1464	319	353	762	36	2	359	34	434	39
Future Volume (vph)	16	31	1464	319	353	762	36	2	359	34	434	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	1.00		0.95	0.95	1.00	
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	0.96	1.00	
Satd. Flow (prot)		1805	3574	1615	3433	3610	1615		1698	1719	1599	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.71	0.96	1.00	
Satd. Flow (perm)		1805	3574	1615	3433	3610	1615		1277	1719	1599	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	33	1541	336	372	802	38	2	378	36	457	41
RTOR Reduction (vph)	0	0	0	192	0	0	19	0	0	0	284	0
Lane Group Flow (vph)	0	50	1541	144	372	802	19	0	206	210	173	0
Heavy Vehicles (%)	0%	0%	1%	0%	2%	0%	0%	0%	1%	0%	1%	0%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Perm	Split	NA	Perm	Perm
Protected Phases	5	5	2		1	6			4	4		
Permitted Phases				2			6	4			4	3
Actuated Green, G (s)		7.6	55.6	55.6	18.4	65.9	65.9		17.0	17.0	17.0	
Effective Green, g (s)		7.6	55.6	55.6	18.4	65.9	65.9		17.0	17.0	17.0	
Actuated g/C Ratio		0.06	0.43	0.43	0.14	0.51	0.51		0.13	0.13	0.13	
Clearance Time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Vehicle Extension (s)		2.0	4.0	4.0	2.0	4.0	4.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		105	1528	690	485	1829	818		166	224	209	
v/s Ratio Prot		0.03	c0.43		c0.11	0.22				0.12		
v/s Ratio Perm				0.09			0.01		c0.16		0.11	
v/c Ratio		0.48	1.01	0.21	0.77	0.44	0.02		1.24	0.94	0.83	
Uniform Delay, d1		59.3	37.2	23.4	53.7	20.3	16.0		56.5	56.0	55.1	
Progression Factor		1.00	1.00	1.00	1.09	0.85	1.00		1.16	1.14	1.98	
Incremental Delay, d2		1.2	25.1	0.7	6.0	0.7	0.0		143.8	38.2	19.6	
Delay (s)		60.5	62.3	24.1	64.6	18.0	16.0		209.3	102.2	128.6	
Level of Service		E	E	C	E	B	B		F	F	F	
Approach Delay (s)			55.6			32.2				141.3		
Approach LOS			E			C				F		
Intersection Summary												
HCM 2000 Control Delay			71.2			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)				29.5		
Intersection Capacity Utilization			89.0%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	23	28
Future Volume (vph)	23	28
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	7.0	7.0
Lane Util. Factor	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.97	1.00
Satd. Flow (prot)	1842	1615
Flt Permitted	0.33	1.00
Satd. Flow (perm)	620	1615
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	24	29
RTOR Reduction (vph)	0	27
Lane Group Flow (vph)	65	2
Heavy Vehicles (%)	0%	0%
Turn Type	NA	Perm
Protected Phases	3	
Permitted Phases		3
Actuated Green, G (s)	10.0	10.0
Effective Green, g (s)	10.0	10.0
Actuated g/C Ratio	0.08	0.08
Clearance Time (s)	7.0	7.0
Vehicle Extension (s)	2.5	2.5
Lane Grp Cap (vph)	47	124
v/s Ratio Prot		
v/s Ratio Perm	c0.10	0.00
v/c Ratio	1.38	0.02
Uniform Delay, d1	60.0	55.5
Progression Factor	1.00	1.00
Incremental Delay, d2	263.0	0.0
Delay (s)	323.0	55.5
Level of Service	F	E
Approach Delay (s)	240.5	
Approach LOS	F	
Intersection Summary		

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1413	541	48	888	276	200
v/c Ratio	0.69	0.47	0.41	0.36	0.76	0.43
Control Delay	10.3	0.6	68.0	8.1	62.4	12.7
Queue Delay	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	0.6	68.0	8.1	62.4	12.7
Queue Length 50th (ft)	164	0	38	183	218	24
Queue Length 95th (ft)	m178	m0	m68	206	310	90
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2060	1160	139	2462	424	512
Starvation Cap Reductn	84	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.47	0.35	0.36	0.65	0.39

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1328	509	45	835	259	188
Future Volume (vph)	1328	509	45	835	259	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1615	1805	3610	1752	1599
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1615	1805	3610	1752	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1413	541	48	888	276	200
RTOR Reduction (vph)	0	236	0	0	0	131
Lane Group Flow (vph)	1413	305	48	888	276	69
Heavy Vehicles (%)	1%	0%	0%	0%	3%	1%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	73.4	73.4	7.3	88.7	26.8	26.8
Effective Green, g (s)	73.4	73.4	7.3	88.7	26.8	26.8
Actuated g/C Ratio	0.56	0.56	0.06	0.68	0.21	0.21
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	2017	911	101	2463	361	329
v/s Ratio Prot	c0.40		0.03	c0.25	c0.16	
v/s Ratio Perm		0.19				0.04
v/c Ratio	0.70	0.34	0.48	0.36	0.76	0.21
Uniform Delay, d1	20.4	15.2	59.5	8.7	48.6	42.8
Progression Factor	0.46	0.20	1.01	0.83	1.00	1.00
Incremental Delay, d2	0.5	0.2	3.2	0.4	10.9	0.7
Delay (s)	9.8	3.2	63.1	7.6	59.5	43.5
Level of Service	A	A	E	A	E	D
Approach Delay (s)	8.0			10.5	52.8	
Approach LOS	A			B	D	
Intersection Summary						
HCM 2000 Control Delay			15.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.71			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			63.8%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1159	436	163	649	366	85
v/c Ratio	0.70	0.47	0.73	0.27	0.87	0.19
Control Delay	14.1	2.4	73.4	10.2	68.7	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	2.4	73.4	10.2	68.7	8.4
Queue Length 50th (ft)	212	3	133	116	294	0
Queue Length 95th (ft)	284	11	208	157	405	41
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1664	933	267	2366	479	491
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.47	0.61	0.27	0.76	0.17
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1113	419	156	623	351	82
Future Volume (vph)	1113	419	156	623	351	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1583	1736	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1583	1736	3610	1805	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1159	436	162	649	366	85
RTOR Reduction (vph)	0	197	0	0	0	65
Lane Group Flow (vph)	1159	239	163	649	366	20
Heavy Vehicles (%)	1%	2%	4%	0%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	60.5	60.5	16.7	85.2	30.3	30.3
Effective Green, g (s)	60.5	60.5	16.7	85.2	30.3	30.3
Actuated g/C Ratio	0.47	0.47	0.13	0.66	0.23	0.23
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1663	736	223	2365	420	376
v/s Ratio Prot	c0.32		c0.09	0.18	c0.20	
v/s Ratio Perm		0.15				0.01
v/c Ratio	0.70	0.33	0.73	0.27	0.87	0.05
Uniform Delay, d1	27.5	21.9	54.5	9.4	48.0	38.7
Progression Factor	0.42	0.24	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.9	11.6	0.3	17.6	0.1
Delay (s)	13.3	6.0	66.1	9.7	65.6	38.8
Level of Service	B	A	E	A	E	D
Approach Delay (s)	11.3			21.0	60.5	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			21.9		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.75			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			77.6%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	UL	TR
Maximum Queue (ft)	42	26	6	54	140	53
Average Queue (ft)	11	2	0	22	62	25
95th Queue (ft)	33	14	4	46	108	46
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	106	189	342	83	157	190	350	148	148	150	32	74
Average Queue (ft)	27	80	185	9	55	85	166	9	63	65	5	20
95th Queue (ft)	81	145	304	52	122	151	317	69	123	117	17	55
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	1	0	0	0	4	0				0
Queuing Penalty (veh)		0	1	0	0	0	1	0				0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	17
Average Queue (ft)	2
95th Queue (ft)	11
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

11/17/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	UL	LT	R
Maximum Queue (ft)	304	1536	1552	480	236	279	269	236	126	253	269	573
Average Queue (ft)	108	1275	1312	435	109	136	121	122	13	141	165	331
95th Queue (ft)	304	1995	1974	660	194	225	216	198	62	216	240	588
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)		27	48									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)	0	50	47	2				0	0	0	0	
Queuing Penalty (veh)	1	23	149	14				0	0	0	0	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	90	63
Average Queue (ft)	32	3
95th Queue (ft)	73	27
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	1	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	415	446	216	93	185	160	353	153
Average Queue (ft)	175	213	78	40	76	63	199	70
95th Queue (ft)	331	362	155	83	146	131	313	128
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)		0			0			
Queuing Penalty (veh)		0			0			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	354	360	222	253	195	144	435	95
Average Queue (ft)	133	145	63	132	104	52	266	27
95th Queue (ft)	284	289	141	222	176	112	409	66
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 190

Appendix F
SYNCHRO & SimTraffic Analysis
Of 2046 Background Conditions

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	412	0	12	301	96	9	6	30	94	4	21
Future Volume (Veh/h)	57	412	0	12	301	96	9	6	30	94	4	21
Sign Control	Free				Free		Stop				Stop	
Grade	0%				0%		0%				0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	448	0	13	327	104	10	7	33	102	4	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	431			448			950	1029	448	962	925	327
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	431			448			950	1029	448	962	925	327
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.0	3.4
p0 queue free %	95			99			95	97	95	51	98	97
cM capacity (veh/h)	1139			1071			207	220	615	208	253	705
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	62	448	13	327	104	50	102	27				
Volume Left	62	0	13	0	0	10	102	0				
Volume Right	0	0	0	0	104	33	0	23				
cSH	1139	1700	1071	1700	1700	374	208	558				
Volume to Capacity	0.05	0.26	0.01	0.19	0.06	0.13	0.49	0.05				
Queue Length 95th (ft)	4	0	1	0	0	11	61	4				
Control Delay (s)	8.3	0.0	8.4	0.0	0.0	16.1	37.8	11.8				
Lane LOS	A	A				C	E	B				
Approach Delay (s)	1.0	0.2				16.1	32.3					
Approach LOS	C						D					
Intersection Summary												
Average Delay			4.9									
Intersection Capacity Utilization			46.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	67	551	82	421	316	10	115	374	6	75	24
v/c Ratio	0.34	0.74	0.11	0.56	0.31	0.01	0.73	0.78	0.05	0.55	0.10
Control Delay	63.1	39.7	0.3	69.8	8.4	0.0	82.6	17.7	54.2	72.4	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	39.7	0.3	69.8	8.4	0.0	82.6	17.7	54.2	72.4	0.8
Queue Length 50th (ft)	28	384	0	181	75	0	94	0	5	65	0
Queue Length 95th (ft)	52	526	0	m238	m88	m0	#194	#130	20	116	0
Internal Link Dist (ft)		1290			1222		3082			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	761	741	750	1036	890	166	484	349	367	420
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.72	0.11	0.56	0.31	0.01	0.69	0.77	0.02	0.20	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	507	75	387	291	9	52	53	344	6	68	22
Future Volume (vph)	62	507	75	387	291	9	52	53	344	6	68	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	1827	1568	3467	1776	1417		1718	1509	1715	1804	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3502	1827	1568	3467	1776	1417		1718	1509	1715	1804	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	551	82	421	316	10	57	58	374	7	74	24
RTOR Reduction (vph)	0	0	49	0	0	4	0	0	339	0	0	22
Lane Group Flow (vph)	67	551	33	421	316	6	0	115	35	6	75	2
Heavy Vehicles (%)	0%	4%	3%	1%	7%	14%	14%	2%	7%	0%	0%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	6.3	53.1	53.1	28.1	74.4	74.4		12.0	12.0	9.8	9.8	9.8
Effective Green, g (s)	6.3	53.1	53.1	28.1	74.4	74.4		12.0	12.0	9.8	9.8	9.8
Actuated g/C Ratio	0.05	0.41	0.41	0.22	0.57	0.57		0.09	0.09	0.08	0.08	0.08
Clearance Time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0	2.0	4.0	4.0		2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	169	746	640	749	1016	810		158	139	129	135	114
v/s Ratio Prot	0.02	c0.30		c0.12	0.18			c0.07		0.00	c0.04	
v/s Ratio Perm			0.02			0.00			0.02			0.00
v/c Ratio	0.40	0.74	0.05	0.56	0.31	0.01		0.73	0.25	0.05	0.56	0.02
Uniform Delay, d1	60.0	32.6	23.2	45.5	14.5	11.9		57.4	54.8	55.8	58.0	55.6
Progression Factor	1.00	1.00	1.00	1.43	0.49	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	6.5	0.2	0.5	0.2	0.0		13.2	0.3	0.1	2.8	0.0
Delay (s)	61.1	39.0	23.4	65.6	7.3	11.9		70.6	55.2	55.8	60.8	55.7
Level of Service	E	D	C	E	A	B		E	E	E	E	E
Approach Delay (s)		39.3			40.2			58.8			59.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			45.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		27.5			
Intersection Capacity Utilization			68.8%				ICU Level of Service		C			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	28	792	408	313	534	20	213	213	497	40	10
v/c Ratio	0.31	0.68	0.51	0.84	0.38	0.03	0.60	0.59	0.86	0.75	0.03
Control Delay	67.7	39.5	4.8	67.8	33.3	0.1	52.3	52.1	39.6	121.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.7	39.5	4.8	67.8	33.3	0.1	52.3	52.1	39.6	121.4	0.2
Queue Length 50th (ft)	23	303	0	141	222	0	191	190	256	33	0
Queue Length 95th (ft)	56	329	62	#211	201	m0	m#345	m#343	#489	#95	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	305		480	415		210	300				95
Base Capacity (vph)	131	1560	934	384	1725	882	357	360	580	56	294
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.51	0.44	0.82	0.31	0.02	0.60	0.59	0.86	0.71	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	729	375	288	491	18	370	22	457	30	6	9
Future Volume (vph)	26	729	375	288	491	18	370	22	457	30	6	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1805	3438	1568	3335	3505	1615	1588	1604	1568		1825	1417
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.28	1.00
Satd. Flow (perm)	1805	3438	1568	3335	3505	1615	1588	1604	1568		533	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	792	408	313	534	20	402	24	497	33	7	10
RTOR Reduction (vph)	0	0	269	0	0	12	0	0	228	0	0	9
Lane Group Flow (vph)	28	792	139	313	534	8	213	213	269	0	40	1
Heavy Vehicles (%)	0%	5%	3%	5%	3%	0%	8%	6%	3%	0%	0%	14%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.6	44.3	44.3	14.5	51.7	51.7	29.2	29.2	29.2		13.0	13.0
Effective Green, g (s)	6.6	44.3	44.3	14.5	51.7	51.7	29.2	29.2	29.2		13.0	13.0
Actuated g/C Ratio	0.05	0.34	0.34	0.11	0.40	0.40	0.22	0.22	0.22		0.10	0.10
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	91	1171	534	371	1393	642	356	360	352		53	141
v/s Ratio Prot	0.02	c0.23		c0.09	c0.15		0.13	0.13				
v/s Ratio Perm			0.09			0.00			c0.17		c0.07	0.00
v/c Ratio	0.31	0.68	0.26	0.84	0.38	0.01	0.60	0.59	0.76		0.75	0.01
Uniform Delay, d1	59.5	36.7	31.0	56.6	27.8	23.7	45.1	45.1	47.2		56.9	52.7
Progression Factor	1.00	1.00	1.00	0.84	1.19	1.00	0.98	0.98	1.55		1.00	1.00
Incremental Delay, d2	0.7	3.1	1.2	14.8	0.8	0.0	1.8	1.7	6.4		43.5	0.0
Delay (s)	60.2	39.9	32.2	62.6	33.8	23.7	46.1	46.0	79.7		100.4	52.7
Level of Service	E	D	C	E	C	C	D	D	E		F	D
Approach Delay (s)		37.8			43.9			64.2			90.9	
Approach LOS		D			D			E			F	
Intersection Summary												
HCM 2000 Control Delay			48.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)			29.5		
Intersection Capacity Utilization			70.1%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	883	449	16	603	238	71
v/c Ratio	0.39	0.39	0.17	0.24	0.73	0.22
Control Delay	8.4	1.5	59.3	9.6	62.5	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.4	1.5	59.3	9.6	62.5	10.4
Queue Length 50th (ft)	86	0	12	148	190	0
Queue Length 95th (ft)	141	m24	m30	181	268	40
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2272	1146	138	2468	412	400
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.39	0.12	0.24	0.58	0.18

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	812	413	15	555	219	65
Future Volume (vph)	812	413	15	555	219	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1524	1805	3539	1703	1429
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1524	1805	3539	1703	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	883	449	16	603	238	71
RTOR Reduction (vph)	0	174	0	0	0	57
Lane Group Flow (vph)	883	275	16	603	238	14
Heavy Vehicles (%)	3%	6%	0%	2%	6%	13%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	79.5	79.5	3.2	90.7	24.8	24.8
Effective Green, g (s)	79.5	79.5	3.2	90.7	24.8	24.8
Actuated g/C Ratio	0.61	0.61	0.02	0.70	0.19	0.19
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	2143	931	44	2469	324	272
v/s Ratio Prot	c0.25		0.01	c0.17	c0.14	
v/s Ratio Perm		0.18				0.01
v/c Ratio	0.41	0.29	0.36	0.24	0.73	0.05
Uniform Delay, d1	13.1	12.0	62.4	7.2	49.5	43.0
Progression Factor	0.63	0.52	0.95	1.21	1.00	1.00
Incremental Delay, d2	0.5	0.6	4.8	0.2	10.1	0.2
Delay (s)	8.7	6.8	64.1	8.9	59.6	43.1
Level of Service	A	A	E	A	E	D
Approach Delay (s)	8.0			10.3	55.8	
Approach LOS	A			B	E	
Intersection Summary						
HCM 2000 Control Delay			15.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.49			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			46.7%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	467	463	113	347	308	12
v/c Ratio	0.27	0.46	0.63	0.15	0.82	0.03
Control Delay	12.4	3.9	70.5	8.6	65.5	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	3.9	70.5	8.6	65.5	16.5
Queue Length 50th (ft)	109	73	93	51	249	0
Queue Length 95th (ft)	52	10	151	85	331	16
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1731	1019	248	2391	469	441
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.45	0.46	0.15	0.66	0.03
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	430	426	104	319	283	11
Future Volume (vph)	430	426	104	319	283	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1568	1612	3539	1752	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1568	1612	3539	1752	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	467	463	113	347	308	12
RTOR Reduction (vph)	0	231	0	0	0	9
Lane Group Flow (vph)	467	232	113	347	308	3
Heavy Vehicles (%)	5%	3%	12%	2%	3%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	65.1	65.1	14.4	87.5	28.0	28.0
Effective Green, g (s)	65.1	65.1	14.4	87.5	28.0	28.0
Actuated g/C Ratio	0.50	0.50	0.11	0.67	0.22	0.22
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1721	785	178	2382	377	347
v/s Ratio Prot	0.14		c0.07	0.10	c0.18	
v/s Ratio Perm		c0.15				0.00
v/c Ratio	0.27	0.30	0.63	0.15	0.82	0.01
Uniform Delay, d1	18.7	19.0	55.3	7.7	48.6	40.1
Progression Factor	0.58	1.11	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.9	7.2	0.1	12.8	0.0
Delay (s)	11.3	22.0	62.5	7.8	61.4	40.1
Level of Service	B	C	E	A	E	D
Approach Delay (s)	16.7			21.3	60.6	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			26.1		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.48			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			56.9%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Queuing and Blocking Report

Baseline

11/17/2025

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	41	26	2	61	96	49
Average Queue (ft)	15	3	0	25	43	16
95th Queue (ft)	38	15	2	50	80	40
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	L	L	T	R	LT	R	L	LT
Maximum Queue (ft)	52	233	455	205	199	213	257	25	170	222	10	91
Average Queue (ft)	7	49	229	44	98	124	97	2	74	107	1	26
95th Queue (ft)	32	137	379	157	177	193	210	15	138	185	6	70
Link Distance (ft)			1319			1150	1150		3106	3106		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	3	0	0	0	1					0
Queuing Penalty (veh)		0	4	0	0	0	0					0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	14
Average Queue (ft)	1
95th Queue (ft)	8
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Baseline

11/17/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	78	324	463	309	201	214	176	164	30	265	295	467
Average Queue (ft)	24	140	258	23	106	108	75	83	6	146	175	257
95th Queue (ft)	60	264	399	150	176	190	144	144	24	235	260	445
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)		0	0	0						0	0	
Queuing Penalty (veh)		0	0	0						0	1	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	66	27
Average Queue (ft)	15	1
95th Queue (ft)	48	13
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	0	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	126	199	122	64	172	148	307	83
Average Queue (ft)	53	108	50	18	66	52	171	34
95th Queue (ft)	110	181	94	50	146	126	277	68
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Queuing and Blocking Report Baseline

11/17/2025

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	124	147	178	212	138	77	384	29
Average Queue (ft)	41	48	65	102	55	17	215	4
95th Queue (ft)	101	114	135	185	115	53	338	18
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 6

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	450	10	28	502	256	7	6	18	165	12	96
Future Volume (Veh/h)	150	450	10	28	502	256	7	6	18	165	12	96
Sign Control	Free				Free		Stop				Stop	
Grade	0%				0%		0%				0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	489	11	30	546	278	8	7	20	179	13	104
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	824			500			1537	1704	494	1444	1432	546
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	824			500			1537	1704	494	1444	1432	546
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	80			97			86	90	97	0	88	81
cM capacity (veh/h)	815			1075			58	72	579	82	105	541
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	163	500	30	546	278	35	179	117				
Volume Left	163	0	30	0	0	8	179	0				
Volume Right	0	11	0	0	278	20	0	104				
cSH	815	1700	1075	1700	1700	130	82	371				
Volume to Capacity	0.20	0.29	0.03	0.32	0.16	0.27	2.17	0.32				
Queue Length 95th (ft)	19	0	2	0	0	25	405	33				
Control Delay (s)	10.5	0.0	8.4	0.0	0.0	42.6	648.2	19.1				
Lane LOS	B	A				E	F	C				
Approach Delay (s)	2.6	0.3				42.6	399.5					
Approach LOS					E		F					
Intersection Summary												
Average Delay			65.9									
Intersection Capacity Utilization			60.5%		ICU Level of Service				B			
Analysis Period (min)			15									

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	119	491	51	373	781	28	90	371	49	51	89
v/c Ratio	0.48	0.57	0.07	0.58	0.72	0.03	0.65	0.80	0.47	0.45	0.38
Control Delay	64.0	29.2	0.2	76.0	14.8	0.0	80.0	19.4	72.1	69.8	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	29.2	0.2	76.0	14.8	0.0	80.0	19.4	72.1	69.8	6.5
Queue Length 50th (ft)	50	291	0	165	279	0	74	0	43	44	0
Queue Length 95th (ft)	81	431	0	m142	m165	m0	132	#110	86	88	13
Internal Link Dist (ft)	1290			1222			3082			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	855	689	648	1085	951	162	479	332	363	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.57	0.07	0.58	0.72	0.03	0.56	0.77	0.15	0.14	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	113	466	48	11	343	742	27	33	52	352	52	43
Future Volume (vph)	113	466	48	11	343	742	27	33	52	352	52	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (prot)	3502	1845	1313		3435	1881	1538		1835	1599	1633	1784
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (perm)	3502	1845	1313		3435	1881	1538		1835	1599	1633	1784
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	491	51	12	361	781	28	35	55	371	55	45
RTOR Reduction (vph)	0	0	27	0	0	0	12	0	0	343	0	0
Lane Group Flow (vph)	119	491	24	0	373	781	16	0	90	28	49	51
Heavy Vehicles (%)	0%	3%	23%	0%	2%	1%	5%	4%	0%	1%	5%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2				6			3		
Actuated Green, G (s)	9.3	60.2	60.2		24.6	75.0	75.0		9.8	9.8	8.4	8.4
Effective Green, g (s)	9.3	60.2	60.2		24.6	75.0	75.0		9.8	9.8	8.4	8.4
Actuated g/C Ratio	0.07	0.46	0.46		0.19	0.58	0.58		0.08	0.08	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	250	854	608		650	1085	887		138	120	105	115
v/s Ratio Prot	0.03	0.27			c0.11	c0.42			c0.05		c0.03	0.03
v/s Ratio Perm			0.02				0.01			0.02		
v/c Ratio	0.48	0.57	0.04		0.57	0.72	0.02		0.65	0.23	0.47	0.44
Uniform Delay, d1	58.0	25.5	19.1		47.9	19.9	11.8		58.4	56.6	58.6	58.5
Progression Factor	1.00	1.00	1.00		1.55	0.66	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	2.8	0.1		0.1	0.2	0.0		8.1	0.4	1.2	1.0
Delay (s)	59.0	28.3	19.2		74.1	13.3	11.8		66.6	56.9	59.8	59.5
Level of Service	E	C	B		E	B	B		E	E	E	E
Approach Delay (s)		33.2				32.4			58.8			58.5
Approach LOS		C				C			E			E
Intersection Summary												
HCM 2000 Control Delay			39.5			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			27.5			
Intersection Capacity Utilization			83.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	85
Future Volume (vph)	85
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	89
RTOR Reduction (vph)	83
Lane Group Flow (vph)	6
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.4
Effective Green, g (s)	8.4
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	104
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.06
Uniform Delay, d1	57.1
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	57.2
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	21	974	445	691	1083	39	217	215	460	75	24
v/c Ratio	0.26	0.71	0.50	1.74	0.67	0.05	0.98	0.96	1.08	1.74	0.07
Control Delay	66.9	36.2	4.0	382.1	19.4	0.1	102.2	99.1	88.3	450.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.9	36.2	4.0	382.1	19.4	0.1	102.2	99.1	88.3	450.8	0.3
Queue Length 50th (ft)	17	357	0	~459	311	0	192	190	~229	~95	0
Queue Length 95th (ft)	46	388	59	m#559	m368	m0	m#348	m#344	#468	#216	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	305		480	415		210	300				95
Base Capacity (vph)	124	1606	968	396	1765	884	222	223	427	43	360
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.61	0.46	1.74	0.61	0.04	0.98	0.96	1.08	1.74	0.07

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	925	423	656	1029	37	389	22	437	33	38	23
Future Volume (vph)	20	925	423	656	1029	37	389	22	437	33	38	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1703	3539	1599	3433	3574	1615	1698	1713	1568		1857	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.16	1.00
Satd. Flow (perm)	1703	3539	1599	3433	3574	1615	1698	1713	1568		300	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	974	445	691	1083	39	409	23	460	35	40	24
RTOR Reduction (vph)	0	0	272	0	0	21	0	0	223	0	0	21
Lane Group Flow (vph)	21	974	173	691	1083	18	217	215	237	0	75	3
Heavy Vehicles (%)	6%	2%	1%	2%	1%	0%	1%	0%	3%	0%	0%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.2	50.4	50.4	15.0	58.7	58.7	17.0	17.0	17.0		18.6	18.6
Effective Green, g (s)	6.2	50.4	50.4	15.0	58.7	58.7	17.0	17.0	17.0		18.6	18.6
Actuated g/C Ratio	0.05	0.39	0.39	0.12	0.45	0.45	0.13	0.13	0.13		0.14	0.14
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	81	1372	619	396	1613	729	222	224	205		42	220
v/s Ratio Prot	0.01	c0.28		c0.20	0.30		0.13	0.13				
v/s Ratio Perm			0.11			0.01			c0.15		c0.25	0.00
v/c Ratio	0.26	0.71	0.28	1.74	0.67	0.02	0.98	0.96	1.16		1.79	0.02
Uniform Delay, d1	59.7	33.6	27.3	57.5	28.1	19.8	56.3	56.2	56.5		55.7	47.8
Progression Factor	1.00	1.00	1.00	1.30	0.64	1.00	0.96	0.96	1.24		1.00	1.00
Incremental Delay, d2	0.6	3.1	1.1	342.8	1.6	0.0	46.6	41.6	105.1		433.1	0.0
Delay (s)	60.3	36.8	28.4	417.8	19.7	19.8	100.8	95.7	175.4		488.8	47.9
Level of Service	E	D	C	F	B	B	F	F	F		F	D
Approach Delay (s)		34.5			171.4			138.1			381.9	
Approach LOS		C			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			122.9									F
HCM 2000 Volume to Capacity ratio			1.14									
Actuated Cycle Length (s)			130.0						29.5			
Intersection Capacity Utilization			80.6%									D
Analysis Period (min)			15									
c Critical Lane Group												

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1070	444	21	1296	531	218
v/c Ratio	0.60	0.43	0.23	0.63	0.95	0.36
Control Delay	11.6	1.2	63.0	16.6	72.6	12.9
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	11.6	1.2	63.0	16.7	72.6	12.9
Queue Length 50th (ft)	140	5	17	302	~489	33
Queue Length 95th (ft)	m155	m12	m31	m330	#771	108
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	1817	1037	129	2309	558	608
Starvation Cap Reductn	0	0	0	213	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.43	0.16	0.62	0.95	0.36

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1006	417	20	1218	499	205
Future Volume (vph)	1006	417	20	1218	499	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1599	1687	3574	1787	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1599	1687	3574	1787	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1070	444	21	1296	531	218
RTOR Reduction (vph)	0	232	0	0	0	113
Lane Group Flow (vph)	1070	212	21	1296	531	105
Heavy Vehicles (%)	2%	1%	7%	1%	1%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	62.0	62.0	4.9	74.9	40.6	40.6
Effective Green, g (s)	62.0	62.0	4.9	74.9	40.6	40.6
Actuated g/C Ratio	0.48	0.48	0.04	0.58	0.31	0.31
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1687	762	63	2059	558	494
v/s Ratio Prot	0.30		0.01	c0.36	c0.30	
v/s Ratio Perm		0.13				0.07
v/c Ratio	0.63	0.28	0.33	0.63	0.95	0.21
Uniform Delay, d1	25.5	20.5	61.0	18.3	43.7	32.9
Progression Factor	0.46	0.22	1.00	0.86	1.00	1.00
Incremental Delay, d2	1.2	0.6	2.5	1.2	26.9	0.4
Delay (s)	12.8	5.1	63.7	16.9	70.7	33.4
Level of Service	B	A	E	B	E	C
Approach Delay (s)	10.6			17.6	59.8	
Approach LOS	B			B	E	
Intersection Summary						
HCM 2000 Control Delay			23.5		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.80			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			73.4%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	861	399	153	774	549	84
v/c Ratio	0.64	0.47	0.71	0.38	0.97	0.15
Control Delay	14.0	3.0	72.1	15.6	75.3	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	3.0	72.1	15.6	75.3	13.4
Queue Length 50th (ft)	165	9	125	177	462	12
Queue Length 95th (ft)	254	23	195	193	#774	55
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1448	871	269	2226	567	560
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.46	0.57	0.35	0.97	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	827	383	147	743	527	81
Future Volume (vph)	827	383	147	743	527	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1553	1752	3574	1770	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1553	1752	3574	1770	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	861	399	153	774	549	84
RTOR Reduction (vph)	0	246	0	0	0	43
Lane Group Flow (vph)	861	153	153	774	549	41
Heavy Vehicles (%)	2%	4%	3%	1%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	49.8	49.8	16.0	73.8	41.7	41.7
Effective Green, g (s)	49.8	49.8	16.0	73.8	41.7	41.7
Actuated g/C Ratio	0.38	0.38	0.12	0.57	0.32	0.32
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1355	594	215	2028	567	518
v/s Ratio Prot	c0.24		c0.09	0.22	c0.31	
v/s Ratio Perm		0.10				0.03
v/c Ratio	0.64	0.26	0.71	0.38	0.97	0.08
Uniform Delay, d1	32.7	27.4	54.8	15.5	43.5	30.8
Progression Factor	0.37	0.59	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.9	10.6	0.5	29.5	0.1
Delay (s)	14.1	17.2	65.4	16.1	73.0	30.8
Level of Service	B	B	E	B	E	C
Approach Delay (s)	15.1			24.2	67.4	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			29.8		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.77			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			79.0%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	R	LTR	L	TR
Maximum Queue (ft)	96	6	33	47	66	312	591
Average Queue (ft)	42	0	8	6	21	222	245
95th Queue (ft)	77	4	28	26	52	377	784
Link Distance (ft)	1920				701	1590	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	225		280	255		315	
Storage Blk Time (%)						21	18
Queuing Penalty (veh)						23	30

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	98	136	327	138	135	208	427	132	130	211	58	107
Average Queue (ft)	23	71	184	27	52	86	198	16	52	95	8	29
95th Queue (ft)	69	123	295	95	113	160	374	87	100	167	31	80
Link Distance (ft)	1319				1150		1150	3106		3106	426	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365	290		260	230				115		
Storage Blk Time (%)	1			0	7			0	0			
Queuing Penalty (veh)	2			0	2			0	0			

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	67
Average Queue (ft)	9
95th Queue (ft)	36
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

11/17/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	115	350	444	314	410	415	690	615	82	262	294	456
Average Queue (ft)	26	186	249	43	387	414	680	152	6	153	171	252
95th Queue (ft)	85	295	372	183	471	416	688	428	44	237	260	477
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)							61	0				
Queuing Penalty (veh)							524	1				
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)	0	0	0	0	9	67	76	3	0	0	0	
Queuing Penalty (veh)	0	0	0	0	46	343	497	1	0	0	0	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	126	66
Average Queue (ft)	41	6
95th Queue (ft)	93	40
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	2	0
Queuing Penalty (veh)	1	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	162	212	99	230	724	717	1111	1109
Average Queue (ft)	80	126	48	73	615	523	1088	1043
95th Queue (ft)	142	189	83	231	873	873	1168	1309
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)					25	1	96	82
Queuing Penalty (veh)					158	5	0	0
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)				0	82			
Queuing Penalty (veh)				1	17			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	164	157	118	283	462	430	1050	1037
Average Queue (ft)	60	58	45	125	207	153	921	751
95th Queue (ft)	134	134	92	227	367	327	1254	1458
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)							65	61
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)				475				
Storage Blk Time (%)				0	0			
Queuing Penalty (veh)				0	0			

Network Summary

Network wide Queuing Penalty: 1652

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	UL	TR
Maximum Queue (ft)	44	27	6	49	138	50
Average Queue (ft)	12	4	0	22	66	25
95th Queue (ft)	35	18	4	45	113	45
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	121	216	356	113	155	182	340	148	156	159	44	78
Average Queue (ft)	28	85	198	11	57	85	156	8	77	76	7	23
95th Queue (ft)	80	155	308	63	121	146	306	59	138	135	26	62
Link Distance (ft)			1319			1150	1150		3106	3106		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	1	0		0	4	0				0
Queuing Penalty (veh)		0	2	0		0	1	0				0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	36
Average Queue (ft)	3
95th Queue (ft)	22
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

11/19/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	UL	LT	R
Maximum Queue (ft)	304	1595	1597	480	229	255	250	236	71	287	365	658
Average Queue (ft)	105	1532	1537	448	114	137	121	126	11	162	188	373
95th Queue (ft)	301	1839	1833	640	196	221	206	201	46	253	298	643
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)		41	72									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)	0	57	54	2				1	0	0	1	
Queuing Penalty (veh)	1	28	183	17				0	0	0	2	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	112	80
Average Queue (ft)	39	6
95th Queue (ft)	89	39
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	2	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	392	428	231	120	190	162	401	168
Average Queue (ft)	174	208	78	50	83	70	210	73
95th Queue (ft)	322	350	163	99	161	143	361	131
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)		0	0		0			
Queuing Penalty (veh)		0	0		0			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	351	369	222	260	215	179	434	104
Average Queue (ft)	138	153	67	143	108	61	265	29
95th Queue (ft)	284	298	152	233	188	137	405	68
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 235

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	38	334	11	14	324	136	7	2	30	4	181	5
Future Volume (Veh/h)	38	334	11	14	324	136	7	2	30	4	181	5
Sign Control	Free				Free				Stop			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	363	12	15	352	148	8	2	33	0	197	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked										0.00		
vC, conflicting volume	500			375			902	981	369	0	861	839
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	500			375			902	981	369	0	861	839
tC, single (s)	4.1			4.1			7.1	6.5	6.2	0.0	7.1	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	0.0	3.5	4.0
p0 queue free %	96			99			96	99	95	0	22	98
cM capacity (veh/h)	1075			1195			223	239	681	0	253	289
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	41	375	15	352	148	43	197	72				
Volume Left	41	0	15	0	0	8	197	0				
Volume Right	0	12	0	0	148	33	0	67				
cSH	1075	1700	1195	1700	1700	464	253	634				
Volume to Capacity	0.04	0.22	0.01	0.21	0.09	0.09	0.78	0.11				
Queue Length 95th (ft)	3	0	1	0	0	8	145	10				
Control Delay (s)	8.5	0.0	8.1	0.0	0.0	13.5	56.0	11.4				
Lane LOS	A			A			B	F	B			
Approach Delay (s)	0.8			0.2			13.5	44.1				
Approach LOS							B	E				
Intersection Summary												
Average Delay			10.4									
Intersection Capacity Utilization			48.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	62
Future Volume (Veh/h)	62
Sign Control	
Grade	
Peak Hour Factor	0.92
Hourly flow rate (vph)	67
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	352
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	352
tC, single (s)	6.2
tC, 2 stage (s)	
tF (s)	3.3
p0 queue free %	90
cM capacity (veh/h)	696
Direction, Lane #	

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	160	532	15	298	546	15	118	308	43	51	55
v/c Ratio	0.55	0.56	0.02	0.63	0.53	0.02	0.70	0.72	0.40	0.45	0.24
Control Delay	64.2	26.6	0.0	72.3	12.1	0.0	78.7	16.4	68.5	70.6	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	26.6	0.0	72.3	12.1	0.0	78.7	16.4	68.5	70.6	2.4
Queue Length 50th (ft)	68	308	0	127	139	0	97	0	37	44	0
Queue Length 95th (ft)	102	450	0	m178	m459	m0	#190	94	77	88	0
Internal Link Dist (ft)		1290			1222		3082			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	942	884	474	1038	959	180	434	349	366	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.56	0.02	0.63	0.53	0.02	0.66	0.71	0.12	0.14	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	152	505	14	28	256	519	14	12	100	293	46	44
Future Volume (vph)	152	505	14	28	256	519	14	12	100	293	46	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00
Satd. Flow (prot)	3502	1881	1615		3440	1881	1615		1869	1615	1715	1796
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00
Satd. Flow (perm)	3502	1881	1615		3440	1881	1615		1869	1615	1715	1796
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	160	532	15	29	269	546	15	13	105	308	48	46
RTOR Reduction (vph)	0	0	7	0	0	0	7	0	0	280	0	0
Lane Group Flow (vph)	160	532	8	0	298	546	8	0	118	28	43	51
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	10%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2			6				3		
Actuated Green, G (s)	10.8	65.2	65.2		17.9	71.8	71.8		11.7	11.7	8.2	8.2
Effective Green, g (s)	10.8	65.2	65.2		17.9	71.8	71.8		11.7	11.7	8.2	8.2
Actuated g/C Ratio	0.08	0.50	0.50		0.14	0.55	0.55		0.09	0.09	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	290	943	809		473	1038	891		168	145	108	113
v/s Ratio Prot	0.05	c0.28			c0.09	c0.29			c0.06		0.03	c0.03
v/s Ratio Perm			0.00				0.01			0.02		
v/c Ratio	0.55	0.56	0.01		0.63	0.53	0.01		0.70	0.19	0.40	0.45
Uniform Delay, d1	57.3	22.5	16.2		52.9	18.4	13.1		57.5	54.8	58.5	58.7
Progression Factor	1.00	1.00	1.00		1.26	0.52	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	2.4	0.0		1.8	0.6	0.0		10.3	0.2	0.9	1.0
Delay (s)	59.1	25.0	16.2		68.5	10.1	13.1		67.8	55.0	59.4	59.8
Level of Service	E	C	B		E	B	B		E	E	E	E
Approach Delay (s)		32.5				30.4			58.5			58.7
Approach LOS		C				C			E			E
Intersection Summary												
HCM 2000 Control Delay			38.7									
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			130.0						27.5			
Intersection Capacity Utilization			79.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	52
Future Volume (vph)	52
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	55
RTOR Reduction (vph)	52
Lane Group Flow (vph)	3
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.2
Effective Green, g (s)	8.2
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	101
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.03
Uniform Delay, d1	57.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	57.2
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	52	1636	357	395	851	40	219	222	485	70	32
v/c Ratio	0.49	1.09	0.40	0.78	0.47	0.04	1.32	0.99	0.99	1.49	0.09
Control Delay	74.0	87.1	4.0	68.6	17.8	0.1	221.1	113.8	65.4	344.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.0	87.1	4.0	68.6	17.8	0.1	221.1	113.8	65.4	344.7	0.6
Queue Length 50th (ft)	43	~814	0	160	260	0	~255	207	196	~81	0
Queue Length 95th (ft)	87	#1015	62	201	305	m0	m#426	m#382	#409	#182	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	305		480	415		210	300				95
Base Capacity (vph)	131	1504	886	686	1827	902	166	224	489	47	337
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	1.09	0.40	0.58	0.47	0.04	1.32	0.99	0.99	1.49	0.09

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	16	33	1554	339	375	808	38	2	381	36	461	42
Future Volume (vph)	16	33	1554	339	375	808	38	2	381	36	461	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	1.00		0.95	0.95	1.00	
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	0.96	1.00	
Satd. Flow (prot)		1805	3574	1615	3433	3610	1615		1698	1719	1599	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.71	0.96	1.00	
Satd. Flow (perm)		1805	3574	1615	3433	3610	1615		1271	1719	1599	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	35	1636	357	395	851	40	2	401	38	485	44
RTOR Reduction (vph)	0	0	0	207	0	0	20	0	0	0	281	0
Lane Group Flow (vph)	0	52	1636	150	395	851	20	0	219	222	204	0
Heavy Vehicles (%)	0%	0%	1%	0%	2%	0%	0%	0%	1%	0%	1%	0%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Perm	Split	NA	Perm	Perm
Protected Phases	5	5	2		1	6			4	4		
Permitted Phases				2			6	4			4	3
Actuated Green, G (s)		7.7	54.7	54.7	19.3	65.8	65.8		17.0	17.0	17.0	
Effective Green, g (s)		7.7	54.7	54.7	19.3	65.8	65.8		17.0	17.0	17.0	
Actuated g/C Ratio		0.06	0.42	0.42	0.15	0.51	0.51		0.13	0.13	0.13	
Clearance Time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Vehicle Extension (s)		2.0	4.0	4.0	2.0	4.0	4.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		106	1503	679	509	1827	817		166	224	209	
v/s Ratio Prot		0.03	c0.46		c0.12	0.24				0.13		
v/s Ratio Perm				0.09			0.01		c0.17		0.13	
v/c Ratio		0.49	1.09	0.22	0.78	0.47	0.02		1.32	0.99	0.98	
Uniform Delay, d1		59.2	37.6	24.0	53.3	20.7	16.1		56.5	56.4	56.3	
Progression Factor		1.00	1.00	1.00	1.10	0.80	1.00		1.13	1.11	1.84	
Incremental Delay, d2		1.3	51.3	0.8	6.1	0.8	0.1		173.9	51.6	49.3	
Delay (s)		60.6	88.9	24.8	64.9	17.5	16.1		237.5	114.5	152.7	
Level of Service		E	F	C	E	B	B		F	F	F	
Approach Delay (s)			77.0			32.0				163.6		
Approach LOS			E			C				F		
Intersection Summary												
HCM 2000 Control Delay			86.6			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.11									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			29.5			
Intersection Capacity Utilization			93.2%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	25	30
Future Volume (vph)	25	30
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	7.0	7.0
Lane Util. Factor	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.97	1.00
Satd. Flow (prot)	1842	1615
Flt Permitted	0.33	1.00
Satd. Flow (perm)	619	1615
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	26	32
RTOR Reduction (vph)	0	30
Lane Group Flow (vph)	70	2
Heavy Vehicles (%)	0%	0%
Turn Type	NA	Perm
Protected Phases	3	
Permitted Phases		3
Actuated Green, G (s)	10.0	10.0
Effective Green, g (s)	10.0	10.0
Actuated g/C Ratio	0.08	0.08
Clearance Time (s)	7.0	7.0
Vehicle Extension (s)	2.5	2.5
Lane Grp Cap (vph)	47	124
v/s Ratio Prot		
v/s Ratio Perm	c0.11	0.00
v/c Ratio	1.49	0.02
Uniform Delay, d1	60.0	55.5
Progression Factor	1.00	1.00
Incremental Delay, d2	304.5	0.0
Delay (s)	364.5	55.5
Level of Service	F	E
Approach Delay (s)	267.6	
Approach LOS	F	
Intersection Summary		

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1500	574	51	943	293	213
v/c Ratio	0.74	0.49	0.44	0.39	0.79	0.46
Control Delay	11.3	0.4	68.8	8.5	63.8	15.2
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	0.4	68.8	8.5	63.8	15.2
Queue Length 50th (ft)	182	0	41	194	231	36
Queue Length 95th (ft)	m177	m0	m71	226	330	107
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2040	1168	138	2441	424	508
Starvation Cap Reductn	79	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.49	0.37	0.39	0.69	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1410	540	48	886	275	200
Future Volume (vph)	1410	540	48	886	275	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1615	1805	3610	1752	1599
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1615	1805	3610	1752	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1500	574	51	943	293	213
RTOR Reduction (vph)	0	253	0	0	0	126
Lane Group Flow (vph)	1500	321	51	943	293	87
Heavy Vehicles (%)	1%	0%	0%	0%	3%	1%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	72.6	72.6	7.3	87.9	27.6	27.6
Effective Green, g (s)	72.6	72.6	7.3	87.9	27.6	27.6
Actuated g/C Ratio	0.56	0.56	0.06	0.68	0.21	0.21
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1995	901	101	2440	371	339
v/s Ratio Prot	c0.42		0.03	c0.26	c0.17	
v/s Ratio Perm		0.20				0.05
v/c Ratio	0.75	0.36	0.50	0.39	0.79	0.26
Uniform Delay, d1	21.8	15.8	59.6	9.2	48.5	42.7
Progression Factor	0.48	0.21	1.01	0.83	1.00	1.00
Incremental Delay, d2	0.2	0.1	3.5	0.4	12.3	0.8
Delay (s)	10.7	3.5	63.5	8.1	60.7	43.5
Level of Service	B	A	E	A	E	D
Approach Delay (s)	8.7			10.9	53.5	
Approach LOS	A			B	D	
Intersection Summary						
HCM 2000 Control Delay			15.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.76			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			67.2%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1231	464	172	690	388	91
v/c Ratio	0.76	0.50	0.76	0.30	0.89	0.20
Control Delay	16.2	2.6	75.1	10.8	70.4	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	2.6	75.1	10.8	70.4	8.1
Queue Length 50th (ft)	235	12	140	131	310	0
Queue Length 95th (ft)	377	11	218	167	#461	43
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1624	920	267	2335	479	495
Starvation Cap Reductn	6	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.50	0.64	0.30	0.81	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1182	445	165	662	372	87
Future Volume (vph)	1182	445	165	662	372	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1583	1736	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1583	1736	3610	1805	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1231	464	172	690	388	91
RTOR Reduction (vph)	0	201	0	0	0	69
Lane Group Flow (vph)	1231	263	172	690	388	22
Heavy Vehicles (%)	1%	2%	4%	0%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	59.1	59.1	17.0	84.1	31.4	31.4
Effective Green, g (s)	59.1	59.1	17.0	84.1	31.4	31.4
Actuated g/C Ratio	0.45	0.45	0.13	0.65	0.24	0.24
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1624	719	227	2335	435	390
v/s Ratio Prot	c0.34		c0.10	0.19	c0.21	
v/s Ratio Perm		0.17				0.01
v/c Ratio	0.76	0.37	0.76	0.30	0.89	0.06
Uniform Delay, d1	29.5	23.2	54.5	10.0	47.7	37.9
Progression Factor	0.44	0.20	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	1.0	13.5	0.3	20.0	0.1
Delay (s)	15.4	5.7	68.0	10.3	67.6	38.0
Level of Service	B	A	E	B	E	D
Approach Delay (s)	12.8			21.8	62.0	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			23.1		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.80			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			81.2%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Appendix G
SYNCHRO & SimTraffic Analysis
Of 2040 Future Conditions

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	388	0	12	283	91	8	6	28	88	3	22
Future Volume (Veh/h)	60	388	0	12	283	91	8	6	28	88	3	22
Sign Control	Free				Free		Stop				Stop	
Grade	0%				0%		0%				0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	422	0	13	308	99	9	7	30	96	3	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	407			422			912	985	422	920	886	308
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	407			422			912	985	422	920	886	308
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.0	3.4
p0 queue free %	94			99			96	97	95	57	99	97
cM capacity (veh/h)	1163			1096			221	233	636	224	266	723
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	65	422	13	308	99	46	96	27				
Volume Left	65	0	13	0	0	9	96	0				
Volume Right	0	0	0	0	99	30	0	24				
cSH	1163	1700	1096	1700	1700	390	224	607				
Volume to Capacity	0.06	0.25	0.01	0.18	0.06	0.12	0.43	0.04				
Queue Length 95th (ft)	4	0	1	0	0	10	50	3				
Control Delay (s)	8.3	0.0	8.3	0.0	0.0	15.5	32.6	11.2				
Lane LOS	A	A				C	D	B				
Approach Delay (s)	1.1	0.3				15.5	27.9					
Approach LOS						C	D					
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			45.3%		ICU Level of Service				A			
Analysis Period (min)			15									

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	63	518	89	457	298	9	109	368	6	71	23
v/c Ratio	0.32	0.73	0.13	0.55	0.29	0.01	0.70	0.78	0.05	0.54	0.10
Control Delay	63.0	40.3	0.5	65.7	7.7	0.0	80.8	17.9	54.5	72.3	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	40.3	0.5	65.7	7.7	0.0	80.8	17.9	54.5	72.3	0.8
Queue Length 50th (ft)	26	357	0	196	65	0	90	0	5	62	0
Queue Length 95th (ft)	50	484	1	m250	m74	m0	#181	#129	20	112	0
Internal Link Dist (ft)		1290			1222		1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	758	739	826	1045	896	165	478	349	367	420
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.68	0.12	0.55	0.29	0.01	0.66	0.77	0.02	0.19	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	477	82	420	274	8	51	50	339	6	64	21
Future Volume (vph)	58	477	82	420	274	8	51	50	339	6	64	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	1827	1568	3467	1776	1417		1715	1509	1715	1804	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3502	1827	1568	3467	1776	1417		1715	1509	1715	1804	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	518	89	457	298	9	55	54	368	7	70	23
RTOR Reduction (vph)	0	0	54	0	0	4	0	0	335	0	0	21
Lane Group Flow (vph)	63	518	35	457	298	5	0	109	33	6	71	2
Heavy Vehicles (%)	0%	4%	3%	1%	7%	14%	14%	2%	7%	0%	0%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	6.2	50.7	50.7	31.0	75.0	75.0		11.8	11.8	9.5	9.5	9.5
Effective Green, g (s)	6.2	50.7	50.7	31.0	75.0	75.0		11.8	11.8	9.5	9.5	9.5
Actuated g/C Ratio	0.05	0.39	0.39	0.24	0.58	0.58		0.09	0.09	0.07	0.07	0.07
Clearance Time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0	2.0	4.0	4.0		2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	167	712	611	826	1024	817		155	136	125	131	111
v/s Ratio Prot	0.02	c0.28		c0.13	0.17			c0.06		0.00	c0.04	
v/s Ratio Perm			0.02			0.00			0.02			0.00
v/c Ratio	0.38	0.73	0.06	0.55	0.29	0.01		0.70	0.25	0.05	0.54	0.02
Uniform Delay, d1	60.0	33.8	24.7	43.4	14.0	11.7		57.4	55.0	56.0	58.2	55.9
Progression Factor	1.00	1.00	1.00	1.40	0.47	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	6.4	0.2	0.4	0.2	0.0		11.2	0.3	0.1	2.4	0.0
Delay (s)	61.1	40.2	24.9	61.0	6.7	11.7		68.6	55.3	56.1	60.6	55.9
Level of Service	E	D	C	E	A	B		E	E	E	E	E
Approach Delay (s)		40.1			39.2			58.3			59.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			45.0				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)			27.5		
Intersection Capacity Utilization			66.9%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	26	749	395	342	503	18	201	202	480	37	9
v/c Ratio	0.29	0.60	0.48	0.88	0.34	0.02	0.64	0.64	0.86	0.70	0.03
Control Delay	67.3	36.6	4.7	70.4	30.2	0.1	53.1	52.8	37.8	112.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.3	36.6	4.7	70.4	30.2	0.1	53.1	52.8	37.8	112.9	0.2
Queue Length 50th (ft)	22	291	0	155	210	0	177	177	235	31	0
Queue Length 95th (ft)	52	320	63	#236	201	m0	m#330	m#330	#436	#77	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	305		480	415		210	300				95
Base Capacity (vph)	131	1560	927	393	1725	882	315	318	558	55	295
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.48	0.43	0.87	0.29	0.02	0.64	0.64	0.86	0.67	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	689	363	315	463	17	350	21	442	28	6	8
Future Volume (vph)	24	689	363	315	463	17	350	21	442	28	6	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1805	3438	1568	3335	3505	1615	1588	1604	1568		1826	1417
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.28	1.00
Satd. Flow (perm)	1805	3438	1568	3335	3505	1615	1588	1604	1568		529	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	749	395	342	503	18	380	23	480	30	7	9
RTOR Reduction (vph)	0	0	252	0	0	10	0	0	247	0	0	8
Lane Group Flow (vph)	26	749	143	342	503	8	201	202	233	0	37	1
Heavy Vehicles (%)	0%	5%	3%	5%	3%	0%	8%	6%	3%	0%	0%	14%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.4	47.0	47.0	15.2	55.3	55.3	25.8	25.8	25.8		13.0	13.0
Effective Green, g (s)	6.4	47.0	47.0	15.2	55.3	55.3	25.8	25.8	25.8		13.0	13.0
Actuated g/C Ratio	0.05	0.36	0.36	0.12	0.43	0.43	0.20	0.20	0.20		0.10	0.10
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	88	1242	566	389	1490	686	315	318	311		52	141
v/s Ratio Prot	0.01	c0.22		c0.10	0.14		0.13	0.13				
v/s Ratio Perm			0.09			0.00			c0.15		c0.07	0.00
v/c Ratio	0.30	0.60	0.25	0.88	0.34	0.01	0.64	0.64	0.75		0.71	0.01
Uniform Delay, d1	59.6	33.9	29.2	56.5	25.1	21.6	47.8	47.8	49.1		56.7	52.7
Progression Factor	1.00	1.00	1.00	0.83	1.15	1.00	0.94	0.94	1.55		1.00	1.00
Incremental Delay, d2	0.7	2.2	1.1	18.5	0.6	0.0	2.9	2.8	6.7		34.8	0.0
Delay (s)	60.3	36.1	30.2	65.3	29.4	21.6	47.8	47.6	82.8		91.4	52.7
Level of Service	E	D	C	E	C	C	D	D	F		F	D
Approach Delay (s)		34.6			43.5			66.8			83.9	
Approach LOS		C			D			E			F	
Intersection Summary												
HCM 2000 Control Delay			47.6				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)			29.5		
Intersection Capacity Utilization			68.1%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	841	427	15	603	237	67
v/c Ratio	0.37	0.38	0.16	0.25	0.72	0.20
Control Delay	7.8	1.3	58.7	9.2	61.3	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	1.3	58.7	9.2	61.3	10.3
Queue Length 50th (ft)	97	0	10	130	189	0
Queue Length 95th (ft)	m137	m22	m28	223	261	37
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2266	1136	138	2470	416	400
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.38	0.11	0.24	0.57	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	774	393	14	555	218	62
Future Volume (vph)	774	393	14	555	218	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1524	1805	3539	1703	1429
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1524	1805	3539	1703	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	841	427	15	603	237	67
RTOR Reduction (vph)	0	167	0	0	0	54
Lane Group Flow (vph)	841	260	15	603	237	13
Heavy Vehicles (%)	3%	6%	0%	2%	6%	13%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	79.3	79.3	3.1	90.4	25.1	25.1
Effective Green, g (s)	79.3	79.3	3.1	90.4	25.1	25.1
Actuated g/C Ratio	0.61	0.61	0.02	0.70	0.19	0.19
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	2138	929	43	2460	328	275
v/s Ratio Prot	c0.24		0.01	c0.17	c0.14	
v/s Ratio Perm		0.17				0.01
v/c Ratio	0.39	0.28	0.35	0.25	0.72	0.05
Uniform Delay, d1	13.0	11.9	62.5	7.3	49.2	42.7
Progression Factor	0.58	0.34	0.94	1.13	1.00	1.00
Incremental Delay, d2	0.4	0.6	4.6	0.2	9.3	0.1
Delay (s)	7.9	4.7	63.4	8.5	58.5	42.9
Level of Service	A	A	E	A	E	D
Approach Delay (s)	6.8			9.8	55.0	
Approach LOS	A			A	E	
Intersection Summary						
HCM 2000 Control Delay			14.4		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.48			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			45.6%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	447	440	107	347	305	11
v/c Ratio	0.26	0.44	0.62	0.15	0.82	0.03
Control Delay	10.8	3.6	70.5	8.5	65.6	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	3.6	70.5	8.5	65.6	16.8
Queue Length 50th (ft)	107	95	88	51	246	0
Queue Length 95th (ft)	47	10	145	85	327	16
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1745	1012	248	2396	468	440
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.43	0.43	0.14	0.65	0.03
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	411	405	98	319	281	10
Future Volume (vph)	411	405	98	319	281	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1568	1612	3539	1752	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1568	1612	3539	1752	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	447	440	107	347	305	11
RTOR Reduction (vph)	0	217	0	0	0	9
Lane Group Flow (vph)	447	223	107	347	305	2
Heavy Vehicles (%)	5%	3%	12%	2%	3%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	65.8	65.8	13.9	87.7	27.8	27.8
Effective Green, g (s)	65.8	65.8	13.9	87.7	27.8	27.8
Actuated g/C Ratio	0.51	0.51	0.11	0.67	0.21	0.21
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1740	793	172	2387	374	345
v/s Ratio Prot	0.13		c0.07	0.10	c0.17	
v/s Ratio Perm		c0.14				0.00
v/c Ratio	0.26	0.28	0.62	0.15	0.82	0.01
Uniform Delay, d1	18.2	18.5	55.5	7.6	48.7	40.2
Progression Factor	0.52	1.04	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.8	6.8	0.1	12.8	0.0
Delay (s)	9.8	20.1	62.4	7.8	61.5	40.2
Level of Service	A	C	E	A	E	D
Approach Delay (s)	14.9			20.6	60.7	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			25.2		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.46			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			56.4%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	45	30	16	50	78	47
Average Queue (ft)	13	3	1	22	37	16
95th Queue (ft)	37	17	8	47	67	40
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	L	L	T	R	LT	R	L	LT
Maximum Queue (ft)	40	228	457	242	227	247	242	31	161	231	18	93
Average Queue (ft)	6	53	229	39	108	135	80	3	68	98	1	23
95th Queue (ft)	26	149	376	137	191	212	183	17	131	178	12	67
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	3	0	0	0	0				0	0
Queuing Penalty (veh)		0	5	0	0	0	0				0	0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	24
Average Queue (ft)	1
95th Queue (ft)	16
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

11/17/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	60	325	476	306	263	284	256	195	30	260	278	436
Average Queue (ft)	23	139	248	29	128	131	84	83	5	139	167	226
95th Queue (ft)	55	259	393	178	231	243	187	150	23	219	250	378
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)		0	0	0	0	0	0	0		0	0	
Queuing Penalty (veh)		0	1	0	0	0	0	0		0	0	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	61	30
Average Queue (ft)	15	1
95th Queue (ft)	46	14
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	132	226	124	65	180	169	343	92
Average Queue (ft)	49	105	47	18	63	48	169	33
95th Queue (ft)	109	191	95	52	138	126	282	73
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	125	130	164	207	143	78	376	21
Average Queue (ft)	37	47	61	98	54	17	209	5
95th Queue (ft)	95	108	130	181	113	56	333	19
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 7

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	424	9	27	473	241	7	6	17	156	12	104
Future Volume (Veh/h)	157	424	9	27	473	241	7	6	17	156	12	104
Sign Control	Free				Free		Stop				Stop	
Grade	0%				0%		0%				0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	171	461	10	29	514	262	8	7	18	170	13	113
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	776			471			1500	1642	466	1396	1385	514
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	776			471			1500	1642	466	1396	1385	514
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	80			97			87	91	97	0	88	80
cM capacity (veh/h)	849			1101			62	79	601	90	112	564
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	171	471	29	514	262	33	170	126				
Volume Left	171	0	29	0	0	8	170	0				
Volume Right	0	10	0	0	262	18	0	113				
cSH	849	1700	1101	1700	1700	133	90	399				
Volume to Capacity	0.20	0.28	0.03	0.30	0.15	0.25	1.89	0.32				
Queue Length 95th (ft)	19	0	2	0	0	23	361	33				
Control Delay (s)	10.3	0.0	8.4	0.0	0.0	41.0	518.0	18.1				
Lane LOS	B			A			E	F	C			
Approach Delay (s)	2.7			0.3			41.0	305.2				
Approach LOS							E	F				
Intersection Summary												
Average Delay			52.8									
Intersection Capacity Utilization			58.9%		ICU Level of Service				B			
Analysis Period (min)			15									

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	462	72	468	736	27	106	456	46	49	84
v/c Ratio	0.46	0.60	0.11	0.59	0.68	0.03	0.73	0.83	0.45	0.44	0.36
Control Delay	63.9	33.4	0.4	77.1	13.7	0.0	86.1	19.1	71.6	69.8	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.9	33.4	0.4	77.1	13.7	0.0	86.1	19.1	71.6	69.8	5.4
Queue Length 50th (ft)	47	297	0	207	261	0	88	0	40	43	0
Queue Length 95th (ft)	78	415	0	m168	m138	m0	#168	#148	83	86	7
Internal Link Dist (ft)		1290			1222		1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	770	636	794	1082	949	160	557	332	363	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.60	0.11	0.59	0.68	0.03	0.66	0.82	0.14	0.13	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	107	439	68	10	434	699	26	51	49	433	49	41
Future Volume (vph)	107	439	68	10	434	699	26	51	49	433	49	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (prot)	3502	1845	1313		3435	1881	1538		1816	1599	1633	1783
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (perm)	3502	1845	1313		3435	1881	1538		1816	1599	1633	1783
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	113	462	72	11	457	736	27	54	52	456	52	43
RTOR Reduction (vph)	0	0	42	0	0	0	11	0	0	420	0	0
Lane Group Flow (vph)	113	462	30	0	468	736	16	0	106	36	46	49
Heavy Vehicles (%)	0%	3%	23%	0%	2%	1%	5%	4%	0%	1%	5%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2			6				3		
Actuated Green, G (s)	9.1	54.3	54.3		30.1	74.8	74.8		10.4	10.4	8.2	8.2
Effective Green, g (s)	9.1	54.3	54.3		30.1	74.8	74.8		10.4	10.4	8.2	8.2
Actuated g/C Ratio	0.07	0.42	0.42		0.23	0.58	0.58		0.08	0.08	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	245	770	548		795	1082	884		145	127	103	112
v/s Ratio Prot	0.03	0.25			c0.14	c0.39			c0.06		c0.03	0.03
v/s Ratio Perm			0.02				0.01			0.02		
v/c Ratio	0.46	0.60	0.05		0.59	0.68	0.02		0.73	0.29	0.45	0.44
Uniform Delay, d1	58.1	29.4	22.6		44.4	19.3	11.8		58.4	56.3	58.7	58.7
Progression Factor	1.00	1.00	1.00		1.68	0.63	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	3.4	0.2		0.1	0.2	0.0		15.0	0.5	1.1	1.0
Delay (s)	59.1	32.9	22.7		74.7	12.4	11.8		73.4	56.8	59.8	59.7
Level of Service	E	C	C		E	B	B		E	E	E	E
Approach Delay (s)		36.3				36.1			59.9			58.6
Approach LOS		D				D			E			E
Intersection Summary												
HCM 2000 Control Delay			42.8			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			27.5			
Intersection Capacity Utilization			89.2%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	80
Future Volume (vph)	80
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	84
RTOR Reduction (vph)	79
Lane Group Flow (vph)	5
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.2
Effective Green, g (s)	8.2
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	101
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.05
Uniform Delay, d1	57.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	57.3
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	20	918	442	743	1022	37	216	213	519	71	23
v/c Ratio	0.25	0.70	0.51	1.88	0.66	0.05	0.97	0.96	1.19	1.69	0.06
Control Delay	66.6	37.2	4.2	437.8	19.2	0.1	98.6	94.5	126.5	420.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.6	37.2	4.2	437.8	19.2	0.1	98.6	94.5	126.5	420.4	0.3
Queue Length 50th (ft)	17	343	0	~507	258	0	192	190	~331	~87	0
Queue Length 95th (ft)	44	361	59	m#619	m333	m0	m#330	m#320	m#554	#210	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	305		480	415		210	300				95
Base Capacity (vph)	124	1606	967	396	1766	885	222	223	436	42	383
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.57	0.46	1.88	0.58	0.04	0.97	0.96	1.19	1.69	0.06

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	872	420	706	971	35	387	21	493	31	36	22
Future Volume (vph)	19	872	420	706	971	35	387	21	493	31	36	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1703	3539	1599	3433	3574	1615	1698	1712	1568		1857	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.14	1.00
Satd. Flow (perm)	1703	3539	1599	3433	3574	1615	1698	1712	1568		268	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	918	442	743	1022	37	407	22	519	33	38	23
RTOR Reduction (vph)	0	0	278	0	0	21	0	0	231	0	0	19
Lane Group Flow (vph)	20	918	164	743	1022	16	216	213	288	0	71	4
Heavy Vehicles (%)	6%	2%	1%	2%	1%	0%	1%	0%	3%	0%	0%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.1	48.2	48.2	15.0	56.6	56.6	17.0	17.0	17.0		20.8	20.8
Effective Green, g (s)	6.1	48.2	48.2	15.0	56.6	56.6	17.0	17.0	17.0		20.8	20.8
Actuated g/C Ratio	0.05	0.37	0.37	0.12	0.44	0.44	0.13	0.13	0.13		0.16	0.16
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	79	1312	592	396	1556	703	222	223	205		42	246
v/s Ratio Prot	0.01	c0.26		c0.22	0.29		0.13	0.12				
v/s Ratio Perm			0.10			0.01			c0.18		c0.27	0.00
v/c Ratio	0.25	0.70	0.28	1.88	0.66	0.02	0.97	0.96	1.40		1.69	0.01
Uniform Delay, d1	59.8	34.8	28.7	57.5	29.0	20.9	56.3	56.1	56.5		54.6	46.0
Progression Factor	1.00	1.00	1.00	1.32	0.62	1.00	0.95	0.95	1.10		1.00	1.00
Incremental Delay, d2	0.6	3.1	1.2	401.4	1.6	0.0	43.9	39.2	201.7		393.6	0.0
Delay (s)	60.4	37.9	29.8	477.1	19.5	21.0	97.1	92.2	264.0		448.2	46.0
Level of Service	E	D	C	F	B	C	F	F	F		F	D
Approach Delay (s)		35.6			208.2			187.4			349.8	
Approach LOS		D			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			150.3				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.20									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		29.5			
Intersection Capacity Utilization			80.5%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1067	446	20	1293	524	205
v/c Ratio	0.59	0.43	0.22	0.64	0.91	0.33
Control Delay	11.2	1.3	62.1	17.2	64.1	12.3
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	11.2	1.3	62.1	17.3	64.1	12.3
Queue Length 50th (ft)	153	10	16	318	416	28
Queue Length 95th (ft)	m161	m15	m31	m332	#759	102
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	1852	1049	129	2309	577	617
Starvation Cap Reductn	0	0	0	181	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.43	0.16	0.61	0.91	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1003	419	19	1215	493	193
Future Volume (vph)	1003	419	19	1215	493	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1599	1687	3574	1787	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1599	1687	3574	1787	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1067	446	20	1293	524	205
RTOR Reduction (vph)	0	233	0	0	0	106
Lane Group Flow (vph)	1067	213	20	1293	524	99
Heavy Vehicles (%)	2%	1%	7%	1%	1%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	62.1	62.1	3.4	73.5	42.0	42.0
Effective Green, g (s)	62.1	62.1	3.4	73.5	42.0	42.0
Actuated g/C Ratio	0.48	0.48	0.03	0.57	0.32	0.32
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1690	763	44	2020	577	511
v/s Ratio Prot	0.30		0.01	c0.36	c0.29	
v/s Ratio Perm		0.13				0.06
v/c Ratio	0.63	0.28	0.45	0.64	0.91	0.19
Uniform Delay, d1	25.4	20.5	62.4	19.2	42.2	31.8
Progression Factor	0.47	0.35	0.99	0.85	1.00	1.00
Incremental Delay, d2	1.1	0.5	5.9	1.3	19.0	0.4
Delay (s)	13.0	7.7	67.7	17.6	61.2	32.2
Level of Service	B	A	E	B	E	C
Approach Delay (s)	11.4			18.4	53.0	
Approach LOS	B			B	D	
Intersection Summary						
HCM 2000 Control Delay			22.5		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			73.0%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	847	397	144	770	549	80
v/c Ratio	0.63	0.47	0.69	0.38	0.96	0.14
Control Delay	14.0	3.5	71.4	15.9	72.4	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	3.5	71.4	15.9	72.4	13.4
Queue Length 50th (ft)	165	65	118	177	458	12
Queue Length 95th (ft)	264	25	185	192	#774	53
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1446	869	269	2226	573	564
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.46	0.54	0.35	0.96	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	813	381	138	739	527	77
Future Volume (vph)	813	381	138	739	527	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1553	1752	3574	1770	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1553	1752	3574	1770	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	847	397	144	770	549	80
RTOR Reduction (vph)	0	245	0	0	0	41
Lane Group Flow (vph)	847	152	144	770	549	39
Heavy Vehicles (%)	2%	4%	3%	1%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	49.8	49.8	15.5	73.3	42.2	42.2
Effective Green, g (s)	49.8	49.8	15.5	73.3	42.2	42.2
Actuated g/C Ratio	0.38	0.38	0.12	0.56	0.32	0.32
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1355	594	208	2015	574	524
v/s Ratio Prot	c0.24		c0.08	0.22	c0.31	
v/s Ratio Perm		0.10				0.02
v/c Ratio	0.63	0.26	0.69	0.38	0.96	0.08
Uniform Delay, d1	32.5	27.4	55.0	15.8	43.0	30.4
Progression Factor	0.38	0.80	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.9	9.5	0.6	26.8	0.1
Delay (s)	14.1	22.7	64.5	16.3	69.8	30.5
Level of Service	B	C	E	B	E	C
Approach Delay (s)	16.8			23.9	64.8	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			30.0		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.76			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			78.1%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	L	T	R	LTR	L	TR
Maximum Queue (ft)	89	26	2	42	61	277	212
Average Queue (ft)	40	8	0	6	21	127	49
95th Queue (ft)	72	26	2	25	51	250	154
Link Distance (ft)			1995		701		1590
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	225	280		255		315	
Storage Blk Time (%)						2	1
Queuing Penalty (veh)						2	1

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	87	225	368	223	177	194	389	211	135	232	38	93
Average Queue (ft)	17	68	196	40	71	101	186	18	59	112	5	27
95th Queue (ft)	53	145	318	138	139	163	347	103	113	197	21	75
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260		230				115	
Storage Blk Time (%)		0	1	0		0	6	0			0	0
Queuing Penalty (veh)		0	3	0		0	2	0			0	0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	64
Average Queue (ft)	7
95th Queue (ft)	32
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

11/20/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	142	356	427	294	410	415	690	381	45	245	264	642
Average Queue (ft)	23	185	248	42	396	414	680	99	3	135	154	318
95th Queue (ft)	82	297	370	179	453	415	688	294	27	210	229	550
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)							63	0				
Queuing Penalty (veh)							534	0				
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)	0	0	0	0	12	63	75	1		0	0	
Queuing Penalty (veh)	0	0	0	0	59	307	530	1		0	0	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	132	87
Average Queue (ft)	41	6
95th Queue (ft)	94	40
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	2	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	157	208	96	230	720	718	1105	1046
Average Queue (ft)	85	127	48	71	662	550	1093	922
95th Queue (ft)	144	189	82	233	837	888	1133	1452
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)					30	1	99	62
Queuing Penalty (veh)					190	4	0	0
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)				0	87			
Queuing Penalty (veh)				1	17			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	156	160	106	268	434	383	1046	1043
Average Queue (ft)	65	65	45	126	220	161	926	795
95th Queue (ft)	141	143	90	214	369	322	1255	1455
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)							72	67
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)				475				
Storage Blk Time (%)				0	0			
Queuing Penalty (veh)				0	0			

Network Summary

Network wide Queuing Penalty: 1652

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	R	LTR	UL	TR
Maximum Queue (ft)	38	2	24	2	46	130	54
Average Queue (ft)	10	0	3	0	20	57	26
95th Queue (ft)	32	2	16	2	43	100	45
Link Distance (ft)	1920				701	1590	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	225		280	255		315	
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	137	365	691	290	252	385	395	87	1118	1123	62	136
Average Queue (ft)	40	140	339	39	161	212	124	5	803	894	7	39
95th Queue (ft)	100	318	667	184	248	431	339	45	1569	1494	33	116
Link Distance (ft)			1322			1150	1150			1094	1094	426
Upstream Blk Time (%)			1							66	67	
Queuing Penalty (veh)			0							0	0	
Storage Bay Dist (ft)	365	365		290	260		230				115	
Storage Blk Time (%)		0	17	0	1	5	3	0			0	1
Queuing Penalty (veh)		1	28	1	1	13	0	0			0	1

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	64
Average Queue (ft)	4
95th Queue (ft)	31
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

11/17/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	UL	LT	R
Maximum Queue (ft)	305	1596	1594	480	391	400	475	380	84	260	1166	1222
Average Queue (ft)	103	1540	1548	462	245	261	196	153	11	139	959	1148
95th Queue (ft)	303	1744	1726	606	395	415	478	346	51	249	1594	1438
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)		43	75				1	0			4	46
Queuing Penalty (veh)		0	0				6	0			20	245
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)	0	62	58	2	1	4	4	1	0	1	4	
Queuing Penalty (veh)	1	29	199	17	2	16	22	0	0	2	7	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	100	66
Average Queue (ft)	33	3
95th Queue (ft)	78	26
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	1	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	419	452	166	118	243	197	560	181
Average Queue (ft)	199	233	77	46	120	87	303	67
95th Queue (ft)	342	377	130	93	214	162	498	131
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)		0			1			
Queuing Penalty (veh)		0			0			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	299	302	192	223	260	213	500	120
Average Queue (ft)	105	120	56	123	126	69	287	27
95th Queue (ft)	234	240	127	197	217	158	445	74
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 611

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	36	315	10	13	305	128	7	2	28	3	171	5
Future Volume (Veh/h)	36	315	10	13	305	128	7	2	28	3	171	5
Sign Control	Free				Free				Stop			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	342	11	14	332	139	8	2	30	0	186	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked										0.00		
vC, conflicting volume	471			353			851	924	348	0	811	791
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	471			353			851	924	348	0	811	791
tC, single (s)	4.1			4.1			7.1	6.5	6.2	0.0	7.1	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	0.0	3.5	4.0
p0 queue free %	96			99			97	99	96	0	33	98
cM capacity (veh/h)	1101			1217			245	259	700	0	276	309
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	39	353	14	332	139	40	186	68				
Volume Left	39	0	14	0	0	8	186	0				
Volume Right	0	11	0	0	139	30	0	63				
cSH	1101	1700	1217	1700	1700	481	276	652				
Volume to Capacity	0.04	0.21	0.01	0.20	0.08	0.08	0.67	0.10				
Queue Length 95th (ft)	3	0	1	0	0	7	111	9				
Control Delay (s)	8.4	0.0	8.0	0.0	0.0	13.2	41.4	11.2				
Lane LOS	A			A			B	E	B			
Approach Delay (s)	0.8			0.2			13.2	33.3				
Approach LOS							B	D				
Intersection Summary												
Average Delay			8.1									
Intersection Capacity Utilization			46.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	58
Future Volume (Veh/h)	58
Sign Control	
Grade	
Peak Hour Factor	0.92
Hourly flow rate (vph)	63
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	332
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	332
tC, single (s)	6.2
tC, 2 stage (s)	
tF (s)	3.3
p0 queue free %	91
cM capacity (veh/h)	714
Direction, Lane #	

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	151	501	26	517	515	14	124	544	40	49	52
v/c Ratio	0.54	0.81	0.04	0.54	0.52	0.02	0.55	0.88	0.38	0.44	0.23
Control Delay	64.2	50.9	0.1	68.3	9.7	0.0	63.0	25.6	67.8	70.4	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	50.9	0.1	68.3	9.7	0.0	63.0	25.6	67.8	70.4	2.3
Queue Length 50th (ft)	63	382	0	225	112	0	97	52	34	43	0
Queue Length 95th (ft)	97	474	0	m280	m123	m0	169	#268	74	86	0
Internal Link Dist (ft)		1290			1222		1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	781	759	964	985	918	226	615	349	366	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.64	0.03	0.54	0.52	0.02	0.55	0.88	0.11	0.13	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	143	476	25	27	465	489	13	24	94	517	43	42
Future Volume (vph)	143	476	25	27	465	489	13	24	94	517	43	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.99
Satd. Flow (prot)	3502	1881	1615		3437	1881	1615		1844	1615	1715	1796
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.99
Satd. Flow (perm)	3502	1881	1615		3437	1881	1615		1844	1615	1715	1796
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	151	501	26	28	489	515	14	25	99	544	45	44
RTOR Reduction (vph)	0	0	17	0	0	0	7	0	0	418	0	0
Lane Group Flow (vph)	151	501	9	0	517	515	7	0	124	126	40	49
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	10%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2			6				3		
Actuated Green, G (s)	10.5	42.6	42.6		36.5	68.1	68.1		15.9	15.9	8.0	8.0
Effective Green, g (s)	10.5	42.6	42.6		36.5	68.1	68.1		15.9	15.9	8.0	8.0
Actuated g/C Ratio	0.08	0.33	0.33		0.28	0.52	0.52		0.12	0.12	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	282	616	529		965	985	846		225	197	105	110
v/s Ratio Prot	0.04	c0.27			c0.15	c0.27			0.07		0.02	c0.03
v/s Ratio Perm			0.01				0.00			c0.08		
v/c Ratio	0.54	0.81	0.02		0.54	0.52	0.01		0.55	0.64	0.38	0.45
Uniform Delay, d1	57.4	40.1	29.5		39.6	20.3	14.8		53.7	54.3	58.6	58.9
Progression Factor	1.00	1.00	1.00		1.57	0.37	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	11.2	0.1		0.2	0.5	0.0		1.7	5.2	0.8	1.0
Delay (s)	58.9	51.3	29.6		62.4	8.0	14.8		55.3	59.6	59.5	59.9
Level of Service	E	D	C		E	A	B		E	E	E	E
Approach Delay (s)		52.2				35.0			58.8			58.9
Approach LOS		D				C			E			E
Intersection Summary												
HCM 2000 Control Delay			47.2			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			27.5			
Intersection Capacity Utilization			97.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	49
Future Volume (vph)	49
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	52
RTOR Reduction (vph)	49
Lane Group Flow (vph)	3
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.0
Effective Green, g (s)	8.0
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	99
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.03
Uniform Delay, d1	57.4
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	57.4
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	50	1541	360	582	802	38	220	222	683	65	29
v/c Ratio	0.48	1.13	0.43	0.90	0.44	0.04	1.32	0.99	1.39	1.38	0.09
Control Delay	73.4	107.9	4.4	68.8	16.4	0.1	210.4	101.0	206.2	306.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	107.9	4.4	68.8	16.4	0.1	210.4	101.0	206.2	306.2	0.5
Queue Length 50th (ft)	41	~812	0	215	224	0	~255	205	~580	~72	0
Queue Length 95th (ft)	84	#952	64	m265	m280	m0	m#369	m#323	m#745	#172	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	305		480	415		210	300				95
Base Capacity (vph)	131	1358	836	686	1829	903	167	224	493	47	337
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	1.13	0.43	0.85	0.44	0.04	1.32	0.99	1.39	1.38	0.09

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	16	31	1464	342	553	762	36	2	384	34	649	39
Future Volume (vph)	16	31	1464	342	553	762	36	2	384	34	649	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	1.00		0.95	0.95	1.00	
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	0.96	1.00	
Satd. Flow (prot)		1805	3574	1615	3433	3610	1615		1698	1718	1599	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.71	0.96	1.00	
Satd. Flow (perm)		1805	3574	1615	3433	3610	1615		1277	1718	1599	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	33	1541	360	582	802	38	2	404	36	683	41
RTOR Reduction (vph)	0	0	0	223	0	0	19	0	0	0	284	0
Lane Group Flow (vph)	0	50	1541	137	582	802	19	0	220	222	399	0
Heavy Vehicles (%)	0%	0%	1%	0%	2%	0%	0%	0%	1%	0%	1%	0%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Perm	Split	NA	Perm	Perm
Protected Phases	5	5	2		1	6			4	4		
Permitted Phases				2			6	4			4	3
Actuated Green, G (s)		7.6	49.4	49.4	24.6	65.9	65.9		17.0	17.0	17.0	
Effective Green, g (s)		7.6	49.4	49.4	24.6	65.9	65.9		17.0	17.0	17.0	
Actuated g/C Ratio		0.06	0.38	0.38	0.19	0.51	0.51		0.13	0.13	0.13	
Clearance Time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Vehicle Extension (s)		2.0	4.0	4.0	2.0	4.0	4.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		105	1358	613	649	1829	818		166	224	209	
v/s Ratio Prot		0.03	c0.43		c0.17	0.22				0.13		
v/s Ratio Perm				0.08			0.01		0.17		c0.25	
v/c Ratio		0.48	1.13	0.22	0.90	0.44	0.02		1.33	0.99	1.91	
Uniform Delay, d1		59.3	40.3	27.3	51.5	20.3	16.0		56.5	56.4	56.5	
Progression Factor		1.00	1.00	1.00	1.04	0.76	1.00		0.96	0.96	1.25	
Incremental Delay, d2		1.2	70.3	0.8	12.8	0.6	0.0		171.5	46.5	420.3	
Delay (s)		60.5	110.6	28.1	66.4	16.0	16.0		225.9	100.5	490.8	
Level of Service		E	F	C	E	B	B		F	F	F	
Approach Delay (s)			94.1			36.7				362.0		
Approach LOS			F			D				F		
Intersection Summary												
HCM 2000 Control Delay			144.9									
HCM 2000 Volume to Capacity ratio			1.24									
Actuated Cycle Length (s)			130.0							29.5		
Intersection Capacity Utilization			102.3%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	23	28
Future Volume (vph)	23	28
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	7.0	7.0
Lane Util. Factor	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.97	1.00
Satd. Flow (prot)	1842	1615
Flt Permitted	0.33	1.00
Satd. Flow (perm)	620	1615
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	24	29
RTOR Reduction (vph)	0	27
Lane Group Flow (vph)	65	2
Heavy Vehicles (%)	0%	0%
Turn Type	NA	Perm
Protected Phases	3	
Permitted Phases		3
Actuated Green, G (s)	10.0	10.0
Effective Green, g (s)	10.0	10.0
Actuated g/C Ratio	0.08	0.08
Clearance Time (s)	7.0	7.0
Vehicle Extension (s)	2.5	2.5
Lane Grp Cap (vph)	47	124
v/s Ratio Prot		
v/s Ratio Perm	c0.10	0.00
v/c Ratio	1.38	0.02
Uniform Delay, d1	60.0	55.5
Progression Factor	1.00	1.00
Incremental Delay, d2	263.0	0.0
Delay (s)	323.0	55.5
Level of Service	F	E
Approach Delay (s)	240.5	
Approach LOS	F	
Intersection Summary		

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1601	582	48	976	401	200
v/c Ratio	0.83	0.51	0.41	0.42	0.95	0.40
Control Delay	14.3	0.6	68.5	10.6	81.5	13.2
Queue Delay	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	0.6	68.5	10.6	81.5	13.2
Queue Length 50th (ft)	242	0	39	206	334	29
Queue Length 95th (ft)	m198	m0	m67	241	#534	97
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	1937	1141	138	2335	424	505
Starvation Cap Reductn	65	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.51	0.35	0.42	0.95	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1505	547	45	917	377	188
Future Volume (vph)	1505	547	45	917	377	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1615	1805	3610	1752	1599
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1615	1805	3610	1752	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1601	582	48	976	401	200
RTOR Reduction (vph)	0	274	0	0	0	118
Lane Group Flow (vph)	1601	308	48	976	401	82
Heavy Vehicles (%)	1%	0%	0%	0%	3%	1%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	68.8	68.8	7.3	84.1	31.4	31.4
Effective Green, g (s)	68.8	68.8	7.3	84.1	31.4	31.4
Actuated g/C Ratio	0.53	0.53	0.06	0.65	0.24	0.24
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1891	854	101	2335	423	386
v/s Ratio Prot	c0.45		0.03	c0.27	c0.23	
v/s Ratio Perm		0.19				0.05
v/c Ratio	0.85	0.36	0.48	0.42	0.95	0.21
Uniform Delay, d1	26.1	17.8	59.5	11.1	48.5	39.4
Progression Factor	0.52	0.31	1.02	0.90	1.00	1.00
Incremental Delay, d2	0.5	0.1	3.1	0.5	31.2	0.6
Delay (s)	14.0	5.6	63.6	10.5	79.7	40.0
Level of Service	B	A	E	B	E	D
Approach Delay (s)	11.7			13.0	66.5	
Approach LOS	B			B	E	
Intersection Summary						
HCM 2000 Control Delay			20.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.87			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			74.6%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1213	476	163	698	402	85
v/c Ratio	0.75	0.51	0.73	0.30	0.90	0.18
Control Delay	15.4	2.1	73.4	11.1	71.8	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.4	2.1	73.4	11.1	71.8	8.3
Queue Length 50th (ft)	263	0	133	136	321	0
Queue Length 95th (ft)	373	m10	208	170	#488	41
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1616	926	267	2317	479	491
Starvation Cap Reductn	6	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.51	0.61	0.30	0.84	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1164	457	156	670	386	82
Future Volume (vph)	1164	457	156	670	386	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1583	1736	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1583	1736	3610	1805	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1212	476	162	698	402	85
RTOR Reduction (vph)	0	210	0	0	0	64
Lane Group Flow (vph)	1213	266	163	698	402	21
Heavy Vehicles (%)	1%	2%	4%	0%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	58.8	58.8	16.7	83.5	32.0	32.0
Effective Green, g (s)	58.8	58.8	16.7	83.5	32.0	32.0
Actuated g/C Ratio	0.45	0.45	0.13	0.64	0.25	0.25
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1616	716	223	2318	444	397
v/s Ratio Prot	c0.34		c0.09	0.19	c0.22	
v/s Ratio Perm		0.17				0.01
v/c Ratio	0.75	0.37	0.73	0.30	0.91	0.05
Uniform Delay, d1	29.5	23.4	54.5	10.3	47.5	37.4
Progression Factor	0.43	0.16	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.9	11.6	0.3	21.6	0.1
Delay (s)	14.7	4.6	66.1	10.6	69.1	37.5
Level of Service	B	A	E	B	E	D
Approach Delay (s)	11.9			21.1	63.6	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			22.8		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			81.0%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Appendix H

SYNCHRO & SimTraffic Analysis Of 2046 Future Conditions

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	412	0	12	301	96	9	6	30	94	4	23
Future Volume (Veh/h)	64	412	0	12	301	96	9	6	30	94	4	23
Sign Control	Free				Free		Stop				Stop	
Grade	0%				0%		0%				0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	448	0	13	327	104	10	7	33	102	4	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	431			448			968	1045	448	978	941	327
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	431			448			968	1045	448	978	941	327
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.0	3.4
p0 queue free %	94			99			95	97	95	50	98	96
cM capacity (veh/h)	1139			1071			200	214	615	202	246	705
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	70	448	13	327	104	50	102	29				
Volume Left	70	0	13	0	0	10	102	0				
Volume Right	0	0	0	0	104	33	0	25				
cSH	1139	1700	1071	1700	1700	366	202	561				
Volume to Capacity	0.06	0.26	0.01	0.19	0.06	0.14	0.50	0.05				
Queue Length 95th (ft)	5	0	1	0	0	12	64	4				
Control Delay (s)	8.4	0.0	8.4	0.0	0.0	16.4	39.7	11.8				
Lane LOS	A	A				C	E	B				
Approach Delay (s)	1.1	0.2				16.4	33.5					
Approach LOS							C	D				
Intersection Summary												
Average Delay			5.2									
Intersection Capacity Utilization			46.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	67	551	92	479	316	10	117	389	6	75	24
v/c Ratio	0.34	0.81	0.13	0.56	0.31	0.01	0.74	0.79	0.05	0.55	0.10
Control Delay	63.1	46.0	0.7	69.9	8.0	0.0	83.6	17.7	54.2	72.4	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	46.0	0.7	69.9	8.0	0.0	83.6	17.7	54.2	72.4	0.8
Queue Length 50th (ft)	28	404	0	205	71	0	96	0	5	65	0
Queue Length 95th (ft)	52	526	3	m253	m78	m0	#200	#135	20	116	0
Internal Link Dist (ft)		1290			1222		3082			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	758	739	863	1035	889	166	498	349	367	420
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.73	0.12	0.56	0.31	0.01	0.70	0.78	0.02	0.20	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	507	85	441	291	9	54	53	358	6	68	22
Future Volume (vph)	62	507	85	441	291	9	54	53	358	6	68	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	1827	1568	3467	1776	1417		1715	1509	1715	1804	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3502	1827	1568	3467	1776	1417		1715	1509	1715	1804	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	551	92	479	316	10	59	58	389	7	74	24
RTOR Reduction (vph)	0	0	58	0	0	4	0	0	353	0	0	22
Lane Group Flow (vph)	67	551	34	479	316	6	0	117	36	6	75	2
Heavy Vehicles (%)	0%	4%	3%	1%	7%	14%	14%	2%	7%	0%	0%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	6.3	48.7	48.7	32.4	74.3	74.3		12.1	12.1	9.8	9.8	9.8
Effective Green, g (s)	6.3	48.7	48.7	32.4	74.3	74.3		12.1	12.1	9.8	9.8	9.8
Actuated g/C Ratio	0.05	0.37	0.37	0.25	0.57	0.57		0.09	0.09	0.08	0.08	0.08
Clearance Time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0	2.0	4.0	4.0		2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	169	684	587	864	1015	809		159	140	129	135	114
v/s Ratio Prot	0.02	c0.30		c0.14	0.18			c0.07		0.00	c0.04	
v/s Ratio Perm			0.02			0.00			0.02			0.00
v/c Ratio	0.40	0.81	0.06	0.55	0.31	0.01		0.74	0.26	0.05	0.56	0.02
Uniform Delay, d1	60.0	36.4	26.0	42.5	14.5	12.0		57.4	54.8	55.8	58.0	55.6
Progression Factor	1.00	1.00	1.00	1.51	0.47	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	9.8	0.2	0.3	0.2	0.0		14.1	0.4	0.1	2.8	0.0
Delay (s)	61.1	46.2	26.2	64.5	7.0	12.0		71.5	55.1	55.8	60.8	55.7
Level of Service	E	D	C	E	A	B		E	E	E	E	E
Approach Delay (s)		45.0			41.3			58.9			59.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			47.6				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		27.5			
Intersection Capacity Utilization			69.7%				ICU Level of Service		C			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	28	792	418	360	534	20	214	214	509	40	10
v/c Ratio	0.31	0.70	0.52	0.94	0.39	0.03	0.59	0.58	0.87	0.75	0.03
Control Delay	67.7	40.6	4.9	81.5	33.0	0.1	49.8	49.6	38.8	121.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.7	40.6	4.9	81.5	33.0	0.1	49.8	49.6	38.8	121.4	0.2
Queue Length 50th (ft)	23	303	0	163	222	0	192	192	267	33	0
Queue Length 95th (ft)	56	329	62	#260	192	m0	m#345	m#343	#512	#95	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	305		480	415		210	300				95
Base Capacity (vph)	131	1560	939	384	1725	882	364	368	586	56	294
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.51	0.45	0.94	0.31	0.02	0.59	0.58	0.87	0.71	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	729	385	331	491	18	372	22	468	30	6	9
Future Volume (vph)	26	729	385	331	491	18	372	22	468	30	6	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1805	3438	1568	3335	3505	1615	1588	1604	1568		1825	1417
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.28	1.00
Satd. Flow (perm)	1805	3438	1568	3335	3505	1615	1588	1604	1568		533	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	792	418	360	534	20	404	24	509	33	7	10
RTOR Reduction (vph)	0	0	279	0	0	12	0	0	226	0	0	9
Lane Group Flow (vph)	28	792	139	360	534	8	214	214	283	0	40	1
Heavy Vehicles (%)	0%	5%	3%	5%	3%	0%	8%	6%	3%	0%	0%	14%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.6	43.1	43.1	15.0	51.0	51.0	29.9	29.9	29.9		13.0	13.0
Effective Green, g (s)	6.6	43.1	43.1	15.0	51.0	51.0	29.9	29.9	29.9		13.0	13.0
Actuated g/C Ratio	0.05	0.33	0.33	0.12	0.39	0.39	0.23	0.23	0.23		0.10	0.10
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	91	1139	519	384	1375	633	365	368	360		53	141
v/s Ratio Prot	0.02	c0.23		c0.11	c0.15		0.13	0.13				
v/s Ratio Perm			0.09			0.00			c0.18		c0.07	0.00
v/c Ratio	0.31	0.70	0.27	0.94	0.39	0.01	0.59	0.58	0.79		0.75	0.01
Uniform Delay, d1	59.5	37.7	31.9	57.0	28.3	24.1	44.5	44.5	47.0		56.9	52.7
Progression Factor	1.00	1.00	1.00	0.87	1.16	1.00	0.93	0.93	1.41		1.00	1.00
Incremental Delay, d2	0.7	3.5	1.3	28.9	0.8	0.0	1.6	1.5	7.2		43.5	0.0
Delay (s)	60.2	41.3	33.1	78.4	33.7	24.2	43.2	43.1	73.5		100.4	52.7
Level of Service	E	D	C	E	C	C	D	D	E		F	D
Approach Delay (s)		38.9			51.1			59.6			90.9	
Approach LOS		D			D			E			F	
Intersection Summary												
HCM 2000 Control Delay			49.5				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)			29.5		
Intersection Capacity Utilization			70.8%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	891	453	16	638	250	71
v/c Ratio	0.40	0.40	0.17	0.26	0.75	0.21
Control Delay	9.6	2.0	61.5	9.5	62.9	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	2.0	61.5	9.5	62.9	10.2
Queue Length 50th (ft)	82	0	12	157	199	0
Queue Length 95th (ft)	m143	m25	m31	177	281	40
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2254	1141	138	2449	412	400
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.40	0.12	0.26	0.61	0.18

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	820	417	15	587	230	65
Future Volume (vph)	820	417	15	587	230	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1524	1805	3539	1703	1429
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1524	1805	3539	1703	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	891	453	16	638	250	71
RTOR Reduction (vph)	0	178	0	0	0	57
Lane Group Flow (vph)	891	275	16	638	250	14
Heavy Vehicles (%)	3%	6%	0%	2%	6%	13%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	78.8	78.8	3.2	90.0	25.5	25.5
Effective Green, g (s)	78.8	78.8	3.2	90.0	25.5	25.5
Actuated g/C Ratio	0.61	0.61	0.02	0.69	0.20	0.20
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	2124	923	44	2450	334	280
v/s Ratio Prot	c0.25		0.01	c0.18	c0.15	
v/s Ratio Perm		0.18				0.01
v/c Ratio	0.42	0.30	0.36	0.26	0.75	0.05
Uniform Delay, d1	13.5	12.3	62.4	7.5	49.2	42.4
Progression Factor	0.70	0.84	0.99	1.15	1.00	1.00
Incremental Delay, d2	0.5	0.6	4.7	0.2	10.6	0.2
Delay (s)	10.0	10.9	66.4	8.9	59.8	42.6
Level of Service	A	B	E	A	E	D
Approach Delay (s)	10.3			10.3	56.0	
Approach LOS	B			B	E	
Intersection Summary						
HCM 2000 Control Delay			16.6		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.51			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			47.5%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	473	466	113	366	323	12
v/c Ratio	0.28	0.46	0.63	0.16	0.83	0.03
Control Delay	12.7	4.4	70.5	9.0	65.3	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.7	4.4	70.5	9.0	65.3	16.2
Queue Length 50th (ft)	111	73	93	56	261	0
Queue Length 95th (ft)	50	11	151	92	344	16
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1710	1014	248	2370	472	444
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.46	0.46	0.15	0.68	0.03
Intersection Summary						

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	435	429	104	337	297	11
Future Volume (vph)	435	429	104	337	297	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1568	1612	3539	1752	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1568	1612	3539	1752	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	473	466	113	366	323	12
RTOR Reduction (vph)	0	236	0	0	0	9
Lane Group Flow (vph)	473	230	113	366	323	3
Heavy Vehicles (%)	5%	3%	12%	2%	3%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	64.1	64.1	14.4	86.5	29.0	29.0
Effective Green, g (s)	64.1	64.1	14.4	86.5	29.0	29.0
Actuated g/C Ratio	0.49	0.49	0.11	0.67	0.22	0.22
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1695	773	178	2354	390	360
v/s Ratio Prot	0.14		c0.07	0.10	c0.18	
v/s Ratio Perm		c0.15				0.00
v/c Ratio	0.28	0.30	0.63	0.16	0.83	0.01
Uniform Delay, d1	19.4	19.6	55.3	8.1	48.1	39.3
Progression Factor	0.58	1.28	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.9	7.2	0.1	13.5	0.0
Delay (s)	11.5	25.9	62.5	8.3	61.6	39.3
Level of Service	B	C	E	A	E	D
Approach Delay (s)	18.7			21.1	60.8	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			27.4		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.48			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			57.6%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	43	33	11	57	77	50
Average Queue (ft)	13	4	0	24	39	17
95th Queue (ft)	37	20	5	48	67	41
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	L	L	T	R	LT	R	L	LT
Maximum Queue (ft)	42	364	510	268	223	234	253	74	173	285	6	106
Average Queue (ft)	8	61	242	50	114	139	95	4	77	110	0	31
95th Queue (ft)	30	181	405	173	193	209	211	38	143	210	3	78
Link Distance (ft)			1319			1150	1150		3106	3106		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	4	0	0	0	1	0				0
Queuing Penalty (veh)		0	7	1	0	0	0	0				0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	38
Average Queue (ft)	1
95th Queue (ft)	18
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

11/17/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	100	367	507	360	285	302	286	185	28	275	307	509
Average Queue (ft)	26	146	265	27	148	153	89	87	4	139	167	285
95th Queue (ft)	71	283	414	181	258	275	198	150	20	227	258	501
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)		0	0	0	0	0		0		0	0	
Queuing Penalty (veh)		0	2	0	0	0		0		0	1	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	78	44
Average Queue (ft)	16	3
95th Queue (ft)	51	24
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	0	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	171	257	129	69	170	167	291	96
Average Queue (ft)	59	117	52	19	71	54	173	36
95th Queue (ft)	133	211	101	52	149	127	270	73
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	133	147	187	224	140	110	405	23
Average Queue (ft)	44	51	63	100	62	20	235	5
95th Queue (ft)	105	117	131	181	119	65	374	19
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 10

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	450	10	28	502	256	7	6	18	165	12	109
Future Volume (Veh/h)	165	450	10	28	502	256	7	6	18	165	12	109
Sign Control	Free				Free		Stop				Stop	
Grade	0%				0%		0%				0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	179	489	11	30	546	278	8	7	20	179	13	118
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	824			500			1583	1736	494	1476	1464	546
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	824			500			1583	1736	494	1476	1464	546
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	78			97			84	90	97	0	87	78
cM capacity (veh/h)	815			1075			51	67	579	76	98	541
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	179	500	30	546	278	35	179	131				
Volume Left	179	0	30	0	0	8	179	0				
Volume Right	0	11	0	0	278	20	0	118				
cSH	815	1700	1075	1700	1700	118	76	374				
Volume to Capacity	0.22	0.29	0.03	0.32	0.16	0.30	2.34	0.35				
Queue Length 95th (ft)	21	0	2	0	0	28	420	38				
Control Delay (s)	10.7	0.0	8.4	0.0	0.0	47.7	729.4	19.7				
Lane LOS	B	A				E	F	C				
Approach Delay (s)	2.8	0.3				47.7	429.5					
Approach LOS					E		F					
Intersection Summary												
Average Delay			72.9									
Intersection Capacity Utilization			61.4%		ICU Level of Service				B			
Analysis Period (min)			15									

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	119	491	74	490	781	28	111	477	49	51	89
v/c Ratio	0.48	0.64	0.12	0.62	0.73	0.03	0.76	0.84	0.47	0.45	0.38
Control Delay	64.0	35.0	0.4	77.6	15.0	0.0	88.2	19.0	72.1	69.8	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	35.0	0.4	77.6	15.0	0.0	88.2	19.0	72.1	69.8	6.5
Queue Length 50th (ft)	50	325	0	217	293	0	92	0	43	44	0
Queue Length 95th (ft)	81	449	0	m171	m150	m0	#178	#152	86	88	13
Internal Link Dist (ft)		1290			1222		3082			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	766	633	794	1074	943	160	576	332	363	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.64	0.12	0.62	0.73	0.03	0.69	0.83	0.15	0.14	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	113	466	70	11	454	742	27	53	52	453	52	43
Future Volume (vph)	113	466	70	11	454	742	27	53	52	453	52	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (prot)	3502	1845	1313		3435	1881	1538		1817	1599	1633	1784
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (perm)	3502	1845	1313		3435	1881	1538		1817	1599	1633	1784
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	491	74	12	478	781	28	56	55	477	55	45
RTOR Reduction (vph)	0	0	43	0	0	0	12	0	0	438	0	0
Lane Group Flow (vph)	119	491	31	0	490	781	16	0	111	39	49	51
Heavy Vehicles (%)	0%	3%	23%	0%	2%	1%	5%	4%	0%	1%	5%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2			6				3		
Actuated Green, G (s)	9.3	53.9	53.9		30.1	74.2	74.2		10.6	10.6	8.4	8.4
Effective Green, g (s)	9.3	53.9	53.9		30.1	74.2	74.2		10.6	10.6	8.4	8.4
Actuated g/C Ratio	0.07	0.41	0.41		0.23	0.57	0.57		0.08	0.08	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	250	764	544		795	1073	877		148	130	105	115
v/s Ratio Prot	0.03	0.27			c0.14	c0.42			c0.06		c0.03	0.03
v/s Ratio Perm			0.02				0.01			0.02		
v/c Ratio	0.48	0.64	0.06		0.62	0.73	0.02		0.75	0.30	0.47	0.44
Uniform Delay, d1	58.0	30.4	22.8		44.8	20.5	12.1		58.4	56.2	58.6	58.5
Progression Factor	1.00	1.00	1.00		1.68	0.65	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	4.1	0.2		0.1	0.2	0.0		17.1	0.5	1.2	1.0
Delay (s)	59.0	34.5	23.0		75.3	13.5	12.1		75.5	56.7	59.8	59.5
Level of Service	E	C	C		E	B	B		E	E	E	E
Approach Delay (s)		37.5				36.8			60.2			58.5
Approach LOS		D				D			E			E
Intersection Summary												
HCM 2000 Control Delay			43.5			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			27.5			
Intersection Capacity Utilization			92.5%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	85
Future Volume (vph)	85
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	89
RTOR Reduction (vph)	83
Lane Group Flow (vph)	6
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.4
Effective Green, g (s)	8.4
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	104
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.06
Uniform Delay, d1	57.1
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	57.2
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	21	974	468	784	1083	39	228	226	545	75	24
v/c Ratio	0.26	0.71	0.52	1.98	0.67	0.05	1.03	1.01	1.28	1.79	0.07
Control Delay	66.9	36.1	4.1	480.9	18.8	0.1	109.5	106.3	161.3	458.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.9	36.1	4.1	480.9	18.8	0.1	109.5	106.3	161.3	458.0	0.3
Queue Length 50th (ft)	17	357	0	~545	308	0	~212	~205	~393	~95	0
Queue Length 95th (ft)	46	388	60	m#630	m333	m0	m#354	m#348	m#602	#216	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	305		480	415		210	300				95
Base Capacity (vph)	124	1606	981	396	1765	884	222	223	427	42	359
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.61	0.48	1.98	0.61	0.04	1.03	1.01	1.28	1.79	0.07

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	925	445	745	1029	37	409	22	518	33	38	23
Future Volume (vph)	20	925	445	745	1029	37	409	22	518	33	38	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1703	3539	1599	3433	3574	1615	1698	1712	1568		1857	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.16	1.00
Satd. Flow (perm)	1703	3539	1599	3433	3574	1615	1698	1712	1568		301	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	974	468	784	1083	39	431	23	545	35	40	24
RTOR Reduction (vph)	0	0	286	0	0	21	0	0	223	0	0	21
Lane Group Flow (vph)	21	974	182	784	1083	18	228	226	322	0	75	3
Heavy Vehicles (%)	6%	2%	1%	2%	1%	0%	1%	0%	3%	0%	0%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.2	50.5	50.5	15.0	58.8	58.8	17.0	17.0	17.0		18.5	18.5
Effective Green, g (s)	6.2	50.5	50.5	15.0	58.8	58.8	17.0	17.0	17.0		18.5	18.5
Actuated g/C Ratio	0.05	0.39	0.39	0.12	0.45	0.45	0.13	0.13	0.13		0.14	0.14
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	81	1374	621	396	1616	730	222	223	205		42	218
v/s Ratio Prot	0.01	c0.28		c0.23	0.30		0.13	0.13				
v/s Ratio Perm			0.11			0.01			c0.21		c0.25	0.00
v/c Ratio	0.26	0.71	0.29	1.98	0.67	0.02	1.03	1.01	1.57		1.79	0.02
Uniform Delay, d1	59.7	33.5	27.4	57.5	28.0	19.7	56.5	56.5	56.5		55.8	47.9
Progression Factor	1.00	1.00	1.00	1.29	0.63	1.00	0.93	0.93	1.04		1.00	1.00
Incremental Delay, d2	0.6	3.1	1.2	447.1	1.5	0.0	57.7	53.9	273.8		433.1	0.0
Delay (s)	60.3	36.7	28.6	521.0	19.1	19.8	110.4	106.6	332.3		488.8	47.9
Level of Service	E	D	C	F	B	B	F	F	F		F	D
Approach Delay (s)		34.4			225.5			230.6			382.0	
Approach LOS		C			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			167.5									F
HCM 2000 Volume to Capacity ratio			1.24									
Actuated Cycle Length (s)			130.0						29.5			
Intersection Capacity Utilization			83.7%									E
Analysis Period (min)			15									
c Critical Lane Group												

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1128	472	21	1366	555	218
v/c Ratio	0.62	0.45	0.23	0.65	1.04	0.37
Control Delay	11.5	1.3	62.4	16.6	93.1	14.3
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	11.5	1.3	62.4	16.8	93.1	14.3
Queue Length 50th (ft)	150	11	16	317	~572	39
Queue Length 95th (ft)	m168	m16	m30	m337	#817	114
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	1840	1058	129	2309	536	585
Starvation Cap Reductn	0	0	0	213	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.45	0.16	0.65	1.04	0.37

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1060	444	20	1284	522	205
Future Volume (vph)	1060	444	20	1284	522	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1599	1687	3574	1787	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1599	1687	3574	1787	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1128	472	21	1366	555	218
RTOR Reduction (vph)	0	241	0	0	0	111
Lane Group Flow (vph)	1128	231	21	1366	555	107
Heavy Vehicles (%)	2%	1%	7%	1%	1%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	63.6	63.6	4.9	76.5	39.0	39.0
Effective Green, g (s)	63.6	63.6	4.9	76.5	39.0	39.0
Actuated g/C Ratio	0.49	0.49	0.04	0.59	0.30	0.30
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1731	782	63	2103	536	474
v/s Ratio Prot	0.32		0.01	c0.38	c0.31	
v/s Ratio Perm		0.14				0.07
v/c Ratio	0.65	0.30	0.33	0.65	1.04	0.23
Uniform Delay, d1	24.9	19.8	61.0	17.8	45.5	34.2
Progression Factor	0.47	0.38	1.00	0.88	1.00	1.00
Incremental Delay, d2	1.0	0.5	2.3	1.2	48.3	0.5
Delay (s)	12.7	8.0	63.2	17.0	93.8	34.7
Level of Service	B	A	E	B	F	C
Approach Delay (s)	11.3			17.7	77.1	
Approach LOS	B			B	E	
Intersection Summary						
HCM 2000 Control Delay			27.2		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.84			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			76.5%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	897	420	153	813	580	84
v/c Ratio	0.65	0.49	0.71	0.39	1.05	0.15
Control Delay	14.3	3.1	72.1	15.3	96.6	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	3.1	72.1	15.3	96.6	14.3
Queue Length 50th (ft)	174	8	125	179	~561	15
Queue Length 95th (ft)	278	21	195	204	#830	57
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1448	883	269	2226	551	544
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.48	0.57	0.37	1.05	0.15

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	861	403	147	780	557	81
Future Volume (vph)	861	403	147	780	557	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1553	1752	3574	1770	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1553	1752	3574	1770	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	897	420	153	812	580	84
RTOR Reduction (vph)	0	255	0	0	0	41
Lane Group Flow (vph)	897	165	153	813	580	43
Heavy Vehicles (%)	2%	4%	3%	1%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	51.0	51.0	16.0	75.0	40.5	40.5
Effective Green, g (s)	51.0	51.0	16.0	75.0	40.5	40.5
Actuated g/C Ratio	0.39	0.39	0.12	0.58	0.31	0.31
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1388	609	215	2061	551	503
v/s Ratio Prot	c0.25		c0.09	0.23	c0.33	
v/s Ratio Perm		0.11				0.03
v/c Ratio	0.65	0.27	0.71	0.39	1.05	0.08
Uniform Delay, d1	32.2	26.9	54.8	15.1	44.8	31.6
Progression Factor	0.38	0.62	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.9	10.6	0.6	52.9	0.1
Delay (s)	14.3	17.7	65.4	15.6	97.7	31.7
Level of Service	B	B	E	B	F	C
Approach Delay (s)	15.3			23.5	89.3	
Approach LOS	B			C	F	
Intersection Summary						
HCM 2000 Control Delay			34.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.81			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			81.6%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	74	17	22	43	244	180
Average Queue (ft)	48	5	8	24	181	76
95th Queue (ft)	84	22	27	52	309	227
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)					3	1
Queuing Penalty (veh)					4	1

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	55	107	297	104	125	144	300	20	144	234	31	79
Average Queue (ft)	25	66	204	37	77	104	195	5	82	150	10	44
95th Queue (ft)	68	116	331	131	139	159	346	23	156	256	40	96
Link Distance (ft)			1319			1150	1150		3106	3106		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)			2	0			7				0	1
Queuing Penalty (veh)			3	0			2				0	1

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	24
Average Queue (ft)	7
95th Queue (ft)	36
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

11/17/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	46	275	317	175	405	415	680	635	56	204	219	427
Average Queue (ft)	19	196	250	62	355	383	519	281	13	154	169	310
95th Queue (ft)	55	304	349	201	476	488	873	665	82	222	245	512
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)							26	0				
Queuing Penalty (veh)							231	2				
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)		0			6	36	38	8	0			
Queuing Penalty (veh)		0			31	183	285	3	0			

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	100	20
Average Queue (ft)	53	4
95th Queue (ft)	123	34
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	4	0
Queuing Penalty (veh)	1	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	146	200	70	77	459	344	1045	644
Average Queue (ft)	89	132	47	29	266	188	673	216
95th Queue (ft)	164	216	79	118	547	399	1159	789
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)					0		9	4
Queuing Penalty (veh)					0		0	0
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)				0	25			
Queuing Penalty (veh)				0	5			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	168	173	104	209	239	174	875	633
Average Queue (ft)	104	114	57	127	157	91	717	323
95th Queue (ft)	195	193	117	225	262	186	1121	947
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)							7	2
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)				475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 753

HCM Unsignalized Intersection Capacity Analysis

1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	
Lane Configurations													
Traffic Volume (veh/h)	38	334	11	14	324	136	7	2	30	4	181	5	
Future Volume (Veh/h)	38	334	11	14	324	136	7	2	30	4	181	5	
Sign Control	Free				Free				Stop				
Grade	0%				0%				0%				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	41	363	12	15	352	148	8	2	33	0	197	5	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None						None						
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked										0.00			
vC, conflicting volume	500			375			902	981	369	0	861	839	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	500			375			902	981	369	0	861	839	
tC, single (s)	4.1			4.1			7.1	6.5	6.2	0.0	7.1	6.5	
tC, 2 stage (s)													
tF (s)	2.2			2.2			3.5	4.0	3.3	0.0	3.5	4.0	
p0 queue free %	96			99			96	99	95	0	22	98	
cM capacity (veh/h)	1075			1195			223	239	681	0	253	289	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2					
Volume Total	41	375	15	352	148	43	197	72					
Volume Left	41	0	15	0	0	8	197	0					
Volume Right	0	12	0	0	148	33	0	67					
cSH	1075	1700	1195	1700	1700	464	253	634					
Volume to Capacity	0.04	0.22	0.01	0.21	0.09	0.09	0.78	0.11					
Queue Length 95th (ft)	3	0	1	0	0	8	145	10					
Control Delay (s)	8.5	0.0	8.1	0.0	0.0	13.5	56.0	11.4					
Lane LOS	A			A			B	F	B				
Approach Delay (s)	0.8			0.2			13.5	44.1					
Approach LOS							B	E					
Intersection Summary													
Average Delay			10.4										
Intersection Capacity Utilization			48.5%		ICU Level of Service				A				
Analysis Period (min)			15										

HCM Unsignalized Intersection Capacity Analysis
1: Longhill Gate Road/Warhill Trail & Longhill Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	62
Future Volume (Veh/h)	62
Sign Control	
Grade	
Peak Hour Factor	0.92
Hourly flow rate (vph)	67
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	352
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	352
tC, single (s)	6.2
tC, 2 stage (s)	
tF (s)	3.3
p0 queue free %	90
cM capacity (veh/h)	696
Direction, Lane #	

Queues

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	160	532	27	534	546	15	131	562	43	51	55
v/c Ratio	0.55	0.89	0.04	0.61	0.59	0.02	0.46	0.88	0.40	0.45	0.24
Control Delay	64.2	58.5	0.1	72.8	11.6	0.0	57.0	27.4	68.5	70.6	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	58.5	0.1	72.8	11.6	0.0	57.0	27.4	68.5	70.6	2.4
Queue Length 50th (ft)	68	428	0	235	132	0	97	80	37	44	0
Queue Length 95th (ft)	102	493	0	m284	m125	m0	#220	#343	77	88	0
Internal Link Dist (ft)		1290			1222		3082			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	781	759	879	918	866	284	637	349	366	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.68	0.04	0.61	0.59	0.02	0.46	0.88	0.12	0.14	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	152	505	26	28	480	519	14	25	100	534	46	44
Future Volume (vph)	152	505	26	28	480	519	14	25	100	534	46	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00
Satd. Flow (prot)	3502	1881	1615		3437	1881	1615		1845	1615	1715	1796
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00
Satd. Flow (perm)	3502	1881	1615		3437	1881	1615		1845	1615	1715	1796
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	160	532	27	29	505	546	15	26	105	562	48	46
RTOR Reduction (vph)	0	0	18	0	0	0	8	0	0	388	0	0
Lane Group Flow (vph)	160	532	9	0	534	546	7	0	131	174	43	51
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	10%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2			6				3		
Actuated Green, G (s)	10.8	41.5	41.5		33.3	63.5	63.5		20.0	20.0	8.2	8.2
Effective Green, g (s)	10.8	41.5	41.5		33.3	63.5	63.5		20.0	20.0	8.2	8.2
Actuated g/C Ratio	0.08	0.32	0.32		0.26	0.49	0.49		0.15	0.15	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	290	600	515		880	918	788		283	248	108	113
v/s Ratio Prot	0.05	c0.28			c0.16	c0.29			0.07		0.03	c0.03
v/s Ratio Perm			0.01				0.00			c0.11		
v/c Ratio	0.55	0.89	0.02		0.61	0.59	0.01		0.46	0.70	0.40	0.45
Uniform Delay, d1	57.3	42.0	30.3		42.6	24.0	17.1		50.1	52.2	58.5	58.7
Progression Factor	1.00	1.00	1.00		1.58	0.39	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	17.5	0.1		0.6	0.9	0.0		0.4	7.1	0.9	1.0
Delay (s)	59.1	59.5	30.3		68.1	10.1	17.1		50.5	59.2	59.4	59.8
Level of Service	E	E	C		E	B	B		D	E	E	E
Approach Delay (s)		58.3				38.5			57.6			58.7
Approach LOS		E				D			E			E
Intersection Summary												
HCM 2000 Control Delay			50.0			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			27.5			
Intersection Capacity Utilization			100.8%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Opportunity Way /Southern Mall Access & Centerville Road

11/17/2025

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	52
Future Volume (vph)	52
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	55
RTOR Reduction (vph)	52
Lane Group Flow (vph)	3
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.2
Effective Green, g (s)	8.2
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	101
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.03
Uniform Delay, d1	57.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	57.2
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Queues

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	52	1636	381	605	851	40	233	234	712	70	32
v/c Ratio	0.49	1.22	0.45	0.92	0.47	0.04	1.40	1.04	1.46	1.49	0.09
Control Delay	74.0	140.3	4.5	70.8	16.6	0.1	242.3	110.9	236.0	344.7	0.6
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	74.0	140.4	4.5	70.8	16.6	0.1	242.3	110.9	236.1	344.7	0.6
Queue Length 50th (ft)	43	~899	0	227	246	0	~277	~224	~618	~81	0
Queue Length 95th (ft)	87	#1038	65	m#295	m292	m0	m#401	m#345	m#784	#182	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	305		480	415		210	300				95
Base Capacity (vph)	131	1346	845	686	1827	902	166	224	489	47	337
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	34	0	0	0	0	0	0	3	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	1.25	0.45	0.88	0.47	0.04	1.40	1.04	1.47	1.49	0.09

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	16	33	1554	362	575	808	38	2	406	36	676	42
Future Volume (vph)	16	33	1554	362	575	808	38	2	406	36	676	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	1.00		0.95	0.95	1.00	
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	0.96	1.00	
Satd. Flow (prot)		1805	3574	1615	3433	3610	1615		1698	1718	1599	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.71	0.96	1.00	
Satd. Flow (perm)		1805	3574	1615	3433	3610	1615		1271	1718	1599	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	35	1636	381	605	851	40	2	427	38	712	44
RTOR Reduction (vph)	0	0	0	237	0	0	20	0	0	0	281	0
Lane Group Flow (vph)	0	52	1636	144	605	851	20	0	233	234	431	0
Heavy Vehicles (%)	0%	0%	1%	0%	2%	0%	0%	0%	1%	0%	1%	0%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Perm	Split	NA	Perm	Perm
Protected Phases	5	5	2		1	6			4	4		
Permitted Phases				2			6	4			4	3
Actuated Green, G (s)		7.7	49.0	49.0	25.0	65.8	65.8		17.0	17.0	17.0	
Effective Green, g (s)		7.7	49.0	49.0	25.0	65.8	65.8		17.0	17.0	17.0	
Actuated g/C Ratio		0.06	0.38	0.38	0.19	0.51	0.51		0.13	0.13	0.13	
Clearance Time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Vehicle Extension (s)		2.0	4.0	4.0	2.0	4.0	4.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		106	1347	608	660	1827	817		166	224	209	
v/s Ratio Prot		0.03	c0.46		c0.18	0.24				0.14		
v/s Ratio Perm				0.09			0.01		0.18		c0.27	
v/c Ratio		0.49	1.21	0.24	0.92	0.47	0.02		1.40	1.04	2.06	
Uniform Delay, d1		59.2	40.5	27.7	51.5	20.7	16.1		56.5	56.5	56.5	
Progression Factor		1.00	1.00	1.00	1.05	0.75	1.00		0.93	0.92	1.17	
Incremental Delay, d2		1.3	103.6	0.9	14.8	0.7	0.0		203.3	60.4	489.0	
Delay (s)		60.6	144.1	28.6	68.9	16.3	16.1		255.9	112.5	555.2	
Level of Service		E	F	C	E	B	B		F	F	F	
Approach Delay (s)			120.7			37.6				408.2		
Approach LOS			F			D				F		
Intersection Summary												
HCM 2000 Control Delay			168.1									
HCM 2000 Volume to Capacity ratio			1.32									
Actuated Cycle Length (s)			130.0							29.5		
Intersection Capacity Utilization			106.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	25	30
Future Volume (vph)	25	30
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	7.0	7.0
Lane Util. Factor	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.97	1.00
Satd. Flow (prot)	1842	1615
Flt Permitted	0.33	1.00
Satd. Flow (perm)	619	1615
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	26	32
RTOR Reduction (vph)	0	30
Lane Group Flow (vph)	70	2
Heavy Vehicles (%)	0%	0%
Turn Type	NA	Perm
Protected Phases	3	
Permitted Phases		3
Actuated Green, G (s)	10.0	10.0
Effective Green, g (s)	10.0	10.0
Actuated g/C Ratio	0.08	0.08
Clearance Time (s)	7.0	7.0
Vehicle Extension (s)	2.5	2.5
Lane Grp Cap (vph)	47	124
v/s Ratio Prot		
v/s Ratio Perm	c0.11	0.00
v/c Ratio	1.49	0.02
Uniform Delay, d1	60.0	55.5
Progression Factor	1.00	1.00
Incremental Delay, d2	304.5	0.0
Delay (s)	364.5	55.5
Level of Service	F	E
Approach Delay (s)	267.6	
Approach LOS	F	
Intersection Summary		

Queues

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1688	615	51	1030	418	213
v/c Ratio	0.87	0.53	0.44	0.44	0.99	0.42
Control Delay	15.7	0.6	69.1	10.2	89.4	15.5
Queue Delay	0.7	0.5	0.0	0.0	0.0	0.0
Total Delay	16.4	1.1	69.1	10.2	89.4	15.5
Queue Length 50th (ft)	255	0	40	218	353	40
Queue Length 95th (ft)	m195	m0	m69	m252	#567	113
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	1932	1155	138	2332	424	503
Starvation Cap Reductn	65	205	0	0	0	0
Spillback Cap Reductn	20	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.65	0.37	0.44	0.99	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Route 199 EB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1587	578	48	968	393	200
Future Volume (vph)	1587	578	48	968	393	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1615	1805	3610	1752	1599
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1615	1805	3610	1752	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1688	615	51	1030	418	213
RTOR Reduction (vph)	0	290	0	0	0	116
Lane Group Flow (vph)	1688	325	51	1030	418	97
Heavy Vehicles (%)	1%	0%	0%	0%	3%	1%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	68.7	68.7	7.3	84.0	31.5	31.5
Effective Green, g (s)	68.7	68.7	7.3	84.0	31.5	31.5
Actuated g/C Ratio	0.53	0.53	0.06	0.65	0.24	0.24
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1888	853	101	2332	424	387
v/s Ratio Prot	c0.47		0.03	c0.29	c0.24	
v/s Ratio Perm		0.20				0.06
v/c Ratio	0.89	0.38	0.50	0.44	0.99	0.25
Uniform Delay, d1	27.4	18.1	59.6	11.4	49.0	39.7
Progression Factor	0.53	0.31	1.02	0.84	1.00	1.00
Incremental Delay, d2	0.7	0.1	3.4	0.5	39.9	0.7
Delay (s)	15.2	5.7	64.1	10.1	88.9	40.4
Level of Service	B	A	E	B	F	D
Approach Delay (s)	12.7			12.7	72.6	
Approach LOS	B			B	E	
Intersection Summary						
HCM 2000 Control Delay			22.1		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.91			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			77.7%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Queues

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1284	503	172	739	424	91
v/c Ratio	0.81	0.55	0.76	0.32	0.93	0.19
Control Delay	17.0	2.3	75.1	11.6	74.8	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	2.3	75.1	11.6	74.8	8.6
Queue Length 50th (ft)	282	2	140	146	345	1
Queue Length 95th (ft)	447	m10	218	182	#530	44
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)			475			
Base Capacity (vph)	1582	914	267	2292	479	493
Starvation Cap Reductn	2	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.55	0.64	0.32	0.89	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

5: Route 199 WB Ramps & Route 60 (Richmond Road)

11/17/2025

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1233	483	165	709	407	87
Future Volume (vph)	1233	483	165	709	407	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1583	1736	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1583	1736	3610	1805	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1284	503	172	739	424	91
RTOR Reduction (vph)	0	213	0	0	0	66
Lane Group Flow (vph)	1284	290	172	739	424	25
Heavy Vehicles (%)	1%	2%	4%	0%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	57.6	57.6	17.0	82.6	32.9	32.9
Effective Green, g (s)	57.6	57.6	17.0	82.6	32.9	32.9
Actuated g/C Ratio	0.44	0.44	0.13	0.64	0.25	0.25
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1583	701	227	2293	456	408
v/s Ratio Prot	c0.36		c0.10	0.20	c0.23	
v/s Ratio Perm		0.18				0.02
v/c Ratio	0.81	0.41	0.76	0.32	0.93	0.06
Uniform Delay, d1	31.5	24.7	54.5	10.9	47.4	36.8
Progression Factor	0.43	0.16	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	1.0	13.5	0.4	25.3	0.1
Delay (s)	16.0	4.8	68.0	11.2	72.7	36.9
Level of Service	B	A	E	B	E	D
Approach Delay (s)	12.9			22.0	66.4	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			24.0		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.84			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			84.5%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	UL	TR
Maximum Queue (ft)	39	27	6	47	168	70
Average Queue (ft)	11	4	0	21	73	26
95th Queue (ft)	33	18	4	43	140	53
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	133	364	861	290	259	435	308	83	3120	3115	35	108
Average Queue (ft)	43	171	388	44	178	217	106	4	1893	2083	6	35
95th Queue (ft)	104	379	725	198	268	364	254	44	3771	3649	23	82
Link Distance (ft)			1319			1150	1150		3106	3106		426
Upstream Blk Time (%)									25	24		
Queuing Penalty (veh)									0	0		
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	24	0	1	6	2	0			0	0
Queuing Penalty (veh)		1	42	1	1	17	0	0			0	0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	78
Average Queue (ft)	4
95th Queue (ft)	32
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

11/19/2025

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	UL	LT	R
Maximum Queue (ft)	304	1596	1599	480	398	408	546	440	71	296	1163	1222
Average Queue (ft)	99	1563	1565	459	264	274	212	158	13	152	1066	1194
95th Queue (ft)	294	1664	1661	619	415	432	494	338	61	275	1492	1307
Link Distance (ft)		1554	1554				676	676			1150	1150
Upstream Blk Time (%)		46	80				0	0			3	51
Queuing Penalty (veh)		0	0				3	0			15	283
Storage Bay Dist (ft)	305			480	415	415			210	300		
Storage Blk Time (%)	0	59	59	2	1	4	4	1	0	1	6	
Queuing Penalty (veh)	1	29	213	17	3	17	20	0	0	1	12	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	114	58
Average Queue (ft)	40	4
95th Queue (ft)	91	30
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	1	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	440	485	291	121	238	216	563	181
Average Queue (ft)	199	236	82	47	116	93	330	72
95th Queue (ft)	346	385	184	95	203	175	529	140
Link Distance (ft)	676	676			702	702	1094	1094
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)		0	0		0			
Queuing Penalty (veh)		2	0		0			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	342	338	160	249	243	192	528	115
Average Queue (ft)	110	127	57	138	127	70	319	31
95th Queue (ft)	249	254	119	224	213	154	514	78
Link Distance (ft)	702	702	702		855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)				475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 680

Appendix I

Signal Warrant Analysis

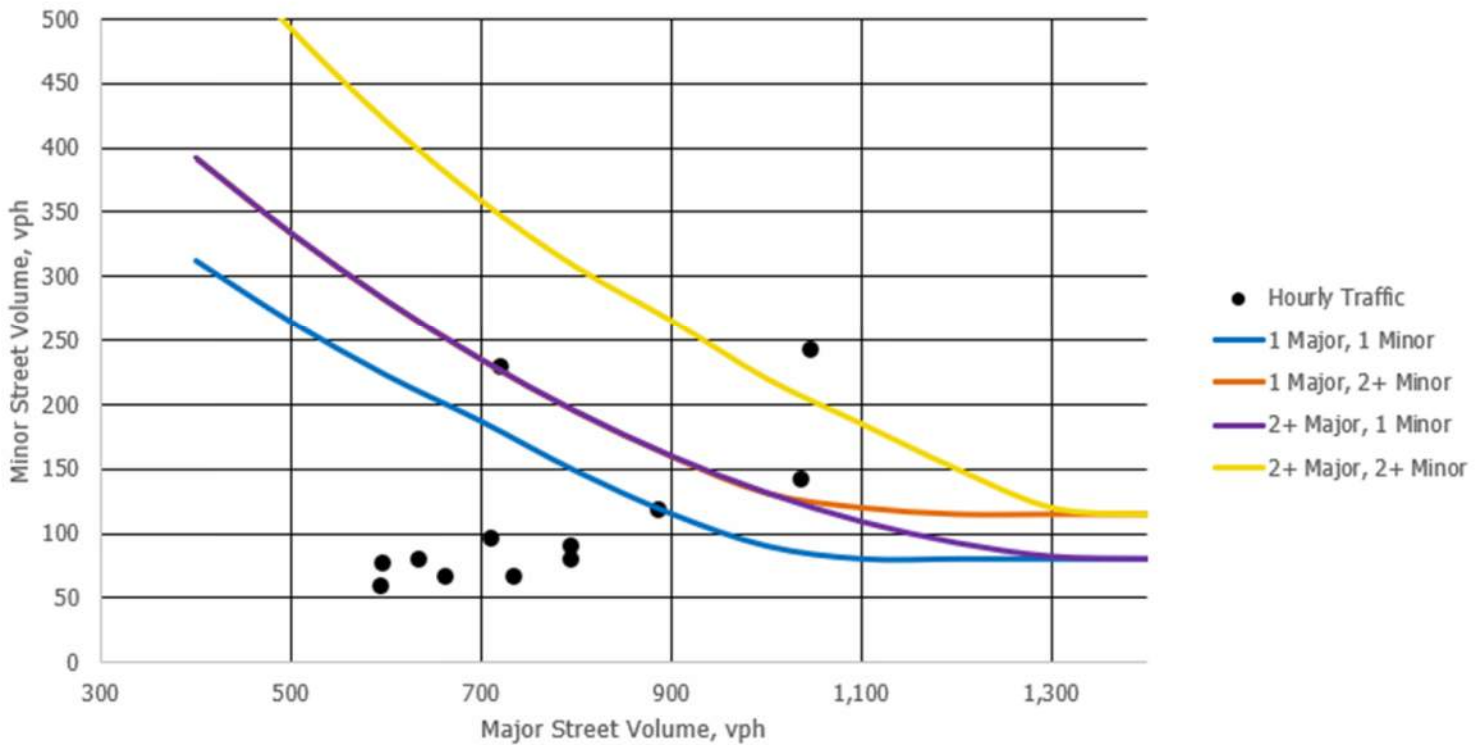
Weekday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	100% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		600	900	480	720
	Minor		150	75	120	60
7:00 AM - 8:00 AM	712	96	N	N	N	N
8:00 AM - 9:00 AM	795	89	N	N	N	Y
9:00 AM - 10:00 AM	736	66	N	N	N	Y
10:00 AM - 11:00 AM	598	77	N	N	N	N
11:00 AM - 12:00 PM	595	58	N	N	N	N
12:00 PM - 1:00 PM	635	80	N	N	N	N
1:00 PM - 2:00 PM	664	66	N	N	N	N
2:00 PM - 3:00 PM	795	79	N	N	N	Y
3:00 PM - 4:00 PM	887	118	N	N	N	Y
4:00 PM - 5:00 PM	1,037	141	N	Y	Y	Y
5:00 PM - 6:00 PM	1,047	242	Y	Y	Y	Y
6:00 PM - 7:00 PM	722	228	Y	N	Y	Y
# of Hours Warrant is Met			2	2	3	7
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			No	No	No	

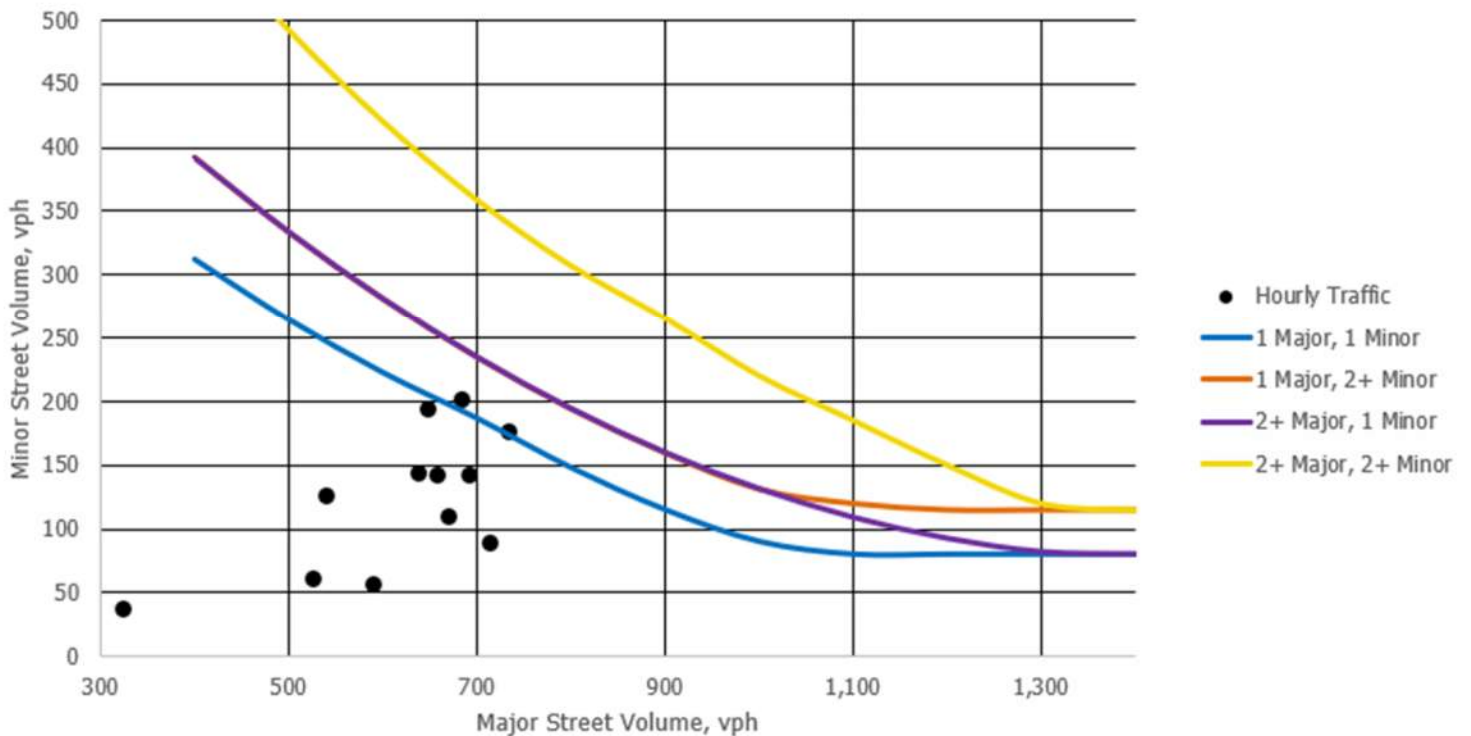
Saturday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	100% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		600	900	480	720
	Minor		150	75	120	60
7:00 AM - 8:00 AM	325	37	N	N	N	N
8:00 AM - 9:00 AM	528	60	N	N	N	N
9:00 AM - 10:00 AM	671	109	N	N	N	N
10:00 AM - 11:00 AM	649	193	Y	N	Y	N
11:00 AM - 12:00 PM	735	176	Y	N	Y	Y
12:00 PM - 1:00 PM	685	201	Y	N	Y	N
1:00 PM - 2:00 PM	694	142	N	N	Y	N
2:00 PM - 3:00 PM	715	88	N	N	N	N
3:00 PM - 4:00 PM	660	141	N	N	Y	N
4:00 PM - 5:00 PM	639	143	N	N	Y	N
5:00 PM - 6:00 PM	592	56	N	N	N	N
6:00 PM - 7:00 PM	542	125	N	N	Y	N
# of Hours Warrant is Met			3	0	7	1
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			No	No	No	

**Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume - 2025
Existing Weekday**



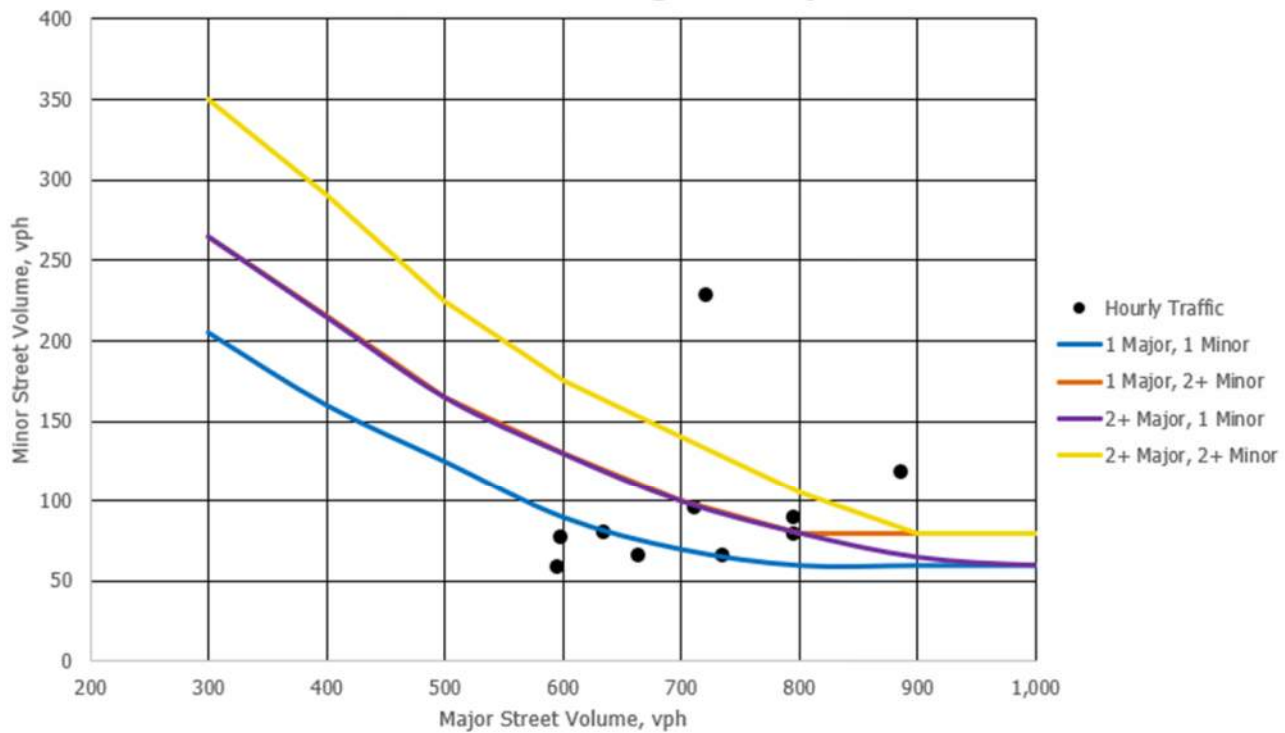
**Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume - 2025
Existing Weekend**



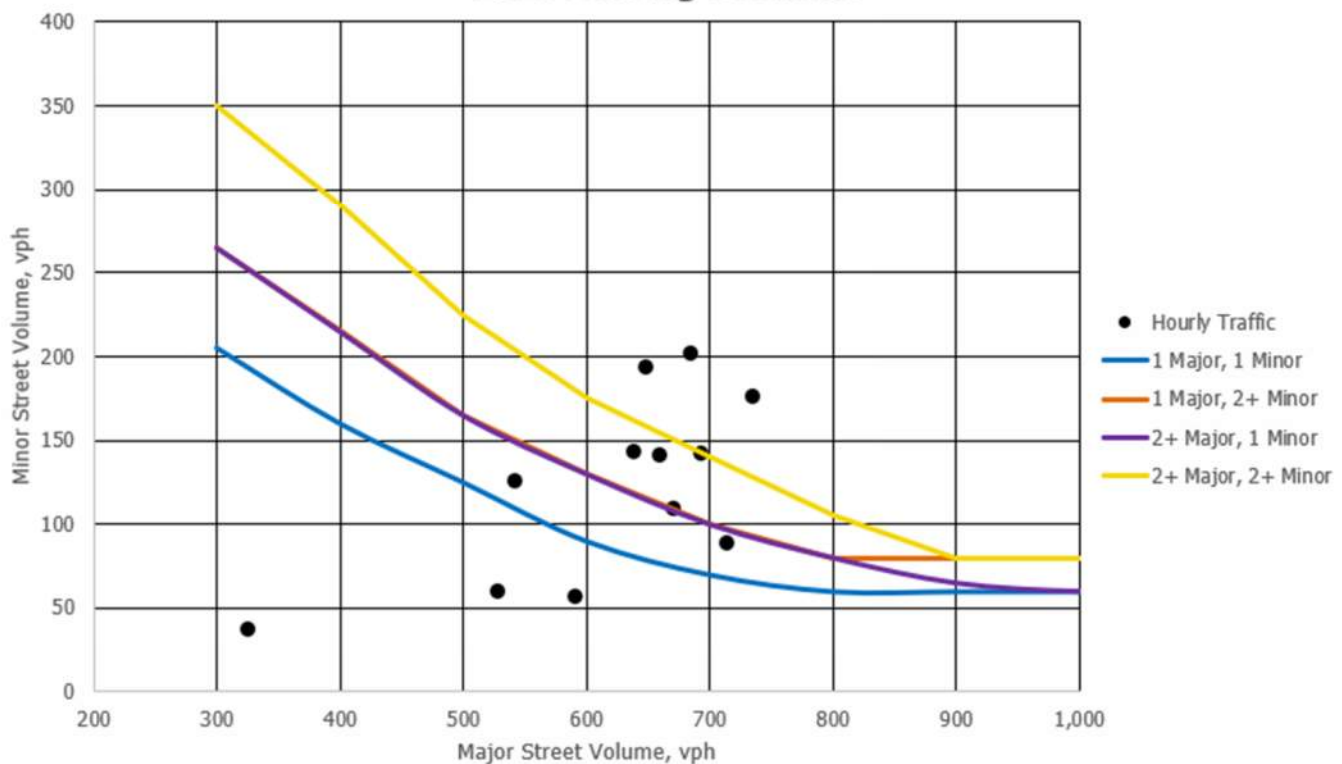
Weekday						
Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	70% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
Threshold	Major				Condition A	Condition B
	Minor		420	630	336	504
			105	53	84	42
7:00 AM - 8:00 AM	712	96	N	Y	Y	Y
8:00 AM - 9:00 AM	795	89	N	Y	Y	Y
9:00 AM - 10:00 AM	736	66	N	Y	N	Y
10:00 AM - 11:00 AM	598	77	N	N	N	Y
11:00 AM - 12:00 PM	595	58	N	N	N	Y
12:00 PM - 1:00 PM	635	80	N	Y	N	Y
1:00 PM - 2:00 PM	664	66	N	Y	N	Y
2:00 PM - 3:00 PM	795	79	N	Y	N	Y
3:00 PM - 4:00 PM	887	118	Y	Y	Y	Y
4:00 PM - 5:00 PM	1,037	141	Y	Y	Y	Y
5:00 PM - 6:00 PM	1,047	242	Y	Y	Y	Y
6:00 PM - 7:00 PM	722	228	Y	Y	Y	Y
# of Hours Warrant is Met			4	10	6	12
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			Yes	Yes	No	

Saturday						
Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	70% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
Threshold	Major				Condition A	Condition B
	Minor		420	630	336	504
			105	53	84	42
7:00 AM - 8:00 AM	325	37	N	N	N	N
8:00 AM - 9:00 AM	528	60	N	N	N	Y
9:00 AM - 10:00 AM	671	109	Y	Y	Y	Y
10:00 AM - 11:00 AM	649	193	Y	Y	Y	Y
11:00 AM - 12:00 PM	735	176	Y	Y	Y	Y
12:00 PM - 1:00 PM	685	201	Y	Y	Y	Y
1:00 PM - 2:00 PM	694	142	Y	Y	Y	Y
2:00 PM - 3:00 PM	715	88	N	Y	Y	Y
3:00 PM - 4:00 PM	660	141	Y	Y	Y	Y
4:00 PM - 5:00 PM	639	143	Y	Y	Y	Y
5:00 PM - 6:00 PM	592	56	N	N	N	Y
6:00 PM - 7:00 PM	542	125	Y	N	Y	Y
# of Hours Warrant is Met			8	8	9	11
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			Yes	Yes	Yes	

**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)
2025 Existing Weekday**



**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)
2025 Existing Weekend**



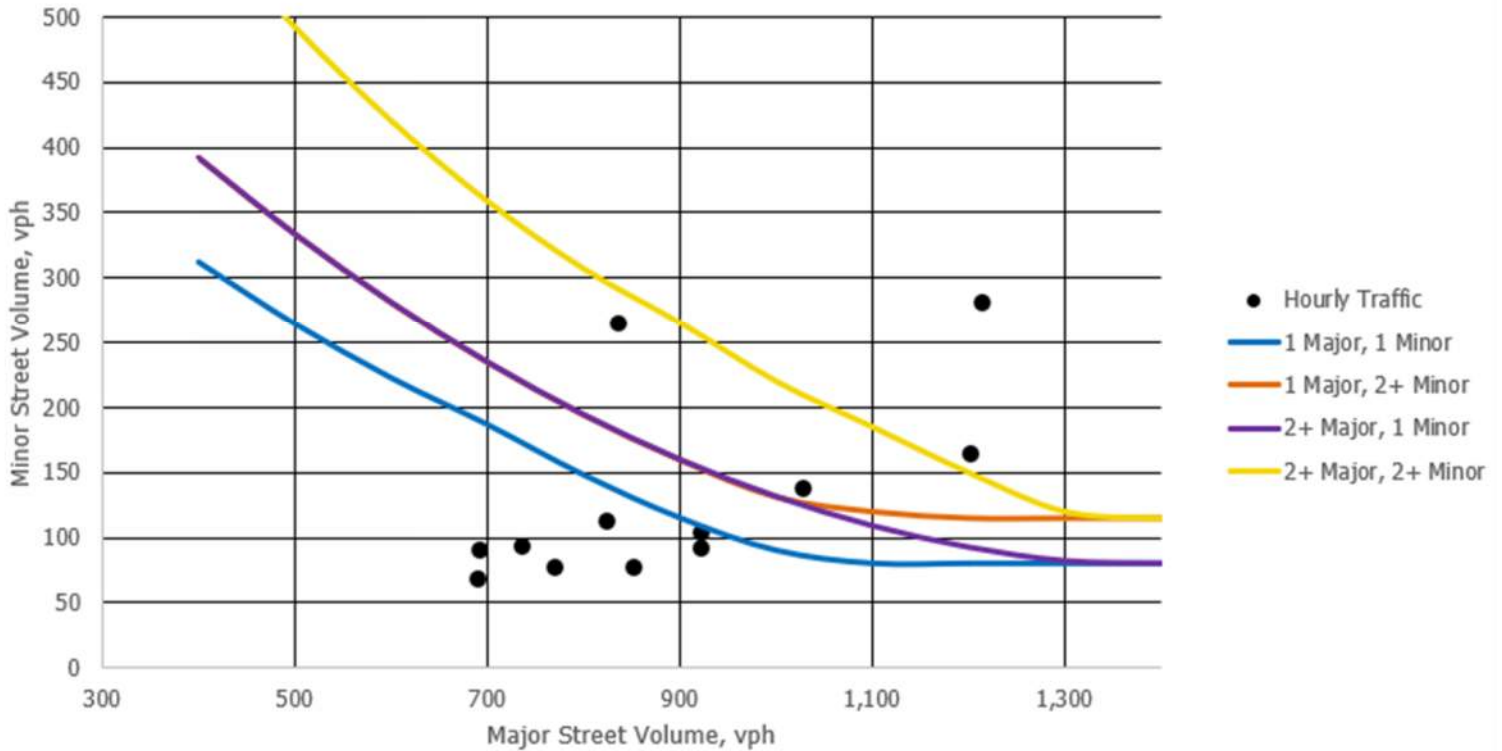
Weekday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	100% WARRANTS			
			# 1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		600	900	480	720
	Minor		150	75	120	60
7:00 AM - 8:00 AM	827	111	N	N	N	Y
8:00 AM - 9:00 AM	923	103	N	Y	N	Y
9:00 AM - 10:00 AM	854	77	N	N	N	Y
10:00 AM - 11:00 AM	694	89	N	N	N	N
11:00 AM - 12:00 PM	691	67	N	N	N	N
12:00 PM - 1:00 PM	737	93	N	N	N	Y
1:00 PM - 2:00 PM	771	77	N	N	N	Y
2:00 PM - 3:00 PM	923	92	N	Y	N	Y
3:00 PM - 4:00 PM	1,030	137	N	Y	Y	Y
4:00 PM - 5:00 PM	1,204	164	Y	Y	Y	Y
5:00 PM - 6:00 PM	1,216	281	Y	Y	Y	Y
6:00 PM - 7:00 PM	838	265	Y	N	Y	Y
# of Hours Warrant is Met			3	5	4	10
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			No	No	No	

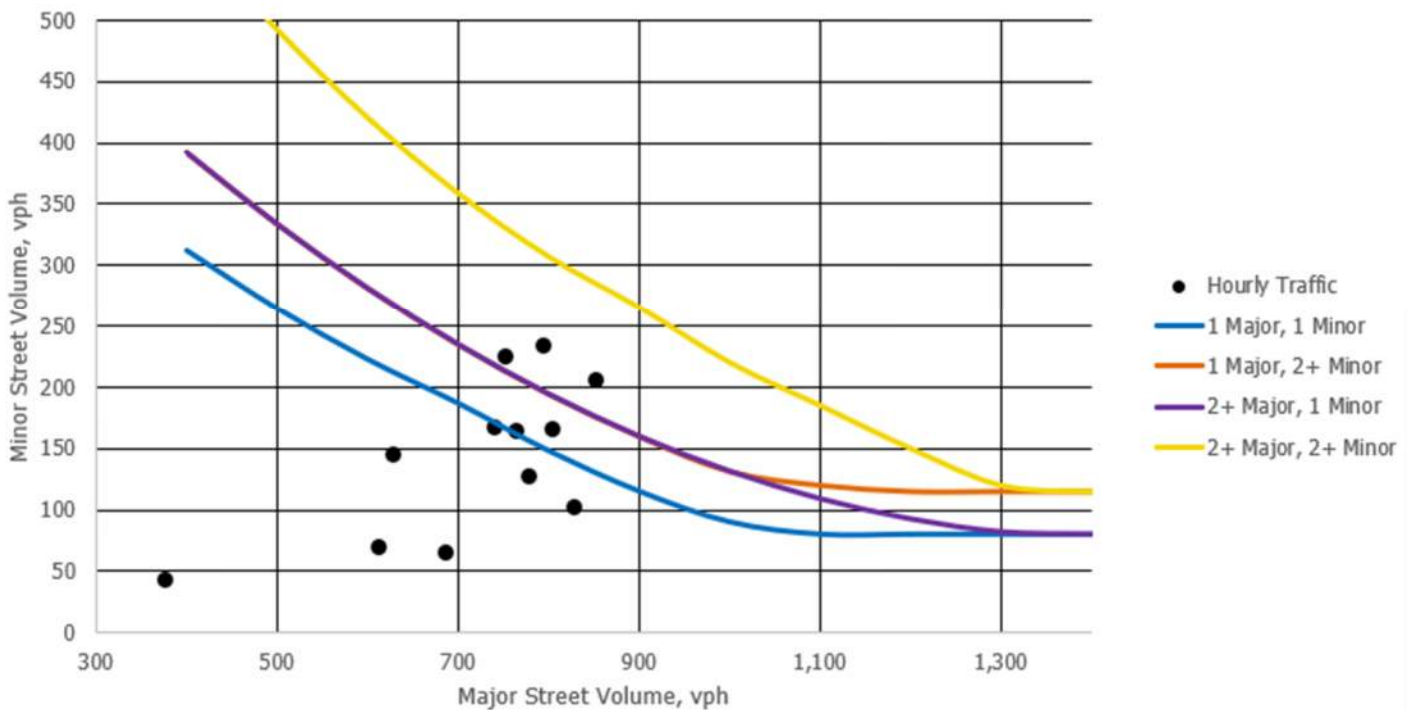
Saturday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	100% WARRANTS			
			# 1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		600	900	480	720
	Minor		150	75	120	60
7:00 AM - 8:00 AM	377	43	N	N	N	N
8:00 AM - 9:00 AM	613	70	N	N	N	N
9:00 AM - 10:00 AM	779	127	N	N	Y	Y
10:00 AM - 11:00 AM	753	224	Y	N	Y	Y
11:00 AM - 12:00 PM	853	204	Y	N	Y	Y
12:00 PM - 1:00 PM	795	233	Y	N	Y	Y
1:00 PM - 2:00 PM	806	165	Y	N	Y	Y
2:00 PM - 3:00 PM	830	102	N	N	N	Y
3:00 PM - 4:00 PM	766	164	Y	N	Y	Y
4:00 PM - 5:00 PM	742	166	Y	N	Y	Y
5:00 PM - 6:00 PM	687	65	N	N	N	N
6:00 PM - 7:00 PM	629	145	N	N	Y	N
# of Hours Warrant is Met			6	0	8	8
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			No	No	Yes	

**Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume - 2040
Background Weekday**



**Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume - 2040
Background Weekend**



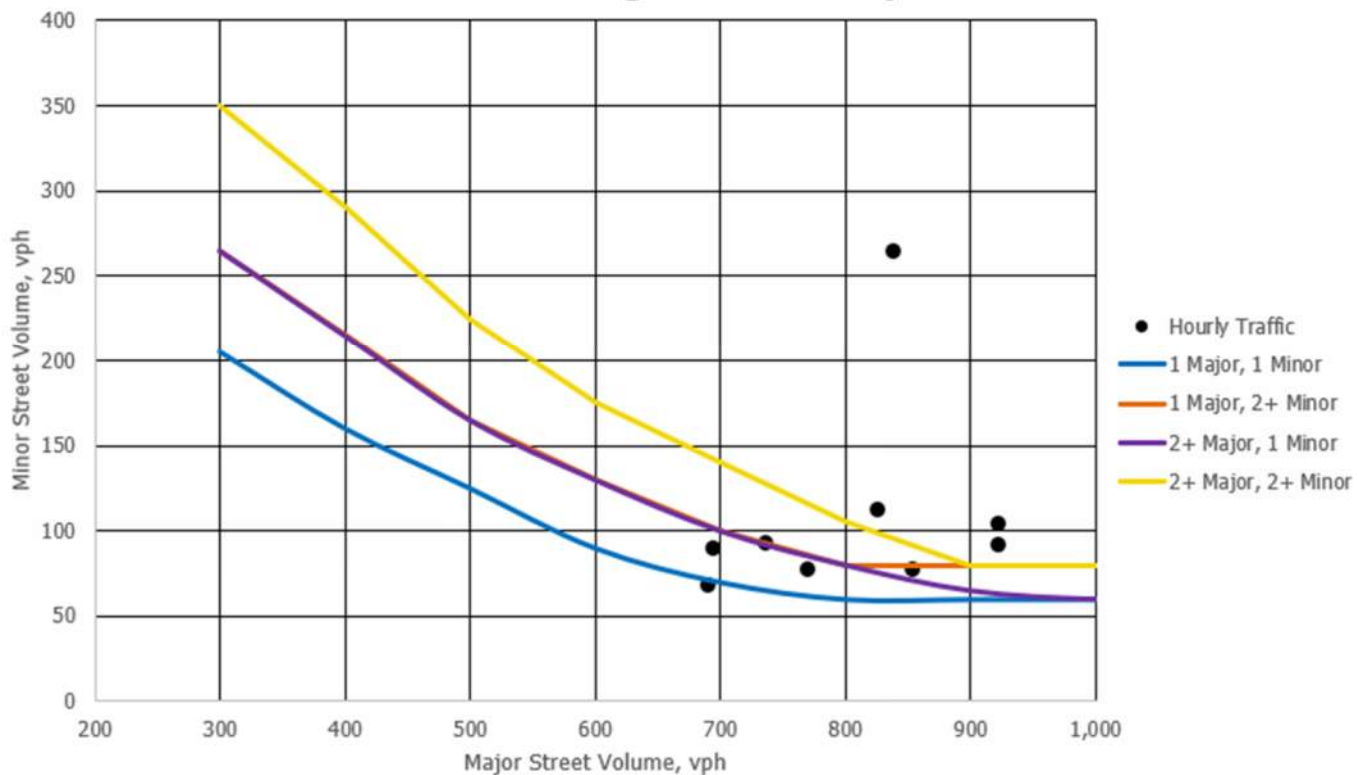
Weekday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	70% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		420	630	336	504
	Minor		105	53	84	42
7:00 AM - 8:00 AM	827	111	Y	Y	Y	Y
8:00 AM - 9:00 AM	923	103	N	Y	Y	Y
9:00 AM - 10:00 AM	854	77	N	Y	N	Y
10:00 AM - 11:00 AM	694	89	N	Y	Y	Y
11:00 AM - 12:00 PM	691	67	N	Y	N	Y
12:00 PM - 1:00 PM	737	93	N	Y	Y	Y
1:00 PM - 2:00 PM	771	77	N	Y	N	Y
2:00 PM - 3:00 PM	923	92	N	Y	Y	Y
3:00 PM - 4:00 PM	1,030	137	Y	Y	Y	Y
4:00 PM - 5:00 PM	1,204	164	Y	Y	Y	Y
5:00 PM - 6:00 PM	1,216	281	Y	Y	Y	Y
6:00 PM - 7:00 PM	838	265	Y	Y	Y	Y
# of Hours Warrant is Met			5	12	9	12
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			No	Yes	Yes	

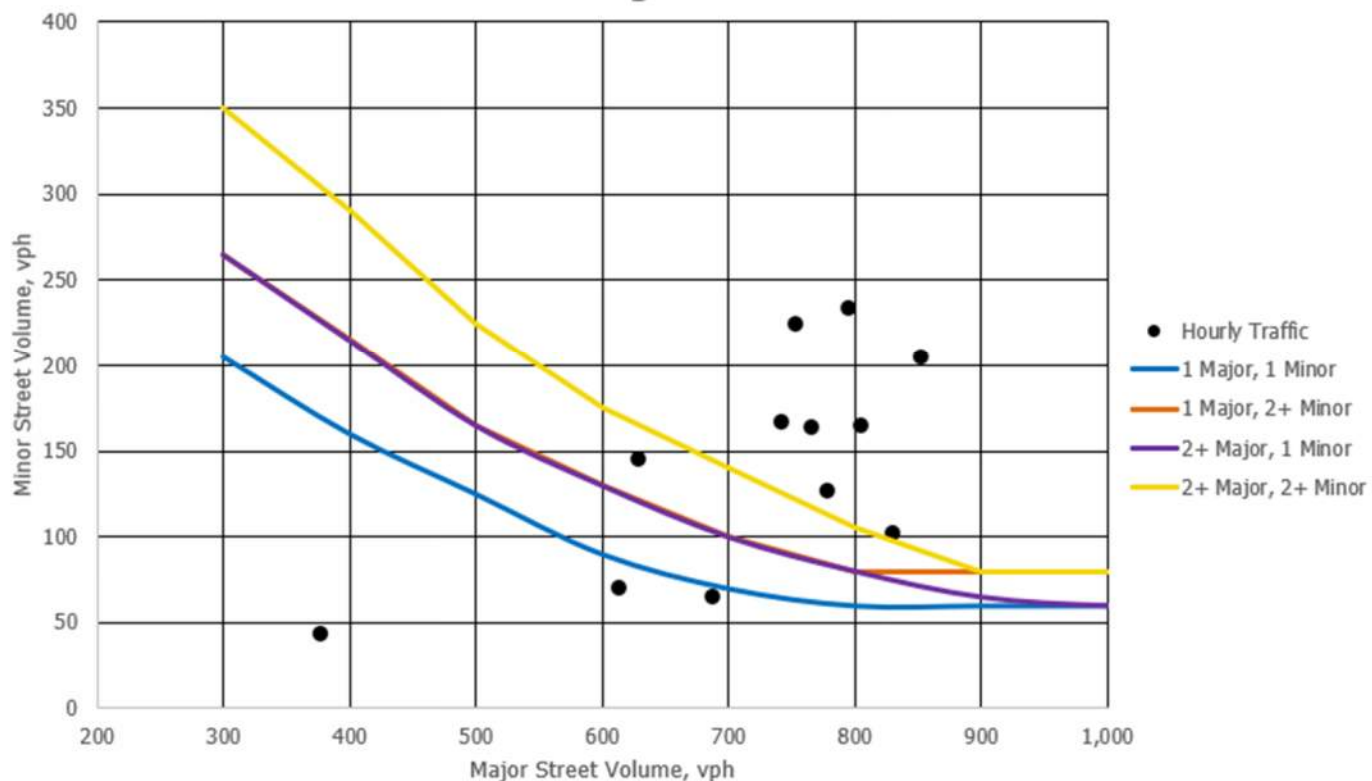
Saturday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	70% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		420	630	336	504
	Minor		105	53	84	42
7:00 AM - 8:00 AM	377	43	N	N	N	N
8:00 AM - 9:00 AM	613	70	N	N	N	Y
9:00 AM - 10:00 AM	779	127	Y	Y	Y	Y
10:00 AM - 11:00 AM	753	224	Y	Y	Y	Y
11:00 AM - 12:00 PM	853	204	Y	Y	Y	Y
12:00 PM - 1:00 PM	795	233	Y	Y	Y	Y
1:00 PM - 2:00 PM	806	165	Y	Y	Y	Y
2:00 PM - 3:00 PM	830	102	N	Y	Y	Y
3:00 PM - 4:00 PM	766	164	Y	Y	Y	Y
4:00 PM - 5:00 PM	742	166	Y	Y	Y	Y
5:00 PM - 6:00 PM	687	65	N	Y	N	Y
6:00 PM - 7:00 PM	629	145	Y	N	Y	Y
# of Hours Warrant is Met			8	9	9	11
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			Yes	Yes	Yes	

**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)
2040 Background Weekday**



**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)
2040 Background Weekend**



Weekday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	100% WARRANTS			
			# 1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		600	900	480	720
	Minor		150	75	120	60
7:00 AM - 8:00 AM	829	114	N	N	N	Y
8:00 AM - 9:00 AM	933	104	N	Y	N	Y
9:00 AM - 10:00 AM	878	88	N	N	N	Y
10:00 AM - 11:00 AM	714	105	N	N	N	N
11:00 AM - 12:00 PM	707	97	N	N	N	N
12:00 PM - 1:00 PM	763	111	N	N	N	Y
1:00 PM - 2:00 PM	792	89	N	N	N	Y
2:00 PM - 3:00 PM	939	116	N	Y	N	Y
3:00 PM - 4:00 PM	1,045	156	Y	Y	Y	Y
4:00 PM - 5:00 PM	1,211	186	Y	Y	Y	Y
5:00 PM - 6:00 PM	1,224	289	Y	Y	Y	Y
6:00 PM - 7:00 PM	847	274	Y	N	Y	Y
# of Hours Warrant is Met			4	5	4	10
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			No	No	No	

Saturday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	100% WARRANTS			
			# 1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		600	900	480	720
	Minor		150	75	120	60
7:00 AM - 8:00 AM	377	43	N	N	N	N
8:00 AM - 9:00 AM	613	70	N	N	N	N
9:00 AM - 10:00 AM	779	127	N	N	Y	Y
10:00 AM - 11:00 AM	753	224	Y	N	Y	Y
11:00 AM - 12:00 PM	853	204	Y	N	Y	Y
12:00 PM - 1:00 PM	795	233	Y	N	Y	Y
1:00 PM - 2:00 PM	806	165	Y	N	Y	Y
2:00 PM - 3:00 PM	830	102	N	N	N	Y
3:00 PM - 4:00 PM	766	164	Y	N	Y	Y
4:00 PM - 5:00 PM	742	166	Y	N	Y	Y
5:00 PM - 6:00 PM	687	65	N	N	N	N
6:00 PM - 7:00 PM	629	145	N	N	Y	N
# of Hours Warrant is Met			6	0	8	8
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			No	No	Yes	

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume - 2040 Future Weekday

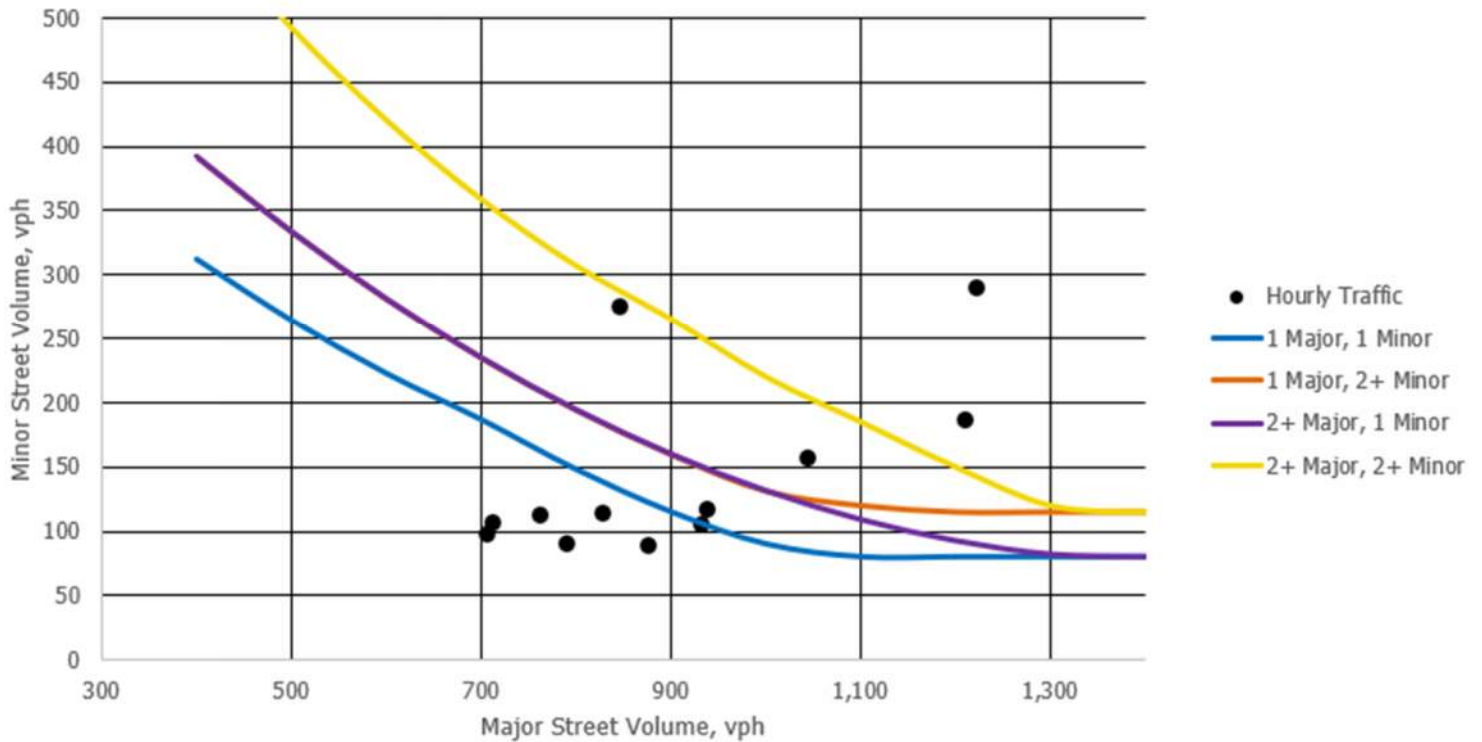
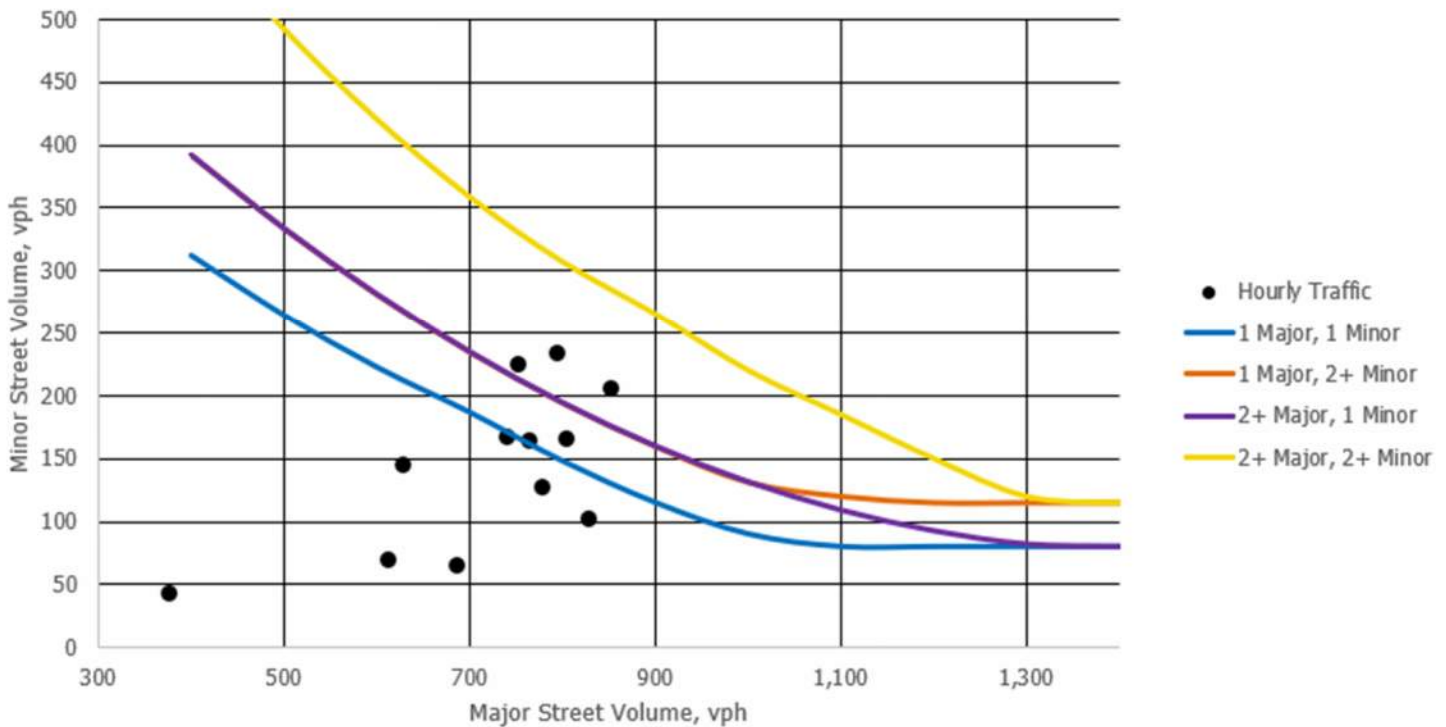


Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume - 2040 Future Weekend



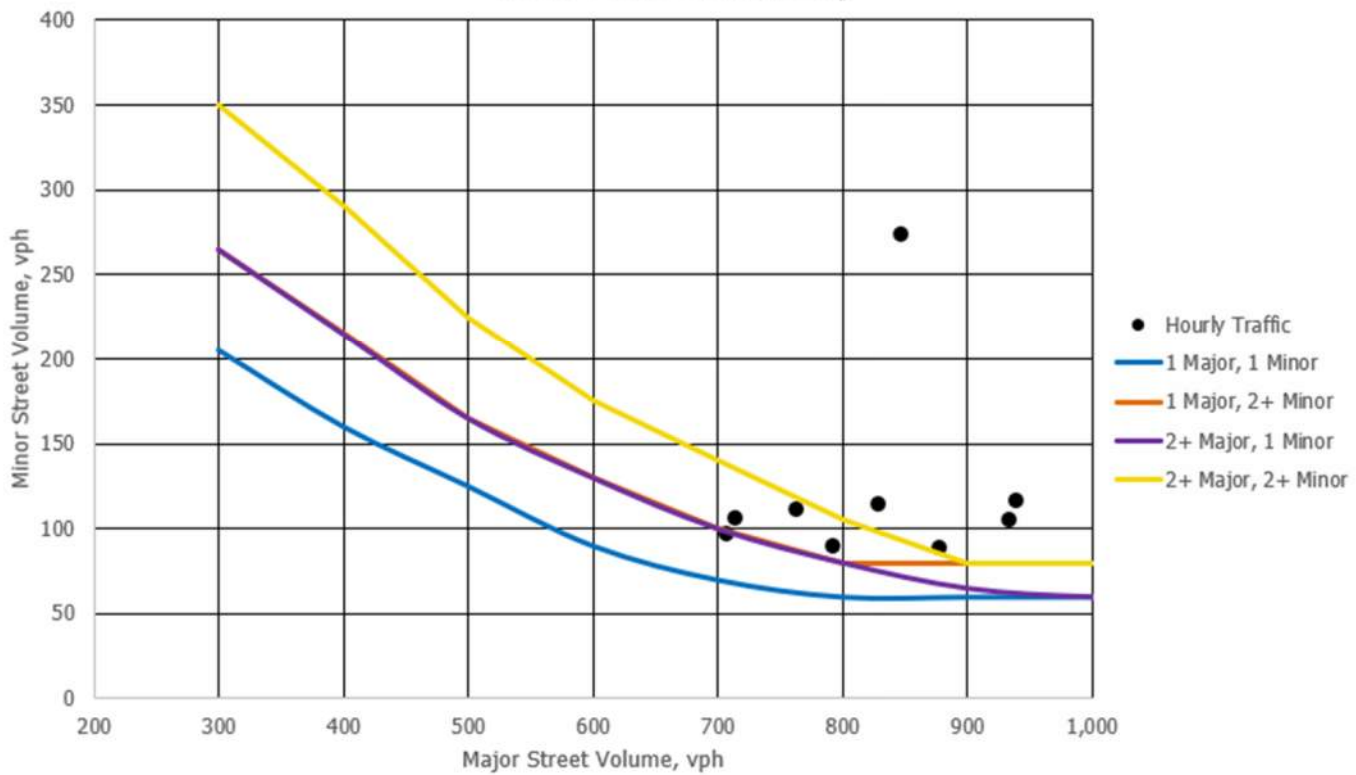
Weekday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	70% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		420	630	336	504
	Minor		105	53	84	42
7:00 AM - 8:00 AM	829	114	Y	Y	Y	Y
8:00 AM - 9:00 AM	933	104	N	Y	Y	Y
9:00 AM - 10:00 AM	878	88	N	Y	Y	Y
10:00 AM - 11:00 AM	714	105	Y	Y	Y	Y
11:00 AM - 12:00 PM	707	97	N	Y	Y	Y
12:00 PM - 1:00 PM	763	111	Y	Y	Y	Y
1:00 PM - 2:00 PM	792	89	N	Y	Y	Y
2:00 PM - 3:00 PM	939	116	Y	Y	Y	Y
3:00 PM - 4:00 PM	1,045	156	Y	Y	Y	Y
4:00 PM - 5:00 PM	1,211	186	Y	Y	Y	Y
5:00 PM - 6:00 PM	1,224	289	Y	Y	Y	Y
6:00 PM - 7:00 PM	847	274	Y	Y	Y	Y
# of Hours Warrant is Met			8	12	12	12
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			Yes	Yes	Yes	

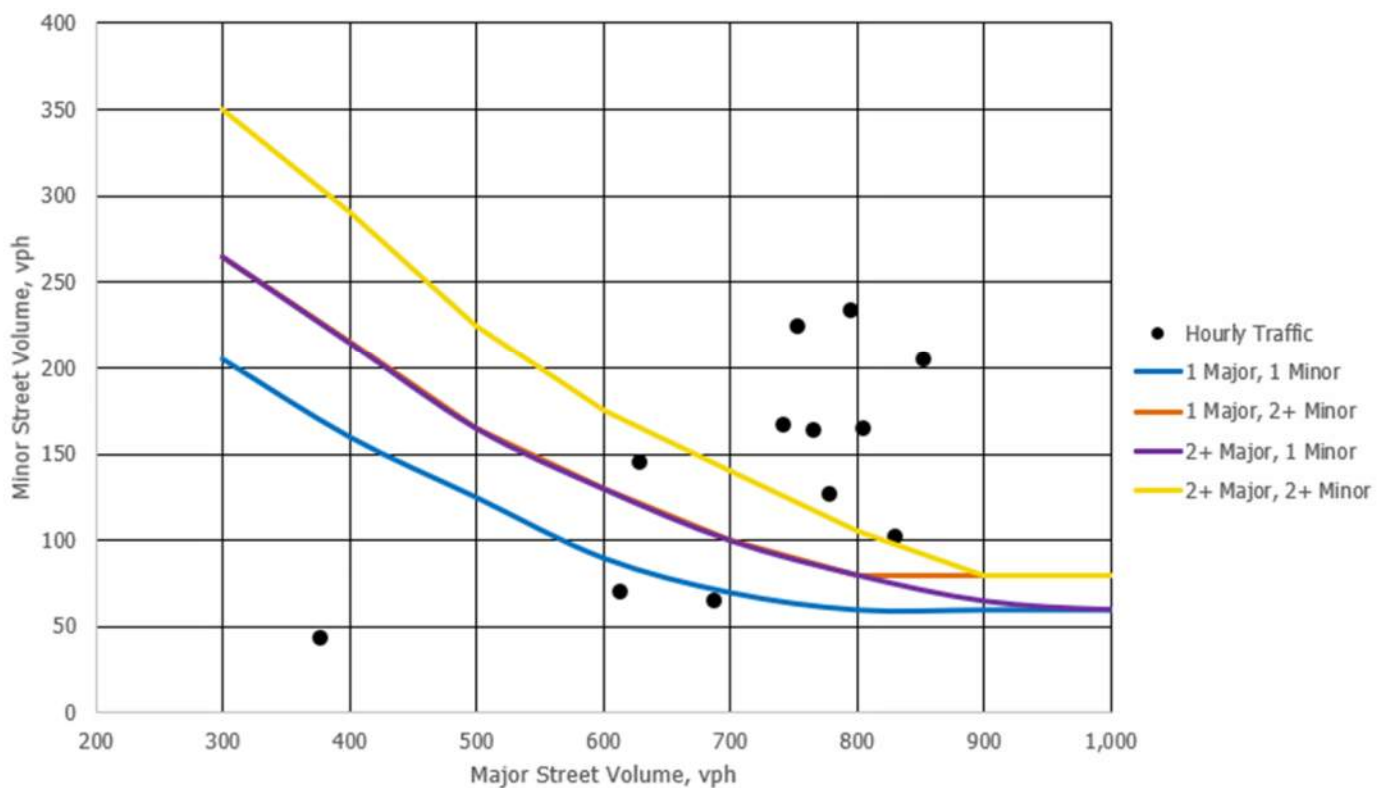
Weekend

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	70% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		420	630	336	504
	Minor		105	53	84	42
7:00 AM - 8:00 AM	385	44	N	N	N	N
8:00 AM - 9:00 AM	625	71	N	N	N	Y
9:00 AM - 10:00 AM	795	129	Y	Y	Y	Y
10:00 AM - 11:00 AM	769	229	Y	Y	Y	Y
11:00 AM - 12:00 PM	870	208	Y	Y	Y	Y
12:00 PM - 1:00 PM	811	238	Y	Y	Y	Y
1:00 PM - 2:00 PM	822	168	Y	Y	Y	Y
2:00 PM - 3:00 PM	847	104	N	Y	Y	Y
3:00 PM - 4:00 PM	782	167	Y	Y	Y	Y
4:00 PM - 5:00 PM	757	169	Y	Y	Y	Y
5:00 PM - 6:00 PM	701	66	N	Y	N	Y
6:00 PM - 7:00 PM	642	148	Y	Y	Y	Y
# of Hours Warrant is Met			8	10	9	11
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			Yes	Yes	Yes	

**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)
2040 Future Weekday**



**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)
2040 Future Weekend**



RESOLUTION

VIRGINIA CODE § 15.2-2232 ACTION ON

CASE NO. SUP-25-0015. 4900 STADIUM ROAD - GENERAL SERVICES HEADQUARTERS

WHEREAS, in accordance with § 15.2-2232 of the Code of Virginia, public buildings shall not be constructed, established, or authorized, unless and until the general location or approximate location, character, and extent thereof has been submitted to and approved by the Planning Commission as being substantially in accord with the adopted Comprehensive Plan or part thereof; and

WHEREAS, Mr. Andrew McKinley, AIA, with Via design architects, pc, has applied on behalf of James City County for a Special Use Permit (SUP) to allow for the construction of a governmental office building exceeding 30,000 square feet of floor area located at 4900 Stadium Road and 4620 Opportunity Way and further identified as James City County Real Estate Tax Map Parcel Nos. 3210100012 and 3210100017, respectively (collectively, the "Properties"), as shown on a plan titled "JCC General Services Site Master Plan" prepared by Via design architects, pc, and Eskew Dumez Ripple, and date stamp received November 10, 2025; and

WHEREAS, in accordance with § 15.2-2204 of the Code of Virginia and Section 24-9 of the James City County Zoning Ordinance, a public hearing was advertised, adjacent property owners notified, and a hearing scheduled for Case No. SUP-25-0015.

NOW, THEREFORE, BE IT RESOLVED that the Planning Commission of James City County, Virginia, for the reasons expressed in the written minutes which shall be transmitted to the Board of Supervisors, finds that the general or approximate location, character, and extent of the public buildings applied for in Case No. SUP-25-0015 are substantially in accord with the Comprehensive Plan and applicable parts thereof.



Jack Haldeman
Chair, Planning Commission

ATTEST:


Susan Istenes, Secretary

Adopted by the Planning Commission of James City County, Virginia, this 3rd day of December, 2025.

SUP25-15_4900StadiumApp-res

RESOLUTION

CASE NO. SUP-23-0007. WARHILL SPORTS COMPLEX

SPECIAL USE PERMIT AND MASTER PLAN AMENDMENT

WHEREAS, the Board of Supervisors of James City County, Virginia, has adopted by Ordinance specific land uses that shall be subjected to a Special Use Permit process; and

WHEREAS, Mr. Alister Perkinson of James City County Parks & Recreation, has applied for a request to amend Case No. SUP-0014-2016 to ensure consistency with the currently adopted park Master Plan from 2021 showing the addition of four multiuse fields, restroom/concessions, stadium complex for softball and baseball, a connection to roads linking Longhill Road and Opportunity Way, lighted pickleball/tennis courts, additional parking to support amenities, existing private indoor pool facility, existing community garden, and existing General Services Grounds Maintenance facility located at 4900 Stadium Road, 5700 Warhill Trail, and 5720 Warhill Trail and further identified as James City County Real Estate Tax Map Parcel Nos. 3210100012, 3210100012A, and 3210100012L, respectively (collectively, the "Properties"); and

WHEREAS, the Planning Commission, following its public hearing on April 5, 2023, recommended approval of Case No. SUP-23-0007 by a vote of 5-0; and

WHEREAS, a public hearing was advertised, adjoining property owners notified, and a hearing conducted on Case No. SUP-23-0007; and

WHEREAS, the Board of Supervisors of James City County, Virginia, finds this use to be consistent with good zoning practices and the 2045 Comprehensive Plan Land Use Map designation for the Property.

NOW, THEREFORE, BE IT RESOLVED that the Board of Supervisors of James City County, Virginia, after consideration of the factors in Section 24-9 of the James City County Code, does hereby approve the issuance of Case No. SUP-23-0007 as described herein with the following conditions:

1. Master Plan and Use. This Special Use Permit (the "SUP") shall be valid for the Warhill Sports Complex Community Recreation facility (the "Project"). The Project is located at 4900 Stadium Road, 5700 and 5720 Warhill Road and further identified as James City County Real Estate Tax Map Parcel Nos. 3210100012, 3210100012A, and 3210100012L, respectively (collectively, the "Properties"). Development of the Properties shall be completed in accordance with the "Warhill Sports Complex Master Plan September 2021," dated September 2021, (the "Master Plan"), with any deviations considered per Section 24-23 (a)(2) of the Zoning Ordinance.
2. Buffer. A minimum 150-foot buffer shall be maintained along the perimeter of the boundary lines of James City County Real Estate Tax Map Parcel No. 3210100012. This buffer shall remain undisturbed with the exception of breaks for roadways and pedestrian connections, utilities, walking and hiking trails, community uses, and other uses shown on the Master Plan or as specifically approved by the Director of Planning.

3. Road Improvements. The southbound right-turn lane on Warhill Trail shall be lengthened to 125 feet prior to June 30, 2027. The Director of Planning shall have the authority to delay required in the completion of the road improvement beyond June 30, 2027, if construction of the athletic fields labeled B, D2, and F on the revised Master Plan have not been completed prior to June 30, 2027.
4. Traffic Management Plan. Beginning on January 31, 2024, and every January 31 of each year thereafter, a Traffic Management Plan ("TMP") addressing the circulation and queueing of vehicles within the Project area shall be submitted to the Virginia Department of Transportation ("VDOT") and to the Director of Planning or his designee for their review and approval. The TMP shall address parking lot usage, signage, pavement markings and other vehicle control and directional devices, and manual traffic controls at the intersection of Warhill Trail and Longhill Road. The TMP shall be submitted until operation of the Longhill Road/Warhill Trail intersection is at a Level of Service "D" or better, as determined by VDOT and the Director of Planning.
5. Traffic Impact Analysis. A Traffic Impact Analysis shall be submitted to the County within five (5) years of adoption of this SUP, or at such earlier time as required by VDOT. The Director of Planning may delay this requirement beyond five (5) years if construction of the athletic fields labeled B, D2, and F on the Master Plan have not been completed within five years of adoption of this SUP.
6. Outdoor Speakers. All outdoor speakers used on the Properties shall be oriented generally towards the interior of the Properties and away from exterior property lines.
7. Master Stormwater Management Plan. The applicant shall submit a Master Stormwater Management ("SWM") Plan for review and approval by the Director of Stormwater and Resource Protection Division within 18 months of adoption of this SUP. Material deviations from the SWM Plan must be approved by the Director of Stormwater and Resource Protection Division. All development of the Properties must adhere to the approved SWM Plan.
8. Severance Clause. This SUP is not severable. Invalidation of any word, phrase, clause, sentence, or paragraph shall invalidate the remainder.

BE IT FURTHER RESOLVED that the SUP conditions set forth herein shall supersede and replace all conditions set forth in Case No. SUP-23-0007.


Michael J. Hipple
Chairman, Board of Supervisors

ATTEST:


Teresa J. Saeed
Deputy Clerk to the Board

SADLER
ICENHOUR
MCGLENNON
LARSON
HIPPLE

VOTES

<u>AYE</u>	<u>NAY</u>	<u>ABSTAIN</u>	<u>ABSENT</u>
	___	___	___
	___	___	___
	___	___	___
	___	___	___

Adopted by the Board of Supervisors of James City County, Virginia, this 9th day of
May, 2023.

SUP23-7WrhlIMPlnAmd-res



VDOT Signal Justification Report (SJR) Hampton Roads District

Date: September 11, 2025

I. Study Intersection

Major Street Route # and Name: Route 612 (Longhill Road) **Direction:** East/West

Minor Street Route # and Name: Route 1570 (Warhill Trail/Longhill Gate Rd) **Direction:** North/South

County or Locality: Williamsburg

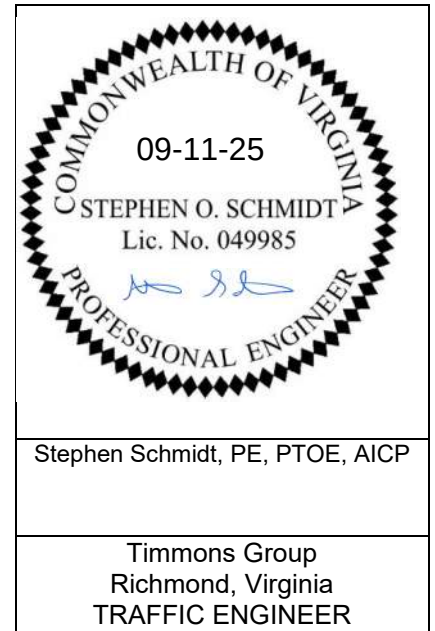
Intersection on Arterial Preservation Network (APN)? No

If on APN, type of APN Corridor? N/A

Sketch/Diagram/Aerial of the Intersection Geometry:



Describe the Origin and Nature of Request. If this SJR is based on a recommendation from another study (e.g. Traffic Impact Analysis or Safety Study), then note the name/date of the study and attach the study to this SJR. The Warhill Sports Complex is located north of the subject intersection and Warhill Trail provides access to both the Sports Complex and Warhill High School. Timmons Group prepared a Traffic Impact Analysis (TIA) for the proposed



Warhill Athletic Complex Master Plan expansion with the most recent submittal in July 2025. VDOT issued comments in August 2025. As a result, this SJR has been prepared to add in supporting documentation to support the recommended traffic signal.

The TIA analyzed traffic signal warrants at the intersection of Longhill Road and Warhill Trail/Longhill Gate Road. A traffic signal is warranted under both existing (using the 70% threshold) and all future scenarios (using the 100% thresholds) with and without the development of the full Master Plan for the complex. Warrant 1A and 1B (70% threshold) were met under 2025 existing conditions and Warrant 1 (Combo with 100% thresholds) is met under background 2040 conditions.

The subject intersection is located 1,375 feet west of the four-legged intersection of Longhill Road/Life Church/Lafayette High School Entrance and 440 feet east of the T-intersection with Lynette Drive.

In accordance with Appendix F of VDOT's Road Design Manual, on a Minor Arterial with a posted speed limit of 45 mph, the required spacing between a traffic signal and an unsignalized intersection/full access intersection (Type 2) is 1,050 feet. The proposed signal exceeds the spacing standard to the intersection with Life Church/Lafayette High School.

Per Appendix F, the required spacing between a traffic signal and a full access T-intersection (Type 3) is 470 feet. The proposed signal is approximately 30 feet shy of the standard to the intersection with Lynette Drive and an Access Management Exception will be required. It is noted that Lynette Drive is an extremely low volume road that serves only five residential units.

A copy of the TIA is included in Appendix A. A copy of the VJuST analysis is included in Appendix B.

If the origin of this SJR comes from another study, what were the key conclusions from that study that are related to this intersection?

As indicated in the attached traffic impact analysis, the traffic signal is warranted under existing conditions (Warrant 1A and 1B at 70%). The traffic growth in the area and addition of sports complex traffic will only strengthen the warrants under future conditions and will meet Warrant 1 (Combo) at 100%.

II. Signal Warrant Analysis Summary Fill in the checkboxes and tables. Submit the full and complete signal warrant analysis as Appendix A to the SJR. An up-to-date signal warrant analysis is required to be submitted along with this SJR.

Intersection Approach Information: The intersection approach information described in this section, including approach directions, should be consistent with the information described in Section 1.

Approach Direction	Road Name/Route Number	Approach Speed	Approach Speed Type	Approach Speed Notes ¹	Number of Through Lanes	Annual Average Daily Traffic (AADT)
Northbound	Longhill Gate Road/1570	25 MPH	Posted Speed Limit	N/A	1	580 PVD (Two-Way based on 2025 counts)
Southbound	Warhill Trail	30 MPH	Posted Speed Limit	N/A	1	260 VPD (Two-Way)
Eastbound	Longhill Road/612	45 MPH	Posted Speed Limit	N/A	1	6,800 VPD (Two-Way)
Westbound	Longhill Road/612	45 MPH	Posted Speed Limit	N/A	1	6,800 VPD (Two-Way)

¹ If approach speed type is not the posted/statutory speed limit, explain the reason why the posted/statutory speed limit was not used.

Summary of Traffic Count Source: Describe background information of the traffic count data (e.g., date when count data was collected, data source, and any explanation of data adjustment). VDOT reserves the right to request additional information related to the traffic counts.

Directional turning movement traffic counts were conducted on Thursday March 6, 2025 from 7AM to 7PM.

Count data is included in the TIA (see Appendix A).

Summary of MUTCD Signal Warrant Analysis:

MUTCD Signal Warrants	Warrant Satisfied?	Notes / Summary
Warrant 1: Eight-Hour Vehicular Volume	☒ Yes ☐ No ☐ N/A	Satisfied under existing 2025 conditions (70% thresholds), Satisfied with 2040 background conditions (100% threshold)
Warrant 1: VDOT ADT Option ¹	☐ Yes ☐ No ☒ N/A	
Warrant 2: Four-Hour Vehicular Volume	☐ Yes ☒ No ☐ N/A	Not met
Warrant 3: Peak Hour ²	☐ Yes ☒ No ☐ N/A	Not met
Warrant 4: Pedestrian Volume	☐ Yes ☐ No ☒ N/A	Click or tap here to enter text.
Warrant 5: School Crossing	☐ Yes ☐ No ☒ N/A	Click or tap here to enter text.
Warrant 6: Coordinated Signal System	☐ Yes ☐ No ☒ N/A	Click or tap here to enter text.
Warrant 7: Crash Experience	☐ Yes ☐ No ☒ N/A	Click or tap here to enter text.
Warrant 8: Roadway Network	☐ Yes ☐ No ☒ N/A	Click or tap here to enter text.
Warrant 9: Intersection Near a Grade Crossing	☐ Yes ☐ No ☒ N/A	Click or tap here to enter text.

Are the signal warrant analyses based on current volumes or anticipated future volumes?

☒ Current volumes ☒ Anticipated future volumes/conditions

If the signal warrant is only met under future conditions, provide a summary of trip generation assumptions and anticipated development thresholds that will trigger the signal being justified:

As noted above, the signal warrant is satisfied under existing conditions at 70% thresholds and will be met in the future at 100% thresholds with only the growth in Background Traffic.

Section 5 of the report details the traffic volume projections due to the expansion of the sports complex.

III. VJuST Innovative Intersection Consideration

Summary of Potentially Feasible Innovative Intersections according to VJuST results:

Innovative Intersection Type	Feasibility Decision and Reason
Two-Way Stop Control	Is a a two-way stop control feasible? ☐ Yes ☒ No Explanation: While geometrically feasible, the existing two-way stop control cannot accommodate the existing or future volumes at the intersection. There are excessive southbound delays in the PM peak hour which will exceed 8 minutes..
Roundabout	Is this Innovative Intersection type feasible? ☒ Yes ☐ No Explanation: A one-lane roundabout scored well in VJuST however there is limited available ROW with inadequate space for a deflection angle for some of the approaches. The roundabout operates with the most delay in the PM peak hour compared with the traffic signal alternatives due to the high volume of westbound traffic in the PM peak hour.
Median U-Turn	Is this Innovative Intersection type feasible? ☐ Yes ☒ No Explanation: A median U-turn scored well in VJuST, however the U-turn locations would need to be located approximately 1,900 feet away from the intersection. This equates to an extra 3,800 feet in deviation of distance driven from the desired destination. Driver frustration may be an issue with this configuration. In addition, the existing roadway does not have a median to facilitate the U-turn maneuver therefore the road would need to be widened. .
Conventional Traffic Signal	Is this Innovative Intersection type feasible? ☒ Yes ☐ No Explanation: The conventional intersection scored well in VJuST, with the second lowest V/C ratio (0.35 AM/0.53 PM). There are no physical limitations for this configuration. This is the recommended configuration. The delay for the conventional traffic signal was comparable with the thru-cut traffic signal.
Thru-Cut Traffic Signal	Is this Innovative Intersection type feasible? ☒ Yes ☐ No Explanation: The thru-cut scored highly in the VJuST evaluation with the lowest V/C ratio in both peak hours. However, a similar issue is apparent with this configuration as with the median U-turn. The U-turn points are located an excessive distance from subject intersection. In addition, there is not a median in the roadway that would help facilitate the U-turn maneuver without additional widening.

IV. Intersection Configuration and Control Recommendations and Signal Justification

Intersection Configuration and Control Recommendations:

To determine the impact of the intersection configuration and control recommendations, a capacity and queueing analysis was completed for both the subject intersection. The analysis examines the existing two-way stop control, a conventional signal, a Thru-Cut and a roundabout.

The analysis was based on the 2040 traffic volumes shown in Figure 6-1 of the TIA (see Appendix A).

The results of the analysis for each of the proposed intersection controls are summarized below:

Two-Way Stop Control Alternative (Synchro/SimTraffic Analysis)

The results of the two-way stop control alternative analysis are included in Appendix C and summarized in Table 1.

As shown in Table 1, with a two-way stop control, the eastbound and westbound approach operates at LOS A in all peaks. In the AM peak hour, the side street (northbound and southbound) approaches operate at LOS D or better. In the PM peak hour, the southbound left operates at LOS F with more than 8 minutes of delay while the northbound approach operates at LOS E. In the Saturday peak hour the southbound left operates at LOS E and the northbound approach operates at LOS B.

Given the poor operational results for the north and southbound approaches, maintaining two-way stop control is not a feasible long-term solution for the intersection.

Traditional Signal Control Alternative (Synchro/SimTraffic Analysis)

The results of the traditional signal control alternative analysis are included in Appendix D and summarized in Table 1.

As shown in Table 1, the proposed signalized intersection operates at an overall LOS B in all peak hours. The mainline eastbound and westbound approaches operate at LOS B in each peak hour. The northbound and southbound approaches operate at LOS C in each peak hour. All queues are contained within the existing storage.

A conventional signal will likely not require additional right-of-way beyond a potential small area needed for the signal equipment. This option will also not require any additional widening of Longhill Road like the thru-cut or roundabout will require.

The option will require an Access Management Exception.

Finally, the conventional signal will provide for pedestrian access across from the residential areas on Longhill Gate Road to the Warhill Sports Complex. The conventional signal will provide crosswalks and pedestrian signal heads in accordance with VDOT standards.

In summary, the conventional signal control option:

- Operates at a LOS B in both peak hours;
- Will not require significant additional right-of-way;
- Will not require additional widening on Longhill Road;
- Will require an Access Management Exception; and
- Will provide for pedestrians to cross Longhill Road.

Thru-Cut Signal Control Alternative (Synchro/SimTraffic Analysis)

The results of the thru-cut signal control alternative analysis are included in Appendix E and summarized in Table 1.

As shown in Table 1, the proposed thru-cut signalized intersection operates at an overall LOS A in the AM and Saturday peak hours and an overall LOS B in the PM peak hour. The mainline eastbound and westbound approaches operate at LOS B or better in each peak hour. The northbound and southbound approaches operate at LOS C or better in each peak hour. All queues are contained within the existing storage.

The thru cut option will require U-turns for traffic trying to travel north or southbound across the intersection. The closest existing U-turn options are located approximately 1,900 feet from the intersection (for a total of 3,800 feet in additional travel distance) and will require widening on Longhill Road to accommodate the U-turns.

The option will require an Access Management Exception.

Finally, the thru-cut signal option will provide for pedestrian access across from the residential areas on Longhill Gate Road to the Warhill Sports Complex. The conventional signal will provide crosswalks and pedestrian signal heads in accordance with VDOT standards.

In summary, the thru-cut signal control option:

- Operates at a LOS A or B in both peak hours;
- Will not require significant additional right-of-way for the signal equipment but will require right-of-way for widening for the medians;
- Will require additional widening on Longhill Road;
- Will require an Access Management Exception; and
- Will provide for pedestrians to cross Longhill Road.

Roundabout (SIDRA)

The results of the single-lane roundabout alternative analysis are included in Appendix F and summarized in Table 1.

As shown in Table 1, the proposed roundabout intersection operates at an overall LOS A in both the AM and Saturday peaks and LOS C in the PM peak hour. All approaches operate at LOS D or better in all peak hours. All queues are contained within the existing storage.

A roundabout will likely require significant additional right-of-way at the intersection and will require widening of Longhill Road to accommodate the deflector islands.

The option will not require any Access Management Exceptions.

Finally, the roundabout option will provide for pedestrian access across from the residential areas on Longhill Gate Road to the Warhill Sports Complex.

In summary, the roundabout option:

- Operates at a LOS C or better in the peak hours;
- Will require significant (the most of any option) additional right-of-way;
- Will not require any Access Management Exceptions; and
- Will provide for pedestrians to cross Longhill Road.

Table 1: Capacity Analysis Results – 2040 Future Conditions

Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR				SATURDAY PEAK HOUR			
			Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Unsignalized	EB Left		8.3	A	4	48	10.3	B	19	99	8.4	A	3	34
	EB Thru-Right		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	<i>EB Approach</i>		<i>1.0</i>	<i>A</i>	--	--	<i>2.7</i>	<i>A</i>	--	--	<i>0.8</i>	<i>A</i>	--	--
	WB Left		8.3	A	1	28	8.4	A	2	26	8.0	A	1	24
	WB Thru		0.0	A	0	0	0.0	A	0	0	0.0	A	0	7
	WB Right		0.0	A	0	12	0.0	A	0	40	0.0	A	0	--
	<i>WB Approach</i>		<i>0.3</i>	<i>A</i>	--	--	<i>0.3</i>	<i>A</i>	--	--	<i>0.2</i>	<i>A</i>	--	--
	NB L-T-R		15.5	C	10	59	40.8	E	23	57	13.2	B	7	49
	<i>NB Approach</i>		<i>15.5</i>	<i>C</i>	--	--	<i>40.8</i>	<i>E</i>	--	--	<i>13.2</i>	<i>B</i>	--	--
	SB Left	200	32.6	D	50	82	513.9	F	360	291	41.4	E	111	124
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Conventional Signal	SB Thru-Right		11.2	B	3	52	18.1	C	33	436	11.2	B	9	56
	<i>SB Approach</i>		<i>28.0</i>	<i>D</i>	--	--	<i>302.9</i>	<i>F</i>	--	--	<i>33.3</i>	<i>D</i>	--	--
	EB Left		9.5	A	31	76	11.9	B	70	125	11.9	B	28	47
	EB Thru-Right		11.3	B	174	186	10.3	B	207	199	13.7	B	187	140
	<i>EB Approach</i>		<i>11.1</i>	<i>B</i>	--	--	<i>10.7</i>	<i>B</i>	--	--	13.6	B	--	--
	WB Left		14.0	B	15	41	15.3	B	26	48	15.3	B	18	29
	WB Thru		18.5	B	180	167	25.3	C	333	284	20.6	C	228	153
	WB Right		14.1	B	24	58	15.8	B	42	183	15.5	B	38	65
	<i>WB Approach</i>		<i>17.3</i>	<i>B</i>	--	--	<i>21.8</i>	<i>C</i>	--	--	19.0	B	--	--
	NB L-T-R		20.7	C	34	61	30.4	C	37	51	22.8	C	34	42
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Thru-Cut Signal	<i>NB Approach</i>		<i>20.7</i>	<i>C</i>	--	--	<i>30.4</i>	<i>C</i>	--	--	22.8	C	--	--
	SB Left	200	20.7	C	78	95	31.5	C	160	159	22.2	C	149	124
	SB Thru-Right		19.1	B	21	53	26.6	C	55	101	17.5	B	31	49
	<i>SB Approach</i>		<i>20.4</i>	<i>C</i>	--	--	<i>29.4</i>	<i>C</i>	--	--	21.0	C	--	--
	Overall		15.0	B	--	--	19.2	B	--	--	17.7	B	--	--
	EB Left		4.6	A	16	57	6.4	A	49	107	5.4	A	15	50
	EB Thru-Right		5.4	A	91	126	5.1	A	147	172	6.2	A	98	132
	<i>EB Approach</i>		<i>5.3</i>	<i>A</i>	--	--	<i>5.4</i>	<i>A</i>	--	--	6.1	A	--	--
	WB Left		8.7	A	11	46	10.9	B	22	44	8.7	A	13	27
	WB Thru		11.1	B	126	126	17.4	B	282	236	11.0	B	151	132
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Roundabout	WB Right		8.8	A	23	59	11.3	B	38	166	8.8	A	29	59
	<i>WB Approach</i>		<i>10.5</i>	<i>B</i>	--	--	<i>15.2</i>	<i>B</i>	--	--	10.3	B	--	--
	NB Left-Right		12.0	B	15	49	18.8	B	8	48	11.1	B	12	46
	<i>NB Approach</i>		<i>12.0</i>	<i>B</i>	--	--	<i>18.8</i>	<i>B</i>	--	--	11.1	B	--	--
	SB Left	200	12.9	B	57	88	21.7	C	132	146	12.8	B	103	110
	SB Right		11.9	B	0	46	19.1	B	0	89	11.2	B	0	52
	<i>SB Approach</i>		<i>12.7</i>	<i>B</i>	--	--	<i>20.6</i>	<i>C</i>	--	--	12.4	B	--	--
	Overall		8.4	A	--	--	12.6	B	--	--	9.4	A	--	--
	EB L-T-R		9.8	A	89	--	18.9	C	355	--	9.9	A	69	--
	<i>EB Approach</i>		9.8	A	--	--	18.9	C	--	--	9.9	A	--	--
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Roundabout	WB L-T-R		8.5	A	69	--	31.7	D	874	--	8.6	A	82	--
	<i>WB Approach</i>		8.5	A	--	--	31.7	D	--	--	8.6	A	--	--
	NB L-T-R		7.7	A	8	--	9.6	A	7	--	7.3	A	7	--
	<i>NB Approach</i>		7.7	A	--	--	9.6	A	--	--	7.3	A	--	--
	SB L-T-R		6.7	A	18	--	15.3	C	87	--	9.2	A	44	--
	<i>SB Approach</i>		6.7	A	--	--	15.3	C	--	--	9.2	A	--	--
	Overall		8.8	A	--	--	23.9	C	--	--	9.1	A	--	--

¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.

² Dual left turn lanes; average storage is provided.

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.

Signal Justification:

As indicated in the attached traffic impact analysis, the traffic signal is warranted under existing conditions (Warrant 1A and 1B at 70%). The traffic growth in the area and addition of sports complex traffic will only strengthen the warrants under future conditions and will meet Warrant 1 (Combo) at 100%.

At-grade alternatives were reviewed and evaluated relative to construction costs, right-of-way acquisition, access, operations, and overall feasibility and context. This review culminated in the selection of the following five (5) potential at-grade intersection alternatives:

1. Two-Way Stop Control
2. Conventional Traffic Signal
3. Thru-Cut
4. Roundabout

The preliminary analysis of each aforementioned alternative indicated the two-way stop control is not a viable long-term solution.

Conventional Signal

As detailed above, the conventional signal provides adequate capacity and queueing for future conditions and has minimal impact on adjacent parcels. In summary, the conventional signal:

- Operates at a LOS B in both peak hours;
- Will not require significant additional right-of-way;
- Will not require additional widening on Longhill Road;
- Will require an Access Management Exception; and
- Will provide for pedestrians to cross Longhill Road.

Thru-cut

As detailed above, the thru-cut option provides adequate capacity and queueing for future conditions but has significant impact on right-of-way and will require additional widening on Longhill Road. In summary, the thru-cut option:

- Operates at a LOS A or B in both peak hours;
- Will not require significant additional right-of-way for the signal equipment but will require right-of-way for widening for the medians;
- Will require additional widening on Longhill Road;
- Will require an Access Management Exception; and
- Will provide for pedestrians to cross Longhill Road.

Roundabout

As detailed above, the roundabout provides adequate capacity and queueing for future conditions but has the most impact on adjacent parcels and will require widening of Longhill Road. In summary, the roundabout:

- Operates at a LOS C or better in the peak hours;
- Will require significant (the most of any option) additional right-of-way;
- Will not require any Access Management Exceptions; and
- Will provide for pedestrians to cross Longhill Road.

Conclusion – It is recommended that the conventional signalized option with pedestrian accommodations be installed at the Longhill Road/Warhill Trail/Longhill Trail intersection. The conventional signal provides adequate capacity for the future conditions, has minimal impact on adjacent parcels, and provides for pedestrians to cross Longhill Road.

V. Approvals If the proposed traffic signal is on an Arterial Preservation Network (APN), the SJR requires approval from the District Traffic Engineer (DTE), District Engineer/Administrator (DE/DA), and State Traffic Engineer (STE). For a proposed traffic signal not on the APN, SJR only requires DTE approval.

Note that new crossovers on the APN must also be approved by the DE/DA and the State Location & Design Engineer as per [IIM-LU-501.1](#).

Signal Justification Report Approvals:

District Traffic Engineer (DTE): Required for all SJRs

☐ Concur ☐ Do Not Concur

Name Signature Date

Comments:

District Engineer/Administrator (DE/DA): Only required if SJR recommends a proposed signal on the APN

☐ Concur ☐ Do Not Concur

Name Signature Date

Comments:

State Traffic Engineer (STE): Only required if SJR recommends a proposed signal on the APN

☐ Approved ☐ Denied

Name Signature Date

Comments:

If additional comments are necessary, please attach the comments on another sheet.

Appendix A: Traffic Impact Analysis

Instructions: Include detailed signal warrant calculations. Output from software packages such as PC Warrants and Trafficware Warrants may be used. Documentation shall show assumptions made as part of the warrant analysis, such as right-turn volume adjustments or use of the 70% factor.

Warhill Sports Complex Traffic Impact Analysis

**Submitted to:
James City County,
Virginia**

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Warhill Sports Complex Traffic Impact Analysis

Prepared For:

James City County

Prepared By:

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July 2025

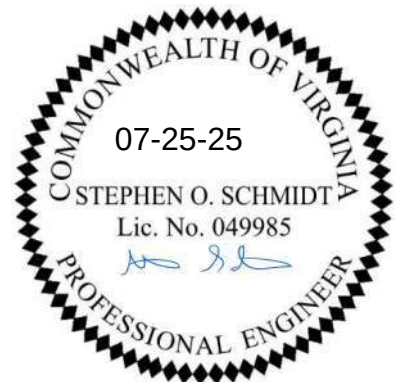


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Appendix C – Traffic Signal Timings

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1 EXECUTIVE SUMMARY

This report presents the findings of the traffic impact analysis (TIA) prepared for the proposed Warhill Athletic Complex Master Plan expansion located in James City County, Virginia.

1.1 PROJECT OVERVIEW

The existing Warhill Sports Complex is located south of Centerville Road, north of Longhill Road, and west of Route 199 as shown in Figure 1-1 (all figures are located at the end of their respective chapter).

The project is a proposed expansion of the existing Warhill Athletic Complex and will consist of 12 sports fields, 87.7 acres of public park space, and a 60,000 SF general services building.

Access to the site will be provided via two existing entrances, Opportunity Way off Centerville Road and Warhill Trail off Longhill Road. The Master Plan is shown on Figure 1-2.

For the purposes of this analysis, the expansion was assumed to be complete by 2040.

When complete, the proposed expansion will generate a total of 1,754 daily trips, 92 AM peak hour trips (72 in and 20 out), 282 PM peak hour trips (148 in and 135 out) and 558 Saturday peak trips (274 in and 284 out).

The purpose of this analysis is to determine the impact of the proposed expansion on the surrounding roadway network. The scope of this study was developed in conjunction with James City County. A copy of the scoping documents is included in Appendix A.

1.2 STUDY LIMITS

As agreed upon in the scoping documents, the study limits include the following five (5) existing intersections:

1. Longhill Gate Road/Warhill Trail and Longhill Road (Unsignalized);
2. Opportunity Way and Centerville Road (Signalized);
3. Opportunity Way and Route 60 (Richmond Highway) (Signalized);
4. Route 199 EB Ramps and Route 60 (Richmond Highway) (Signalized); and
5. Route 199 WB Ramps and Route 60 (Richmond Highway) (Signalized).

In accordance with the scoping agreement, analyses were completed for the following scenarios:

1. 2025 Existing Traffic Conditions;
2. 2040 Background Traffic Conditions (without development of the site);
3. 2040 Future Traffic Conditions (with development of the site);
4. 2046 Background Traffic Conditions (without development of the site); and
5. 2046 Future Traffic Conditions (with development of the site).

The following steps were taken to determine the potential traffic impacts associated with this project:

1. Data Collection – Weekday and Saturday traffic counts were provided when public schools were in session.
2. Traffic Growth – As agreed upon in scoping, a 1% annual growth rate was applied to existing traffic volumes to account for development growth outside of the study area.
3. Trip Generation – Traffic generated by the proposed development was estimated using the 11th edition of the Institute of Transportation Engineers' *Trip Generation Manual*.
4. Traffic Distributions – The distribution of trips generated by the proposed developed was based on the existing traffic volumes, the nature of the use, and local knowledge.
5. Site Traffic Projections – Future traffic volumes were determined by combining the total background traffic volumes with proposed new trips generated by the site to create the total future traffic volumes used in the analysis.
6. Traffic Capacity Analysis – Level of service calculations for existing, background, and future conditions were performed using Synchro Version 11 with SimTraffic for signalized and unsignalized intersections.
7. Queuing Analysis – The 95th percentile queue lengths (Synchro) and maximum queues (SimTraffic) were reviewed at the intersections listed above.

1.3 PRINCIPAL FINDINGS

Under 2025 existing conditions, all signalized intersections operate at LOS D or better during all three peak periods. The unsignalized intersection of Longhill Road and Warhill Trail operates at LOS C during the AM and Saturday peak and LOS F during the PM peak.

Under 2040 total background conditions, including growth in existing traffic and the approved background developments, the signalized intersections operate at acceptable LOS E or better during all peaks with the exception of the Route 60/Centerville Road intersection which operates at LOS F. The unsignalized intersection of Longhill Road and Warhill Trail operates at LOS D during the AM and Saturday peaks and LOS F during the PM peak.

Under 2040 total future conditions, including the growth in existing traffic, background developments and site trips, the intersections continue to perform in similar conditions to 2040 background in terms of delay. Queues are considerably increased for traffic entering the network from Opportunity Way.

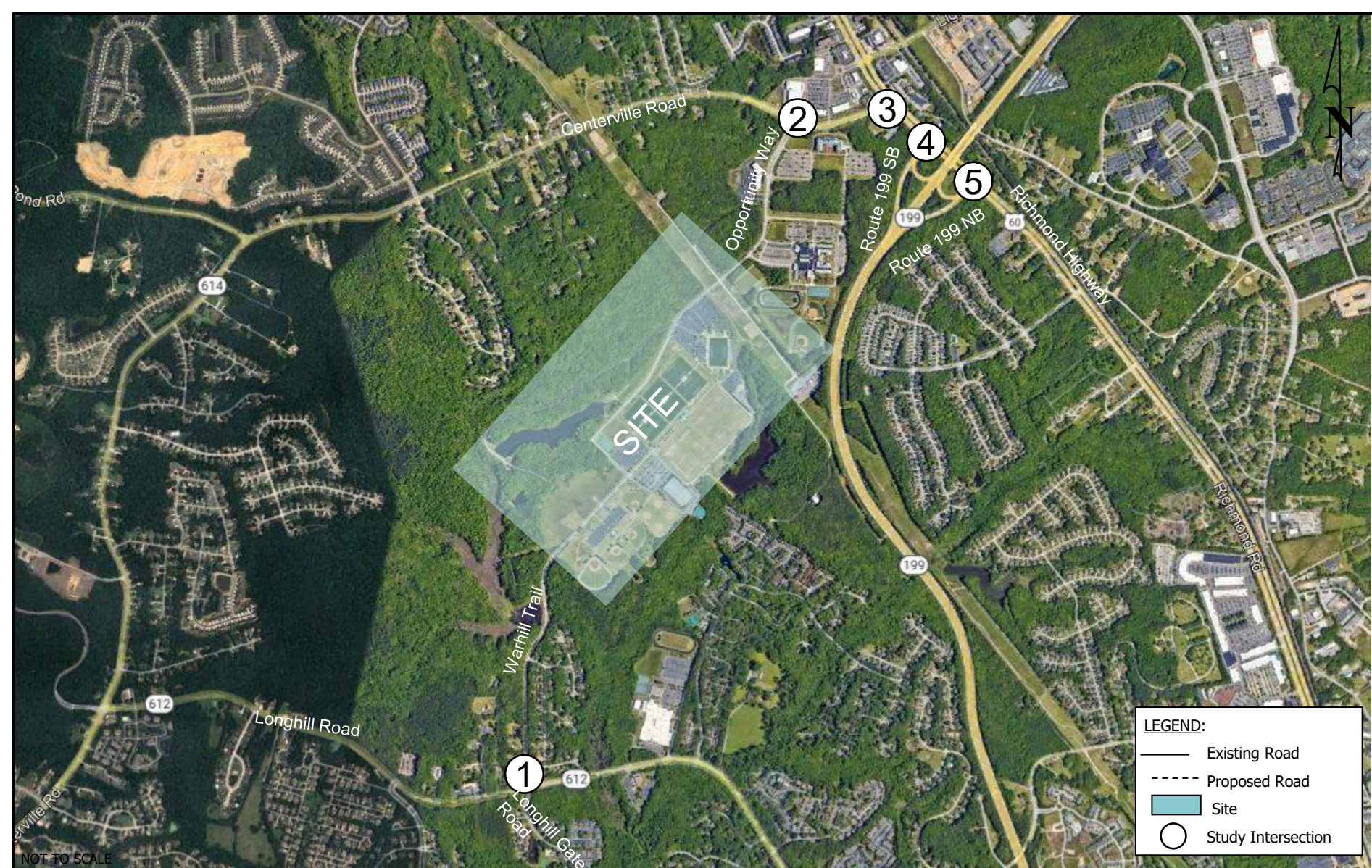
Under 2046 total background conditions, including the growth in existing traffic and the approved background developments, all intersections continue to perform in similar conditions to 2040 background.

Under 2046 total future conditions, including the growth in existing traffic, background developments and site trips, the intersections continue to perform in similar conditions to 2046 background with increased queueing from vehicles entering the network from Opportunity Way.

A traffic signal is warranted at the Longhill Road/Longhill Gate Road/Warhill Trail intersection. The intersections meets Warrant 1A and 1B (70% threshold) under 2025 existing conditions and meets Warrant 1 (Combination Warrant – 100% threshold) under 2040 background conditions. Installation of a traffic signal should be considered at the intersection.

1.4 RECOMMENDATIONS

Installation of a traffic signal should be considered at the Longhill Road/Longhill Gate Road/Warhill Trail intersection. The southbound approach operates at LOS F and the intersection warrants the installation of a traffic signal under existing and future traffic conditions.



A- Baseball Complex
 4 Baseball Fields, lighted
 1 Multiuse Field for T-ball
 Parking- 260-400 Spaces
 Concession/Rest Room Building

B- Softball/Baseball Complex
 2 Large synthetic turf baseball fields, 2 synthetic turf softball/multiuse fields, lighted
 Parking- 260-400 Spaces
 Concession/Rest Room Building

C- Multiuse Field Complex
 8 Grass Fields, adjustable orientation
 6 Multiuse Fields with Synthetic Turf, lighted
 Parking- 440 Spaces
 Concession/Rest Room Building

D- Stadium Complex
 Football, Soccer, lighted
 600-1000 Stadium parking, some shared, some available in the utility corridor

D2- Baseball/Softball Stadium Complex
 Baseball, softball, lighted
 Parking - 400-600 Spaces

E- Connector Road

F- Multipurpose Field Complex
 4 Multipurpose Fields, adjustable orientation, lighted
 Parking - 200 Spaces
 Concession/Rest Room Building

G1- Existing WISC Building

G2- Existing Indoor pool facility

H- Athletic Courts
 Basketball, Pickleball, Tennis, lighted
 Parking- 75 spaces

I- Community Garden

J1, J2, J3, J4, J5 - Unprogrammed Open Space

K1- Multiuse Nature Trail
 Soft surface 3.5 Mile s around park perimeter

L- Paved Multiuse Trail in utility corridor

M- Paved Multiuse Trails
 around Soccer Complex 1 mile and Baseball/Softball Complex- 1-mile

N3- Dominion Power Sub station

O - Grounds Maintenance Facility



Master Plan

Warhill Sports Complex
Feb 2023



0 300 600 1,200 Feet

2 BACKGROUND INFORMATION

2.1 DESCRIPTION OF ON-SITE DEVELOPMENT

The existing Warhill Sports Complex is located south of Centerville Road, north of Longhill Road, and west of Route 199 as shown in Figure 1-1 (all figures are located at the end of their respective chapter).

The project is a proposed expansion of the existing Warhill Athletic Complex and will consist of 12 sports fields, 87.7 acres of public park space, and a 60,000 SF general services building.

Access to the site will be provided via two existing entrances, Opportunity Way off Centerville Road and Warhill Trail off Longhill Road. The Master Plan is shown on Figure 1-2.

For the purposes of this analysis, the expansion was assumed to be complete by 2040.

When complete, the proposed expansion will generate a total of 1,754 daily trips, 92 AM peak hour trips (72 in and 20 out), 282 PM peak hour trips (148 in and 135 out) and 558 Saturday peak trips (274 in and 284 out).

The purpose of this analysis is to determine the impact of the proposed expansion on the surrounding roadway network. The scope of this study was developed in conjunction with James City County. A copy of the scoping documents is included in Appendix A.

2.2 STUDY LIMITS

As agreed upon in the scoping documents, the study limits include the following five (5) existing intersections:

1. Longhill Gate Road/Warhill Trail and Longhill Road (Unsignalized);
2. Opportunity Way and Centerville Road (Signalized);
3. Opportunity Way and Route 60 (Richmond Highway) (Signalized);
4. Route 199 SB Ramps and Route 60 (Richmond Highway) (Signalized); and
5. Route 199 NB Ramps and Route 60 (Richmond Highway) (Signalized).

The existing intersection geometry for the study intersections can be found in Figure 2-1.

2.3 EXISTING ROADWAY NETWORK

Longhill Gate Road is a two lane, undivided local road with no posted speed limit, assumed to be 25 mph.

Warhill Trail is a two-lane, undivided local road with a posted speed limit of 30 mph. Warhill Trail serves as a connector from Longhill Road to the existing Warhill Athletic Complex. According to 2023 VDOT AADT data, Warhill Trail services 260 vehicles per day.

Longhill Road is a two-lane, undivided minor arterial roadway with a posted speed limit of 45 mph. According to 2023 VDOT AADT data, Longhill Road services 6,800 vehicles per day from Centerville Road to Seasons Tree.

Opportunity Way is a two-lane, undivided local road with a posted speed limit of 35 mph. Opportunity Way serves as a connector from the existing Warhill Athletic Complex and Centerville Road. According to 2023 VDOT AADT data, Opportunity Way services 70 vehicles per day.

Centerville Road is a four-lane, undivided minor arterial roadway with a posted speed limit of 45 mph. According to 2023 VDOT AADT data, Centerville Road services 11,000 vehicles per day from Adams Hunt Road to US 60 (Richmond Highway).

Route 60 (Richmond Highway) is a four lane, divided, principal arterial roadway with a posted speed limit of 45 mph. According to 2023 VDOT AADT data, Route 60 services 26,000 vehicles per day from Centerville Road to the Route 199 Eastbound ramps.

2.4 FUTURE IMPROVEMENTS AND BACKGROUND DEVELOPMENTS

There are no planned or funded future improvements in the study area to be considered within the timeframe of the analysis.

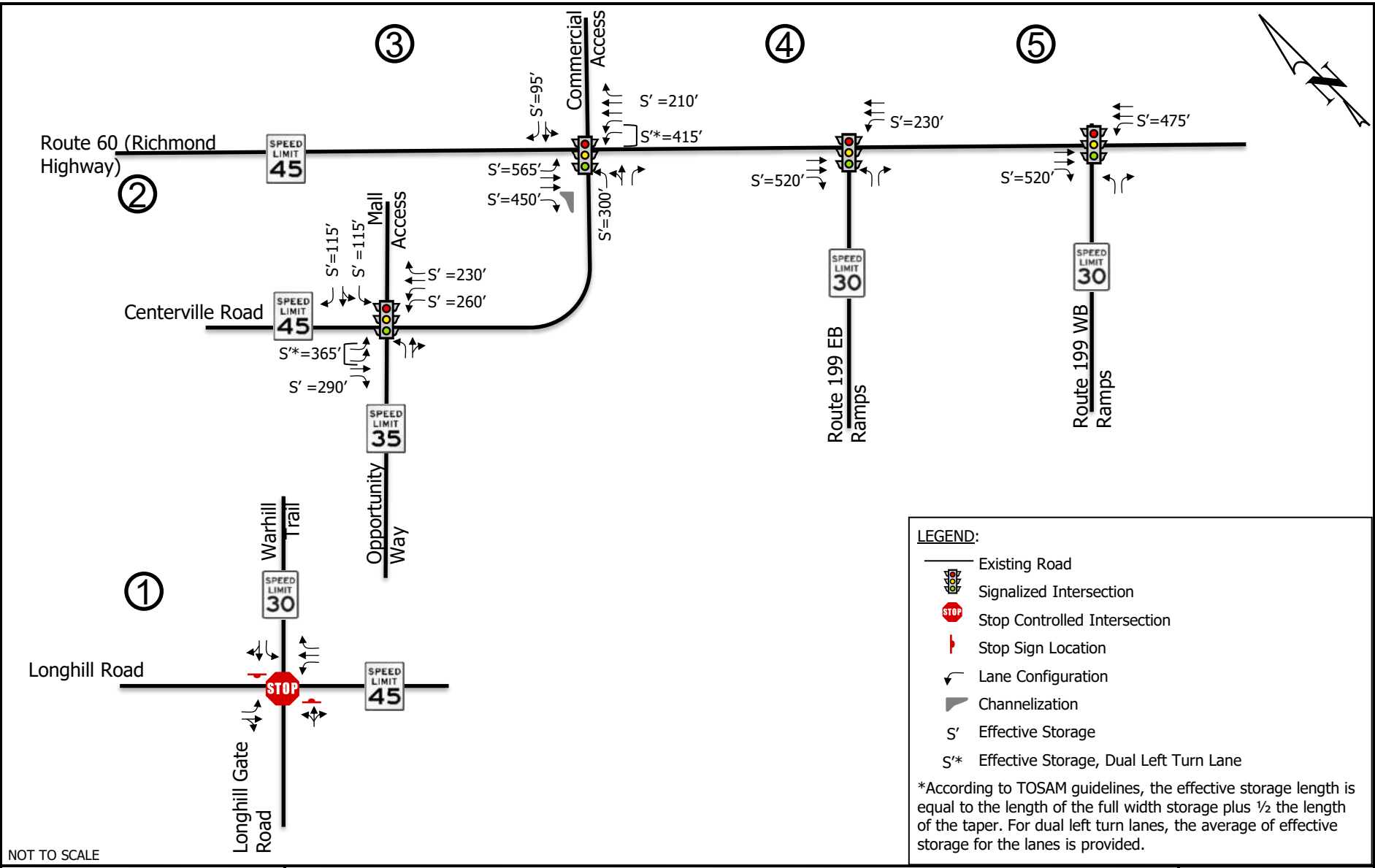
There are two developments planned in the study area, the Cardinal Ridge Mixed Use Development and the James City County Municipal Office Building. The trips associated with these background developments can be found in 4-1.

2.5 OTHER MODES OF TRANSPORTATION

Currently, there is a shared use path present along Longhill Road that extends throughout the Warhill Athletic Complex. There is a shared use path along the north side of Centerville Road and a shared use path along Opportunity Way approaching the sports complex.

The area is served by the WATA Longhill Road Bus Line with stops at the intersections of Longhill Road/Warhill Trail and Centerville Road/Opportunity Way.

To be conservative, all site generated traffic was assumed to be vehicular based, and no reductions were applied for other modes of transportation.



3 2025 EXISTING CONDITIONS

3.1 EXISTING TRAFFIC VOLUMES

Existing peak hour turning movement counts were conducted at each of the study intersections on Thursday, March 6, 2025 and Saturday, March 8, 2025. The counts included heavy vehicles by movement, pedestrians, and bikes.

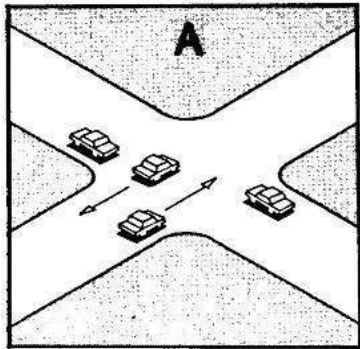
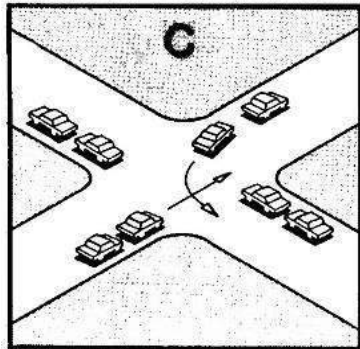
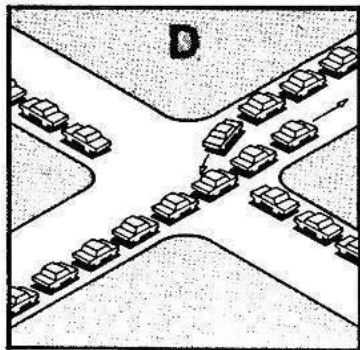
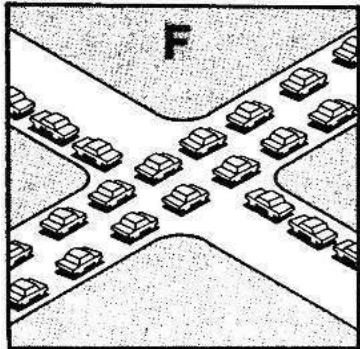
The common AM peak hour was found to be 7:00 AM – 8:00 AM and the common PM peak hour was found to be 4:30 PM – 5:30 PM. The Saturday peak was found to be 12:00 PM – 1:00 PM. The existing vehicle traffic counts are shown on Figure 3-1; The complete traffic data is included in Appendix B.

Existing signal timings for the signalized intersections were provided by VDOT and are included in Appendix C.

3.2 CAPACITY ANALYSIS

Capacity analysis allows traffic engineers to determine the impacts of traffic on the surrounding roadway network. The Transportation Research Board's (TRB) *Highway Capacity Manual* (HCM) methodologies govern how the capacity analyses are conducted and how the results are interpreted. There are six letter grades of Levels of Service (LOS) from A to F, with LOS A representing the best operating conditions and LOS F the worst operating conditions. Table 3-1 shows in detail how each of these levels of service are interpreted.

Table 3-1: Level of Service Definitions

Level of Service	Roadway Segments or Controlled Access Highways	Intersections	
A	Free flow, low traffic density.	No vehicle waits longer than one signal indication.	
B	Delay is not unreasonable, stable traffic flow.	On a rare occasion motorists wait through more than one signal indication.	
C	Stable condition, movements somewhat restricted due to higher volumes, but not objectionable for motorists.	Intermittently drivers wait through more than one signal indication, and occasionally backups may develop behind left turning vehicles, traffic flow still stable and acceptable.	
D	Movements more restricted, queues and delays may occur during short peaks, but lower demands occur often enough to permit clearing, thus preventing excessive backups.	Delays at intersections may become extensive with some, especially left-turning vehicles waiting two or more signal indications, but enough cycles with lower demand occur to permit periodic clearance, thus preventing excessive backups.	
E	Actual capacity of the roadway involves delay to all motorists due to congestion.	Very long queues may create lengthy delays, especially for left-turning vehicles.	
F	Forced flow with demand volumes greater than capacity resulting in complete congestion. Volumes drop to zero in extreme cases.	Backups from locations downstream restrict or prevent movement of vehicles out of approach creating a storage area during part or all of an hour.	

SOURCE: "A Policy on Design of Design of Urban Highways and Arterial Streets" - AASHTO, 1973 based upon material published in "Highway Capacity Manual", National Academy of Sciences, 1965.

For signalized and unsignalized intersections, level of service is defined in terms of **delay**, a measure of driver discomfort, frustration, fuel consumption and lost travel time. Table 3-2 summarizes the delay associated with each LOS category:

Table 3-2: Signalized and Unsignalized Intersection Level of Service Criteria

Signalized Intersections		Unsignalized Intersections	
Level of Service	Control Delay per Vehicle (sec/veh)	Level of Service	Average Control Delay (sec/veh)
A	≤ 10	A	0 to 10
B	> 10 to ≤ 20	B	> 10 to ≤ 15
C	> 20 to ≤ 35	C	> 15 to ≤ 25
D	> 35 to ≤ 55	D	> 25 to ≤ 35
E	> 55 to ≤ 80	E	> 35 to ≤ 50
F	> 80	F	> 50

Source: Exhibit 16-2 and Exhibit 17-2 from TRB's "Highway Capacity Manual 2000"

Capacity analyses were performed to assess existing (2025), total background (2040 and 2046), and total future (2040 and 2046) operational conditions. The signalized and unsignalized intersections were analyzed using SYNCHRO Version 11 based on HCM 2000 methodologies with the following assumptions:

- Level terrain;
- 12-foot lane widths;
- Existing peak hour factor as determined by the traffic counts (by intersection) for existing scenario;
- The higher of the existing peak hour factor as determined by traffic counts (by intersection) or a peak hour factor of 0.92 for the background and total future scenarios.
- Heavy vehicle percentage as determined by the traffic counts (by movement); and
- Traffic signals timing data provided by VDOT.

Queuing analyses were conducted using both the HCM 2000 Edition methodology (as calculated by SYNCHRO) and SimTraffic simulations. The Synchro 95th percentile queue is the maximum back of queue for a particular lane within a lane group considering 95th percentile traffic volumes. The SimTraffic maximum queues are the average maximum queues after 10 runs of 60 minutes each.

Note that it is possible for the 95th percentile queue to be higher than the SimTraffic maximum queue due to the method in which each software calculates its respective value. The 95th percentile queue is based on an HCM formula while the SimTraffic maximum queue varies based on simulation results.

3.3 EXISTING CONDITIONS CAPACITY ANALYSIS RESULTS

Table 3-3 summarizes the 2025 existing intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the 2025 existing roadway geometry (Figure 2-1), peak hour traffic volumes shown on Figure 3-1 and the existing signal timings as provided by VDOT.

The corresponding SYNCHRO and SimTraffic reports are included in Appendix D. Note that the intersection numbers shown on the LOS, delay, and queue length summary tables correspond with the intersection node numbers used in the Synchro models and report figures.

As shown in Table 3-3, under 2025 existing conditions:

At the unsignalized intersection of Longhill Road and Longhill Gate Road/Warhill Trail, all approaches operate at LOS C or better during all peaks with the exception of the southbound approach of Warhill Trail which operates at LOS F during the PM peak. All queues are contained within the existing provided storage. This intersection is the subject of a traffic signal warrant analysis below.

The signalized intersection of Centerville Road and Opportunity Way operates at an overall LOS D during all three peaks. The mainline eastbound and westbound approaches of Centerville Road operates at LOS C or better during all three peaks. The northbound and southbound approaches of Opportunity Way and the Mall Access operate at LOS E during all three peaks. All queues are contained within the existing provided storage with the exception of the westbound left which slightly extends beyond the provided storage.

The signalized intersection of Centerville Road and Route 60 operates at overall LOS D during the AM and Saturday peaks and LOS E during the PM peak. The mainline eastbound and westbound approaches of Route 60 operate at LOS D or better during all peaks with the exception of the westbound approach in the PM peak which operates at LOS F and experiences left turn queues that extend beyond the provided storage. The northbound approach of Centerville Road operates at LOS D during the AM peak and LOS F during the PM and Saturday peaks. The southbound approach of the Commercial Access operates at LOS E during the AM peak and LOS F during the PM and Saturday peaks.

The signalized intersection of Route 60 and the Route 199 Eastbound ramps operates at LOS B during all three peaks. The mainline eastbound and westbound approaches of Route 60 operate at LOS A during all three peaks. The northbound approach of the Route 199 EB ramp operates at LOS E during the AM peak and LOS D during the PM and Saturday peaks. All queues are contained within the existing storage with significant northbound queueing present during the PM peak.

The signalized intersection of Route 60 and the Route 199 Westbound ramps operates at LOS C during the AM and PM peaks and LOS B during the Saturday peak. The mainline eastbound and westbound approaches of Route 60 operate at LOS C or better during all three peaks. The northbound approach operates at LOS E during the AM and Saturday peaks and LOS D during the PM peak. All queues are contained within the existing provided storage.

**Table 3-3: 2025 Existing Traffic
Intersection Level of Service and Delay Summary**

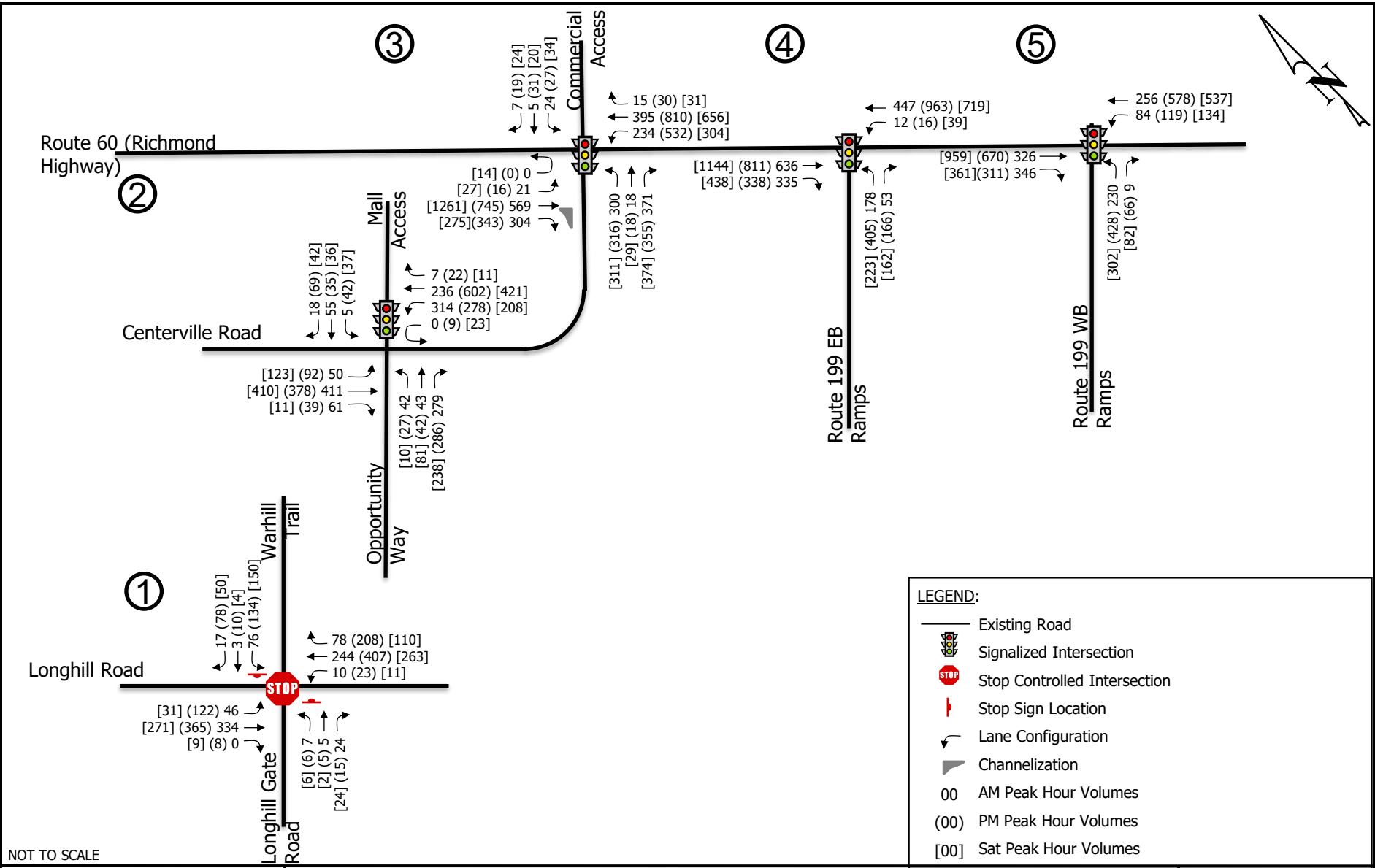
Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR				SATURDAY PEAK HOUR			
			Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Unsignalized	EB Left		8.1	A	3	41	9.6	A	13	76	8.2	A	2	34
	EB Thru-Right		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	EB Approach		1.0	A	--	--	2.4	A	--	--	0.8	A	--	--
	WB Left		8.2	A	1	32	8.2	A	2	30	7.9	A	1	24
	WB Thru		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	WB Right		0.0	A	0	10	0.0	A	0	0	0.0	A	0	2
	WB Approach		0.2	A	--	--	0.3	A	--	--	0.2	A	--	--
	NB L-T-R		13.7	B	7	56	24.7	C	11	49	12.2	B	5	33
	NB Approach		13.7	B	--	--	24.7	C	--	--	12.2	B	--	--
	SB Left	200	23.4	C	31	84	157.3	F	200	187	26.1	D	65	95
	SB Thru-Right		10.8	B	3	39	14.7	B	19	77	10.6	B	7	50
	SB Approach		20.8	C	--	--	100.6	F	--	--	21.9	C	--	--
2. Centerville Road (E-W) and Opportunity Way (N) and Mall Access (S) Signalized	EB Dual Left ²	365	61.0	E	41	212	59.3	E	69	122	58.9	E	86	131
	EB Thru		54.8	D	384	595	20.4	C	314	259	19.0	B	351	266
	EB Right	290	25.1	C	0	265	15.3	B	0	83	13.7	B	0	29
	EB Approach		51.9	D	--	--	27.0	C	--	--	27.9	C	--	--
	WB Dual Left ²	260	45.0	D	191	263	72.9	E	m136	162	68.3	E	m151	148
	WB Thru		12.1	B	95	224	9.6	A	m145	514	7.9	A	m133	343
	WB Right	230	12.5	B	m0	60	10.9	B	m0	209	12.1	B	m0	129
	WB Approach		30.7	C	--	--	29.6	C	--	--	29.0	C	--	--
	NB Left-Thru	200	88.3	F	127	175	61.9	E	110	101	61.7	E	134	120
	NB Right		55.4	E	0	264	57.3	E	93	144	55.3	E	81	118
	NB Approach		63.1	E	--	--	58.2	E	--	--	59.6	E	--	--
	SB Left	115	55.0	D	15	9	59.9	E	74	30	57.1	E	67	27
	SB Left-Thru		61.3	E	91	89	59.6	E	74	82	60.0	E	76	61
	SB Right	115	54.8	D	0	25	57.7	E	0	52	57.8	E	0	13
	SB Approach		59.5	E	--	--	58.8	E	--	--	59.1	E	--	--
	Overall		47.2	D	--	--	36.4	D	--	--	36.3	D	--	--
3. Route 60 (E-W) and Centerville Road (N) and Commercial Access (S) Signalized	EB Left	565	60.3	E	49	84	60.4	E	40	75	60.4	E	75	139
	EB Thru		28.4	C	285	349	42.5	D	332	379	36.4	D	#667	592
	EB Right	450	25.3	C	62	68	33.6	C	61	198	22.5	C	87	113
	EB Approach		28.1	C	--	--	40.0	D	--	--	34.6	C	--	--
	WB Dual Left ²	415	44.3	D	110	165	204.1	F	#457	415	62.0	E	176	195
	WB Thru		25.2	C	235	184	27.1	C	304	680	18.1	B	253	199
	WB Right	210	18.5	B	m0	28	24.1	C	m0	34	15.5	B	m0	52
	WB Approach		32.0	C	--	--	95.7	F	--	--	31.5	C	--	--
	NB Left	300	39.5	D	m192	210	79.0	E	m#265	205	90.0	F	#292	212
	NB Left-Thru		39.1	D	m191	227	77.7	E	m#264	217	86.5	F	#282	240
	NB Right		64.8	E	m253	270	104.4	F	#251	268	134.9	F	#242	330
	NB Approach		53.1	D	--	--	91.8	F	--	--	112.7	F	--	--
	SB Left-Thru		74.9	E	62	54	152.1	F	#166	116	260.0	F	#151	96
	SB Right	95	53.6	D	0	13	40.9	D	0	59	55.5	E	0	36
	SB Approach		70.7	E	--	--	124.7	F	--	--	197.8	F	--	--
	Overall		37.5	D	--	--	76.6	E	--	--	54.0	D	--	--
4. Route 60 (E-W) Route 199 EB Ramps (N) Signalized	EB Thru		7.3	A	135	189	13.7	B	m125	190	8.3	A	m167	440
	EB Right	520	2.9	A	16	80	6.1	A	m11	91	1.7	A	m0	198
	EB Approach		5.8	A	--	--	11.4	B	--	--	6.5	A	--	--
	WB Left	230	65.1	E	m29	54	64.8	E	m28	133	61.3	E	m62	92
	WB Thru		6.9	A	146	146	14.1	B	282	374	6.7	A	187	163
	WB Approach		8.4	A	--	--	14.9	B	--	--	9.4	A	--	--
	NB Left		59.0	E	225	275	50.3	D	#542	1036	58.3	E	264	327
	NB Right		44.7	D	34	76	33.0	C	65	920	43.9	D	58	154
	NB Approach		55.7	E	--	--	45.3	D	--	--	52.2	D	--	--
	Overall		13.4	B	--	--	19.9	B	--	--	13.8	B	--	--
5. Route 60 (E-W) Route 199 WB Ramps (N) Signalized	EB Thru		8.0	A	51	101	11.1	B	163	169	9.9	A	225	298
	EB Right	520	20.0	B	35	134	16.8	B	17	93	6.7	A	12	170
	EB Approach		14.2	B	--	--	12.9	B	--	--	9.0	A	--	--
	WB Left	475	61.6	E	129	192	61.9	E	161	203	64.0	E	180	219
	WB Thru		6.2	A	62	121	13.1	B	155	238	8.2	A	133	177
	WB Approach		19.9	B	--	--	21.5	C	--	--	19.4	B	--	--
	NB Left		62.3	E	279	314	57.1	E	#544	545	62.6	E	342	354
	NB Right		43.4	D	15	23	33.0	C	39	78	40.9	D	38	55
	NB Approach		61.6	E	--	--	53.9	D	--	--	58.5	E	--	--
	Overall		24.8	C	--	--	25.0	C	--	--	19.8	B	--	--

¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.

² Dual left turn lanes; average storage is provided.

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.



NOT TO SCALE

4 2040 BACKGROUND CONDITIONS

The background 2040 volumes were analyzed assuming the proposed roadway geometry in conjunction with projected background traffic volumes, which consists of general traffic growth and the approved neighboring developments

4.1 GENERAL TRAFFIC GROWTH

The background volumes were based on a 1.0% annual growth rate. The growth rate was compounded annually for the 15-year period from 2025 to 2040 and was applied to all movements at the study intersections.

4.2 APPROVED BACKGROUND DEVELOPMENTS

Per scoping with the County, there are two background developments in the surrounding area, the Cardinal Ridge Development and the James City County Municipal Complex located east of the Warhill Athletics Complex. The development trips were distributed along the roadway network based on the distributions from their respective studies and are shown on Figure 4-1

Given the nature of the uses, the background development trips were only applied to the AM and PM peak hours.

4.3 TOTAL BACKGROUND TRAFFIC VOLUMES

The 2040 background (existing + growth) volumes were added to the background development trips (Figure 4-1) to yield the 2040 total background traffic volumes shown in Figure 4-2.

4.4 BACKGROUND 2040 CAPACITY ANALYSIS RESULTS

Table 4-1 summarizes the 2040 background intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the existing roadway geometry (Figure 2-2) and the total background peak hour traffic volumes shown on Figure 4-2.

The corresponding Synchro and SimTraffic reports are included in Appendix E. Note that the intersection numbers shown on the LOS, delay, and queue length summary tables correspond with the intersection node numbers used in the Synchro models and report figures.

As shown in Table 4-1, under 2040 background conditions,

At the unsignalized intersection of Longhill Road and Longhill Gate Road/Warhill Trail, all approaches operate at LOS D or better during all peaks with the exception of the southbound approach of Warhill Trail which operates at LOS F during the PM peak. All queues are contained within the existing provided storage. This intersection is the subject of a traffic signal warrant analysis below.

The signalized intersection of Centerville Road and Opportunity Way continues to operate at an overall LOS D during all three peaks. The mainline eastbound and westbound approaches of Centerville Road continue to operate at acceptable LOS during all three peaks. The northbound and southbound approaches of Opportunity Way and the Mall Access continue to operate at LOS E during all three peaks.

The signalized intersection of Centerville Road and Route 60 operates at overall LOS D during the AM peak, LOS F during the PM peak and LOS E during the Saturday peak. The mainline eastbound and westbound approaches of Route 60 operate at LOS D or better during all peaks with the exception of the westbound approach in the PM peak which operates at LOS F and experiences left turn queues that fill the provided storage. The northbound approach of Centerville Road operates at LOS E during the AM peak and LOS F during the PM and Saturday peaks. The southbound approach of the Commercial Access operates at LOS F during all three peaks.

The signalized intersection of Route 60 and the Route 199 Eastbound ramps operates at LOS B the AM and Saturday peaks and LOS C during the PM peak. The mainline eastbound and westbound approaches of Route 60 operate at LOS B or better during all three peaks. The northbound approach of the Route 199 EB ramp continues to operate at LOS E during the AM peak and LOS D during the PM and Saturday peaks. All queues are contained within the existing storage with significant northbound queueing present during the PM peak.

The signalized intersection of Route 60 and the Route 199 Westbound ramps operates at LOS C during all three peaks. The mainline eastbound and westbound approaches of Route 60 operate at LOS C or better during all three peaks. The northbound approach operates at LOS E during the all three peaks. All queues are contained within the existing provided storage.

**Table 4-1: 2040 Total Background Conditions
Intersection Level of Service and Delay Summary**

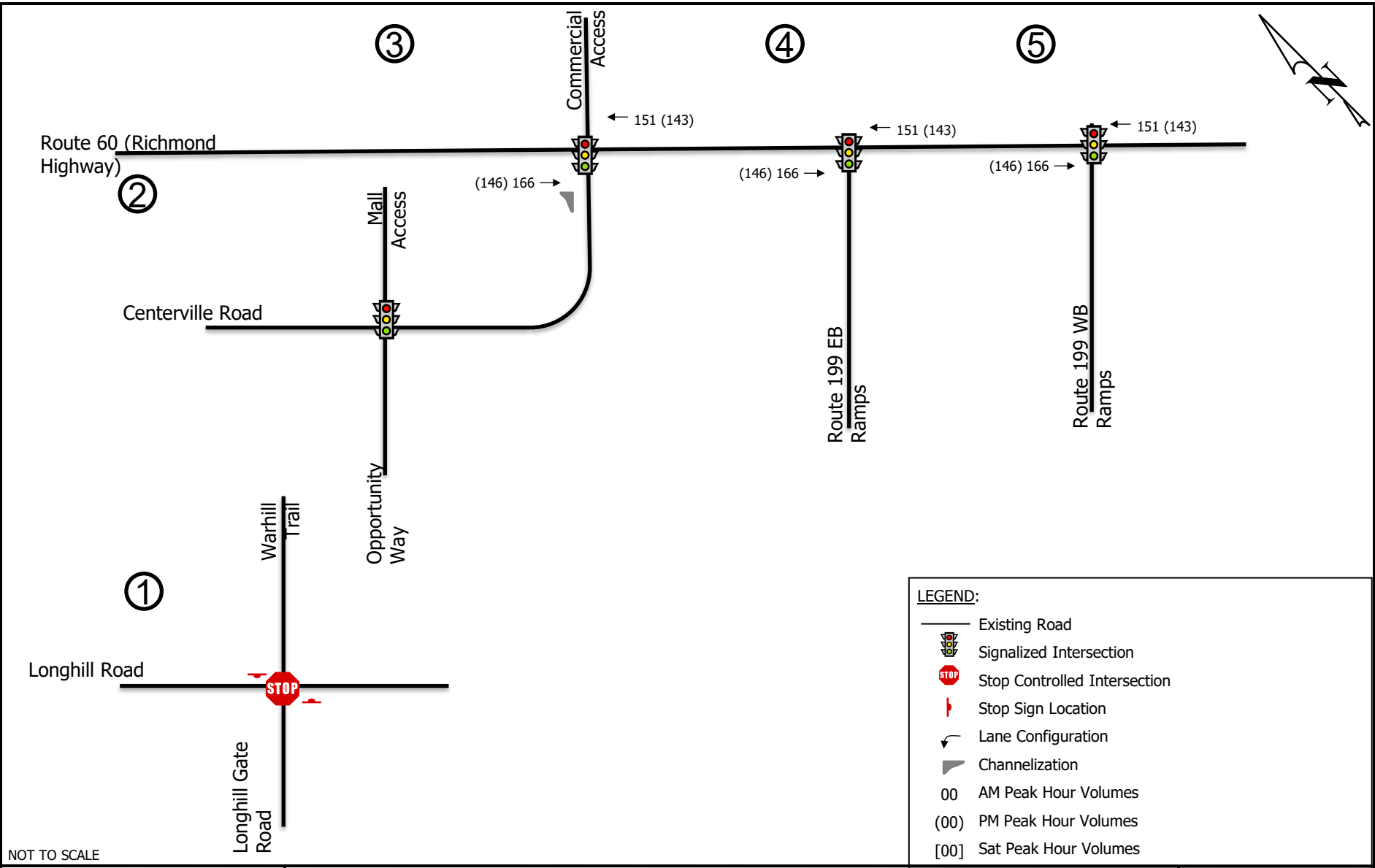
Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR				SATURDAY PEAK HOUR			
			Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Unsignalized	EB Left		8.3	A	4	40	10.2	B	16	94	8.4	A	3	41
	EB Thru-Right		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	EB Approach		1.0	A	--	--	2.5	A	--	--	0.8	A	--	--
	WB Left		8.3	A	1	36	8.4	A	2	60	8.0	A	1	24
	WB Thru		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	WB Right		0.0	A	0	10	0.0	A	0	0	0.0	A	0	12
	WB Approach		0.3	A	--	--	0.3	A	--	--	0.2	A	--	--
	NB L-T-R		15.3	C	10	58	36.9	E	21	60	13.2	B	7	53
	NB Approach		15.3	C	--	--	36.9	E	--	--	13.2	B	--	--
	SB Left	200	31.4	D	48	89	451.3	F	344	286	41.4	E	111	135
2. Centerville Road (E-W) and Opportunity Way (N) and Mall Access (S) Signalized	SB Thru-Right		11.2	B	3	43	17.6	C	29	330	11.2	B	9	51
	SB Approach		27.2	D	--	--	279.1	F	--	--	33.3	D	--	--
	EB Dual Left ²	365	61.1	E	50	117	59.1	E	78	149	58.9	E	97	187
	EB Thru		34.3	C	484	358	25.6	C	392	310	23.0	C	427	330
	EB Right	290	21.9	C	0	197	17.9	B	0	111	15.5	B	0	55
	EB Approach		35.4	D	--	--	31.1	C	--	--	31.0	C	--	--
	WB Dual Left ²	260	65.4	E	228	208	74.5	E	m138	150	68.6	E	m171	157
	WB Thru		7.1	A	m85	249	12.1	B	m152	440	8.8	A	m140	382
	WB Right	230	11.6	B	m0	55	11.5	B	m0	194	12.9	B	m0	170
	WB Approach		40.0	D	--	--	31.7	C	--	--	29.7	C	--	--
3. Route 60 (E-W) and Centerville Road (N) and Commercial Access (S) Signalized	NB Left-Thru	200	68.2	E	#177	149	64.9	E	127	113	64.5	E	156	158
	NB Right		55.4	E	#123	233	57.0	E	#102	196	54.9	D	89	138
	NB Approach		58.4	E	--	--	58.6	E	--	--	57.5	E	--	--
	SB Left	115	56.1	E	20	9	59.8	E	83	56	59.5	E	74	28
	SB Left-Thru		60.6	E	112	83	59.7	E	86	88	59.9	E	86	87
	SB Right	115	55.9	E	0	29	57.3	E	7	53	57.4	E	0	45
	SB Approach		59.3	E	--	--	58.6	E	--	--	58.9	E	--	--
	Overall		43.8	D	--	--	38.6	D	--	--	37.7	D	--	--
	EB Left	565	60.3	E	52	78	60.4	E	44	68	60.5	E	84	526
	EB Thru		36.5	D	361	449	35.8	D	437	428	62.3	E	#917	1447
4. Route 60 (E-W) Route 199 EB Ramps (N) Signalized	EB Right	450	28.3	C	57	84	26.4	C	58	201	25.3	C	132	1156
	EB Approach		34.6	C	--	--	33.5	C	--	--	55.8	E	--	--
	WB Dual Left ²	415	64.2	E	#194	202	373.9	F	m#531	415	64.6	E	192	242
	WB Thru		29.3	C	238	185	18.5	B	m400	691	18.0	B	288	214
	WB Right	210	20.6	C	m0	29	18.2	B	m0	48	16.0	B	m0	37
	WB Approach		39.7	D	--	--	145.1	F	--	--	32.2	C	--	--
	NB Left	300	53.4	D	m#330	260	89.4	F	m#326	274	209.3	F	#397	233
	NB Left-Thru		53.3	D	m#239	294	85.4	F	m#318	340	102.2	F	#352	282
	NB Right		94.2	F	#463	412	148.6	F	#430	363	128.6	F	#361	576
	NB Approach		75.4	E	--	--	118.9	F	--	--	141.3	F	--	--
5. Route 60 (E-W) Route 199 WB Ramps (N) Signalized	SB Left-Thru		92.3	F	#98	57	450.7	F	#204	115	323.0	F	#172	110
	SB Right	95	54.0	D	0	10	50.3	D	0	72	55.5	E	0	65
	SB Approach		84.8	F	--	--	352.7	F	--	--	197.8	F	--	--
	Overall		47.9	D	--	--	105.2	F	--	--	71.3	E	--	--
	EB Thru		8.1	A	m151	218	12.7	B	m157	214	9.8	A	m178	468
	EB Right	520	4.5	A	m17	121	3.2	A	m9	100	3.2	A	m0	248
	EB Approach		7.0	A	--	--	10.2	B	--	--	8.0	A	--	--
	WB Left	230	70.5	E	m32	58	69.8	E	m32	230	63.1	E	m68	118
	WB Thru		7.1	A	174	176	16.4	B	m321	722	7.6	A	206	161
	WB Approach		8.4	A	--	--	17.2	B	--	--	10.5	B	--	--
6. Route 60 (E-W) Route 199 WB Ramps (N) Signalized	NB Left		58.9	E	253	309	61.6	E	#715	1115	59.5	E	310	369
	NB Right		43.7	D	38	82	33.2	C	95	1118	43.5	D	90	188
	NB Approach		55.4	E	--	--	53.3	D	--	--	52.8	D	--	--
	Overall		13.2	B	--	--	21.2	C	--	--	15.0	B	--	--
	EB Thru		9.2	A	44	165	13.0	B	274	180	13.3	B	284	337
	EB Right	520	14.6	B	1	145	16.5	B	19	93	8.5	A	9	203
	EB Approach		11.5	B	--	--	14.0	B	--	--	12.0	B	--	--
	WB Left	475	62.4	E	145	194	64.5	E	185	208	66.1	E	208	259
	WB Thru		7.8	A	116	167	15.2	B	215	325	9.7	A	157	188
	WB Approach		17.6	B	--	--	22.4	C	--	--	21.0	C	--	--
7. Route 60 (E-W) Route 199 WB Ramps (N) Signalized	NB Left		61.7	E	314	371	74.8	E	#716	1044	65.6	E	405	423
	NB Right		41.1	D	16	20	32.3	C	50	1038	38.8	D	41	84
	NB Approach		61.0	E	--	--	69.1	E	--	--	60.5	E	--	--
	Overall		21.1	C	--	--	28.1	C	--	--	22.2	C	--	--

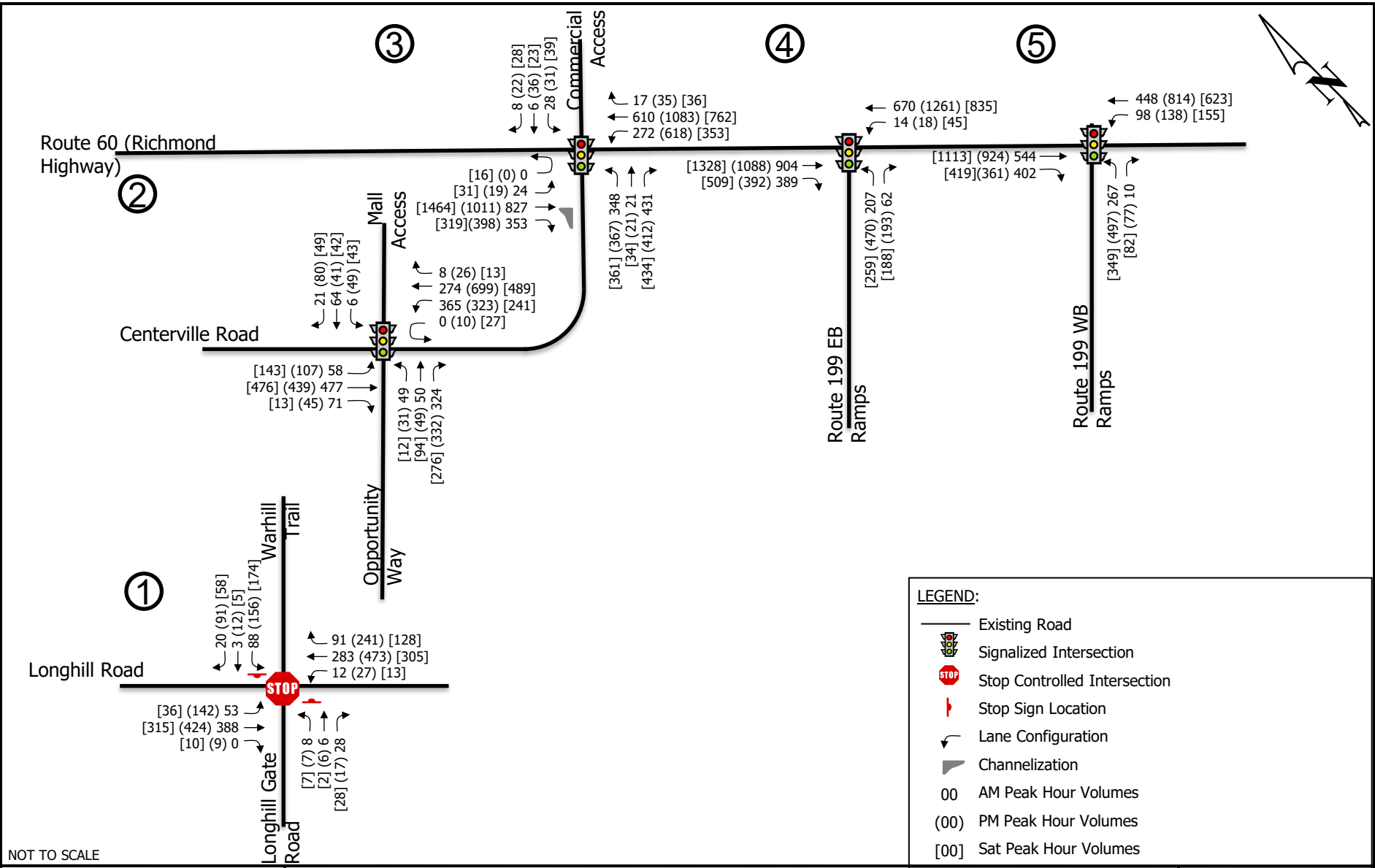
¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.

² Dual left turn lanes; average storage is provided.

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.





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5 TRIP GENERATION

The project is a proposed expansion of the existing Warhill Athletic Complex and will consist of 12 sports fields, 87.7 acres of public park space, a 60,000 SF general services building.

Access to the site will be provided via two existing entrances, Opportunity Way off Centerville Road and Warhill Trail off Longhill Road. of A site plan is shown on Figure 1-2.

For the purposes of this analysis, the development was assumed to be complete and occupied by 2040.

5.1 SITE TRIP GENERATION

The site-generated traffic volumes shown in Table 5-1 were estimated using the 11th Edition of the Institute of Transportation Engineers' (ITE) *Trip Generation Manual* and were calculated using the number of square feet as the independent variable.

ITE does not have data for a general services building. For trip generation purposes, the building was assumed to be a "research and development center" as that is the closest available fit.

Table 5-1: Trip Generation Summary

Table 3-11 ITE Generation Summary													
Buildout Land Use	Size	Units	Land Use Code	Weekday						Weekend SAT PEAK			Average Daily Trips
				AM Peak Hour			PM Peak Hour			In	Out	Total	
In	Out	Total	In	Out	Total	In	Out	Total					
1. ITE Trip Generation ⁽¹⁾													
Warhill Athletics Complex													
B. Softball/Baseball Complex ⁽²⁾	4	Fields	488	2	2	4	43	22	66	43	47	91	285
D. Stadium Complex ⁽³⁾	4	Fields	488	2	2	4	43	22	66	43	47	91	285
F. Multipurpose Field Complex ⁽⁴⁾	4	Fields	488	2	2	4	43	22	66	43	47	91	285
Warhill Athletics Complex Subtotal				7	5	12	130	67	197	130	141	272	856
Public Park ⁽⁵⁾													
Outdoor Fitness Court	0.033	Acre	411	0	0	0	0	0	0	0	0	0	0
Skate Park	0.413	Acre	411	0	0	0	0	0	0	0	0	1	0
Pool	0.308	Acre	411	0	0	0	0	0	0	0	0	1	0
Unassigned Green Space	86.90	Acre	411	1	1	2	5	4	10	85	85	170	68
Public Park Subtotal				1	1	2	5	4	10	86	86	172	68
James City County General Services Department													
Research and Development Center ⁽⁶⁾	60,000	S.F.	760	64	14	78	12	63	75	57	57	115	830
James City County General Services Department Subtotal				64	14	78	12	63	75	57	57	115	830
Total ITE Generated Trips				72	19	92	148	135	282	274	284	558	1,754

Notes: (1) Based on the Institute of Transportation Engineers Trip Generation, 11th Edition. Assumes General Urban/Suburban land use category.

(2) 2 synthetic turf baseball fields, 2 synthetic turf softball fields. For trip generation purposes, considered a 4 field soccer complex (LU 488)

(3) Lighted Football Soccer Complex For trip generation purposes, considered a 4 field soccer complex due to size relative to number of parking spaces (LU 488)

(4) 4 multipurpose fields For trip generation purposes, considered a 4 field soccer complex (LU 488)

(5) Public Park consists of the proposed fitness court, County Skate Park, 50 meter pool, and unassigned green space with multiuse trails throughout

(6) Research and Development Center consists may consist offices and light fabrication areas, a similar use to the general service department which will consist of warehouse, a fuel island and a fleet building

As shown in Table 5-1, the proposed development will generate a total of 1,754 daily trips, 92 AM peak hour trips (72 in and 19 out), 282 PM peak hour trips (148 in and 135 out) and 558 Saturday peak trips (274 in and 284 out).

5.2 EXTERNAL TRIP DISTRIBUTIONS

The distribution of trips generated by the proposed developed was based on the existing traffic volumes, the nature of the use, and local knowledge. Different distributions were used for the weekday traffic and weekend traffic to account for the difference in traffic patterns for visitors to the Warhill Athletic Complex.

The following weekday directional distributions were assumed for the site and are shown on Figure 5-1:

- 10% to/from the west on Longhill Road;
- 15% to/from the west on Centerville Road;
- 15% to/from the north on Route 60;
- 25% to/from the south on Route 60;
- 20% to/from the south on Route 199; and
- 15% to/from the north on Route 199.

The following weekend directional distributions were assumed for the site and are shown on Figure 5-2:

- 5% to/from the west on Centerville Road;
- 10% to/from the north on Route 60;
- 20% to/from the south on Route 60;
- 50% to/from the south on Route 199; and
- 15% to/from the north on Route 199.

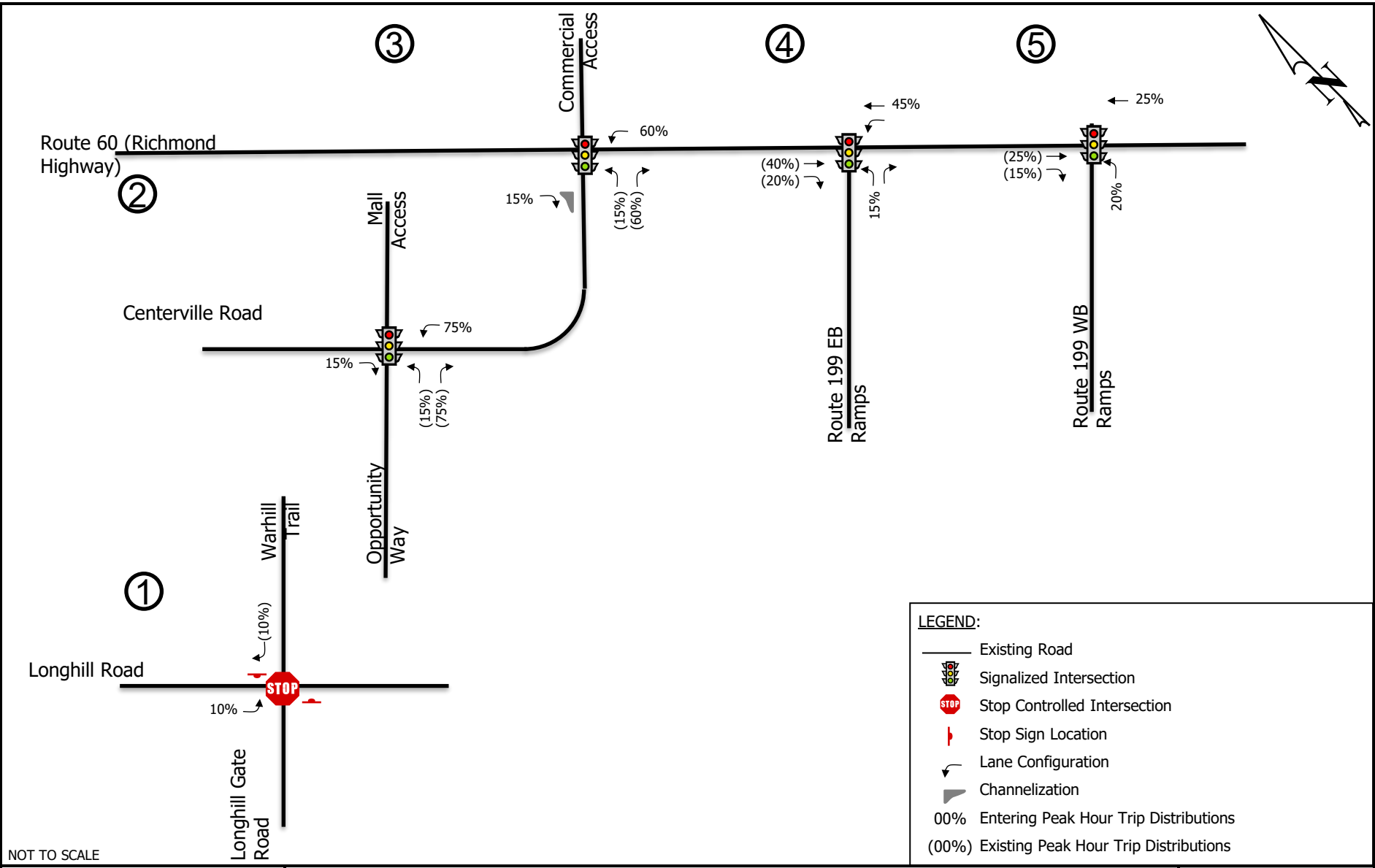
The intersection trip distributions can be found in Figure 5-3 and 5-4.

5.3 TRAFFIC ASSIGNMENT

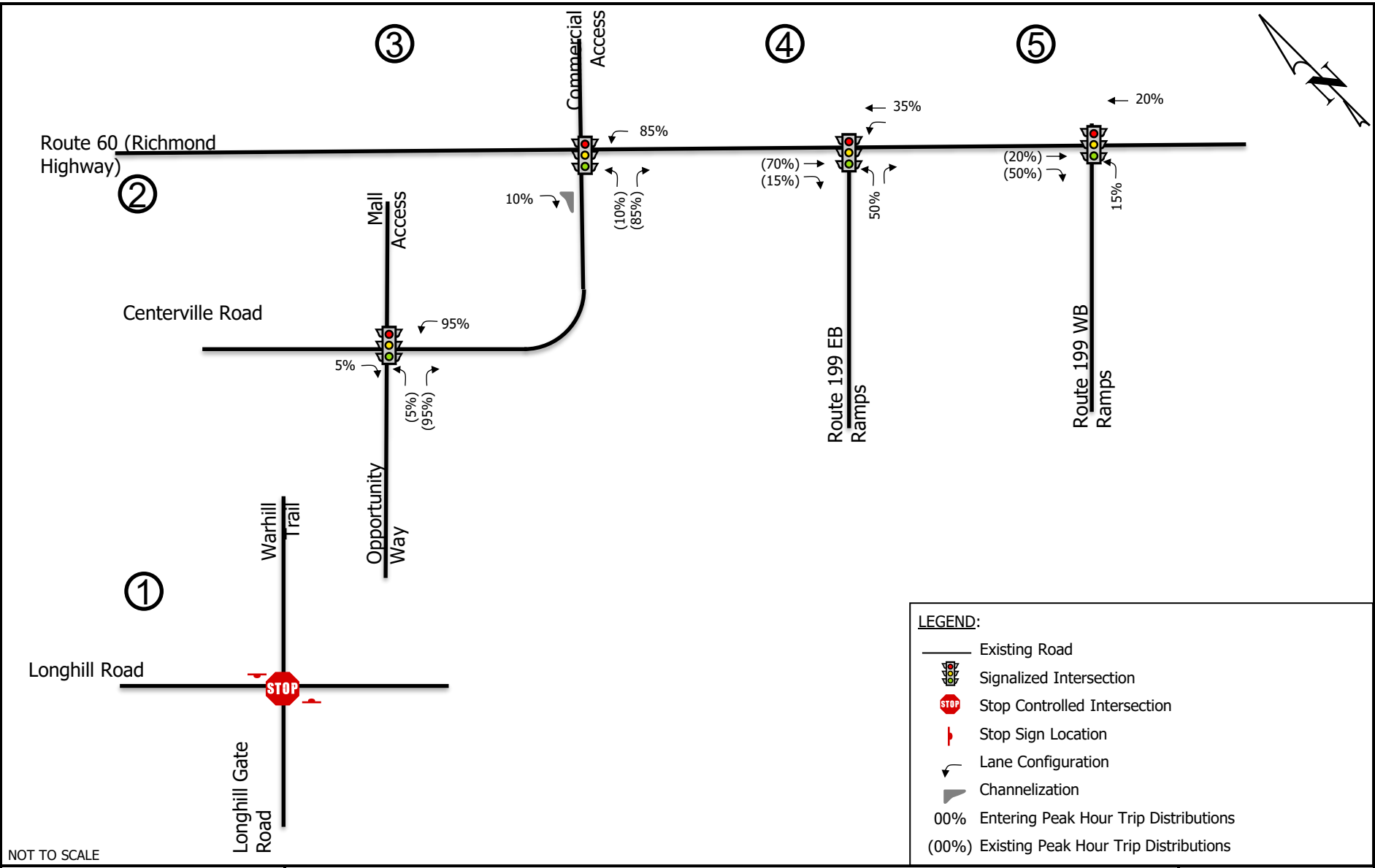
The trip distribution percentages for the external trips from Figure 5-3 and 5-4 were applied to the trip generation table (Table 5-1) to distribute the external trips to the surrounding roadway network. The peak hour site trips can be found in Figure 5-5.





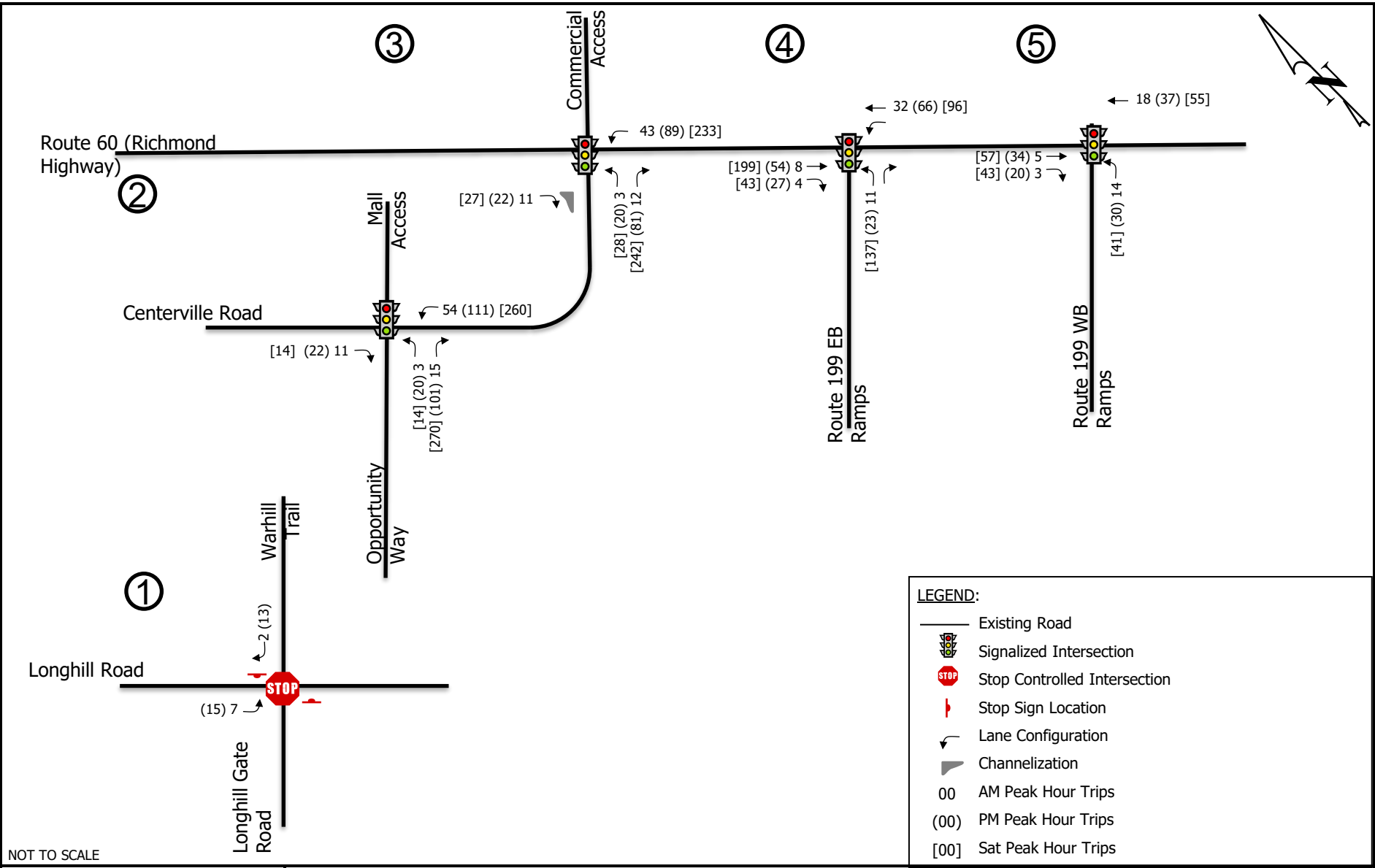


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 TIMMONS GROUP YOUR VISION ACHIEVED THROUGH OURS.	Intersection Weekend Trip Distributions Warhill Athletic Complex James City County, Virginia	Figure 5-4
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Warhill Athletic Complex Site Trips
 Warhill Athletic Complex
 James City County, Virginia

Figure
 5-5

6 2040 TOTAL FUTURE CONDITIONS

To complete the analysis of 2040 total future conditions (total background volumes with the proposed development), the estimated site trips were added to the 2040 total background traffic volumes. The projected volumes were then used to complete the capacity analysis.

6.1 TOTAL FUTURE TRAFFIC VOLUMES

The site generated trips shown on Figure 5-5 were added to the 2040 background traffic volumes (Figure 4-2) to yield the 2040 total future traffic volumes shown in Figure 6-1.

6.2 2040 FUTURE CONDITIONS ANALYSIS RESULTS

Table 6-1 summarizes the 2040 total future intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the proposed roadway geometry (Figure 2-2), 2040 total future peak hour traffic volumes (Figure 6-1), and the existing signal timings as provided by VDOT.

The corresponding Synchro and SimTraffic reports are included in Appendix G. Note that the intersection numbers shown on the LOS, delay, and queue length summary tables correspond with the intersection node numbers used in the Synchro models and report figures.

As shown in Table 6-1, under 2040 total future conditions with development of the site:

At the unsignalized intersection of Longhill Road and Longhill Gate Road/Warhill Trail, all approaches operate at LOS D or better during all peaks with the exception of the southbound approach of Warhill Trail which operates at LOS F during the PM peak. All queues are contained within the existing provided storage. This intersection is the subject of a traffic signal warrant analysis below.

The signalized intersection of Centerville Road and Opportunity Way continues to operate at an overall LOS D during all three peaks. The mainline eastbound and westbound approaches of Centerville Road operate at LOS D during all three peaks with the exception of the eastbound approach which operates at LOS E during the Saturday peak. The northbound and southbound approaches of Opportunity Way and the Mall Access operate at LOS E during all three peaks. Significant northbound queues are present during the Saturday peak.

The signalized intersection of Centerville Road and Route 60 operates at overall LOS D during the AM peak and LOS F during the PM and Saturday peaks. The mainline eastbound and westbound approaches of Route 60 operate at LOS D or better during all peaks with the exception of the westbound approach in the PM peak which operates at LOS F. The northbound and southbound approaches of Centerville Road and the Commercial Access operate at LOS F during all three peaks with the exception of the northbound approach in the AM peak which operates at LOS E. Significant northbound and eastbound queues are present during the Saturday peak.

The signalized intersection of Route 60 and the Route 199 Eastbound ramps operates at LOS B the AM peak and LOS C during the PM and Saturday peak. The mainline eastbound and westbound approaches of Route 60 operate at LOS B or better during all three peaks. The northbound approach of the Route 199 EB ramp operates at LOS E during all three peaks. All queues are contained within the existing storage with significant northbound queueing present during the PM peak.

The signalized intersection of Route 60 and the Route 199 Westbound ramps operates at LOS C during all three peaks. The mainline eastbound and westbound approaches of Route 60 operate at LOS C or better during all three peaks. The northbound approach operates at LOS E during the all three peaks. All queues are contained within the existing provided storage.

**Table 6-1: 2040 Total Future Conditions
Intersection Level of Service and Delay Summary**

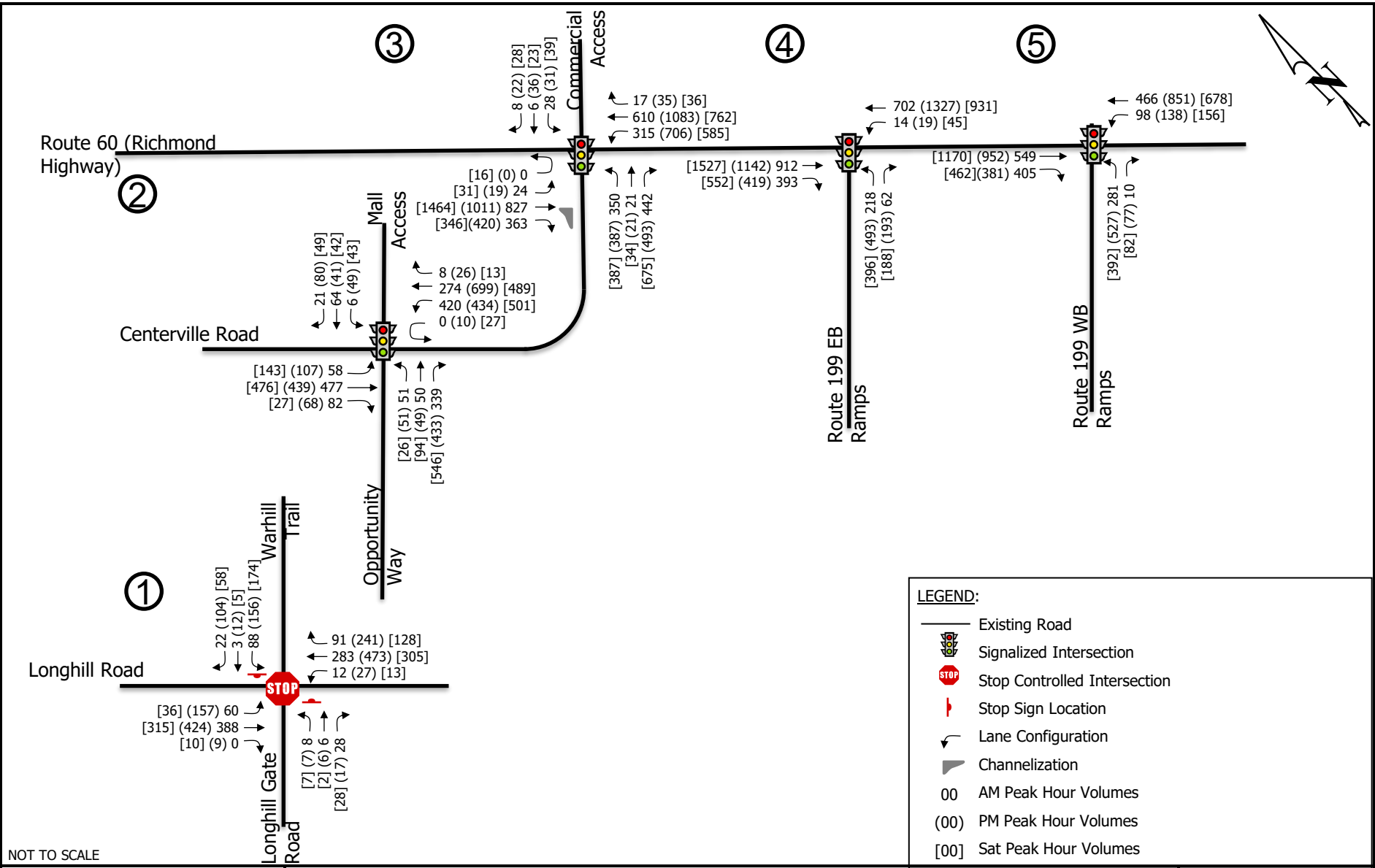
Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR				SATURDAY PEAK HOUR			
			Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Unsignalized	EB Left		8.3	A	4	48	10.3	B	19	99	8.4	A	3	34
	EB Thru-Right		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	EB Approach		1.0	A	--	--	2.7	A	--	--	0.8	A	--	--
	WB Left		8.3	A	1	28	8.4	A	2	26	8.0	A	1	24
	WB Thru		0.0	A	0	0	0.0	A	0	0	0.0	A	0	7
	WB Right		0.0	A	0	12	0.0	A	0	40	0.0	A	0	--
	WB Approach		0.3	A	--	--	0.3	A	--	--	0.2	A	--	--
	NB L-T-R		15.5	C	10	59	40.8	E	23	57	13.2	B	7	49
	NB Approach		15.5	C	--	--	40.8	E	--	--	13.2	B	--	--
	SB Left	200	32.6	D	50	82	513.9	F	360	291	41.4	E	111	124
	SB Thru-Right		11.2	B	3	52	18.1	C	33	436	11.2	B	9	56
	SB Approach		28.0	D	--	--	302.9	F	--	--	33.3	D	--	--
2. Centerville Road (E-W) and Opportunity Way (N) and Mail Access (S) Signalized	EB Dual Left ²	365	61.1	E	50	123	59.1	E	78	203	58.9	E	97	365
	EB Thru		40.2	D	484	422	32.9	C	415	402	60.4	E	474	821
	EB Right	290	24.9	C	1	290	22.7	C	0	270	31.8	C	0	290
	EB Approach		40.1	D	--	--	36.3	D	--	--	58.9	E	--	--
	WB Dual Left ²	260	64.1	E	m247	212	74.7	E	m168	240	68.8	E	m293	523
	WB Thru		6.8	A	m76	228	12.3	B	m137	364	9.0	A	m99	483
	WB Right	230	11.7	B	m0	33	11.8	B	m0	132	17.4	B	m0	65
	WB Approach		41.1	D	--	--	36.0	D	--	--	39.7	D	--	--
	NB Left-Thru	200	68.6	E	#181	177	73.4	E	#168	154	49.3	D	#172	1116
	NB Right		55.3	E	#129	203	56.8	E	#148	268	56.5	E	#329	1118
	NB Approach		58.3	E	--	--	59.9	E	--	--	55.2	E	--	--
	SB Left	115	56.1	E	20	10	59.8	E	83	45	59.5	E	74	47
	SB Left-Thru		60.6	E	112	85	59.7	E	86	91	59.9	E	86	118
	SB Right	115	55.9	E	0	33	57.3	E	7	69	57.4	E	0	99
	SB Approach		59.3	E	--	--	58.6	E	--	--	58.9	E	--	--
	Overall		45.8	D	--	--	42.7	D	--	--	49.9	D	--	--
3. Route 60 (E-W) and Centerville Road (N) and Commercial Access (S) Signalized	EB Left	565	60.3	E	52	73	60.4	E	44	65	60.5	E	84	565
	EB Thru		38.2	D	358	424	35.7	D	437	438	117.9	F	#952	1594
	EB Right	450	29.4	C	57	168	26.6	C	60	231	30.9	C	163	1582
	EB Approach		26.0	C	--	--	33.4	C	--	--	100.3	F	--	--
	WB Dual Left ²	415	76.2	E	#241	290	475.3	F	m#602	415	68.1	E	m#322	400
	WB Thru		29.4	C	219	309	18.0	B	m355	691	16.1	B	m270	580
	WB Right	210	21.1	C	m0	28	18.2	B	m0	30	16.0	B	m0	68
	WB Approach		44.9	D	--	--	195.0	F	--	--	38.1	D	--	--
	NB Left	300	49.6	D	m#333	270	97.1	F	m#330	264	229.2	F	m#377	263
	NB Left-Thru		49.4	D	m#331	288	92.2	F	m#320	312	99.9	F	m#324	1163
	NB Right		87.2	F	#486	429	294.9	F	m#567	808	546.2	F	m#785	1223
	NB Approach		70.0	E	--	--	204.3	F	--	--	399.2	F	--	--
	SB Left-Thru		92.4	F	#100	66	450.7	F	#204	108	323.0	F	#172	106
	SB Right	95	54.1	D	0	12	50.4	D	0	69	55.5	E	0	80
	SB Approach		84.9	F	--	--	352.7	F	--	--	240.5	F	--	--
	Overall		48.6	D	--	--	145.3	F	--	--	157.8	F	--	--
4. Route 60 (E-W) Route 199 EB Ramps (N) Signalized	EB Thru		8.8	A	m155	213	12.1	B	m171	215	14.2	B	m200	461
	EB Right	520	5.9	A	m18	107	5.4	A	m12	120	5.9	A	m0	212
	EB Approach		8.0	A	--	--	10.3	B	--	--	12.0	B	--	--
	WB Left	230	70.5	E	m30	63	69.8	E	m29	230	63.5	E	m66	153
	WB Thru		7.5	A	184	161	16.1	B	m328	734	10.6	B	244	282
	WB Approach		8.7	A	--	--	16.9	B	--	--	13.0	B	--	--
	NB Left		59.4	E	266	312	84.5	F	#759	1115	90.9	F	#572	780
	NB Right		43.1	D	38	96	34.9	C	102	994	39.9	D	98	395
	NB Approach		55.8	E	--	--	70.5	E	--	--	74.5	E	--	--
	Overall		14.0	B	--	--	24.3	C	--	--	22.3	C	--	--
5. Route 60 (E-W) Route 199 WB Ramps (N) Signalized	EB Thru		9.7	A	56	146	13.4	B	313	176	15.0	B	378	276
	EB Right	520	17.3	B	1	159	16.3	B	19	100	6.6	A	m8	164
	EB Approach		12.9	B	--	--	14.2	B	--	--	12.6	B	--	--
	WB Left	475	62.4	E	145	211	64.5	E	185	412	66.1	E	208	261
	WB Thru		8.2	A	125	168	14.9	B	227	550	10.8	B	172	241
	WB Approach		17.7	B	--	--	21.9	C	--	--	21.2	C	--	--
	NB Left		61.5	E	327	360	99.5	F	#774	1052	70.3	E	#500	500
	NB Right		40.2	D	16	50	33.1	C	53	1043	37.3	D	41	158
	NB Approach		60.7	E	--	--	91.0	F	--	--	64.7	E	--	--
	Overall		22.1	C	--	--	32.7	C	--	--	23.4	C	--	--

¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.

² Dual left turn lanes; average storage is provided.

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.



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7 2046 BACKGROUND CONDITIONS

In accordance with VDOT standards, a buildout plus six years (2046) analysis scenario was completed.

The 2046 background volumes were based on a 1.0% annual growth rate. The growth rate was compounded annually for the 21 year period from 2025 to 2046 and was applied to all movements at the study intersections.

7.1 TOTAL BACKGROUND TRAFFIC VOLUMES

The 2046 background (existing + growth) volumes were added to the background development trips on Figure 4-1 to yield the 2046 total background traffic volumes shown in Figure 7-1.

7.2 BACKGROUND 2046 CAPACITY ANALYSIS RESULTS

Table 7-1 summarizes the 2046 background intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the existing roadway geometry, 2046 total background peak hour traffic volumes shown on Figure 4-4, and the existing signal timings as provided by VDOT.

The corresponding Synchro and SimTraffic reports are included in Appendix F. Note that the intersection numbers shown on the LOS, delay, and queue length summary tables correspond with the intersection node numbers used in the Synchro models and report figures.

As shown in Table 7-1, under 2046 total background conditions,

At the unsignalized intersection of Longhill Road and Longhill Gate Road/Warhill Trail, the mainline eastbound and westbound approaches of Longhill Road operate at LOS A during all three peaks. The northbound approach of Longhill Gate Road operates at LOS C during the AM peak, LOS E during the PM peak and LOS B during the Saturday peak. The southbound approach of Warhill Trail operates at LOS D during the AM peak, LOS F during the PM peak and LOS E during the Saturday peak.

The signalized intersection of Centerville Road and Opportunity Way continues to operate at an overall LOS D during all three peaks. The mainline eastbound and westbound approaches of Centerville Road continue to operate at acceptable LOS during all three peaks. The northbound and southbound approaches of Opportunity Way and the Mall Access continue to operate at LOS E during all three peaks.

The signalized intersection of Centerville Road and Route 60 operates at overall LOS D during the AM peak, LOS F during the PM peak and LOS F during the Saturday peak. The mainline eastbound approach of Route 60 operates at LOS D during the AM peak, LOS C during the PM peak and LOS E during the Saturday peak with significant queues during the Saturday peak. The mainline westbound approach of Route 60 operates at LOS D during the AM peak, LOS F during the PM peak and LOS C during the Saturday peak. The northbound approach of Centerville Road operates at LOS E during the AM peak and LOS F during the PM and Saturday peaks. The southbound approach of the Commercial Access operates at LOS F during all three peaks.

The signalized intersection of Route 60 and the Route 199 Eastbound ramps operates at LOS B the AM and Saturday peaks and LOS C during the PM peak. The mainline eastbound and westbound approaches of Route 60 operate at LOS B or better during all three peaks. The northbound approach of the Route 199 EB ramp operates at LOS E during the AM and PM peaks and LOS D during the Saturday peak. All queues are contained within the existing storage with significant northbound queueing present during the PM peak.

The signalized intersection of Route 60 and the Route 199 Westbound ramps operates at LOS C during all three peaks. The mainline eastbound and westbound approaches of Route 60 operate at LOS C or better during all three peaks. The northbound approach operates at LOS E during all three peaks. A significant northbound queue is present during the PM peak.

**Table 7-1: 2046 Total Background Conditions
Intersection Level of Service and Delay Summary**

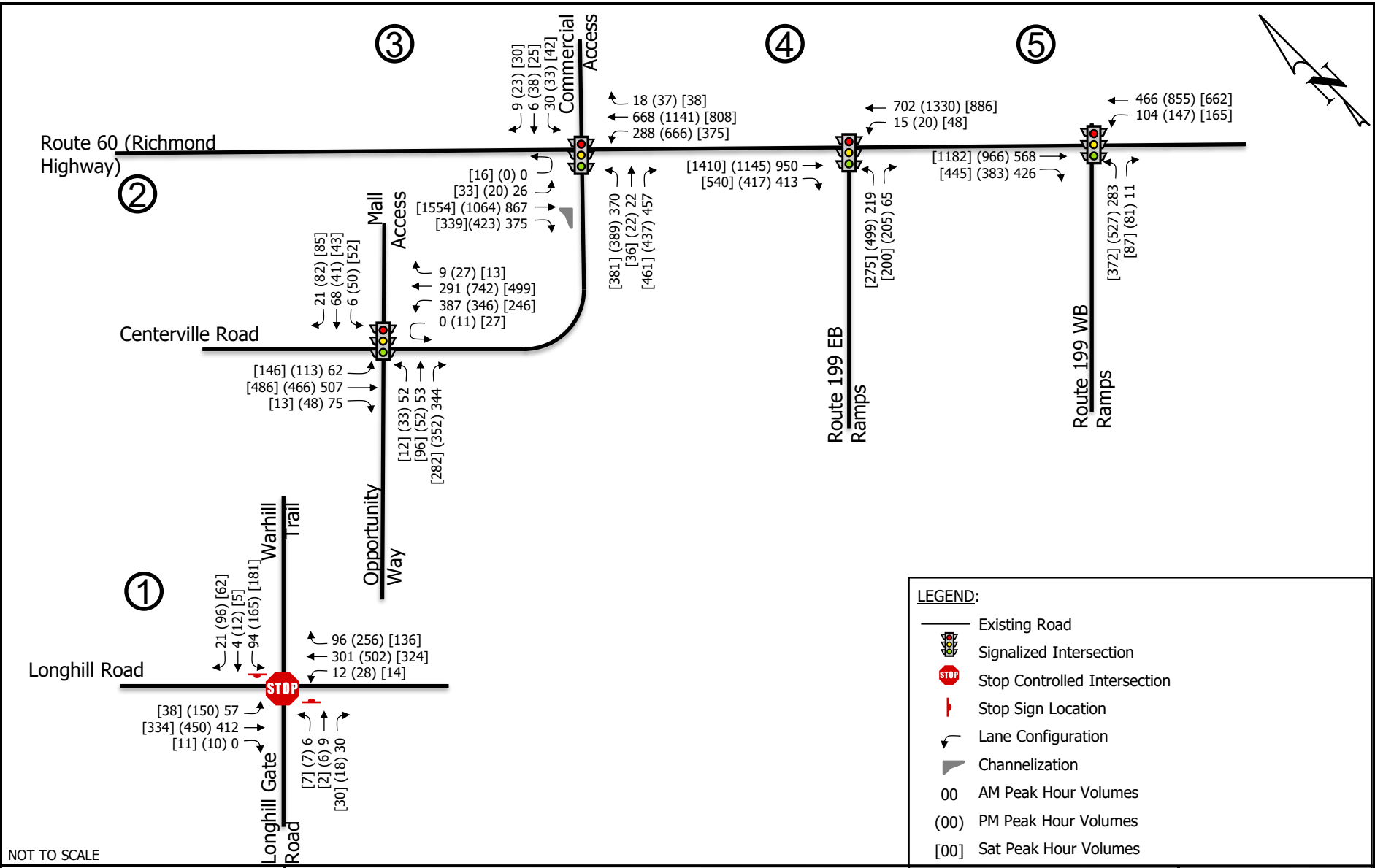
Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR				SATURDAY PEAK HOUR			
			Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Unsignalized	EB Left		8.3	A	4	45	10.5	B	19	101	8.5	A	3	34
	EB Thru-Right		0.0	A	0	0	0.0	A	0	2	0.0	A	0	0
	EB Approach		1.0	A	--	--	2.6	A	--	--	0.8	A	--	--
	WB Left		8.4	A	1	31	8.4	A	2	35	8.1	A	1	26
	WB Thru		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	WB Right		0.0	A	0	14	0.0	A	0	40	0.0	A	0	6
	WB Approach		0.2	A	--	--	0.3	A	--	--	0.2	A	--	--
	NB L-T-R		16.1	C	11	64	42.6	E	25	68	13.5	B	8	53
	NB Approach		16.1	C	--	--	42.6	E	--	--	13.5	B	--	--
	SB Left	200	37.8	E	61	107	648.2	F	405	309	56.0	F	145	174
2. Centerville Road (E-W) and Opportunity Way (N) and Mall Access (S) Signalized	SB Thru-Right		11.8	B	4	47	19.1	C	33	634	11.4	B	10	50
	SB Approach		32.3	D	--	--	339.5	F	--	--	44.1	E	--	--
	EB Dual Left ²	365	61.1	E	52	187	59.0	E	81	172	59.1	E	102	193
	EB Thru		39.0	D	526	448	28.3	C	431	343	25.0	C	450	373
	EB Right	290	23.4	C	0	242	19.2	B	0	113	16.2	B	0	162
	EB Approach		39.3	D	--	--	33.2	C	--	--	32.5	C	--	--
	WB Dual Left ²	260	65.2	E	m238	225	74.3	E	m142	148	68.3	E	m179	201
	WB Thru		7.4	A	m91	244	13.1	B	m162	434	9.2	A	m139	395
	WB Right	230	11.9	B	m0	91	11.8	B	m0	209	13.1	B	m0	128
	WB Approach		40.0	D	--	--	32.3	C	--	--	29.7	C	--	--
	NB Left-Thru	200	70.6	E	#194	159	66.6	E	132	117	67.8	E	#190	155
	NB Right		55.2	E	#130	195	56.9	E	#110	195	55.0	D	94	223
	NB Approach		58.8	E	--	--	58.8	E	--	--	58.5	E	--	--
	SB Left	115	55.8	E	20	6	59.8	E	86	53	59.4	E	77	38
	SB Left-Thru		60.8	E	116	115	59.5	E	88	105	59.8	E	88	93
3. Route 60 (E-W) and Centerville Road (N) and Commercial Access (S) Signalized	SB Right	115	55.7	E	0	32	57.2	E	13	85	57.2	E	0	28
	SB Approach		59.3	E	--	--	58.5	E	--	--	58.7	E	--	--
	Overall		45.3	D	--	--	39.4	D	--	--	38.4	D	--	--
	EB Left	565	60.2	E	56	74	60.3	E	46	56	60.6	E	87	565
	EB Thru		37.3	D	377	465	35.5	D	470	494	88.9	F	#1015	1596
	EB Right	450	28.5	C	57	248	26.1	C	74	316	26.5	C	153	1591
	EB Approach		35.2	D	--	--	33.2	C	--	--	77.3	E	--	--
	WB Dual Left ²	415	70.4	E	#210	242	416.3	F	m#545	415	64.9	E	201	258
	WB Thru		28.5	C	250	242	18.5	B	m393	691	17.5	B	305	230
	WB Right	210	20.5	C	m0	28	17.5	B	m0	48	16.1	B	m0	86
	WB Approach		41.1	D	--	--	160.9	F	--	--	32.0	C	--	--
	NB Left	300	53.4	D	m#345	287	100.8	F	m#348	245	237.5	F	m#426	274
	NB Left-Thru		53.1	D	m#343	339	95.7	F	m#344	262	114.5	F	m#382	426
	NB Right		104.7	F	#536	498	198.9	F	#493	494	152.7	F	#409	663
	NB Approach		81.0	F	--	--	150.2	F	--	--	163.6	F	--	--
4. Route 60 (E-W) Route 199 EB Ramps (N) Signalized	SB Left-Thru		101.4	F	#110	73	490.9	F	#210	111	364.5	F	#182	109
	SB Right	95	54.1	D	0	20	51.6	D	0	72	55.5	E	0	70
	SB Approach		91.9	F	--	--	384.4	F	--	--	267.6	F	--	--
	Overall		50.3	D	--	--	118.7	F	--	--	86.7	F	--	--
	EB Thru		8.8	A	m160	197	12.1	B	m163	212	10.7	B	m177	409
	EB Right	520	5.9	A	m18	106	3.4	A	m9	113	3.5	A	m0	162
	EB Approach		7.9	A	--	--	9.8	A	--	--	8.7	A	--	--
	WB Left	230	69.6	E	m31	59	65.5	E	m31	230	63.5	E	m71	115
	WB Thru		7.8	A	189	156	15.8	B	m327	725	8.1	A	226	176
	WB Approach		9.0	A	--	--	16.5	B	--	--	10.9	B	--	--
5. Route 60 (E-W) Route 199 WB Ramps (N) Signalized	NB Left		59.6	E	268	318	94.1	F	#771	1112	60.7	E	330	360
	NB Right		43.1	D	40	93	35.7	D	108	1110	43.5	D	107	175
	NB Approach		55.8	E	--	--	77.1	E	--	--	53.5	D	--	--
	Overall		14.0	B	--	--	25.4	C	--	--	15.6	B	--	--
	EB Thru		9.9	A	107	141	13.3	B	301	188	15.4	B	377	366
	EB Right	520	19.8	B	29	142	12.6	B	16	114	8.4	A	9	191
	EB Approach		14.1	B	--	--	13.1	B	--	--	13.5	B	--	--
	WB Left	475	62.5	E	151	236	65.4	E	195	383	68.0	E	218	257
	WB Thru		8.3	A	125	161	14.7	B	228	569	10.3	B	167	222
	WB Approach		18.2	B	--	--	22.2	C	--	--	21.8	C	--	--
Overall	NB Left		61.4	E	331	368	103.0	F	#774	1051	67.6	E	#461	441
	NB Right		40.1	D	16	29	33.4	C	55	1036	38.0	D	43	101
	NB Approach		60.6	E	--	--	93.8	F	--	--	62.0	E	--	--
	Overall		22.7	C	--	--	32.7	C	--	--	23.5	C	--	--

¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.

² Dual left turn lanes; average storage is provided.

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.



NOT TO SCALE

8 2046 TOTAL FUTURE CONDITIONS

To complete the analysis of 2046 total conditions (with the proposed development), the estimated site trips were added to the total background 2046 traffic volumes. The projected volumes were then used to complete the capacity analysis.

8.1 TOTAL FUTURE TRAFFIC VOLUMES

The site generated trips shown on Figure 5-5 were added to the 2046 total background traffic volumes (Figure 7-1) to yield the 2046 total future traffic volumes shown in Figure 8-1.

8.2 2046 FUTURE CONDITIONS ANALYSIS RESULTS

Table 8-1 summarizes the 2046 total future intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the existing roadway geometry, 2046 total future peak hour traffic volumes (Figure 8-1), and the existing signal timings as provided by VDOT.

The corresponding Synchro and SimTraffic reports are included in Appendix H. Note that the intersection numbers shown on the LOS, delay, and queue length summary tables correspond with the intersection node numbers used in the Synchro models and report figures.

From existing conditions, the unsignalized intersection of Longhill Road and Warhill Trail, the mainline eastbound and westbound approaches of Longhill Road operate at LOS A during all three peaks. The northbound approach of Longhill Gate Road continues to operate at acceptable LOS E or better during all three peaks. The southbound approach of Warhill Trail worsens from LOS C to LOS D in the AM peak, continues to operate at LOS F during the PM peak and worsens from LOS C to LOS E during the Saturday peak.

From existing conditions, the intersection of Centerville Road and Opportunity Way continues to operate at LOS D during all three peaks. The northbound approach continues to operate at LOS E during all peaks with increased queues during the Saturday peak.

From existing conditions, the intersection of Route 60 and the Route 199 EB ramps continues to operate at LOS B during the AM peak and worsens from LOS B to LOS C in the PM and Saturday peaks. All queueing and approach delays continue to operate similar to existing.

From existing conditions, the intersection of Route 60 and the Route 199 WB ramps continues to operate at LOS C during the AM and PM peaks and worsens to LOS C from LOS B during the Saturday peak. All queueing and approach delays continue to operate similar to existing.

**Table 8-1: 2046 Total Future Conditions
Intersection Level of Service and Delay Summary**

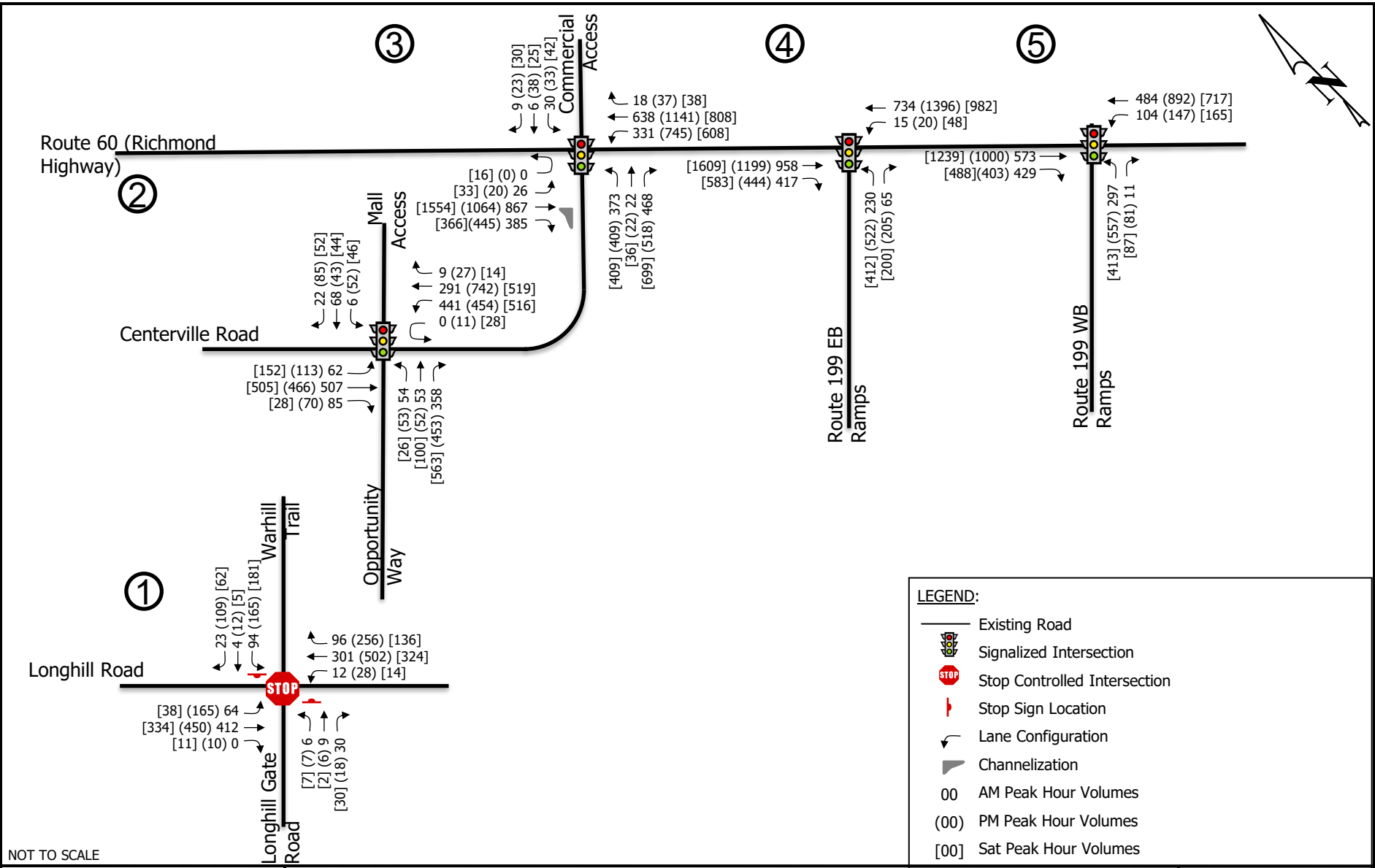
Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR				SATURDAY PEAK HOUR			
			Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)	Delay ¹ (sec/veh)	LOS ¹	95th Percentile Queue Length (ft)	Simulated Maximum Queue Length (ft)
1. Longhill Road (E-W) and Longhill Gate Rd (N)/ Warhill Trail (S) Unsignalized	EB Left		8.4	A	5	39	10.6	B	21	104	8.5	A	3	32
	EB Thru-Right		0.0	A	0	2	0.0	A	0	0	0.0	A	0	0
	EB Approach		1.1	A	--	--	2.8	A	--	--	0.8	A	--	--
	WB Left		8.4	A	1	31	8.4	A	2	31	8.1	A	1	29
	WB Thru		0.0	A	0	0	0.0	A	0	0	0.0	A	0	0
	WB Right		0.0	A	0	10	0.0	A	0	31	0.0	A	0	6
	WB Approach		0.2	A	--	--	0.3	A	--	--	0.2	A	--	--
	NB L-T-R		16.4	C	12	70	47.5	E	28	78	13.5	B	8	53
	NB Approach		16.4	C	--	--	47.5	E	--	--	13.5	B	--	--
	SB Left	200	39.7	E	64	90	724.1	F	419	302	56.0	F	145	148
	SB Thru-Right		11.8	B	4	47	19.7	C	38	617	11.4	B	10	53
	SB Approach		33.5	D	--	--	426.4	F	--	--	44.1	E	--	--
2. Centerville Road (E-W) and Opportunity Way (N) and Mall Access (S) Signalized	EB Dual Left ²	365	61.1	E	52	311	59.0	E	81	248	59.1	E	102	364
	EB Thru		46.2	D	526	488	34.5	C	449	458	58.1	E	493	732
	EB Right	290	26.2	C	3	290	23.0	C	0	289	30.1	C	0	264
	EB Approach		45.0	D	--	--	37.5	D	--	--	57.2	E	--	--
	WB Dual Left ²	260	64.4	E	m253	254	75.5	E	m171	203	76.6	E	m295	505
	WB Thru		7.1	A	m80	239	13.4	B	m147	393	10.1	B	m98	342
	WB Right	230	12.0	B	m0	47	12.1	B	m0	149	19.0	B	m0	26
	WB Approach		41.2	D	--	--	36.8	D	--	--	43.8	D	--	--
	NB Left-Thru	200	71.5	E	m#200	191	75.5	E	#178	352	47.2	D	#221	3123
	NB Right		55.1	E	#135	255	56.7	E	#152	557	58.9	E	#403	3133
	NB Approach		58.9	E	--	--	60.2	E	--	--	56.7	E	--	--
	SB Left	115	55.8	E	20	13	59.8	E	86	62	59.4	E	77	45
	SB Left-Thru		60.8	E	116	104	59.5	E	88	125	59.8	E	88	126
	SB Right	115	55.7	E	0	45	57.2	E	13	107	57.2	E	0	78
	SB Approach		59.3	E	--	--	58.5	E	--	--	58.7	E	--	--
	Overall		47.6	D	--	--	43.4	D	--	--	51.6	D	--	--
3. Route 60 (E-W) and Centerville Road (N) and Commercial Access (S) Signalized	EB Left	565	60.2	E	56	77	60.3	E	46	116	60.6	E	87	564
	EB Thru		37.8	D	377	519	35.2	D	470	500	151.1	F	#1038	1595
	EB Right	450	28.8	C	58	325	26.2	C	76	325	31.9	C	185	1590
	EB Approach		35.5	D	--	--	32.9	C	--	--	126.7	F	--	--
	WB Dual Left ²	415	85.9	F	#260	284	519.5	F	m#620	415	72.1	E	m#339	414
	WB Thru		27.4	C	237	274	17.8	B	m361	691	16.4	B	m283	655
	WB Right	210	20.4	C	m0	45	17.4	B	m0	68	16.1	B	m0	107
	WB Approach		46.9	D	--	--	212.2	F	--	--	39.7	D	--	--
	NB Left	300	51.2	D	m#345	277	110.4	F	m#354	294	260.1	F	m#403	279
	NB Left-Thru		50.8	D	m#343	337	106.6	F	m#348	832	114.2	F	m#348	1159
	NB Right		108.3	F	#559	610	360.9	F	m#628	1016	613.0	F	m#834	1223
	NB Approach		82.1	F	--	--	246.2	F	--	--	447.3	F	--	--
	SB Left-Thru		101.4	F	#110	77	491.0	F	#210	145	364.5	F	#182	143
	SB Right	95	54.1	D	0	30	51.8	D	0	88	55.5	E	0	77
	SB Approach		91.9	F	--	--	384.6	F	--	--	267.6	F	--	--
	Overall		52.5	D	--	--	162.0	F	--	--	181.5	F	--	--
4. Route 60 (E-W) Route 199 EB Ramps (N) Signalized	EB Thru		9.2	A	m162	232	12.2	B	m177	227	15.7	B	m198	406
	EB Right	520	7.1	A	m19	131	5.7	A	m13	118	6.1	A	m0	182
	EB Approach		8.6	A	--	--	10.4	B	--	--	13.2	B	--	--
	WB Left	230	69.1	E	m30	76	65.4	E	m29	230	64.1	E	m69	178
	WB Thru		8.2	A	198	185	16.0	B	m336	726	10.2	B	m254	262
	WB Approach		9.4	A	--	--	16.7	B	--	--	12.7	B	--	--
	NB Left		59.8	E	281	372	122.4	F	#817	1117	101.7	F	#604	794
	NB Right		42.6	D	40	124	36.7	D	114	889	40.4	D	113	561
	NB Approach		56.0	E	--	--	98.2	F	--	--	81.7	F	--	--
	Overall		14.6	B	--	--	29.6	C	--	--	24.0	C	--	--
5. Route 60 (E-W) Route 199 WB Ramps (N) Signalized	EB Thru		10.3	B	133	166	13.6	B	319	178	16.2	B	458	250
	EB Right	520	22.6	C	137	147	12.6	B	16	94	7.4	A	m7	148
	EB Approach		15.6	B	--	--	13.3	B	--	--	13.7	B	--	--
	WB Left	475	62.5	E	151	211	65.4	E	195	430	68.0	E	218	258
	WB Thru		8.8	A	133	168	14.6	B	241	723	11.4	B	184	239
	WB Approach		18.3	B	--	--	21.8	C	--	--	22.0	C	--	--
	NB Left		61.6	E	345	396	132.4	F	#830	1043	73.6	E	#542	514
	NB Right		39.3	D	16	24	34.0	C	57	1043	36.7	D	45	175
	NB Approach		60.8	E	--	--	119.9	F	--	--	67.2	E	--	--
	Overall		23.7	C	--	--	38.2	D	--	--	24.7	C	--	--

¹ Overall intersection LOS and delay reported for signalized intersections and roundabouts only.

² Dual left turn lanes; average storage is provided.

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m - Volume for 95th percentile queue is metered by upstream signal.



9 SIGNAL WARRANTS AT LONGHILL ROAD/LONGHILL GATE ROAD/WARHILL TRAIL

Signal warrant analyses were completed for 2025 existing conditions, 2040 background conditions and 2040 future conditions. The warrant analyses were conducted following procedures from the 2009 edition of the *Manual on Uniform Traffic Control Devices* (MUTCD) and the hourly volumes from 7:00 AM to 7:00 PM. In accordance with VDOT standards, Warrant 1 (Eight-Hour) and Warrant 2 (Four-Hour) outlined in the 2009 MUTCD was considered for the analyses and are described in detail below.

The following seven (7) warrants were not included in this analysis because they are not applicable to the nature/context of the development and/or adjacent roadway infrastructure.

- Warrant 3 – Peak Hour Volume
- Warrant 4 – Pedestrian Volume
- Warrant 5 – School Crossing
- Warrant 6 – Coordinated Signal System
- Warrant 7- Crash Experience
- Warrant 8 – Roadway Network
- Warrant 9 – Intersection Near a Grade Crossing

The MUTCD contains both 100% and 70% volume thresholds that can be used in the signal warrant analysis with 70% volume thresholds being considered when "...major street speed exceeds 40 mph or in an isolated community with a population of less than 10,000). As the posted speed limit is 45 mph on Longhill Road, the 70% volume thresholds were also considered.

As shown in Figure 2-1, the major street (Longhill Road) has two lanes for moving traffic on the eastbound approach, one left turn lane and one through lane, and three lanes for moving traffic on the westbound approach, one left turn lane, one through lane, and one right turn lane. The minor street (Warhill Trail) has one lane in each direction.

The lane geometry used in the traffic signal warrant analysis for the major street is assumed to be two (2) lanes and the minor street one (1) lane.

The full results tables for the signal warrant analyses can be found in Appendix I.

9.1 WARRANT 1 (EIGHT-HOUR VEHICULAR VOLUME)

According to the MUTCD, "the need for a traffic control signal shall be considered if an engineering study finds that **one** of the following conditions exist for each of any 8 hours of an average day":

Condition A (100% Volume Threshold):

This warrant is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Volume Thresholds: The volume thresholds for a two-lane major street approach and a one-lane minor street approach from the 2009 MUTCD Table 4C-1 indicate the need for a traffic control signal is considered when, for each of any eight (8) hours of an average day, a minimum of **600** vehicles per

hour exist on the major street approaches and **150** vehicles per hour are present on the higher-volume minor street approach.

2025 Existing Conditions Under 2025 existing conditions, the required vehicle volume on the minor street approach was present for three (3) of the eight (8) required hours based on the volume thresholds for the one-lane minor street approach on Saturday and two (2) of the eight (8) required hours on a weekday. Therefore, this warrant is **not** considered met under 2025 existing conditions.

2040 Background Conditions: Under 2040 background conditions, the required vehicle volume on the minor street approach was present for six (6) of the eight (8) required hours based on the volume thresholds for the one-lane minor street approach on Saturday and three (3) of the eight (8) required hours on a weekday. Therefore, this warrant is **not** considered met under 2040 background conditions.

2040 Future Conditions: Under 2040 future conditions, the required vehicle volume on the minor street approach was present for six (6) of the eight (8) required hours based on the volume thresholds for the one-lane minor street approach on Saturday and four (4) of the eight (8) required hours on a weekday. Therefore, this warrant is **not** considered met under 2040 future conditions.

Summary: A traffic signal is **not warranted** at the intersection under any scenario using Warrant 1A 100% thresholds.

Condition A (70% Volume Threshold):

This warrant is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Volume Thresholds: The volume thresholds for a two-lane major street approach and a one-lane minor street approach from the 2009 MUTCD Table 4C-1 indicate the need for a traffic control signal for 70% volume thresholds is considered when, for each of any eight (8) hours of an average day, a minimum of **420** vehicles per hour exist on the major street approaches and **105** vehicles per hour are present on the higher-volume minor street approach.

2025 Existing Conditions Under 2025 existing conditions, the required vehicle volume on the minor street approach was present for eight (8) of the eight (8) required hours based on the 70% volume thresholds for the one-lane minor street approach on Saturday and four (4) of the eight (8) required hours on a weekday. Therefore, this warrant **is** considered met under 2025 existing conditions for 70% volume thresholds.

2040 Background Conditions: Under 2040 background conditions, the required vehicle volume on the minor street approach was present for eight (8) of the eight (8) required hours based on the 70% volume thresholds for the one-lane minor street approach on Saturday and five (5) of the eight (8) required hours on a weekday. Therefore, this warrant **is** considered met under 2040 background conditions for 70% volume thresholds.

2040 Future Conditions: Under 2040 future conditions, the required vehicle volume on the minor street approach was present for eight (8) of the eight (8) required hours based on the 70% volume thresholds for the one-lane minor street approach on Saturday and eight (8) of the eight (8) required hours on a weekday. Therefore, this warrant **is** considered met under 2040 future conditions for 70% volume thresholds.

Summary: A traffic signal **is warranted** at the intersection using Warrant 1A 70% thresholds. The signal is warranted under 2025 existing conditions.

Condition B (100% Threshold):

This warrant is intended for application at locations where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Volume Thresholds: The volume thresholds for a two-lane major street approach and a one-lane minor street approach from the 2009 MUTCD Table 4C-1 indicate the need for a traffic control signal is considered when, for each of any eight (8) hours of an average day, a minimum of **900** vehicles per hour exist on the major street approaches and **75** vehicles are present on the higher-volume minor street approach.

2025 Existing Conditions Under 2025 existing conditions, the required vehicle volume on the minor street approach was present for zero (0) of the eight (8) required hours based on the volume thresholds for the one-lane minor street approach on Saturday and two (2) of the eight (8) required hours on a weekday. Therefore, this warrant is **not** considered met under 2025 existing conditions.

2040 Background Conditions: Under 2040 background conditions, the required vehicle volume on the minor street approach was present for zero (0) of the eight (8) required hours based on the volume thresholds for the one-lane minor street approach on Saturday and five (5) of the eight (8) required hours on a weekday. Therefore, this warrant is **not** considered met under 2040 background conditions.

2040 Future Conditions: Under 2040 future conditions, the required vehicle volume on the minor street approach was present for zero (0) of the eight (8) required hours based on the volume thresholds for the one-lane minor street approach on Saturday and five (5) of the eight (8) required hours on a weekday. Therefore, this warrant is **not** considered met under 2040 future conditions.

Summary: A traffic signal **is not warranted** at the intersection under existing, background, and future scenarios using Warrant 1B 100% thresholds.

Condition B (70% Threshold):

This warrant is intended for application at locations where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Volume Thresholds: The volume thresholds for a two-lane major street approach and a one-lane minor street approach from the 2009 MUTCD Table 4C-1 indicate the need for a traffic control signal is considered for 70% volume thresholds when, for each of any eight (8) hours of an average day, a minimum of **630** vehicles per hour exist on the major street approaches and **53** vehicles are present on the higher-volume minor street approach.

2025 Existing Conditions Under 2025 existing conditions, the required vehicle volume on the minor street approach was present for eight (8) of the eight (8) required hours based on the 70% volume thresholds for the one-lane minor street approach on Saturday and 10 of the eight (8) required hours on a weekday. Therefore, this warrant **is** considered met under 2025 existing conditions for 70% volume thresholds.

2040 Background Conditions: Under 2040 background conditions, the required vehicle volume on the minor street approach was present for nine (9) of the eight (8) required hours based on the 70% volume thresholds for the one-lane minor street approach on Saturday and 12 of the eight (8) required hours on a weekday. Therefore, this warrant **is** considered met under 2040 background conditions for 70% volume thresholds.

2040 Future Conditions: Under 2040 future conditions, the required vehicle volume on the minor street approach was present for nine (9) of the eight (8) required hours based on the 70% volume thresholds for the one-lane minor street approach on Saturday and 12 of the eight (8) required hours on a weekday. Therefore, this warrant **is** considered met under 2040 future conditions for 70% volume thresholds.

*Summary: A traffic signal **is warranted** at the intersection using Warrant 1B 70% thresholds. The signal is warranted under 2025 existing conditions.*

Combination of Conditions A and B (100% Threshold):

This warrant reduces the volume thresholds found in Conditions A and B by 20% and considers both conditions simultaneously.

Volume Thresholds: The volume thresholds for a two-lane major street approach and a one-lane minor street approach from the 2009 MUTCD Table 4C-1 indicate the need for a traffic control signal is considered when, for each of any eight (8) hours of an average day, a minimum of **480** vehicles are present on the major street approaches and **120** vehicles are present on the higher volumes minor street approach (Condition A) and a minimum of **720** vehicles are present on the major street approaches and **60** vehicles are present on the higher volumes minor street approach (Condition B).

2025 Existing Conditions: Under 2025 existing conditions, the required vehicle volume on the minor street approach was present for seven (7) of the eight (8) required hours for Condition A and one (1) of the eight (8) required hours for Condition B on Saturday. The required vehicle volume on the minor street approach was present for three (3) of the eight (8) required hours for Condition A and seven (7) of the eight (8) required hours for Condition B on a weekday. Therefore, this warrant is **not** considered met under 2025 existing conditions.

2040 Background Conditions: Under 2040 background volumes, the required vehicle volume on the minor street approach was present for eight (8) of the eight (8) required hours for Condition A and eight (8) of the eight (8) required hours for Condition B on Saturday. The required vehicle volume on the minor street approach was present for four (4) of the eight (8) required hours for Condition A and 10 of the eight (8) required hours for Condition B on a weekday. Therefore, this warrant **is** considered met under 2040 background conditions.

2040 Future Conditions: Under 2040 future volumes, the required vehicle volume on the minor street approach was present for eight (8) of the eight (8) required hours for Condition A and eight (8) of the eight (8) required hours for Condition B on Saturday. The required vehicle volume on the minor street approach was present for four (4) of the eight (8) required hours for Condition A and 10 of the eight (8) required hours for Condition B on a weekday. Therefore, this warrant **is** considered met under 2040 future conditions.

Summary: A traffic signal **is warranted** at the intersection using the Combination of Conditions A and B 100% volume thresholds. The signal is warranted under 2040 background conditions (without the development of the site).

Combination of Conditions A and B (70% Threshold):

This warrant reduces the volume thresholds found in Conditions A and B to 56% and considers both conditions simultaneously.

Volume Thresholds: The volume thresholds for a two-lane major street approach and a one-lane minor street approach from the 2009 MUTCD Table 4C-1 under 70% thresholds indicate the need for a traffic control signal is considered when, for each of any eight (8) hours of an average day, a minimum of **336** vehicles are present on the major street approaches and **84** vehicles are present on the higher volumes minor street approach (Condition A) and a minimum of **504** vehicles are present on the major street approaches and **42** vehicles are present on the higher volumes minor street approach (Condition B).

2025 Existing Conditions: Under 2025 existing conditions, the required vehicle volume on the minor street approach was present for nine (9) of the eight (8) required hours for Condition A and 11 of the eight (8) required hours for Condition B on Saturday. The required vehicle volume on the minor street approach was present for six (6) of the eight (8) required hours for Condition A and 12 of the eight (8) required hours for Condition B on a weekday. Therefore, this warrant **is** considered met under 2025 existing conditions for the 70% volume threshold.

2040 Background Conditions: Under 2040 background volumes, the required vehicle volume on the minor street approach was present for nine (9) of the eight (8) required hours for Condition A and 11 of the eight (8) required hours for Condition B on Saturday. The required vehicle volume on the minor street approach was present for nine (9) of the eight (8) required hours for Condition A and 12 of the eight (8) required hours for Condition B on a weekday. Therefore, this warrant **is** considered met under 2040 background conditions for the 70% volume threshold.

2040 Future Conditions: Under 2040 future volumes, the required vehicle volume on the minor street approach was present for nine (9) of the eight (8) required hours for Condition A and 11 of the eight (8) required hours for Condition B on Saturday. The required vehicle volume on the minor street approach was present for 12 of the eight (8) required hours for Condition A and 12 of the eight (8) required hours for Condition B on a weekday. Therefore, this warrant **is** considered met under 2040 future conditions for the 70% volume threshold.

Summary: A traffic signal **is warranted** at the intersection using the Combination of Conditions A and B 70% volume thresholds. The signal is warranted under 2025 existing conditions.

Warrant 1 Summary

A traffic signal is warranted at the Longhill Road/Longhill Gate Road/Warhill Trail intersection. The intersection meets Warrant 1A and 1B (70% threshold) under 2025 existing conditions and meets Warrant 1 (Combination Warrant – 100% threshold) under 2040 background conditions. Installation of a traffic signal should be considered at the intersection.

9.2 WARRANT 2 (FOUR-HOUR VEHICULAR VOLUME)

According to the MUTCD, this warrant is intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic signal. The need for a traffic control signal can be considered when, for each of any four (4) hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the minor street approach all fall above the applicable curve on MUTCD Figure 4C-1 for the 100% volume threshold and Figure 4C-2 for 70% volume threshold and combination of approach lanes.

As detailed above, the intersection is characterized by the “2 or more lanes & 1 lane” line. The graphs can be found in Appendix I.

Warrant 2 Summary

A traffic signal is not warranted at the intersection using Warrant 2 under any scenario.

10 CONCLUSIONS

Analyses were performed for the 2025 existing volumes, the (2040 and 2046) total background volumes (including the approved background developments and growth), and the (2040 and 2046) total future volumes, which includes site traffic generated by Warhill Athletics Complex expansion.

10.1 PRINCIPAL FINDINGS

Under 2025 existing conditions, all signalized intersections operate at LOS D or better during all three peak periods. The unsignalized intersection of Longhill Road and Warhill Trail operates at LOS C during the AM and Saturday peak and LOS F during the PM peak.

Under 2040 total background conditions, including growth in existing traffic and the approved background developments, the signalized intersections operate at acceptable LOS E or better during all peaks with the exception of the Route 60/Centerville Road intersection which operates at LOS F. The unsignalized intersection of Longhill Road and Warhill Trail operates at LOS D during the AM and Saturday peaks and LOS F during the PM peak.

Under 2040 total future conditions, including the growth in existing traffic, background developments and site trips, the intersections continue to perform in similar conditions to 2040 background in terms of delay. Queues are considerably increased for traffic entering the network from Opportunity Way.

Under 2046 total background conditions, including the growth in existing traffic and the approved background developments, all intersections continue to perform in similar conditions to 2040 background.

Under 2046 total future conditions, including the growth in existing traffic, background developments and site trips, the intersections continue to perform in similar conditions to 2046 background with increased queueing from vehicles entering the network from Opportunity Way.

A traffic signal is warranted at the Longhill Road/Longhill Gate Road/Warhill Trail intersection. The intersections meets Warrant 1A and 1B (70% threshold) under 2025 existing conditions and meets Warrant 1 (Combination Warrant – 100% threshold) under 2040 background conditions. Installation of a traffic signal should be considered at the intersection.

10.2 RECOMMENDATIONS

Installation of a traffic signal should be considered at the Longhill Road/Longhill Gate Road/Warhill Trail intersection. The southbound approach operates at LOS F and the intersection warrants the installation of a traffic signal under existing and future traffic conditions.

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Appendix A Scoping

PRE-SCOPE OF WORK MEETING FORM

Information on the Project Traffic Impact Analysis Base Assumptions

The applicant is responsible for entering the relevant information and submitting the form to VDOT and the locality no less than three (3) business days prior to the meeting. If a form is not received by this deadline, the scope of work meeting may be postponed.

Contact Information

Consultant Name: Steve Schmidt
Tele: 804.200.6502
E-mail: steve.schmidt@timmons.com

Developer/Owner Name:
Tele:
E-mail:

Project Information

Project Name: Warhill Athletic Complex Locality/County: James City County

Project Location: (Attach regional and site specific location map) The site is generally located south of Centerville Road, north of Longhill Road and west of Route 199 as shown in Figure 1.

Submission Type Comp Plan ☐ Rezoning ☐ Site Plan ☒ Subd Plat ☐

Project Description: (Including details on the land use, acreage, phasing, access location, etc. Attach additional sheet if necessary) The site is an expansion of the current Warhill Sports Complex as per the February 2023 Master Plan by James City County.

Proposed Use(s): (Check all that apply; attach additional pages as necessary) Residential ☐ Commercial ☐ Mixed Use ☒ Other ☐

Residential Uses(s)

Number of Units: _____
ITE LU Code(s): _____

Commercial Use(s)

ITE LU Code(s): _____

Square Ft or Other Variable: _____

Other Use(s)

ITE LU Code(s): 760
488
411
Independent Variable(s): Fields
Acres
S.F.

Total Peak Hour Trip Projection: Less than 100 ☐ 100 – 499 ☐ 500 – 999 ☒ 1,000 or more ☐

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

Traffic Impact Analysis Assumptions				
Study Period	Existing Year: 2024	Build-out Year: 2040		Design Year: 2042
Study Area Boundaries (Attach map)	North: Centerville Road		South: Longhill Road	
	East: SR 199		West: Centerville Road	
External Factors That Could Affect Project (Planned road improvements, other nearby developments)	Future James City County Municipal Complex and Cardinal Ridge Development			
Consistency With Comprehensive Plan (Land use, transportation plan)	Consistent with Comprehensive Plan			
Available Traffic Data (Historical, forecasts)	VDOT AADT Data, new traffic counts to be conducted, monthly park attendance volumes			
Trip Distribution (Attach sketch)	Road Name:		Road Name:	
	Road Name: see notes		Road Name:	
Annual Vehicle Trip Growth Rate:	1% consistent with other studies	Peak Period for Study (check all that apply)	☒ AM ☒ PM ☒ SAT	
		Peak Hour of the Generator		
Study Intersections and/or Road Segments (Attach additional sheets as necessary)	1.Route 612 (Longhill Road) and Warhill Trail/Longhill Gate Road		6.	
	2.Route 614 (Centerville Road) and Opportunity Way		7.	
	3.US Route 60 (Richmond Road) and Route 614 (Centerville Road)		8.	
	4.US Route 60 (Richmond Road) and Route 199 SB Ramps		9.	
	5.US Route 60 (Richmond Road) and Route 199 NB Ramps		10.	
Trip Adjustment Factors	Internal allowance: ☐ Yes ☒ No Reduction: ____% trips		Pass-by allowance: ☐ Yes ☒ No Reduction: ____% trips	
Software Methodology	☒ Synchro ☒ HCS (v.2000/+) ☐ aaSIDRA ☐ CORSIM ☐ Other ____			
Traffic Signal Proposed or Affected (Analysis software to be used, progression speed, cycle length)	2. Opportunity Way and Route 614 (Centerville Road) 3. Route 614 (Centerville Road) and Route 60 (Richmond Road) 4.Route 60 (Richmond Road) and Route 199 SB Ramps 5. Route 60 (Richmond Road) and Route 199 NB Ramps			

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.

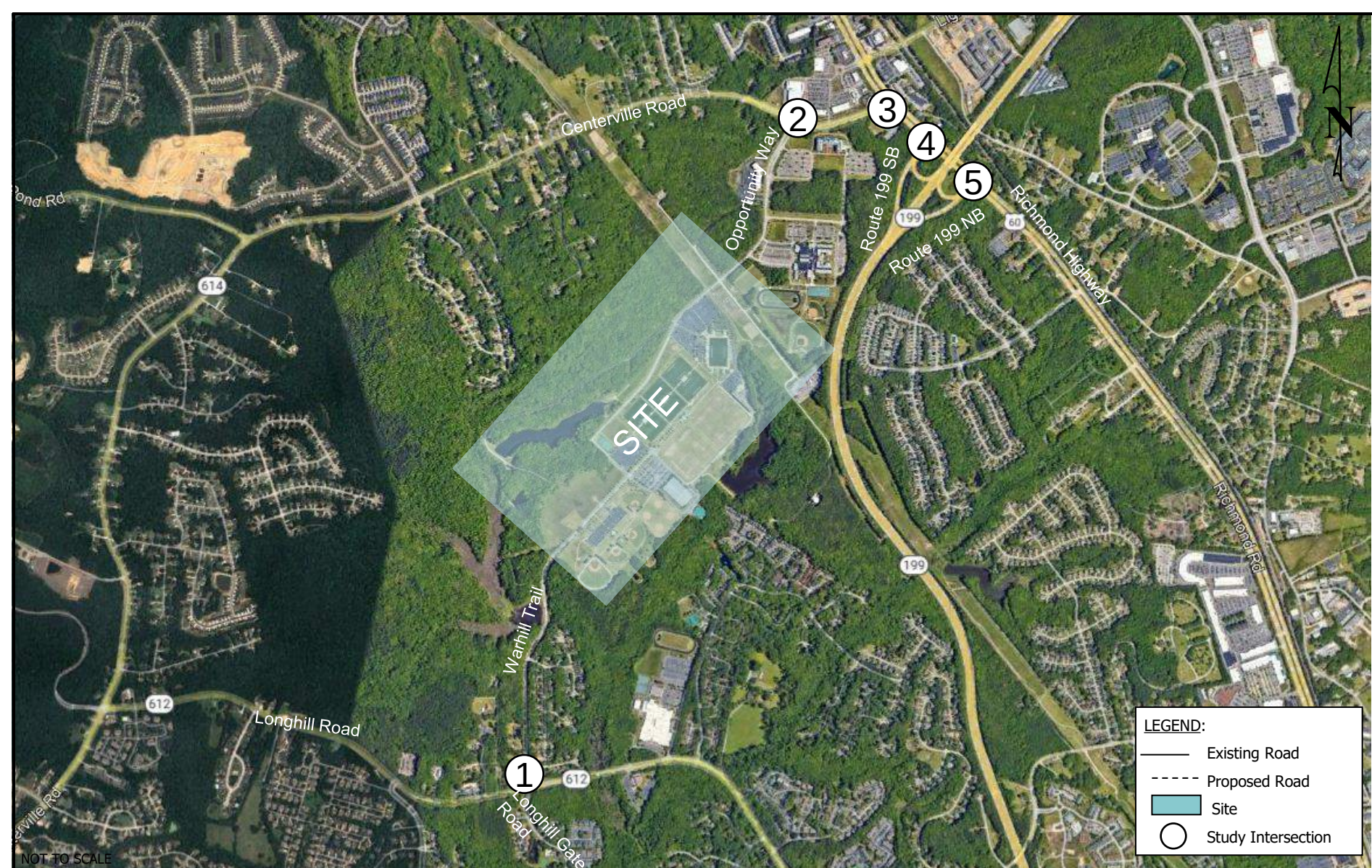
Improvement(s) Assumed or to be Considered	
Background Traffic Studies Considered	JCC Municipal Complex TIA, Cardinal Ridge TIA
Plan Submission	☒ Master Development Plan (MDP) ☐ Generalized Development Plan (GDP) ☐ Preliminary/Sketch Plan ☐ Other Plan type (Final Site, Subd. Plan)
Additional Issues to be Addressed	☒ Queuing analysis ☐ Actuation/Coordination ☐ Weaving analysis ☐ Merge analysis ☒ Bike/Ped Accommodations ☒ Intersection(s) ☐ TDM Measures ☒ Other Signal Warrant at Route 612/Warhill Trl intersection

NOTES on ASSUMPTIONS: 1. See attached for distributions and trip generation

SIGNED: _____ DATE: _____
Applicant or Consultant

PRINT NAME: _____
Applicant or Consultant

It is important for the applicant to provide sufficient information to county and VDOT staff so that questions regarding geographic scope, alternate methodology, or other issues can be answered at the scoping meeting.





Weekday Distribution

Figure
2



Buildout				Weekday						Weekend			Average Daily Trips
Land Use	Size	Units	Land Use Code	AM Peak Hour			PM Peak Hour			SAT PEAK			
				In	Out	Total	In	Out	Total	In	Out	Total	
1. ITE Trip Generation ⁽¹⁾													
Warhill Athletics Complex													
B. Softball/Baseball Complex ⁽²⁾	4	Fields	488	2	2	4	43	22	66	43	47	91	285
D. Stadium Complex ⁽³⁾	4	Fields	488	2	2	4	43	22	66	43	47	91	285
F. Multipurpose Field Complex ⁽⁴⁾	4	Fields	488	2	2	4	43	22	66	43	47	91	285
Warhill Athletics Complex Subtotal	12	Fields		7	5	12	130	67	197	130	141	272	856
Public Park ⁽⁵⁾													
Outdoor Fitness Court	0.033	Acre	411	0	0	0	0	0	0	0	0	0	0
Skate Park	0.413	Acre	411	0	0	0	0	0	0	0	0	1	0
Pool	0.308	Acre	411	0	0	0	0	0	0	0	0	1	0
Unassigned Green Space	86.90	Acre	411	1	1	2	5	4	10	85	85	170	68
Public Park Subtotal	87.654	Acre		1	1	2	5	4	10	86	86	172	68
James City County General Services Department													
Research and Development Center ⁽⁵⁾	50,000	S.F.	760	57	12	69	11	56	67	48	48	96	733
Fire Station	20,000	S.F.	575	7	2	10	3	7	10	5	5	10	96
James City County General Services Department Subtotal				64	15	79	14	63	77	53	53	105	829
Total ITE Generated Trips				72	20	92	149	135	283	269	280	549	1,753

Notes: (1) Based on the Institute of Transportation Engineers Trip Generation, 11th Edition. Assumes General Urban/Suburban land use category.

(2) 2 synthetic turf baseball fields, 2 synthetic turf softball fields. For trip generation purposes, considered a 4 field soccer complex (LU 488)

(3) Lighted Football Soccer Complex For trip generation purposes, considered a 4 field soccer complex due to size relative to number of parking spaces (LU 488)

(4) 4 multipurpose fields For trip generation purposes, considered a 4 field soccer complex (LU 488)

(5) Public Park consists of the proposed fitness court, County Skate Park, 50 meter pool, and unassigned green space with multiuse trails throughout

(6) Research and Development Center consists may consist offices and light fabrication areas, a similar use to the general service department which will consist of warehouse, a fuel island and a fleet building

NOT TO SCALE

Appendix B

Traffic Counts

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

Full Length (7 AM-7 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 7:00AM	2	0	30	0	32	0	15	51	5	0	71	0	6	1	1	0	8	0	0	112	11	0	123	0	234
7:15AM	8	1	11	0	20	0	26	72	2	0	100	0	6	2	1	0	9	0	0	56	14	0	70	0	199
7:30AM	6	1	14	0	21	0	19	58	1	0	78	0	10	1	1	0	12	0	0	73	15	0	88	0	199
7:45AM	1	1	21	0	23	0	18	63	2	0	83	0	2	1	4	0	7	0	0	93	6	0	99	0	212
Hourly Total	17	3	76	0	96	0	78	244	10	0	332	0	24	5	7	0	36	0	0	334	46	0	380	0	844
8:00AM	5	0	5	0	10	0	14	86	1	0	101	0	5	1	0	0	6	0	1	91	6	0	98	0	215
8:15AM	11	0	14	0	25	0	15	74	0	0	89	0	2	0	4	0	6	0	0	83	7	0	90	0	210
8:30AM	7	0	13	0	20	0	18	83	0	0	101	0	5	0	1	0	6	0	1	106	7	0	114	0	241
8:45AM	12	0	22	0	34	0	25	73	3	0	101	0	11	0	0	0	11	0	0	94	7	0	101	0	247
Hourly Total	35	0	54	0	89	0	72	316	4	0	392	0	23	1	5	0	29	0	2	374	27	0	403	0	913
9:00AM	12	0	11	0	23	0	11	75	0	0	86	0	1	2	0	0	3	0	0	61	5	0	66	0	178
9:15AM	3	0	7	0	10	0	16	96	0	0	112	0	2	1	0	0	3	0	2	74	10	0	86	0	211
9:30AM	5	1	9	0	15	0	15	62	3	0	80	0	6	2	1	0	9	0	2	126	8	0	136	0	240
9:45AM	5	2	11	0	18	0	14	60	3	0	77	0	1	1	1	0	3	0	2	86	5	0	93	0	191
Hourly Total	25	3	38	0	66	0	56	293	6	0	355	0	10	6	2	0	18	0	6	347	28	0	381	0	820
10:00AM	7	0	10	0	17	0	11	59	3	0	73	0	5	0	0	0	5	0	0	74	6	0	80	1	175
10:15AM	5	0	4	0	9	0	19	58	1	0	78	0	4	2	0	0	6	0	1	70	5	0	76	1	169
10:30AM	11	3	20	0	34	0	15	47	3	0	65	0	3	3	1	0	7	0	0	67	4	0	71	0	177
10:45AM	4	0	13	0	17	0	14	45	4	0	63	0	2	2	0	0	4	0	0	87	5	0	92	0	176
Hourly Total	27	3	47	0	77	0	59	209	11	0	279	0	14	7	1	0	22	0	1	298	20	0	319	2	697
11:00AM	5	0	6	1	12	0	5	65	5	0	75	0	3	0	1	0	4	0	1	53	0	0	54	0	145
11:15AM	3	1	12	0	16	0	11	66	3	0	80	0	5	1	1	0	7	0	1	71	4	0	76	2	179
11:30AM	6	2	9	0	17	0	9	67	6	0	82	0	5	2	0	0	7	0	1	72	5	0	78	0	184
11:45AM	5	2	7	0	14	0	18	54	3	0	75	0	4	0	2	0	6	0	0	69	6	0	75	0	170
Hourly Total	19	5	34	1	59	0	43	252	17	0	312	0	17	3	4	0	24	0	3	265	15	0	283	2	678
12:00PM	5	0	14	0	19	0	11	65	4	0	80	0	5	1	1	0	7	0	1	73	3	0	77	0	183
12:15PM	7	1	18	0	26	0	8	70	3	0	81	0	4	0	0	0	4	0	0	66	4	0	70	0	181
12:30PM	8	1	13	0	22	0	11	80	7	0	98	0	4	2	0	0	6	0	0	67	1	0	68	0	194
12:45PM	5	2	6	0	13	0	14	72	5	0	91	0	2	0	3	0	5	0	1	66	3	0	70	0	179
Hourly Total	25	4	51	0	80	0	44	287	19	0	350	0	15	3	4	0	22	0	2	272	11	0	285	0	737
1:00PM	3	1	15	0	19	0	9	70	2	0	81	0	2	2	2	0	6	0	0	65	3	0	68	1	174
1:15PM	6	0	7	0	13	0	16	65	6	0	87	0	3	0	0	0	3	0	0	68	5	0	73	0	176
1:30PM	2	2	14	0	18	0	14	75	5	0	94	0	1	1	1	0	3	0	2	75	2	0	79	0	194
1:45PM	3	1	12	0	16	0	11	70	5	0	86	0	4	0	3	0	7	0	0	92	4	0	96	1	205
Hourly Total	14	4	48	0	66	0	50	280	18	0	348	0	10	3	6	0	19	0	2	300	14	0	316	2	749
2:00PM	4	1	19	0	24	0	18	75	7	0	100	0	4	1	2	0	7	0	0	64	7	0	71	0	202
2:15PM	7	0	14	0	21	0	16	105	2	0	123	0	4	0	1	0	5	0	0	70	9	0	79	0	228
2:30PM	7	0	8	0	15	2	20	92	6	0	118	0	2	0	4	0	6	0	1	72	11	0	84	1	223
2:45PM	8	1	10	0	19	0	28	86	3	0	117	0	3	0	1	0	4	0	2	83	18	0	103	0	243
Hourly Total	26	2	51	0	79	2	82	358	18	0	458	0	13	1	8	0	22	0	3	289	45	0	337	1	896
3:00PM	14	0	20	0	34	1	25	99	3	0	127	0	1	0	0	0	1	0	0	96	24	0	120	0	282
3:15PM	12	0	16	0	28	0	27	99	4	0	130	0	7	3	1	0	11	0	6	77	21	0	104	0	273
3:30PM	10	1	19	0	30	0	29	97	4	0	130	0	3	2	0	0	5	0	2	65	10	0	77	0	242
3:45PM	7	0	19	0	26	0	29	91	5	0	125	0	3	0	0	0	3	0	0	59	15	0	74	0	228
Hourly Total	43	1	74	0	118	1	110	386	16	0	512	0	14	5	1	0	20	0	8	297	70	0	375	0	1025
4:00PM	4	0	11	0	15	0	8	98	4	0	110	0	5	1	0	0	6	0	2	97	7	0	106	0	237
4:15PM	4	1	15	0	20	0	39	85	6	0	130	0	5	1	1	0	7	0	5	137	19	0	161	0	318
4:30PM	30	1	27	0	58	0	43	97	5	0	145	0	2	0	0	0	2	0	3	110	21	0	134	0	339
4:45PM	12	3	33	0	48	0	37	95	3	0	135	0	5	1	4	0	10	0	1	102	13	0	116	0	309
Hourly Total	50	5	86	0	141	0	127	375	18	0	520	0	17	3	5	0	25	0	11	446	60	0	517	0	1203
5:00PM	21	3	40	0	64	0	52	99	5	0	156	0	4	2	0	0	6	0	3	89	36	0	128	0	354
5:15PM	15	3	34	0	52	0	76	116	10	0	202	0	4	2	2	0	8	0	1	64	52	0	117	0	379
5:30PM	33	2	44	0	79	0	30	86	8	0	124	0	4	1	1	0	6	0	1	88	13	0	102	0	311
5:45PM	12	1	34	0	47	0	35	84	4	0	123	0	2	0	0	0	2	0	1	77	17	0	95	0	267
Hourly Total	81	9	152	0	242	0	193	385	27	0	605	0	14	5	3	0	22	0	6	318	118	0	442	0	1311
6:00PM	18	2	29	0	49	0	26	74	3	0	103	0	3	3	1	0	7	0	1	69	21	0	91	1	250
6:15PM	14	0	32	0	46	0	39	70	6	0	115	0	2	1	1	0	4	0	1	47	29	0	77	0	242
6:30PM	27	2	42	1	72	0	42	63	3	0	108	0	4	1	0	0	5	0	0	47	16	0	63	0	248
6:45PM	21	0	41	0	62	0	40	57	6	0	103	0	4	0	1	0	5	0	0	44	18	0	62	0	232

Leg Direction	Warhill Trl Southbound							Longhill Rd Westbound							Longhill Gate Rd Northbound							Longhill Rd Eastbound							
Time	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		Int
Hourly Total	80	4	144	1	229	0		147	264	18	0	429	0		13	5	3	0	21	0		2	207	84	0	293	1		972
Total	442	43	855	2	1342	3		1061	3649	182	0	4892	0		184	47	49	0	280	0		46	3747	538	0	4331	8		10845
% Approach	32.9%	3.2%	63.7%	0.1%	-	-		21.7%	74.6%	3.7%	0%	-	-		65.7%	16.8%	17.5%	0%	-	-		1.1%	86.5%	12.4%	0%	-	-		-
% Total	4.1%	0.4%	7.9%	0%	12.4%	-		9.8%	33.6%	1.7%	0%	45.1%	-		1.7%	0.4%	0.5%	0%	2.6%	-		0.4%	34.6%	5.0%	0%	39.9%	-		-
Lights and Motorcycles	424	43	846	2	1315	-		1048	3495	175	0	4718	-		180	46	45	0	271	-		44	3602	524	0	4170	-		10474
% Lights and Motorcycles	95.9%	100%	98.9%	100%	98.0%	-		98.8%	95.8%	96.2%	0%	96.4%	-		97.8%	97.9%	91.8%	0%	96.8%	-		95.7%	96.1%	97.4%	0%	96.3%	-		96.6%
Heavy	18	0	9	0	27	-		13	154	7	0	174	-		4	1	4	0	9	-		2	145	14	0	161	-		371
% Heavy	4.1%	0%	1.1%	0%	2.0%	-		1.2%	4.2%	3.8%	0%	3.6%	-		2.2%	2.1%	8.2%	0%	3.2%	-		4.3%	3.9%	2.6%	0%	3.7%	-		3.4%
Pedestrians	-	-	-	-	-	3		-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	8		
% Pedestrians	-	-	-	-	-	100%		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	100%		-
Bicycles on Crosswalk	-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	0		
% Bicycles on Crosswalk	-	-	-	-	-	0%		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	0%		-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

Full Length (7 AM-7 PM)

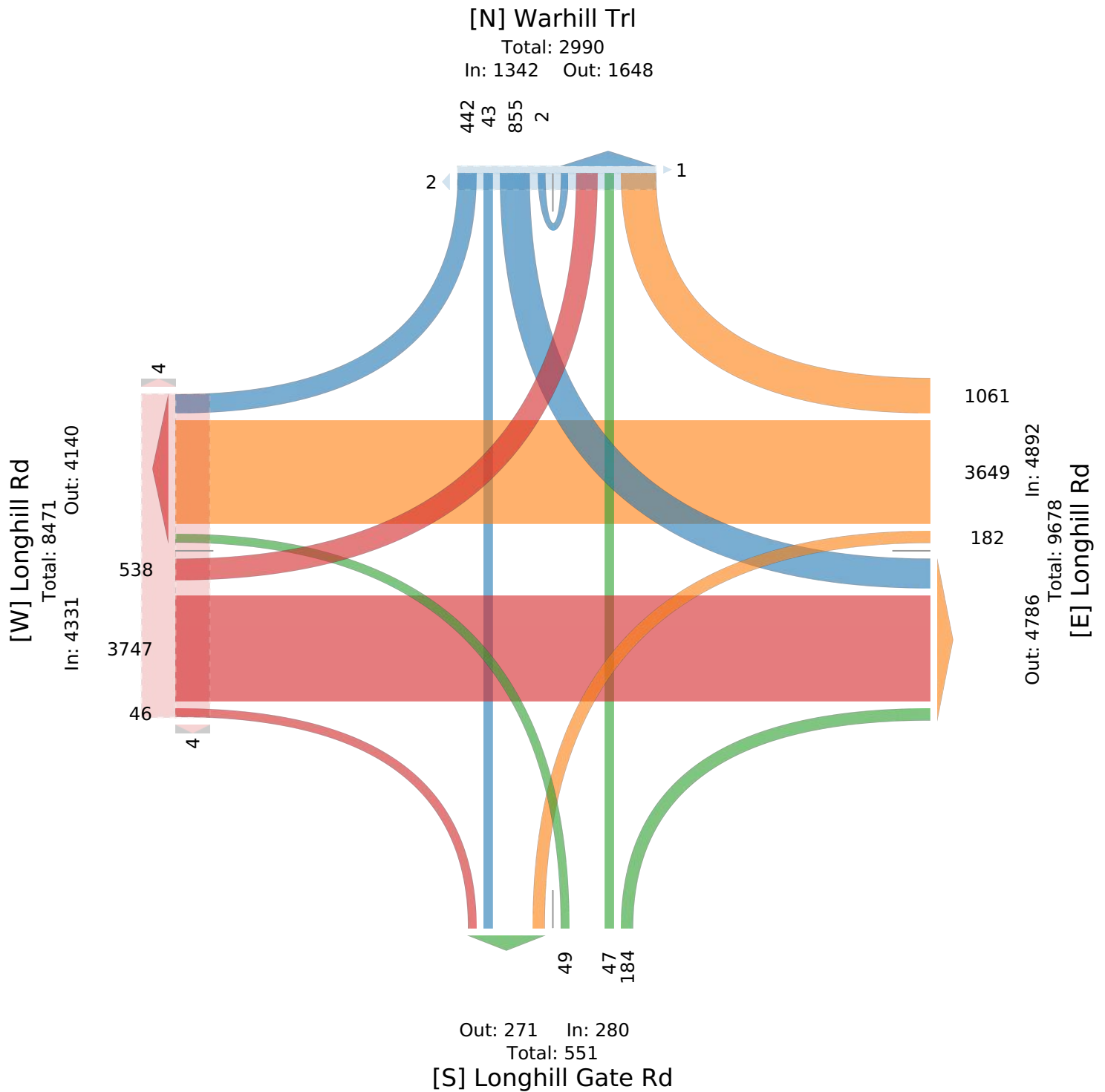
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

AM Peak (8 AM - 9 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 8:00AM	5	0	5	0	10	0	14	86	1	0	101	0	5	1	0	0	6	0	1	91	6	0	98	0	215
8:15AM	11	0	14	0	25	0	15	74	0	0	89	0	2	0	4	0	6	0	0	83	7	0	90	0	210
8:30AM	7	0	13	0	20	0	18	83	0	0	101	0	5	0	1	0	6	0	1	106	7	0	114	0	241
8:45AM	12	0	22	0	34	0	25	73	3	0	101	0	11	0	0	0	11	0	0	94	7	0	101	0	247
Total	35	0	54	0	89	0	72	316	4	0	392	0	23	1	5	0	29	0	2	374	27	0	403	0	913
% Approach	39.3%	0%	60.7%	0%	-	-	18.4%	80.6%	1.0%	0%	-	-	79.3%	3.4%	17.2%	0%	-	-	0.5%	92.8%	6.7%	0%	-	-	-
% Total	3.8%	0%	5.9%	0%	9.7%	-	7.9%	34.6%	0.4%	0%	42.9%	-	2.5%	0.1%	0.5%	0%	3.2%	-	0.2%	41.0%	3.0%	0%	44.1%	-	-
PHF	0.729	-	0.614	-	0.654	-	0.720	0.919	0.333	-	0.970	-	0.523	0.250	0.313	-	0.659	-	0.500	0.882	0.964	-	0.884	-	0.924
Lights and Motorcycles	34	0	51	0	85	-	69	299	4	0	372	-	23	1	5	0	29	-	2	363	26	0	391	-	877
% Lights and Motorcycles	97.1%	0%	94.4%	0%	95.5%	-	95.8%	94.6%	100%	0%	94.9%	-	100%	100%	100%	0%	100%	-	100%	97.1%	96.3%	0%	97.0%	-	96.1%
Heavy	1	0	3	0	4	-	3	17	0	0	20	-	0	0	0	0	0	-	0	11	1	0	12	-	36
% Heavy	2.9%	0%	5.6%	0%	4.5%	-	4.2%	5.4%	0%	0%	5.1%	-	0%	0%	0%	0%	0%	-	0%	2.9%	3.7%	0%	3.0%	-	3.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

AM Peak (8 AM - 9 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

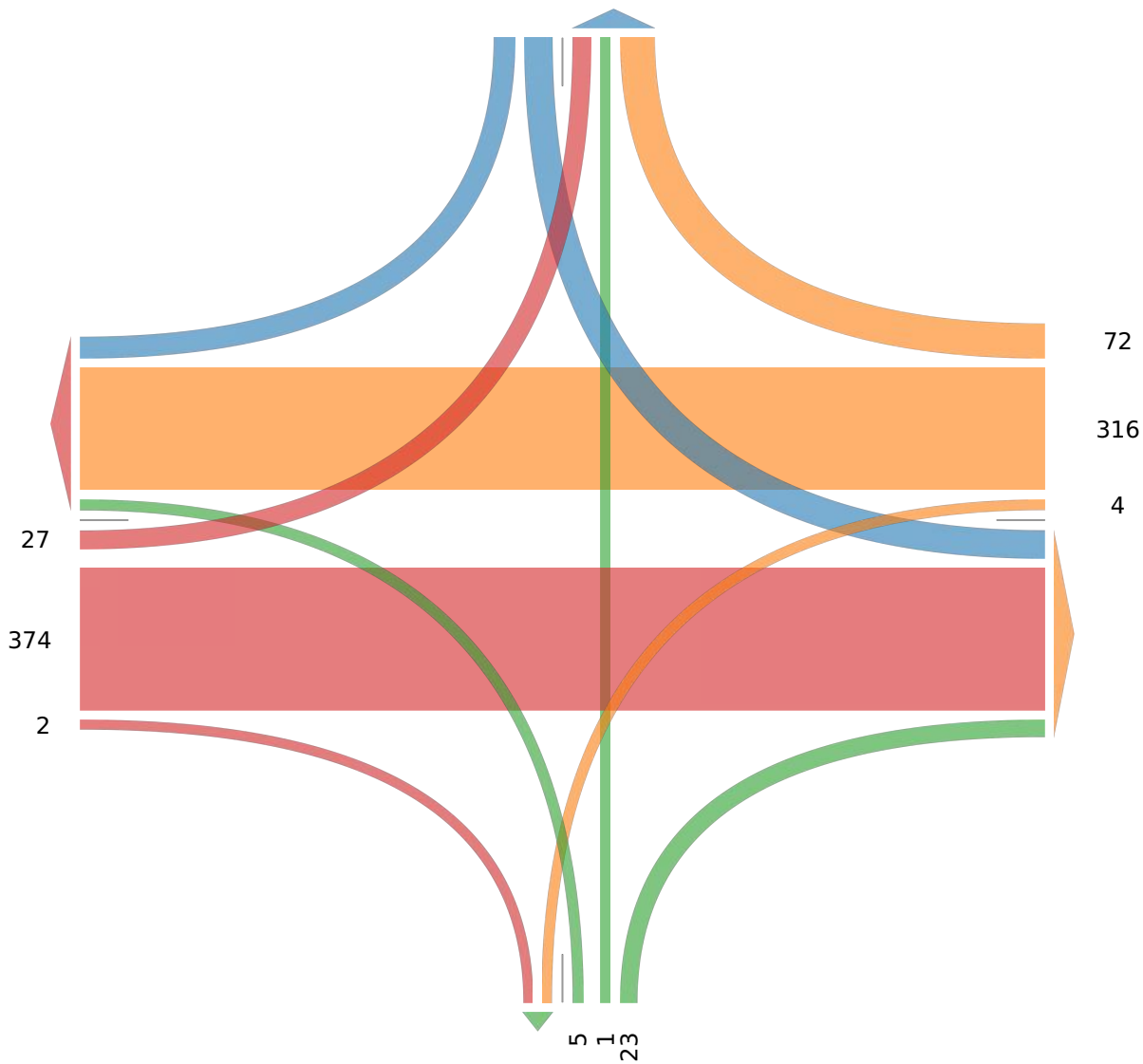
[N] Warhill Trl

Total: 189
In: 89 Out: 100

35 54

[W] Longhill Rd

Total: 759
In: 403 Out: 356



Out: 6 In: 29
Total: 35
[S] Longhill Gate Rd

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

Midday Peak (1 PM - 2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345,

Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 1:00PM	3	1	15	0	19	0	9	70	2	0	81	0	2	2	2	0	6	0	0	65	3	0	68	1	174
1:15PM	6	0	7	0	13	0	16	65	6	0	87	0	3	0	0	0	3	0	0	68	5	0	73	0	176
1:30PM	2	2	14	0	18	0	14	75	5	0	94	0	1	1	1	0	3	0	2	75	2	0	79	0	194
1:45PM	3	1	12	0	16	0	11	70	5	0	86	0	4	0	3	0	7	0	0	92	4	0	96	1	205
Total	14	4	48	0	66	0	50	280	18	0	348	0	10	3	6	0	19	0	2	300	14	0	316	2	749
% Approach	21.2%	6.1%	72.7%	0%	-	-	14.4%	80.5%	5.2%	0%	-	-	52.6%	15.8%	31.6%	0%	-	-	0.6%	94.9%	4.4%	0%	-	-	-
% Total	1.9%	0.5%	6.4%	0%	8.8%	-	6.7%	37.4%	2.4%	0%	46.5%	-	1.3%	0.4%	0.8%	0%	2.5%	-	0.3%	40.1%	1.9%	0%	42.2%	-	-
PHF	0.583	0.500	0.800	-	0.868	-	0.781	0.933	0.750	-	0.926	-	0.625	0.375	0.500	-	0.679	-	0.250	0.815	0.700	-	0.823	-	0.913
Lights and Motorcycles	12	4	47	0	63	-	50	268	15	0	333	-	10	3	5	0	18	-	2	285	12	0	299	-	713
% Lights and Motorcycles	85.7%	100%	97.9%	0%	95.5%	-	100%	95.7%	83.3%	0%	95.7%	-	100%	100%	83.3%	0%	94.7%	-	100%	95.0%	85.7%	0%	94.6%	-	95.2%
Heavy	2	0	1	0	3	-	0	12	3	0	15	-	0	0	1	0	1	-	0	15	2	0	17	-	36
% Heavy	14.3%	0%	2.1%	0%	4.5%	-	0%	4.3%	16.7%	0%	4.3%	-	0%	0%	16.7%	0%	5.3%	-	0%	5.0%	14.3%	0%	5.4%	-	4.8%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

Midday Peak (1 PM - 2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



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[N] Warhill Trl

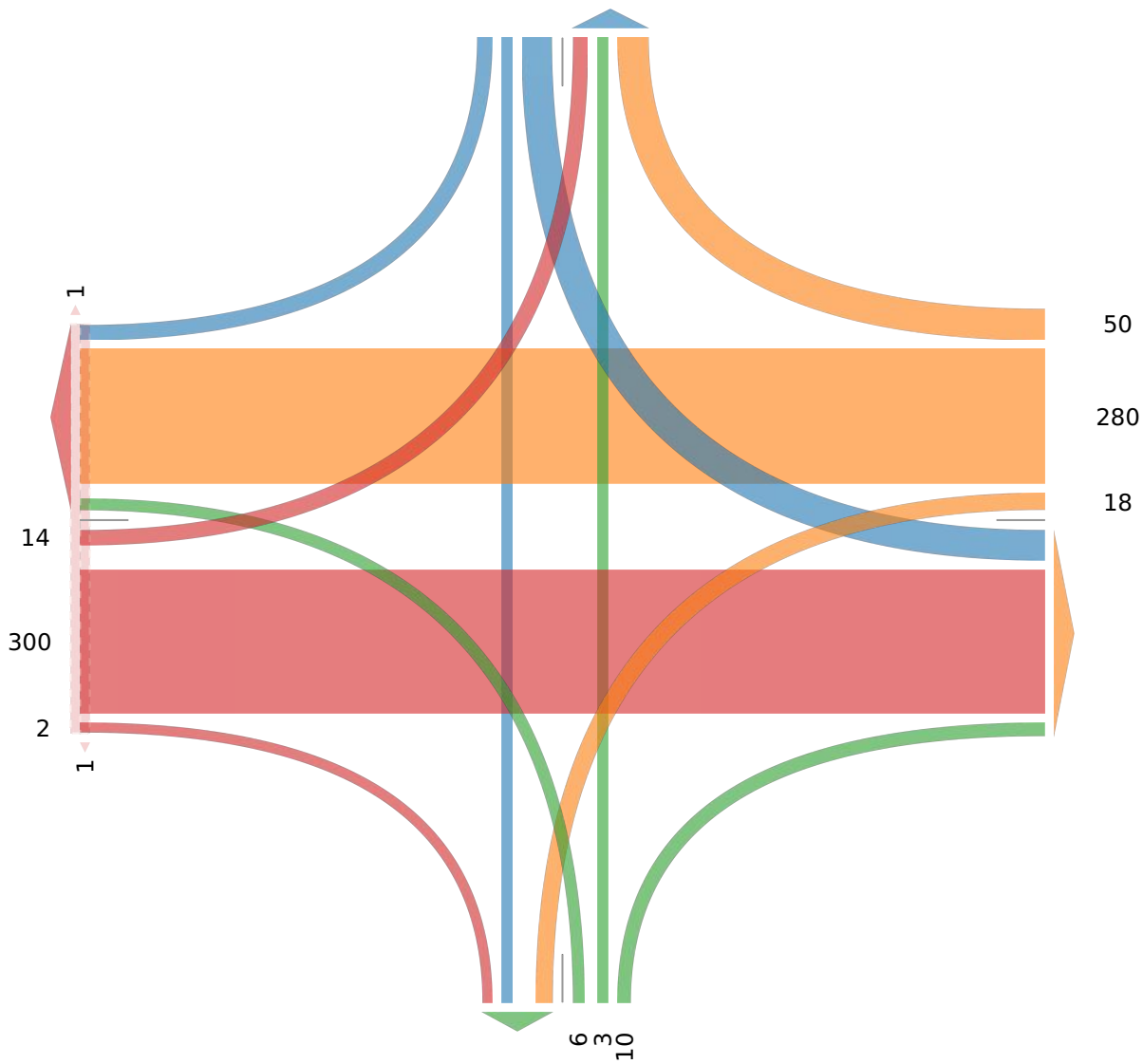
Total: 133

In: 66 Out: 67

14 4 48

[W] Longhill Rd

Total: 616
In: 316 Out: 300



Out: 24 In: 19
Total: 43
[S] Longhill Gate Rd

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 4:30PM	30	1	27	0	58	0	43	97	5	0	145	0	2	0	0	0	2	0	3	110	21	0	134	0	339
4:45PM	12	3	33	0	48	0	37	95	3	0	135	0	5	1	4	0	10	0	1	102	13	0	116	0	309
5:00PM	21	3	40	0	64	0	52	99	5	0	156	0	4	2	0	0	6	0	3	89	36	0	128	0	354
5:15PM	15	3	34	0	52	0	76	116	10	0	202	0	4	2	2	0	8	0	1	64	52	0	117	0	379
Total	78	10	134	0	222	0	208	407	23	0	638	0	15	5	6	0	26	0	8	365	122	0	495	0	1381
% Approach	35.1%	4.5%	60.4%	0%	-	-	32.6%	63.8%	3.6%	0%	-	-	57.7%	19.2%	23.1%	0%	-	-	1.6%	73.7%	24.6%	0%	-	-	-
% Total	5.6%	0.7%	9.7%	0%	16.1%	-	15.1%	29.5%	1.7%	0%	46.2%	-	1.1%	0.4%	0.4%	0%	1.9%	-	0.6%	26.4%	8.8%	0%	35.8%	-	-
PHF	0.650	0.833	0.838	-	0.867	-	0.684	0.877	0.575	-	0.790	-	0.750	0.625	0.375	-	0.650	-	0.667	0.830	0.587	-	0.924	-	0.911
Lights and Motorcycles	77	10	133	0	220	-	206	393	23	0	622	-	15	5	6	0	26	-	8	351	122	0	481	-	1349
% Lights and Motorcycles	98.7%	100%	99.3%	0%	99.1%	-	99.0%	96.6%	100%	0%	97.5%	-	100%	100%	100%	0%	100%	-	100%	96.2%	100%	0%	97.2%	-	97.7%
Heavy	1	0	1	0	2	-	2	14	0	0	16	-	0	0	0	0	0	-	0	14	0	0	14	-	32
% Heavy	1.3%	0%	0.7%	0%	0.9%	-	1.0%	3.4%	0%	0%	2.5%	-	0%	0%	0%	0%	0%	-	0%	3.8%	0%	0%	2.8%	-	2.3%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275068, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Warhill Trl

Total: 557

In: 222 Out: 335

78
10
134

[W] Longhill Rd

Total: 986
In: 495 Out: 491

122

365

8

208

407

23

Out: 514 In: 638

Total: 1152

[E] Longhill Rd

Out: 41 In: 26
Total: 67

[S] Longhill Gate Rd



1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

Full Length (7 AM-7 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound							Longhill Rd Westbound							Longhill Gate Rd Northbound							Longhill Rd Eastbound							
Time	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*	Int	
2025-03-08 7:00AM	2	0	7	0	9	1		9	19	0	0	28	0		1	0	0	0	1	0		0	24	2	0	26	0		64
7:15AM	3	0	7	0	10	0		11	23	1	0	35	0		1	1	0	0	2	0		1	30	6	0	37	0		84
7:30AM	4	0	5	0	9	0		14	18	0	0	32	0		1	2	1	0	4	0		0	48	4	0	52	0		97
7:45AM	2	0	7	0	9	0		45	35	0	0	80	0		4	0	0	0	4	0		0	24	11	0	35	0		128
Hourly Total	11	0	26	0	37	1		79	95	1	0	175	0		7	3	1	0	11	0		1	126	23	0	150	0		373
8:00AM	3	1	5	0	9	0		55	27	0	0	82	0		3	1	0	0	4	0		1	32	12	0	45	0		140
8:15AM	2	1	5	0	8	0		32	31	0	0	63	0		5	1	1	0	7	0		1	46	16	0	63	0		141
8:30AM	3	0	8	0	11	0		25	32	1	0	58	0		4	2	2	0	8	0		0	52	13	0	65	0		142
8:45AM	10	0	22	0	32	0		25	37	3	0	65	0		3	0	1	0	4	0		0	65	22	0	87	0		188
Hourly Total	18	2	40	0	60	0		137	127	4	0	268	0		15	4	4	0	23	0		2	195	63	0	260	0		611
9:00AM	4	0	13	0	17	0		24	38	3	0	65	0		3	5	0	0	8	0		1	47	9	0	57	0		147
9:15AM	7	0	12	0	19	0		47	35	2	0	84	0		3	1	1	0	5	0		0	42	12	0	54	0		162
9:30AM	14	0	22	0	36	0		74	47	1	0	122	0		4	0	0	0	4	0		1	60	14	0	75	0		237
9:45AM	11	1	25	0	37	0		52	52	3	0	107	0		8	1	2	0	11	0		1	67	39	0	107	0		262
Hourly Total	36	1	72	0	109	0		197	172	9	0	378	0		18	7	3	0	28	0		3	216	74	0	293	0		808
10:00AM	17	2	18	0	37	0		24	62	0	0	86	0		6	2	0	0	8	0		0	50	11	0	61	0		192
10:15AM	9	0	26	0	35	0		27	48	1	0	76	0		3	0	0	0	3	0		2	78	11	0	91	0		205
10:30AM	8	1	67	1	77	0		30	48	2	0	80	0		7	2	1	0	10	0		3	72	16	0	91	2		258
10:45AM	9	1	35	0	45	0		88	70	6	0	164	0		6	0	0	0	6	0		0	70	30	0	100	0		315
Hourly Total	43	4	146	1	194	0		169	228	9	0	406	0		22	4	1	0	27	0		5	270	68	0	343	2		970
11:00AM	16	0	26	0	42	0		35	55	8	0	98	0		6	1	1	0	8	0		2	70	10	0	82	0		230
11:15AM	15	3	35	0	53	0		26	71	7	0	104	0		9	2	3	0	14	0		0	76	13	0	89	2		260
11:30AM	10	0	41	0	51	0		17	71	3	0	91	0		3	0	1	0	4	0		2	68	3	0	73	0		219
11:45AM	7	0	23	0	30	0		23	77	2	0	102	0		4	1	0	0	5	0		3	83	10	0	96	0		233
Hourly Total	48	3	125	0	176	0		101	274	20	0	395	0		22	4	5	0	31	0		7	297	36	0	340	2		942
12:00PM	18	0	73	3	94	0		13	77	3	0	93	0		5	0	1	0	6	0		2	70	8	0	80	0		273
12:15PM	12	1	22	0	35	0		24	60	2	0	86	0		7	0	2	0	9	0		2	70	6	0	78	0		208
12:30PM	12	2	24	0	38	0		33	62	3	0	98	0		4	2	1	0	7	0		3	68	9	0	80	0		223
12:45PM	8	1	28	0	37	0		40	64	3	0	107	0		8	0	2	0	10	0		2	63	8	0	73	0		227
Hourly Total	50	4	147	3	204	0		110	263	11	0	384	0		24	2	6	0	32	0		9	271	31	0	311	0		931
1:00PM	6	1	16	0	23	0		25	64	2	0	91	0		3	1	1	0	5	0		1	64	2	0	67	0		186
1:15PM	9	1	12	0	22	0		20	70	2	0	92	0		5	0	2	0	7	0		2	60	5	0	67	0		188
1:30PM	11	3	63	0	77	0		21	79	1	0	101	0		2	5	0	0	7	0		1	73	4	0	78	0		263
1:45PM	4	2	14	0	20	0		26	77	4	0	107	0		2	2	1	0	5	0		1	83	7	0	91	0		223
Hourly Total	30	7	105	0	142	0		92	290	9	0	391	0		12	8	4	0	24	0		5	280	18	0	303	0		860
2:00PM	7	1	16	0	24	0		51	73	5	0	129	0		5	0	1	0	6	0		3	87	11	0	101	0		260
2:15PM	2	0	8	0	10	0		35	69	6	0	110	0		1	0	1	0	2	0		0	65	6	0	71	0		193
2:30PM	5	2	14	0	21	0		18	56	7	0	81	0		1	3	1	0	5	0		2	72	3	0	77	0		184
2:45PM	5	2	26	0	33	0		20	55	4	0	79	0		1	1	3	0	5	0		0	62	5	0	67	1		184
Hourly Total	19	5	64	0	88	0		124	253	22	0	399	0		8	4	6	0	18	0		5	286	25	0	316	1		821
3:00PM	3	0	64	0	67	0		13	76	1	0	90	0		2	1	0	0	3	0		1	71	3	0	75	0		235
3:15PM	2	1	23	1	27	0		21	58	6	0	85	0		3	0	2	0	5	0		1	82	6	0	89	0		206
3:30PM	8	1	19	0	28	0		18	66	4	0	88	0		4	0	1	0	5	0		1	69	2	0	72	0		193
3:45PM	1	2	17	0	20	0		22	64	4	0	90	0		2	2	2	0	6	0		1	64	6	0	71	2		187
Hourly Total	14	4	123	1	142	0		74	264	15	0	353	0		11	3	5	0	19	0		4	286	17	0	307	2		821
4:00PM	6	0	16	0	22	0		30	63	6	0	99	0		2	1	2	0	5	0		1	64	4	0	69	0		195
4:15PM	9	0	21	0	30	0		20	64	7	0	91	0		3	3	1	0	7	0		1	57	1	0	59	1		187
4:30PM	8	0	68	0	76	0		11	70	3	0	84	0		5	1	0	0	6	0		1	64	4	0	69	0		235
4:45PM	5	2	8	0	15	0		15	60	4	0	79	0		5	0	3	0	8	1		1	88	0	0	89	0		191
Hourly Total	28	2	113	0	143	0		76	257	20	0	353	0		15	5	6	0	26	1		4	273	9	0	286	1		808
5:00PM	3	0	11	0	14	0		15	65	4	0	84	0		7	0	1	0	8	0		0	74	3	0	77	1		183
5:15PM	4	0	18	0	22	0		9	58	4	0	71	0		3	2	1	0	6	0		1	77	3	0	81	0		180
5:30PM	1	0	4	0	5	0		5	65	5	0	75	0		1	5	2	0	8	0		0	58	1	0	59	0		

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
Hourly Total	19	2	104	0	125	0	34	280	18	0	332	0	8	1	4	0	13	0	5	195	10	0	210	0	680
Total	328	34	1109	5	1476	1	1230	2762	155	0	4147	0	175	53	49	0	277	1	52	2961	385	0	3398	9	9298
% Approach	22.2%	2.3%	75.1%	0.3%	-	-	29.7%	66.6%	3.7%	0%	-	-	63.2%	19.1%	17.7%	0%	-	-	1.5%	87.1%	11.3%	0%	-	-	-
% Total	3.5%	0.4%	11.9%	0.1%	15.9%	-	13.2%	29.7%	1.7%	0%	44.6%	-	1.9%	0.6%	0.5%	0%	3.0%	-	0.6%	31.8%	4.1%	0%	36.5%	-	-
Lights and Motorcycles	328	33	1106	5	1472	-	1229	2727	155	0	4111	-	174	53	49	0	276	-	52	2931	384	0	3367	-	9226
% Lights and Motorcycles	100%	97.1%	99.7%	100%	99.7%	-	99.9%	98.7%	100%	0%	99.1%	-	99.4%	100%	100%	0%	99.6%	-	100%	99.0%	99.7%	0%	99.1%	-	99.2%
Heavy	0	1	3	0	4	-	1	35	0	0	36	-	1	0	0	0	1	-	0	30	1	0	31	-	72
% Heavy	0%	2.9%	0.3%	0%	0.3%	-	0.1%	1.3%	0%	0%	0.9%	-	0.6%	0%	0%	0%	0.4%	-	0%	1.0%	0.3%	0%	0.9%	-	0.8%
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	9	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

Full Length (7 AM-7 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Warhill Trl

Total: 3149

In: 1476 Out: 1673

328
34
1109
5

[W] Longhill Rd

Total: 6537

Out: 3139

In: 3398

385
2961

52

4

1230

2762

155

In: 4147

Out: 4245

Total: 8392

[E] Longhill Rd

Out: 241 In: 277

Total: 518

[S] Longhill Gate Rd

49
53
175

1

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 10:00AM	17	2	18	0	37	0	24	62	0	0	86	0	6	2	0	0	8	0	0	50	11	0	61	0	192
10:15AM	9	0	26	0	35	0	27	48	1	0	76	0	3	0	0	0	3	0	2	78	11	0	91	0	205
10:30AM	8	1	67	1	77	0	30	48	2	0	80	0	7	2	1	0	10	0	3	72	16	0	91	2	258
10:45AM	9	1	35	0	45	0	88	70	6	0	164	0	6	0	0	0	6	0	0	70	30	0	100	0	315
Total	43	4	146	1	194	0	169	228	9	0	406	0	22	4	1	0	27	0	5	270	68	0	343	2	970
% Approach	22.2%	2.1%	75.3%	0.5%	-	-	41.6%	56.2%	2.2%	0%	-	-	81.5%	14.8%	3.7%	0%	-	-	1.5%	78.7%	19.8%	0%	-	-	-
% Total	4.4%	0.4%	15.1%	0.1%	20.0%	-	17.4%	23.5%	0.9%	0%	41.9%	-	2.3%	0.4%	0.1%	0%	2.8%	-	0.5%	27.8%	7.0%	0%	35.4%	-	-
PHF	0.632	0.500	0.545	0.250	0.630	-	0.480	0.814	0.375	-	0.619	-	0.786	0.500	0.250	-	0.675	-	0.417	0.865	0.567	-	0.858	-	0.770
Lights and Motorcycles	43	3	146	1	193	-	169	227	9	0	405	-	22	4	1	0	27	-	5	268	67	0	340	-	965
% Lights and Motorcycles	100%	75.0%	100%	100%	99.5%	-	100%	99.6%	100%	0%	99.8%	-	100%	100%	100%	0%	100%	-	100%	99.3%	98.5%	0%	99.1%	-	99.5%
Heavy	0	1	0	0	1	-	0	1	0	0	1	-	0	0	0	0	0	-	0	2	1	0	3	-	5
% Heavy	0%	25.0%	0%	0%	0.5%	-	0%	0.4%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0%	0.7%	1.5%	0%	0.9%	-	0.5%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Warhill Trl

Total: 436

In: 194

Out: 242

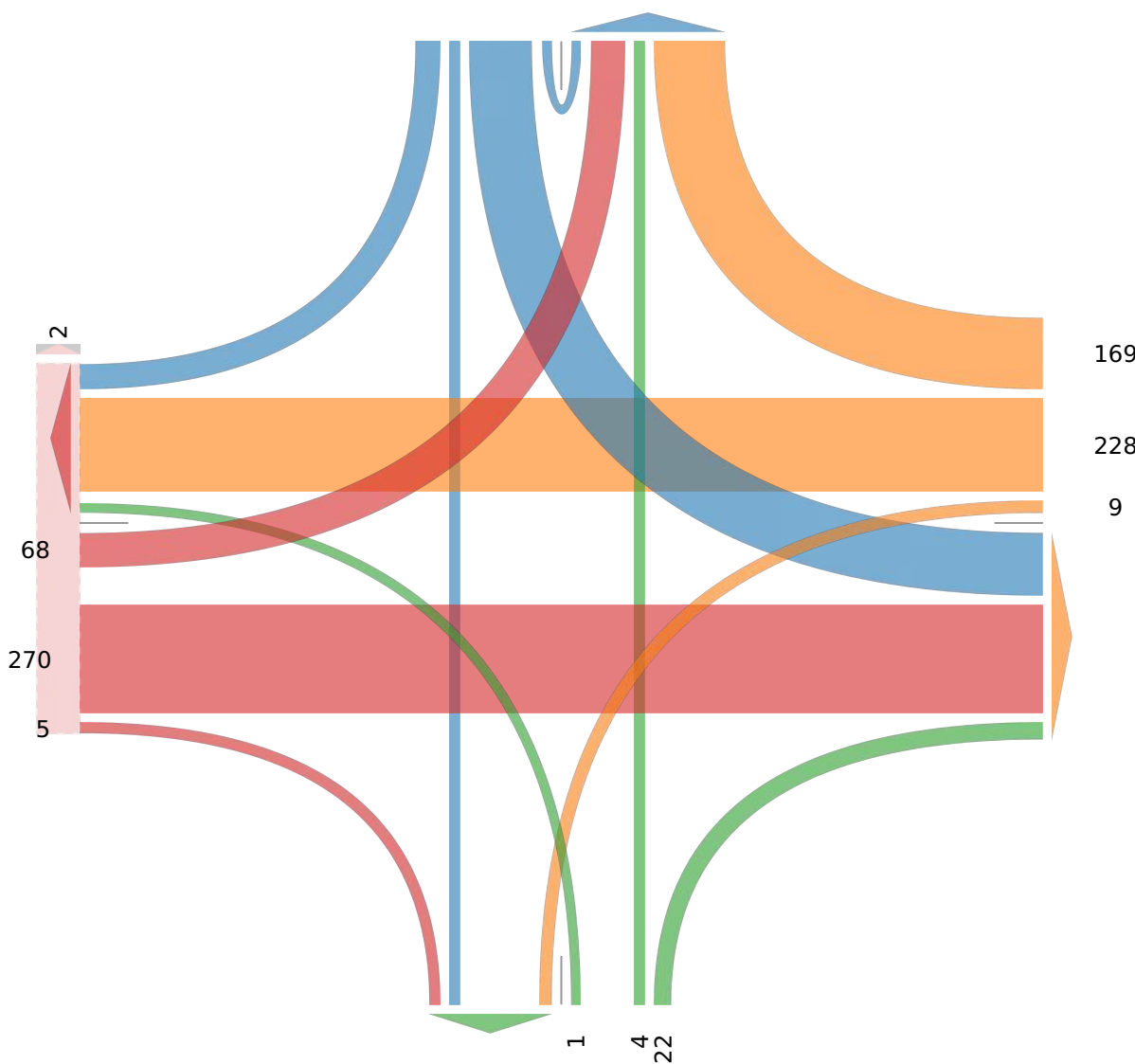
43
4
146
1

[W] Longhill Rd

Total: 615

Out: 272

In: 343



Out: 18

In: 27

Total: 45

[S] Longhill Gate Rd

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

Midday Peak (WKND) (11:15 AM - 12:15 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345,

Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 11:15AM	15	3	35	0	53	0	26	71	7	0	104	0	9	2	3	0	14	0	0	76	13	0	89	2	260
11:30AM	10	0	41	0	51	0	17	71	3	0	91	0	3	0	1	0	4	0	2	68	3	0	73	0	219
11:45AM	7	0	23	0	30	0	23	77	2	0	102	0	4	1	0	0	5	0	3	83	10	0	96	0	233
12:00PM	18	0	73	3	94	0	13	77	3	0	93	0	5	0	1	0	6	0	2	70	8	0	80	0	273
Total	50	3	172	3	228	0	79	296	15	0	390	0	21	3	5	0	29	0	7	297	34	0	338	2	985
% Approach	21.9%	1.3%	75.4%	1.3%	-	-	20.3%	75.9%	3.8%	0%	-	-	72.4%	10.3%	17.2%	0%	-	-	2.1%	87.9%	10.1%	0%	-	-	-
% Total	5.1%	0.3%	17.5%	0.3%	23.1%	-	8.0%	30.1%	1.5%	0%	39.6%	-	2.1%	0.3%	0.5%	0%	2.9%	-	0.7%	30.2%	3.5%	0%	34.3%	-	-
PHF	0.694	0.250	0.589	0.250	0.606	-	0.760	0.961	0.536	-	0.938	-	0.583	0.375	0.417	-	0.518	-	0.583	0.895	0.654	-	0.880	-	0.902
Lights and Motorcycles	50	3	171	3	227	-	79	295	15	0	389	-	21	3	5	0	29	-	7	296	34	0	337	-	982
% Lights and Motorcycles	100%	100%	99.4%	100%	99.6%	-	100%	99.7%	100%	0%	99.7%	-	100%	100%	100%	0%	100%	-	100%	99.7%	100%	0%	99.7%	-	99.7%
Heavy	0	0	1	0	1	-	0	1	0	0	1	-	0	0	0	0	0	-	0	1	0	0	1	-	3
% Heavy	0%	0%	0.6%	0%	0.4%	-	0%	0.3%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.3%	-	0.3%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

Midday Peak (WKND) (11:15 AM - 12:15 PM) - Overall Peak Hour

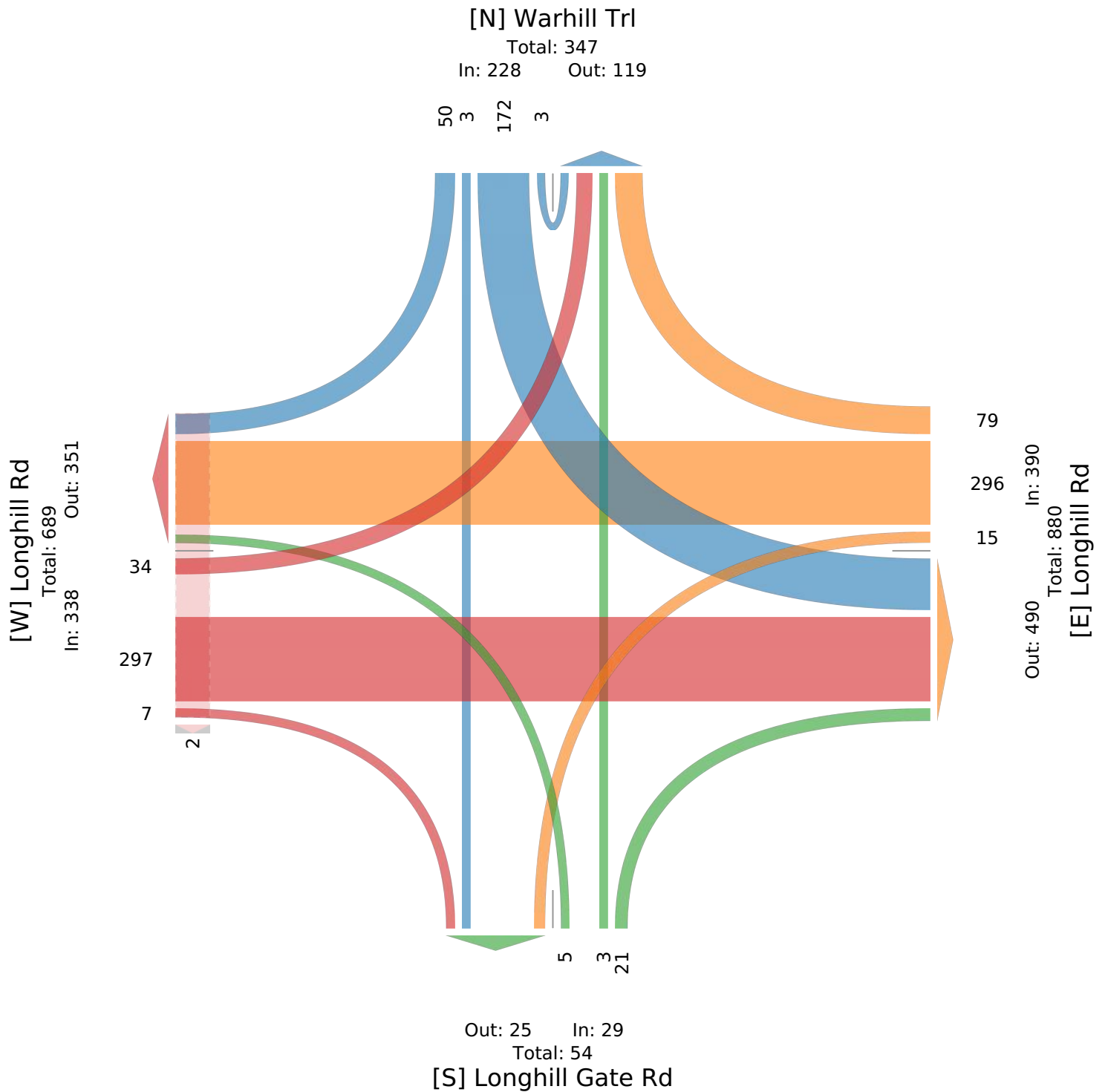
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

PM Peak (WKND) (1:30 PM - 2:30 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Warhill Trl Southbound						Longhill Rd Westbound						Longhill Gate Rd Northbound						Longhill Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 1:30PM	11	3	63	0	77	0	21	79	1	0	101	0	2	5	0	0	7	0	1	73	4	0	78	0	263
1:45PM	4	2	14	0	20	0	26	77	4	0	107	0	2	2	1	0	5	0	1	83	7	0	91	0	223
2:00PM	7	1	16	0	24	0	51	73	5	0	129	0	5	0	1	0	6	0	3	87	11	0	101	0	260
2:15PM	2	0	8	0	10	0	35	69	6	0	110	0	1	0	1	0	2	0	0	65	6	0	71	0	193
Total	24	6	101	0	131	0	133	298	16	0	447	0	10	7	3	0	20	0	5	308	28	0	341	0	939
% Approach	18.3%	4.6%	77.1%	0%	-	-	29.8%	66.7%	3.6%	0%	-	-	50.0%	35.0%	15.0%	0%	-	-	1.5%	90.3%	8.2%	0%	-	-	-
% Total	2.6%	0.6%	10.8%	0%	14.0%	-	14.2%	31.7%	1.7%	0%	47.6%	-	1.1%	0.7%	0.3%	0%	2.1%	-	0.5%	32.8%	3.0%	0%	36.3%	-	-
PHF	0.545	0.500	0.401	-	0.425	-	0.652	0.943	0.667	-	0.866	-	0.500	0.350	0.750	-	0.714	-	0.417	0.885	0.636	-	0.844	-	0.893
Lights and Motorcycles	24	6	101	0	131	-	132	293	16	0	441	-	10	7	3	0	20	-	5	304	28	0	337	-	929
% Lights and Motorcycles	100%	100%	100%	0%	100%	-	99.2%	98.3%	100%	0%	98.7%	-	100%	100%	100%	0%	100%	-	100%	98.7%	100%	0%	98.8%	-	98.9%
Heavy	0	0	0	0	0	-	1	5	0	0	6	-	0	0	0	0	0	-	0	4	0	0	4	-	10
% Heavy	0%	0%	0%	0%	0%	-	0.8%	1.7%	0%	0%	1.3%	-	0%	0%	0%	0%	0%	-	0%	1.3%	0%	0%	1.2%	-	1.1%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1-Longhill Rd & Warhill Trl-Longhill Gate Rd... - TMC

Sat Mar 8, 2025

PM Peak (WKND) (1:30 PM - 2:30 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275073, Location: 37.313455, -76.769947



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Warhill Trl

Total: 299

In: 131 Out: 168

24
6
101

[W] Longhill Rd

Total: 666
In: 341 Out: 325

28

308

5

133

298

16

Out: 419
Total: 866
In: 447

[E] Longhill Rd

Out: 27 In: 20
Total: 47

[S] Longhill Gate Rd

3
7
10

2-Centerville Rd & Opportunity War (VA25-002... - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275069, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345, Jacksonville Beach, FL, 32250, US

Leg Direction	Shopping Center Ent Southbound						Centerville Rd Westbound						Opportunity Way Northbound						Centerville Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 7:00AM	3	44	0	0	47	0	0	44	207	0	251	2	125	19	20	0	164	0	44	80	12	0	136	0	598
7:15AM	7	6	2	0	15	0	2	47	56	0	105	0	105	10	17	0	132	0	8	106	17	0	131	0	383
7:30AM	6	2	1	0	9	0	2	64	24	0	90	0	39	10	5	0	54	0	8	105	12	0	125	0	278
7:45AM	2	3	2	0	7	0	3	81	27	0	111	0	10	4	0	0	14	0	1	120	9	0	130	0	262
Hourly Total	18	55	5	0	78	0	7	236	314	0	557	2	279	43	42	0	364	0	61	411	50	0	522	0	1521
8:00AM	1	1	2	0	4	0	1	70	32	1	104	0	14	6	2	0	22	0	2	127	18	0	147	0	277
8:15AM	4	2	1	0	7	0	0	82	32	0	114	0	16	4	3	0	23	0	5	110	21	0	136	0	280
8:30AM	6	2	4	0	12	0	3	77	37	1	118	0	17	4	2	0	23	0	5	104	10	0	119	0	272
8:45AM	7	2	5	0	14	0	2	76	65	0	143	0	31	7	3	0	41	0	4	93	21	0	118	0	316
Hourly Total	18	7	12	0	37	0	6	305	166	2	479	0	78	21	10	0	109	0	16	434	70	0	520	0	1145
4:00PM	16	5	1	0	22	0	8	126	60	3	197	13	66	14	2	0	82	0	6	88	24	0	118	0	419
4:15PM	12	6	15	0	33	0	2	131	52	2	187	5	45	5	6	0	56	0	6	99	18	0	123	0	399
4:30PM	21	10	11	0	42	0	7	141	61	1	210	8	79	19	9	0	107	0	11	98	35	0	144	0	503
4:45PM	19	8	7	0	34	0	6	149	63	0	218	6	66	7	4	0	77	0	7	103	19	0	129	0	458
Hourly Total	68	29	34	0	131	0	23	547	236	6	812	32	256	45	21	0	322	0	30	388	96	0	514	0	1779
5:00PM	13	8	14	0	35	0	6	161	76	3	246	7	87	8	9	0	104	0	11	88	18	0	117	0	502
5:15PM	16	9	10	0	35	0	3	151	78	5	237	5	54	8	5	0	67	0	10	89	20	0	119	0	458
5:30PM	16	5	7	0	28	0	5	137	48	3	193	3	47	11	5	0	63	0	5	82	29	0	116	0	400
5:45PM	19	7	9	0	35	0	6	137	76	0	219	0	52	12	7	0	71	0	9	87	13	0	109	0	434
Hourly Total	64	29	40	0	133	0	20	586	278	11	895	15	240	39	26	0	305	0	35	346	80	0	461	0	1794
Total	168	120	91	0	379	0	56	1674	994	19	2743	49	853	148	99	0	1100	0	142	1579	296	0	2017	0	6239
% Approach	44.3%	31.7%	24.0%	0%	-	-	2.0%	61.0%	36.2%	0.7%	-	-	77.5%	13.5%	9.0%	0%	-	-	7.0%	78.3%	14.7%	0%	-	-	-
% Total	2.7%	1.9%	1.5%	0%	6.1%	-	0.9%	26.8%	15.9%	0.3%	44.0%	-	13.7%	2.4%	1.6%	0%	17.6%	-	2.3%	25.3%	4.7%	0%	32.3%	-	-
Lights and Motorcycles	166	120	87	0	373	-	53	1619	977	19	2668	-	826	147	91	0	1064	-	129	1526	295	0	1950	-	6055
% Lights and Motorcycles	98.8%	100%	95.6%	0%	98.4%	-	94.6%	96.7%	98.3%	100%	97.3%	-	96.8%	99.3%	91.9%	0%	96.7%	-	90.8%	96.6%	99.7%	0%	96.7%	-	97.1%
Heavy	2	0	4	0	6	-	3	55	17	0	75	-	27	1	8	0	36	-	13	53	1	0	67	-	184
% Heavy	1.2%	0%	4.4%	0%	1.6%	-	5.4%	3.3%	1.7%	0%	2.7%	-	3.2%	0.7%	8.1%	0%	3.3%	-	9.2%	3.4%	0.3%	0%	3.3%	-	2.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	47	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	95.9%	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	4.1%	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Centerville Rd & Opportunity War (VA25-002... - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275069, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Shopping Center Ent

Total: 879

In: 379 Out: 500

168
120
91

[W] Centerville Rd
Total: 3958
In: 2017 Out: 1941

296
1579
142

Out: 2542 In: 2743
Total: 5285
[E] Centerville Rd

18
56
1674
994
19

31

99
148
853

Out: 1256 In: 1100
Total: 2356

[S] Opportunity Way

2-Centerville Rd & Opportunity War (VA25-002... - TMC

Thu Mar 6, 2025

AM Peak (7 AM - 8 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275069, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345,

Jacksonville Beach, FL, 32250, US

Leg Direction	Shopping Center Ent Southbound						Centerville Rd Westbound						Opportunity Way Northbound						Centerville Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 7:00AM	3	44	0	0	47	0	0	44	207	0	251	2	125	19	20	0	164	0	44	80	12	0	136	0	598
7:15AM	7	6	2	0	15	0	2	47	56	0	105	0	105	10	17	0	132	0	8	106	17	0	131	0	383
7:30AM	6	2	1	0	9	0	2	64	24	0	90	0	39	10	5	0	54	0	8	105	12	0	125	0	278
7:45AM	2	3	2	0	7	0	3	81	27	0	111	0	10	4	0	0	14	0	1	120	9	0	130	0	262
Total	18	55	5	0	78	0	7	236	314	0	557	2	279	43	42	0	364	0	61	411	50	0	522	0	1521
% Approach	23.1%	70.5%	6.4%	0%	-	-	1.3%	42.4%	56.4%	0%	-	-	76.6%	11.8%	11.5%	0%	-	-	11.7%	78.7%	9.6%	0%	-	-	-
% Total	1.2%	3.6%	0.3%	0%	5.1%	-	0.5%	15.5%	20.6%	0%	36.6%	-	18.3%	2.8%	2.8%	0%	23.9%	-	4.0%	27.0%	3.3%	0%	34.3%	-	-
PHF	0.643	0.313	0.625	-	0.415	-	0.583	0.728	0.379	-	0.555	-	0.558	0.566	0.525	-	0.555	-	0.347	0.856	0.735	-	0.960	-	0.636
Lights and Motorcycles	17	55	5	0	77	-	6	220	312	0	538	-	260	42	36	0	338	-	59	396	50	0	505	-	1458
% Lights and Motorcycles	94.4%	100%	100%	0%	98.7%	-	85.7%	93.2%	99.4%	0%	96.6%	-	93.2%	97.7%	85.7%	0%	92.9%	-	96.7%	96.4%	100%	0%	96.7%	-	95.9%
Heavy	1	0	0	0	1	-	1	16	2	0	19	-	19	1	6	0	26	-	2	15	0	0	17	-	63
% Heavy	5.6%	0%	0%	0%	1.3%	-	14.3%	6.8%	0.6%	0%	3.4%	-	6.8%	2.3%	14.3%	0%	7.1%	-	3.3%	3.6%	0%	0%	3.3%	-	4.1%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Centerville Rd & Opportunity War (VA25-002... - TMC

Thu Mar 6, 2025

AM Peak (7 AM - 8 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275069, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

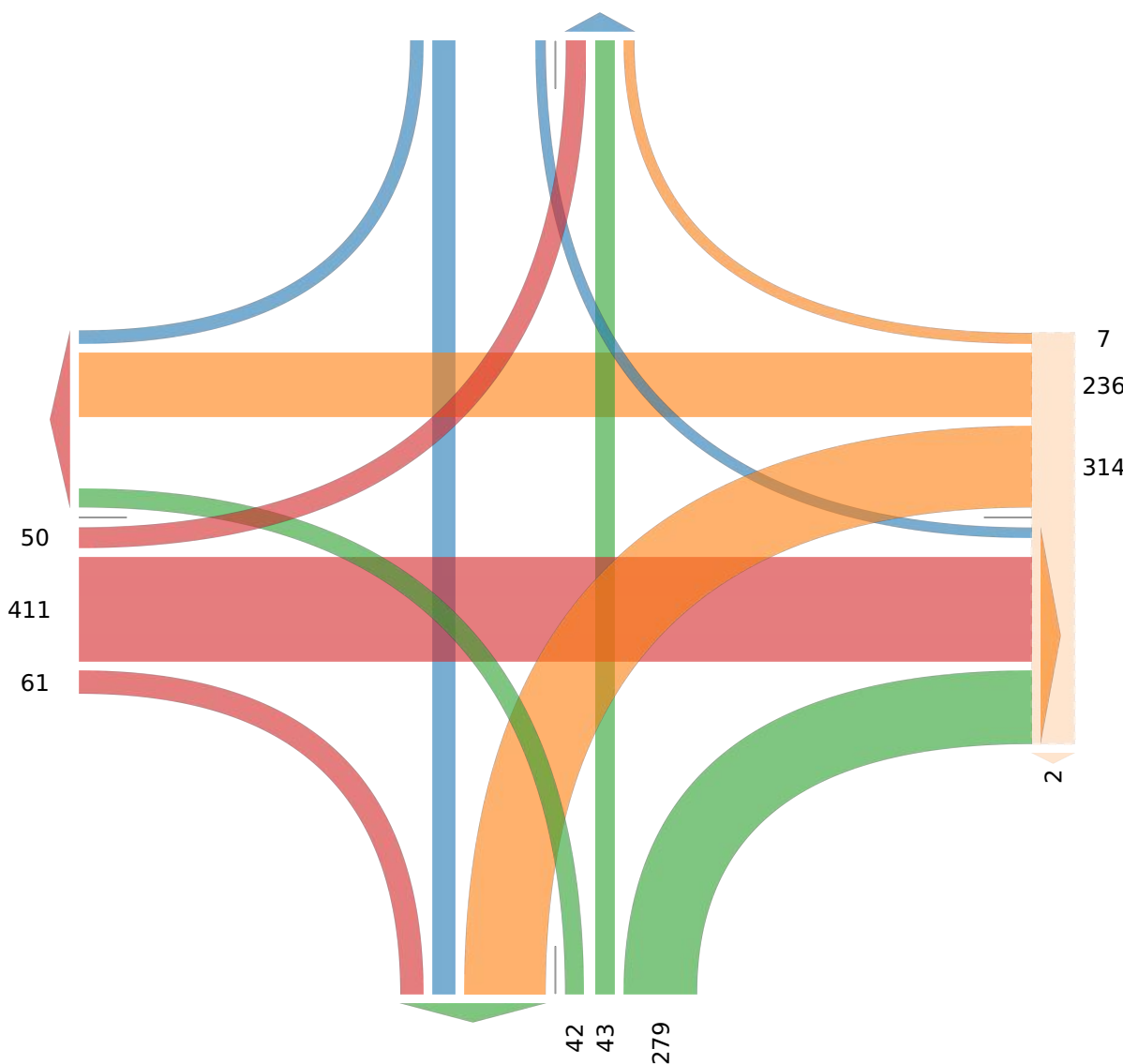
[N] Shopping Center Ent

Total: 178
In: 78 Out: 100

18 55 5

[W] Centerville Rd

Total: 818
In: 522 Out: 296



Out: 430 In: 364
Total: 794
[S] Opportunity Way

2-Centerville Rd & Opportunity War (VA25-002... - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275069, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Shopping Center Ent Southbound						Centerville Rd Westbound						Opportunity Way Northbound						Centerville Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 4:30PM	21	10	11	0	42	0	7	141	61	1	210	8	79	19	9	0	107	0	11	98	35	0	144	0	503
4:45PM	19	8	7	0	34	0	6	149	63	0	218	6	66	7	4	0	77	0	7	103	19	0	129	0	458
5:00PM	13	8	14	0	35	0	6	161	76	3	246	7	87	8	9	0	104	0	11	88	18	0	117	0	502
5:15PM	16	9	10	0	35	0	3	151	78	5	237	5	54	8	5	0	67	0	10	89	20	0	119	0	458
Total	69	35	42	0	146	0	22	602	278	9	911	26	286	42	27	0	355	0	39	378	92	0	509	0	1921
% Approach	47.3%	24.0%	28.8%	0%	-	-	2.4%	66.1%	30.5%	1.0%	-	-	80.6%	11.8%	7.6%	0%	-	-	7.7%	74.3%	18.1%	0%	-	-	-
% Total	3.6%	1.8%	2.2%	0%	7.6%	-	1.1%	31.3%	14.5%	0.5%	47.4%	-	14.9%	2.2%	1.4%	0%	18.5%	-	2.0%	19.7%	4.8%	0%	26.5%	-	-
PHF	0.821	0.875	0.750	-	0.869	-	0.786	0.935	0.891	0.450	0.926	-	0.822	0.553	0.750	-	0.829	-	0.886	0.917	0.657	-	0.884	-	0.955
Lights and Motorcycles	69	35	40	0	144	-	21	596	273	9	899	-	283	42	26	0	351	-	30	368	92	0	490	-	1884
% Lights and Motorcycles	100%	100%	95.2%	0%	98.6%	-	95.5%	99.0%	98.2%	100%	98.7%	-	99.0%	100%	96.3%	0%	98.9%	-	76.9%	97.4%	100%	0%	96.3%	-	98.1%
Heavy	0	0	2	0	2	-	1	6	5	0	12	-	3	0	1	0	4	-	9	10	0	0	19	-	37
% Heavy	0%	0%	4.8%	0%	1.4%	-	4.5%	1.0%	1.8%	0%	1.3%	-	1.0%	0%	3.7%	0%	1.1%	-	23.1%	2.6%	0%	0%	3.7%	-	1.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	26	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Centerville Rd & Opportunity War (VA25-002... - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275069, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

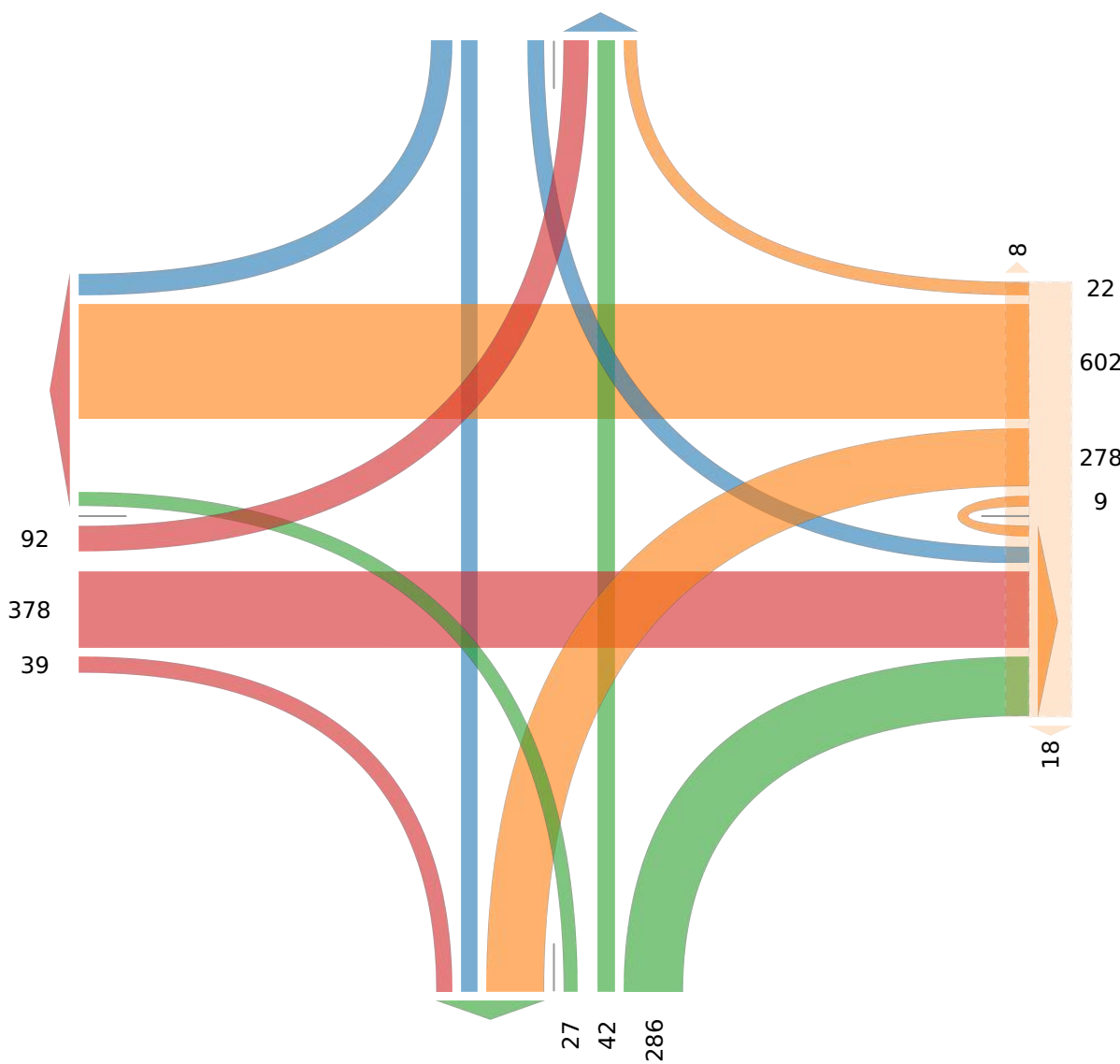
[N] Shopping Center Ent

Total: 302

In: 146 Out: 156

69 35 42

[W] Centerville Rd
Total: 1207
In: 509 Out: 698



Out: 715 In: 911
Total: 1626
[E] Centerville Rd

Out: 352 In: 355
Total: 707
[S] Opportunity Way

2-Centerville Rd & Opportunity Way-SAT (VA25... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Shopping Center Ent Southbound						Centerville Rd Westbound						Opportunity Way Northbound						Centerville Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 10:00AM	11	8	5	0	24	0	4	84	33	6	127	0	28	8	1	0	37	0	1	83	21	0	105	0	293
10:15AM	6	0	4	0	10	0	5	65	31	6	107	0	29	8	3	0	40	0	2	87	19	0	108	0	265
10:30AM	8	3	9	0	20	0	6	73	52	4	135	0	75	22	3	0	100	0	4	79	23	0	106	0	361
10:45AM	15	4	10	0	29	0	2	85	63	6	156	0	42	6	8	0	56	0	9	100	14	0	123	0	364
Hourly Total	40	15	28	0	83	0	17	307	179	22	525	0	174	44	15	0	233	0	16	349	77	0	442	0	1283
11:00AM	6	3	8	0	17	0	4	97	57	2	160	0	39	8	13	0	60	0	3	117	26	0	146	0	383
11:15AM	13	3	7	0	23	0	1	82	46	3	132	0	44	13	4	0	61	0	2	133	25	0	160	0	376
11:30AM	17	3	10	0	30	0	4	87	28	6	125	0	36	11	1	0	48	0	3	97	23	1	124	0	327
11:45AM	14	2	8	0	24	0	2	103	34	3	142	0	61	12	2	0	75	0	7	95	13	0	115	0	356
Hourly Total	50	11	33	0	94	0	11	369	165	14	559	0	180	44	20	0	244	0	15	442	87	1	545	0	1442
12:00PM	9	6	9	0	24	0	1	94	29	7	131	0	96	33	5	0	134	0	2	108	33	0	143	0	432
12:15PM	11	12	12	0	35	0	1	105	46	6	158	0	46	17	2	0	65	0	3	105	36	0	144	0	402
12:30PM	8	10	11	0	29	0	3	106	62	6	177	0	34	15	0	0	49	0	3	90	22	0	115	0	370
12:45PM	14	8	5	0	27	0	6	116	71	4	197	0	62	16	3	0	81	0	3	107	32	0	142	0	447
Hourly Total	42	36	37	0	115	0	11	421	208	23	663	0	238	81	10	0	329	0	11	410	123	0	544	0	1651
1:00PM	14	7	3	0	24	0	2	93	30	2	127	0	30	9	2	0	41	0	5	96	21	0	122	0	314
1:15PM	14	3	13	0	30	0	3	133	27	4	167	0	35	14	0	0	49	0	0	80	28	1	109	0	355
1:30PM	9	4	8	0	21	0	2	148	28	8	186	0	96	12	4	0	112	0	8	112	20	0	140	0	459
1:45PM	23	5	4	0	32	0	6	127	38	3	174	0	23	9	4	0	36	0	1	87	22	0	110	0	352
Hourly Total	60	19	28	0	107	0	13	501	123	17	654	0	184	44	10	0	238	0	14	375	91	1	481	0	1480
2:00PM	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Hourly Total	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	192	81	126	0	399	0	52	1599	675	76	2402	0	776	213	55	0	1044	0	56	1576	378	2	2012	0	5857
% Approach	48.1%	20.3%	31.6%	0%	-	-	2.2%	66.6%	28.1%	3.2%	-	-	74.3%	20.4%	5.3%	0%	-	-	2.8%	78.3%	18.8%	0.1%	-	-	-
% Total	3.3%	1.4%	2.2%	0%	6.8%	-	0.9%	27.3%	11.5%	1.3%	41.0%	-	13.2%	3.6%	0.9%	0%	17.8%	-	1.0%	26.9%	6.5%	0%	34.4%	-	-
Lights and Motorcycles	192	81	125	0	398	-	52	1580	666	76	2374	-	773	213	54	0	1040	-	56	1557	378	2	1993	-	5805
% Lights and Motorcycles	100%	100%	99.2%	0%	99.7%	-	100%	98.8%	98.7%	100%	98.8%	-	99.6%	100%	98.2%	0%	99.6%	-	100%	98.8%	100%	100%	99.1%	-	99.1%
Heavy	0	0	1	0	1	-	0	19	9	0	28	-	3	0	1	0	4	-	0	19	0	0	19	-	52
% Heavy	0%	0%	0.8%	0%	0.3%	-	0%	1.2%	1.3%	0%	1.2%	-	0.4%	0%	1.8%	0%	0.4%	-	0%	1.2%	0%	0%	0.9%	-	0.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Centerville Rd & Opportunity War-SAT (VA25... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Shopping Center Ent

Total: 1042

In: 399 Out: 643

192

81

126

[W] Centerville Rd

Total: 3860

In: 2012

Out: 1848

2

378

1576

56

52

1599

675

76

In: 2402

Out: 2554

Total: 4956

[E] Centerville Rd

Out: 812 In: 1044

Total: 1856

[S] Opportunity Way

55

213

776

2-Centerville Rd & Opportunity War-SAT (VA25... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Shopping Center Ent Southbound						Centerville Rd Westbound						Opportunity Way Northbound						Centerville Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 10:00AM	11	8	5	0	24	0	4	84	33	6	127	0	28	8	1	0	37	0	1	83	21	0	105	0	293
10:15AM	6	0	4	0	10	0	5	65	31	6	107	0	29	8	3	0	40	0	2	87	19	0	108	0	265
10:30AM	8	3	9	0	20	0	6	73	52	4	135	0	75	22	3	0	100	0	4	79	23	0	106	0	361
10:45AM	15	4	10	0	29	0	2	85	63	6	156	0	42	6	8	0	56	0	9	100	14	0	123	0	364
Total	40	15	28	0	83	0	17	307	179	22	525	0	174	44	15	0	233	0	16	349	77	0	442	0	1283
% Approach	48.2%	18.1%	33.7%	0%	-	-	3.2%	58.5%	34.1%	4.2%	-	-	74.7%	18.9%	6.4%	0%	-	-	3.6%	79.0%	17.4%	0%	-	-	-
% Total	3.1%	1.2%	2.2%	0%	6.5%	-	1.3%	23.9%	14.0%	1.7%	40.9%	-	13.6%	3.4%	1.2%	0%	18.2%	-	1.2%	27.2%	6.0%	0%	34.5%	-	-
PHF	0.667	0.469	0.700	-	0.716	-	0.708	0.903	0.710	0.917	0.841	-	0.580	0.500	0.469	-	0.583	-	0.444	0.873	0.837	-	0.898	-	0.881
Lights and Motorcycles	40	15	27	0	82	-	17	302	178	22	519	-	173	44	15	0	232	-	16	346	77	0	439	-	1272
% Lights and Motorcycles	100%	100%	96.4%	0%	98.8%	-	100%	98.4%	99.4%	100%	98.9%	-	99.4%	100%	100%	0%	99.6%	-	100%	99.1%	100%	0%	99.3%	-	99.1%
Heavy	0	0	1	0	1	-	0	5	1	0	6	-	1	0	0	0	1	-	0	3	0	0	3	-	11
% Heavy	0%	0%	3.6%	0%	1.2%	-	0%	1.6%	0.6%	0%	1.1%	-	0.6%	0%	0%	0%	0.4%	-	0%	0.9%	0%	0%	0.7%	-	0.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Centerville Rd & Opportunity War-SAT (VA25... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Shopping Center Ent

Total: 221

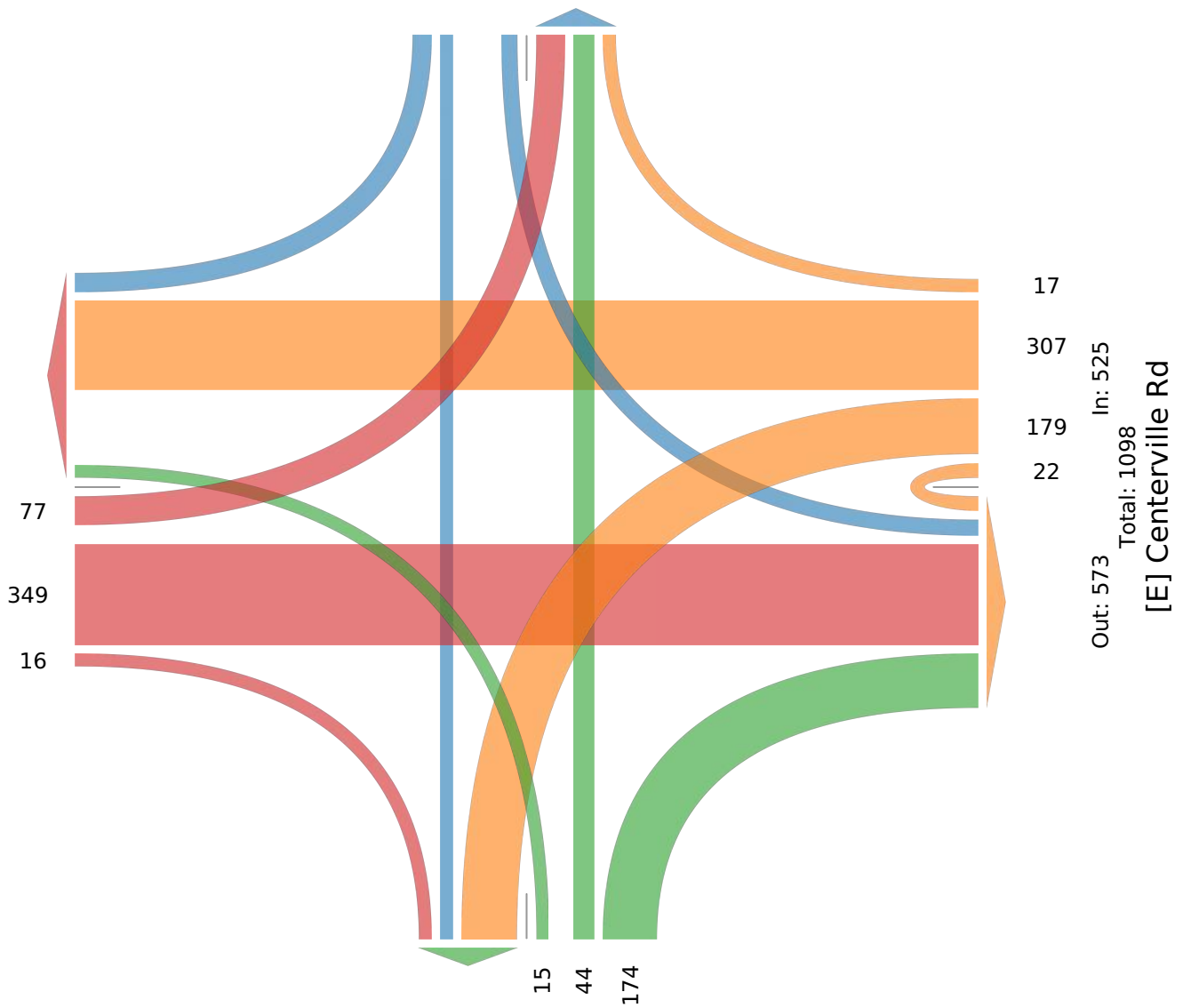
In: 83 Out: 138

40 15 28

[W] Centerville Rd

Total: 804

In: 442 Out: 362



2-Centerville Rd & Opportunity War-SAT (VA25... - TMC

Sat Mar 8, 2025

Midday Peak (WKND) (12 PM - 1 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345,

Jacksonville Beach, FL, 32250, US

Leg Direction	Shopping Center Ent Southbound						Centerville Rd Westbound						Opportunity Way Northbound						Centerville Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 12:00PM	9	6	9	0	24	0	1	94	29	7	131	0	96	33	5	0	134	0	2	108	33	0	143	0	432
12:15PM	11	12	12	0	35	0	1	105	46	6	158	0	46	17	2	0	65	0	3	105	36	0	144	0	402
12:30PM	8	10	11	0	29	0	3	106	62	6	177	0	34	15	0	0	49	0	3	90	22	0	115	0	370
12:45PM	14	8	5	0	27	0	6	116	71	4	197	0	62	16	3	0	81	0	3	107	32	0	142	0	447
Total	42	36	37	0	115	0	11	421	208	23	663	0	238	81	10	0	329	0	11	410	123	0	544	0	1651
% Approach	36.5%	31.3%	32.2%	0%	-	-	1.7%	63.5%	31.4%	3.5%	-	-	72.3%	24.6%	3.0%	0%	-	-	2.0%	75.4%	22.6%	0%	-	-	-
% Total	2.5%	2.2%	2.2%	0%	7.0%	-	0.7%	25.5%	12.6%	1.4%	40.2%	-	14.4%	4.9%	0.6%	0%	19.9%	-	0.7%	24.8%	7.5%	0%	32.9%	-	-
PHF	0.750	0.750	0.771	-	0.821	-	0.458	0.907	0.732	0.821	0.841	-	0.620	0.614	0.500	-	0.614	-	0.917	0.949	0.854	-	0.944	-	0.923
Lights and Motorcycles	42	36	37	0	115	-	11	416	204	23	654	-	237	81	9	0	327	-	11	407	123	0	541	-	1637
% Lights and Motorcycles	100%	100%	100%	0%	100%	-	100%	98.8%	98.1%	100%	98.6%	-	99.6%	100%	90.0%	0%	99.4%	-	100%	99.3%	100%	0%	99.4%	-	99.2%
Heavy	0	0	0	0	0	-	0	5	4	0	9	-	1	0	1	0	2	-	0	3	0	0	3	-	14
% Heavy	0%	0%	0%	0%	0%	-	0%	1.2%	1.9%	0%	1.4%	-	0.4%	0%	10.0%	0%	0.6%	-	0%	0.7%	0%	0%	0.6%	-	0.8%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Centerville Rd & Opportunity War-SAT (VA25... - TMC

Sat Mar 8, 2025

Midday Peak (WKND) (12 PM - 1 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Shopping Center Ent

Total: 330

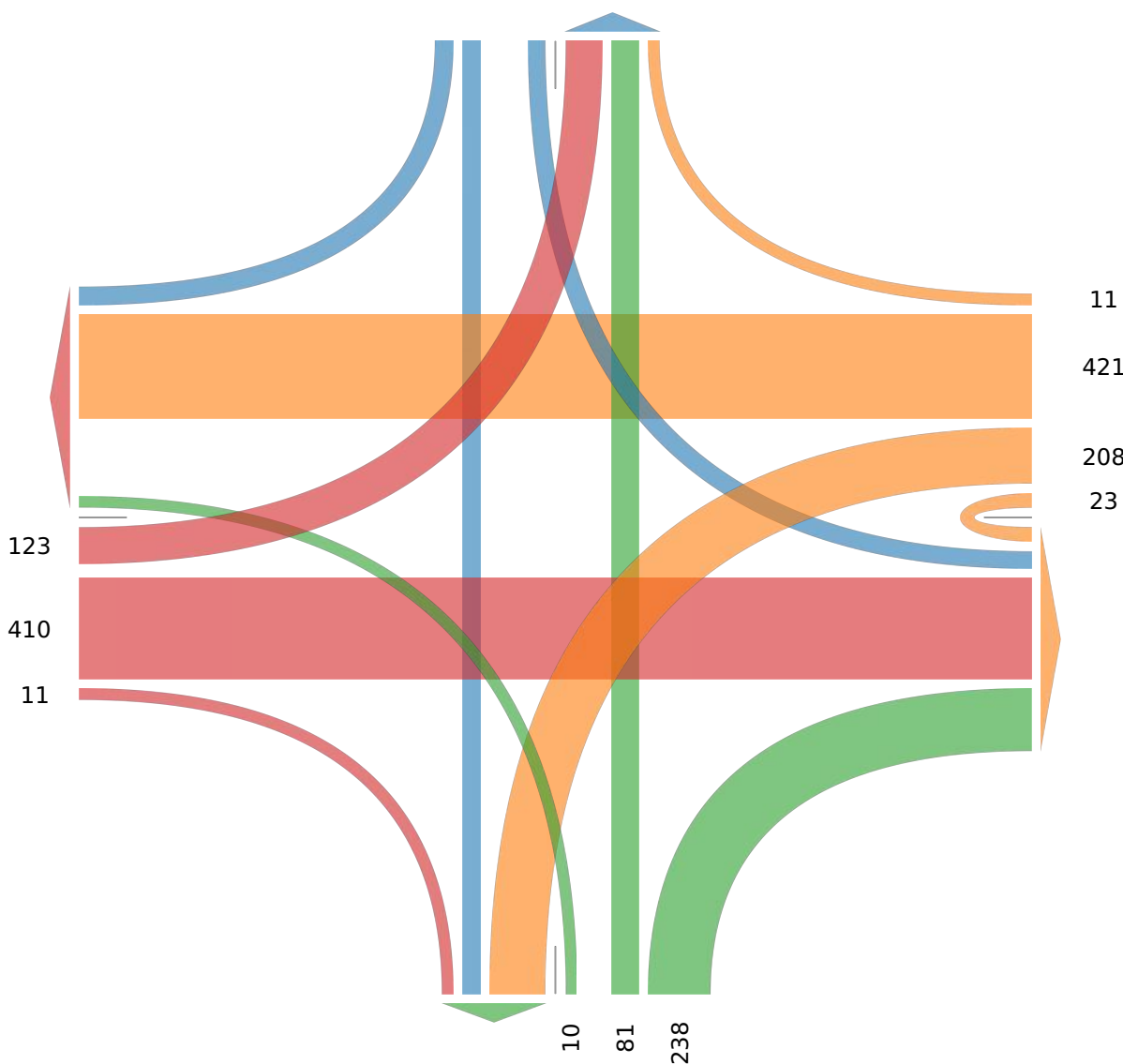
In: 115 Out: 215

42 36 37

[W] Centerville Rd

Total: 1017

In: 544 Out: 473



Out: 255 In: 329

Total: 584

[S] Opportunity Way

Out: 708 In: 663

Total: 1371

[E] Centerville Rd

2-Centerville Rd & Opportunity War-SAT (VA25... - TMC

Sat Mar 8, 2025

PM Peak (WKND) (1 PM - 2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Shopping Center Ent Southbound							Centerville Rd Westbound							Opportunity Way Northbound							Centerville Rd Eastbound							
Time	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		Int
2025-03-08 1:00PM	14	7	3	0	24	0		2	93	30	2	127	0		30	9	2	0	41	0		5	96	21	0	122	0		314
1:15PM	14	3	13	0	30	0		3	133	27	4	167	0		35	14	0	0	49	0		0	80	28	1	109	0		355
1:30PM	9	4	8	0	21	0		2	148	28	8	186	0		96	12	4	0	112	0		8	112	20	0	140	0		459
1:45PM	23	5	4	0	32	0		6	127	38	3	174	0		23	9	4	0	36	0		1	87	22	0	110	0		352
Total	60	19	28	0	107	0		13	501	123	17	654	0		184	44	10	0	238	0		14	375	91	1	481	0		1480
% Approach	56.1%	17.8%	26.2%	0%	-	-		2.0%	76.6%	18.8%	2.6%	-	-		77.3%	18.5%	4.2%	0%	-	-		2.9%	78.0%	18.9%	0.2%	-	-		-
% Total	4.1%	1.3%	1.9%	0%	7.2%	-		0.9%	33.9%	8.3%	1.1%	44.2%	-		12.4%	3.0%	0.7%	0%	16.1%	-		0.9%	25.3%	6.1%	0.1%	32.5%	-		-
PHF	0.652	0.679	0.538	-	0.836	-		0.542	0.846	0.809	0.531	0.879	-		0.479	0.786	0.625	-	0.531	-		0.438	0.837	0.813	0.250	0.859	-		0.806
Lights and Motorcycles	60	19	28	0	107	-		13	496	122	17	648	-		184	44	10	0	238	-		14	368	91	1	474	-		1467
% Lights and Motorcycles	100%	100%	100%	0%	100%	-		100%	99.0%	99.2%	100%	99.1%	-		100%	100%	100%	0%	100%	-		100%	98.1%	100%	100%	98.5%	-		99.1%
Heavy	0	0	0	0	0	-		0	5	1	0	6	-		0	0	0	0	0	-		0	7	0	0	7	-		13
% Heavy	0%	0%	0%	0%	0%	-		0%	1.0%	0.8%	0%	0.9%	-		0%	0%	0%	0%	0%	-		0%	1.9%	0%	0%	1.5%	-		0.9%
Pedestrians	-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	-		0
% Pedestrians	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-
Bicycles on Crosswalk	-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	-		0
% Bicycles on Crosswalk	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2-Centerville Rd & Opportunity War-SAT (VA25... - TMC

Sat Mar 8, 2025

PM Peak (WKND) (1 PM - 2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275074, Location: 37.337996, -76.757654



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

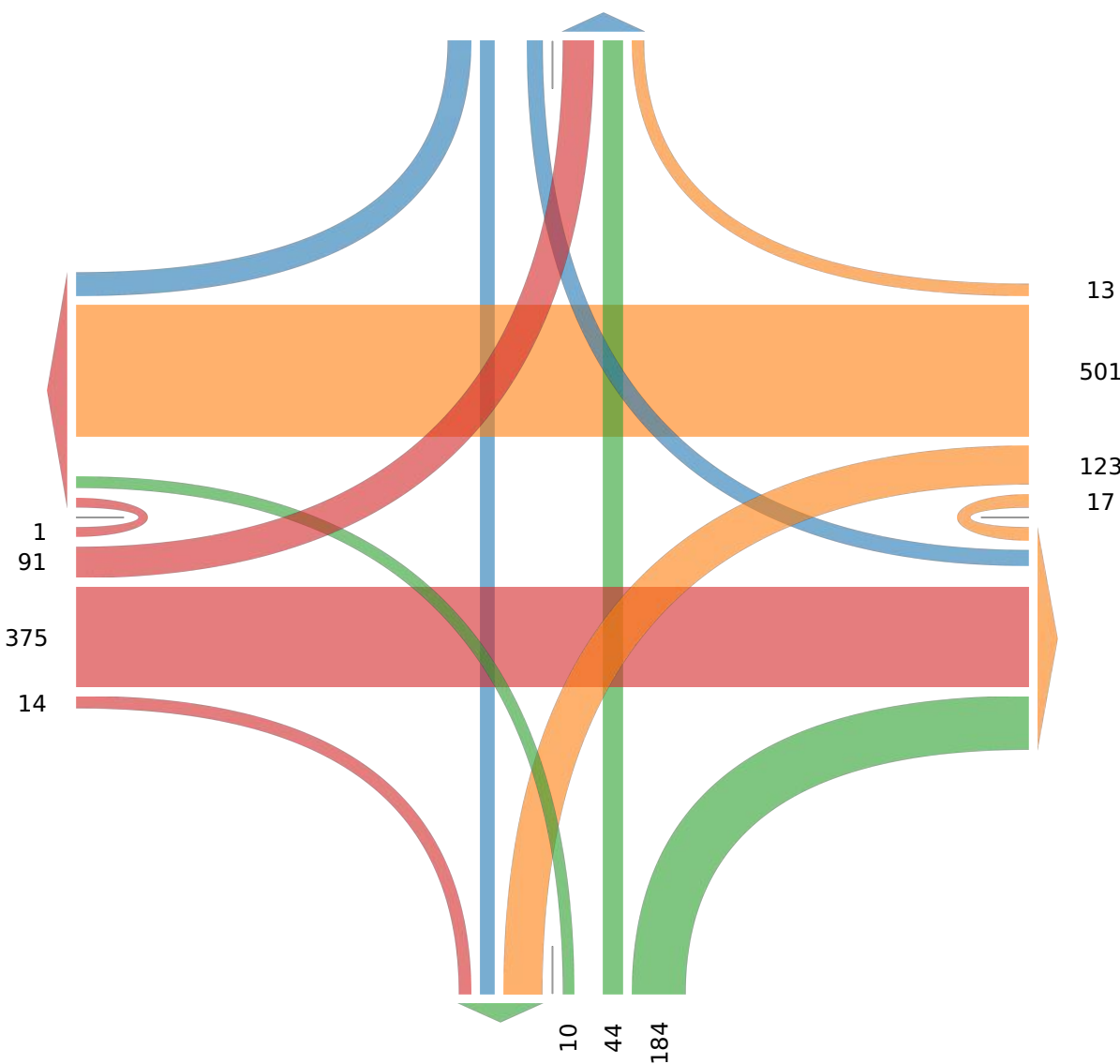
[N] Shopping Center Ent

Total: 255

In: 107 Out: 148

60 19 28

[W] Centerville Rd
Total: 1053
In: 481 Out: 572



[E] Centerville Rd
Total: 1258
In: 654 Out: 604

Out: 156 In: 238

Total: 394

[S] Opportunity Way

3-Richmond Rd & Centerville Rd (VA25-0027) - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275070, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345, Jacksonville Beach, FL, 32250, US

Leg Direction	Business Driveway Southbound						Richmond Rd Westbound						Centerville Rd Northbound						Richmond Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 7:00AM	4	2	3	0	9	0	4	73	72	0	149	0	82	6	94	0	182	0	170	125	4	0	299	0	639
7:15AM	1	0	7	0	8	0	3	92	50	1	146	0	130	5	99	0	234	0	36	129	6	0	171	0	559
7:30AM	2	3	8	0	13	0	5	101	37	0	143	0	80	5	60	0	145	0	48	154	6	0	208	0	509
7:45AM	0	0	6	0	6	0	3	129	74	0	206	0	79	2	47	0	128	0	50	161	5	0	216	0	556
Hourly Total	7	5	24	0	36	0	15	395	233	1	644	0	371	18	300	0	689	0	304	569	21	0	894	0	2263
8:00AM	2	0	4	0	6	1	2	82	44	0	128	0	77	6	63	0	146	0	67	185	7	2	261	0	541
8:15AM	5	1	7	0	13	0	0	121	49	0	170	0	77	4	50	0	131	0	56	162	5	0	223	0	537
8:30AM	2	1	6	0	9	0	3	109	53	0	165	0	67	5	52	0	124	0	58	160	6	0	224	0	522
8:45AM	8	2	8	0	18	0	6	93	71	0	170	0	60	8	53	0	121	0	77	155	9	0	241	0	550
Hourly Total	17	4	25	0	46	1	11	405	217	0	633	0	281	23	218	0	522	0	258	662	27	2	949	0	2150
4:00PM	6	3	12	0	21	0	6	174	106	0	286	0	84	4	66	0	154	0	89	176	5	0	270	0	731
4:15PM	6	5	5	0	16	0	11	194	116	0	321	0	72	6	84	0	162	0	83	178	2	0	263	0	762
4:30PM	6	5	4	0	15	0	9	195	135	0	339	0	83	1	75	0	159	0	81	199	4	0	284	0	797
4:45PM	5	7	6	0	18	0	7	186	117	0	310	0	83	7	91	0	181	0	84	176	6	0	266	0	775
Hourly Total	23	20	27	0	70	0	33	749	474	0	1256	0	322	18	316	0	656	0	337	729	17	0	1083	0	3065
5:00PM	4	10	10	0	24	0	6	231	141	1	379	0	103	2	81	1	187	0	89	177	2	0	268	0	858
5:15PM	4	9	7	0	20	0	8	198	139	0	345	0	86	8	69	0	163	0	89	193	4	0	286	0	814
5:30PM	4	5	4	0	13	0	4	169	108	0	281	0	72	1	68	0	141	0	71	157	3	2	233	0	668
5:45PM	2	7	3	0	12	0	4	174	128	0	306	0	82	3	56	0	141	0	78	145	4	1	228	0	687
Hourly Total	14	31	24	0	69	0	22	772	516	1	1311	0	343	14	274	1	632	0	327	672	13	3	1015	0	3027
6:00PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1
Total	61	60	100	0	221	1	81	2321	1440	2	3844	0	1317	73	1108	1	2499	0	1227	2632	78	5	3942	0	10506
% Approach	27.6%	27.1%	45.2%	0%	-	-	2.1%	60.4%	37.5%	0.1%	-	-	52.7%	2.9%	44.3%	0%	-	-	31.1%	66.8%	2.0%	0.1%	-	-	-
% Total	0.6%	0.6%	1.0%	0%	2.1%	-	0.8%	22.1%	13.7%	0%	36.6%	-	12.5%	0.7%	10.5%	0%	23.8%	-	11.7%	25.1%	0.7%	0%	37.5%	-	-
Lights and Motorcycles	59	60	100	0	219	-	80	2267	1399	1	3747	-	1275	72	1067	1	2415	-	1186	2570	76	5	3837	-	10218
% Lights and Motorcycles	96.7%	100%	100%	0%	99.1%	-	98.8%	97.7%	97.2%	50.0%	97.5%	-	96.8%	98.6%	96.3%	100%	96.6%	-	96.7%	97.6%	97.4%	100%	97.3%	-	97.3%
Heavy	2	0	0	0	2	-	1	54	41	1	97	-	42	1	41	0	84	-	41	62	2	0	105	-	288
% Heavy	3.3%	0%	0%	0%	0.9%	-	1.2%	2.3%	2.8%	50.0%	2.5%	-	3.2%	1.4%	3.7%	0%	3.4%	-	3.3%	2.4%	2.6%	0%	2.7%	-	2.7%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3-Richmond Rd & Centerville Rd (VA25-0027) - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275070, Location: 37.338616, -76.753189

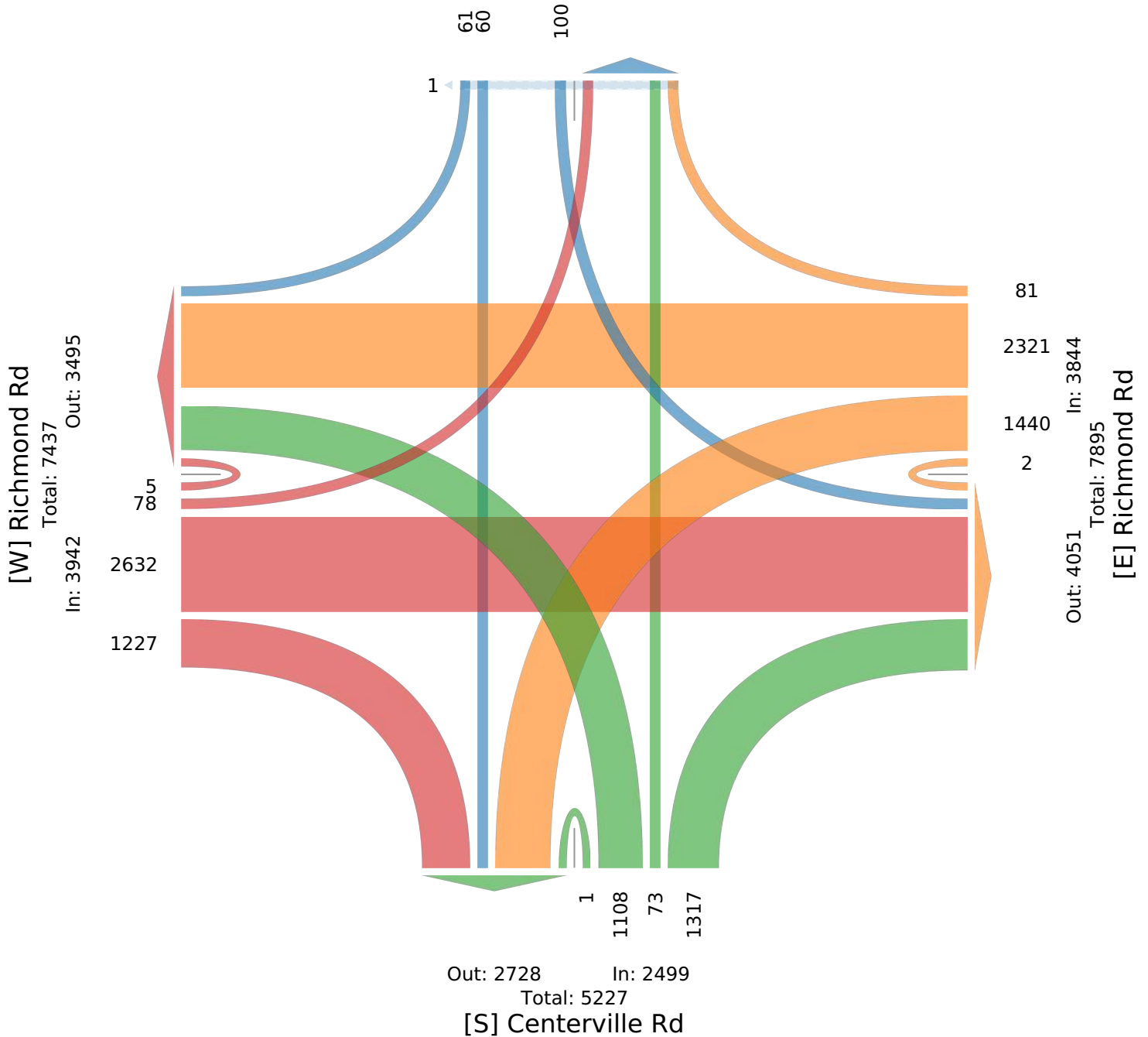


Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Business Driveway

Total: 453

In: 221 Out: 232



3-Richmond Rd & Centerville Rd (VA25-0027) - TMC

Thu Mar 6, 2025

AM Peak (7 AM - 8 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275070, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Business Driveway Southbound						Richmond Rd Westbound						Centerville Rd Northbound						Richmond Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 7:00AM	4	2	3	0	9	0	4	73	72	0	149	0	82	6	94	0	182	0	170	125	4	0	299	0	639
7:15AM	1	0	7	0	8	0	3	92	50	1	146	0	130	5	99	0	234	0	36	129	6	0	171	0	559
7:30AM	2	3	8	0	13	0	5	101	37	0	143	0	80	5	60	0	145	0	48	154	6	0	208	0	509
7:45AM	0	0	6	0	6	0	3	129	74	0	206	0	79	2	47	0	128	0	50	161	5	0	216	0	556
Total	7	5	24	0	36	0	15	395	233	1	644	0	371	18	300	0	689	0	304	569	21	0	894	0	2263
% Approach	19.4%	13.9%	66.7%	0%	-	-	2.3%	61.3%	36.2%	0.2%	-	-	53.8%	2.6%	43.5%	0%	-	-	34.0%	63.6%	2.3%	0%	-	-	-
% Total	0.3%	0.2%	1.1%	0%	1.6%	-	0.7%	17.5%	10.3%	0%	28.5%	-	16.4%	0.8%	13.3%	0%	30.4%	-	13.4%	25.1%	0.9%	0%	39.5%	-	-
PHF	0.438	0.417	0.750	-	0.692	-	0.750	0.766	0.787	0.250	0.782	-	0.713	0.750	0.758	-	0.736	-	0.447	0.884	0.875	-	0.747	-	0.885
Lights and Motorcycles	6	5	24	0	35	-	15	385	222	1	623	-	360	17	277	0	654	-	295	542	21	0	858	-	2170
% Lights and Motorcycles	85.7%	100%	100%	0%	97.2%	-	100%	97.5%	95.3%	100%	96.7%	-	97.0%	94.4%	92.3%	0%	94.9%	-	97.0%	95.3%	100%	0%	96.0%	-	95.9%
Heavy	1	0	0	0	1	-	0	10	11	0	21	-	11	1	23	0	35	-	9	27	0	0	36	-	93
% Heavy	14.3%	0%	0%	0%	2.8%	-	0%	2.5%	4.7%	0%	3.3%	-	3.0%	5.6%	7.7%	0%	5.1%	-	3.0%	4.7%	0%	0%	4.0%	-	4.1%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3-Richmond Rd & Centerville Rd (VA25-0027) - TMC

Thu Mar 6, 2025

AM Peak (7 AM - 8 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275070, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Business Driveway

Total: 90

In: 36 Out: 54

7 5 24

[W] Richmond Rd

Total: 1596

In: 894 Out: 702

21
569
304

15
395
233
1

Out: 965 In: 644

Total: 1609

[E] Richmond Rd

Out: 542 In: 689

Total: 1231

[S] Centerville Rd

300
18
371

3-Richmond Rd & Centerville Rd (VA25-0027) - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275070, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Business Driveway Southbound						Richmond Rd Westbound						Centerville Rd Northbound						Richmond Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-06 4:30PM	6	5	4	0	15	0	9	195	135	0	339	0	83	1	75	0	159	0	81	199	4	0	284	0	797
4:45PM	5	7	6	0	18	0	7	186	117	0	310	0	83	7	91	0	181	0	84	176	6	0	266	0	775
5:00PM	4	10	10	0	24	0	6	231	141	1	379	0	103	2	81	1	187	0	89	177	2	0	268	0	858
5:15PM	4	9	7	0	20	0	8	198	139	0	345	0	86	8	69	0	163	0	89	193	4	0	286	0	814
Total	19	31	27	0	77	0	30	810	532	1	1373	0	355	18	316	1	690	0	343	745	16	0	1104	0	3244
% Approach	24.7%	40.3%	35.1%	0%	-	-	2.2%	59.0%	38.7%	0.1%	-	-	51.4%	2.6%	45.8%	0.1%	-	-	31.1%	67.5%	1.4%	0%	-	-	-
% Total	0.6%	1.0%	0.8%	0%	2.4%	-	0.9%	25.0%	16.4%	0%	42.3%	-	10.9%	0.6%	9.7%	0%	21.3%	-	10.6%	23.0%	0.5%	0%	34.0%	-	-
PHF	0.792	0.775	0.675	-	0.802	-	0.833	0.877	0.943	0.250	0.906	-	0.862	0.563	0.868	0.250	0.922	-	0.963	0.936	0.667	-	0.965	-	0.945
Lights and Motorcycles	18	31	27	0	76	-	30	798	523	0	1351	-	346	18	312	1	677	-	341	733	15	0	1089	-	3193
% Lights and Motorcycles	94.7%	100%	100%	0%	98.7%	-	100%	98.5%	98.3%	0%	98.4%	-	97.5%	100%	98.7%	100%	98.1%	-	99.4%	98.4%	93.8%	0%	98.6%	-	98.4%
Heavy	1	0	0	0	1	-	0	12	9	1	22	-	9	0	4	0	13	-	2	12	1	0	15	-	51
% Heavy	5.3%	0%	0%	0%	1.3%	-	0%	1.5%	1.7%	100%	1.6%	-	2.5%	0%	1.3%	0%	1.9%	-	0.6%	1.6%	6.3%	0%	1.4%	-	1.6%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3-Richmond Rd & Centerville Rd (VA25-0027) - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275070, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Business Driveway

Total: 141

In: 77 Out: 64

19
31

27

[W] Richmond Rd
Total: 2249
In: 1104 Out: 1145

16

745

343

30

810

532

1

Out: 1128 In: 1373
Total: 2501

[E] Richmond Rd

Out: 907 In: 690

Total: 1597

[S] Centerville Rd

1
316
18
355

3-Richmond Rd & Centerville Rd-SAT (VA25-002... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275075, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates

14286 Beach Blvd, 19-345, Jacksonville Beach, FL, 32250, US

Leg Direction	Business Driveway Southbound						Richmond Rd Westbound						Centerville Rd Northbound						Richmond Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 10:00AM	3	5	5	0	13	0	6	133	75	0	214	0	67	4	54	0	125	0	42	151	7	0	200	0	552
10:15AM	4	3	8	0	15	0	9	122	70	1	202	0	74	7	47	0	128	0	46	153	6	0	205	0	550
10:30AM	7	5	8	0	20	0	8	131	89	0	228	0	86	6	61	0	153	1	45	191	5	0	241	0	642
10:45AM	9	3	12	0	24	0	6	140	83	2	231	0	97	3	69	0	169	0	64	202	3	0	269	0	693
Hourly Total	23	16	33	0	72	0	29	526	317	3	875	0	324	20	231	0	575	1	197	697	21	0	915	0	2437
11:00AM	4	6	6	0	16	0	6	134	92	0	232	0	84	8	71	0	163	0	64	184	8	1	257	0	668
11:15AM	7	4	4	0	15	1	4	128	74	3	209	0	118	8	65	0	191	0	67	207	5	3	282	0	697
11:30AM	14	4	6	0	24	0	5	162	76	0	243	0	80	8	57	0	145	0	52	232	4	2	290	0	702
11:45AM	7	6	11	0	24	0	12	155	46	1	214	0	89	8	71	0	168	0	49	322	6	2	379	0	785
Hourly Total	32	20	27	0	79	1	27	579	288	4	898	0	371	32	264	0	667	0	232	945	23	8	1208	0	2852
12:00PM	7	7	13	0	27	0	12	148	71	0	231	0	135	8	82	2	227	0	59	282	6	6	353	0	838
12:15PM	7	5	5	0	17	0	6	164	63	0	233	0	96	8	74	0	178	0	62	336	7	1	406	0	834
12:30PM	4	5	6	0	15	0	6	170	79	0	255	0	67	9	62	0	138	0	72	322	7	6	407	0	815
12:45PM	6	3	10	0	19	0	7	174	90	1	272	0	76	4	91	0	171	0	82	321	7	1	411	0	873
Hourly Total	24	20	34	0	78	0	31	656	303	1	991	0	374	29	309	2	714	0	275	1261	27	14	1577	0	3360
1:00PM	5	0	9	0	14	0	7	207	91	0	305	0	55	5	63	0	123	0	55	347	9	7	418	0	860
1:15PM	5	6	6	0	17	1	12	162	78	1	253	0	78	2	50	0	130	0	63	365	12	2	442	0	842
1:30PM	11	7	8	0	26	0	15	182	102	2	301	0	128	10	73	0	211	0	53	302	2	4	361	0	899
1:45PM	9	7	9	0	25	0	10	181	97	1	289	0	66	5	59	0	130	0	63	375	9	1	448	0	892
Hourly Total	30	20	32	0	82	1	44	732	368	4	1148	0	327	22	245	0	594	0	234	1389	32	14	1669	0	3493
2:00PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	109	76	126	0	311	2	131	2493	1276	12	3912	0	1396	103	1049	2	2550	1	938	4292	103	36	5369	0	12142
% Approach	35.0%	24.4%	40.5%	0%	-	-	3.3%	63.7%	32.6%	0.3%	-	-	54.7%	4.0%	41.1%	0.1%	-	-	17.5%	79.9%	1.9%	0.7%	-	-	-
% Total	0.9%	0.6%	1.0%	0%	2.6%	-	1.1%	20.5%	10.5%	0.1%	32.2%	-	11.5%	0.8%	8.6%	0%	21.0%	-	7.7%	35.3%	0.8%	0.3%	44.2%	-	-
Lights and Motorcycles	109	76	126	0	311	-	131	2472	1257	12	3872	-	1383	103	1037	2	2525	-	934	4261	103	36	5334	-	12042
% Lights and Motorcycles	100%	100%	100%	0%	100%	-	100%	99.2%	98.5%	100%	99.0%	-	99.1%	100%	98.9%	100%	99.0%	-	99.6%	99.3%	100%	100%	99.3%	-	99.2%
Heavy	0	0	0	0	0	-	0	21	19	0	40	-	13	0	12	0	25	-	4	31	0	0	35	-	100
% Heavy	0%	0%	0%	0%	0%	-	0%	0.8%	1.5%	0%	1.0%	-	0.9%	0%	1.1%	0%	1.0%	-	0.4%	0.7%	0%	0%	0.7%	-	0.8%
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	50.0%	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	50.0%	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Thru, U: U-Turn

3-Richmond Rd & Centerville Rd-SAT (VA25-002... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275075, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Business Driveway

Total: 648

In: 311 Out: 337

109
76

126

1

1

[W] Richmond Rd

Total: 9056
In: 5369 Out: 3687

36
103

4292

938

131

2493

1276

12

Out: 5826 In: 3912

Total: 9738

[E] Richmond Rd

1

2

1049

103

1396

Out: 2292 In: 2550

Total: 4842

[S] Centerville Rd

3-Richmond Rd & Centerville Rd-SAT (VA25-002... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275075, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Business Driveway Southbound						Richmond Rd Westbound						Centerville Rd Northbound						Richmond Rd Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2025-03-08 10:00AM	3	5	5	0	13	0	6	133	75	0	214	0	67	4	54	0	125	0	42	151	7	0	200	0	552
10:15AM	4	3	8	0	15	0	9	122	70	1	202	0	74	7	47	0	128	0	46	153	6	0	205	0	550
10:30AM	7	5	8	0	20	0	8	131	89	0	228	0	86	6	61	0	153	1	45	191	5	0	241	0	642
10:45AM	9	3	12	0	24	0	6	140	83	2	231	0	97	3	69	0	169	0	64	202	3	0	269	0	693
Total	23	16	33	0	72	0	29	526	317	3	875	0	324	20	231	0	575	1	197	697	21	0	915	0	2437
% Approach	31.9%	22.2%	45.8%	0%	-	-	3.3%	60.1%	36.2%	0.3%	-	-	56.3%	3.5%	40.2%	0%	-	-	21.5%	76.2%	2.3%	0%	-	-	-
% Total	0.9%	0.7%	1.4%	0%	3.0%	-	1.2%	21.6%	13.0%	0.1%	35.9%	-	13.3%	0.8%	9.5%	0%	23.6%	-	8.1%	28.6%	0.9%	0%	37.5%	-	-
PHF	0.639	0.800	0.688	-	0.750	-	0.806	0.939	0.890	0.375	0.947	-	0.835	0.714	0.837	-	0.851	-	0.770	0.863	0.750	-	0.850	-	0.879
Lights and Motorcycles	23	16	33	0	72	-	29	517	311	3	860	-	321	20	228	0	569	-	197	689	21	0	907	-	2408
% Lights and Motorcycles	100%	100%	100%	0%	100%	-	100%	98.3%	98.1%	100%	98.3%	-	99.1%	100%	98.7%	0%	99.0%	-	100%	98.9%	100%	0%	99.1%	-	98.8%
Heavy	0	0	0	0	0	-	0	9	6	0	15	-	3	0	3	0	6	-	0	8	0	0	8	-	29
% Heavy	0%	0%	0%	0%	0%	-	0%	1.7%	1.9%	0%	1.7%	-	0.9%	0%	1.3%	0%	1.0%	-	0%	1.1%	0%	0%	0.9%	-	1.2%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3-Richmond Rd & Centerville Rd-SAT (VA25-002... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275075, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Business Driveway

Total: 142

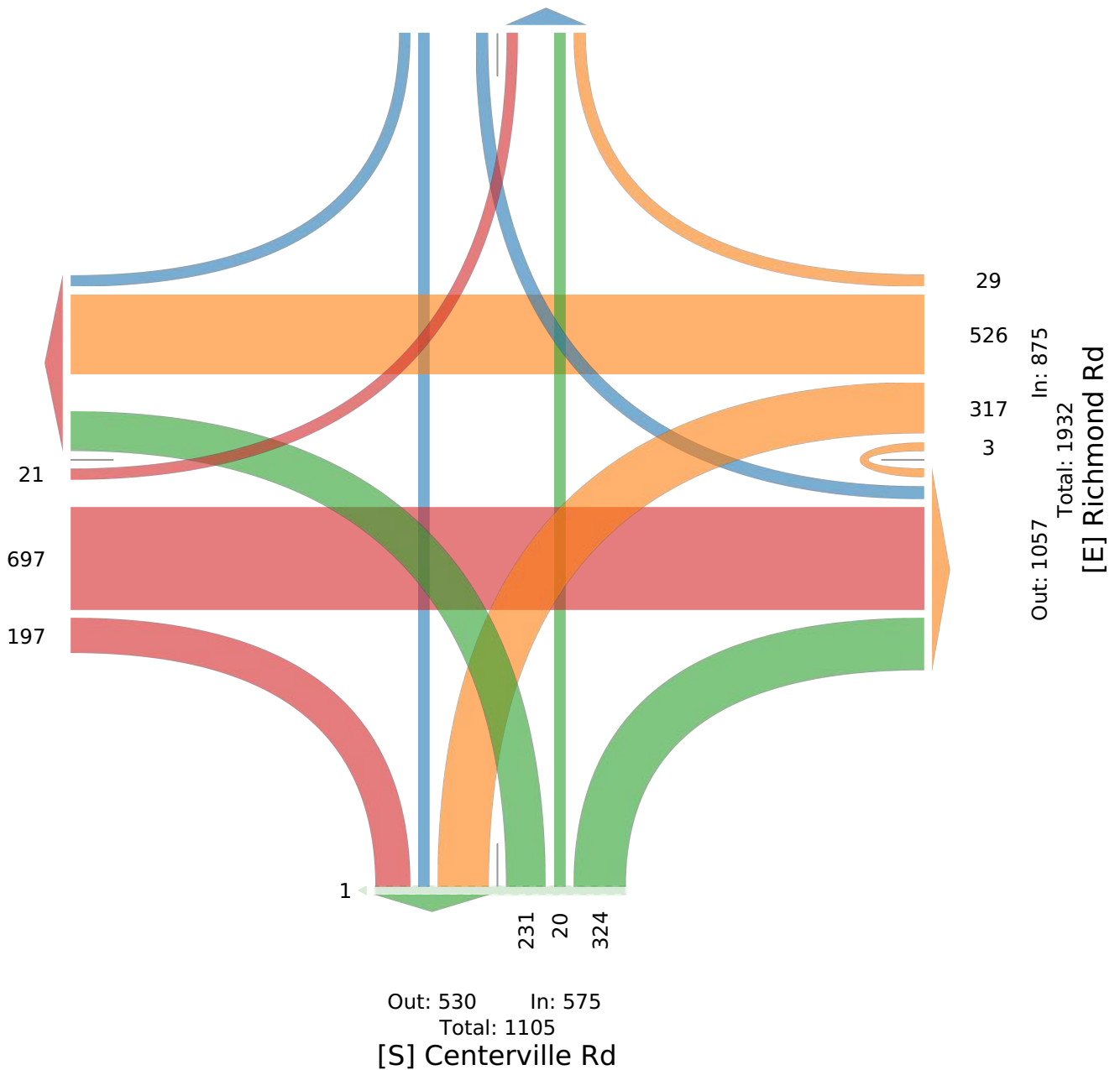
In: 72 Out: 70

23 16 33

[W] Richmond Rd

Total: 1695

In: 915 Out: 780



3-Richmond Rd & Centerville Rd-SAT (VA25-002... - TMC

Sat Mar 8, 2025

Midday Peak (WKND), PM Peak (WKND) (1 PM - 2 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275075, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Business Driveway Southbound							Richmond Rd Westbound							Centerville Rd Northbound							Richmond Rd Eastbound							
Time	R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		R	T	L	U	App	Ped*		Int
2025-03-08 1:00PM	5	0	9	0	14	0		7	207	91	0	305	0		55	5	63	0	123	0		55	347	9	7	418	0		860
1:15PM	5	6	6	0	17	1		12	162	78	1	253	0		78	2	50	0	130	0		63	365	12	2	442	0		842
1:30PM	11	7	8	0	26	0		15	182	102	2	301	0		128	10	73	0	211	0		53	302	2	4	361	0		899
1:45PM	9	7	9	0	25	0		10	181	97	1	289	0		66	5	59	0	130	0		63	375	9	1	448	0		892
Total	30	20	32	0	82	1		44	732	368	4	1148	0		327	22	245	0	594	0		234	1389	32	14	1669	0		3493
% Approach	36.6%	24.4%	39.0%	0%	-	-		3.8%	63.8%	32.1%	0.3%	-	-		55.1%	3.7%	41.2%	0%	-	-		14.0%	83.2%	1.9%	0.8%	-	-		-
% Total	0.9%	0.6%	0.9%	0%	2.3%	-		1.3%	21.0%	10.5%	0.1%	32.9%	-		9.4%	0.6%	7.0%	0%	17.0%	-		6.7%	39.8%	0.9%	0.4%	47.8%	-		-
PHF	0.682	0.714	0.889	-	0.788	-		0.733	0.884	0.902	0.500	0.941	-		0.639	0.550	0.839	-	0.704	-		0.929	0.926	0.667	0.500	0.931	-		0.971
Lights and Motorcycles	30	20	32	0	82	-		44	727	365	4	1140	-		324	22	240	0	586	-		232	1385	32	14	1663	-		3471
% Lights and Motorcycles	100%	100%	100%	0%	100%	-		100%	99.3%	99.2%	100%	99.3%	-		99.1%	100%	98.0%	0%	98.7%	-		99.1%	99.7%	100%	100%	99.6%	-		99.4%
Heavy	0	0	0	0	0	-		0	5	3	0	8	-		3	0	5	0	8	-		2	4	0	0	6	-		22
% Heavy	0%	0%	0%	0%	0%	-		0%	0.7%	0.8%	0%	0.7%	-		0.9%	0%	2.0%	0%	1.3%	-		0.9%	0.3%	0%	0%	0.4%	-		0.6%
Pedestrians	-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	-		0
% Pedestrians	-	-	-	-	-	0%		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-
Bicycles on Crosswalk	-	-	-	-	-	1		-	-	-	-	-	0		-	-	-	-	-	0		-	-	-	-	-	-		0
% Bicycles on Crosswalk	-	-	-	-	-	100%		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-		-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3-Richmond Rd & Centerville Rd-SAT (VA25-002... - TMC

Sat Mar 8, 2025

Midday Peak (WKND), PM Peak (WKND) (1 PM - 2 PM) - Overall Peak

Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275075, Location: 37.338616, -76.753189



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

[N] Business Driveway

Total: 180
In: 82 Out: 98

30 20 32

1

[W] Richmond Rd

Total: 2690
In: 1669 Out: 1021

14 32

1389

234

44

732

368

4

In: 1148
Total: 2900

Out: 1752

[E] Richmond Rd

245 22 327

Out: 622 In: 594
Total: 1216

[S] Centerville Rd

4-Richmond Rd & Rte 199 SB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275071, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 SB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-06 7:00AM	123	2	0	125	0	11	41	0	52	0	55	140	1	196	0	373
7:15AM	98	3	0	101	0	12	41	0	53	0	83	186	0	269	0	423
7:30AM	93	4	0	97	0	11	34	0	45	0	88	152	0	240	0	382
7:45AM	133	3	0	136	0	19	62	0	81	0	109	158	0	267	0	484
Hourly Total	447	12	0	459	0	53	178	0	231	0	335	636	1	972	0	1662
8:00AM	106	9	2	117	0	13	34	0	47	0	97	166	0	263	0	427
8:15AM	122	9	0	131	0	12	37	0	49	0	107	154	0	261	0	441
8:30AM	130	7	0	137	0	14	38	0	52	0	99	124	1	224	0	413
8:45AM	123	7	0	130	0	21	39	0	60	0	97	134	2	233	0	423
Hourly Total	481	32	2	515	0	60	148	0	208	0	400	578	3	981	0	1704
9:00AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00PM	212	2	0	214	0	37	80	0	117	0	85	165	0	250	0	581
4:15PM	238	5	0	243	0	47	85	0	132	0	82	195	0	277	0	652
4:30PM	231	2	0	233	0	37	97	0	134	0	86	181	0	267	0	634
4:45PM	215	6	0	221	1	47	97	0	144	0	81	194	0	275	0	640
Hourly Total	896	15	0	911	1	168	359	0	527	0	334	735	0	1069	0	2507
5:00PM	260	4	1	265	0	47	106	0	153	0	89	208	0	297	0	715
5:15PM	257	3	0	260	0	35	105	0	140	0	82	228	0	310	0	710
5:30PM	224	1	0	225	0	49	62	0	111	0	81	183	0	264	0	600
5:45PM	206	5	1	212	0	44	99	0	143	0	75	179	0	254	0	609
Hourly Total	947	13	2	962	0	175	372	0	547	0	327	798	0	1125	0	2634
Total	2771	72	4	2847	1	456	1057	0	1513	0	1396	2747	4	4147	0	8507
% Approach	97.3%	2.5%	0.1%	-	-	30.1%	69.9%	0%	-	-	33.7%	66.2%	0.1%	-	-	-
% Total	32.6%	0.8%	0%	33.5%	-	5.4%	12.4%	0%	17.8%	-	16.4%	32.3%	0%	48.7%	-	-
Lights and Motorcycles	2719	71	4	2794	-	434	1024	0	1458	-	1360	2673	4	4037	-	8289
% Lights and Motorcycles	98.1%	98.6%	100%	98.1%	-	95.2%	96.9%	0%	96.4%	-	97.4%	97.3%	100%	97.3%	-	97.4%
Heavy	52	1	0	53	-	22	33	0	55	-	36	74	0	110	-	218
% Heavy	1.9%	1.4%	0%	1.9%	-	4.8%	3.1%	0%	3.6%	-	2.6%	2.7%	0%	2.7%	-	2.6%
Pedestrians	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4-Richmond Rd & Rte 199 SB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

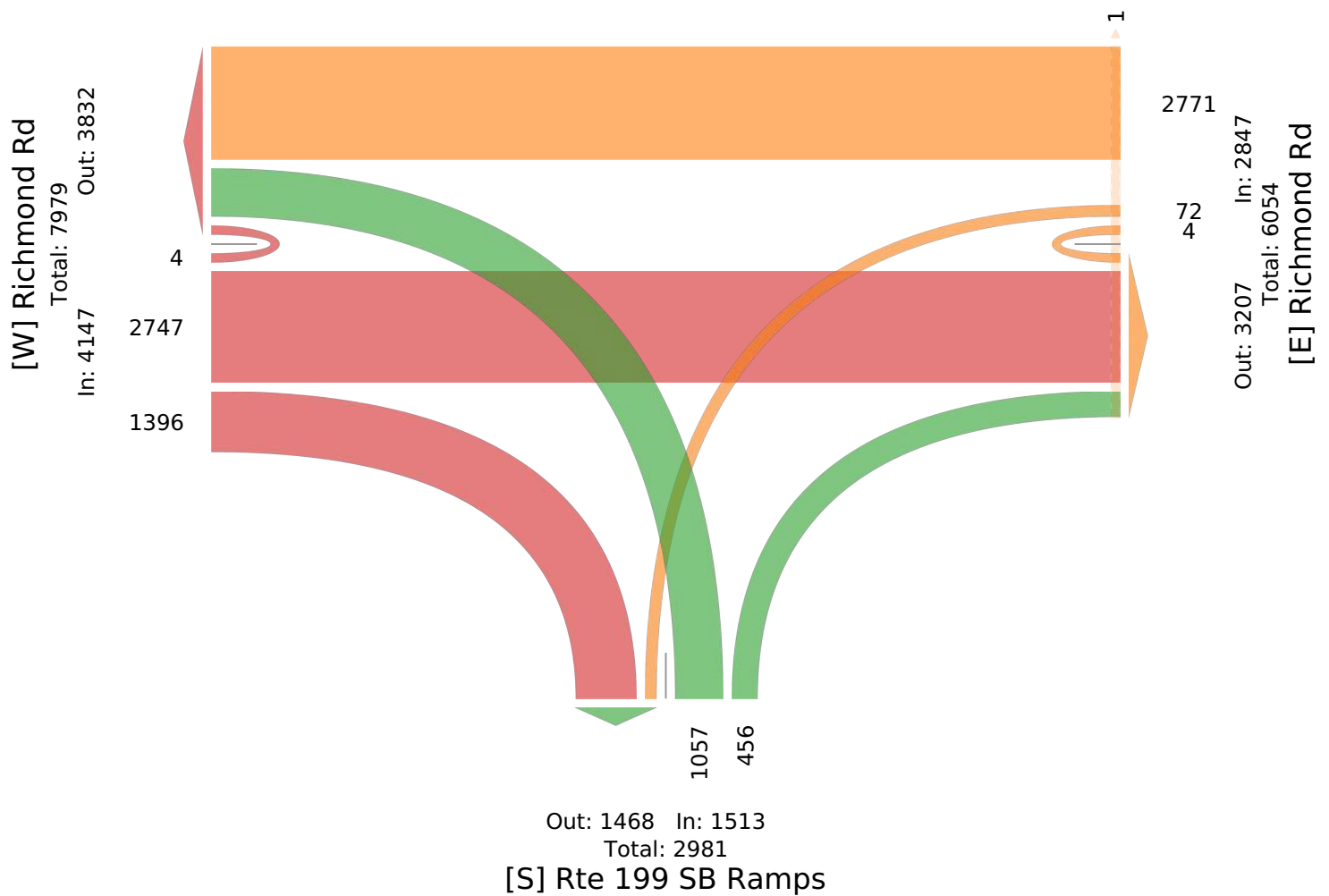
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275071, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



4-Richmond Rd & Rte 199 SB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275071, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 SB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-06 7:45AM	133	3	0	136	0	19	62	0	81	0	109	158	0	267	0	484
8:00AM	106	9	2	117	0	13	34	0	47	0	97	166	0	263	0	427
8:15AM	122	9	0	131	0	12	37	0	49	0	107	154	0	261	0	441
8:30AM	130	7	0	137	0	14	38	0	52	0	99	124	1	224	0	413
Total	491	28	2	521	0	58	171	0	229	0	412	602	1	1015	0	1765
% Approach	94.2%	5.4%	0.4%	-	-	25.3%	74.7%	0%	-	-	40.6%	59.3%	0.1%	-	-	-
% Total	27.8%	1.6%	0.1%	29.5%	-	3.3%	9.7%	0%	13.0%	-	23.3%	34.1%	0.1%	57.5%	-	-
PHF	0.923	0.778	0.250	0.951	-	0.763	0.690	-	0.707	-	0.945	0.907	0.250	0.950	-	0.912
Lights and Motorcycles	472	28	2	502	-	52	160	0	212	-	394	578	1	973	-	1687
% Lights and Motorcycles	96.1%	100%	100%	96.4%	-	89.7%	93.6%	0%	92.6%	-	95.6%	96.0%	100%	95.9%	-	95.6%
Heavy	19	0	0	19	-	6	11	0	17	-	18	24	0	42	-	78
% Heavy	3.9%	0%	0%	3.6%	-	10.3%	6.4%	0%	7.4%	-	4.4%	4.0%	0%	4.1%	-	4.4%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4-Richmond Rd & Rte 199 SB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

AM Peak (7:45 AM - 8:45 AM)

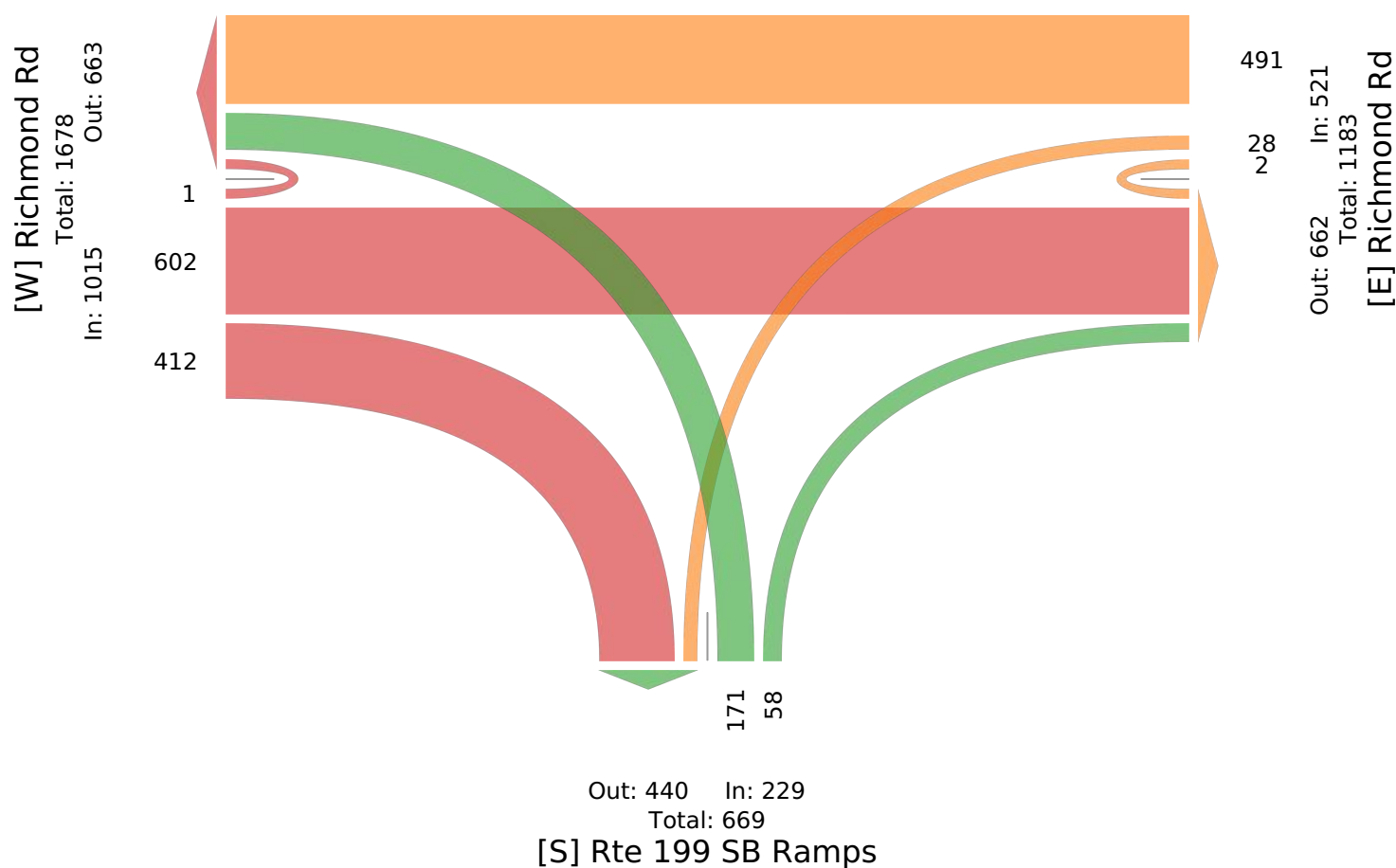
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275071, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



4-Richmond Rd & Rte 199 SB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275071, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 SB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-06 4:30PM	231	2	0	233	0	37	97	0	134	0	86	181	0	267	0	634
4:45PM	215	6	0	221	1	47	97	0	144	0	81	194	0	275	0	640
5:00PM	260	4	1	265	0	47	106	0	153	0	89	208	0	297	0	715
5:15PM	257	3	0	260	0	35	105	0	140	0	82	228	0	310	0	710
Total	963	15	1	979	1	166	405	0	571	0	338	811	0	1149	0	2699
% Approach	98.4%	1.5%	0.1%	-	-	29.1%	70.9%	0%	-	-	29.4%	70.6%	0%	-	-	-
% Total	35.7%	0.6%	0%	36.3%	-	6.2%	15.0%	0%	21.2%	-	12.5%	30.0%	0%	42.6%	-	-
PHF	0.926	0.625	0.250	0.924	-	0.883	0.955	-	0.933	-	0.949	0.889	-	0.927	-	0.944
Lights and Motorcycles	950	14	1	965	-	162	399	0	561	-	336	791	0	1127	-	2653
% Lights and Motorcycles	98.7%	93.3%	100%	98.6%	-	97.6%	98.5%	0%	98.2%	-	99.4%	97.5%	0%	98.1%	-	98.3%
Heavy	13	1	0	14	-	4	6	0	10	-	2	20	0	22	-	46
% Heavy	1.3%	6.7%	0%	1.4%	-	2.4%	1.5%	0%	1.8%	-	0.6%	2.5%	0%	1.9%	-	1.7%
Pedestrians	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4-Richmond Rd & Rte 199 SB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

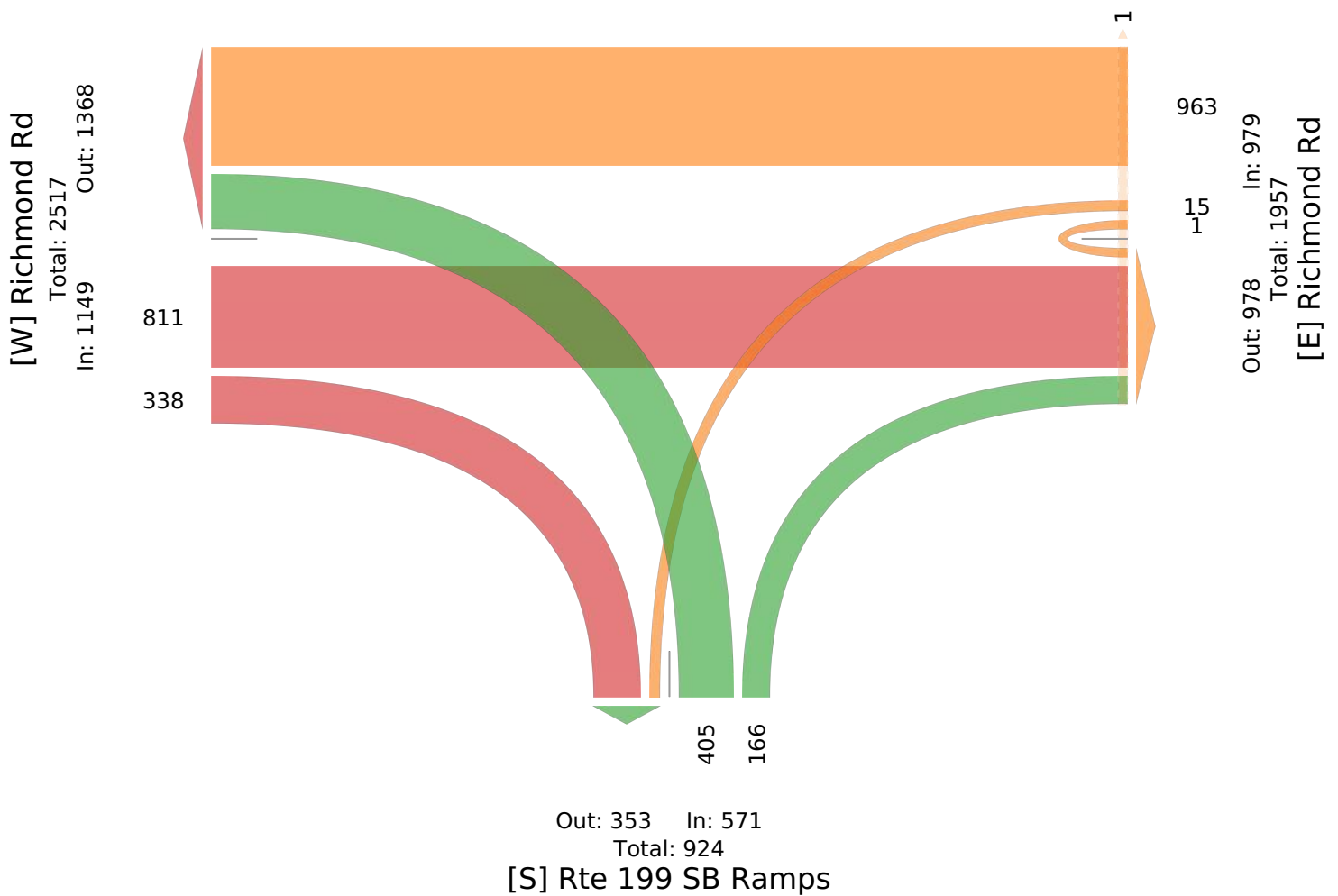
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275071, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



4-Richmond Rd & Rte 199 SB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275076, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 SB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-08 10:00AM	161	7	0	168	0	43	58	0	101	0	72	163	0	235	0	504
10:15AM	141	5	1	147	0	31	62	0	93	0	70	170	0	240	0	480
10:30AM	146	4	0	150	0	54	70	0	124	1	72	194	0	266	0	540
10:45AM	158	6	0	164	0	54	72	0	126	0	91	212	1	304	0	594
Hourly Total	606	22	1	629	0	182	262	0	444	1	305	739	1	1045	0	2118
11:00AM	164	7	0	171	0	37	65	0	102	0	69	215	1	285	0	558
11:15AM	176	5	1	182	0	32	36	0	68	0	95	242	0	337	0	587
11:30AM	199	7	1	207	0	31	51	0	82	0	73	232	0	305	0	594
11:45AM	194	9	0	203	0	43	50	0	93	0	115	288	0	403	0	699
Hourly Total	733	28	2	763	0	143	202	0	345	0	352	977	1	1330	0	2438
12:00PM	193	12	1	206	0	47	53	0	100	0	109	296	3	408	0	714
12:15PM	156	5	0	161	0	37	42	0	79	0	110	292	1	403	0	643
12:30PM	182	7	0	189	0	44	61	0	105	0	108	289	0	397	0	691
12:45PM	188	14	0	202	0	34	67	0	101	0	111	267	2	380	0	683
Hourly Total	719	38	1	758	0	162	223	0	385	0	438	1144	6	1588	0	2731
1:00PM	210	10	1	221	0	43	59	0	102	0	101	273	0	374	0	697
1:15PM	185	11	0	196	0	32	62	0	94	0	100	267	3	370	0	660
1:30PM	220	4	0	224	0	53	70	0	123	0	101	287	0	388	0	735
1:45PM	212	8	0	220	0	59	66	0	125	0	118	273	3	394	0	739
Hourly Total	827	33	1	861	0	187	257	0	444	0	420	1100	6	1526	0	2831
2:00PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2885	121	5	3011	0	674	944	0	1618	1	1515	3960	14	5489	0	10118
% Approach	95.8%	4.0%	0.2%	-	-	41.7%	58.3%	0%	-	-	27.6%	72.1%	0.3%	-	-	-
% Total	28.5%	1.2%	0%	29.8%	-	6.7%	9.3%	0%	16.0%	-	15.0%	39.1%	0.1%	54.2%	-	-
Lights and Motorcycles	2871	120	5	2996	-	666	919	0	1585	-	1506	3926	14	5446	-	10027
% Lights and Motorcycles	99.5%	99.2%	100%	99.5%	-	98.8%	97.4%	0%	98.0%	-	99.4%	99.1%	100%	99.2%	-	99.1%
Heavy	14	1	0	15	-	8	25	0	33	-	9	34	0	43	-	91
% Heavy	0.5%	0.8%	0%	0.5%	-	1.2%	2.6%	0%	2.0%	-	0.6%	0.9%	0%	0.8%	-	0.9%
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4-Richmond Rd & Rte 199 SB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

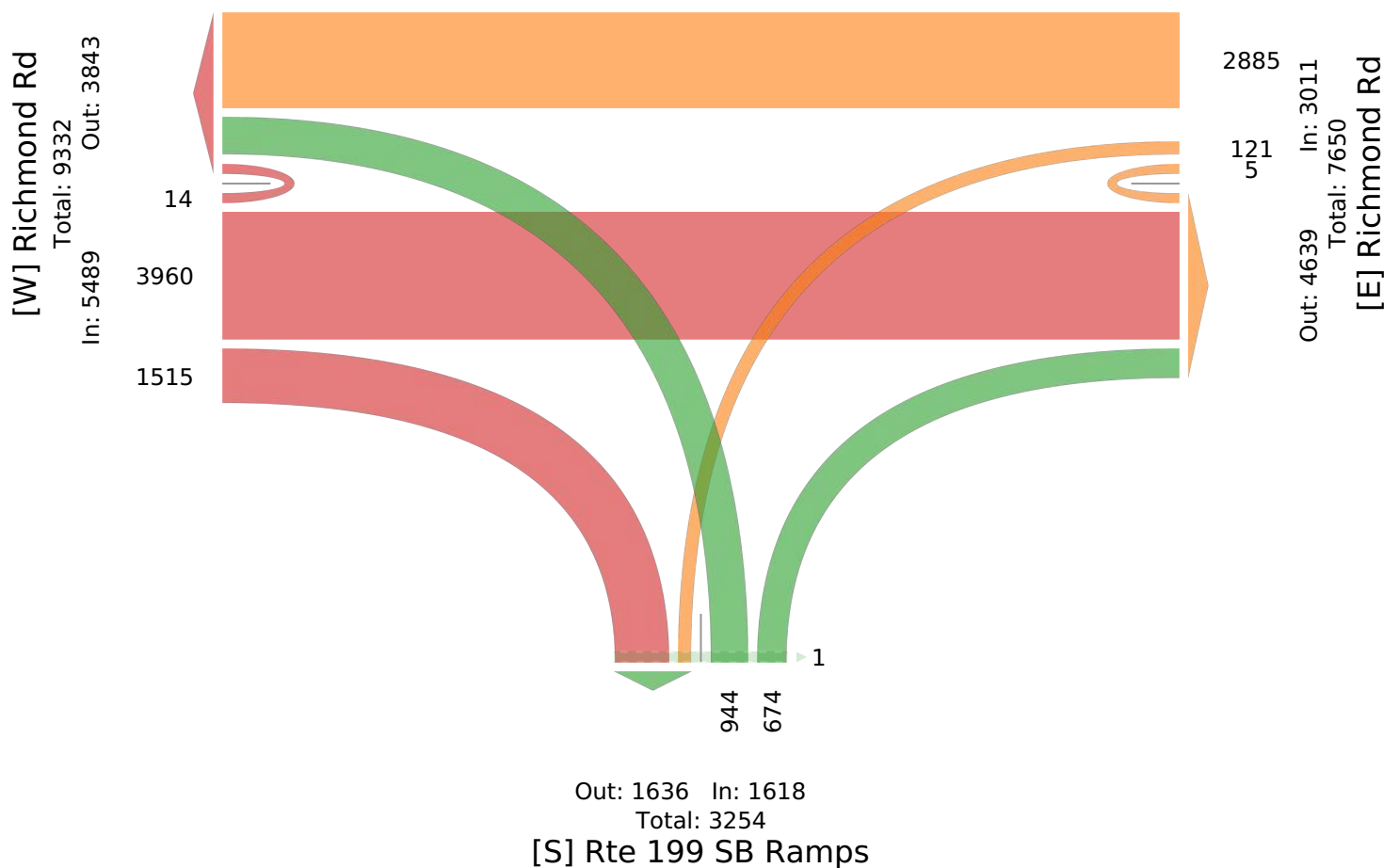
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275076, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



4-Richmond Rd & Rte 199 SB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275076, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 SB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-08 10:00AM	161	7	0	168	0	43	58	0	101	0	72	163	0	235	0	504
10:15AM	141	5	1	147	0	31	62	0	93	0	70	170	0	240	0	480
10:30AM	146	4	0	150	0	54	70	0	124	1	72	194	0	266	0	540
10:45AM	158	6	0	164	0	54	72	0	126	0	91	212	1	304	0	594
Total	606	22	1	629	0	182	262	0	444	1	305	739	1	1045	0	2118
% Approach	96.3%	3.5%	0.2%	-	-	41.0%	59.0%	0%	-	-	29.2%	70.7%	0.1%	-	-	-
% Total	28.6%	1.0%	0%	29.7%	-	8.6%	12.4%	0%	21.0%	-	14.4%	34.9%	0%	49.3%	-	-
PHF	0.941	0.786	0.250	0.936	-	0.843	0.910	-	0.881	-	0.838	0.871	0.250	0.859	-	0.891
Lights and Motorcycles	599	22	1	622	-	180	255	0	435	-	301	734	1	1036	-	2093
% Lights and Motorcycles	98.8%	100%	100%	98.9%	-	98.9%	97.3%	0%	98.0%	-	98.7%	99.3%	100%	99.1%	-	98.8%
Heavy	7	0	0	7	-	2	7	0	9	-	4	5	0	9	-	25
% Heavy	1.2%	0%	0%	1.1%	-	1.1%	2.7%	0%	2.0%	-	1.3%	0.7%	0%	0.9%	-	1.2%
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4-Richmond Rd & Rte 199 SB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

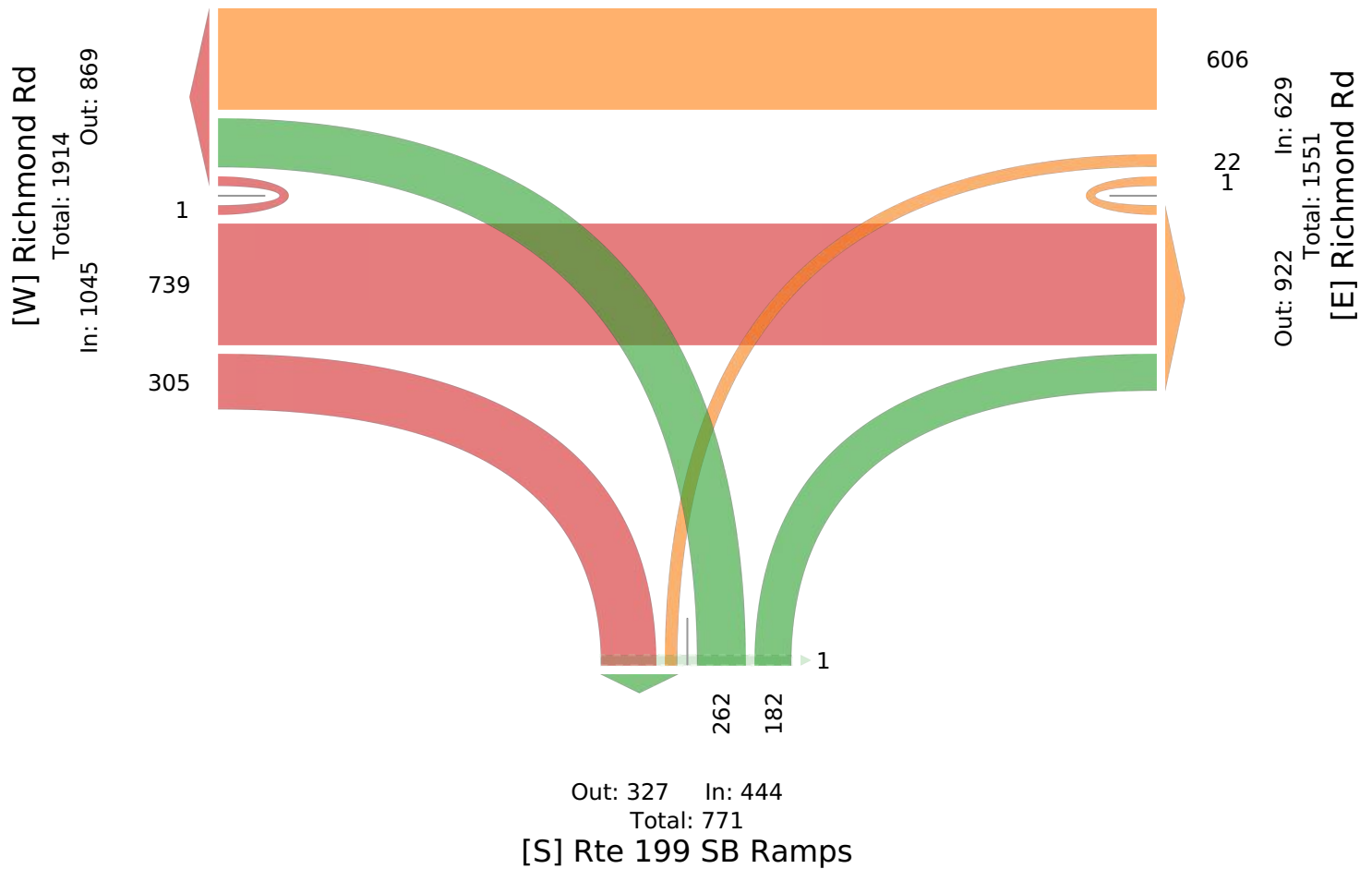
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275076, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



4-Richmond Rd & Rte 199 SB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Midday Peak (WKND), PM Peak (WKND) (1 PM - 2 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275076, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 SB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-08 1:00PM	210	10	1	221	0	43	59	0	102	0	101	273	0	374	0	697
1:15PM	185	11	0	196	0	32	62	0	94	0	100	267	3	370	0	660
1:30PM	220	4	0	224	0	53	70	0	123	0	101	287	0	388	0	735
1:45PM	212	8	0	220	0	59	66	0	125	0	118	273	3	394	0	739
Total	827	33	1	861	0	187	257	0	444	0	420	1100	6	1526	0	2831
% Approach	96.1%	3.8%	0.1%	-	-	42.1%	57.9%	0%	-	-	27.5%	72.1%	0.4%	-	-	-
% Total	29.2%	1.2%	0%	30.4%	-	6.6%	9.1%	0%	15.7%	-	14.8%	38.9%	0.2%	53.9%	-	-
PHF	0.940	0.750	0.250	0.961	-	0.792	0.918	-	0.888	-	0.890	0.958	0.500	0.968	-	0.958
Lights and Motorcycles	824	33	1	858	-	186	251	0	437	-	417	1096	6	1519	-	2814
% Lights and Motorcycles	99.6%	100%	100%	99.7%	-	99.5%	97.7%	0%	98.4%	-	99.3%	99.6%	100%	99.5%	-	99.4%
Heavy	3	0	0	3	-	1	6	0	7	-	3	4	0	7	-	17
% Heavy	0.4%	0%	0%	0.3%	-	0.5%	2.3%	0%	1.6%	-	0.7%	0.4%	0%	0.5%	-	0.6%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4-Richmond Rd & Rte 199 SB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Midday Peak (WKND), PM Peak (WKND) (1 PM - 2 PM) - Overall Peak Hour

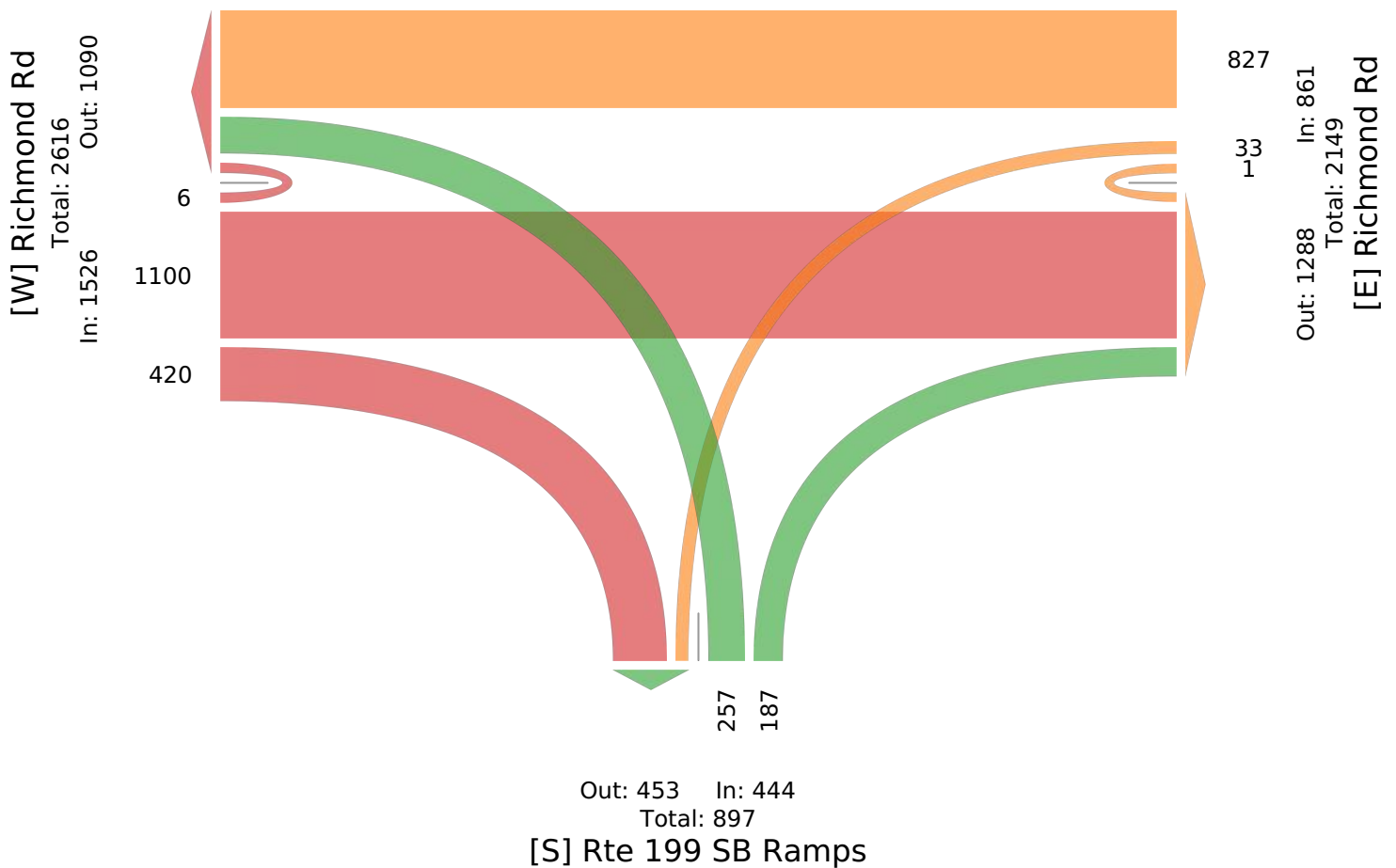
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275076, Location: 37.337241, -76.75134



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



5-Richmond Rd & Rte 199 NB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275072, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 NB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-06 7:00AM	60	18	0	78	0	4	60	0	64	0	81	68	1	150	0	292
7:15AM	49	23	0	72	0	2	51	0	53	0	110	76	2	188	0	313
7:30AM	70	18	0	88	0	0	50	0	50	0	78	92	0	170	0	308
7:45AM	77	25	0	102	0	3	69	0	72	0	77	90	0	167	0	341
Hourly Total	256	84	0	340	0	9	230	0	239	0	346	326	3	675	0	1254
8:00AM	53	24	1	78	0	5	45	0	50	0	77	102	0	179	0	307
8:15AM	81	16	0	97	0	4	62	0	66	0	68	101	0	169	0	332
8:30AM	72	14	0	86	0	5	66	0	71	0	63	85	0	148	0	305
8:45AM	78	11	0	89	0	6	61	0	67	0	52	96	0	148	0	304
Hourly Total	284	65	1	350	0	20	234	0	254	0	260	384	0	644	0	1248
4:00PM	134	23	0	157	0	13	82	0	95	0	67	144	1	212	0	464
4:15PM	145	28	1	174	0	16	106	0	122	0	67	163	0	230	0	526
4:30PM	141	38	2	181	0	22	109	0	131	0	68	163	1	232	0	544
4:45PM	137	23	1	161	0	15	104	0	119	0	76	161	2	239	0	519
Hourly Total	557	112	4	673	0	66	401	0	467	0	278	631	4	913	0	2053
5:00PM	164	25	0	189	0	9	106	0	115	0	81	161	0	242	0	546
5:15PM	136	30	0	166	0	20	109	0	129	0	86	180	2	268	0	563
5:30PM	124	24	2	150	0	15	90	0	105	0	63	151	0	214	0	469
5:45PM	139	17	2	158	0	12	86	0	98	0	64	153	1	218	0	474
Hourly Total	563	96	4	663	0	56	391	0	447	0	294	645	3	942	0	2052
Total	1660	357	9	2026	0	151	1256	0	1407	0	1178	1986	10	3174	0	6607
% Approach	81.9%	17.6%	0.4%	-	-	10.7%	89.3%	0%	-	-	37.1%	62.6%	0.3%	-	-	-
% Total	25.1%	5.4%	0.1%	30.7%	-	2.3%	19.0%	0%	21.3%	-	17.8%	30.1%	0.2%	48.0%	-	-
Lights and Motorcycles	1631	337	8	1976	-	151	1224	0	1375	-	1139	1930	10	3079	-	6430
% Lights and Motorcycles	98.3%	94.4%	88.9%	97.5%	-	100%	97.5%	0%	97.7%	-	96.7%	97.2%	100%	97.0%	-	97.3%
Heavy	29	20	1	50	-	0	32	0	32	-	39	56	0	95	-	177
% Heavy	1.7%	5.6%	11.1%	2.5%	-	0%	2.5%	0%	2.3%	-	3.3%	2.8%	0%	3.0%	-	2.7%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5-Richmond Rd & Rte 199 NB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

Full Length (7 AM-9 AM, 4 PM-6 PM)

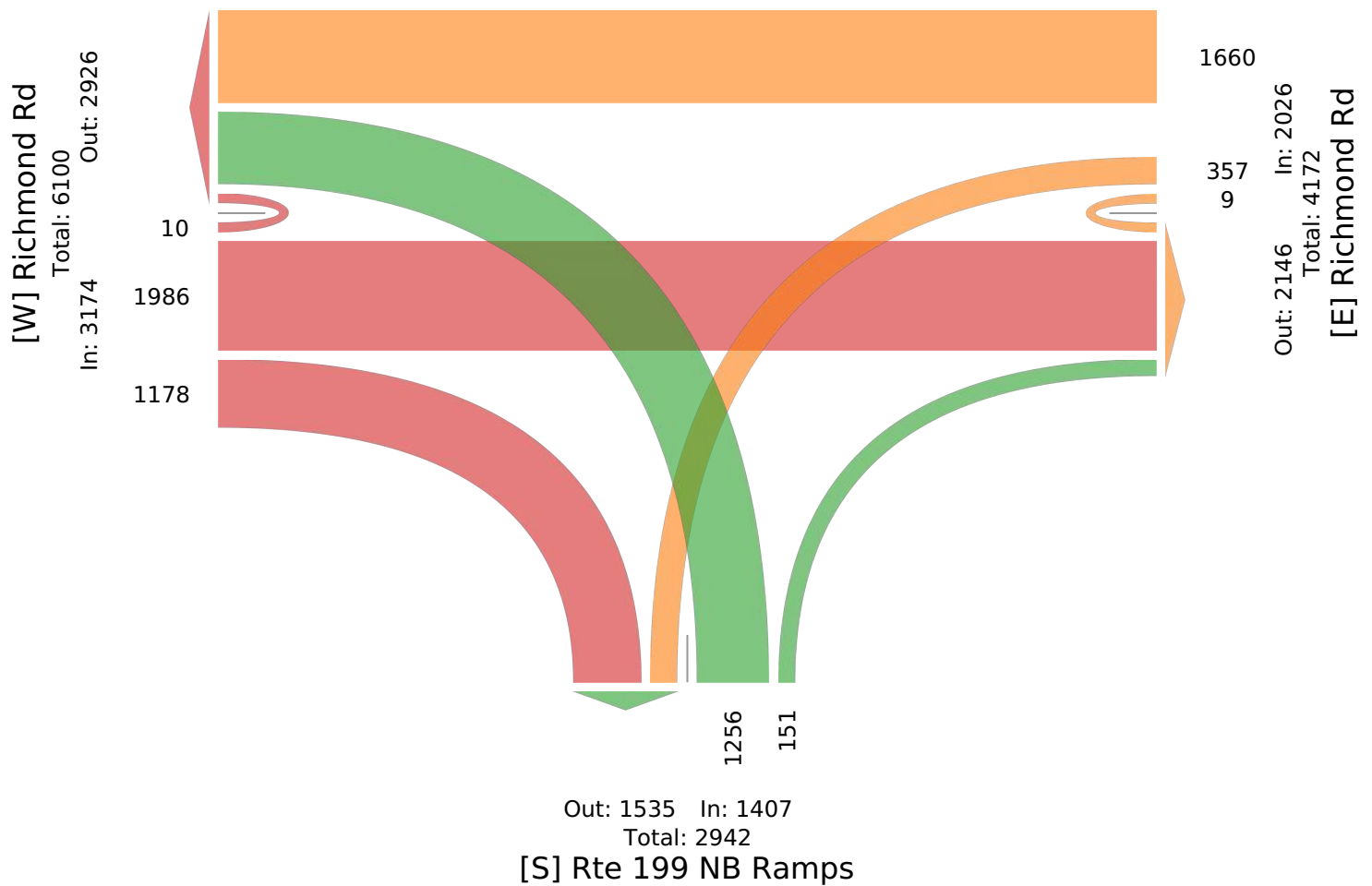
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275072, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



5-Richmond Rd & Rte 199 NB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275072, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 NB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-06 7:30AM	70	18	0	88	0	0	50	0	50	0	78	92	0	170	0	308
7:45AM	77	25	0	102	0	3	69	0	72	0	77	90	0	167	0	341
8:00AM	53	24	1	78	0	5	45	0	50	0	77	102	0	179	0	307
8:15AM	81	16	0	97	0	4	62	0	66	0	68	101	0	169	0	332
Total	281	83	1	365	0	12	226	0	238	0	300	385	0	685	0	1288
% Approach	77.0%	22.7%	0.3%	-	-	5.0%	95.0%	0%	-	-	43.8%	56.2%	0%	-	-	-
% Total	21.8%	6.4%	0.1%	28.3%	-	0.9%	17.5%	0%	18.5%	-	23.3%	29.9%	0%	53.2%	-	-
PHF	0.867	0.830	0.250	0.895	-	0.600	0.819	-	0.826	-	0.962	0.944	-	0.957	-	0.944
Lights and Motorcycles	272	76	1	349	-	12	212	0	224	-	290	364	0	654	-	1227
% Lights and Motorcycles	96.8%	91.6%	100%	95.6%	-	100%	93.8%	0%	94.1%	-	96.7%	94.5%	0%	95.5%	-	95.3%
Heavy	9	7	0	16	-	0	14	0	14	-	10	21	0	31	-	61
% Heavy	3.2%	8.4%	0%	4.4%	-	0%	6.2%	0%	5.9%	-	3.3%	5.5%	0%	4.5%	-	4.7%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5-Richmond Rd & Rte 199 NB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

AM Peak (7:30 AM - 8:30 AM)

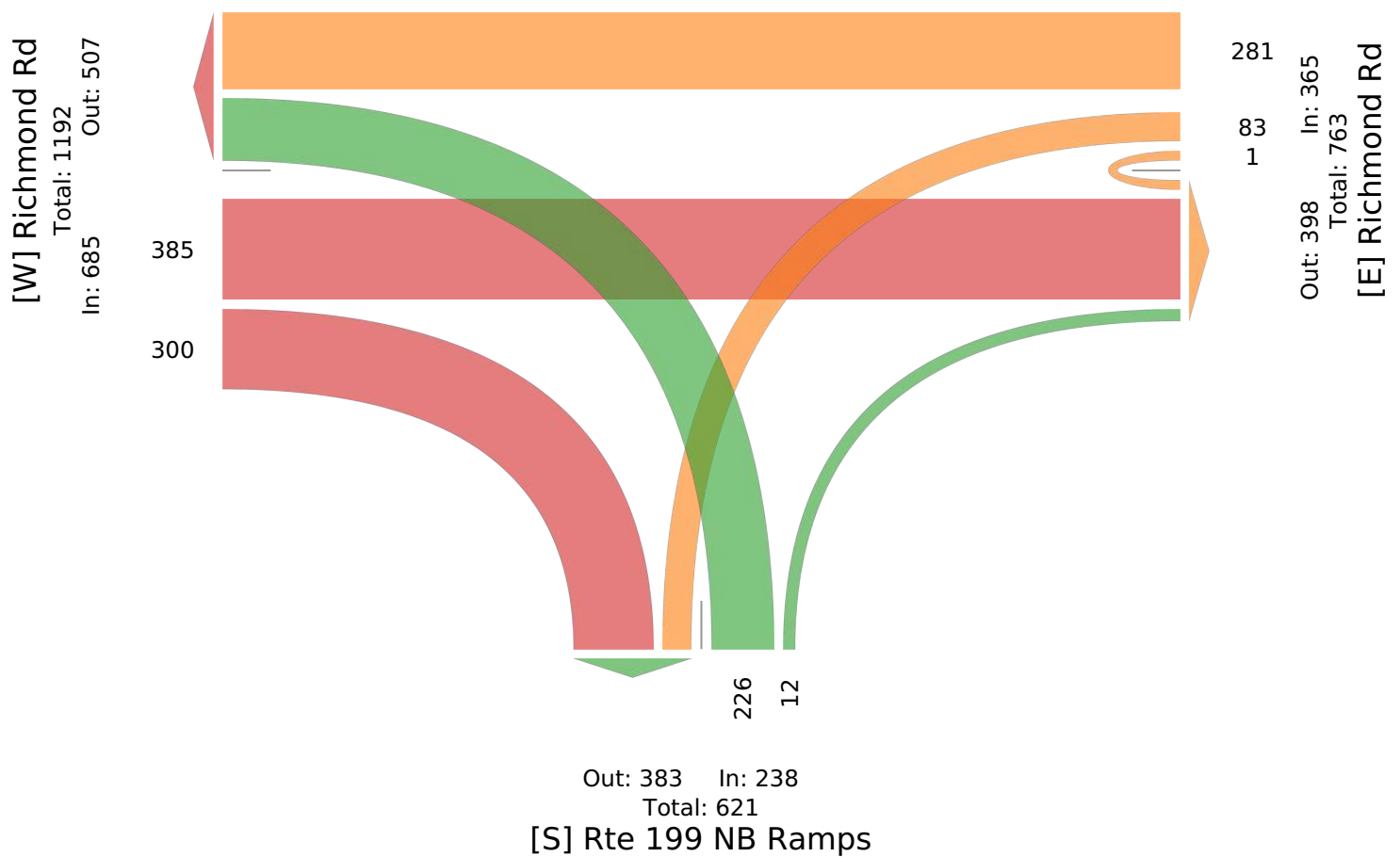
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275072, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



5-Richmond Rd & Rte 199 NB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275072, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 NB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-06 4:30PM	141	38	2	181	0	22	109	0	131	0	68	163	1	232	0	544
4:45PM	137	23	1	161	0	15	104	0	119	0	76	161	2	239	0	519
5:00PM	164	25	0	189	0	9	106	0	115	0	81	161	0	242	0	546
5:15PM	136	30	0	166	0	20	109	0	129	0	86	180	2	268	0	563
Total	578	116	3	697	0	66	428	0	494	0	311	665	5	981	0	2172
% Approach	82.9%	16.6%	0.4%	-	-	13.4%	86.6%	0%	-	-	31.7%	67.8%	0.5%	-	-	-
% Total	26.6%	5.3%	0.1%	32.1%	-	3.0%	19.7%	0%	22.7%	-	14.3%	30.6%	0.2%	45.2%	-	-
PHF	0.881	0.763	0.375	0.922	-	0.750	0.982	-	0.943	-	0.904	0.924	0.625	0.915	-	0.964
Lights and Motorcycles	570	112	2	684	-	66	420	0	486	-	300	651	5	956	-	2126
% Lights and Motorcycles	98.6%	96.6%	66.7%	98.1%	-	100%	98.1%	0%	98.4%	-	96.5%	97.9%	100%	97.5%	-	97.9%
Heavy	8	4	1	13	-	0	8	0	8	-	11	14	0	25	-	46
% Heavy	1.4%	3.4%	33.3%	1.9%	-	0%	1.9%	0%	1.6%	-	3.5%	2.1%	0%	2.5%	-	2.1%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5-Richmond Rd & Rte 199 NB Ramps (VA25-0027) - TMC

Thu Mar 6, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

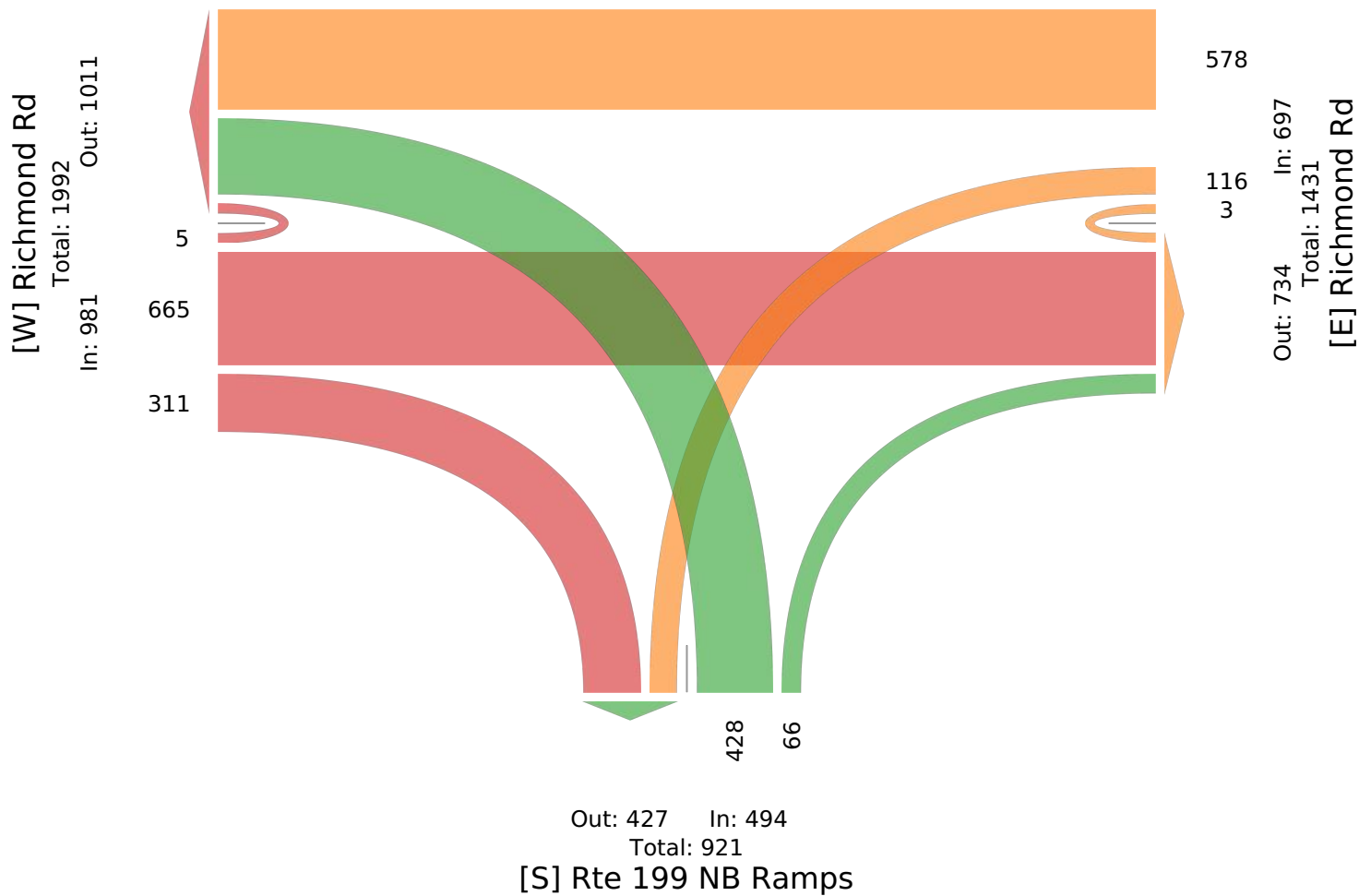
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275072, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



5-Richmond Rd & Rte 199 NB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275077, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 NB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-08 10:00AM	106	23	1	130	0	15	62	0	77	0	70	139	0	209	0	416
10:15AM	100	21	0	121	0	10	61	0	71	0	61	151	0	212	0	404
10:30AM	84	29	1	114	0	13	70	0	83	1	71	162	0	233	0	430
10:45AM	114	26	1	141	0	17	62	0	79	0	75	204	2	281	0	501
Hourly Total	404	99	3	506	0	55	255	0	310	1	277	656	2	935	0	1751
11:00AM	113	26	0	139	0	19	64	0	83	0	66	182	0	248	0	470
11:15AM	123	43	0	166	0	21	68	0	89	0	97	190	1	288	0	543
11:30AM	120	37	1	158	0	21	79	0	100	0	72	191	0	263	0	521
11:45AM	147	30	0	177	0	24	69	0	93	0	83	252	0	335	0	605
Hourly Total	503	136	1	640	0	85	280	0	365	0	318	815	1	1134	0	2139
12:00PM	121	25	1	147	0	23	78	1	102	0	115	245	1	361	0	610
12:15PM	129	36	0	165	0	14	73	1	88	0	72	255	1	328	0	581
12:30PM	129	34	1	164	0	20	75	0	95	0	87	227	1	315	0	574
12:45PM	158	36	1	195	0	14	72	1	87	0	87	232	2	321	0	603
Hourly Total	537	131	3	671	0	71	298	3	372	0	361	959	5	1325	0	2368
1:00PM	164	27	0	191	0	27	83	0	110	0	83	216	0	299	0	600
1:15PM	139	38	0	177	0	18	56	0	74	0	86	224	2	312	0	563
1:30PM	153	41	1	195	0	22	82	2	106	0	101	238	3	342	0	643
1:45PM	164	40	1	205	0	31	76	0	107	1	86	223	3	312	0	624
Hourly Total	620	146	2	768	0	98	297	2	397	1	356	901	8	1265	0	2430
2:00PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2064	512	9	2585	0	309	1130	5	1444	2	1312	3331	16	4659	0	8688
% Approach	79.8%	19.8%	0.3%	-	-	21.4%	78.3%	0.3%	-	-	28.2%	71.5%	0.3%	-	-	-
% Total	23.8%	5.9%	0.1%	29.8%	-	3.6%	13.0%	0.1%	16.6%	-	15.1%	38.3%	0.2%	53.6%	-	-
Lights and Motorcycles	2052	496	9	2557	-	307	1123	5	1435	-	1291	3307	16	4614	-	8606
% Lights and Motorcycles	99.4%	96.9%	100%	98.9%	-	99.4%	99.4%	100%	99.4%	-	98.4%	99.3%	100%	99.0%	-	99.1%
Heavy	12	16	0	28	-	2	7	0	9	-	21	24	0	45	-	82
% Heavy	0.6%	3.1%	0%	1.1%	-	0.6%	0.6%	0%	0.6%	-	1.6%	0.7%	0%	1.0%	-	0.9%
Pedestrians	-	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5-Richmond Rd & Rte 199 NB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Full Length (10 AM-2 PM)

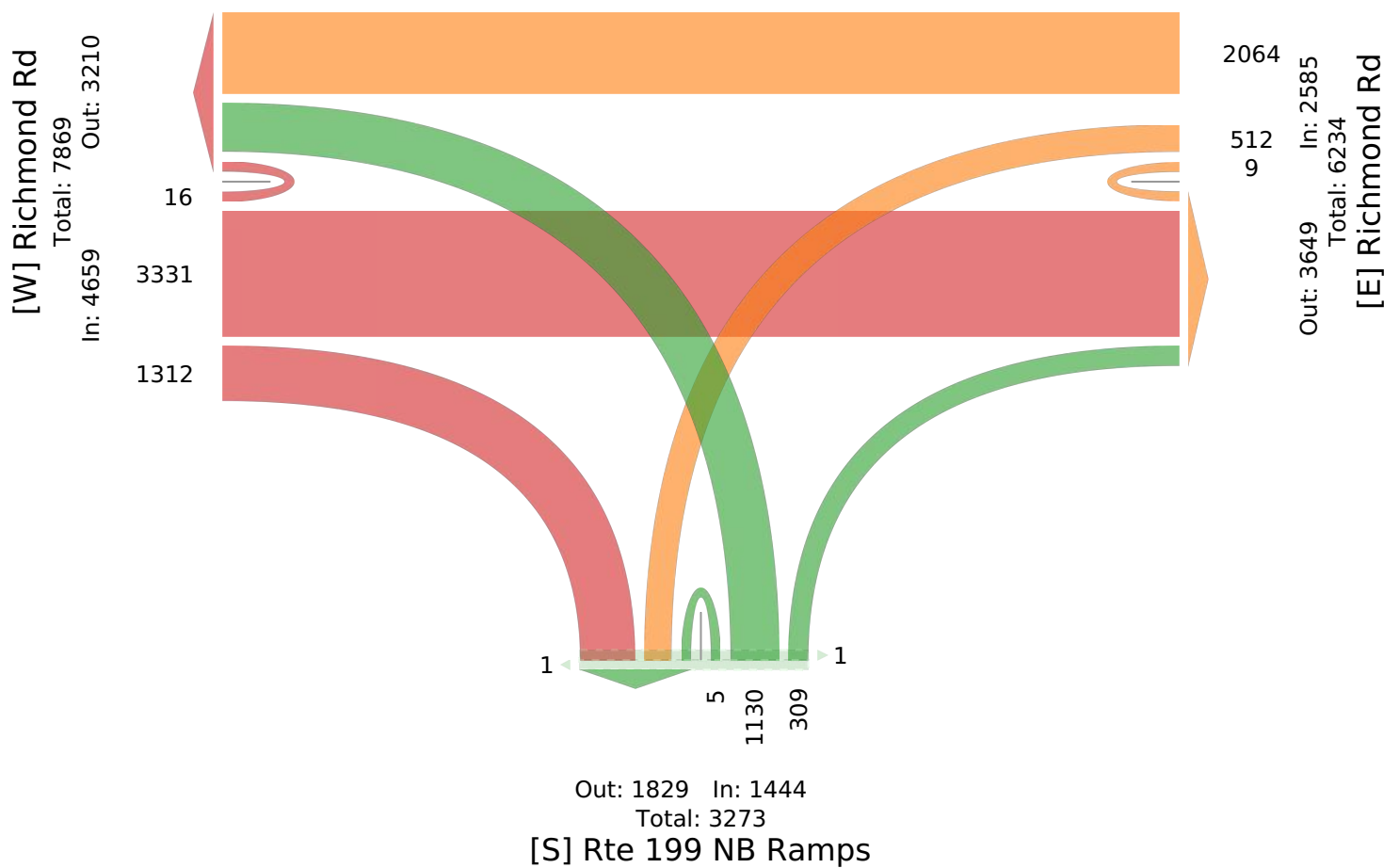
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275077, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



5-Richmond Rd & Rte 199 NB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275077, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 NB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-08 10:00AM	106	23	1	130	0	15	62	0	77	0	70	139	0	209	0	416
10:15AM	100	21	0	121	0	10	61	0	71	0	61	151	0	212	0	404
10:30AM	84	29	1	114	0	13	70	0	83	1	71	162	0	233	0	430
10:45AM	114	26	1	141	0	17	62	0	79	0	75	204	2	281	0	501
Total	404	99	3	506	0	55	255	0	310	1	277	656	2	935	0	1751
% Approach	79.8%	19.6%	0.6%	-	-	17.7%	82.3%	0%	-	-	29.6%	70.2%	0.2%	-	-	-
% Total	23.1%	5.7%	0.2%	28.9%	-	3.1%	14.6%	0%	17.7%	-	15.8%	37.5%	0.1%	53.4%	-	-
PHF	0.886	0.853	0.750	0.897	-	0.809	0.911	-	0.934	-	0.923	0.804	0.250	0.832	-	0.874
Lights and Motorcycles	398	95	3	496	-	54	254	0	308	-	275	649	2	926	-	1730
% Lights and Motorcycles	98.5%	96.0%	100%	98.0%	-	98.2%	99.6%	0%	99.4%	-	99.3%	98.9%	100%	99.0%	-	98.8%
Heavy	6	4	0	10	-	1	1	0	2	-	2	7	0	9	-	21
% Heavy	1.5%	4.0%	0%	2.0%	-	1.8%	0.4%	0%	0.6%	-	0.7%	1.1%	0%	1.0%	-	1.2%
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5-Richmond Rd & Rte 199 NB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

AM Peak (WKND) (10 AM - 11 AM)

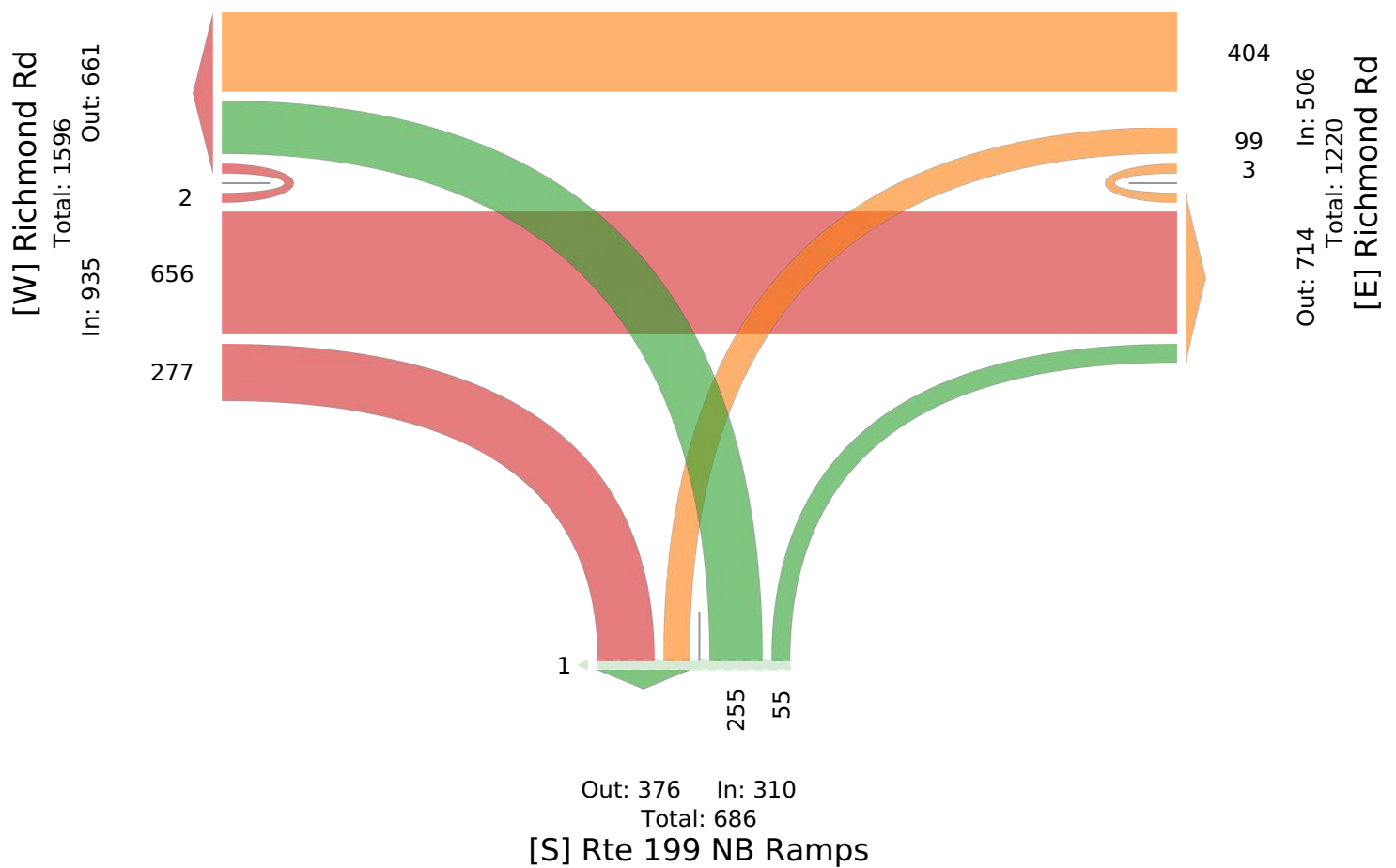
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275077, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



5-Richmond Rd & Rte 199 NB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Midday Peak (WKND), PM Peak (WKND) (1 PM - 2 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275077, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US

Leg Direction	Richmond Rd Westbound					Rte 199 NB Ramps Northbound					Richmond Rd Eastbound					
Time	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	Int
2025-03-08 1:00PM	164	27	0	191	0	27	83	0	110	0	83	216	0	299	0	600
1:15PM	139	38	0	177	0	18	56	0	74	0	86	224	2	312	0	563
1:30PM	153	41	1	195	0	22	82	2	106	0	101	238	3	342	0	643
1:45PM	164	40	1	205	0	31	76	0	107	1	86	223	3	312	0	624
Total	620	146	2	768	0	98	297	2	397	1	356	901	8	1265	0	2430
% Approach	80.7%	19.0%	0.3%	-	-	24.7%	74.8%	0.5%	-	-	28.1%	71.2%	0.6%	-	-	-
% Total	25.5%	6.0%	0.1%	31.6%	-	4.0%	12.2%	0.1%	16.3%	-	14.7%	37.1%	0.3%	52.1%	-	-
PHF	0.945	0.890	0.500	0.937	-	0.790	0.895	0.250	0.902	-	0.881	0.946	0.667	0.925	-	0.945
Lights and Motorcycles	619	143	2	764	-	97	295	2	394	-	352	899	8	1259	-	2417
% Lights and Motorcycles	99.8%	97.9%	100%	99.5%	-	99.0%	99.3%	100%	99.2%	-	98.9%	99.8%	100%	99.5%	-	99.5%
Heavy	1	3	0	4	-	1	2	0	3	-	4	2	0	6	-	13
% Heavy	0.2%	2.1%	0%	0.5%	-	1.0%	0.7%	0%	0.8%	-	1.1%	0.2%	0%	0.5%	-	0.5%
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5-Richmond Rd & Rte 199 NB Ramps-SAT (VA25-0... - TMC

Sat Mar 8, 2025

Midday Peak (WKND), PM Peak (WKND) (1 PM - 2 PM) - Overall Peak Hour

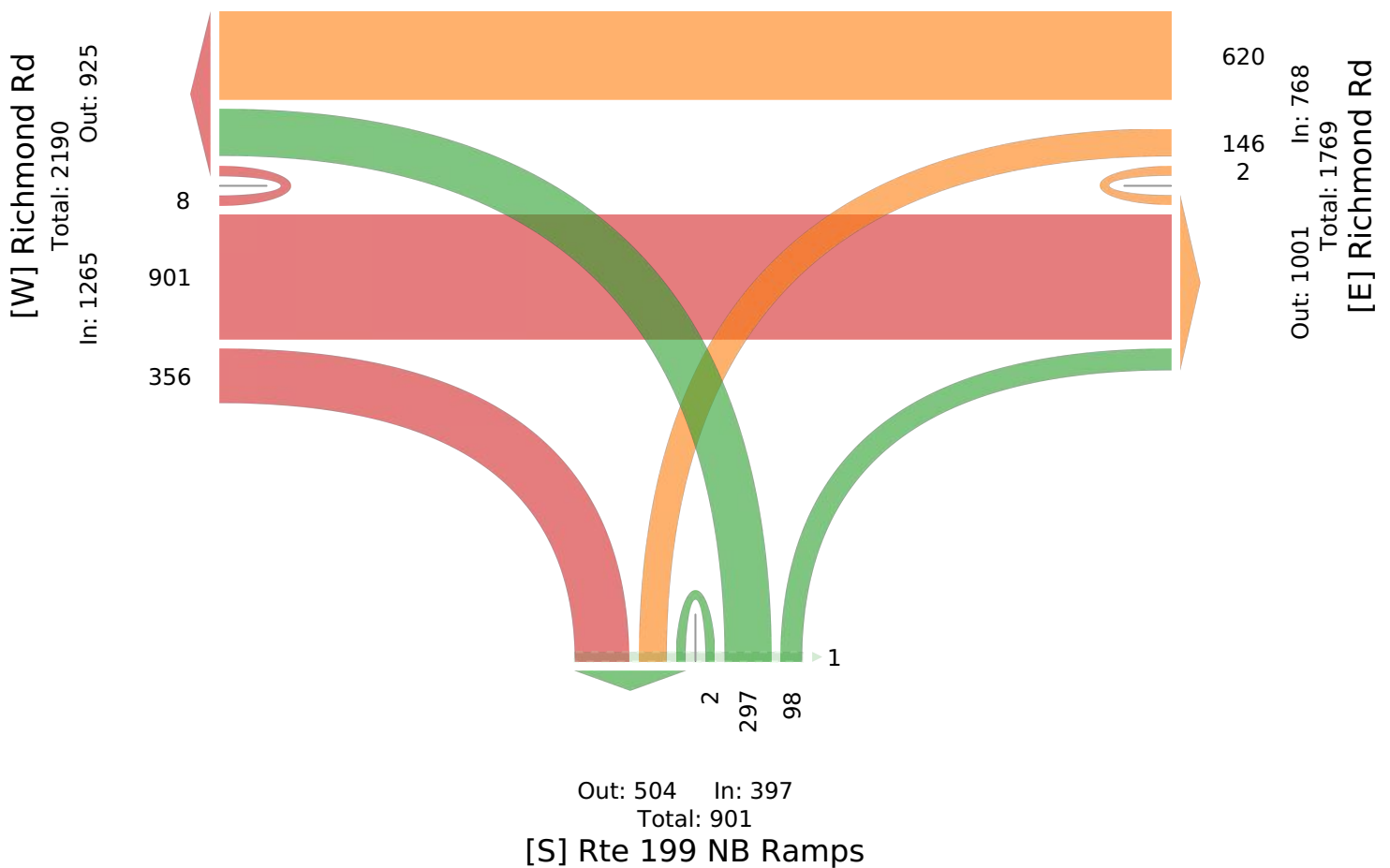
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1275077, Location: 37.335725, -76.749375



Provided by: Peggy Malone & Associates
14286 Beach Blvd, 19-345,
Jacksonville Beach, FL, 32250, US



Appendix C

Traffic Signal Timings

Rt 614 & Warhill

Phase Timing

3/4/2025 8:34:58 AM

[illegible]

Rt 614 & Warhill

Phase Options

3/4/2025 8:34:58 AM

[illegible]

Rt 614 & Warhill

Phase Startup Options

3/4/2025 8:34:58 AM

Startup Flash

Mode

Startup All Red

Yellow

Phases	1-8								9-16							
Startup Phases		2				6										
Startup Yellow		2				6										
Startup Red																
Startup No Walk																
Startup Next																
Startup Yel Fls																
Startup FYA																
No Veh Call	1	2	3	4	5	6	7	8								
No Ped Call		2		4		6		8								

Phase Startup Timing

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Start Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Max Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Unit

Red Revert

Ped Protect

AdvFls in Flash

Rt 614 & Warhill

Ring Sequence / Conflicting Phases

3/4/2025 8:34:58 AM

Ringgroup 1

[illegible]

Ringgroup 2

Custom Sequences

[illegible]

Conflicting Phases

1-8

9-16

[illegible]

Rt 614 & Warhill

MCE Options

3/4/2025 8:34:58 AM

Phases	1-8						9-16					
MCE Ped Protect												
MCE Veh Call												
MCE Ped Call												
MCE Veh Omit												
MCE Ped Omit												
MCE Veh Sync												
MCE Ped Sync												
MCE Halt Don't Walk												

LRV Phases 1-8

MCE LRV Term Early

--	--	--	--	--	--	--	--

Rt 614 & Warhill

FYA/FRA

3/4/2025 8:34:58 AM

FYA	1	2	3	4	5	6	7	8
Prot Phs	0	0	0	0	0	0	0	0
Opp Thru	0	0	0	0	0	0	0	0
Start Phs	0	0	0	0	0	0	0	0
Opp Ped	0	0	0	0	0	0	0	0
Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min FYA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skip Prot Red	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Head Mode	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1

Ped Hawk 1

Veh Phase	0		
Ped Phase	0		
Flash Yel	0.0	Dark Signal	Yes
Flash Delay	0.0	Flash Carryover	0.0
Green Mode	Normal		

Ped Hawk 2

Veh Phase	0		
Ped Phase	0		
Flash Yel	0.0	Dark Signal	Yes
Flash Delay	0.0	Flash Carryover	0.0
Green Mode	Normal		

Ped Hawk 3

Veh Phase	0		
Ped Phase	0		
Flash Yel	0.0	Dark Signal	Yes
Flash Delay	0.0	Flash Carryover	0.0
Green Mode	Normal		

Ped Hawk 4

Veh Phase	0		
Ped Phase	0		
Flash Yel	0.0	Dark Signal	Yes
Flash Delay	0.0	Flash Carryover	0.0
Green Mode	Normal		

Rt 614 & Warhill

Overlap Startup Options

3/4/2025 8:34:58 AM

Overlaps

1-8

9-16

Startup Overlap Green

Startup Overlap Yellow

Overlap Startup Timing

[illegible]

Overlap Unit Options

Overlaps

1-8

9-16

[illegible]

Rt 614 & Warhill

Coordination Options

3/4/2025 8:34:58 AM

Sync Time	00:00	RTC Set Time	00:00
Transition Mode	Best 2	Ped Adjust	None
Trans Short %	20	Trans Long %	35
Offset Reference	Lag FO	Short Cycles	0
Dual Entry	Normal	Overlap F/O	Disabled
Master Sync Mode	RTC	Master Sync Length	0
Adapt Thresh	0	Adapt Step	0
External Plan Max	0		
Hardwire No Match	Sched	Hardwire Sync Fail	0
Override Omit/Recall	No		
Phases	1-8	9-16	
No Trans Recall	☐	☐	☐
Trans Ped Recall	☐	☐	☐
Trans Phases	☐	☐	☐

Rt 614 & Warhill

Hardwire Plans

3/4/2025 8:34:58 AM

Hardwire	Plan Select							Pattern	Offset	Mode
Plan 1								0	0	Hardwire
Plan 2								0	0	Hardwire
Plan 3								0	0	Hardwire
Plan 4								0	0	Hardwire
Plan 5								0	0	Hardwire
Plan 6								0	0	Hardwire
Plan 7								0	0	Hardwire
Plan 8								0	0	Hardwire
Plan 9								0	0	Hardwire
Plan 10								0	0	Hardwire
Plan 11								0	0	Hardwire
Plan 12								0	0	Hardwire
Plan 13								0	0	Hardwire
Plan 14								0	0	Hardwire
Plan 15								0	0	Hardwire
Plan 16								0	0	Hardwire
Plan 17								0	0	Hardwire
Plan 18								0	0	Hardwire
Plan 19								0	0	Hardwire
Plan 20								0	0	Hardwire
Plan 21								0	0	Hardwire
Plan 22								0	0	Hardwire
Plan 23								0	0	Hardwire
Plan 24								0	0	Hardwire
Plan 25								0	0	Hardwire
Plan 26								0	0	Hardwire
Plan 27								0	0	Hardwire
Plan 28								0	0	Hardwire
Plan 29								0	0	Hardwire
Plan 30								0	0	Hardwire
Plan 31								0	0	Hardwire
Plan 32								0	0	Hardwire

Rt 614 & Warhill

Soft Interconnect

3/4/2025 8:34:58 AM

Mode

Slave

Remote Int Number

0

Yield Delay

0

Yield Duration

0

Permissive

0

Local Hold Limit

0

Phases

1-8

9-16

Local Control Phases

Local Hold Phases

Local Perm Phases

Local Call Phases

Remote Perm Phases

Remote Hold Phases

[illegible]

Rt 614 & Warhill

Coordination Pattern 1

3/4/2025 8:34:58 AM

[illegible]

Rt 614 & Warhill

Coordination Pattern 2

3/4/2025 8:34:58 AM

[illegible]

[illegible]

Rt 614 & Warhill

Coordination Pattern 3

3/4/2025 8:34:58 AM

[illegible]

Rt 614 & Warhill

Coordination Pattern 4

3/4/2025 8:34:58 AM

[illegible]

[illegible]

Rt 614 & Warhill

Coordination Pattern 5

3/4/2025 8:34:58 AM

[illegible]

Rt 614 & Warhill

Preempt Inputs

3/4/2025 8:34:58 AM

Preempt Input	1	2	3	4	5	6	7	8	9	10
Delay	0	0	0	0	0	0	0	0	0	0
Checkout Limit	0	0	0	0	0	0	0	0	0	0
Locked	No	No	No	No	No	No	No	No	No	No
Interlock	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Input Number	0	0	0	0	0	0	0	0	0	0
Input Priority	All	All	All	All	All	All	All	All	All	All
Delay Mode	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp

Preempt Priority

Preempt	1	2	3	4	5	6	7	8	9	10
Priority	0	0	0	0	0	0	0	0	0	0

Remote Preemption

Remote Preempt	RM 1	RM 2	RM 3	RM 4	RM 5	RM 6	RM 7	RM 8
Int Number	0	0	0	0	0	0	0	0
PE Number	0	0	0	0	0	0	0	0
Mode	Dis	Dis	Dis	Dis	Dis	Dis	Dis	Dis
Slack	0	0	0	0	0	0	0	0
Travel Time	0	0	0	0	0	0	0	0
Alt TT 1	0	0	0	0	0	0	0	0
Alt TT 2	0	0	0	0	0	0	0	0
Alt TT 3	0	0	0	0	0	0	0	0
Alt TT 4	0	0	0	0	0	0	0	0
Alt TT 5	0	0	0	0	0	0	0	0
Alt TT 6	0	0	0	0	0	0	0	0
Alt TT 7	0	0	0	0	0	0	0	0

Rt 614 & Warhill

Preempt 1 (Configuration)

3/4/2025 8:34:58 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

[illegible]

Preempt 1 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8						9-16					
Omit Olap Grn Clr												
Phs EWlk to Grn												
TClr 1 Veh Phases												
TClr 1 Ped Phases												
TClr 1 Olap												
TClr 1 Olap Ped												
TClr 2 Veh Phases												
TClr 2 Ped Phases												
TClr 2 Olap												
TClr 2 Olap Ped												
Init Dwell Phases												
Dwell Veh Phases	1					6						
Dwell Ped Phases												
Dwell Olap												
Dwell Olap Ped												
Exit Veh Phases	2					6						
Exit Ped Phases												
Exit Olap												
Exit Olap Ped												
Zero Phase Walk	2		4									
Zero Phase Ped Clr	2		4									
Zero Phase Green	1	2	3	4	5	6						
Zero Olap Walk												
Zero Olap Ped Clr												
Zero Olap Green												
Dwell-Phase Red												
Dwell-Phase Red Flash												
Dwell-Phase Yel Flash												
Dwell-Olap Red Flash												
Dwell-Olap Yel Flash												
Dwell-Ped Dark												
Dwell-Olap Ped Dark												

Start Green

0

Start Walk

0

Start Ped Clr

0

Track Clear 1

0

Track Clear 2

0

TC1 Extend

0

TC1 Max

0

Exit Ped Clr

0

Exit Yellow

0.0

Exit Red

0.0

Min Dwell

0

Min Duration

0

Dwell Extend

0

Max Dwell

0

Max Call

180

Reserve Inh Same

0

Reserve Inh All

0

Delay

0

Phases/Overlaps

TClr 1 FR Olap

TClr 2 FR Olap

Dwell FR Olap

TClr 1 FYA

TClr 2 FYA

Dwell FYA

1-8

9-16

Rt 614 & Warhill

Preempt 2 (Configuration)

3/4/2025 8:34:58 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	2		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 2 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	0	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	0	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	2	5				
Dwell Ped Phases						
Dwell Olap						
Dwell Olap Ped						
Exit Veh Phases	2	6				
Exit Ped Phases						
Exit Olap						
Exit Olap Ped						
Zero Phase Walk	2	4				
Zero Phase Ped Clr	2	4				
Zero Phase Green	1	2				
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Rt 614 & Warhill

Preempt 3 (Configuration)

3/4/2025 8:34:58 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8																																										
Enable Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>										3							<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	LRV Disable	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Max	0
	3																																													
Preempt Inputs								LRV Dwell Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																					
								LRV Omit	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Delay	0																											
								LRV No Yel	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																					

Preempt 3 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0																
Omit Olap Grn Clr	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>											Start Ped Clr	0
Phs EWlk to Grn	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Exit Red	0.0		
TClr 1 Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Min Dwell	0	Min Duration	0
TClr 2 Veh Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Dwell Extend	0		
TClr 2 Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Max Dwell	0	Max Call	180
TClr 2 Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Reserve Inh Same	0		
TClr 2 Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Reserve Inh All	0		
Init Dwell Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Delay	0		
Dwell Veh Phases	<table><tr><td></td><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>		3							<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
	3																					
Dwell Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Exit Veh Phases	<table><tr><td></td><td>2</td><td></td><td></td><td>6</td><td></td><td></td><td></td></tr></table>		2			6				<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
	2			6																		
Exit Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Exit Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Exit Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Zero Phase Walk	<table><tr><td></td><td>2</td><td></td><td>4</td><td></td><td></td><td></td><td></td></tr></table>		2		4					<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
	2		4																			
Zero Phase Ped Clr	<table><tr><td></td><td>2</td><td></td><td>4</td><td></td><td></td><td></td><td></td></tr></table>		2		4					<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
	2		4																			
Zero Phase Green	<table><tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td></td></tr></table>		1	2	3	4	5	6		<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
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Zero Olap Walk	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Zero Olap Ped Clr	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Zero Olap Green	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Phase Red	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Phase Red Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Phase Yel Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Olap Red Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Olap Yel Flash	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Ped Dark	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												
Dwell-Olap Ped Dark	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												

Rt 614 & Warhill

Preempt 4 (Configuration)

3/4/2025 8:34:58 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8																																										
Enable Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>4</td><td></td><td></td><td></td><td></td><td></td></tr></table>											4						<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	LRV Disable	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Max	0
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Preempt 4 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0																
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Phs EWlk to Grn	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Exit Red	0.0		
TClr 1 Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Min Dwell	0	Min Duration	0
TClr 2 Veh Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Dwell Extend	0		
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TClr 2 Olap	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Reserve Inh Same	0		
TClr 2 Olap Ped	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>									Reserve Inh All	0		
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Rt 614 & Warhill

Preempt 5 (Configuration)

3/4/2025 8:34:58 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	In Step
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8																																																		
Enable Phases	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	LRV Disable	<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																	Max	0
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Preempt 5 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0																																																																																																																																																																																																																																														
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Rt 614 & Warhill

TOD Pattern Events

3/4/2025 8:34:58 AM

[illegible]

Rt 614 & Warhill

Holidays

3/4/2025 8:34:58 AM

	Active Holidays							Month	Day	DOW							WOM
Date 1								0	0								0
Date 2								0	0								0
Date 3								0	0								0
Date 4								0	0								0
Date 5								0	0								0
Date 6								0	0								0
Date 7								0	0								0
Date 8								0	0								0
Date 9								0	0								0
Date 10								0	0								0
Date 11								0	0								0
Date 12								0	0								0
Date 13								0	0								0
Date 14								0	0								0
Date 15								0	0								0
Date 16								0	0								0
Date 17								0	0								0
Date 18								0	0								0
Date 19								0	0								0
Date 20								0	0								0
Date 21								0	0								0
Date 22								0	0								0
Date 23								0	0								0
Date 24								0	0								0
Date 25								0	0								0
Date 26								0	0								0
Date 27								0	0								0
Date 28								0	0								0
Date 29								0	0								0
Date 30								0	0								0
Date 31								0	0								0
Date 32								0	0								0

Rt 614 & Warhill

Vehicle Detector 1

3/4/2025 8:34:58 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 2

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

1							
---	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

1							
---	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 614 & Warhill

Vehicle Detector 5

3/4/2025 8:34:58 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 6

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

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Rt 614 & Warhill

Vehicle Detector 7

3/4/2025 8:34:58 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

	2						
--	---	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

	2						
--	---	--	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 8

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

			5				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

			5				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 614 & Warhill

Vehicle Detector 9

3/4/2025 8:34:58 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

			5				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

			5				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 10

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

		4					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

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--	--	--	--	--	--	--	--

Extend Phases

		4					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 614 & Warhill

Vehicle Detector 11

3/4/2025 8:34:58 AM

Delay 0.0

Extend

0.0

Carryover 0.0

Queue Limit

0

Mode	No Disc
------	---------

Added	Enabled
-------	---------

System	Enabled
--------	---------

Fail Mode	None
-----------	------

Max Pres

No Act	0
--------	---

Erratic	0
---------	---

Fail Time 0

Delay 2

0.0

Phases

1-8

9-16

Call Phases

Yellow Lock Phases

Red Lock Phases

Extend Phases

XSwitch Phases

Bike Call Phases

[illegible]

Pedestrian Detector 5

No Act	0
--------	---

Max Pres

Erratic	0
---------	---

Fail Mode	None
-----------	------

1-8

5

Call Walk2

No Act	0
--------	---

Max Pres	0
----------	---

Erratic	0
---------	---

Fail Mode	None
-----------	------

1-8

6

Call Walk2

No Act	0
--------	---

Max Pres	0
----------	---

Erratic	0
---------	---

Fail Mode	None
-----------	------

1-8

7

Call Walk2

No Act	0
--------	---

Max Pres	0
----------	---

Erratic	0
---------	---

Fail Mode	None
-----------	------

1-8

8

Call Walk2

Rt 614 & Warhill

Transit/LRV Startup/Options

3/4/2025 8:34:58 AM

No Startup Call

LRV 1-8

--	--	--	--	--	--	--	--

Warn Flash Rate

1 Hz

Rsrv Inh Mode

Seconds

Rt 614 & Warhill

Control / Config

3/4/2025 8:34:58 AM

Pattern Mode	Free																		
Manual Pattern	0	Manual Offset	0																
Stop Time Input	Enabled																		
Aux Switch	None	0																	
DLS Mode	Auto	Time Zone	Est (UTC-5)																
GPS Thresh	0																		
Password Timeout	5																		
Maint Phs Recalls	1-8 <table><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										9-16 <table><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>								
Maint Ped Recalls	<table><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										<table><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>								

Serial 1 Port Configuration

Broadcast Plan/Sync	Disabled	Broadcast Time	00:00
Serial Rebroadcast	Disabled	Response	None

Serial 2 Port Configuration

Broadcast Plan/Sync	Disabled	Broadcast Time	00:00
---------------------	---------------------------------------	----------------	------------------------------------

Ethernet Port Configuration

Broadcast Plan/Sync	Disabled	Broadcast Time	00:00
Serial Rebroadcast	Disabled		

Peer Configuration

Peer 1	0
Peer 2	0
Peer 3	0
Peer 4	0
Peer 5	0
Peer 6	0
Peer 7	0
Peer 8	0

Rt 60 & 614

Phase Timing

3/4/2025 8:30:37 AM

[illegible]

Rt 60 & 614

Phase Options

3/4/2025 8:30:37 AM

[illegible]

Rt 60 & 614

Phase Startup Options

3/4/2025 8:30:37 AM

Startup Flash	0	Mode	Yel->Red																																																																																																																																
Startup All Red	0	Yellow	0.0																																																																																																																																
Phases	1-8	9-16																																																																																																																																	
Startup Phases	<table><tr><td></td><td>2</td><td></td><td></td><td></td><td>6</td><td></td><td></td></tr><tr><td></td><td>2</td><td></td><td></td><td></td><td>6</td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>		2				6				2				6																																																			<table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>																																																																	
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No Ped Call		2		4		6		8																																																																																																																											

Phase Startup Timing

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Start Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Max Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Unit

Red Revert	0.0	Ped Protect	No	AdvFls in Flash	No
------------	----------------------------------	-------------	---------------------------------	-----------------	---------------------------------

Rt 60 & 614

Ring Sequence / Conflicting Phases

3/4/2025 8:30:37 AM

Ringgroup 1

[illegible]

Ringgroup 2

Custom Sequences

[illegible]

Conflicting Phases

1-8

9-16

[illegible]

Rt 60 & 614

MCE Options

3/4/2025 8:30:37 AM

Phases	1-8					9-16				
MCE Ped Protect										
MCE Veh Call										
MCE Ped Call										
MCE Veh Omit										
MCE Ped Omit										
MCE Veh Sync										
MCE Ped Sync										
MCE Halt Don't Walk										

LRV Phases	1-8
MCE LRV Term Early	

Rt 60 & 614

FYA/FRA

3/4/2025 8:30:37 AM

FYA	1	2	3	4	5	6	7	8
Prot Phs	0	0	0	0	0	0	0	0
Opp Thru	0	0	0	0	0	0	0	0
Start Phs	0	0	0	0	0	0	0	0
Opp Ped	0	0	0	0	0	0	0	0
Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min FYA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skip Prot Red	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Head Mode	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1

Ped Hawk 1

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 2

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 3

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 4

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Rt 60 & 614

Overlap Startup Options

3/4/2025 8:30:37 AM

Overlaps

1-8

9-16

Startup Overlap Green

Startup Overlap Yellow

Overlap Startup Timing

[illegible]

Overlap Unit Options

Overlaps

1-8

9-16

[illegible]

Rt 60 & 614

Coordination Options

3/4/2025 8:30:37 AM

Sync Time 00:00

RTC Set Time 00:00

Transition Mode	Best 2
-----------------	--------

Ped Adjust	None
------------	------

Trans Short %	20
---------------	----

Trans Long % 35

Offset Reference

Lag FO

Short Cycles

0

Dual Entry

Normal

Overlap F/O Disabled

Master Sync Mode	RTC
------------------	-----

Master Sync Length	0
--------------------	---

Adapt Thresh	0
--------------	---

Adapt Step	0
------------	---

External Plan Max	0
-------------------	---

Hardwire No Match	Sched

Hardwire Sync Fail	0
--------------------	---

Override Omit/Recall	No
----------------------	----

Phases 1-8

9-16

No Trans Recall							

--	--	--	--	--	--	--	--

Trans Ped Recall							
------------------	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Trans Phases							
--------------	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 60 & 614

Hardwire Plans

3/4/2025 8:30:37 AM

Hardwire	Plan Select							Pattern	Offset	Mode
Plan 1								0	0	Hardwire
Plan 2								0	0	Hardwire
Plan 3								0	0	Hardwire
Plan 4								0	0	Hardwire
Plan 5								0	0	Hardwire
Plan 6								0	0	Hardwire
Plan 7								0	0	Hardwire
Plan 8								0	0	Hardwire
Plan 9								0	0	Hardwire
Plan 10								0	0	Hardwire
Plan 11								0	0	Hardwire
Plan 12								0	0	Hardwire
Plan 13								0	0	Hardwire
Plan 14								0	0	Hardwire
Plan 15								0	0	Hardwire
Plan 16								0	0	Hardwire
Plan 17								0	0	Hardwire
Plan 18								0	0	Hardwire
Plan 19								0	0	Hardwire
Plan 20								0	0	Hardwire
Plan 21								0	0	Hardwire
Plan 22								0	0	Hardwire
Plan 23								0	0	Hardwire
Plan 24								0	0	Hardwire
Plan 25								0	0	Hardwire
Plan 26								0	0	Hardwire
Plan 27								0	0	Hardwire
Plan 28								0	0	Hardwire
Plan 29								0	0	Hardwire
Plan 30								0	0	Hardwire
Plan 31								0	0	Hardwire
Plan 32								0	0	Hardwire

Rt 60 & 614

Soft Interconnect

3/4/2025 8:30:37 AM

Mode

Slave

Remote Int Number

0

Yield Delay

0

Yield Duration

0

Permissive

0

Local Hold Limit

0

Phases

1-8

9-16

Local Control Phases

Local Hold Phases

Local Perm Phases

Local Call Phases

Remote Perm Phases

Remote Hold Phases

Rt 60 & 614

Coordination Pattern 4

3/4/2025 8:30:37 AM

Cycle 130 Ringgroup 1 - Offset 1 118 Offset 2 0 Offset 3 0

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max 2	Walk Rest	Yield
-----------------	-----------	----------	-------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit	15
------------------	----

Perm 2 Start Perm 2 End

Alt Sequence 1 3

TOD Link

0

[illegible]

Trans Mode	Default
------------	---------

Offset Ref	Default
------------	---------

Adaptive Mode	Disabled
---------------	----------

Disable Priority							
------------------	--	--	--	--	--	--	--

Progression Phases

Priority Alt Seq

Reserve Extend							
----------------	--	--	--	--	--	--	--

[illegible]

Rt 60 & 614

Coordination Pattern 4

3/4/2025 8:30:37 AM

[illegible]

Rt 60 & 614

Coordination Pattern 5

3/4/2025 8:30:37 AM

Cycle Ringgroup 1 - Offset 1 Offset 2 Offset 3

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max 2	Walk Rest	Yield
-----------------	-----------	----------	-------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit Perm 2 Start Perm 2 End

Alt Sequence	1		3					TOD Link	0
--------------	---	--	---	--	--	--	--	----------	---

[illegible]

Trans Mode	Default
------------	---------

Offset Ref	Default
------------	---------

Adaptive Mode ☐ Disabled

Disable Priority							
------------------	--	--	--	--	--	--	--

[illegible][illegible]

Reserve Extend							
----------------	--	--	--	--	--	--	--

[illegible]

Rt 60 & 614

Coordination Pattern 5

3/4/2025 8:30:37 AM

[illegible]

Rt 60 & 614

Preempt Inputs

3/4/2025 8:30:37 AM

Preempt Input	1	2	3	4	5	6	7	8	9	10
Delay	0	0	0	0	0	0	0	0	0	0
Checkout Limit	0	0	0	0	0	0	0	0	0	0
Locked	No	No	No	No	No	No	No	No	No	No
Interlock	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Input Number	0	0	0	0	0	0	0	0	0	0
Input Priority	All	All	All	All	All	All	All	All	All	All
Delay Mode	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp

Preempt Priority

Preempt	1	2	3	4	5	6	7	8	9	10
Priority	0	0	0	0	0	0	0	0	0	0

Remote Preemption

Remote Preempt	RM 1	RM 2	RM 3	RM 4	RM 5	RM 6	RM 7	RM 8
Int Number	0	0	0	0	0	0	0	0
PE Number	0	0	0	0	0	0	0	0
Mode	Dis	Dis	Dis	Dis	Dis	Dis	Dis	Dis
Slack	0	0	0	0	0	0	0	0
Travel Time	0	0	0	0	0	0	0	0
Alt TT 1	0	0	0	0	0	0	0	0
Alt TT 2	0	0	0	0	0	0	0	0
Alt TT 3	0	0	0	0	0	0	0	0
Alt TT 4	0	0	0	0	0	0	0	0
Alt TT 5	0	0	0	0	0	0	0	0
Alt TT 6	0	0	0	0	0	0	0	0
Alt TT 7	0	0	0	0	0	0	0	0

Rt 60 & 614

Preempt 1 (Configuration)

3/4/2025 8:30:37 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8								9-16																1-8									
Enable Phases	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐									LVR Disable	☐	☐	☐	☐	☐	☐	☐	Max	0
Preempt Inputs	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐									LVR Dwell Flash	☐	☐	☐	☐	☐	☐	☐		
																	LVR Omit	☐	☐	☐	☐	☐	☐	☐	☐	Delay	0							
																	LVR No Yel	☐	☐	☐	☐	☐	☐	☐	☐									

Preempt 1 (Timing/Phases/Overlaps)

[illegible]

Rt 60 & 614

Preempt 2 (Configuration)

3/4/2025 8:30:37 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	2		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 2 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	0	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	0	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	2	5				
Dwell Ped Phases						
Dwell Olap						
Dwell Olap Ped						
Exit Veh Phases	2	6				
Exit Ped Phases						
Exit Olap						
Exit Olap Ped						
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green	1	2				
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Phases/Overlaps	1-8	9-16
TClr 1 FR Olap		
TClr 2 FR Olap		
Dwell FR Olap		
TClr 1 FYA		
TClr 2 FYA		
Dwell FYA		

Rt 60 & 614

Preempt 3 (Configuration)

3/4/2025 8:30:37 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8								9-16									1-8									
Enable Phases																	LRV Disable								Max	0	
Preempt Inputs			3														LRV Dwell Flash										
																	LRV Omit								Delay	0	
																	LRV No Yel										

Preempt 3 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8						9-16					
Omit Olap Grn Clr												
Phs EWlk to Grn												
TClr 1 Veh Phases												
TClr 1 Ped Phases												
TClr 1 Olap												
TClr 1 Olap Ped												
TClr 2 Veh Phases												
TClr 2 Ped Phases												
TClr 2 Olap												
TClr 2 Olap Ped												
Init Dwell Phases												
Dwell Veh Phases		3										
Dwell Ped Phases												
Dwell Olap												
Dwell Olap Ped												
Exit Veh Phases	2				6							
Exit Ped Phases												
Exit Olap												
Exit Olap Ped												
Zero Phase Walk												
Zero Phase Ped Clr												
Zero Phase Green	1	2	3	4	5	6						
Zero Olap Walk												
Zero Olap Ped Clr												
Zero Olap Green												
Dwell-Phase Red												
Dwell-Phase Red Flash												
Dwell-Phase Yel Flash												
Dwell-Olap Red Flash												
Dwell-Olap Yel Flash												
Dwell-Ped Dark												
Dwell-Olap Ped Dark												

Start Green

0

Start Walk

0

Start Ped Clr

0

Track Clear 1

0

Track Clear 2

0

TC1 Extend

0

TC1 Max

0

Exit Ped Clr

0

Exit Yellow

0.0

Exit Red

0.0

Min Dwell

0

Min Duration

0

Dwell Extend

0

Max Dwell

0

Max Call

180

Reserve Inh Same

0

Reserve Inh All

0

Delay

0

Phases/Overlaps

TClr 1 FR Olap

TClr 2 FR Olap

Dwell FR Olap

TClr 1 FYA

TClr 2 FYA

Dwell FYA

1-8

9-16

Rt 60 & 614

Preempt 4 (Configuration)

3/4/2025 8:30:37 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	4		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 4 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	0	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	0	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	4					
Dwell Ped Phases						
Dwell Olap						
Dwell Olap Ped						
Exit Veh Phases	2	6				
Exit Ped Phases						
Exit Olap						
Exit Olap Ped						
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green	1	2				
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Rt 60 & 614

Preempt 5 (Configuration)

3/4/2025 8:30:37 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	In Step
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	5		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 5 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	0	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	0	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases						
Dwell Ped Phases			Phases/Overlaps	1-8	9-16	
Dwell Olap			TClr 1 FR Olap			
Dwell Olap Ped			TClr 2 FR Olap			
Exit Veh Phases			Dwell FR Olap			
Exit Ped Phases			TClr 1 FYA			
Exit Olap			TClr 2 FYA			
Exit Olap Ped			Dwell FYA			
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green						
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Rt 60 & 614

TOD Pattern Events

3/4/2025 8:30:37 AM

	Time	DOW							Holidays							Mode	Pattern	Offset
Event 1	07:00		M	T	W	T	F									Sched	5	0
Event 2	09:00		M	T	W	T	F									Sched	5	0
Event 3	15:30		M	T	W	T	F									Sched	5	0
Event 4	20:00		M	T	W	T	F									Sched	0	0
Event 5	08:00	S						S								Sched	5	0
Event 6	20:00	S						S								Sched	0	0
Event 7	00:00															Sched	0	0
Event 8	00:00															Sched	0	0
Event 9	00:00															Sched	0	0
Event 10	00:00															Sched	0	0
Event 11	00:00															Sched	0	0
Event 12	00:00															Sched	0	0
Event 13	00:00															Sched	0	0
Event 14	00:00															Sched	0	0
Event 15	00:00															Sched	0	0
Event 16	00:00															Sched	0	0
Event 17	00:00															Sched	0	0
Event 18	00:00															Sched	0	0
Event 19	00:00															Sched	0	0
Event 20	00:00															Sched	0	0
Event 21	00:00															Sched	0	0
Event 22	00:00															Sched	0	0
Event 23	00:00															Sched	0	0
Event 24	00:00															Sched	0	0
Event 25	00:00															Sched	0	0
Event 26	00:00															Sched	0	0
Event 27	00:00															Sched	0	0
Event 28	00:00															Sched	0	0
Event 29	00:00															Sched	0	0
Event 30	00:00															Sched	0	0
Event 31	00:00															Sched	0	0
Event 32	00:00															Sched	0	0

Rt 60 & 614

Holidays

3/4/2025 8:30:37 AM

	Active Holidays	Month	Day	DOW	WOM
Date 1		0	0		0
Date 2		0	0		0
Date 3		0	0		0
Date 4		0	0		0
Date 5		0	0		0
Date 6		0	0		0
Date 7		0	0		0
Date 8		0	0		0
Date 9		0	0		0
Date 10		0	0		0
Date 11		0	0		0
Date 12		0	0		0
Date 13		0	0		0
Date 14		0	0		0
Date 15		0	0		0
Date 16		0	0		0
Date 17		0	0		0
Date 18		0	0		0
Date 19		0	0		0
Date 20		0	0		0
Date 21		0	0		0
Date 22		0	0		0
Date 23		0	0		0
Date 24		0	0		0
Date 25		0	0		0
Date 26		0	0		0
Date 27		0	0		0
Date 28		0	0		0
Date 29		0	0		0
Date 30		0	0		0
Date 31		0	0		0
Date 32		0	0		0

Rt 60 & 614

Vehicle Detector 1

3/4/2025 8:30:37 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 2

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

		3					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 60 & 614

Vehicle Detector 3

3/4/2025 8:30:37 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 4

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 60 & 614

Vehicle Detector 5

3/4/2025 8:30:37 AM

Delay Extend Carryover Queue Limit

Mode	No Disc	Added	Enabled	System	Enabled
------	---------	-------	---------	--------	---------

Fail Mode None Max Pres 0 No Act 0 Erratic 0 Fail Time 0

Delay 2

Phases	1-8	9-16
--------	-----	------

[illegible]

Vehicle Detector 6

Delay Extend Carryover Queue Limit

Mode	No Disc	Added	Enabled	System	Enabled
------	---------	-------	---------	--------	---------

Fail Mode	None	Max Pres	0	No Act	0	Erratic	0	Fail Time	0
-----------	------	----------	---	--------	---	---------	---	-----------	---

Delay 2	0.0
---------	-----

Phases	1-8	9-16
--------	-----	------

[illegible]

Rt 60 & 614

Vehicle Detector 7

3/4/2025 8:30:37 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

			4				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

			4				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 8

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

			4				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

			4				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 60 & 614

Vehicle Detector 9

3/4/2025 8:30:37 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

		4					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

		4					
--	--	---	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 10

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

	2						
--	---	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

	2						
--	---	--	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 60 & 614

Vehicle Detector 11

3/4/2025 8:30:37 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

	2						
--	---	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

	2						
--	---	--	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 12

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

			5				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

			5				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt 60 & 614

Pedestrian Detector 5

3/4/2025 8:30:37 AM

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

5

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Pedestrian Detector 6

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

6

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Pedestrian Detector 7

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

7

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Pedestrian Detector 8

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

8

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Rt 60 & 614

Transit/LRV Startup/Options

3/4/2025 8:30:37 AM

No Startup Call

LRV 1-8

--	--	--	--	--	--	--	--

Warn Flash Rate

1 Hz

Rsrv Inh Mode

Seconds

Rt 60 & 614

Control / Config

3/4/2025 8:30:37 AM

Pattern Mode	Central		
Manual Pattern	0	Manual Offset	0
Stop Time Input	Enabled		
Aux Switch	None	0	
DLS Mode	D4	Time Zone	Est (UTC-5)
GPS Thresh	0		
Password Timeout	5		
Maint Phs Recalls	1-8		9-16
Maint Ped Recalls			

Serial 1 Port Configuration

Broadcast Plan/Sync	Disabled	Broadcast Time	00:00
Serial Rebroadcast	Disabled	Response	None

Serial 2 Port Configuration

Broadcast Plan/Sync	Disabled	Broadcast Time	00:00
---------------------	---------------------------------------	----------------	------------------------------------

Ethernet Port Configuration

Broadcast Plan/Sync	Disabled	Broadcast Time	00:00
Serial Rebroadcast	Disabled		

Peer Configuration

Peer 1	0
Peer 2	0
Peer 3	0
Peer 4	0
Peer 5	0
Peer 6	0
Peer 7	0
Peer 8	0

Rt. 199 WB off ramp & 60

Phase Timing

3/4/2025 8:22:33 AM

[illegible]

Rt. 199 WB off ramp & 60

Phase Options

3/4/2025 8:22:33 AM

[illegible]

Rt. 199 WB off ramp & 60

Ring Sequence / Conflicting Phases

3/4/2025 8:22:33 AM

Ringgroup 1

[illegible]

Ringgroup 2

Custom Sequences

[illegible]

Conflicting Phases

1-8

9-16

[illegible]

Rt. 199 WB off ramp & 60

MCE Options

3/4/2025 8:22:33 AM

Phases

1-8

9-16

MCE Ped Protect		2		4		6		8								
MCE Veh Call	1	2	3	4	5	6	7	8								
MCE Ped Call		2		4		6		8								
MCE Veh Omit																
MCE Ped Omit																
MCE Veh Sync																
MCE Ped Sync																
MCE Halt Don't Walk																

LRV Phases

1-8

MCE LRV Term Early								
--------------------	--	--	--	--	--	--	--	--

Rt. 199 WB off ramp & 60

FYA/FRA

3/4/2025 8:22:33 AM

FYA	1	2	3	4	5	6	7	8
Prot Phs	0	0	0	0	0	0	0	0
Opp Thru	0	0	0	0	0	0	0	0
Start Phs	0	0	0	0	0	0	0	0
Opp Ped	0	0	0	0	0	0	0	0
Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min FYA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skip Prot Red	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Head Mode	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1

Ped Hawk 1

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 2

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 3

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Ped Hawk 4

Veh Phase

Ped Phase

Flash Yel Dark Signal

Flash Delay Flash Carryover

Green Mode

Rt. 199 WB off ramp & 60

Overlap Startup Options

3/4/2025 8:22:33 AM

Overlaps

1-8

9-16

Startup Overlap Green

Startup Overlap Yellow

Overlap Startup Timing

[illegible]

Overlap Unit Options

Overlaps

1-8

9-16

[illegible]

Rt. 199 WB off ramp & 60

Coordination Options

3/4/2025 8:22:33 AM

Sync Time 00:00

RTC Set Time 00:00

Transition Mode	Best 2
-----------------	--------

Ped Adjust	None
------------	------

Trans Short %	20
---------------	----

Trans Long %	35
--------------	----

Offset Reference	Lag FO
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
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72	72
73	73
74	74
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76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99

Short Cycles

0

Dual Entry	Normal
------------	--------

Overlap F/O	Disabled
-------------	----------

Master Sync Mode	RTC
------------------	-----

Master Sync Length	0
--------------------	---

Adapt Thresh

Adapt Step	0
------------	---

External Plan Max	0
-------------------	---

Hardwire No Match	Sched

Hardwire Sync Fail	0
--------------------	---

Override Omit/Recall	No
----------------------	----

Phases 1-8

9-16

No Trans Recall							
-----------------	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Trans Ped Recall							
------------------	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Trans Phases							
--------------	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt. 199 WB off ramp & 60

Hardwire Plans

3/4/2025 8:22:33 AM

Hardwire	Plan Select							Pattern	Offset	Mode
Plan 1								0	0	Hardwire
Plan 2								0	0	Hardwire
Plan 3								0	0	Hardwire
Plan 4								0	0	Hardwire
Plan 5								0	0	Hardwire
Plan 6								0	0	Hardwire
Plan 7								0	0	Hardwire
Plan 8								0	0	Hardwire
Plan 9								0	0	Hardwire
Plan 10								0	0	Hardwire
Plan 11								0	0	Hardwire
Plan 12								0	0	Hardwire
Plan 13								0	0	Hardwire
Plan 14								0	0	Hardwire
Plan 15								0	0	Hardwire
Plan 16								0	0	Hardwire
Plan 17								0	0	Hardwire
Plan 18								0	0	Hardwire
Plan 19								0	0	Hardwire
Plan 20								0	0	Hardwire
Plan 21								0	0	Hardwire
Plan 22								0	0	Hardwire
Plan 23								0	0	Hardwire
Plan 24								0	0	Hardwire
Plan 25								0	0	Hardwire
Plan 26								0	0	Hardwire
Plan 27								0	0	Hardwire
Plan 28								0	0	Hardwire
Plan 29								0	0	Hardwire
Plan 30								0	0	Hardwire
Plan 31								0	0	Hardwire
Plan 32								0	0	Hardwire

Rt. 199 WB off ramp & 60

Soft Interconnect

3/4/2025 8:22:33 AM

Mode	Slave
------	-------

Remote Int Number	0
-------------------	---

Yield Delay	0
-------------	---

Yield Duration

Permissive	0
------------	---

Local Hold Limit

0

Phases

1-8

9-16

Local Control Phases

Local Hold Phases

Local Perm Phases

Local Call Phases

Remote Perm Phases

Remote Hold Phases

Rt. 199 WB off ramp & 60

Coordination Pattern 1

3/4/2025 8:22:33 AM

Cycle 110 Ringgroup 1 - Offset 1 36 Offset 2 0 Offset 3 0

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max Inh	Walk Rest	Yield
-----------------	-----------	----------	---------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit	0
------------------	---

Perm 2 Start

0

Perm 2 End

0

Alt Sequence	1						
--------------	---	--	--	--	--	--	--

TOD Link 0

[illegible]

Trans Mode	Default
------------	---------

Offset Ref	Default
------------	---------

Adaptive Mode	Disabled
---------------	----------

Disable Priority							
------------------	--	--	--	--	--	--	--

Progression Phases	Phase 1							Phase 2						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Phase 1														
Phase 2														
Phase 3														
Phase 4														
Phase 5														
Phase 6														
Phase 7														
Phase 8														
Phase 9														
Phase 10														
Phase 11														
Phase 12														
Phase 13														
Phase 14														
Phase 15														
Phase 16														
Phase 17														
Phase 18														
Phase 19														
Phase 20														

[illegible]

Reserve Extend							
----------------	--	--	--	--	--	--	--

[illegible]

Rt. 199 WB off ramp & 60

Coordination Pattern 1

3/4/2025 8:22:33 AM

[illegible]

Rt. 199 WB off ramp & 60

Coordination Pattern 2

3/4/2025 8:22:33 AM

Cycle 130 Ringgroup 1 - Offset 1 120 Offset 2 0 Offset 3 0

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max Inh	Walk Rest	Yield
-----------------	-----------	----------	---------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit	0
------------------	---

Perm 2 Start

0

Perm 2 End

0

Alt Sequence	1						
--------------	---	--	--	--	--	--	--

TOD Link 0

Phases/Overlaps

1-8

9-16

Trans Mode	Default
------------	---------

[illegible]

No Extend										
-----------	--	--	--	--	--	--	--	--	--	--

[illegible]

Veh = Ped Perm												
----------------	--	--	--	--	--	--	--	--	--	--	--	--

Walk Rest												
-----------	--	--	--	--	--	--	--	--	--	--	--	--

Ped Recall												
------------	--	--	--	--	--	--	--	--	--	--	--	--

[illegible][illegible]

Ped Recycle												
-------------	--	--	--	--	--	--	--	--	--	--	--	--

Min Recall												
------------	--	--	--	--	--	--	--	--	--	--	--	--

Max Recall															
------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Cond Serv															
-----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Veh Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

Ped Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Term Reserve										
--------------	--	--	--	--	--	--	--	--	--	--

[illegible]

Max Inhibit												
-------------	--	--	--	--	--	--	--	--	--	--	--	--

FYA Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Offset Ref	Default
------------	---------

ntive Mode Disabled

Adaptive Mode	Disabled
---------------	----------

Disable Priority

--	--	--	--	--	--	--	--

Progression Phases																		

[illegible][illegible][illegible]

Rt. 199 WB off ramp & 60

Coordination Pattern 2

3/4/2025 8:22:33 AM

[illegible]

Rt. 199 WB off ramp & 60

Coordination Pattern 3

3/4/2025 8:22:33 AM

Cycle 140 Ringgroup 1 - Offset 1 8 Offset 2 0 Offset 3 0

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max Inh	Walk Rest	Yield
-----------------	-----------	----------	---------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit	0
------------------	---

Perm 2 Start

0

Perm 2 End

0

Alt Sequence	1						
--------------	---	--	--	--	--	--	--

TOD Link

0

Phases/Overlaps

1-8

9-16

Trans Mode	Default
------------	---------

[illegible][illegible][illegible]

Veh = Ped Perm												
----------------	--	--	--	--	--	--	--	--	--	--	--	--

Walk Rest												
-----------	--	--	--	--	--	--	--	--	--	--	--	--

Ped Recall												
------------	--	--	--	--	--	--	--	--	--	--	--	--

Cond Ped Call												
---------------	--	--	--	--	--	--	--	--	--	--	--	--

Olap Ped Recall															
-----------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Min Recall												
------------	--	--	--	--	--	--	--	--	--	--	--	--

Max Recall														
------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Cond Serv															
-----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

[illegible][illegible]

Ped Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Term Reserve										
--------------	--	--	--	--	--	--	--	--	--	--

Perm 1 Phases										
---------------	--	--	--	--	--	--	--	--	--	--

Max Inhibit												
-------------	--	--	--	--	--	--	--	--	--	--	--	--

FYA Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

Adapt Phases												
--------------	--	--	--	--	--	--	--	--	--	--	--	--

Offset Ref	Default
------------	---------

ntive Mode Disabled

Adaptive Mode	Disabled
---------------	----------

Disable Priority

--	--	--	--	--	--	--	--

[illegible]

Priority								
Alt Seq								

Reserve Extend									
----------------	--	--	--	--	--	--	--	--	--

[illegible]

Rt. 199 WB off ramp & 60

Coordination Pattern 3

3/4/2025 8:22:33 AM

[illegible]

Rt. 199 WB off ramp & 60

Coordination Pattern 4

3/4/2025 8:22:33 AM

Cycle 130 Ringgroup 1 - Offset 1 0 Offset 2 0 Offset 3 0

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max Inh	Walk Rest	Yield
-----------------	-----------	----------	---------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit	0
------------------	---

Perm 2 Start

0

Perm 2 End

0

Alt Sequence

--	--	--	--	--	--	--	--

TOD Link 0

Phases/Overlaps

1-8

9-16

Trans Mode	Default
------------	---------

[illegible][illegible][illegible]

Veh = Ped Perm												
----------------	--	--	--	--	--	--	--	--	--	--	--	--

Walk															
Rest															

Ped Recall															
------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Cond Ped Call												
---------------	--	--	--	--	--	--	--	--	--	--	--	--

Olap Ped Recall												
-----------------	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Min Recall															
------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Max Recall														
------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Reservice															
-----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

[illegible][illegible]

Olap	Omit

Term Reserve												
--------------	--	--	--	--	--	--	--	--	--	--	--	--

Perm 1 Phases												
---------------	--	--	--	--	--	--	--	--	--	--	--	--

Max Inhibit												
-------------	--	--	--	--	--	--	--	--	--	--	--	--

FYA Omit												
----------	--	--	--	--	--	--	--	--	--	--	--	--

[illegible]

Offset Ref	Default
------------	---------

Offset Ref	Default
------------	---------

Adaptive Mode	Disabled
---------------	----------

Disable Priority							
------------------	--	--	--	--	--	--	--

Progression Phases	Phase 1							Phase 2						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Phase 1														
Phase 2														
Phase 3														
Phase 4														
Phase 5														
Phase 6														
Phase 7														
Phase 8														
Phase 9														
Phase 10														

Priority							
Alt Seq							

Reserve Extend							
----------------	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Priority Timing-Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
-----------------------	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----

[illegible][illegible]

Rt. 199 WB off ramp & 60

Coordination Pattern 4

3/4/2025 8:22:33 AM

[illegible]

Rt. 199 WB off ramp & 60

Preempt Inputs

3/4/2025 8:22:33 AM

Preempt Input	1	2	3	4	5	6	7	8	9	10
Delay	0	0	0	0	0	0	0	0	0	0
Checkout Limit	0	0	0	0	0	0	0	0	0	0
Locked	No	No	No	No	No	No	No	No	No	No
Interlock	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Input Number	0	0	0	0	0	0	0	0	0	0
Input Priority	All	All	All	All	All	All	All	All	All	All
Delay Mode	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp

Preempt Priority

Preempt	1	2	3	4	5	6	7	8	9	10
Priority	0	0	0	0	0	0	0	0	0	0

Remote Preemption

Remote Preempt	RM 1	RM 2	RM 3	RM 4	RM 5	RM 6	RM 7	RM 8
Int Number	0	0	0	0	0	0	0	0
PE Number	0	0	0	0	0	0	0	0
Mode	Dis	Dis	Dis	Dis	Dis	Dis	Dis	Dis
Slack	0	0	0	0	0	0	0	0
Travel Time	0	0	0	0	0	0	0	0
Alt TT 1	0	0	0	0	0	0	0	0
Alt TT 2	0	0	0	0	0	0	0	0
Alt TT 3	0	0	0	0	0	0	0	0
Alt TT 4	0	0	0	0	0	0	0	0
Alt TT 5	0	0	0	0	0	0	0	0
Alt TT 6	0	0	0	0	0	0	0	0
Alt TT 7	0	0	0	0	0	0	0	0

Rt. 199 WB off ramp & 60

Preempt 1 (Configuration)

3/4/2025 8:22:33 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

[illegible]

Preempt 1 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8						9-16					
Omit Olap Grn Clr												
Phs EWlk to Grn												
TClr 1 Veh Phases												
TClr 1 Ped Phases												
TClr 1 Olap												
TClr 1 Olap Ped												
TClr 2 Veh Phases												
TClr 2 Ped Phases												
TClr 2 Olap												
TClr 2 Olap Ped												
Init Dwell Phases												
Dwell Veh Phases	1					6						
Dwell Ped Phases												
Dwell Olap												
Dwell Olap Ped												
Exit Veh Phases	2					6						
Exit Ped Phases												
Exit Olap												
Exit Olap Ped												
Zero Phase Walk												
Zero Phase Ped Clr												
Zero Phase Green	1	2	3	4	5	6						
Zero Olap Walk												
Zero Olap Ped Clr												
Zero Olap Green												
Dwell-Phase Red												
Dwell-Phase Red Flash												
Dwell-Phase Yel Flash												
Dwell-Olap Red Flash												
Dwell-Olap Yel Flash												
Dwell-Ped Dark												
Dwell-Olap Ped Dark												

Start Green

0

Start Walk

0

Start Ped Clr

0

Track Clear 1

0

Track Clear 2

0

TC1 Extend

0

TC1 Max

0

Exit Ped Clr

0

Exit Yellow

0.0

Exit Red

0.0

Min Dwell

0

Min Duration

0

Dwell Extend

0

Max Dwell

0

Max Call

180

Reserve Inh Same

0

Reserve Inh All

0

Delay

0

Phases/Overlaps

TClr 1 FR Olap

TClr 2 FR Olap

Dwell FR Olap

TClr 1 FYA

TClr 2 FYA

Dwell FYA

1-8

9-16

Rt. 199 WB off ramp & 60

Preempt 2 (Configuration)

3/4/2025 8:22:33 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	2		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 2 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	0	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	0	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	2					
Dwell Ped Phases						
Dwell Olap						
Dwell Olap Ped						
Exit Veh Phases	2	6				
Exit Ped Phases						
Exit Olap						
Exit Olap Ped						
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green	1	2				
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Phases/Overlaps	1-8	9-16
TClr 1 FR Olap		
TClr 2 FR Olap		
Dwell FR Olap		
TClr 1 FYA		
TClr 2 FYA		
Dwell FYA		

Rt. 199 WB off ramp & 60

Preempt 4 (Configuration)

3/4/2025 8:22:33 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	4		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 4 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	10	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	0	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	4					
Dwell Ped Phases						
Dwell Olap						
Dwell Olap Ped						
Exit Veh Phases	2	6				
Exit Ped Phases						
Exit Olap						
Exit Olap Ped						
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green	1	2				
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Rt. 199 WB off ramp & 60

Preempt 6 (Configuration)

3/4/2025 8:22:33 AM

Enabled	Yes	Dwell Mode	Flash	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	6		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 6 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	10	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	180	Max Call	0
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	1	6				
Dwell Ped Phases			Phases/Overlaps	1-8	9-16	
Dwell Olap			TClr 1 FR Olap			
Dwell Olap Ped			TClr 2 FR Olap			
Exit Veh Phases			Dwell FR Olap			
Exit Ped Phases			TClr 1 FYA			
Exit Olap			TClr 2 FYA			
Exit Olap Ped			Dwell FYA	5		
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green						
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Rt. 199 WB off ramp & 60

TOD Pattern Events

3/4/2025 8:22:33 AM

	Time	DOW							Holidays							Mode	Pattern	Offset
Event 1	07:00		M	T	W	T	F									Sched	4	1
Event 2	09:00		M	T	W	T	F									Sched	4	1
Event 3	15:30		M	T	W	T	F									Sched	4	1
Event 4	20:00		M	T	W	T	F									Free	0	0
Event 5	08:00	S						S								Sched	4	1
Event 6	20:00	S						S								Free	0	0
Event 7	00:00															Sched	0	0
Event 8	00:00															Sched	0	0
Event 9	00:00															Sched	0	0
Event 10	00:00															Sched	0	0
Event 11	00:00															Sched	0	0
Event 12	00:00															Sched	0	0
Event 13	00:00															Sched	0	0
Event 14	00:00															Sched	0	0
Event 15	00:00															Sched	0	0
Event 16	00:00															Sched	0	0
Event 17	00:00															Sched	0	0
Event 18	00:00															Sched	0	0
Event 19	00:00															Sched	0	0
Event 20	00:00															Sched	0	0
Event 21	00:00															Sched	0	0
Event 22	00:00															Sched	0	0
Event 23	00:00															Sched	0	0
Event 24	00:00															Sched	0	0
Event 25	00:00															Sched	0	0
Event 26	00:00															Sched	0	0
Event 27	00:00															Sched	0	0
Event 28	00:00															Sched	0	0
Event 29	00:00															Sched	0	0
Event 30	00:00															Sched	0	0
Event 31	00:00															Sched	0	0
Event 32	00:00															Sched	0	0

Rt. 199 WB off ramp & 60

Holidays

3/4/2025 8:22:33 AM

	Active Holidays							Month	Day	DOW							WOM
Date 1								0	0								0
Date 2								0	0								0
Date 3								0	0								0
Date 4								0	0								0
Date 5								0	0								0
Date 6								0	0								0
Date 7								0	0								0
Date 8								0	0								0
Date 9								0	0								0
Date 10								0	0								0
Date 11								0	0								0
Date 12								0	0								0
Date 13								0	0								0
Date 14								0	0								0
Date 15								0	0								0
Date 16								0	0								0
Date 17								0	0								0
Date 18								0	0								0
Date 19								0	0								0
Date 20								0	0								0
Date 21								0	0								0
Date 22								0	0								0
Date 23								0	0								0
Date 24								0	0								0
Date 25								0	0								0
Date 26								0	0								0
Date 27								0	0								0
Date 28								0	0								0
Date 29								0	0								0
Date 30								0	0								0
Date 31								0	0								0
Date 32								0	0								0

Rt. 199 WB off ramp & 60

Vehicle Detector 1

3/4/2025 8:22:33 AM

Delay Extend Carryover Queue Limit

Mode	No Disc	Added	Disabled	System	Enabled
------	---------	-------	----------	--------	---------

Fail Mode	None	Max Pres	0	No Act	0	Erratic	0	Fail Time	0
-----------	------	----------	---	--------	---	---------	---	-----------	---

Delay 2	0.0
---------	-----

Phases	1-8	9-16
--------	-----	------

[illegible]

Vehicle Detector 2

Delay Extend Carryover Queue Limit

Mode	No Disc	Added	Disabled	System	Disabled
------	---------	-------	----------	--------	----------

Fail Mode	None	Max Pres	0	No Act	0	Erratic	0	Fail Time	0
-----------	------	----------	---	--------	---	---------	---	-----------	---

Delay 2

0.0

Phases	1-8	9-16
--------	-----	------

[illegible]

Rt. 199 WB off ramp & 60

Vehicle Detector 4

3/4/2025 8:22:33 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

			4				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

			4				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 6

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

				6			
--	--	--	--	---	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

				6			
--	--	--	--	---	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt. 199 WB off ramp & 60

Vehicle Detector 7

3/4/2025 8:22:33 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

						7	
--	--	--	--	--	--	---	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

						7	
--	--	--	--	--	--	---	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 8

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

							8
--	--	--	--	--	--	--	---

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

							8
--	--	--	--	--	--	--	---

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt. 199 WB off ramp & 60

Pedestrian Detector 2

3/4/2025 8:22:33 AM

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Pedestrian Detector 4

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Pedestrian Detector 6

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Pedestrian Detector 8

No Act

Max Pres

Erratic

Fail Mode

Phases/Overlaps

1-8

9-16

Call Ped Phases

Call Ped Olaps

Call Phases

Locked Call Phases

Ped Entry Phases

Olap Ped Entry Phases

Ped Cascade Phases

Call Walk2

Rt. 199 WB off ramp & 60

Transit/LRV Startup/Options

3/4/2025 8:22:33 AM

No Startup Call

LRV 1-8							

Warn Flash Rate

1 Hz

Rsrv Inh Mode

Seconds

Rt. 199 WB off ramp & 60

Control / Config

3/4/2025 8:22:33 AM

Pattern Mode

Manual Pattern Manual Offset

Stop Time Input

Aux Switch

DLS Mode Time Zone

GPS Thresh

Password Timeout

Maint Phs Recalls

Maint Ped Recalls

Serial 1 Port Configuration

Broadcast Plan/Sync

Broadcast Time

Serial Rebroadcast

Response

Serial 2 Port Configuration

Broadcast Plan/Sync

Broadcast Time

Ethernet Port Configuration

Broadcast Plan/Sync

Broadcast Time

Serial Rebroadcast

Peer Configuration

Peer 1

Peer 2

Peer 3

Peer 4

Peer 5

Peer 6

Peer 7

Peer 8

Rt. 199 EB off ramp & 60 Piano

Phase Timing

3/4/2025 8:27:43 AM

[illegible]

Rt. 199 EB off ramp & 60 Piano

Phase Options

3/4/2025 8:27:43 AM

[illegible]

Rt. 199 EB off ramp & 60 Piano

Phase Startup Options

3/4/2025 8:27:43 AM

Startup Flash

Mode

Startup All Red

Yellow

Phases	1-8								9-16							
Startup Phases	2			6												
Startup Yellow	2			6												
Startup Red																
Startup No Walk																
Startup Next																
Startup Yel Fls																
Startup FYA																
No Veh Call	1	3	4	5	7	8										
No Ped Call	2	4	6	8												

Phase Startup Timing

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Start Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Max Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Unit

Red Revert

Ped Protect

AdvFls in Flash

Rt. 199 EB off ramp & 60 Piano

Ring Sequence / Conflicting Phases

3/4/2025 8:27:43 AM

Ringgroup 1

[illegible]

Ringgroup 2

Custom Sequences

[illegible]

Conflicting Phases

1-8

9-16

[illegible]

Rt. 199 EB off ramp & 60 Piano

MCE Options

3/4/2025 8:27:43 AM

Phases	1-8								9-16							
MCE Ped Protect		2		4		6		8								
MCE Veh Call	1	2	3	4	5	6	7	8								
MCE Ped Call		2		4		6		8								
MCE Veh Omit																
MCE Ped Omit																
MCE Veh Sync																
MCE Ped Sync																
MCE Halt Don't Walk																

LRV Phases	1-8							
MCE LRV Term Early								

Rt. 199 EB off ramp & 60 Piano

FYA/FRA

3/4/2025 8:27:43 AM

FYA	1	2	3	4	5	6	7	8
Prot Phs	0	0	0	0	0	0	0	0
Opp Thru	0	0	0	0	0	0	0	0
Start Phs	0	0	0	0	0	0	0	0
Opp Ped	0	0	0	0	0	0	0	0
Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Min FYA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Skip Prot Red	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Head Mode	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1	FYA 1

Ped Hawk 1

Veh Phase	0		
Ped Phase	0		
Flash Yel	0.0	Dark Signal	Yes
Flash Delay	0.0	Flash Carryover	0.0
Green Mode	Normal		

Ped Hawk 2

Veh Phase	0		
Ped Phase	0		
Flash Yel	0.0	Dark Signal	Yes
Flash Delay	0.0	Flash Carryover	0.0
Green Mode	Normal		

Ped Hawk 3

Veh Phase	0		
Ped Phase	0		
Flash Yel	0.0	Dark Signal	Yes
Flash Delay	0.0	Flash Carryover	0.0
Green Mode	Normal		

Ped Hawk 4

Veh Phase	0		
Ped Phase	0		
Flash Yel	0.0	Dark Signal	Yes
Flash Delay	0.0	Flash Carryover	0.0
Green Mode	Normal		

Rt. 199 EB off ramp & 60 Piano

Coordination Options

3/4/2025 8:27:43 AM

Sync Time	00:00	RTC Set Time	00:00	
Transition Mode	Best 2	Ped Adjust	None	
Trans Short %	20	Trans Long %	35	
Offset Reference	Lag FO	Short Cycles	0	
Dual Entry	Normal	Overlap F/O	Disabled	
Master Sync Mode	RTC	Master Sync Length	0	
Adapt Thresh	0	Adapt Step	0	
External Plan Max	0			
Hardwire No Match	Sched	Hardwire Sync Fail	0	
Override Omit/Recall	No			
Phases	1-8	9-16		
No Trans Recall	☐	☐	☐	☐
Trans Ped Recall	☐	☐	☐	☐
Trans Phases	☐	☐	☐	☐

Rt. 199 EB off ramp & 60 Piano

Hardwire Plans

3/4/2025 8:27:43 AM

Hardwire	Plan Select								Pattern	Offset	Mode
Plan 1									0	0	Hardwire
Plan 2									0	0	Hardwire
Plan 3									0	0	Hardwire
Plan 4									0	0	Hardwire
Plan 5									0	0	Hardwire
Plan 6									0	0	Hardwire
Plan 7									0	0	Hardwire
Plan 8									0	0	Hardwire
Plan 9									0	0	Hardwire
Plan 10									0	0	Hardwire
Plan 11									0	0	Hardwire
Plan 12									0	0	Hardwire
Plan 13									0	0	Hardwire
Plan 14									0	0	Hardwire
Plan 15									0	0	Hardwire
Plan 16									0	0	Hardwire
Plan 17									0	0	Hardwire
Plan 18									0	0	Hardwire
Plan 19									0	0	Hardwire
Plan 20									0	0	Hardwire
Plan 21									0	0	Hardwire
Plan 22									0	0	Hardwire
Plan 23									0	0	Hardwire
Plan 24									0	0	Hardwire
Plan 25									0	0	Hardwire
Plan 26									0	0	Hardwire
Plan 27									0	0	Hardwire
Plan 28									0	0	Hardwire
Plan 29									0	0	Hardwire
Plan 30									0	0	Hardwire
Plan 31									0	0	Hardwire
Plan 32									0	0	Hardwire

Rt. 199 EB off ramp & 60 Piano

Soft Interconnect

3/4/2025 8:27:43 AM

Mode	Slave
------	-------

Remote Int Number 0

Yield Delay Yield Duration

Permissive	0
------------	---

Local Hold Limit	0
------------------	---

Phases

1-8

9-16

Local Control Phases

Local Hold Phases

Local Perm Phases

Local Call Phases

Remote Perm Phases

Remote Hold Phases

Rt. 199 EB off ramp & 60 Piano

Coordination Pattern 4

3/4/2025 8:27:43 AM

Cycle 130 Ringgroup 1 - Offset 1 124 Offset 2 0 Offset 3 0

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max 2	Walk Rest	Yield
-----------------	-----------	----------	-------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit	15	Perm 2 Start	0	Perm 2 End	0
------------------	----	--------------	---	------------	---

Alt Sequence			TOD Link	0
--------------	-------------	--	----------	--------------

Phases/Overlaps	1-8	9-16
-----------------	-----	------

Trans Mode	Default
------------	---------

Offset Ref	Default
------------	---------

Adaptive Mode	Disabled
---------------	----------

Disable Priority

--	--	--	--	--	--	--	--

Progression Phases	Phase 1: Initial Assessment						Phase 2: Core Skill Development						Phase 3: Advanced Application					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
1. Initial Assessment																		
2. Core Skill Development																		
3. Advanced Application																		
4. Final Evaluation																		

	Seq	Alt	Priority
Priority Alt Seq			

Reserve Extend							
----------------	--	--	--	--	--	--	--

[illegible][illegible]

Rt. 199 EB off ramp & 60 Piano

Coordination Pattern 4

3/4/2025 8:27:43 AM

[illegible]

Rt. 199 EB off ramp & 60 Piano

Coordination Pattern 5

3/4/2025 8:27:43 AM

Cycle 130 Ringgroup 1 - Offset 1 0 Offset 2 0 Offset 3 0

Ringgroup 2 - Offset 1 Offset 2 Offset 3

[illegible]

Permissive Mode	Sing Band	Max Mode	Max 2	Walk Rest	Yield
-----------------	-----------	----------	-------	-----------	-------

Ped Permissive	Yield
----------------	-------

Permissive Limit	15	Perm 2 Start	0	Perm 2 End	0
------------------	----	--------------	---	------------	---

Alt Sequence			TOD Link	0
--------------	-------------	--	----------	--------------

Phases/Overlaps	1-8	9-16
1. Initial Assessment	1. Initial Assessment	1. Initial Assessment
2. Data Collection	2. Data Collection	2. Data Collection
3. Data Analysis	3. Data Analysis	3. Data Analysis
4. Report Writing	4. Report Writing	4. Report Writing
5. Presentation	5. Presentation	5. Presentation
6. Feedback	6. Feedback	6. Feedback
7. Revision	7. Revision	7. Revision
8. Final Report	8. Final Report	8. Final Report
9. Final Review	9. Final Review	9. Final Review
10. Archiving	10. Archiving	10. Archiving
11. Dissemination	11. Dissemination	11. Dissemination
12. Evaluation	12. Evaluation	12. Evaluation
13. Reflection	13. Reflection	13. Reflection
14. Conclusion	14. Conclusion	14. Conclusion
15. Acknowledgments	15. Acknowledgments	15. Acknowledgments
16. Appendix	16. Appendix	16. Appendix

Trans Mode	Default
------------	---------

Offset Ref	Default
------------	---------

Adaptive Mode	Disabled
---------------	----------

Disable Priority

--	--	--	--	--	--	--	--

Progression Phases	Phase 1: Initial Assessment						Phase 2: Core Skill Development						Phase 3: Advanced Application					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
1. Initial Assessment																		
2. Core Skill Development																		
3. Advanced Application																		

Priority	Alt	Seq

Reserve Extend							
----------------	--	--	--	--	--	--	--

[illegible][illegible]

Rt. 199 EB off ramp & 60 Piano

Coordination Pattern 5

3/4/2025 8:27:43 AM

[illegible]

Rt. 199 EB off ramp & 60 Piano

Preempt Inputs

3/4/2025 8:27:43 AM

Preempt Input	1	2	3	4	5	6	7	8	9	10
Delay	0	0	0	0	0	0	0	0	0	0
Checkout Limit	0	0	0	0	0	0	0	0	0	0
Locked	No	No	No	No	No	No	No	No	No	No
Interlock	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Input Number	0	0	0	0	0	0	0	0	0	0
Input Priority	All	All	All	All	All	All	All	All	All	All
Delay Mode	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp	Inp

Preempt Priority

Preempt	1	2	3	4	5	6	7	8	9	10
Priority	0	0	0	0	0	0	0	0	0	0

Remote Preemption

Remote Preempt	RM 1	RM 2	RM 3	RM 4	RM 5	RM 6	RM 7	RM 8
Int Number	0	0	0	0	0	0	0	0
PE Number	0	0	0	0	0	0	0	0
Mode	Dis	Dis	Dis	Dis	Dis	Dis	Dis	Dis
Slack	0	0	0	0	0	0	0	0
Travel Time	0	0	0	0	0	0	0	0
Alt TT 1	0	0	0	0	0	0	0	0
Alt TT 2	0	0	0	0	0	0	0	0
Alt TT 3	0	0	0	0	0	0	0	0
Alt TT 4	0	0	0	0	0	0	0	0
Alt TT 5	0	0	0	0	0	0	0	0
Alt TT 6	0	0	0	0	0	0	0	0
Alt TT 7	0	0	0	0	0	0	0	0

Rt. 199 EB off ramp & 60 Piano

Preempt 2 (Configuration)

3/4/2025 8:27:43 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	2		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 2 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	0	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	0	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	2					
Dwell Ped Phases						
Dwell Olap						
Dwell Olap Ped						
Exit Veh Phases	2	6				
Exit Ped Phases						
Exit Olap						
Exit Olap Ped						
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green	1	2				
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Phases/Overlaps	1-8	9-16
TClr 1 FR Olap		
TClr 2 FR Olap		
Dwell FR Olap		
TClr 1 FYA		
TClr 2 FYA		
Dwell FYA		

Rt. 199 EB off ramp & 60 Piano

Preempt 4 (Configuration)

3/4/2025 8:27:43 AM

Enabled	Yes	Dwell Mode	Normal	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	4		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 4 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	10	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	180	Max Call	180
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	4					
Dwell Ped Phases						
Dwell Olap						
Dwell Olap Ped						
Exit Veh Phases	2	6				
Exit Ped Phases						
Exit Olap						
Exit Olap Ped						
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green	1	2				
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Rt. 199 EB off ramp & 60 Piano

Preempt 6 (Configuration)

3/4/2025 8:27:43 AM

Enabled	Yes	Dwell Mode	Flash	Output Mode	All
Output2 Mode	All	Fail Action	Preempt Off	Exit Mode	Normal
Override Flash	No	Change Phasenext	Yes		

	1-8	9-16		1-8	
Enable Phases			LRV Disable		Max 0
Preempt Inputs	6		LRV Dwell Flash		
			LRV Omit		Delay 0
			LRV No Yel		

Preempt 6 (Timing/Phases/Overlaps)

Phases/Overlaps	1-8	9-16	Start Green	0	Start Walk	0
Omit Olap Grn Clr					Start Ped Clr	0
Phs EWlk to Grn			Track Clear 1	0	Track Clear 2	0
TClr 1 Veh Phases			TC1 Extend	0	TC1 Max	0
TClr 1 Ped Phases			Exit Ped Clr	0	Exit Yellow	0.0
TClr 1 Olap			Exit Red	0.0		
TClr 1 Olap Ped			Min Dwell	10	Min Duration	0
TClr 2 Veh Phases			Dwell Extend	0		
TClr 2 Ped Phases			Max Dwell	180	Max Call	0
TClr 2 Olap			Reserve Inh Same	0		
TClr 2 Olap Ped			Reserve Inh All	0		
Init Dwell Phases			Delay	0		
Dwell Veh Phases	1	6	Phases/Overlaps	1-8	9-16	
Dwell Ped Phases			TClr 1 FR Olap			
Dwell Olap			TClr 2 FR Olap			
Dwell Olap Ped			Dwell FR Olap			
Exit Veh Phases			TClr 1 FYA			
Exit Ped Phases			TClr 2 FYA			
Exit Olap			Dwell FYA	5		
Exit Olap Ped						
Zero Phase Walk						
Zero Phase Ped Clr						
Zero Phase Green						
Zero Olap Walk						
Zero Olap Ped Clr						
Zero Olap Green						
Dwell-Phase Red						
Dwell-Phase Red Flash						
Dwell-Phase Yel Flash						
Dwell-Olap Red Flash						
Dwell-Olap Yel Flash						
Dwell-Ped Dark						
Dwell-Olap Ped Dark						

Rt. 199 EB off ramp & 60 Piano

TOD Pattern Events

3/4/2025 8:27:43 AM

	Time	DOW							Holidays							Mode	Pattern	Offset
Event 1	07:00		M	T	W	T	F									Sched	5	0
Event 2	09:00		M	T	W	T	F									Sched	5	0
Event 3	15:30		M	T	W	T	F									Sched	5	0
Event 4	20:00		M	T	W	T	F									Sched	0	0
Event 5	08:00	S						S								Sched	5	0
Event 6	20:00	S						S								Sched	0	0
Event 7	00:00															Sched	0	0
Event 8	00:00															Sched	0	0
Event 9	00:00															Sched	0	0
Event 10	00:00															Sched	0	0
Event 11	00:00															Sched	0	0
Event 12	00:00															Sched	0	0
Event 13	00:00															Sched	0	0
Event 14	00:00															Sched	0	0
Event 15	00:00															Sched	0	0
Event 16	00:00															Sched	0	0
Event 17	00:00															Sched	0	0
Event 18	00:00															Sched	0	0
Event 19	00:00															Sched	0	0
Event 20	00:00															Sched	0	0
Event 21	00:00															Sched	0	0
Event 22	00:00															Sched	0	0
Event 23	00:00															Sched	0	0
Event 24	00:00															Sched	0	0
Event 25	00:00															Sched	0	0
Event 26	00:00															Sched	0	0
Event 27	00:00															Sched	0	0
Event 28	00:00															Sched	0	0
Event 29	00:00															Sched	0	0
Event 30	00:00															Sched	0	0
Event 31	00:00															Sched	0	0
Event 32	00:00															Sched	0	0

Rt. 199 EB off ramp & 60 Piano

Holidays

3/4/2025 8:27:43 AM

	Active Holidays	Month	Day	DOW	WOM
Date 1		0	0		0
Date 2		0	0		0
Date 3		0	0		0
Date 4		0	0		0
Date 5		0	0		0
Date 6		0	0		0
Date 7		0	0		0
Date 8		0	0		0
Date 9		0	0		0
Date 10		0	0		0
Date 11		0	0		0
Date 12		0	0		0
Date 13		0	0		0
Date 14		0	0		0
Date 15		0	0		0
Date 16		0	0		0
Date 17		0	0		0
Date 18		0	0		0
Date 19		0	0		0
Date 20		0	0		0
Date 21		0	0		0
Date 22		0	0		0
Date 23		0	0		0
Date 24		0	0		0
Date 25		0	0		0
Date 26		0	0		0
Date 27		0	0		0
Date 28		0	0		0
Date 29		0	0		0
Date 30		0	0		0
Date 31		0	0		0
Date 32		0	0		0

Rt. 199 EB off ramp & 60 Piano

Vehicle Detector 1

3/4/2025 8:27:43 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 2

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

					6		
--	--	--	--	--	---	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt. 199 EB off ramp & 60 Piano

Vehicle Detector 3

3/4/2025 8:27:43 AM

Delay Extend Carryover Queue Limit

Mode	No Disc	Added	Enabled	System	Enabled
------	---------	-------	---------	--------	---------

Fail Mode

None

 Max Pres

0

 No Act

0

 Erratic

0

 Fail Time

0

Delay 2

Phases	1-8	9-16
--------	-----	------

[illegible]

Vehicle Detector 4

Delay Extend Carryover Queue Limit

Mode	No Disc	Added	Enabled	System	Enabled
------	---------	-------	---------	--------	---------

Fail Mode	None	Max Pres	0	No Act	0	Erratic	0	Fail Time	0
-----------	------	----------	---	--------	---	---------	---	-----------	---

Delay 2	0.0
---------	-----

Phases	1-8	9-16
--------	-----	------

Call Phases			4									
Yellow Lock Phases												
Red Lock Phases												
Extend Phases			4									
XSwitch Phases												
Bike Call Phases												

Rt. 199 EB off ramp & 60 Piano

Vehicle Detector 5

3/4/2025 8:27:43 AM

Delay

Extend

Carryover

Queue Limit

Mode

Added

System

Fail Mode

Max Pres

No Act

Erratic

Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

			4				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

			4				
--	--	--	---	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 6

Delay

Extend

Carryover

Queue Limit

Mode

Added

System

Fail Mode

Max Pres

No Act

Erratic

Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

	2						
--	---	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

	2						
--	---	--	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt. 199 EB off ramp & 60 Piano

Vehicle Detector 7

3/4/2025 8:27:43 AM

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

	2						
--	---	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

	2						
--	---	--	--	--	--	--	--

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Vehicle Detector 8

Delay Extend Carryover Queue Limit

Mode Added System

Fail Mode Max Pres No Act Erratic Fail Time

Delay 2

Phases

1-8

9-16

Call Phases

							8
--	--	--	--	--	--	--	---

--	--	--	--	--	--	--	--

Yellow Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Red Lock Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Extend Phases

							8
--	--	--	--	--	--	--	---

--	--	--	--	--	--	--	--

XSwitch Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Bike Call Phases

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

Rt. 199 EB off ramp & 60 Piano

Transit/LRV Startup/Options

3/4/2025 8:27:43 AM

No Startup Call

LRV 1-8

--	--	--	--	--	--	--	--

Warn Flash Rate

1 Hz

Rsrv Inh Mode

Seconds

Rt. 199 EB off ramp & 60 Piano

Control / Config

3/4/2025 8:27:43 AM

Pattern Mode	Central																		
Manual Pattern	0	Manual Offset	0																
Stop Time Input	Enabled																		
Aux Switch	None	0																	
DLS Mode	D4	Time Zone	Est (UTC-5)																
		GPS Thresh	0																
Password Timeout	5																		
Maint Phs Recalls	1-8 <table><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										9-16 <table><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>								
Maint Ped Recalls	<table><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>																		

Serial 1 Port Configuration

Broadcast Plan/Sync	Disabled	Broadcast Time	00:00
Serial Rebroadcast	Disabled	Response	None

Serial 2 Port Configuration

Broadcast Plan/Sync	Disabled	Broadcast Time	00:00
---------------------	---------------------------------------	----------------	------------------------------------

Ethernet Port Configuration

Broadcast Plan/Sync	Disabled	Broadcast Time	00:00
Serial Rebroadcast	Disabled		

Peer Configuration

Peer 1	0
Peer 2	0
Peer 3	0
Peer 4	0
Peer 5	0
Peer 6	0
Peer 7	0
Peer 8	0

Appendix D
SYNCHRO & SimTraffic Analysis
Of 2025 Existing Conditions

2025 Existing AM Peak
1: Longhill Gate Road/Warhill Trail & Longhill Road

Baseline
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	334	0	10	244	78	7	5	24	76	3	17
Future Volume (Veh/h)	46	334	0	10	244	78	7	5	24	76	3	17
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	51	371	0	11	271	87	8	6	27	84	3	19
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	358			371			786	853	371	796	766	271
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	358			371			786	853	371	796	766	271
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.0	3.4
p0 queue free %	96			99			97	98	96	70	99	97
cM capacity (veh/h)	1212			1145			275	283	679	279	318	758
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	51	371	11	271	87	41	84	22				
Volume Left	51	0	11	0	0	8	84	0				
Volume Right	0	0	0	0	87	27	0	19				
cSH	1212	1700	1145	1700	1700	455	279	638				
Volume to Capacity	0.04	0.22	0.01	0.16	0.05	0.09	0.30	0.03				
Queue Length 95th (ft)	3	0	1	0	0	7	31	3				
Control Delay (s)	8.1	0.0	8.2	0.0	0.0	13.7	23.4	10.8				
Lane LOS	A		A			B	C	B				
Approach Delay (s)	1.0		0.2			13.7	20.8					
Approach LOS						B	C					
Intersection Summary												
Average Delay				3.5								
Intersection Capacity Utilization				41.8%	ICU Level of Service				A			
Analysis Period (min)				15								

2025 Existing AM Peak
2: Opportunity Way /Southern Mall Access & Centerville Road

Baseline
Queues



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	78	642	95	491	369	11	133	436	7	87	28
v/c Ratio	0.37	0.91	0.14	0.62	0.36	0.01	0.84	0.82	0.05	0.59	0.11
Control Delay	63.3	54.7	0.9	49.4	13.6	0.0	97.2	18.3	53.2	72.9	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	54.7	0.9	49.4	13.6	0.0	97.2	18.3	53.2	72.9	0.9
Queue Length 50th (ft)	32	486	0	132	227	0	112	0	6	75	0
Queue Length 95th (ft)	41	384	0	191	95	m0	127	0	15	91	0
Internal Link Dist (ft)	1290			1222			1066			438	
Turn Bay Length (ft)	365	290		260	230		115			115	
Base Capacity (vph)	471	758	739	795	1019	877	160	536	349	367	420
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.85	0.13	0.62	0.36	0.01	0.83	0.81	0.02	0.24	0.07

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	411	61	314	236	7	42	43	279	5	55	18
Future Volume (vph)	50	411	61	314	236	7	42	43	279	5	55	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	1827	1568	3467	1776	1417		1717	1509	1715	1804	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3502	1827	1568	3467	1776	1417		1717	1509	1715	1804	1524
Peak-hour factor, PHF	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Adj. Flow (vph)	78	642	95	491	369	11	66	67	436	8	86	28
RTOR Reduction (vph)	0	0	58	0	0	5	0	0	396	0	0	26
Lane Group Flow (vph)	78	642	37	491	369	6	0	133	40	7	87	2
Heavy Vehicles (%)	0%	4%	3%	1%	7%	14%	14%	2%	7%	0%	0%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	6.7	50.5	50.5	29.8	73.1	73.1		12.0	12.0	10.7	10.7	10.7
Effective Green, g (s)	6.7	50.5	50.5	29.8	73.1	73.1		12.0	12.0	10.7	10.7	10.7
Actuated g/C Ratio	0.05	0.39	0.39	0.23	0.56	0.56		0.09	0.09	0.08	0.08	0.08
Clearance Time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0	2.0	4.0	4.0		2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	180	709	609	794	998	796		158	139	141	148	125
v/s Ratio Prot	0.02	c0.35		c0.14	0.21			c0.08		0.00	c0.05	
v/s Ratio Perm			0.02			0.00			0.03			0.00
v/c Ratio	0.43	0.91	0.06	0.62	0.37	0.01		0.84	0.29	0.05	0.59	0.02
Uniform Delay, d1	59.8	37.5	24.9	45.0	15.7	12.5		58.1	55.0	55.0	57.5	54.8
Progression Factor	1.00	1.00	1.00	0.98	0.75	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	17.3	0.2	1.0	0.3	0.0		30.3	0.4	0.1	3.8	0.0
Delay (s)	61.0	54.8	25.1	45.0	12.1	12.5		88.3	55.4	55.0	61.3	54.8
Level of Service	E	D	C	D	B	B		F	E	E	E	D
Approach Delay (s)		51.9			30.7			63.1			59.5	
Approach LOS		D			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			47.2				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)			27.5		
Intersection Capacity Utilization			59.7%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	24	639	342	263	444	17	179	178	417	33	8
v/c Ratio	0.28	0.45	0.40	0.74	0.27	0.02	0.69	0.68	0.76	0.62	0.03
Control Delay	66.8	30.5	4.6	50.1	27.3	0.1	43.1	42.6	17.8	101.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.8	30.5	4.6	50.1	27.3	0.1	43.1	42.6	17.8	101.2	0.1
Queue Length 50th (ft)	20	209	0	116	179	0	154	152	179	27	0
Queue Length 95th (ft)	49	285	62	110	235	m0	m192	m191	m253	62	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	131	1622	920	391	1802	914	265	268	554	57	289
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.39	0.37	0.67	0.25	0.02	0.68	0.66	0.75	0.58	0.03

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

2025 Existing AM Peak

Baseline

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	569	304	234	395	15	300	18	371	24	5	7
Future Volume (vph)	21	569	304	234	395	15	300	18	371	24	5	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1805	3438	1568	3335	3505	1615	1588	1604	1568		1825	1417
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.30	1.00
Satd. Flow (perm)	1805	3438	1568	3335	3505	1615	1588	1604	1568		576	1417
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	24	639	342	263	444	17	337	20	417	27	6	8
RTOR Reduction (vph)	0	0	200	0	0	9	0	0	293	0	0	7
Lane Group Flow (vph)	24	639	142	263	444	8	179	178	124	0	33	1
Heavy Vehicles (%)	0%	5%	3%	5%	3%	0%	8%	6%	3%	0%	0%	14%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.3	53.9	53.9	13.8	60.9	60.9	21.3	21.3	21.3		12.0	12.0
Effective Green, g (s)	6.3	53.9	53.9	13.8	60.9	60.9	21.3	21.3	21.3		12.0	12.0
Actuated g/C Ratio	0.05	0.41	0.41	0.11	0.47	0.47	0.16	0.16	0.16		0.09	0.09
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	87	1425	650	354	1641	756	260	262	256		53	130
v/s Ratio Prot	0.01	c0.19		c0.08	c0.13		c0.11	0.11				
v/s Ratio Perm			0.09			0.00			0.08		c0.06	0.00
v/c Ratio	0.28	0.45	0.22	0.74	0.27	0.01	0.69	0.68	0.49		0.62	0.01
Uniform Delay, d1	59.7	27.4	24.5	56.4	21.0	18.5	51.2	51.1	49.4		56.8	53.6
Progression Factor	1.00	1.00	1.00	0.66	1.18	1.00	0.69	0.69	1.30		1.00	1.00
Incremental Delay, d2	0.6	1.0	0.8	7.0	0.4	0.0	4.0	3.7	0.8		18.0	0.0
Delay (s)	60.3	28.4	25.3	44.3	25.2	18.5	39.5	39.1	64.8		74.9	53.6
Level of Service	E	C	C	D	C	B	D	D	E		E	D
Approach Delay (s)		28.1			32.0			53.1			70.7	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			37.5				HCM 2000 Level of Service		D			
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		29.5			
Intersection Capacity Utilization			60.4%				ICU Level of Service		B			
Analysis Period (min)			15									
c Critical Lane Group												

2025 Existing AM Peak
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Baseline
Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	740	390	14	520	207	62
v/c Ratio	0.32	0.34	0.15	0.21	0.69	0.21
Control Delay	7.1	1.0	60.7	7.5	62.1	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	1.0	60.7	7.5	62.1	11.4
Queue Length 50th (ft)	65	0	9	73	166	0
Queue Length 95th (ft)	135	16	m29	146	225	34
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2330	1143	138	2523	412	393
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.34	0.10	0.21	0.50	0.16

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

2025 Existing AM Peak
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Baseline
HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑
Traffic Volume (vph)	636	335	12	447	178	53
Future Volume (vph)	636	335	12	447	178	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1524	1805	3539	1703	1429
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1524	1805	3539	1703	1429
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	740	390	14	520	207	62
RTOR Reduction (vph)	0	145	0	0	0	51
Lane Group Flow (vph)	740	245	14	520	207	11
Heavy Vehicles (%)	3%	6%	0%	2%	6%	13%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	81.6	81.6	3.1	92.7	22.8	22.8
Effective Green, g (s)	81.6	81.6	3.1	92.7	22.8	22.8
Actuated g/C Ratio	0.63	0.63	0.02	0.71	0.18	0.18
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	2200	956	43	2523	298	250
v/s Ratio Prot	c0.21		0.01	c0.15	c0.12	
v/s Ratio Perm		0.16				0.01
v/c Ratio	0.34	0.26	0.33	0.21	0.69	0.04
Uniform Delay, d1	11.4	10.7	62.4	6.3	50.3	44.5
Progression Factor	0.61	0.22	0.97	1.07	1.00	1.00
Incremental Delay, d2	0.4	0.6	4.2	0.2	8.6	0.2
Delay (s)	7.3	2.9	65.1	6.9	59.0	44.7
Level of Service	A	A	E	A	E	D
Approach Delay (s)	5.8			8.4	55.7	
Approach LOS	A			A	E	
Intersection Summary						
HCM 2000 Control Delay			13.4		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.42			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			39.5%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

2025 Existing AM Peak
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Baseline
Queues

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	354	376	91	278	250	10
v/c Ratio	0.19	0.37	0.58	0.11	0.78	0.03
Control Delay	8.9	3.5	70.2	6.9	66.7	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	3.5	70.2	6.9	66.7	19.2
Queue Length 50th (ft)	66	73	75	35	203	0
Queue Length 95th (ft)	51	35	129	62	279	15
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1878	1027	248	2495	464	435
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.37	0.37	0.11	0.54	0.02
Intersection Summary						

2025 Existing AM Peak
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Baseline
HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑
Traffic Volume (vph)	326	346	84	256	230	9
Future Volume (vph)	326	346	84	256	230	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1568	1612	3539	1752	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1568	1612	3539	1752	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	354	376	91	278	250	10
RTOR Reduction (vph)	0	170	0	0	0	8
Lane Group Flow (vph)	354	206	91	278	250	2
Heavy Vehicles (%)	5%	3%	12%	2%	3%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	71.1	71.1	12.6	91.7	23.8	23.8
Effective Green, g (s)	71.1	71.1	12.6	91.7	23.8	23.8
Actuated g/C Ratio	0.55	0.55	0.10	0.71	0.18	0.18
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1880	857	156	2496	320	295
v/s Ratio Prot	0.10		c0.06	0.08	c0.14	
v/s Ratio Perm		c0.13				0.00
v/c Ratio	0.19	0.24	0.58	0.11	0.78	0.01
Uniform Delay, d1	14.9	15.4	56.2	6.1	50.6	43.4
Progression Factor	0.53	1.26	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.6	5.5	0.1	11.7	0.0
Delay (s)	8.0	20.0	61.6	6.2	62.3	43.4
Level of Service	A	C	E	A	E	D
Approach Delay (s)	14.2			19.9	61.6	
Approach LOS	B			B	E	
Intersection Summary						
HCM 2000 Control Delay			24.8		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.40			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			52.8%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	41	32	10	56	84	39
Average Queue (ft)	11	2	0	21	35	12
95th Queue (ft)	34	16	6	47	64	34
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	L	L	T	R	LT	R	L	LT
Maximum Queue (ft)	62	212	595	265	234	263	224	60	175	264	9	89
Average Queue (ft)	8	43	185	41	66	96	68	3	59	77	1	18
95th Queue (ft)	34	133	408	161	170	201	160	29	132	188	5	62
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	4	0	0	0	0	0				0
Queuing Penalty (veh)		0	6	1	0	1	0	0				0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	25
Average Queue (ft)	1
95th Queue (ft)	14
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	84	248	349	68	165	184	163	173	28	210	227	270
Average Queue (ft)	21	96	191	3	79	78	57	72	5	105	136	138
95th Queue (ft)	58	201	314	37	147	146	123	143	22	185	208	245
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)								0			0	
Queuing Penalty (veh)								0			0	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	54	13
Average Queue (ft)	11	1
95th Queue (ft)	37	10
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	118	189	80	54	146	134	275	76
Average Queue (ft)	36	86	35	13	50	34	143	24
95th Queue (ft)	92	161	65	41	115	98	247	56
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	95	101	134	192	121	56	314	23
Average Queue (ft)	28	36	44	82	41	10	171	5
95th Queue (ft)	75	89	101	157	95	37	279	18
Link Distance (ft)	703	703			855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 8

2025 Existing PM Peak

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	365	8	23	407	208	6	5	15	134	10	78
Future Volume (Veh/h)	122	365	8	23	407	208	6	5	15	134	10	78
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	134	401	9	25	447	229	7	5	16	147	11	86
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	676			410			1262	1400	406	1184	1175	447
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	676			410			1262	1400	406	1184	1175	447
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			98			93	96	98	0	93	86
cM capacity (veh/h)	925			1160			106	119	650	138	162	616
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	134	410	25	447	229	28	147	97				
Volume Left	134	0	25	0	0	7	147	0				
Volume Right	0	9	0	0	229	16	0	86				
cSH	925	1700	1160	1700	1700	211	138	467				
Volume to Capacity	0.14	0.24	0.02	0.26	0.13	0.13	1.06	0.21				
Queue Length 95th (ft)	13	0	2	0	0	11	200	19				
Control Delay (s)	9.6	0.0	8.2	0.0	0.0	24.7	157.3	14.7				
Lane LOS	A		A			C	F	B				
Approach Delay (s)	2.4		0.3			24.7	100.6					
Approach LOS						C	F					
Intersection Summary												
Average Delay				17.6								
Intersection Capacity Utilization				52.3%	ICU Level of Service				A			
Analysis Period (min)				15								

2025 Existing PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road

Queues

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	97	398	41	302	634	23	72	301	40	41	73
v/c Ratio	0.43	0.41	0.05	0.62	0.57	0.02	0.56	0.77	0.41	0.39	0.32
Control Delay	63.7	21.7	0.1	74.6	11.0	0.0	74.7	20.0	70.7	68.4	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.7	21.7	0.1	74.6	11.0	0.0	74.7	20.0	70.7	68.4	3.8
Queue Length 50th (ft)	41	198	0	134	178	0	60	0	34	35	0
Queue Length 95th (ft)	69	314	0	m136	m145	m0	110	93	74	74	0
Internal Link Dist (ft)	1290			1222			1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	962	756	485	1116	974	162	415	332	364	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.41	0.05	0.62	0.57	0.02	0.44	0.73	0.12	0.11	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

2025 Existing PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	92	378	39	9	278	602	22	27	42	286	42	35
Future Volume (vph)	92	378	39	9	278	602	22	27	42	286	42	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00
Satd. Flow (prot)	3502	1845	1313		3435	1881	1538		1835	1599	1633	1788
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00
Satd. Flow (perm)	3502	1845	1313		3435	1881	1538		1835	1599	1633	1788
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	398	41	9	293	634	23	28	44	301	44	37
RTOR Reduction (vph)	0	0	20	0	0	0	9	0	0	280	0	0
Lane Group Flow (vph)	97	398	21	0	302	634	14	0	72	21	40	41
Heavy Vehicles (%)	0%	3%	23%	0%	2%	1%	5%	4%	0%	1%	5%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2				6			3		
Actuated Green, G (s)	8.5	67.7	67.7		18.4	77.1	77.1		9.1	9.1	7.8	7.8
Effective Green, g (s)	8.5	67.7	67.7		18.4	77.1	77.1		9.1	9.1	7.8	7.8
Actuated g/C Ratio	0.07	0.52	0.52		0.14	0.59	0.59		0.07	0.07	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	228	960	683		486	1115	912		128	111	97	107
v/s Ratio Prot	0.03	0.22			c0.09	c0.34			c0.04		c0.02	0.02
v/s Ratio Perm			0.02				0.01			0.01		
v/c Ratio	0.43	0.41	0.03		0.62	0.57	0.01		0.56	0.19	0.41	0.38
Uniform Delay, d1	58.4	19.0	15.2		52.5	16.2	10.9		58.5	57.0	58.9	58.8
Progression Factor	1.00	1.00	1.00		1.38	0.58	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	1.3	0.1		0.6	0.3	0.0		3.3	0.3	1.0	0.8
Delay (s)	59.3	20.4	15.3		72.9	9.6	10.9		61.9	57.3	59.9	59.6
Level of Service	E	C	B		E	A	B		E	E	E	E
Approach Delay (s)		27.0				29.6			58.2			58.8
Approach LOS		C				C			E			E
Intersection Summary												
HCM 2000 Control Delay			36.4									
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			130.0						27.5			
Intersection Capacity Utilization			72.5%									
Analysis Period (min)			15									
c Critical Lane Group												

2025 Existing PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	69
Future Volume (vph)	69
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	73
RTOR Reduction (vph)	69
Lane Group Flow (vph)	4
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	7.8
Effective Green, g (s)	7.8
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	96
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.05
Uniform Delay, d1	57.6
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	57.7
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

2025 Existing PM Peak

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	17	784	361	560	853	32	176	176	374	61	20
v/c Ratio	0.22	0.70	0.48	1.30	0.61	0.04	0.83	0.82	0.81	0.97	0.04
Control Delay	65.9	41.8	4.9	192.5	27.0	0.1	84.4	83.6	34.9	157.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.9	41.8	4.9	192.5	27.0	0.1	84.4	83.6	34.9	157.3	0.2
Queue Length 50th (ft)	14	304	0	~318	370	0	152	152	112	51	0
Queue Length 95th (ft)	40	332	61	#457	304	m0	m#265	m#264	#251	#166	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	124	1606	922	432	1759	882	224	225	469	63	449
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.49	0.39	1.30	0.48	0.04	0.79	0.78	0.80	0.97	0.04
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

2025 Existing PM Peak

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	745	343	532	810	30	316	18	355	27	31	19
Future Volume (vph)	16	745	343	532	810	30	316	18	355	27	31	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1703	3539	1599	3433	3574	1615	1698	1713	1568		1857	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.16	1.00
Satd. Flow (perm)	1703	3539	1599	3433	3574	1615	1698	1713	1568		307	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	784	361	560	853	32	333	19	374	28	33	20
RTOR Reduction (vph)	0	0	246	0	0	19	0	0	264	0	0	16
Lane Group Flow (vph)	17	784	115	560	853	13	176	176	110	0	61	4
Heavy Vehicles (%)	6%	2%	1%	2%	1%	0%	1%	0%	3%	0%	0%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	5.9	41.3	41.3	16.4	51.3	51.3	16.3	16.3	16.3		27.0	27.0
Effective Green, g (s)	5.9	41.3	41.3	16.4	51.3	51.3	16.3	16.3	16.3		27.0	27.0
Actuated g/C Ratio	0.05	0.32	0.32	0.13	0.39	0.39	0.13	0.13	0.13		0.21	0.21
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	77	1124	507	433	1410	637	212	214	196		63	319
v/s Ratio Prot	0.01	c0.22		c0.16	0.24		c0.10	0.10				
v/s Ratio Perm			0.07			0.01			0.07		c0.20	0.00
v/c Ratio	0.22	0.70	0.23	1.29	0.60	0.02	0.83	0.82	0.56		0.97	0.01
Uniform Delay, d1	59.8	38.9	32.6	56.8	31.3	24.0	55.5	55.4	53.5		51.1	40.9
Progression Factor	1.00	1.00	1.00	1.02	0.82	1.00	1.05	1.05	1.89		1.00	1.00
Incremental Delay, d2	0.5	3.6	1.0	146.0	1.6	0.0	20.6	19.3	3.1		101.0	0.0
Delay (s)	60.4	42.5	33.6	204.1	27.1	24.1	79.0	77.7	104.4		152.1	40.9
Level of Service	E	D	C	F	C	C	E	E	F		F	D
Approach Delay (s)		40.0			95.7			91.8			124.7	
Approach LOS		D			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			76.6				HCM 2000 Level of Service		E			
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		29.5			
Intersection Capacity Utilization			70.0%				ICU Level of Service		C			
Analysis Period (min)			15									
c Critical Lane Group												

2025 Existing PM Peak
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	863	360	17	1024	431	177
v/c Ratio	0.46	0.36	0.15	0.49	0.79	0.30
Control Delay	12.6	1.4	59.6	14.3	53.3	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	1.4	59.6	14.3	53.3	7.6
Queue Length 50th (ft)	101	0	13	260	324	7
Queue Length 95th (ft)	m125	m11	m28	282	#542	65
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	1952	1043	137	2309	544	596
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.35	0.12	0.44	0.79	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2025 Existing PM Peak

4: Route 199 EB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

							
Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑	↑↑	↑	↑
Traffic Volume (vph)	811	338	1	15	963	405	166
Future Volume (vph)	811	338	1	15	963	405	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00		1.00	0.95	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1599		1693	3574	1787	1583
Flt Permitted	1.00	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	3539	1599		1783	3574	1787	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	863	360	1	16	1024	431	177
RTOR Reduction (vph)	0	183	0	0	0	0	115
Lane Group Flow (vph)	863	177	0	17	1024	431	62
Heavy Vehicles (%)	2%	1%	0%	7%	1%	1%	2%
Turn Type	NA	Perm	custom	Prot	NA	Prot	Perm
Protected Phases	2			1	6	4	
Permitted Phases		2	1				4
Actuated Green, G (s)	63.9	63.9		4.0	75.9	39.6	39.6
Effective Green, g (s)	63.9	63.9		4.0	75.9	39.6	39.6
Actuated g/C Ratio	0.49	0.49		0.03	0.58	0.30	0.30
Clearance Time (s)	6.0	6.0		8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0		3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1739	785		54	2086	544	482
v/s Ratio Prot	0.24				c0.29	c0.24	
v/s Ratio Perm		0.11		0.01			0.04
v/c Ratio	0.50	0.23		0.31	0.49	0.79	0.13
Uniform Delay, d1	22.2	18.9		61.7	15.8	41.4	32.7
Progression Factor	0.58	0.30		1.00	0.85	1.00	1.00
Incremental Delay, d2	0.8	0.5		2.9	0.7	8.9	0.3
Delay (s)	13.7	6.1		64.8	14.1	50.3	33.0
Level of Service	B	A		E	B	D	C
Approach Delay (s)	11.4				14.9	45.3	
Approach LOS	B				B	D	
Intersection Summary							
HCM 2000 Control Delay			19.9		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.64				
Actuated Cycle Length (s)			130.0		Sum of lost time (s)		22.5
Intersection Capacity Utilization			61.1%		ICU Level of Service		B
Analysis Period (min)			15				
c Critical Lane Group							

2025 Existing PM Peak
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	698	324	124	602	446	69
v/c Ratio	0.47	0.38	0.64	0.28	0.86	0.13
Control Delay	11.6	3.2	69.4	13.5	60.6	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	3.2	69.4	13.5	60.6	9.5
Queue Length 50th (ft)	132	53	102	129	346	3
Queue Length 95th (ft)	163	17	161	155	#544	39
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1539	858	269	2239	524	523
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.38	0.46	0.27	0.85	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2025 Existing PM Peak

5: Route 199 WB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑
Traffic Volume (vph)	670	311	119	578	428	66
Future Volume (vph)	670	311	119	578	428	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1553	1752	3574	1770	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1553	1752	3574	1770	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	698	324	124	602	446	69
RTOR Reduction (vph)	0	187	0	0	0	45
Lane Group Flow (vph)	698	137	124	602	446	24
Heavy Vehicles (%)	2%	4%	3%	1%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	54.9	54.9	14.5	77.4	38.1	38.1
Effective Green, g (s)	54.9	54.9	14.5	77.4	38.1	38.1
Actuated g/C Ratio	0.42	0.42	0.11	0.60	0.29	0.29
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1494	655	195	2127	518	473
v/s Ratio Prot	c0.20		c0.07	0.17	c0.25	
v/s Ratio Perm		0.09				0.01
v/c Ratio	0.47	0.21	0.64	0.28	0.86	0.05
Uniform Delay, d1	27.0	23.8	55.2	12.8	43.4	33.0
Progression Factor	0.38	0.68	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.7	6.6	0.3	13.7	0.0
Delay (s)	11.1	16.8	61.9	13.1	57.1	33.0
Level of Service	B	B	E	B	E	C
Approach Delay (s)	12.9			21.5	53.9	
Approach LOS	B			C	D	
Intersection Summary						
HCM 2000 Control Delay			25.0		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			67.6%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	76	30	30	49	187	77
Average Queue (ft)	32	5	3	17	72	34
95th Queue (ft)	59	22	17	41	147	59
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	64	122	259	83	142	162	514	209	101	144	30	82
Average Queue (ft)	12	58	135	19	52	85	187	13	40	60	5	18
95th Queue (ft)	43	104	224	62	119	141	397	80	81	114	18	53
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)			0	0	0	0	5	0				0
Queuing Penalty (veh)			0	0	0	0	1	0				0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	52
Average Queue (ft)	6
95th Queue (ft)	27
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	75	302	379	198	410	415	680	656	34	205	217	268
Average Queue (ft)	16	157	216	24	361	372	460	267	6	110	129	139
95th Queue (ft)	50	257	330	119	492	493	908	690	24	175	191	234
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)							20	0				
Queuing Penalty (veh)							136	2				
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)					8	34	35	0				
Queuing Penalty (veh)					32	139	185	0				

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	116	59
Average Queue (ft)	35	4
95th Queue (ft)	89	31
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	2	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	UL	T	T	L	R
Maximum Queue (ft)	149	190	91	133	374	310	1036	920
Average Queue (ft)	71	105	39	25	198	148	734	485
95th Queue (ft)	130	165	71	89	432	360	1378	1344
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)					1	0	45	35
Queuing Penalty (veh)					3	0	0	0
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)				0	9			
Queuing Penalty (veh)				0	1			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	154	169	93	203	238	186	545	78
Average Queue (ft)	58	70	39	97	115	57	344	20
95th Queue (ft)	127	144	78	165	199	142	518	58
Link Distance (ft)	703	703			855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 499

2025 Existing Saturday

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	
Lane Configurations													
Traffic Volume (veh/h)	31	271	9	11	263	110	6	2	24	3	147	4	
Future Volume (Veh/h)	31	271	9	11	263	110	6	2	24	3	147	4	
Sign Control	Free				Free				Stop				
Grade	0%				0%				0%				
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Hourly flow rate (vph)	34	298	10	12	289	121	7	2	26	0	162	4	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None						None						
Median storage veh													
Upstream signal (ft)													
pX, platoon unblocked										0.00			
vC, conflicting volume	410			308				741	805	303	0	706	689
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	410			308				741	805	303	0	706	689
tC, single (s)	4.1			4.1				7.1	6.5	6.2	0.0	7.1	6.5
tC, 2 stage (s)													
tF (s)	2.2			2.2				3.5	4.0	3.3	0.0	3.5	4.0
p0 queue free %	97			99				98	99	96	0	51	99
cM capacity (veh/h)	1160			1264				299	306	741	0	329	357
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2					
Volume Total	34	308	12	289	121	35	162	59					
Volume Left	34	0	12	0	0	7	162	0					
Volume Right	0	10	0	0	121	26	0	55					
cSH	1160	1700	1264	1700	1700	538	329	702					
Volume to Capacity	0.03	0.18	0.01	0.17	0.07	0.07	0.49	0.08					
Queue Length 95th (ft)	2	0	1	0	0	5	65	7					
Control Delay (s)	8.2	0.0	7.9	0.0	0.0	12.2	26.1	10.6					
Lane LOS	A			A				B	D	B			
Approach Delay (s)	0.8			0.2				12.2	21.9				
Approach LOS							B	C					
Intersection Summary													
Average Delay			5.5										
Intersection Capacity Utilization			43.1%		ICU Level of Service			A					
Analysis Period (min)			15										

2025 Existing Saturday
1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	50
Future Volume (Veh/h)	50
Sign Control	
Grade	
Peak Hour Factor	0.91
Hourly flow rate (vph)	55
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	289
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	289
tC, single (s)	6.2
tC, 2 stage (s)	
tF (s)	3.3
p0 queue free %	93
cM capacity (veh/h)	755
Direction, Lane #	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	129	432	12	243	443	12	96	251	35	42	44
v/c Ratio	0.50	0.42	0.01	0.66	0.41	0.01	0.60	0.68	0.35	0.40	0.20
Control Delay	64.1	21.0	0.0	73.0	9.4	0.0	72.4	16.5	67.7	69.5	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	21.0	0.0	73.0	9.4	0.0	72.4	16.5	67.7	69.5	2.0
Queue Length 50th (ft)	54	209	0	108	90	0	80	0	30	36	0
Queue Length 95th (ft)	86	351	0	m151	m133	m0	134	81	67	76	0
Internal Link Dist (ft)		1290			1222		1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	1018	943	373	1072	986	182	383	349	366	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.42	0.01	0.65	0.41	0.01	0.53	0.66	0.10	0.11	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

2025 Existing Saturday

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	123	410	11	23	208	421	11	10	81	238	37	36
Future Volume (vph)	123	410	11	23	208	421	11	10	81	238	37	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00
Satd. Flow (prot)	3502	1881	1615		3440	1881	1615		1868	1615	1715	1796
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00
Satd. Flow (perm)	3502	1881	1615		3440	1881	1615		1868	1615	1715	1796
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	129	432	12	24	219	443	12	11	85	251	39	38
RTOR Reduction (vph)	0	0	6	0	0	0	5	0	0	230	0	0
Lane Group Flow (vph)	129	432	6	0	243	443	7	0	96	21	35	42
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	10%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2				6			3		
Actuated Green, G (s)	9.7	70.4	70.4		13.9	74.1	74.1		11.1	11.1	7.6	7.6
Effective Green, g (s)	9.7	70.4	70.4		13.9	74.1	74.1		11.1	11.1	7.6	7.6
Actuated g/C Ratio	0.07	0.54	0.54		0.11	0.57	0.57		0.09	0.09	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	261	1018	874		367	1072	920		159	137	100	104
v/s Ratio Prot	0.04	0.23			c0.07	c0.24			c0.05		0.02	c0.02
v/s Ratio Perm			0.00				0.00			0.01		
v/c Ratio	0.49	0.42	0.01		0.66	0.41	0.01		0.60	0.16	0.35	0.40
Uniform Delay, d1	57.8	17.7	13.7		55.8	15.7	12.1		57.3	55.1	58.8	59.0
Progression Factor	1.00	1.00	1.00		1.17	0.48	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	1.3	0.0		3.3	0.3	0.0		4.4	0.2	0.8	0.9
Delay (s)	58.9	19.0	13.7		68.3	7.9	12.1		61.7	55.3	59.6	60.0
Level of Service	E	B	B		E	A	B		E	E	E	E
Approach Delay (s)		27.9				29.0			57.1			59.1
Approach LOS		C				C			E			E
Intersection Summary												
HCM 2000 Control Delay			36.3		HCM 2000 Level of Service					D		
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			130.0		Sum of lost time (s)					27.5		
Intersection Capacity Utilization			69.6%		ICU Level of Service					C		
Analysis Period (min)			15									
c Critical Lane Group												

2025 Existing Saturday

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	42
Future Volume (vph)	42
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	44
RTOR Reduction (vph)	41
Lane Group Flow (vph)	3
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	7.6
Effective Green, g (s)	7.6
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	94
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.03
Uniform Delay, d1	57.7
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	57.8
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

2025 Existing Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	43	1327	289	319	691	33	179	177	394	57	25
v/c Ratio	0.43	0.83	0.34	0.74	0.37	0.04	0.84	0.83	0.80	1.21	0.07
Control Delay	71.4	37.6	6.3	66.5	18.6	0.1	94.9	92.4	35.8	249.4	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.4	37.6	6.3	66.5	18.6	0.1	94.9	92.4	35.8	249.4	0.4
Queue Length 50th (ft)	36	512	24	118	207	0	161	158	111	~58	0
Queue Length 95th (ft)	75	#667	87	176	253	m0	#292	#282	#242	#151	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	131	1603	856	686	1859	915	222	224	501	47	337
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.83	0.34	0.47	0.37	0.04	0.81	0.79	0.79	1.21	0.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2025 Existing Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

												
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	14	27	1261	275	303	656	31	309	29	374	34	20
Future Volume (vph)	14	27	1261	275	303	656	31	309	29	374	34	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00
Frt		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97
Satd. Flow (prot)		1805	3574	1615	3433	3610	1615	1698	1719	1599		1842
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.33
Satd. Flow (perm)		1805	3574	1615	3433	3610	1615	1698	1719	1599		620
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	15	28	1327	289	319	691	33	325	31	394	36	21
RTOR Reduction (vph)	0	0	0	132	0	0	16	0	0	294	0	0
Lane Group Flow (vph)	0	43	1327	157	319	691	17	179	177	100	0	57
Heavy Vehicles (%)	0%	0%	1%	0%	2%	0%	0%	1%	0%	1%	0%	0%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA
Protected Phases	5	5	2		1	6		4	4			3
Permitted Phases				2			6			4	3	
Actuated Green, G (s)		7.3	58.4	58.4	16.4	67.0	67.0	16.2	16.2	16.2		10.0
Effective Green, g (s)		7.3	58.4	58.4	16.4	67.0	67.0	16.2	16.2	16.2		10.0
Actuated g/C Ratio		0.06	0.45	0.45	0.13	0.52	0.52	0.12	0.12	0.12		0.08
Clearance Time (s)		8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0
Vehicle Extension (s)		2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5
Lane Grp Cap (vph)		101	1605	725	433	1860	832	211	214	199		47
v/s Ratio Prot		0.02	c0.37		c0.09	0.19		c0.11	0.10			
v/s Ratio Perm				0.10			0.01			0.06		c0.09
v/c Ratio		0.43	0.83	0.22	0.74	0.37	0.02	0.85	0.83	0.50		1.21
Uniform Delay, d1		59.3	31.4	21.8	54.7	18.9	15.4	55.7	55.5	53.1		60.0
Progression Factor		1.00	1.00	1.00	1.04	0.93	1.00	1.19	1.19	2.50		1.00
Incremental Delay, d2		1.1	5.0	0.7	5.3	0.5	0.0	23.4	20.2	1.8		200.2
Delay (s)		60.4	36.4	22.5	62.0	18.1	15.5	90.0	86.5	134.9		260.2
Level of Service		E	D	C	E	B	B	F	F	F		F
Approach Delay (s)			34.6			31.5			112.7			197.8
Approach LOS			C			C			F			F
Intersection Summary												
HCM 2000 Control Delay			54.0			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			29.5			
Intersection Capacity Utilization			79.7%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

2025 Existing Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	24
Future Volume (vph)	24
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.0
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	25
RTOR Reduction (vph)	23
Lane Group Flow (vph)	2
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	3
Actuated Green, G (s)	10.0
Effective Green, g (s)	10.0
Actuated g/C Ratio	0.08
Clearance Time (s)	7.0
Vehicle Extension (s)	2.5
Lane Grp Cap (vph)	124
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.02
Uniform Delay, d1	55.5
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	55.5
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

2025 Existing Saturday
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1217	466	40	765	237	172
v/c Ratio	0.57	0.40	0.36	0.30	0.72	0.39
Control Delay	8.8	0.7	65.4	7.2	61.2	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	0.7	65.4	7.2	61.2	8.4
Queue Length 50th (ft)	98	0	32	153	190	0
Queue Length 95th (ft)	m167	m0	m62	187	264	58
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2131	1151	138	2524	424	517
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.40	0.29	0.30	0.56	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

2025 Existing Saturday
4: Route 199 EB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	1144	438	38	719	223	162
Future Volume (vph)	1144	438	38	719	223	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1615	1805	3610	1752	1599
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1615	1805	3610	1752	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1217	466	40	765	237	172
RTOR Reduction (vph)	0	194	0	0	0	139
Lane Group Flow (vph)	1217	272	40	765	237	33
Heavy Vehicles (%)	1%	0%	0%	0%	3%	1%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	75.9	75.9	7.0	90.9	24.6	24.6
Effective Green, g (s)	75.9	75.9	7.0	90.9	24.6	24.6
Actuated g/C Ratio	0.58	0.58	0.05	0.70	0.19	0.19
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	2086	942	97	2524	331	302
v/s Ratio Prot	c0.34		0.02	c0.21	c0.14	
v/s Ratio Perm		0.17				0.02
v/c Ratio	0.58	0.29	0.41	0.30	0.72	0.11
Uniform Delay, d1	17.1	13.5	59.5	7.5	49.4	43.6
Progression Factor	0.45	0.10	0.99	0.86	1.00	1.00
Incremental Delay, d2	0.6	0.4	2.7	0.3	8.8	0.3
Delay (s)	8.3	1.7	61.3	6.7	58.3	43.9
Level of Service	A	A	E	A	E	D
Approach Delay (s)	6.5			9.4	52.2	
Approach LOS	A			A	D	
Intersection Summary						
HCM 2000 Control Delay			13.8		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.61			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			56.1%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

2025 Existing Saturday
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	999	376	140	559	315	74
v/c Ratio	0.56	0.39	0.68	0.23	0.82	0.18
Control Delay	10.6	1.8	71.2	8.9	66.4	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	1.8	71.2	8.9	66.4	9.2
Queue Length 50th (ft)	73	0	115	87	255	0
Queue Length 95th (ft)	225	12	180	133	342	38
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1775	975	267	2443	479	482
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.39	0.52	0.23	0.66	0.15
Intersection Summary						

2025 Existing Saturday
5: Route 199 WB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑
Traffic Volume (vph)	959	361	134	537	302	71
Future Volume (vph)	959	361	134	537	302	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1583	1736	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1583	1736	3610	1805	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	999	376	140	559	315	74
RTOR Reduction (vph)	0	189	0	0	0	58
Lane Group Flow (vph)	999	187	140	559	315	16
Heavy Vehicles (%)	1%	2%	4%	0%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	64.6	64.6	15.4	88.0	27.5	27.5
Effective Green, g (s)	64.6	64.6	15.4	88.0	27.5	27.5
Actuated g/C Ratio	0.50	0.50	0.12	0.68	0.21	0.21
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1776	786	205	2443	381	341
v/s Ratio Prot	c0.28		c0.08	0.15	c0.17	
v/s Ratio Perm		0.12				0.01
v/c Ratio	0.56	0.24	0.68	0.23	0.83	0.05
Uniform Delay, d1	22.8	18.7	55.0	8.0	49.0	40.8
Progression Factor	0.38	0.33	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.6	9.0	0.2	13.7	0.1
Delay (s)	9.9	6.7	64.0	8.2	62.6	40.9
Level of Service	A	A	E	A	E	D
Approach Delay (s)	9.0			19.4	58.5	
Approach LOS	A			B	E	
Intersection Summary						
HCM 2000 Control Delay			19.8		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.65			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			69.4%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	UL	TR
Maximum Queue (ft)	34	24	2	33	95	50
Average Queue (ft)	7	3	0	18	48	24
95th Queue (ft)	27	15	2	40	80	44
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	76	131	266	29	127	148	343	129	120	118	27	61
Average Queue (ft)	19	67	148	6	39	69	137	8	51	51	4	13
95th Queue (ft)	54	110	233	24	98	125	277	59	100	90	14	43
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)			0				2	0				0
Queuing Penalty (veh)			0				0	0				0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	13
Average Queue (ft)	1
95th Queue (ft)	8
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	139	522	592	113	181	195	194	199	52	212	240	330
Average Queue (ft)	40	317	377	5	90	113	90	100	10	118	143	201
95th Queue (ft)	107	489	556	60	161	180	159	169	38	185	211	309
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)		0						0	0			
Queuing Penalty (veh)		0						0	0			

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	96	36
Average Queue (ft)	27	2
95th Queue (ft)	71	23
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	1	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	405	440	198	92	163	144	327	154
Average Queue (ft)	149	186	71	42	65	50	169	62
95th Queue (ft)	316	352	143	82	132	117	281	118
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)		0	0					
Queuing Penalty (veh)		0	0					

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	287	298	170	219	177	140	354	55
Average Queue (ft)	95	109	55	115	82	40	211	22
95th Queue (ft)	211	222	116	189	152	99	324	47
Link Distance (ft)	703	703			855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 1

Appendix E
SYNCHRO & SimTraffic Analysis
Of 2040 Background Conditions

2040 Background AM Peak
1: Longhill Gate Road/Warhill Trail & Longhill Road

Baseline
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	388	0	12	283	91	8	6	28	88	3	20
Future Volume (Veh/h)	53	388	0	12	283	91	8	6	28	88	3	20
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	58	422	0	13	308	99	9	7	30	96	3	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	407			422			896	971	422	906	872	308
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	407			422			896	971	422	906	872	308
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.0	3.4
p0 queue free %	95			99			96	97	95	58	99	97
cM capacity (veh/h)	1163			1096			228	239	636	230	273	723
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	58	422	13	308	99	46	96	25				
Volume Left	58	0	13	0	0	9	96	0				
Volume Right	0	0	0	0	99	30	0	22				
cSH	1163	1700	1096	1700	1700	397	230	604				
Volume to Capacity	0.05	0.25	0.01	0.18	0.06	0.12	0.42	0.04				
Queue Length 95th (ft)	4	0	1	0	0	10	48	3				
Control Delay (s)	8.3	0.0	8.3	0.0	0.0	15.3	31.4	11.2				
Lane LOS	A		A			C	D	B				
Approach Delay (s)	1.0		0.3			15.3	27.2					
Approach LOS						C	D					
Intersection Summary												
Average Delay	4.3											
Intersection Capacity Utilization	45.3%			ICU Level of Service				A				
Analysis Period (min)	15											

2040 Background AM Peak
2: Opportunity Way /Southern Mall Access & Centerville Road

Baseline
Queues



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	63	518	77	397	298	9	107	352	6	71	23
v/c Ratio	0.32	0.66	0.10	0.56	0.28	0.01	0.70	0.77	0.05	0.54	0.10
Control Delay	63.0	35.1	0.3	69.4	8.2	0.0	80.8	18.0	54.5	72.3	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	35.1	0.3	69.4	8.2	0.0	80.8	18.0	54.5	72.3	0.8
Queue Length 50th (ft)	26	338	0	171	68	0	88	0	5	62	0
Queue Length 95th (ft)	50	484	0	228	m85	m0	#177	#123	20	112	0
Internal Link Dist (ft)		1290			1222		1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	781	757	703	1047	897	164	463	349	367	420
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.66	0.10	0.56	0.28	0.01	0.65	0.76	0.02	0.19	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	477	71	365	274	8	49	50	324	6	64	21
Future Volume (vph)	58	477	71	365	274	8	49	50	324	6	64	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	1827	1568	3467	1776	1417		1718	1509	1715	1804	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3502	1827	1568	3467	1776	1417		1718	1509	1715	1804	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	518	77	397	298	9	53	54	352	7	70	23
RTOR Reduction (vph)	0	0	44	0	0	4	0	0	321	0	0	21
Lane Group Flow (vph)	63	518	33	397	298	5	0	107	31	6	71	2
Heavy Vehicles (%)	0%	4%	3%	1%	7%	14%	14%	2%	7%	0%	0%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	6.2	55.5	55.5	26.4	75.2	75.2		11.6	11.6	9.5	9.5	9.5
Effective Green, g (s)	6.2	55.5	55.5	26.4	75.2	75.2		11.6	11.6	9.5	9.5	9.5
Actuated g/C Ratio	0.05	0.43	0.43	0.20	0.58	0.58		0.09	0.09	0.07	0.07	0.07
Clearance Time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0	2.0	4.0	4.0		2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	167	779	669	704	1027	819		153	134	125	131	111
v/s Ratio Prot	0.02	c0.28		c0.11	0.17			c0.06		0.00	c0.04	
v/s Ratio Perm			0.02			0.00			0.02			0.00
v/c Ratio	0.38	0.66	0.05	0.56	0.29	0.01		0.70	0.23	0.05	0.54	0.02
Uniform Delay, d1	60.0	29.8	21.8	46.6	13.9	11.6		57.5	55.1	56.0	58.2	55.9
Progression Factor	1.00	1.00	1.00	1.39	0.50	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	4.5	0.1	0.5	0.2	0.0		10.7	0.3	0.1	2.4	0.0
Delay (s)	61.1	34.3	21.9	65.4	7.1	11.6		68.2	55.4	56.1	60.6	55.9
Level of Service	E	C	C	E	A	B		E	E	E	E	E
Approach Delay (s)		35.4			40.0			58.4			59.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			43.8				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)			27.5		
Intersection Capacity Utilization			66.0%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	26	899	384	296	663	18	200	201	468	37	9
v/c Ratio	0.29	0.68	0.46	0.82	0.43	0.02	0.64	0.64	0.89	0.71	0.03
Control Delay	67.3	36.2	4.0	69.9	28.9	0.1	59.6	59.4	46.8	114.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.3	36.2	4.0	69.9	28.9	0.1	59.6	59.4	46.8	114.7	0.2
Queue Length 50th (ft)	22	339	0	111	265	0	181	183	239	30	0
Queue Length 95th (ft)	52	361	57	#194	238	m0	m#330	m#329	#463	#98	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	131	1560	921	384	1725	882	311	314	528	55	282
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.58	0.42	0.77	0.38	0.02	0.64	0.64	0.89	0.67	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2040 Background AM Peak

Baseline

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	827	353	272	610	17	348	21	431	28	6	8
Future Volume (vph)	24	827	353	272	610	17	348	21	431	28	6	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1805	3438	1568	3335	3505	1615	1588	1604	1568		1826	1417
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.31	1.00
Satd. Flow (perm)	1805	3438	1568	3335	3505	1615	1588	1604	1568		593	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	899	384	296	663	18	378	23	468	30	7	9
RTOR Reduction (vph)	0	0	237	0	0	10	0	0	221	0	0	8
Lane Group Flow (vph)	26	899	147	296	663	8	200	201	247	0	37	1
Heavy Vehicles (%)	0%	5%	3%	5%	3%	0%	8%	6%	3%	0%	0%	14%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.4	49.7	49.7	14.2	57.0	57.0	25.5	25.5	25.5		11.6	11.6
Effective Green, g (s)	6.4	49.7	49.7	14.2	57.0	57.0	25.5	25.5	25.5		11.6	11.6
Actuated g/C Ratio	0.05	0.38	0.38	0.11	0.44	0.44	0.20	0.20	0.20		0.09	0.09
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	88	1314	599	364	1536	708	311	314	307		52	126
v/s Ratio Prot	0.01	c0.26		c0.09	c0.19		0.13	0.13				
v/s Ratio Perm			0.09			0.00			c0.16		c0.06	0.00
v/c Ratio	0.30	0.68	0.25	0.81	0.43	0.01	0.64	0.64	0.80		0.71	0.01
Uniform Delay, d1	59.6	33.6	27.4	56.6	25.3	20.6	48.1	48.0	49.9		57.6	53.9
Progression Factor	1.00	1.00	1.00	0.93	1.12	1.00	1.04	1.04	1.68		1.00	1.00
Incremental Delay, d2	0.7	2.9	1.0	11.9	0.8	0.0	3.2	3.1	10.3		34.8	0.0
Delay (s)	60.3	36.5	28.3	64.2	29.3	20.6	53.4	53.3	94.2		92.3	54.0
Level of Service	E	D	C	E	C	C	D	D	F		F	D
Approach Delay (s)		34.6			39.7			75.4			84.8	
Approach LOS		C			D			E			F	
Intersection Summary												
HCM 2000 Control Delay			47.9				HCM 2000 Level of Service		D			
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		29.5			
Intersection Capacity Utilization			71.2%				ICU Level of Service		C			
Analysis Period (min)			15									
c Critical Lane Group												

2040 Background AM Peak
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Baseline
Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	983	423	15	728	225	67
v/c Ratio	0.43	0.37	0.16	0.29	0.71	0.21
Control Delay	7.9	1.2	65.4	7.7	62.0	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.9	1.2	65.4	7.7	62.0	10.7
Queue Length 50th (ft)	89	0	11	150	180	0
Queue Length 95th (ft)	m151	m17	m32	174	253	38
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2294	1144	138	2489	412	397
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.37	0.11	0.29	0.55	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

2040 Background AM Peak
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Baseline
HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑
Traffic Volume (vph)	904	389	14	670	207	62
Future Volume (vph)	904	389	14	670	207	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1524	1805	3539	1703	1429
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1524	1805	3539	1703	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	983	423	15	728	225	67
RTOR Reduction (vph)	0	162	0	0	0	55
Lane Group Flow (vph)	983	261	15	728	225	12
Heavy Vehicles (%)	3%	6%	0%	2%	6%	13%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	80.3	80.3	3.1	91.4	24.1	24.1
Effective Green, g (s)	80.3	80.3	3.1	91.4	24.1	24.1
Actuated g/C Ratio	0.62	0.62	0.02	0.70	0.19	0.19
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	2165	941	43	2488	315	264
v/s Ratio Prot	c0.28		0.01	c0.21	c0.13	
v/s Ratio Perm		0.17				0.01
v/c Ratio	0.45	0.28	0.35	0.29	0.71	0.05
Uniform Delay, d1	13.2	11.5	62.5	7.2	49.7	43.5
Progression Factor	0.58	0.34	1.06	0.95	1.00	1.00
Incremental Delay, d2	0.5	0.5	4.6	0.3	9.2	0.2
Delay (s)	8.1	4.5	70.5	7.1	58.9	43.7
Level of Service	A	A	E	A	E	D
Approach Delay (s)	7.0			8.4	55.4	
Approach LOS	A			A	E	
Intersection Summary						
HCM 2000 Control Delay			13.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.52			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			48.5%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

2040 Background AM Peak
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Baseline
Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	591	437	107	487	290	11
v/c Ratio	0.33	0.43	0.62	0.20	0.81	0.03
Control Delay	10.0	2.9	70.5	8.4	66.0	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	2.9	70.5	8.4	66.0	17.2
Queue Length 50th (ft)	126	51	88	73	235	0
Queue Length 95th (ft)	44	1	145	116	314	16
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1769	1019	248	2419	465	437
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.43	0.43	0.20	0.62	0.03
Intersection Summary						

2040 Background AM Peak
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Baseline
HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑
Traffic Volume (vph)	544	402	98	448	267	10
Future Volume (vph)	544	402	98	448	267	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1568	1612	3539	1752	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1568	1612	3539	1752	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	591	437	107	487	290	11
RTOR Reduction (vph)	0	212	0	0	0	9
Lane Group Flow (vph)	591	225	107	487	290	2
Heavy Vehicles (%)	5%	3%	12%	2%	3%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	66.9	66.9	13.9	88.8	26.7	26.7
Effective Green, g (s)	66.9	66.9	13.9	88.8	26.7	26.7
Actuated g/C Ratio	0.51	0.51	0.11	0.68	0.21	0.21
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1769	806	172	2417	359	331
v/s Ratio Prot	c0.17		c0.07	0.14	c0.17	
v/s Ratio Perm		0.14				0.00
v/c Ratio	0.33	0.28	0.62	0.20	0.81	0.01
Uniform Delay, d1	18.5	17.9	55.5	7.6	49.2	41.1
Progression Factor	0.47	0.77	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.8	6.8	0.2	12.5	0.0
Delay (s)	9.2	14.6	62.4	7.8	61.7	41.1
Level of Service	A	B	E	A	E	D
Approach Delay (s)	11.5			17.6	61.0	
Approach LOS	B			B	E	
Intersection Summary						
HCM 2000 Control Delay			21.1		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.49			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			55.6%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	40	36	10	58	89	43
Average Queue (ft)	12	3	1	23	38	15
95th Queue (ft)	34	19	6	48	67	37
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	L	L	T	R	LT	R	L	LT
Maximum Queue (ft)	37	117	358	197	188	208	249	55	149	233	9	83
Average Queue (ft)	6	42	198	35	88	115	86	4	65	85	1	22
95th Queue (ft)	26	81	316	123	162	184	199	32	124	166	4	62
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)			1	0		0	1					0
Queuing Penalty (veh)			2	0		0	0					0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	29
Average Queue (ft)	1
95th Queue (ft)	15
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	78	340	449	84	194	202	168	185	29	260	294	412
Average Queue (ft)	25	166	257	6	102	97	81	98	4	134	162	226
95th Queue (ft)	62	287	397	55	174	175	148	162	19	222	253	375
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)								0		0	0	
Queuing Penalty (veh)								0		0	0	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	57	10
Average Queue (ft)	14	1
95th Queue (ft)	44	6
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	149	218	121	58	176	150	309	82
Average Queue (ft)	57	103	45	16	66	52	160	31
95th Queue (ft)	121	180	85	45	143	123	264	66
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	151	165	145	194	167	102	371	20
Average Queue (ft)	51	61	55	98	67	25	207	4
95th Queue (ft)	119	132	114	173	136	70	323	17
Link Distance (ft)	703	703			855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 2

2040 Background PM Peak

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	424	9	27	473	241	7	6	17	156	12	91
Future Volume (Veh/h)	142	424	9	27	473	241	7	6	17	156	12	91
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	154	461	10	29	514	262	8	7	18	170	13	99
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	776			471			1452	1608	466	1362	1351	514
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	776			471			1452	1608	466	1362	1351	514
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	82			97			89	92	97	0	89	82
cM capacity (veh/h)	849			1101			70	84	601	97	121	564
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	154	471	29	514	262	33	170	112				
Volume Left	154	0	29	0	0	8	170	0				
Volume Right	0	10	0	0	262	18	0	99				
cSH	849	1700	1101	1700	1700	146	97	396				
Volume to Capacity	0.18	0.28	0.03	0.30	0.15	0.23	1.75	0.28				
Queue Length 95th (ft)	16	0	2	0	0	21	344	29				
Control Delay (s)	10.2	0.0	8.4	0.0	0.0	36.9	451.3	17.6				
Lane LOS	B		A			E	F	C				
Approach Delay (s)	2.5		0.3			36.9	279.1					
Approach LOS						E	F					
Intersection Summary												
Average Delay				46.8								
Intersection Capacity Utilization				58.1%	ICU Level of Service				B			
Analysis Period (min)				15								

2040 Background PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road

Queues



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	462	47	351	736	27	85	349	46	49	84
v/c Ratio	0.46	0.52	0.07	0.59	0.67	0.03	0.63	0.79	0.45	0.44	0.36
Control Delay	63.9	26.6	0.2	76.0	13.4	0.0	78.2	19.5	71.6	69.8	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.9	26.6	0.2	76.0	13.4	0.0	78.2	19.5	71.6	69.8	5.4
Queue Length 50th (ft)	47	260	0	156	249	0	70	0	40	43	0
Queue Length 95th (ft)	78	392	0	m138	m152	m0	127	#102	83	86	7
Internal Link Dist (ft)	1290			1222			1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	887	709	598	1094	957	162	459	332	363	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.52	0.07	0.59	0.67	0.03	0.52	0.76	0.14	0.13	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2040 Background PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	107	439	45	10	323	699	26	31	49	332	49	41
Future Volume (vph)	107	439	45	10	323	699	26	31	49	332	49	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (prot)	3502	1845	1313		3435	1881	1538		1835	1599	1633	1783
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (perm)	3502	1845	1313		3435	1881	1538		1835	1599	1633	1783
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	113	462	47	11	340	736	27	33	52	349	52	43
RTOR Reduction (vph)	0	0	24	0	0	0	11	0	0	323	0	0
Lane Group Flow (vph)	113	462	23	0	351	736	16	0	85	26	46	49
Heavy Vehicles (%)	0%	3%	23%	0%	2%	1%	5%	4%	0%	1%	5%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2				6			3		
Actuated Green, G (s)	9.1	62.5	62.5		22.7	75.6	75.6		9.6	9.6	8.2	8.2
Effective Green, g (s)	9.1	62.5	62.5		22.7	75.6	75.6		9.6	9.6	8.2	8.2
Actuated g/C Ratio	0.07	0.48	0.48		0.17	0.58	0.58		0.07	0.07	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	245	887	631		599	1093	894		135	118	103	112
v/s Ratio Prot	0.03	0.25			c0.10	c0.39			c0.05		c0.03	0.03
v/s Ratio Perm			0.02				0.01			0.02		
v/c Ratio	0.46	0.52	0.04		0.59	0.67	0.02		0.63	0.22	0.45	0.44
Uniform Delay, d1	58.1	23.4	17.8		49.3	18.7	11.5		58.5	56.7	58.7	58.7
Progression Factor	1.00	1.00	1.00		1.51	0.64	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	2.2	0.1		0.1	0.2	0.0		6.5	0.3	1.1	1.0
Delay (s)	59.1	25.6	17.9		74.5	12.1	11.5		64.9	57.0	59.8	59.7
Level of Service	E	C	B		E	B	B		E	E	E	E
Approach Delay (s)		31.1				31.7			58.6			58.6
Approach LOS		C				C			E			E
Intersection Summary												
HCM 2000 Control Delay			38.6			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			27.5			
Intersection Capacity Utilization			79.8%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

2040 Background PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	80
Future Volume (vph)	80
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	84
RTOR Reduction (vph)	79
Lane Group Flow (vph)	5
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.2
Effective Green, g (s)	8.2
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	101
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.05
Uniform Delay, d1	57.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	57.3
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

2040 Background PM Peak

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	20	1064	419	651	1140	37	205	203	434	71	23
v/c Ratio	0.25	0.74	0.47	1.64	0.67	0.04	0.92	0.91	1.04	1.65	0.07
Control Delay	66.6	35.4	3.8	340.4	18.4	0.1	92.9	90.3	77.5	417.8	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.6	35.4	3.8	340.4	18.4	0.1	92.9	90.3	77.5	417.8	0.4
Queue Length 50th (ft)	17	386	1	~422	296	0	180	177	~205	~90	0
Queue Length 95th (ft)	44	437	58	m#531	m400	m0	m#326	m#318	#430	#204	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	124	1606	953	396	1780	891	222	223	419	43	331
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.66	0.44	1.64	0.64	0.04	0.92	0.91	1.04	1.65	0.07
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

2040 Background PM Peak

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1011	398	618	1083	35	367	21	412	31	36	22
Future Volume (vph)	19	1011	398	618	1083	35	367	21	412	31	36	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1703	3539	1599	3433	3574	1615	1698	1713	1568		1857	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.19	1.00
Satd. Flow (perm)	1703	3539	1599	3433	3574	1615	1698	1713	1568		352	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	1064	419	651	1140	37	386	22	434	33	38	23
RTOR Reduction (vph)	0	0	246	0	0	19	0	0	215	0	0	20
Lane Group Flow (vph)	20	1064	173	651	1140	18	205	203	219	0	71	3
Heavy Vehicles (%)	6%	2%	1%	2%	1%	0%	1%	0%	3%	0%	0%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.1	53.2	53.2	15.0	61.6	61.6	17.0	17.0	17.0		15.8	15.8
Effective Green, g (s)	6.1	53.2	53.2	15.0	61.6	61.6	17.0	17.0	17.0		15.8	15.8
Actuated g/C Ratio	0.05	0.41	0.41	0.12	0.47	0.47	0.13	0.13	0.13		0.12	0.12
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	79	1448	654	396	1693	765	222	224	205		42	186
v/s Ratio Prot	0.01	c0.30		c0.19	0.32		0.12	0.12				
v/s Ratio Perm			0.11			0.01			c0.14		c0.20	0.00
v/c Ratio	0.25	0.73	0.26	1.64	0.67	0.02	0.92	0.91	1.07		1.69	0.02
Uniform Delay, d1	59.8	32.4	25.4	57.5	26.4	18.2	55.9	55.7	56.5		57.1	50.3
Progression Factor	1.00	1.00	1.00	1.32	0.64	1.00	0.98	0.98	1.28		1.00	1.00
Incremental Delay, d2	0.6	3.4	1.0	298.1	1.6	0.0	34.5	30.6	76.2		393.6	0.0
Delay (s)	60.4	35.8	26.4	373.9	18.5	18.2	89.4	85.4	148.6		450.7	50.3
Level of Service	E	D	C	F	B	B	F	F	F		F	D
Approach Delay (s)		33.5			145.1			118.9			352.7	
Approach LOS		C			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			105.2			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.08									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			29.5			
Intersection Capacity Utilization			81.3%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

2040 Background PM Peak
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1157	417	20	1341	500	205
v/c Ratio	0.62	0.40	0.22	0.65	0.90	0.34
Control Delay	10.9	0.9	64.0	16.1	64.4	11.3
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	10.9	0.9	64.0	16.2	64.4	11.3
Queue Length 50th (ft)	154	3	16	318	401	24
Queue Length 95th (ft)	m157	m9	m32	m321	#715	95
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	1880	1045	129	2309	555	605
Starvation Cap Reductn	0	0	0	163	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.40	0.16	0.62	0.90	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2040 Background PM Peak

4: Route 199 EB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	1088	392	19	1261	470	193
Future Volume (vph)	1088	392	19	1261	470	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1599	1687	3574	1787	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1599	1687	3574	1787	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1157	417	20	1341	500	205
RTOR Reduction (vph)	0	213	0	0	0	114
Lane Group Flow (vph)	1157	204	20	1341	500	91
Heavy Vehicles (%)	2%	1%	7%	1%	1%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	63.7	63.7	3.4	75.1	40.4	40.4
Effective Green, g (s)	63.7	63.7	3.4	75.1	40.4	40.4
Actuated g/C Ratio	0.49	0.49	0.03	0.58	0.31	0.31
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1734	783	44	2064	555	491
v/s Ratio Prot	0.33		0.01	c0.38	c0.28	
v/s Ratio Perm		0.13				0.06
v/c Ratio	0.67	0.26	0.45	0.65	0.90	0.19
Uniform Delay, d1	25.1	19.4	62.4	18.6	42.9	32.8
Progression Factor	0.45	0.14	1.02	0.81	1.00	1.00
Incremental Delay, d2	1.3	0.5	5.9	1.3	18.7	0.4
Delay (s)	12.7	3.2	69.8	16.4	61.6	33.2
Level of Service	B	A	E	B	E	C
Approach Delay (s)	10.2			17.2	53.3	
Approach LOS	B			B	D	
Intersection Summary						
HCM 2000 Control Delay			21.2		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			73.0%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

2040 Background PM Peak
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	956	376	144	848	518	80
v/c Ratio	0.67	0.44	0.69	0.41	0.97	0.15
Control Delay	13.0	2.9	71.4	14.9	76.8	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	2.9	71.4	14.9	76.8	12.6
Queue Length 50th (ft)	168	48	118	182	~474	10
Queue Length 95th (ft)	274	19	185	215	#716	50
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1464	862	269	2226	536	534
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.44	0.54	0.38	0.97	0.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

2040 Background PM Peak

5: Route 199 WB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑
Traffic Volume (vph)	918	361	138	814	497	77
Future Volume (vph)	918	361	138	814	497	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1553	1752	3574	1770	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1553	1752	3574	1770	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	956	376	144	848	518	80
RTOR Reduction (vph)	0	224	0	0	0	45
Lane Group Flow (vph)	956	152	144	848	518	35
Heavy Vehicles (%)	2%	4%	3%	1%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	52.6	52.6	15.5	76.1	39.4	39.4
Effective Green, g (s)	52.6	52.6	15.5	76.1	39.4	39.4
Actuated g/C Ratio	0.40	0.40	0.12	0.59	0.30	0.30
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1431	628	208	2092	536	489
v/s Ratio Prot	c0.27		c0.08	0.24	c0.29	
v/s Ratio Perm		0.10				0.02
v/c Ratio	0.67	0.24	0.69	0.41	0.97	0.07
Uniform Delay, d1	31.6	25.5	55.0	14.7	44.6	32.3
Progression Factor	0.35	0.61	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.8	9.5	0.6	30.2	0.1
Delay (s)	13.0	16.5	64.5	15.2	74.8	32.3
Level of Service	B	B	E	B	E	C
Approach Delay (s)	14.0			22.4	69.1	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			28.1		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.78			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			79.3%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	94	28	42	60	286	330
Average Queue (ft)	40	7	6	20	149	79
95th Queue (ft)	73	24	26	48	306	298
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)					6	3
Queuing Penalty (veh)					6	4

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	63	149	310	111	141	150	440	194	113	196	56	88
Average Queue (ft)	14	63	167	21	52	82	190	17	48	76	6	26
95th Queue (ft)	45	119	271	64	112	136	365	102	96	148	27	66
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)			0	0			5	0			0	0
Queuing Penalty (veh)			1	0			1	0			0	0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	53
Average Queue (ft)	5
95th Queue (ft)	22
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	68	356	428	201	411	415	691	627	48	274	340	363
Average Queue (ft)	22	213	268	29	404	414	675	145	5	144	165	204
95th Queue (ft)	54	318	388	130	420	421	756	494	30	228	263	331
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)							58	0				
Queuing Penalty (veh)							506	2				
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)					15	65	68	0	0	0	1	
Queuing Penalty (veh)					79	351	421	0	0	0	1	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	115	72
Average Queue (ft)	39	6
95th Queue (ft)	91	38
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	2	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	175	214	100	230	722	718	1115	1118
Average Queue (ft)	89	126	46	69	550	494	1080	1047
95th Queue (ft)	153	189	79	224	862	849	1243	1415
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)					11	1	94	93
Queuing Penalty (veh)					75	6	0	0
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)				0	71			
Queuing Penalty (veh)				1	14			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	176	180	93	208	325	284	1044	1038
Average Queue (ft)	69	69	43	113	181	121	863	561
95th Queue (ft)	146	154	81	184	291	244	1249	1365
Link Distance (ft)	703	703			855	855	1011	1011
Upstream Blk Time (%)							49	35
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)			520	475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 1467

2040 Background Saturday

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	36	315	10	13	305	128	7	2	28	3	171	5
Future Volume (Veh/h)	36	315	10	13	305	128	7	2	28	3	171	5
Sign Control	Free				Free				Stop			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	342	11	14	332	139	8	2	30	0	186	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked										0.00		
vC, conflicting volume	471			353			851	924	348	0	811	791
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	471			353			851	924	348	0	811	791
tC, single (s)	4.1			4.1			7.1	6.5	6.2	0.0	7.1	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	0.0	3.5	4.0
p0 queue free %	96			99			97	99	96	0	33	98
cM capacity (veh/h)	1101			1217			245	259	700	0	276	309
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	39	353	14	332	139	40	186	68				
Volume Left	39	0	14	0	0	8	186	0				
Volume Right	0	11	0	0	139	30	0	63				
cSH	1101	1700	1217	1700	1700	481	276	652				
Volume to Capacity	0.04	0.21	0.01	0.20	0.08	0.08	0.67	0.10				
Queue Length 95th (ft)	3	0	1	0	0	7	111	9				
Control Delay (s)	8.4	0.0	8.0	0.0	0.0	13.2	41.4	11.2				
Lane LOS	A			A			B	E	B			
Approach Delay (s)	0.8			0.2			13.2	33.3				
Approach LOS							B	D				
Intersection Summary												
Average Delay	8.1											
Intersection Capacity Utilization	46.8%			ICU Level of Service					A			
Analysis Period (min)	15											

2040 Background Saturday
1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	58
Future Volume (Veh/h)	58
Sign Control	
Grade	
Peak Hour Factor	0.92
Hourly flow rate (vph)	63
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	332
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	332
tC, single (s)	6.2
tC, 2 stage (s)	
tF (s)	3.3
p0 queue free %	91
cM capacity (veh/h)	714
Direction, Lane #	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	151	501	14	282	515	14	112	291	40	49	52
v/c Ratio	0.54	0.52	0.02	0.65	0.49	0.01	0.66	0.71	0.38	0.44	0.23
Control Delay	64.2	24.9	0.0	72.7	10.7	0.0	75.2	16.1	67.8	70.4	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	24.9	0.0	72.7	10.7	0.0	75.2	16.1	67.8	70.4	2.3
Queue Length 50th (ft)	63	276	0	122	119	0	92	0	34	43	0
Queue Length 95th (ft)	97	427	0	m171	m140	m0	156	89	74	86	0
Internal Link Dist (ft)		1290			1222		1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	963	900	436	1043	963	184	421	349	366	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.52	0.02	0.65	0.49	0.01	0.61	0.69	0.11	0.13	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

2040 Background Saturday

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	143	476	13	27	241	489	13	12	94	276	43	42
Future Volume (vph)	143	476	13	27	241	489	13	12	94	276	43	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.99
Satd. Flow (prot)	3502	1881	1615		3440	1881	1615		1867	1615	1715	1796
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.99
Satd. Flow (perm)	3502	1881	1615		3440	1881	1615		1867	1615	1715	1796
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	151	501	14	28	254	515	14	13	99	291	45	44
RTOR Reduction (vph)	0	0	7	0	0	0	6	0	0	265	0	0
Lane Group Flow (vph)	151	501	7	0	282	515	8	0	112	26	40	49
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	10%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2				6			3		
Actuated Green, G (s)	10.5	66.7	66.7		16.5	72.2	72.2		11.8	11.8	8.0	8.0
Effective Green, g (s)	10.5	66.7	66.7		16.5	72.2	72.2		11.8	11.8	8.0	8.0
Actuated g/C Ratio	0.08	0.51	0.51		0.13	0.56	0.56		0.09	0.09	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	282	965	828		436	1044	896		169	146	105	110
v/s Ratio Prot	0.04	c0.27			c0.08	c0.27			c0.06		0.02	c0.03
v/s Ratio Perm			0.00				0.00			0.02		
v/c Ratio	0.54	0.52	0.01		0.65	0.49	0.01		0.66	0.18	0.38	0.45
Uniform Delay, d1	57.4	21.0	15.5		54.0	17.7	12.9		57.2	54.6	58.6	58.9
Progression Factor	1.00	1.00	1.00		1.23	0.47	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	2.0	0.0		2.2	0.5	0.0		7.3	0.2	0.8	1.0
Delay (s)	58.9	23.0	15.5		68.6	8.8	12.9		64.5	54.9	59.5	59.9
Level of Service	E	C	B		E	A	B		E	D	E	E
Approach Delay (s)		31.0				29.7			57.5			58.9
Approach LOS		C				C			E			E
Intersection Summary												
HCM 2000 Control Delay			37.7									
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			130.0						27.5			
Intersection Capacity Utilization			76.5%									
Analysis Period (min)			15									
c Critical Lane Group												

2040 Background Saturday

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	49
Future Volume (vph)	49
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	52
RTOR Reduction (vph)	49
Lane Group Flow (vph)	3
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.0
Effective Green, g (s)	8.0
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	99
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.03
Uniform Delay, d1	57.4
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	57.4
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

2040 Background Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	50	1541	336	372	802	38	206	210	457	65	29
v/c Ratio	0.48	1.01	0.41	0.77	0.44	0.04	1.23	0.94	0.93	1.38	0.09
Control Delay	73.4	62.5	9.4	68.3	18.4	0.1	192.5	104.3	52.0	306.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	62.5	9.4	68.3	18.4	0.1	192.5	104.3	52.0	306.2	0.5
Queue Length 50th (ft)	41	~687	49	148	245	0	~229	193	170	~72	0
Queue Length 95th (ft)	84	#917	132	192	288	m0	#397	#352	#361	#172	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	131	1527	827	686	1829	903	167	224	493	47	337
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	1.01	0.41	0.54	0.44	0.04	1.23	0.94	0.93	1.38	0.09
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

2040 Background Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations		↩	↩↩	↩	↩↩	↩↩	↩		↩	↩	↩	↩
Traffic Volume (vph)	16	31	1464	319	353	762	36	2	359	34	434	39
Future Volume (vph)	16	31	1464	319	353	762	36	2	359	34	434	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	1.00		0.95	0.95	1.00	
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	0.96	1.00	
Satd. Flow (prot)		1805	3574	1615	3433	3610	1615		1698	1719	1599	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.71	0.96	1.00	
Satd. Flow (perm)		1805	3574	1615	3433	3610	1615		1277	1719	1599	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	33	1541	336	372	802	38	2	378	36	457	41
RTOR Reduction (vph)	0	0	0	137	0	0	19	0	0	0	284	0
Lane Group Flow (vph)	0	50	1541	199	372	802	19	0	206	210	173	0
Heavy Vehicles (%)	0%	0%	1%	0%	2%	0%	0%	0%	1%	0%	1%	0%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Perm	Split	NA	Perm	Perm
Protected Phases	5	5	2		1	6			4	4		
Permitted Phases				2			6	4			4	3
Actuated Green, G (s)		7.6	55.6	55.6	18.4	65.9	65.9		17.0	17.0	17.0	
Effective Green, g (s)		7.6	55.6	55.6	18.4	65.9	65.9		17.0	17.0	17.0	
Actuated g/C Ratio		0.06	0.43	0.43	0.14	0.51	0.51		0.13	0.13	0.13	
Clearance Time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Vehicle Extension (s)		2.0	4.0	4.0	2.0	4.0	4.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		105	1528	690	485	1829	818		166	224	209	
v/s Ratio Prot		0.03	c0.43		c0.11	0.22				0.12		
v/s Ratio Perm				0.12			0.01		c0.16		0.11	
v/c Ratio		0.48	1.01	0.29	0.77	0.44	0.02		1.24	0.94	0.83	
Uniform Delay, d1		59.3	37.2	24.3	53.7	20.3	16.0		56.5	56.0	55.1	
Progression Factor		1.00	1.00	1.00	1.09	0.85	1.00		1.16	1.14	1.98	
Incremental Delay, d2		1.2	25.1	1.1	6.0	0.7	0.0		143.8	38.2	19.6	
Delay (s)		60.5	62.3	25.3	64.6	18.0	16.0		209.3	102.2	128.6	
Level of Service		E	E	C	E	B	B		F	F	F	
Approach Delay (s)			55.8			32.2				141.3		
Approach LOS			E			C				F		
Intersection Summary												
HCM 2000 Control Delay			71.3			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			29.5			
Intersection Capacity Utilization			89.0%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

2040 Background Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	23	28
Future Volume (vph)	23	28
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	7.0	7.0
Lane Util. Factor	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.97	1.00
Satd. Flow (prot)	1842	1615
Flt Permitted	0.33	1.00
Satd. Flow (perm)	620	1615
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	24	29
RTOR Reduction (vph)	0	27
Lane Group Flow (vph)	65	2
Heavy Vehicles (%)	0%	0%
Turn Type	NA	Perm
Protected Phases	3	
Permitted Phases		3
Actuated Green, G (s)	10.0	10.0
Effective Green, g (s)	10.0	10.0
Actuated g/C Ratio	0.08	0.08
Clearance Time (s)	7.0	7.0
Vehicle Extension (s)	2.5	2.5
Lane Grp Cap (vph)	47	124
v/s Ratio Prot		
v/s Ratio Perm	c0.10	0.00
v/c Ratio	1.38	0.02
Uniform Delay, d1	60.0	55.5
Progression Factor	1.00	1.00
Incremental Delay, d2	263.0	0.0
Delay (s)	323.0	55.5
Level of Service	F	E
Approach Delay (s)	240.5	
Approach LOS	F	
Intersection Summary		



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1413	541	48	888	276	200
v/c Ratio	0.69	0.47	0.41	0.36	0.76	0.43
Control Delay	10.3	0.6	68.0	8.1	62.4	12.7
Queue Delay	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	0.6	68.0	8.1	62.4	12.7
Queue Length 50th (ft)	164	0	38	183	218	24
Queue Length 95th (ft)	m178	m0	m68	206	310	90
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2060	1160	139	2462	424	512
Starvation Cap Reductn	84	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.47	0.35	0.36	0.65	0.39

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

2040 Background Saturday

4: Route 199 EB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	1328	509	45	835	259	188
Future Volume (vph)	1328	509	45	835	259	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1615	1805	3610	1752	1599
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1615	1805	3610	1752	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1413	541	48	888	276	200
RTOR Reduction (vph)	0	236	0	0	0	131
Lane Group Flow (vph)	1413	305	48	888	276	69
Heavy Vehicles (%)	1%	0%	0%	0%	3%	1%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	73.4	73.4	7.3	88.7	26.8	26.8
Effective Green, g (s)	73.4	73.4	7.3	88.7	26.8	26.8
Actuated g/C Ratio	0.56	0.56	0.06	0.68	0.21	0.21
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	2017	911	101	2463	361	329
v/s Ratio Prot	c0.40		0.03	c0.25	c0.16	
v/s Ratio Perm		0.19				0.04
v/c Ratio	0.70	0.34	0.48	0.36	0.76	0.21
Uniform Delay, d1	20.4	15.2	59.5	8.7	48.6	42.8
Progression Factor	0.46	0.20	1.01	0.83	1.00	1.00
Incremental Delay, d2	0.5	0.2	3.2	0.4	10.9	0.7
Delay (s)	9.8	3.2	63.1	7.6	59.5	43.5
Level of Service	A	A	E	A	E	D
Approach Delay (s)	8.0			10.5	52.8	
Approach LOS	A			B	D	
Intersection Summary						
HCM 2000 Control Delay			15.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.71			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			63.8%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

2040 Background Saturday
 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Queues

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1159	436	163	649	366	85
v/c Ratio	0.70	0.45	0.73	0.27	0.87	0.19
Control Delay	14.1	2.0	73.4	10.2	68.7	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	2.0	73.4	10.2	68.7	8.4
Queue Length 50th (ft)	212	3	133	116	294	0
Queue Length 95th (ft)	284	9	208	157	405	41
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1664	970	267	2366	479	491
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.45	0.61	0.27	0.76	0.17
Intersection Summary						

2040 Background Saturday

5: Route 199 WB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑
Traffic Volume (vph)	1113	419	156	623	351	82
Future Volume (vph)	1113	419	156	623	351	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1583	1736	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1583	1736	3610	1805	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1159	436	162	649	366	85
RTOR Reduction (vph)	0	233	0	0	0	65
Lane Group Flow (vph)	1159	203	163	649	366	20
Heavy Vehicles (%)	1%	2%	4%	0%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	60.5	60.5	16.7	85.2	30.3	30.3
Effective Green, g (s)	60.5	60.5	16.7	85.2	30.3	30.3
Actuated g/C Ratio	0.47	0.47	0.13	0.66	0.23	0.23
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1663	736	223	2365	420	376
v/s Ratio Prot	c0.32		c0.09	0.18	c0.20	
v/s Ratio Perm		0.13				0.01
v/c Ratio	0.70	0.28	0.73	0.27	0.87	0.05
Uniform Delay, d1	27.5	21.3	54.5	9.4	48.0	38.7
Progression Factor	0.42	0.37	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.7	11.6	0.3	17.6	0.1
Delay (s)	13.3	8.5	66.1	9.7	65.6	38.8
Level of Service	B	A	E	A	E	D
Approach Delay (s)	12.0			21.0	60.5	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			22.2		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.75			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			77.6%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	UL	TR
Maximum Queue (ft)	41	24	12	53	135	51
Average Queue (ft)	9	3	0	21	60	25
95th Queue (ft)	30	16	5	45	105	44
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	114	187	330	55	142	157	382	170	158	138	28	87
Average Queue (ft)	23	76	176	7	53	82	174	11	66	64	6	21
95th Queue (ft)	69	140	284	41	114	135	332	74	127	114	20	60
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	1	0			5	0				0
Queuing Penalty (veh)		0	1	0			1	0				0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	45
Average Queue (ft)	3
95th Queue (ft)	23
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	UL	LT	R
Maximum Queue (ft)	526	1397	1447	1156	207	242	214	193	37	233	282	576
Average Queue (ft)	134	1040	1087	446	106	129	99	111	9	139	167	338
95th Queue (ft)	472	1679	1697	1517	173	199	169	174	32	206	244	618
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)		7	17	11								
Queuing Penalty (veh)		0	0	0								
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)	0	37						0				
Queuing Penalty (veh)	1	17						0				

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	110	65
Average Queue (ft)	37	4
95th Queue (ft)	86	32
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	1	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	418	468	248	118	161	161	369	188
Average Queue (ft)	192	224	93	47	80	66	199	86
95th Queue (ft)	338	373	189	95	145	132	327	161
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)		0						
Queuing Penalty (veh)		0						
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)		0	0					
Queuing Penalty (veh)		1	0					

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	320	337	203	259	188	150	423	84
Average Queue (ft)	138	151	65	130	101	52	254	26
95th Queue (ft)	273	280	139	217	170	115	377	57
Link Distance (ft)	703	703			855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 22

Appendix F

SYNCHRO & SimTraffic Analysis Of 2046 Background Conditions

2046 Background AM Peak
1: Longhill Gate Road/Warhill Trail & Longhill Road

Baseline
HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	412	0	12	301	96	9	6	30	94	4	21
Future Volume (Veh/h)	57	412	0	12	301	96	9	6	30	94	4	21
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	448	0	13	327	104	10	7	33	102	4	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	431			448			950	1029	448	962	925	327
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	431			448			950	1029	448	962	925	327
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.0	3.4
p0 queue free %	95			99			95	97	95	51	98	97
cM capacity (veh/h)	1139			1071			207	220	615	208	253	705
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	62	448	13	327	104	50	102	27				
Volume Left	62	0	13	0	0	10	102	0				
Volume Right	0	0	0	0	104	33	0	23				
cSH	1139	1700	1071	1700	1700	374	208	558				
Volume to Capacity	0.05	0.26	0.01	0.19	0.06	0.13	0.49	0.05				
Queue Length 95th (ft)	4	0	1	0	0	11	61	4				
Control Delay (s)	8.3	0.0	8.4	0.0	0.0	16.1	37.8	11.8				
Lane LOS	A		A			C	E	B				
Approach Delay (s)	1.0		0.2			16.1	32.3					
Approach LOS						C	D					
Intersection Summary												
Average Delay				4.9								
Intersection Capacity Utilization				46.9%	ICU Level of Service				A			
Analysis Period (min)				15								

2046 Background AM Peak
2: Opportunity Way /Southern Mall Access & Centerville Road

Baseline
Queues



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	67	551	82	421	316	10	115	374	6	75	24
v/c Ratio	0.34	0.74	0.11	0.56	0.31	0.01	0.73	0.78	0.05	0.55	0.10
Control Delay	63.1	39.7	0.3	69.4	8.5	0.0	82.6	17.7	54.2	72.4	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	39.7	0.3	69.4	8.5	0.0	82.6	17.7	54.2	72.4	0.8
Queue Length 50th (ft)	28	384	0	181	75	0	94	0	5	65	0
Queue Length 95th (ft)	52	526	0	m238	m91	m0	#194	#130	20	116	0
Internal Link Dist (ft)		1290			1222		1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	761	741	750	1036	890	166	484	349	367	420
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.72	0.11	0.56	0.31	0.01	0.69	0.77	0.02	0.20	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	507	75	387	291	9	52	53	344	6	68	22
Future Volume (vph)	62	507	75	387	291	9	52	53	344	6	68	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	1827	1568	3467	1776	1417		1718	1509	1715	1804	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3502	1827	1568	3467	1776	1417		1718	1509	1715	1804	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	551	82	421	316	10	57	58	374	7	74	24
RTOR Reduction (vph)	0	0	49	0	0	4	0	0	339	0	0	22
Lane Group Flow (vph)	67	551	33	421	316	6	0	115	35	6	75	2
Heavy Vehicles (%)	0%	4%	3%	1%	7%	14%	14%	2%	7%	0%	0%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	6.3	53.1	53.1	28.1	74.4	74.4		12.0	12.0	9.8	9.8	9.8
Effective Green, g (s)	6.3	53.1	53.1	28.1	74.4	74.4		12.0	12.0	9.8	9.8	9.8
Actuated g/C Ratio	0.05	0.41	0.41	0.22	0.57	0.57		0.09	0.09	0.08	0.08	0.08
Clearance Time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0	2.0	4.0	4.0		2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	169	746	640	749	1016	810		158	139	129	135	114
v/s Ratio Prot	0.02	c0.30		c0.12	0.18			c0.07		0.00	c0.04	
v/s Ratio Perm			0.02			0.00			0.02			0.00
v/c Ratio	0.40	0.74	0.05	0.56	0.31	0.01		0.73	0.25	0.05	0.56	0.02
Uniform Delay, d1	60.0	32.6	23.2	45.5	14.5	11.9		57.4	54.8	55.8	58.0	55.6
Progression Factor	1.00	1.00	1.00	1.42	0.50	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	6.5	0.2	0.5	0.2	0.0		13.2	0.3	0.1	2.8	0.0
Delay (s)	61.1	39.0	23.4	65.2	7.4	11.9		70.6	55.2	55.8	60.8	55.7
Level of Service	E	D	C	E	A	B		E	E	E	E	E
Approach Delay (s)		39.3			40.0			58.8			59.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			45.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)			27.5		
Intersection Capacity Utilization			68.8%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	28	942	408	313	693	20	213	213	497	40	10
v/c Ratio	0.31	0.71	0.48	0.84	0.45	0.02	0.69	0.69	0.97	0.75	0.04
Control Delay	67.7	36.8	4.0	75.3	27.9	0.1	59.8	59.4	58.1	123.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.7	36.8	4.0	75.3	27.9	0.1	59.8	59.4	58.1	123.9	0.2
Queue Length 50th (ft)	23	352	0	119	277	0	195	195	~286	33	0
Queue Length 95th (ft)	56	377	57	#210	250	m0	m#345	m#343	#536	#110	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	131	1560	934	384	1728	883	307	310	515	56	280
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.60	0.44	0.82	0.40	0.02	0.69	0.69	0.97	0.71	0.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2046 Background AM Peak

Baseline

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway) Route 60 (Richmond Road)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	867	375	288	638	18	370	22	457	30	6	9
Future Volume (vph)	26	867	375	288	638	18	370	22	457	30	6	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1805	3438	1568	3335	3505	1615	1588	1604	1568		1825	1417
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.32	1.00
Satd. Flow (perm)	1805	3438	1568	3335	3505	1615	1588	1604	1568		603	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	942	408	313	693	20	402	24	497	33	7	10
RTOR Reduction (vph)	0	0	251	0	0	11	0	0	212	0	0	9
Lane Group Flow (vph)	28	942	157	313	693	9	213	213	285	0	40	1
Heavy Vehicles (%)	0%	5%	3%	5%	3%	0%	8%	6%	3%	0%	0%	14%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.6	49.9	49.9	14.5	57.3	57.3	25.1	25.1	25.1		11.5	11.5
Effective Green, g (s)	6.6	49.9	49.9	14.5	57.3	57.3	25.1	25.1	25.1		11.5	11.5
Actuated g/C Ratio	0.05	0.38	0.38	0.11	0.44	0.44	0.19	0.19	0.19		0.09	0.09
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	91	1319	601	371	1544	711	306	309	302		53	125
v/s Ratio Prot	0.02	c0.27		c0.09	c0.20		0.13	0.13				
v/s Ratio Perm			0.10			0.01			c0.18		c0.07	0.00
v/c Ratio	0.31	0.71	0.26	0.84	0.45	0.01	0.70	0.69	0.94		0.75	0.01
Uniform Delay, d1	59.5	34.0	27.4	56.6	25.3	20.4	48.9	48.8	51.7		57.9	54.0
Progression Factor	1.00	1.00	1.00	0.98	1.09	1.00	1.00	1.00	1.48		1.00	1.00
Incremental Delay, d2	0.7	3.3	1.1	14.6	0.9	0.0	4.5	4.2	28.0		43.5	0.0
Delay (s)	60.2	37.3	28.5	70.4	28.5	20.5	53.4	53.1	104.7		101.4	54.1
Level of Service	E	D	C	E	C	C	D	D	F		F	D
Approach Delay (s)		35.2			41.1			81.0			91.9	
Approach LOS		D			D			F			F	
Intersection Summary												
HCM 2000 Control Delay			50.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)			29.5		
Intersection Capacity Utilization			73.9%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

2046 Background AM Peak
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Baseline
Queues

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1033	449	16	763	238	71
v/c Ratio	0.45	0.39	0.17	0.31	0.73	0.22
Control Delay	8.5	1.3	64.5	8.4	62.5	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.5	1.3	64.5	8.4	62.5	10.4
Queue Length 50th (ft)	81	0	12	160	190	0
Queue Length 95th (ft)	m160	m18	m31	189	268	40
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2272	1146	138	2468	412	400
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.39	0.12	0.31	0.58	0.18

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

2046 Background AM Peak
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Baseline
HCM Signalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	950	413	15	702	219	65
Future Volume (vph)	950	413	15	702	219	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1524	1805	3539	1703	1429
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1524	1805	3539	1703	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1033	449	16	763	238	71
RTOR Reduction (vph)	0	174	0	0	0	57
Lane Group Flow (vph)	1033	275	16	763	238	14
Heavy Vehicles (%)	3%	6%	0%	2%	6%	13%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	79.5	79.5	3.2	90.7	24.8	24.8
Effective Green, g (s)	79.5	79.5	3.2	90.7	24.8	24.8
Actuated g/C Ratio	0.61	0.61	0.02	0.70	0.19	0.19
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	2143	931	44	2469	324	272
v/s Ratio Prot	c0.29		0.01	c0.22	c0.14	
v/s Ratio Perm		0.18				0.01
v/c Ratio	0.48	0.29	0.36	0.31	0.73	0.05
Uniform Delay, d1	13.9	12.0	62.4	7.6	49.5	43.0
Progression Factor	0.60	0.44	1.04	0.99	1.00	1.00
Incremental Delay, d2	0.5	0.5	4.8	0.3	10.1	0.2
Delay (s)	8.8	5.9	69.6	7.8	59.6	43.1
Level of Service	A	A	E	A	E	D
Approach Delay (s)	7.9			9.0	55.8	
Approach LOS	A			A	E	
Intersection Summary						
HCM 2000 Control Delay			14.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.55			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			50.5%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

2046 Background AM Peak
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Baseline
Queues

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	617	463	113	507	308	12
v/c Ratio	0.36	0.46	0.63	0.21	0.82	0.03
Control Delay	10.8	3.6	70.5	9.0	65.5	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	3.6	70.5	9.0	65.5	16.5
Queue Length 50th (ft)	127	55	93	79	249	0
Queue Length 95th (ft)	107	29	151	125	331	16
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1731	1019	248	2391	469	441
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.45	0.46	0.21	0.66	0.03
Intersection Summary						

2046 Background AM Peak
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Baseline
HCM Signalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	568	426	104	466	283	11
Future Volume (vph)	568	426	104	466	283	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1568	1612	3539	1752	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1568	1612	3539	1752	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	617	463	113	507	308	12
RTOR Reduction (vph)	0	231	0	0	0	9
Lane Group Flow (vph)	617	232	113	507	308	3
Heavy Vehicles (%)	5%	3%	12%	2%	3%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	65.1	65.1	14.4	87.5	28.0	28.0
Effective Green, g (s)	65.1	65.1	14.4	87.5	28.0	28.0
Actuated g/C Ratio	0.50	0.50	0.11	0.67	0.22	0.22
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1721	785	178	2382	377	347
v/s Ratio Prot	c0.18		c0.07	0.14	c0.18	
v/s Ratio Perm		0.15				0.00
v/c Ratio	0.36	0.30	0.63	0.21	0.82	0.01
Uniform Delay, d1	19.7	19.0	55.3	8.1	48.6	40.1
Progression Factor	0.47	0.99	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.9	7.2	0.2	12.8	0.0
Delay (s)	9.9	19.8	62.5	8.3	61.4	40.1
Level of Service	A	B	E	A	E	D
Approach Delay (s)	14.1			18.2	60.6	
Approach LOS	B			B	E	
Intersection Summary						
HCM 2000 Control Delay			22.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.51			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			56.9%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	45	31	14	64	107	47
Average Queue (ft)	14	3	1	25	41	15
95th Queue (ft)	39	17	8	52	80	40
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	L	L	T	R	LT	R	L	LT
Maximum Queue (ft)	63	187	448	242	203	225	244	91	159	195	6	115
Average Queue (ft)	8	50	233	41	97	123	87	5	71	99	0	31
95th Queue (ft)	37	120	365	148	176	195	195	46	130	171	3	84
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	4	0		0	1	0				0
Queuing Penalty (veh)		0	5	0		0	0	0				0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	32
Average Queue (ft)	1
95th Queue (ft)	17
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	74	345	465	248	214	242	242	206	28	287	339	498
Average Queue (ft)	22	185	281	17	106	111	96	105	5	143	170	290
95th Queue (ft)	57	292	417	112	191	209	182	170	22	242	275	484
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)								0		0	1	
Queuing Penalty (veh)								0		0	1	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	73	20
Average Queue (ft)	16	1
95th Queue (ft)	49	11
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	0	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	148	197	106	59	156	144	318	93
Average Queue (ft)	62	110	48	16	69	54	161	32
95th Queue (ft)	126	176	88	46	129	120	269	71
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	132	141	142	236	161	117	368	29
Average Queue (ft)	50	57	61	98	74	32	200	6
95th Queue (ft)	114	120	118	189	138	88	321	23
Link Distance (ft)	703	703			855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 7

2046 Background PM Peak

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	450	10	28	502	256	7	6	18	165	12	96
Future Volume (Veh/h)	150	450	10	28	502	256	7	6	18	165	12	96
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	489	11	30	546	278	8	7	20	179	13	104
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	824			500			1537	1704	494	1444	1432	546
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	824			500			1537	1704	494	1444	1432	546
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	80			97			86	90	97	0	88	81
cM capacity (veh/h)	815			1075			58	72	579	82	105	541
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	163	500	30	546	278	35	179	117				
Volume Left	163	0	30	0	0	8	179	0				
Volume Right	0	11	0	0	278	20	0	104				
cSH	815	1700	1075	1700	1700	130	82	371				
Volume to Capacity	0.20	0.29	0.03	0.32	0.16	0.27	2.17	0.32				
Queue Length 95th (ft)	19	0	2	0	0	25	405	33				
Control Delay (s)	10.5	0.0	8.4	0.0	0.0	42.6	648.2	19.1				
Lane LOS	B		A			E	F	C				
Approach Delay (s)	2.6		0.3			42.6	399.5					
Approach LOS						E	F					
Intersection Summary												
Average Delay	65.9											
Intersection Capacity Utilization	60.5%			ICU Level of Service					B			
Analysis Period (min)	15											

2046 Background PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road

Queues

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	119	491	51	373	781	28	90	371	49	51	89
v/c Ratio	0.48	0.57	0.07	0.58	0.72	0.03	0.65	0.80	0.47	0.45	0.38
Control Delay	64.0	29.2	0.2	76.2	14.6	0.0	80.0	19.4	72.1	69.8	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	29.2	0.2	76.2	14.6	0.0	80.0	19.4	72.1	69.8	6.5
Queue Length 50th (ft)	50	291	0	166	286	0	74	0	43	44	0
Queue Length 95th (ft)	81	431	0	m142	m162	m0	132	#110	86	88	13
Internal Link Dist (ft)	1290			1222			1066			438	
Turn Bay Length (ft)	365	290		260	230		115			115	
Base Capacity (vph)	471	855	689	648	1085	951	162	479	332	363	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.57	0.07	0.58	0.72	0.03	0.56	0.77	0.15	0.14	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2046 Background PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	113	466	48	11	343	742	27	33	52	352	52	43
Future Volume (vph)	113	466	48	11	343	742	27	33	52	352	52	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (prot)	3502	1845	1313		3435	1881	1538		1835	1599	1633	1784
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (perm)	3502	1845	1313		3435	1881	1538		1835	1599	1633	1784
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	491	51	12	361	781	28	35	55	371	55	45
RTOR Reduction (vph)	0	0	27	0	0	0	12	0	0	343	0	0
Lane Group Flow (vph)	119	491	24	0	373	781	16	0	90	28	49	51
Heavy Vehicles (%)	0%	3%	23%	0%	2%	1%	5%	4%	0%	1%	5%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2				6			3		
Actuated Green, G (s)	9.3	60.2	60.2		24.6	75.0	75.0		9.8	9.8	8.4	8.4
Effective Green, g (s)	9.3	60.2	60.2		24.6	75.0	75.0		9.8	9.8	8.4	8.4
Actuated g/C Ratio	0.07	0.46	0.46		0.19	0.58	0.58		0.08	0.08	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	250	854	608		650	1085	887		138	120	105	115
v/s Ratio Prot	0.03	0.27			c0.11	c0.42			c0.05		c0.03	0.03
v/s Ratio Perm			0.02				0.01			0.02		
v/c Ratio	0.48	0.57	0.04		0.57	0.72	0.02		0.65	0.23	0.47	0.44
Uniform Delay, d1	58.0	25.5	19.1		47.9	19.9	11.8		58.4	56.6	58.6	58.5
Progression Factor	1.00	1.00	1.00		1.55	0.64	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	2.8	0.1		0.1	0.2	0.0		8.1	0.4	1.2	1.0
Delay (s)	59.0	28.3	19.2		74.3	13.1	11.8		66.6	56.9	59.8	59.5
Level of Service	E	C	B		E	B	B		E	E	E	E
Approach Delay (s)		33.2				32.3			58.8			58.5
Approach LOS		C				C			E			E
Intersection Summary												
HCM 2000 Control Delay			39.4	HCM 2000 Level of Service			D					
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			130.0	Sum of lost time (s)			27.5					
Intersection Capacity Utilization			83.1%	ICU Level of Service			E					
Analysis Period (min)			15									
c Critical Lane Group												

2046 Background PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis



Movement	SBR
Lane Configurations	7
Traffic Volume (vph)	85
Future Volume (vph)	85
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	89
RTOR Reduction (vph)	83
Lane Group Flow (vph)	6
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.4
Effective Green, g (s)	8.4
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	104
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.06
Uniform Delay, d1	57.1
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	57.2
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

2046 Background PM Peak

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	21	1120	445	691	1201	39	217	215	460	75	24
v/c Ratio	0.26	0.75	0.49	1.74	0.69	0.04	0.98	0.96	1.12	1.74	0.08
Control Delay	66.9	35.3	4.5	381.2	18.5	0.1	102.2	99.1	102.7	451.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.9	35.3	4.5	381.2	18.5	0.1	102.2	99.1	102.7	451.5	0.5
Queue Length 50th (ft)	17	400	11	~459	356	0	192	190	~258	~100	0
Queue Length 95th (ft)	46	470	74	m#545	m393	m0	m#348	m#344	#493	#210	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	124	1606	955	396	1788	894	222	223	412	43	315
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.70	0.47	1.74	0.67	0.04	0.98	0.96	1.12	1.74	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2046 Background PM Peak

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway) Route 60 (Richmond Road)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1064	423	656	1141	37	389	22	437	33	38	23
Future Volume (vph)	20	1064	423	656	1141	37	389	22	437	33	38	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1703	3539	1599	3433	3574	1615	1698	1713	1568		1857	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.21	1.00
Satd. Flow (perm)	1703	3539	1599	3433	3574	1615	1698	1713	1568		390	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	1120	445	691	1201	39	409	23	460	35	40	24
RTOR Reduction (vph)	0	0	244	0	0	20	0	0	208	0	0	21
Lane Group Flow (vph)	21	1120	201	691	1201	19	217	215	252	0	75	3
Heavy Vehicles (%)	6%	2%	1%	2%	1%	0%	1%	0%	3%	0%	0%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.2	54.7	54.7	15.0	63.0	63.0	17.0	17.0	17.0		14.3	14.3
Effective Green, g (s)	6.2	54.7	54.7	15.0	63.0	63.0	17.0	17.0	17.0		14.3	14.3
Actuated g/C Ratio	0.05	0.42	0.42	0.12	0.48	0.48	0.13	0.13	0.13		0.11	0.11
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	81	1489	672	396	1732	782	222	224	205		42	169
v/s Ratio Prot	0.01	c0.32		c0.20	0.34		0.13	0.13				
v/s Ratio Perm			0.13			0.01			c0.16		c0.19	0.00
v/c Ratio	0.26	0.75	0.30	1.74	0.69	0.02	0.98	0.96	1.23		1.79	0.02
Uniform Delay, d1	59.7	31.9	25.0	57.5	26.0	17.5	56.3	56.2	56.5		57.9	51.6
Progression Factor	1.00	1.00	1.00	1.29	0.65	1.00	0.96	0.96	1.18		1.00	1.00
Incremental Delay, d2	0.6	3.6	1.1	342.2	1.6	0.0	46.6	41.6	132.3		433.1	0.0
Delay (s)	60.3	35.5	26.1	416.3	18.5	17.5	100.8	95.7	198.9		490.9	51.6
Level of Service	E	D	C	F	B	B	F	F	F		F	D
Approach Delay (s)		33.2			160.9			150.2			384.4	
Approach LOS		C			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			118.7			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.13									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			29.5			
Intersection Capacity Utilization			84.5%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

2046 Background PM Peak
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Queues

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1218	444	21	1415	531	218
v/c Ratio	0.65	0.42	0.23	0.66	1.03	0.38
Control Delay	11.0	0.9	64.5	15.5	93.4	13.4
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	11.0	0.9	64.5	15.6	93.4	13.4
Queue Length 50th (ft)	147	3	16	313	~551	35
Queue Length 95th (ft)	m163	m9	m31	m327	#771	108
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	1863	1052	129	2309	515	573
Starvation Cap Reductn	0	0	0	181	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.42	0.16	0.66	1.03	0.38
Intersection Summary						
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.						
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.						
m Volume for 95th percentile queue is metered by upstream signal.						

2046 Background PM Peak

4: Route 199 EB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	1145	417	20	1330	499	205
Future Volume (vph)	1145	417	20	1330	499	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1599	1687	3574	1787	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1599	1687	3574	1787	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1218	444	21	1415	531	218
RTOR Reduction (vph)	0	222	0	0	0	117
Lane Group Flow (vph)	1218	222	21	1415	531	101
Heavy Vehicles (%)	2%	1%	7%	1%	1%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	65.1	65.1	4.9	78.0	37.5	37.5
Effective Green, g (s)	65.1	65.1	4.9	78.0	37.5	37.5
Actuated g/C Ratio	0.50	0.50	0.04	0.60	0.29	0.29
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1772	800	63	2144	515	456
v/s Ratio Prot	c0.34		0.01	c0.40	c0.30	
v/s Ratio Perm		0.14				0.06
v/c Ratio	0.69	0.28	0.33	0.66	1.03	0.22
Uniform Delay, d1	24.7	18.8	61.0	17.2	46.2	35.1
Progression Factor	0.44	0.15	1.04	0.84	1.00	1.00
Incremental Delay, d2	1.2	0.5	2.3	1.2	47.9	0.5
Delay (s)	12.1	3.4	65.5	15.8	94.1	35.7
Level of Service	B	A	E	B	F	D
Approach Delay (s)	9.8			16.5	77.1	
Approach LOS	A			B	E	
Intersection Summary						
HCM 2000 Control Delay			25.4		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.84			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			76.5%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

2046 Background PM Peak
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Queues

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1006	399	153	891	549	84
v/c Ratio	0.69	0.46	0.71	0.42	1.06	0.16
Control Delay	13.4	2.5	72.1	14.5	101.9	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	2.5	72.1	14.5	101.9	13.7
Queue Length 50th (ft)	176	6	125	186	~550	13
Queue Length 95th (ft)	301	16	195	228	#774	55
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1473	879	269	2226	516	515
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.45	0.57	0.40	1.06	0.16

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2046 Background PM Peak

5: Route 199 WB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	966	383	147	855	527	81
Future Volume (vph)	966	383	147	855	527	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1553	1752	3574	1770	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1553	1752	3574	1770	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1006	399	153	891	549	84
RTOR Reduction (vph)	0	235	0	0	0	45
Lane Group Flow (vph)	1006	164	153	891	549	39
Heavy Vehicles (%)	2%	4%	3%	1%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	53.5	53.5	16.0	77.5	38.0	38.0
Effective Green, g (s)	53.5	53.5	16.0	77.5	38.0	38.0
Actuated g/C Ratio	0.41	0.41	0.12	0.60	0.29	0.29
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1456	639	215	2130	517	472
v/s Ratio Prot	c0.28		c0.09	0.25	c0.31	
v/s Ratio Perm		0.11				0.02
v/c Ratio	0.69	0.26	0.71	0.42	1.06	0.08
Uniform Delay, d1	31.5	25.2	54.8	14.1	46.0	33.4
Progression Factor	0.35	0.47	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.8	10.6	0.6	57.0	0.1
Delay (s)	13.3	12.6	65.4	14.7	103.0	33.4
Level of Service	B	B	E	B	F	C
Approach Delay (s)	13.1			22.2	93.8	
Approach LOS	B			C	F	
Intersection Summary						
HCM 2000 Control Delay			32.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.82			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			82.8%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	R	LTR	L	TR
Maximum Queue (ft)	101	2	35	40	68	309	634
Average Queue (ft)	41	0	9	6	20	208	249
95th Queue (ft)	76	2	29	24	50	376	802
Link Distance (ft)	1920				701	1590	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	225		280	255		315	
Storage Blk Time (%)						25	16
Queuing Penalty (veh)						27	27

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	127	172	343	113	123	148	434	209	117	195	53	105
Average Queue (ft)	23	75	175	23	53	82	189	17	49	86	8	29
95th Queue (ft)	73	129	287	81	110	133	364	96	96	155	32	76
Link Distance (ft)			1322			1150	1150			1094	1094	426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365	290		260	230			115			
Storage Blk Time (%)	0		1	0	7			0	0			
Queuing Penalty (veh)	0		1	0	2			0	0			

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	85
Average Queue (ft)	9
95th Queue (ft)	42
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	56	420	494	316	410	415	691	500	48	245	262	494
Average Queue (ft)	15	223	273	52	384	414	681	125	5	146	163	265
95th Queue (ft)	45	351	437	219	475	414	688	322	30	219	235	454
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)							63	0				
Queuing Penalty (veh)							572	0				
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)					9	66	75	2	0	0	0	
Queuing Penalty (veh)					50	375	495	1	0	0	0	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	111	72
Average Queue (ft)	36	5
95th Queue (ft)	86	34
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	1	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	174	212	113	230	721	725	1112	1110
Average Queue (ft)	94	134	51	68	665	543	1094	1062
95th Queue (ft)	156	194	91	229	828	882	1121	1290
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)					30	1	94	91
Queuing Penalty (veh)					206	5	0	0
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)				0	86			
Queuing Penalty (veh)				1	18			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	188	175	114	383	569	525	1051	1036
Average Queue (ft)	73	70	47	136	269	207	984	886
95th Queue (ft)	155	148	89	280	474	421	1183	1404
Link Distance (ft)	703	703			855	855	1011	1011
Upstream Blk Time (%)							77	73
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)			520	475				
Storage Blk Time (%)				0	2			
Queuing Penalty (veh)				0	3			

Network Summary

Network wide Queuing Penalty: 1785

2046 Background Saturday

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	38	334	11	14	324	136	7	2	30	4	181	5
Future Volume (Veh/h)	38	334	11	14	324	136	7	2	30	4	181	5
Sign Control	Free				Free				Stop			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	363	12	15	352	148	8	2	33	0	197	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked							0.00					
vC, conflicting volume	500			375			902	981	369	0	861	839
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	500			375			902	981	369	0	861	839
tC, single (s)	4.1			4.1			7.1	6.5	6.2	0.0	7.1	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	0.0	3.5	4.0
p0 queue free %	96			99			96	99	95	0	22	98
cM capacity (veh/h)	1075			1195			223	239	681	0	253	289
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	41	375	15	352	148	43	197	72				
Volume Left	41	0	15	0	0	8	197	0				
Volume Right	0	12	0	0	148	33	0	67				
cSH	1075	1700	1195	1700	1700	464	253	634				
Volume to Capacity	0.04	0.22	0.01	0.21	0.09	0.09	0.78	0.11				
Queue Length 95th (ft)	3	0	1	0	0	8	145	10				
Control Delay (s)	8.5	0.0	8.1	0.0	0.0	13.5	56.0	11.4				
Lane LOS	A		A			B	F	B				
Approach Delay (s)	0.8		0.2			13.5	44.1					
Approach LOS						B	E					
Intersection Summary												
Average Delay	10.4											
Intersection Capacity Utilization	48.5%			ICU Level of Service					A			
Analysis Period (min)	15											

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	62
Future Volume (Veh/h)	62
Sign Control	
Grade	
Peak Hour Factor	0.92
Hourly flow rate (vph)	67
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	352
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	352
tC, single (s)	6.2
tC, 2 stage (s)	
tF (s)	3.3
p0 queue free %	90
cM capacity (veh/h)	696
Direction, Lane #	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	160	532	15	298	546	15	118	308	43	51	55
v/c Ratio	0.55	0.56	0.02	0.63	0.53	0.02	0.70	0.72	0.40	0.45	0.24
Control Delay	64.2	26.6	0.0	72.1	11.1	0.0	78.7	16.4	68.5	70.6	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	26.6	0.0	72.1	11.1	0.0	78.7	16.4	68.5	70.6	2.4
Queue Length 50th (ft)	68	308	0	129	125	0	97	0	37	44	0
Queue Length 95th (ft)	102	450	0	m179	m139	m0	#190	94	77	88	0
Internal Link Dist (ft)		1290			1222		1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	942	884	474	1038	959	180	434	349	366	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.56	0.02	0.63	0.53	0.02	0.66	0.71	0.12	0.14	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2046 Background Saturday

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	152	505	14	28	256	519	14	12	100	293	46	44
Future Volume (vph)	152	505	14	28	256	519	14	12	100	293	46	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00
Satd. Flow (prot)	3502	1881	1615		3440	1881	1615		1869	1615	1715	1796
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00
Satd. Flow (perm)	3502	1881	1615		3440	1881	1615		1869	1615	1715	1796
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	160	532	15	29	269	546	15	13	105	308	48	46
RTOR Reduction (vph)	0	0	7	0	0	0	7	0	0	280	0	0
Lane Group Flow (vph)	160	532	8	0	298	546	8	0	118	28	43	51
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	10%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2				6			3		
Actuated Green, G (s)	10.8	65.2	65.2		17.9	71.8	71.8		11.7	11.7	8.2	8.2
Effective Green, g (s)	10.8	65.2	65.2		17.9	71.8	71.8		11.7	11.7	8.2	8.2
Actuated g/C Ratio	0.08	0.50	0.50		0.14	0.55	0.55		0.09	0.09	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	290	943	809		473	1038	891		168	145	108	113
v/s Ratio Prot	0.05	c0.28			c0.09	c0.29			c0.06		0.03	c0.03
v/s Ratio Perm			0.00				0.01			0.02		
v/c Ratio	0.55	0.56	0.01		0.63	0.53	0.01		0.70	0.19	0.40	0.45
Uniform Delay, d1	57.3	22.5	16.2		52.9	18.4	13.1		57.5	54.8	58.5	58.7
Progression Factor	1.00	1.00	1.00		1.26	0.47	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	2.4	0.0		1.8	0.6	0.0		10.3	0.2	0.9	1.0
Delay (s)	59.1	25.0	16.2		68.3	9.2	13.1		67.8	55.0	59.4	59.8
Level of Service	E	C	B		E	A	B		E	E	E	E
Approach Delay (s)		32.5				29.7			58.5			58.7
Approach LOS		C				C			E			E
Intersection Summary												
HCM 2000 Control Delay			38.4	HCM 2000 Level of Service			D					
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			130.0	Sum of lost time (s)			27.5					
Intersection Capacity Utilization			79.5%	ICU Level of Service			D					
Analysis Period (min)			15									
c Critical Lane Group												



Movement	SBR
Lane Configurations	↰
Traffic Volume (vph)	52
Future Volume (vph)	52
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	55
RTOR Reduction (vph)	52
Lane Group Flow (vph)	3
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.2
Effective Green, g (s)	8.2
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	101
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.03
Uniform Delay, d1	57.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	57.2
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

2046 Background Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	52	1636	357	395	851	40	219	222	485	70	32
v/c Ratio	0.49	1.09	0.44	0.78	0.47	0.04	1.32	0.99	0.99	1.49	0.09
Control Delay	74.0	87.1	10.7	68.6	17.8	0.1	221.0	113.8	65.4	344.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.0	87.1	10.7	68.6	17.8	0.1	221.0	113.8	65.4	344.7	0.6
Queue Length 50th (ft)	43	~814	61	160	260	0	~255	207	196	~81	0
Queue Length 95th (ft)	87	#1015	153	201	305	m0	m#426	m#382	#409	#182	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	131	1504	818	686	1827	902	166	224	489	47	337
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	1.09	0.44	0.58	0.47	0.04	1.32	0.99	0.99	1.49	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2046 Background Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway) Route 60 (Richmond Road)

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations		↩	↩↩	↩	↩↩	↩↩	↩		↩	↩	↩	
Traffic Volume (vph)	16	33	1554	339	375	808	38	2	381	36	461	42
Future Volume (vph)	16	33	1554	339	375	808	38	2	381	36	461	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	1.00		0.95	0.95	1.00	
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	0.96	1.00	
Satd. Flow (prot)		1805	3574	1615	3433	3610	1615		1698	1719	1599	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.71	0.96	1.00	
Satd. Flow (perm)		1805	3574	1615	3433	3610	1615		1271	1719	1599	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	35	1636	357	395	851	40	2	401	38	485	44
RTOR Reduction (vph)	0	0	0	138	0	0	20	0	0	0	281	0
Lane Group Flow (vph)	0	52	1636	219	395	851	20	0	219	222	204	0
Heavy Vehicles (%)	0%	0%	1%	0%	2%	0%	0%	0%	1%	0%	1%	0%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Perm	Split	NA	Perm	Perm
Protected Phases	5	5	2		1	6			4	4		
Permitted Phases				2			6	4			4	3
Actuated Green, G (s)		7.7	54.7	54.7	19.3	65.8	65.8		17.0	17.0	17.0	
Effective Green, g (s)		7.7	54.7	54.7	19.3	65.8	65.8		17.0	17.0	17.0	
Actuated g/C Ratio		0.06	0.42	0.42	0.15	0.51	0.51		0.13	0.13	0.13	
Clearance Time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Vehicle Extension (s)		2.0	4.0	4.0	2.0	4.0	4.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		106	1503	679	509	1827	817		166	224	209	
v/s Ratio Prot		0.03	c0.46		c0.12	0.24				0.13		
v/s Ratio Perm				0.14			0.01		c0.17		0.13	
v/c Ratio		0.49	1.09	0.32	0.78	0.47	0.02		1.32	0.99	0.98	
Uniform Delay, d1		59.2	37.6	25.2	53.3	20.7	16.1		56.5	56.4	56.3	
Progression Factor		1.00	1.00	1.00	1.10	0.80	1.00		1.13	1.11	1.84	
Incremental Delay, d2		1.3	51.3	1.3	6.1	0.8	0.1		173.9	51.6	49.3	
Delay (s)		60.6	88.9	26.5	64.9	17.5	16.1		237.5	114.5	152.7	
Level of Service		E	F	C	E	B	B		F	F	F	
Approach Delay (s)			77.3			32.0				163.6		
Approach LOS			E			C				F		
Intersection Summary												
HCM 2000 Control Delay			86.7			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.11									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			29.5			
Intersection Capacity Utilization			93.2%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

2046 Background Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway) Route 60 (Richmond Road)



Movement	SBT	SBR
Lane Configurations	↕	↗
Traffic Volume (vph)	25	30
Future Volume (vph)	25	30
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	7.0	7.0
Lane Util. Factor	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.97	1.00
Satd. Flow (prot)	1842	1615
Flt Permitted	0.33	1.00
Satd. Flow (perm)	619	1615
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	26	32
RTOR Reduction (vph)	0	30
Lane Group Flow (vph)	70	2
Heavy Vehicles (%)	0%	0%
Turn Type	NA	Perm
Protected Phases	3	
Permitted Phases		3
Actuated Green, G (s)	10.0	10.0
Effective Green, g (s)	10.0	10.0
Actuated g/C Ratio	0.08	0.08
Clearance Time (s)	7.0	7.0
Vehicle Extension (s)	2.5	2.5
Lane Grp Cap (vph)	47	124
v/s Ratio Prot		
v/s Ratio Perm	c0.11	0.00
v/c Ratio	1.49	0.02
Uniform Delay, d1	60.0	55.5
Progression Factor	1.00	1.00
Incremental Delay, d2	304.5	0.0
Delay (s)	364.5	55.5
Level of Service	F	E
Approach Delay (s)	267.6	
Approach LOS	F	
Intersection Summary		

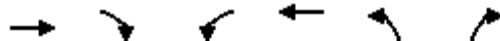
						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1500	574	51	943	293	213
v/c Ratio	0.74	0.49	0.44	0.39	0.79	0.46
Control Delay	11.3	0.4	68.8	8.5	63.8	15.2
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	0.4	68.8	8.5	63.8	15.2
Queue Length 50th (ft)	182	0	41	194	231	36
Queue Length 95th (ft)	m177	m0	m71	226	330	107
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2040	1168	138	2441	424	508
Starvation Cap Reductn	79	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.49	0.37	0.39	0.69	0.42
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

2046 Background Saturday

4: Route 199 EB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	1410	540	48	886	275	200
Future Volume (vph)	1410	540	48	886	275	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1615	1805	3610	1752	1599
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1615	1805	3610	1752	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1500	574	51	943	293	213
RTOR Reduction (vph)	0	253	0	0	0	126
Lane Group Flow (vph)	1500	321	51	943	293	87
Heavy Vehicles (%)	1%	0%	0%	0%	3%	1%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	72.6	72.6	7.3	87.9	27.6	27.6
Effective Green, g (s)	72.6	72.6	7.3	87.9	27.6	27.6
Actuated g/C Ratio	0.56	0.56	0.06	0.68	0.21	0.21
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1995	901	101	2440	371	339
v/s Ratio Prot	c0.42		0.03	c0.26	c0.17	
v/s Ratio Perm		0.20				0.05
v/c Ratio	0.75	0.36	0.50	0.39	0.79	0.26
Uniform Delay, d1	21.8	15.8	59.6	9.2	48.5	42.7
Progression Factor	0.48	0.21	1.01	0.83	1.00	1.00
Incremental Delay, d2	0.2	0.1	3.5	0.4	12.3	0.8
Delay (s)	10.7	3.5	63.5	8.1	60.7	43.5
Level of Service	B	A	E	A	E	D
Approach Delay (s)	8.7			10.9	53.5	
Approach LOS	A			B	D	
Intersection Summary						
HCM 2000 Control Delay			15.6		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.76			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			67.2%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1231	464	172	690	388	91
v/c Ratio	0.76	0.48	0.76	0.30	0.89	0.20
Control Delay	16.2	2.0	75.1	10.8	70.4	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	2.0	75.1	10.8	70.4	8.1
Queue Length 50th (ft)	235	10	140	131	310	0
Queue Length 95th (ft)	377	9	218	167	#461	43
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1624	972	267	2335	479	495
Starvation Cap Reductn	6	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.48	0.64	0.30	0.81	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	1182	445	165	662	372	87
Future Volume (vph)	1182	445	165	662	372	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1583	1736	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1583	1736	3610	1805	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1231	464	172	690	388	91
RTOR Reduction (vph)	0	253	0	0	0	69
Lane Group Flow (vph)	1231	211	172	690	388	22
Heavy Vehicles (%)	1%	2%	4%	0%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	59.1	59.1	17.0	84.1	31.4	31.4
Effective Green, g (s)	59.1	59.1	17.0	84.1	31.4	31.4
Actuated g/C Ratio	0.45	0.45	0.13	0.65	0.24	0.24
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1624	719	227	2335	435	390
v/s Ratio Prot	c0.34		c0.10	0.19	c0.21	
v/s Ratio Perm		0.13				0.01
v/c Ratio	0.76	0.29	0.76	0.30	0.89	0.06
Uniform Delay, d1	29.5	22.3	54.5	10.0	47.7	37.9
Progression Factor	0.44	0.34	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.7	13.5	0.3	20.0	0.1
Delay (s)	15.4	8.4	68.0	10.3	67.6	38.0
Level of Service	B	A	E	B	E	D
Approach Delay (s)	13.5			21.8	62.0	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			23.5		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.80			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			81.2%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	UL	TR
Maximum Queue (ft)	34	26	6	53	174	50
Average Queue (ft)	10	4	0	22	70	25
95th Queue (ft)	31	19	4	45	133	45
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	122	193	376	162	160	201	395	128	155	223	38	93
Average Queue (ft)	33	86	200	11	58	87	167	8	70	92	6	25
95th Queue (ft)	91	159	343	76	128	159	339	59	134	242	23	67
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	2	0		0	5	0				0
Queuing Penalty (veh)		0	3	0		0	1	0				0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	28
Average Queue (ft)	3
95th Queue (ft)	16
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	UL	LT	R
Maximum Queue (ft)	565	1594	1596	1591	243	258	227	230	86	274	426	663
Average Queue (ft)	199	1457	1473	1374	115	138	116	121	12	164	257	422
95th Queue (ft)	612	1883	1860	2110	206	227	204	199	57	268	674	883
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)		44	65	64							0	3
Queuing Penalty (veh)		0	0	0							2	12
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)	0	59						1	0	0	4	
Queuing Penalty (veh)	1	29						0	0	0	9	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	109	70
Average Queue (ft)	41	5
95th Queue (ft)	92	33
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	2	0
Queuing Penalty (veh)	1	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	381	409	162	115	176	171	360	175
Average Queue (ft)	171	203	75	47	86	71	196	74
95th Queue (ft)	296	327	129	98	152	140	315	143
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	359	366	191	257	222	176	441	101
Average Queue (ft)	142	154	62	137	109	60	265	27
95th Queue (ft)	293	303	129	227	194	133	406	67
Link Distance (ft)	703	703			855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 59

Appendix G
SYNCHRO & SimTraffic Analysis
Of 2040 Future Conditions

2040 Future AM Peak

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	388	0	12	283	91	8	6	28	88	3	21
Future Volume (Veh/h)	60	388	0	12	283	91	8	6	28	88	3	21
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	422	0	13	308	99	9	7	30	96	3	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	407			422			910	985	422	920	886	308
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	407			422			910	985	422	920	886	308
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.0	3.4
p0 queue free %	94			99			96	97	95	57	99	97
cM capacity (veh/h)	1163			1096			221	233	636	224	266	723
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	65	422	13	308	99	46	96	26				
Volume Left	65	0	13	0	0	9	96	0				
Volume Right	0	0	0	0	99	30	0	23				
cSH	1163	1700	1096	1700	1700	390	224	604				
Volume to Capacity	0.06	0.25	0.01	0.18	0.06	0.12	0.43	0.04				
Queue Length 95th (ft)	4	0	1	0	0	10	50	3				
Control Delay (s)	8.3	0.0	8.3	0.0	0.0	15.5	32.6	11.2				
Lane LOS	A		A			C	D	B				
Approach Delay (s)	1.1		0.3			15.5	28.0					
Approach LOS						C	D					
Intersection Summary												
Average Delay				4.4								
Intersection Capacity Utilization				45.3%	ICU Level of Service				A			
Analysis Period (min)				15								

2040 Future AM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road

Queues



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	63	518	89	457	298	9	109	367	6	71	23
v/c Ratio	0.32	0.73	0.13	0.55	0.29	0.01	0.70	0.78	0.05	0.54	0.10
Control Delay	63.0	40.3	0.5	68.9	7.8	0.0	80.8	17.9	54.5	72.3	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	40.3	0.5	68.9	7.8	0.0	80.8	17.9	54.5	72.3	0.8
Queue Length 50th (ft)	26	357	0	196	65	0	90	0	5	62	0
Queue Length 95th (ft)	50	484	1	m247	m76	m0	#181	#129	20	112	0
Internal Link Dist (ft)		1290			1222		1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	758	739	826	1045	896	165	477	349	367	420
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.68	0.12	0.55	0.29	0.01	0.66	0.77	0.02	0.19	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2040 Future AM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	477	82	420	274	8	51	50	338	6	64	21
Future Volume (vph)	58	477	82	420	274	8	51	50	338	6	64	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	1827	1568	3467	1776	1417		1715	1509	1715	1804	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3502	1827	1568	3467	1776	1417		1715	1509	1715	1804	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	518	89	457	298	9	55	54	367	7	70	23
RTOR Reduction (vph)	0	0	54	0	0	4	0	0	334	0	0	21
Lane Group Flow (vph)	63	518	35	457	298	5	0	109	33	6	71	2
Heavy Vehicles (%)	0%	4%	3%	1%	7%	14%	14%	2%	7%	0%	0%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	6.2	50.7	50.7	31.0	75.0	75.0		11.8	11.8	9.5	9.5	9.5
Effective Green, g (s)	6.2	50.7	50.7	31.0	75.0	75.0		11.8	11.8	9.5	9.5	9.5
Actuated g/C Ratio	0.05	0.39	0.39	0.24	0.58	0.58		0.09	0.09	0.07	0.07	0.07
Clearance Time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0	2.0	4.0	4.0		2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	167	712	611	826	1024	817		155	136	125	131	111
v/s Ratio Prot	0.02	c0.28		c0.13	0.17			c0.06		0.00	c0.04	
v/s Ratio Perm			0.02			0.00			0.02			0.00
v/c Ratio	0.38	0.73	0.06	0.55	0.29	0.01		0.70	0.24	0.05	0.54	0.02
Uniform Delay, d1	60.0	33.8	24.7	43.4	14.0	11.7		57.4	55.0	56.0	58.2	55.9
Progression Factor	1.00	1.00	1.00	1.47	0.47	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	6.4	0.2	0.4	0.2	0.0		11.2	0.3	0.1	2.4	0.0
Delay (s)	61.1	40.2	24.9	64.1	6.8	11.7		68.6	55.3	56.1	60.6	55.9
Level of Service	E	D	C	E	A	B		E	E	E	E	E
Approach Delay (s)		40.1			41.1			58.3			59.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			45.8				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)			27.5		
Intersection Capacity Utilization			66.9%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

2040 Future AM Peak

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	26	899	395	342	663	18	201	202	480	37	9
v/c Ratio	0.29	0.70	0.48	0.90	0.44	0.02	0.62	0.62	0.89	0.71	0.03
Control Delay	67.3	37.5	4.1	79.9	28.8	0.1	56.3	56.1	45.7	115.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.3	37.5	4.1	79.9	28.8	0.1	56.3	56.1	45.7	115.4	0.2
Queue Length 50th (ft)	22	339	0	129	266	0	182	183	248	30	0
Queue Length 95th (ft)	52	358	57	#241	219	m0	m#333	m#331	#486	#100	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	131	1560	927	384	1727	883	323	326	538	55	281
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.58	0.43	0.89	0.38	0.02	0.62	0.62	0.89	0.67	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2040 Future AM Peak

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	827	363	315	610	17	350	21	442	28	6	8
Future Volume (vph)	24	827	363	315	610	17	350	21	442	28	6	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1805	3438	1568	3335	3505	1615	1588	1604	1568		1826	1417
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.31	1.00
Satd. Flow (perm)	1805	3438	1568	3335	3505	1615	1588	1604	1568		598	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	899	395	342	663	18	380	23	480	30	7	9
RTOR Reduction (vph)	0	0	249	0	0	10	0	0	219	0	0	8
Lane Group Flow (vph)	26	899	146	342	663	8	201	202	261	0	37	1
Heavy Vehicles (%)	0%	5%	3%	5%	3%	0%	8%	6%	3%	0%	0%	14%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.4	48.2	48.2	14.8	56.1	56.1	26.5	26.5	26.5		11.5	11.5
Effective Green, g (s)	6.4	48.2	48.2	14.8	56.1	56.1	26.5	26.5	26.5		11.5	11.5
Actuated g/C Ratio	0.05	0.37	0.37	0.11	0.43	0.43	0.20	0.20	0.20		0.09	0.09
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	88	1274	581	379	1512	696	323	326	319		52	125
v/s Ratio Prot	0.01	c0.26		c0.10	c0.19		0.13	0.13				
v/s Ratio Perm			0.09			0.00			c0.17		c0.06	0.00
v/c Ratio	0.30	0.71	0.25	0.90	0.44	0.01	0.62	0.62	0.82		0.71	0.01
Uniform Delay, d1	59.6	34.9	28.4	56.9	25.9	21.1	47.2	47.2	49.5		57.6	54.0
Progression Factor	1.00	1.00	1.00	0.94	1.10	1.00	1.00	1.00	1.55		1.00	1.00
Incremental Delay, d2	0.7	3.3	1.0	22.6	0.9	0.0	2.6	2.4	10.7		34.8	0.0
Delay (s)	60.3	38.2	29.4	76.2	29.4	21.1	49.6	49.4	87.2		92.4	54.1
Level of Service	E	D	C	E	C	C	D	D	F		F	D
Approach Delay (s)		36.0			44.9			70.0			84.9	
Approach LOS		D			D			E			F	
Intersection Summary												
HCM 2000 Control Delay			48.6				HCM 2000 Level of Service		D			
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		29.5			
Intersection Capacity Utilization			71.9%				ICU Level of Service		C			
Analysis Period (min)			15									
c Critical Lane Group												

2040 Future AM Peak
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Queues

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	991	427	15	763	237	67
v/c Ratio	0.44	0.37	0.16	0.31	0.73	0.21
Control Delay	8.6	1.4	65.4	8.1	62.4	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.6	1.4	65.4	8.1	62.4	10.6
Queue Length 50th (ft)	80	0	11	161	189	0
Queue Length 95th (ft)	m155	m18	m30	184	266	38
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2276	1139	138	2470	412	397
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.37	0.11	0.31	0.58	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

2040 Future AM Peak
4: Route 199 EB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑
Traffic Volume (vph)	912	393	14	702	218	62
Future Volume (vph)	912	393	14	702	218	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1524	1805	3539	1703	1429
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1524	1805	3539	1703	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	991	427	15	763	237	67
RTOR Reduction (vph)	0	166	0	0	0	54
Lane Group Flow (vph)	991	261	15	763	237	13
Heavy Vehicles (%)	3%	6%	0%	2%	6%	13%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	79.6	79.6	3.1	90.7	24.8	24.8
Effective Green, g (s)	79.6	79.6	3.1	90.7	24.8	24.8
Actuated g/C Ratio	0.61	0.61	0.02	0.70	0.19	0.19
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	2146	933	43	2469	324	272
v/s Ratio Prot	c0.28		0.01	c0.22	c0.14	
v/s Ratio Perm		0.17				0.01
v/c Ratio	0.46	0.28	0.35	0.31	0.73	0.05
Uniform Delay, d1	13.6	11.8	62.5	7.6	49.5	43.0
Progression Factor	0.61	0.45	1.06	0.95	1.00	1.00
Incremental Delay, d2	0.5	0.5	4.6	0.3	9.9	0.2
Delay (s)	8.8	5.9	70.5	7.5	59.4	43.1
Level of Service	A	A	E	A	E	D
Approach Delay (s)	8.0			8.7	55.8	
Approach LOS	A			A	E	
Intersection Summary						
HCM 2000 Control Delay			14.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.53			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			49.4%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

2040 Future AM Peak
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Queues

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	597	440	107	507	305	11
v/c Ratio	0.34	0.44	0.62	0.21	0.82	0.03
Control Delay	10.6	3.3	70.5	8.9	65.6	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	3.3	70.5	8.9	65.6	16.8
Queue Length 50th (ft)	128	56	88	78	246	0
Queue Length 95th (ft)	56	1	145	125	327	16
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1745	1012	248	2396	468	440
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.43	0.43	0.21	0.65	0.03
Intersection Summary						

2040 Future AM Peak

5: Route 199 WB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑
Traffic Volume (vph)	549	405	98	466	281	10
Future Volume (vph)	549	405	98	466	281	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1568	1612	3539	1752	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1568	1612	3539	1752	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	597	440	107	507	305	11
RTOR Reduction (vph)	0	217	0	0	0	9
Lane Group Flow (vph)	597	223	107	507	305	2
Heavy Vehicles (%)	5%	3%	12%	2%	3%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	65.8	65.8	13.9	87.7	27.8	27.8
Effective Green, g (s)	65.8	65.8	13.9	87.7	27.8	27.8
Actuated g/C Ratio	0.51	0.51	0.11	0.67	0.21	0.21
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1740	793	172	2387	374	345
v/s Ratio Prot	c0.17		c0.07	0.14	c0.17	
v/s Ratio Perm		0.14				0.00
v/c Ratio	0.34	0.28	0.62	0.21	0.82	0.01
Uniform Delay, d1	19.2	18.5	55.5	8.0	48.7	40.2
Progression Factor	0.48	0.89	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.8	6.8	0.2	12.8	0.0
Delay (s)	9.7	17.3	62.4	8.2	61.5	40.2
Level of Service	A	B	E	A	E	D
Approach Delay (s)	12.9			17.7	60.7	
Approach LOS	B			B	E	
Intersection Summary						
HCM 2000 Control Delay			22.1	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			130.0	Sum of lost time (s)		22.5
Intersection Capacity Utilization			56.4%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	48	28	12	59	82	52
Average Queue (ft)	14	3	1	24	37	16
95th Queue (ft)	38	16	6	49	69	42
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	L	L	T	R	LT	R	L	LT
Maximum Queue (ft)	37	123	422	290	198	212	228	33	177	203	10	85
Average Queue (ft)	7	45	223	52	104	130	83	3	67	91	1	24
95th Queue (ft)	27	97	353	182	178	199	193	16	132	165	5	66
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)			2	0		0	0					0
Queuing Penalty (veh)			3	1		0	0					0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	33
Average Queue (ft)	1
95th Queue (ft)	17
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	73	335	424	168	270	290	309	242	28	270	288	429
Average Queue (ft)	22	165	253	15	144	150	117	110	4	135	159	246
95th Queue (ft)	57	285	380	92	258	287	263	195	19	224	240	395
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)							0					
Queuing Penalty (veh)							0					
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)					0	0	0	0		0	0	
Queuing Penalty (veh)					0	1	0	0		0	0	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	66	12
Average Queue (ft)	15	1
95th Queue (ft)	45	6
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	148	213	107	63	161	152	312	96
Average Queue (ft)	60	109	47	18	72	54	169	26
95th Queue (ft)	126	187	83	48	140	128	278	67
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	146	138	159	211	168	110	360	50
Average Queue (ft)	45	54	57	100	76	27	211	5
95th Queue (ft)	112	123	118	180	145	76	331	32
Link Distance (ft)	703	703			855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 6

2040 Total Future PM Peak

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	424	9	27	473	241	7	6	17	156	12	104
Future Volume (Veh/h)	156	424	9	27	473	241	7	6	17	156	12	104
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	170	461	10	29	514	262	8	7	18	170	13	113
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	776			471			1498	1640	466	1394	1383	514
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	776			471			1498	1640	466	1394	1383	514
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	80			97			87	91	97	0	88	80
cM capacity (veh/h)	849			1101			62	79	601	90	113	564
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	170	471	29	514	262	33	170	126				
Volume Left	170	0	29	0	0	8	170	0				
Volume Right	0	10	0	0	262	18	0	113				
cSH	849	1700	1101	1700	1700	133	90	400				
Volume to Capacity	0.20	0.28	0.03	0.30	0.15	0.25	1.88	0.32				
Queue Length 95th (ft)	19	0	2	0	0	23	360	33				
Control Delay (s)	10.3	0.0	8.4	0.0	0.0	40.8	513.9	18.1				
Lane LOS	B		A			E	F	C				
Approach Delay (s)	2.7		0.3			40.8	302.9					
Approach LOS						E	F					
Intersection Summary												
Average Delay	52.4											
Intersection Capacity Utilization	58.8%			ICU Level of Service					B			
Analysis Period (min)	15											

2040 Total Future PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road

Queues



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	462	72	468	736	27	106	456	46	49	84
v/c Ratio	0.46	0.60	0.11	0.59	0.68	0.03	0.73	0.83	0.45	0.44	0.36
Control Delay	63.9	33.4	0.4	77.0	13.6	0.0	86.1	19.1	71.6	69.8	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.9	33.4	0.4	77.0	13.6	0.0	86.1	19.1	71.6	69.8	5.4
Queue Length 50th (ft)	47	297	0	207	262	0	88	0	40	43	0
Queue Length 95th (ft)	78	415	0	m168	m137	m0	#168	#148	83	86	7
Internal Link Dist (ft)		1290			1222		1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	770	636	794	1082	949	160	557	332	363	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.60	0.11	0.59	0.68	0.03	0.66	0.82	0.14	0.13	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2040 Total Future PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	107	439	68	10	434	699	26	51	49	433	49	41
Future Volume (vph)	107	439	68	10	434	699	26	51	49	433	49	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (prot)	3502	1845	1313		3435	1881	1538		1816	1599	1633	1783
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (perm)	3502	1845	1313		3435	1881	1538		1816	1599	1633	1783
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	113	462	72	11	457	736	27	54	52	456	52	43
RTOR Reduction (vph)	0	0	42	0	0	0	11	0	0	420	0	0
Lane Group Flow (vph)	113	462	30	0	468	736	16	0	106	36	46	49
Heavy Vehicles (%)	0%	3%	23%	0%	2%	1%	5%	4%	0%	1%	5%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2				6			3		
Actuated Green, G (s)	9.1	54.3	54.3		30.1	74.8	74.8		10.4	10.4	8.2	8.2
Effective Green, g (s)	9.1	54.3	54.3		30.1	74.8	74.8		10.4	10.4	8.2	8.2
Actuated g/C Ratio	0.07	0.42	0.42		0.23	0.58	0.58		0.08	0.08	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	245	770	548		795	1082	884		145	127	103	112
v/s Ratio Prot	0.03	0.25			c0.14	c0.39			c0.06		c0.03	0.03
v/s Ratio Perm			0.02				0.01			0.02		
v/c Ratio	0.46	0.60	0.05		0.59	0.68	0.02		0.73	0.29	0.45	0.44
Uniform Delay, d1	58.1	29.4	22.6		44.4	19.3	11.8		58.4	56.3	58.7	58.7
Progression Factor	1.00	1.00	1.00		1.68	0.63	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	3.4	0.2		0.1	0.2	0.0		15.0	0.5	1.1	1.0
Delay (s)	59.1	32.9	22.7		74.7	12.3	11.8		73.4	56.8	59.8	59.7
Level of Service	E	C	C		E	B	B		E	E	E	E
Approach Delay (s)		36.3				36.0			59.9			58.6
Approach LOS		D				D			E			E
Intersection Summary												
HCM 2000 Control Delay			42.7			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			27.5			
Intersection Capacity Utilization			89.2%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

2040 Total Future PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	80
Future Volume (vph)	80
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	84
RTOR Reduction (vph)	79
Lane Group Flow (vph)	5
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.2
Effective Green, g (s)	8.2
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	101
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.05
Uniform Delay, d1	57.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	57.3
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

2040 Total Future PM Peak

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	20	1064	442	743	1140	37	216	213	519	71	23
v/c Ratio	0.25	0.73	0.48	1.88	0.67	0.04	0.97	0.96	1.24	1.69	0.07
Control Delay	66.6	35.3	3.8	436.9	17.9	0.1	98.6	94.5	146.7	421.2	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.6	35.3	3.8	436.9	17.9	0.1	98.6	94.5	146.7	421.2	0.4
Queue Length 50th (ft)	17	383	1	~507	306	0	192	190	~359	~91	0
Queue Length 95th (ft)	44	437	60	m#602	m355	m0	m#330	m#320	m#567	#204	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	124	1606	966	396	1780	891	222	223	419	42	329
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.66	0.46	1.88	0.64	0.04	0.97	0.96	1.24	1.69	0.07
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

2040 Total Future PM Peak

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1011	420	706	1083	35	387	21	493	31	36	22
Future Volume (vph)	19	1011	420	706	1083	35	387	21	493	31	36	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1703	3539	1599	3433	3574	1615	1698	1712	1568		1857	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.19	1.00
Satd. Flow (perm)	1703	3539	1599	3433	3574	1615	1698	1712	1568		355	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	1064	442	743	1140	37	407	22	519	33	38	23
RTOR Reduction (vph)	0	0	260	0	0	19	0	0	215	0	0	20
Lane Group Flow (vph)	20	1064	182	743	1140	18	216	213	304	0	71	3
Heavy Vehicles (%)	6%	2%	1%	2%	1%	0%	1%	0%	3%	0%	0%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.1	53.3	53.3	15.0	61.7	61.7	17.0	17.0	17.0		15.7	15.7
Effective Green, g (s)	6.1	53.3	53.3	15.0	61.7	61.7	17.0	17.0	17.0		15.7	15.7
Actuated g/C Ratio	0.05	0.41	0.41	0.12	0.47	0.47	0.13	0.13	0.13		0.12	0.12
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	79	1450	655	396	1696	766	222	223	205		42	185
v/s Ratio Prot	0.01	c0.30		c0.22	0.32		0.13	0.12				
v/s Ratio Perm			0.11			0.01			c0.19		c0.20	0.00
v/c Ratio	0.25	0.73	0.28	1.88	0.67	0.02	0.97	0.96	1.48		1.69	0.02
Uniform Delay, d1	59.8	32.4	25.5	57.5	26.3	18.1	56.3	56.1	56.5		57.1	50.3
Progression Factor	1.00	1.00	1.00	1.30	0.63	1.00	0.95	0.95	1.04		1.00	1.00
Incremental Delay, d2	0.6	3.3	1.1	400.9	1.5	0.0	43.9	39.2	236.1		393.6	0.0
Delay (s)	60.4	35.7	26.6	475.3	18.0	18.2	97.1	92.2	294.9		450.7	50.4
Level of Service	E	D	C	F	B	B	F	F	F		F	D
Approach Delay (s)		33.4			195.0			204.3			352.7	
Approach LOS		C			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			145.3			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.18									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			29.5			
Intersection Capacity Utilization			84.4%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

2040 Total Future PM Peak
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1215	446	20	1412	524	205
v/c Ratio	0.63	0.42	0.22	0.66	1.00	0.36
Control Delay	10.5	1.0	64.0	15.9	85.6	12.9
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	10.5	1.0	64.0	16.0	85.6	12.9
Queue Length 50th (ft)	152	7	16	324	~500	31
Queue Length 95th (ft)	m171	m12	m29	m328	#759	102
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	1928	1074	129	2309	524	575
Starvation Cap Reductn	0	0	0	171	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.42	0.16	0.66	1.00	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2040 Total Future PM Peak

4: Route 199 EB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	1142	419	19	1327	493	193
Future Volume (vph)	1142	419	19	1327	493	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1599	1687	3574	1787	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1599	1687	3574	1787	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1215	446	20	1412	524	205
RTOR Reduction (vph)	0	220	0	0	0	111
Lane Group Flow (vph)	1215	226	20	1412	524	94
Heavy Vehicles (%)	2%	1%	7%	1%	1%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	65.9	65.9	3.4	77.3	38.2	38.2
Effective Green, g (s)	65.9	65.9	3.4	77.3	38.2	38.2
Actuated g/C Ratio	0.51	0.51	0.03	0.59	0.29	0.29
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1794	810	44	2125	525	465
v/s Ratio Prot	0.34		0.01	c0.40	c0.29	
v/s Ratio Perm		0.14				0.06
v/c Ratio	0.68	0.28	0.45	0.66	1.00	0.20
Uniform Delay, d1	24.1	18.4	62.4	17.7	45.9	34.5
Progression Factor	0.46	0.27	1.03	0.84	1.00	1.00
Incremental Delay, d2	1.1	0.4	5.6	1.3	38.6	0.5
Delay (s)	12.1	5.4	69.8	16.1	84.5	34.9
Level of Service	B	A	E	B	F	C
Approach Delay (s)	10.3			16.9	70.5	
Approach LOS	B			B	E	
Intersection Summary						
HCM 2000 Control Delay			24.3		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.83			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			76.1%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

2040 Total Future PM Peak
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	992	397	144	886	549	80
v/c Ratio	0.68	0.45	0.69	0.42	1.05	0.15
Control Delay	13.5	2.9	71.4	14.7	98.0	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	2.9	71.4	14.7	98.0	13.9
Queue Length 50th (ft)	176	46	118	185	~550	13
Queue Length 95th (ft)	313	19	185	227	#774	53
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1478	879	269	2226	522	519
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.45	0.54	0.40	1.05	0.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

2040 Total Future PM Peak

5: Route 199 WB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑
Traffic Volume (vph)	952	381	138	851	527	77
Future Volume (vph)	952	381	138	851	527	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1553	1752	3574	1770	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1553	1752	3574	1770	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	992	397	144	886	549	80
RTOR Reduction (vph)	0	233	0	0	0	42
Lane Group Flow (vph)	992	164	144	886	549	38
Heavy Vehicles (%)	2%	4%	3%	1%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	53.6	53.6	15.5	77.1	38.4	38.4
Effective Green, g (s)	53.6	53.6	15.5	77.1	38.4	38.4
Actuated g/C Ratio	0.41	0.41	0.12	0.59	0.30	0.30
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1459	640	208	2119	522	477
v/s Ratio Prot	c0.28		c0.08	0.25	c0.31	
v/s Ratio Perm		0.11				0.02
v/c Ratio	0.68	0.26	0.69	0.42	1.05	0.08
Uniform Delay, d1	31.2	25.1	55.0	14.3	45.8	33.0
Progression Factor	0.36	0.62	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.8	9.5	0.6	53.7	0.1
Delay (s)	13.4	16.3	64.5	14.9	99.5	33.1
Level of Service	B	B	E	B	F	C
Approach Delay (s)	14.2			21.9	91.0	
Approach LOS	B			C	F	
Intersection Summary						
HCM 2000 Control Delay			32.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.81			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			81.9%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	99	26	40	57	291	436
Average Queue (ft)	42	7	5	19	171	133
95th Queue (ft)	79	25	24	45	331	460
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)					11	7
Queuing Penalty (veh)					13	11

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	75	203	402	270	174	240	364	132	154	268	45	91
Average Queue (ft)	17	71	206	39	76	112	184	15	60	115	7	26
95th Queue (ft)	51	148	342	133	154	196	335	89	119	212	27	66
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	2	0	0	0	7	0				0
Queuing Penalty (veh)		0	4	0	0	0	2	0				0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	69
Average Queue (ft)	7
95th Queue (ft)	33
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	65	400	438	231	410	415	691	316	30	264	312	808
Average Queue (ft)	21	221	269	44	392	414	680	93	3	154	176	466
95th Queue (ft)	54	349	396	174	468	417	688	223	18	241	284	790
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)							62					
Queuing Penalty (veh)							565					
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)		0			10	65	75	1		0	1	
Queuing Penalty (veh)		0			54	351	528	0		1	2	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	108	69
Average Queue (ft)	35	5
95th Queue (ft)	82	35
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	1	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	188	215	120	230	734	717	1115	994
Average Queue (ft)	93	136	51	74	685	525	1099	964
95th Queue (ft)	159	199	93	234	809	910	1113	1555
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)					36	1	100	87
Queuing Penalty (veh)					245	6	0	0
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)				0	87			
Queuing Penalty (veh)				1	17			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	175	176	100	412	550	514	1052	1043
Average Queue (ft)	68	65	44	148	290	234	975	890
95th Queue (ft)	150	146	85	319	514	459	1210	1422
Link Distance (ft)	703	703			855	855	1011	1011
Upstream Blk Time (%)					0	0	82	77
Queuing Penalty (veh)					0	0	0	0
Storage Bay Dist (ft)			520	475				
Storage Blk Time (%)				0	3			
Queuing Penalty (veh)				0	4			

Network Summary

Network wide Queuing Penalty: 1807

2040 Future Saturday

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	36	315	10	13	305	128	7	2	28	3	171	5
Future Volume (Veh/h)	36	315	10	13	305	128	7	2	28	3	171	5
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	342	11	14	332	139	8	2	30	0	186	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked							0.00					
vC, conflicting volume	471			353			851	924	348	0	811	791
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	471			353			851	924	348	0	811	791
tC, single (s)	4.1			4.1			7.1	6.5	6.2	0.0	7.1	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	0.0	3.5	4.0
p0 queue free %	96			99			97	99	96	0	33	98
cM capacity (veh/h)	1101			1217			245	259	700	0	276	309
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	39	353	14	332	139	40	186	68				
Volume Left	39	0	14	0	0	8	186	0				
Volume Right	0	11	0	0	139	30	0	63				
cSH	1101	1700	1217	1700	1700	481	276	652				
Volume to Capacity	0.04	0.21	0.01	0.20	0.08	0.08	0.67	0.10				
Queue Length 95th (ft)	3	0	1	0	0	7	111	9				
Control Delay (s)	8.4	0.0	8.0	0.0	0.0	13.2	41.4	11.2				
Lane LOS	A		A			B	E	B				
Approach Delay (s)	0.8		0.2			13.2	33.3					
Approach LOS						B	D					
Intersection Summary												
Average Delay				8.1								
Intersection Capacity Utilization				46.8%	ICU Level of Service				A			
Analysis Period (min)				15								

2040 Future Saturday
1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	58
Future Volume (Veh/h)	58
Sign Control	
Grade	
Peak Hour Factor	0.92
Hourly flow rate (vph)	63
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	332
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	332
tC, single (s)	6.2
tC, 2 stage (s)	
tF (s)	3.3
p0 queue free %	91
cM capacity (veh/h)	714
Direction, Lane #	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	151	501	28	555	515	14	126	575	40	49	52
v/c Ratio	0.54	0.88	0.05	0.61	0.57	0.02	0.42	0.87	0.38	0.44	0.23
Control Delay	64.2	59.9	0.1	73.5	10.4	0.0	54.8	25.1	67.8	70.4	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	59.9	0.1	73.5	10.4	0.0	54.8	25.1	67.8	70.4	2.3
Queue Length 50th (ft)	63	401	0	249	107	0	92	74	34	43	0
Queue Length 95th (ft)	97	474	0	m293	m99	m0	#172	#329	74	86	0
Internal Link Dist (ft)		1290			1222		1066			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	781	759	913	910	859	298	660	349	366	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.64	0.04	0.61	0.57	0.02	0.42	0.87	0.11	0.13	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2040 Future Saturday

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	143	476	27	27	501	489	13	26	94	546	43	42
Future Volume (vph)	143	476	27	27	501	489	13	26	94	546	43	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.99
Satd. Flow (prot)	3502	1881	1615		3436	1881	1615		1840	1615	1715	1796
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.99
Satd. Flow (perm)	3502	1881	1615		3436	1881	1615		1840	1615	1715	1796
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	151	501	28	28	527	515	14	27	99	575	45	44
RTOR Reduction (vph)	0	0	20	0	0	0	7	0	0	399	0	0
Lane Group Flow (vph)	151	501	8	0	555	515	7	0	126	176	40	49
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	10%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2				6			3		
Actuated Green, G (s)	10.5	39.4	39.4		34.5	62.9	62.9		21.1	21.1	8.0	8.0
Effective Green, g (s)	10.5	39.4	39.4		34.5	62.9	62.9		21.1	21.1	8.0	8.0
Actuated g/C Ratio	0.08	0.30	0.30		0.27	0.48	0.48		0.16	0.16	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	282	570	489		911	910	781		298	262	105	110
v/s Ratio Prot	0.04	c0.27			c0.16	c0.27			0.07		0.02	c0.03
v/s Ratio Perm			0.01				0.00			c0.11		
v/c Ratio	0.54	0.88	0.02		0.61	0.57	0.01		0.42	0.67	0.38	0.45
Uniform Delay, d1	57.4	43.0	31.7		41.8	23.8	17.4		49.0	51.2	58.6	58.9
Progression Factor	1.00	1.00	1.00		1.63	0.35	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	17.4	0.1		0.6	0.7	0.0		0.4	5.3	0.8	1.0
Delay (s)	58.9	60.4	31.8		68.8	9.0	17.4		49.3	56.5	59.5	59.9
Level of Service	E	E	C		E	A	B		D	E	E	E
Approach Delay (s)		58.9				39.7			55.2			58.9
Approach LOS		E				D			E			E
Intersection Summary												
HCM 2000 Control Delay			49.9			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			27.5			
Intersection Capacity Utilization			100.6%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

2040 Future Saturday

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	49
Future Volume (vph)	49
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	52
RTOR Reduction (vph)	49
Lane Group Flow (vph)	3
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.0
Effective Green, g (s)	8.0
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	99
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.03
Uniform Delay, d1	57.4
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	57.4
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

2040 Future Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	50	1541	364	616	802	38	222	223	711	65	29
v/c Ratio	0.48	1.15	0.48	0.92	0.44	0.04	1.33	1.00	1.44	1.38	0.09
Control Delay	73.4	114.7	12.6	70.1	16.5	0.1	214.1	100.7	230.1	306.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	114.7	12.6	70.1	16.5	0.1	214.1	100.7	230.1	306.2	0.5
Queue Length 50th (ft)	41	~812	72	229	225	0	~254	201	~608	~72	0
Queue Length 95th (ft)	84	#952	163	m#322	m270	m0	m#377	m#324	m#785	#172	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	131	1338	754	686	1829	903	167	224	493	47	337
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	1.15	0.48	0.90	0.44	0.04	1.33	1.00	1.44	1.38	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2040 Future Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Movement												
Lane Configurations		↔	↕	↕	↕	↕	↕		↕	↕	↕	
Traffic Volume (vph)	16	31	1464	346	585	762	36	2	387	34	675	39
Future Volume (vph)	16	31	1464	346	585	762	36	2	387	34	675	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	1.00		0.95	0.95	1.00	
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	0.96	1.00	
Satd. Flow (prot)		1805	3574	1615	3433	3610	1615		1698	1718	1599	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.71	0.96	1.00	
Satd. Flow (perm)		1805	3574	1615	3433	3610	1615		1277	1718	1599	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	33	1541	364	616	802	38	2	407	36	711	41
RTOR Reduction (vph)	0	0	0	149	0	0	19	0	0	0	284	0
Lane Group Flow (vph)	0	50	1541	215	616	802	19	0	222	223	427	0
Heavy Vehicles (%)	0%	0%	1%	0%	2%	0%	0%	0%	1%	0%	1%	0%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Perm	Split	NA	Perm	Perm
Protected Phases	5	5	2		1	6			4	4		
Permitted Phases				2			6	4			4	3
Actuated Green, G (s)		7.6	48.7	48.7	25.3	65.9	65.9		17.0	17.0	17.0	
Effective Green, g (s)		7.6	48.7	48.7	25.3	65.9	65.9		17.0	17.0	17.0	
Actuated g/C Ratio		0.06	0.37	0.37	0.19	0.51	0.51		0.13	0.13	0.13	
Clearance Time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Vehicle Extension (s)		2.0	4.0	4.0	2.0	4.0	4.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		105	1338	605	668	1829	818		166	224	209	
v/s Ratio Prot		0.03	c0.43		c0.18	0.22				0.13		
v/s Ratio Perm				0.13			0.01		0.17		c0.27	
v/c Ratio		0.48	1.15	0.35	0.92	0.44	0.02		1.34	1.00	2.04	
Uniform Delay, d1		59.3	40.6	29.3	51.4	20.3	16.0		56.5	56.5	56.5	
Progression Factor		1.00	1.00	1.00	1.02	0.76	1.00		0.93	0.93	1.17	
Incremental Delay, d2		1.2	77.3	1.6	15.6	0.6	0.0		176.5	47.6	479.9	
Delay (s)		60.5	117.9	30.9	68.1	16.1	16.0		229.2	99.9	546.2	
Level of Service		E	F	C	E	B	B		F	F	F	
Approach Delay (s)			100.3			38.1				399.2		
Approach LOS			F			D				F		
Intersection Summary												
HCM 2000 Control Delay			157.8			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.27									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			29.5			
Intersection Capacity Utilization			103.9%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

2040 Future Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	23	28
Future Volume (vph)	23	28
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	7.0	7.0
Lane Util. Factor	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.97	1.00
Satd. Flow (prot)	1842	1615
Flt Permitted	0.33	1.00
Satd. Flow (perm)	620	1615
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	24	29
RTOR Reduction (vph)	0	27
Lane Group Flow (vph)	65	2
Heavy Vehicles (%)	0%	0%
Turn Type	NA	Perm
Protected Phases	3	
Permitted Phases		3
Actuated Green, G (s)	10.0	10.0
Effective Green, g (s)	10.0	10.0
Actuated g/C Ratio	0.08	0.08
Clearance Time (s)	7.0	7.0
Vehicle Extension (s)	2.5	2.5
Lane Grp Cap (vph)	47	124
v/s Ratio Prot		
v/s Ratio Perm	c0.10	0.00
v/c Ratio	1.38	0.02
Uniform Delay, d1	60.0	55.5
Progression Factor	1.00	1.00
Incremental Delay, d2	263.0	0.0
Delay (s)	323.0	55.5
Level of Service	F	E
Approach Delay (s)	240.5	
Approach LOS	F	
Intersection Summary		

2040 Future Saturday
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1624	587	48	990	421	200
v/c Ratio	0.84	0.51	0.41	0.42	0.99	0.40
Control Delay	14.6	0.6	68.4	10.7	91.1	13.4
Queue Delay	0.4	0.4	0.0	0.0	0.0	0.0
Total Delay	15.0	1.0	68.4	10.7	91.1	13.4
Queue Length 50th (ft)	250	0	38	210	356	30
Queue Length 95th (ft)	m200	m0	m66	244	#572	98
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	1933	1143	138	2332	424	504
Starvation Cap Reductn	65	192	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.62	0.35	0.42	0.99	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2040 Future Saturday
4: Route 199 EB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	1527	552	45	931	396	188
Future Volume (vph)	1527	552	45	931	396	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1615	1805	3610	1752	1599
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1615	1805	3610	1752	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1624	587	48	990	421	200
RTOR Reduction (vph)	0	277	0	0	0	117
Lane Group Flow (vph)	1624	310	48	990	421	83
Heavy Vehicles (%)	1%	0%	0%	0%	3%	1%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	68.7	68.7	7.3	84.0	31.5	31.5
Effective Green, g (s)	68.7	68.7	7.3	84.0	31.5	31.5
Actuated g/C Ratio	0.53	0.53	0.06	0.65	0.24	0.24
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1888	853	101	2332	424	387
v/s Ratio Prot	c0.45		0.03	c0.27	c0.24	
v/s Ratio Perm		0.19				0.05
v/c Ratio	0.86	0.36	0.48	0.42	0.99	0.21
Uniform Delay, d1	26.5	17.9	59.5	11.2	49.1	39.4
Progression Factor	0.52	0.32	1.02	0.90	1.00	1.00
Incremental Delay, d2	0.5	0.1	3.1	0.5	41.8	0.6
Delay (s)	14.2	5.9	63.5	10.6	90.9	39.9
Level of Service	B	A	E	B	F	D
Approach Delay (s)	12.0			13.0	74.5	
Approach LOS	B			B	E	
Intersection Summary						
HCM 2000 Control Delay			22.3		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.89			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			76.2%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

2040 Future Saturday
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1219	481	163	706	408	85
v/c Ratio	0.76	0.49	0.73	0.31	0.91	0.18
Control Delay	15.7	1.6	73.4	11.2	72.8	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	1.6	73.4	11.2	72.8	8.3
Queue Length 50th (ft)	266	0	133	138	328	0
Queue Length 95th (ft)	378	m8	208	172	#500	41
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1611	977	267	2312	479	491
Starvation Cap Reductn	6	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.49	0.61	0.31	0.85	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2040 Future Saturday
5: Route 199 WB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑
Traffic Volume (vph)	1170	462	156	678	392	82
Future Volume (vph)	1170	462	156	678	392	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1583	1736	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1583	1736	3610	1805	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1219	481	162	706	408	85
RTOR Reduction (vph)	0	264	0	0	0	64
Lane Group Flow (vph)	1219	217	163	706	408	21
Heavy Vehicles (%)	1%	2%	4%	0%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	58.6	58.6	16.7	83.3	32.2	32.2
Effective Green, g (s)	58.6	58.6	16.7	83.3	32.2	32.2
Actuated g/C Ratio	0.45	0.45	0.13	0.64	0.25	0.25
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1611	713	223	2313	447	400
v/s Ratio Prot	c0.34		c0.09	0.20	c0.23	
v/s Ratio Perm		0.14				0.01
v/c Ratio	0.76	0.30	0.73	0.31	0.91	0.05
Uniform Delay, d1	29.8	22.7	54.5	10.4	47.5	37.3
Progression Factor	0.44	0.26	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.6	11.6	0.3	22.8	0.1
Delay (s)	15.0	6.6	66.1	10.8	70.3	37.3
Level of Service	B	A	E	B	E	D
Approach Delay (s)	12.6			21.2	64.7	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			23.4		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.80			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			81.5%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	UL	TR
Maximum Queue (ft)	34	24	7	49	124	56
Average Queue (ft)	10	3	0	20	60	26
95th Queue (ft)	31	17	6	45	100	48
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	134	365	821	290	258	523	483	65	1116	1118	47	118
Average Queue (ft)	41	151	375	42	184	262	142	4	932	1003	6	37
95th Queue (ft)	99	340	790	185	281	544	436	36	1556	1444	27	91
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)			1			0	0		78	80		
Queuing Penalty (veh)			0			0	1		0	0		
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	20	0	1	11	2	0			0	0
Queuing Penalty (veh)		1	33	1	1	32	0	0			0	0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	99
Average Queue (ft)	6
95th Queue (ft)	41
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	UL	LT	R
Maximum Queue (ft)	565	1594	1590	1582	398	400	580	495	68	263	1163	1223
Average Queue (ft)	226	1515	1524	1449	312	321	315	189	8	132	1070	1202
95th Queue (ft)	657	1780	1759	2045	468	481	702	454	42	243	1510	1271
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)		48	74	73			3	0			2	51
Queuing Penalty (veh)		0	0	0			21	0			12	280
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)	0	68			2	13	10	2	0	0	2	
Queuing Penalty (veh)	1	32			8	48	56	1	0	1	4	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	106	80
Average Queue (ft)	34	5
95th Queue (ft)	82	33
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	1	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	434	461	212	153	282	217	780	395
Average Queue (ft)	193	223	75	51	131	91	395	131
95th Queue (ft)	333	364	152	105	229	176	793	504
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)							3	2
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)		0	0	0	1			
Queuing Penalty (veh)		0	0	0	0			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	272	276	164	261	241	202	500	158
Average Queue (ft)	98	112	54	132	129	67	300	29
95th Queue (ft)	208	218	110	222	217	153	460	89
Link Distance (ft)	703	703			855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 534

Appendix H

SYNCHRO & SimTraffic Analysis Of 2046 Future Conditions

2046 Future AM Peak

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	412	0	12	301	96	9	6	30	94	4	22
Future Volume (Veh/h)	64	412	0	12	301	96	9	6	30	94	4	22
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	448	0	13	327	104	10	7	33	102	4	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	431			448			967	1045	448	978	941	327
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	431			448			967	1045	448	978	941	327
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.0	3.4
p0 queue free %	94			99			95	97	95	50	98	97
cM capacity (veh/h)	1139			1071			200	214	615	202	246	705
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	70	448	13	327	104	50	102	28				
Volume Left	70	0	13	0	0	10	102	0				
Volume Right	0	0	0	0	104	33	0	24				
cSH	1139	1700	1071	1700	1700	367	202	557				
Volume to Capacity	0.06	0.26	0.01	0.19	0.06	0.14	0.50	0.05				
Queue Length 95th (ft)	5	0	1	0	0	12	64	4				
Control Delay (s)	8.4	0.0	8.4	0.0	0.0	16.4	39.7	11.8				
Lane LOS	A		A			C	E	B				
Approach Delay (s)	1.1		0.2			16.4	33.7					
Approach LOS						C	D					
Intersection Summary												
Average Delay				5.2								
Intersection Capacity Utilization				46.9%	ICU Level of Service				A			
Analysis Period (min)				15								



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	67	551	92	479	316	10	117	389	6	75	24
v/c Ratio	0.34	0.81	0.13	0.56	0.31	0.01	0.74	0.79	0.05	0.55	0.10
Control Delay	63.1	46.0	0.7	69.7	8.1	0.0	83.6	17.7	54.2	72.4	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	46.0	0.7	69.7	8.1	0.0	83.6	17.7	54.2	72.4	0.8
Queue Length 50th (ft)	28	404	0	205	71	0	96	0	5	65	0
Queue Length 95th (ft)	52	526	3	m253	m80	m0	#200	#135	20	116	0
Internal Link Dist (ft)		1290			1222		3082			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	758	739	863	1035	889	166	498	349	367	420
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.73	0.12	0.56	0.31	0.01	0.70	0.78	0.02	0.20	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2046 Future AM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	507	85	441	291	9	54	53	358	6	68	22
Future Volume (vph)	62	507	85	441	291	9	54	53	358	6	68	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	1827	1568	3467	1776	1417		1715	1509	1715	1804	1524
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3502	1827	1568	3467	1776	1417		1715	1509	1715	1804	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	551	92	479	316	10	59	58	389	7	74	24
RTOR Reduction (vph)	0	0	58	0	0	4	0	0	353	0	0	22
Lane Group Flow (vph)	67	551	34	479	316	6	0	117	36	6	75	2
Heavy Vehicles (%)	0%	4%	3%	1%	7%	14%	14%	2%	7%	0%	0%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	6.3	48.7	48.7	32.4	74.3	74.3		12.1	12.1	9.8	9.8	9.8
Effective Green, g (s)	6.3	48.7	48.7	32.4	74.3	74.3		12.1	12.1	9.8	9.8	9.8
Actuated g/C Ratio	0.05	0.37	0.37	0.25	0.57	0.57		0.09	0.09	0.08	0.08	0.08
Clearance Time (s)	7.5	6.0	6.0	7.0	6.0	6.0		6.5	6.5	7.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0	2.0	4.0	4.0		2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	169	684	587	864	1015	809		159	140	129	135	114
v/s Ratio Prot	0.02	c0.30		c0.14	0.18			c0.07		0.00	c0.04	
v/s Ratio Perm			0.02			0.00			0.02			0.00
v/c Ratio	0.40	0.81	0.06	0.55	0.31	0.01		0.74	0.26	0.05	0.56	0.02
Uniform Delay, d1	60.0	36.4	26.0	42.5	14.5	12.0		57.4	54.8	55.8	58.0	55.6
Progression Factor	1.00	1.00	1.00	1.51	0.48	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	9.8	0.2	0.3	0.2	0.0		14.1	0.4	0.1	2.8	0.0
Delay (s)	61.1	46.2	26.2	64.4	7.1	12.0		71.5	55.1	55.8	60.8	55.7
Level of Service	E	D	C	E	A	B		E	E	E	E	E
Approach Delay (s)		45.0			41.2			58.9			59.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			47.6				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)			27.5		
Intersection Capacity Utilization			69.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

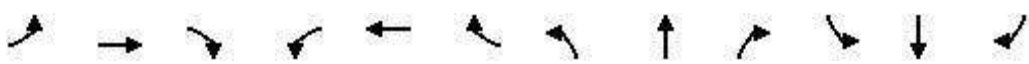
2046 Future AM Peak

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	28	942	418	360	693	20	214	214	509	40	10
v/c Ratio	0.31	0.72	0.49	0.94	0.45	0.02	0.70	0.69	0.99	0.75	0.04
Control Delay	67.7	37.2	4.1	88.5	26.9	0.1	57.9	57.5	61.8	123.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.7	37.2	4.1	88.5	26.9	0.1	57.9	57.5	61.8	123.9	0.2
Queue Length 50th (ft)	23	352	0	145	277	0	196	196	~291	33	0
Queue Length 95th (ft)	56	377	58	#260	237	m0	m#345	m#343	#559	#110	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	131	1560	939	384	1728	883	305	308	513	56	280
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.60	0.45	0.94	0.40	0.02	0.70	0.69	0.99	0.71	0.04
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

2046 Future AM Peak

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	867	385	331	638	18	372	22	468	30	6	9
Future Volume (vph)	26	867	385	331	638	18	372	22	468	30	6	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1805	3438	1568	3335	3505	1615	1588	1604	1568		1825	1417
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.32	1.00
Satd. Flow (perm)	1805	3438	1568	3335	3505	1615	1588	1604	1568		603	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	942	418	360	693	20	404	24	509	33	7	10
RTOR Reduction (vph)	0	0	259	0	0	11	0	0	212	0	0	9
Lane Group Flow (vph)	28	942	159	360	693	9	214	214	297	0	40	1
Heavy Vehicles (%)	0%	5%	3%	5%	3%	0%	8%	6%	3%	0%	0%	14%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.6	49.5	49.5	15.0	57.4	57.4	25.0	25.0	25.0		11.5	11.5
Effective Green, g (s)	6.6	49.5	49.5	15.0	57.4	57.4	25.0	25.0	25.0		11.5	11.5
Actuated g/C Ratio	0.05	0.38	0.38	0.12	0.44	0.44	0.19	0.19	0.19		0.09	0.09
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	91	1309	597	384	1547	713	305	308	301		53	125
v/s Ratio Prot	0.02	c0.27		c0.11	c0.20		0.13	0.13				
v/s Ratio Perm			0.10			0.01			c0.19		c0.07	0.00
v/c Ratio	0.31	0.72	0.27	0.94	0.45	0.01	0.70	0.69	0.99		0.75	0.01
Uniform Delay, d1	59.5	34.3	27.7	57.0	25.3	20.4	49.0	48.9	52.3		57.9	54.0
Progression Factor	1.00	1.00	1.00	1.00	1.05	1.00	0.95	0.95	1.35		1.00	1.00
Incremental Delay, d2	0.7	3.4	1.1	28.6	0.9	0.0	4.7	4.4	37.7		43.5	0.0
Delay (s)	60.2	37.8	28.8	85.9	27.4	20.4	51.2	50.8	108.3		101.4	54.1
Level of Service	E	D	C	F	C	C	D	D	F		F	D
Approach Delay (s)		35.5			46.9			82.1			91.9	
Approach LOS		D			D			F			F	
Intersection Summary												
HCM 2000 Control Delay			52.5				HCM 2000 Level of Service		D			
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		29.5			
Intersection Capacity Utilization			74.6%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

2046 Future AM Peak
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Queues

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1041	453	16	798	250	71
v/c Ratio	0.46	0.40	0.17	0.33	0.75	0.21
Control Delay	8.9	1.5	64.1	8.8	62.9	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	1.5	64.1	8.8	62.9	10.2
Queue Length 50th (ft)	78	0	13	168	199	0
Queue Length 95th (ft)	m162	m19	m30	198	281	40
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	2254	1141	138	2449	412	400
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.40	0.12	0.33	0.61	0.18

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

2046 Future AM Peak

4: Route 199 EB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	958	417	15	734	230	65
Future Volume (vph)	958	417	15	734	230	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1524	1805	3539	1703	1429
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1524	1805	3539	1703	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1041	453	16	798	250	71
RTOR Reduction (vph)	0	178	0	0	0	57
Lane Group Flow (vph)	1041	275	16	798	250	14
Heavy Vehicles (%)	3%	6%	0%	2%	6%	13%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	78.8	78.8	3.2	90.0	25.5	25.5
Effective Green, g (s)	78.8	78.8	3.2	90.0	25.5	25.5
Actuated g/C Ratio	0.61	0.61	0.02	0.69	0.20	0.20
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	2124	923	44	2450	334	280
v/s Ratio Prot	c0.30		0.01	c0.23	c0.15	
v/s Ratio Perm		0.18				0.01
v/c Ratio	0.49	0.30	0.36	0.33	0.75	0.05
Uniform Delay, d1	14.3	12.3	62.4	7.9	49.2	42.4
Progression Factor	0.60	0.54	1.03	0.99	1.00	1.00
Incremental Delay, d2	0.5	0.5	4.7	0.3	10.6	0.2
Delay (s)	9.2	7.1	69.1	8.2	59.8	42.6
Level of Service	A	A	E	A	E	D
Approach Delay (s)	8.6			9.4	56.0	
Approach LOS	A			A	E	
Intersection Summary						
HCM 2000 Control Delay			14.6		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.56			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			51.3%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

2046 Future AM Peak
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Queues

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	623	466	113	526	323	12
v/c Ratio	0.37	0.46	0.63	0.22	0.83	0.03
Control Delay	11.2	3.9	70.5	9.5	65.4	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.2	3.9	70.5	9.5	65.4	16.2
Queue Length 50th (ft)	132	61	93	85	261	0
Queue Length 95th (ft)	133	137	151	133	345	16
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1710	1014	248	2370	471	444
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.46	0.46	0.22	0.69	0.03
Intersection Summary						

2046 Future AM Peak
5: Route 199 WB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑
Traffic Volume (vph)	573	429	104	484	297	11
Future Volume (vph)	573	429	104	484	297	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1568	1612	3539	1752	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1568	1612	3539	1752	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	623	466	113	526	323	12
RTOR Reduction (vph)	0	236	0	0	0	9
Lane Group Flow (vph)	623	230	113	526	323	3
Heavy Vehicles (%)	5%	3%	12%	2%	3%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	64.1	64.1	14.4	86.5	29.0	29.0
Effective Green, g (s)	64.1	64.1	14.4	86.5	29.0	29.0
Actuated g/C Ratio	0.49	0.49	0.11	0.67	0.22	0.22
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1695	773	178	2354	390	360
v/s Ratio Prot	c0.18		c0.07	0.15	c0.18	
v/s Ratio Perm		0.15				0.00
v/c Ratio	0.37	0.30	0.63	0.22	0.83	0.01
Uniform Delay, d1	20.4	19.6	55.3	8.5	48.1	39.3
Progression Factor	0.48	1.11	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.9	7.2	0.2	13.5	0.0
Delay (s)	10.3	22.6	62.5	8.8	61.6	39.3
Level of Service	B	C	E	A	E	D
Approach Delay (s)	15.6			18.3	60.8	
Approach LOS	B			B	E	
Intersection Summary						
HCM 2000 Control Delay			23.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.53			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			57.6%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	39	31	10	70	90	47
Average Queue (ft)	15	4	0	25	41	17
95th Queue (ft)	38	20	5	53	72	41
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	L	L	T	R	LT	R	L	LT
Maximum Queue (ft)	48	311	488	290	220	254	239	47	191	255	13	104
Average Queue (ft)	8	57	249	52	114	141	85	4	84	112	1	30
95th Queue (ft)	32	158	408	178	197	222	190	30	155	203	6	79
Link Distance (ft)			1319			1150	1150		3106	3106		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	5	0	0	0	0					1
Queuing Penalty (veh)		0	8	1	0	0	0					0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	45
Average Queue (ft)	2
95th Queue (ft)	21
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	77	319	519	325	273	284	274	250	45	277	337	610
Average Queue (ft)	25	180	290	33	148	153	136	127	5	151	177	342
95th Queue (ft)	63	288	446	194	291	313	384	315	30	250	285	604
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)							2	0				
Queuing Penalty (veh)							8	0				
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)					0	4	4	0		0	1	
Queuing Penalty (veh)					1	12	12	0		0	2	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	77	30
Average Queue (ft)	20	2
95th Queue (ft)	57	17
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	0	0
Queuing Penalty (veh)	0	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	175	232	131	76	185	160	372	124
Average Queue (ft)	69	120	52	17	82	59	179	34
95th Queue (ft)	141	194	98	54	167	133	378	89
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB				
Directions Served	T	T	R	L	T	T	L	R				
Maximum Queue (ft)	150	166	147	211	168	123	396	24				
Average Queue (ft)	50	58	63	100	77	34	216	5				
95th Queue (ft)	118	124	124	180	142	86	349	19				
Link Distance (ft)	703	703			855	855	1011	1011				
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			520	475								
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 46

2046 Total Future PM Peak

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	164	450	10	28	502	256	7	6	18	165	12	109
Future Volume (Veh/h)	164	450	10	28	502	256	7	6	18	165	12	109
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	178	489	11	30	546	278	8	7	20	179	13	118
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	824			500			1581	1734	494	1474	1462	546
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	824			500			1581	1734	494	1474	1462	546
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	78			97			84	90	97	0	87	78
cM capacity (veh/h)	815			1075			51	67	579	77	99	541
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	178	500	30	546	278	35	179	131				
Volume Left	178	0	30	0	0	8	179	0				
Volume Right	0	11	0	0	278	20	0	118				
cSH	815	1700	1075	1700	1700	119	77	375				
Volume to Capacity	0.22	0.29	0.03	0.32	0.16	0.29	2.33	0.35				
Queue Length 95th (ft)	21	0	2	0	0	28	419	38				
Control Delay (s)	10.6	0.0	8.4	0.0	0.0	47.5	724.1	19.7				
Lane LOS	B		A			E	F	C				
Approach Delay (s)	2.8		0.3			47.5	426.4					
Approach LOS						E	F					
Intersection Summary												
Average Delay	72.5											
Intersection Capacity Utilization	61.3%			ICU Level of Service					B			
Analysis Period (min)	15											

2046 Total Future PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road

Queues

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	119	491	74	490	781	28	111	477	49	51	89
v/c Ratio	0.48	0.64	0.12	0.62	0.73	0.03	0.76	0.84	0.47	0.45	0.38
Control Delay	64.0	35.0	0.4	77.8	14.8	0.0	88.2	19.0	72.1	69.8	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	35.0	0.4	77.8	14.8	0.0	88.2	19.0	72.1	69.8	6.5
Queue Length 50th (ft)	50	325	0	218	300	0	92	0	43	44	0
Queue Length 95th (ft)	81	449	0	m171	m147	m0	#178	#152	86	88	13
Internal Link Dist (ft)	1290			1222			3082			438	
Turn Bay Length (ft)	365	290		260	230		115			115	
Base Capacity (vph)	471	766	633	794	1074	943	160	576	332	363	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.64	0.12	0.62	0.73	0.03	0.69	0.83	0.15	0.14	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2046 Total Future PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	113	466	70	11	454	742	27	53	52	453	52	43
Future Volume (vph)	113	466	70	11	454	742	27	53	52	453	52	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (prot)	3502	1845	1313		3435	1881	1538		1817	1599	1633	1784
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.99
Satd. Flow (perm)	3502	1845	1313		3435	1881	1538		1817	1599	1633	1784
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	491	74	12	478	781	28	56	55	477	55	45
RTOR Reduction (vph)	0	0	43	0	0	0	12	0	0	438	0	0
Lane Group Flow (vph)	119	491	31	0	490	781	16	0	111	39	49	51
Heavy Vehicles (%)	0%	3%	23%	0%	2%	1%	5%	4%	0%	1%	5%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2				6			3		
Actuated Green, G (s)	9.3	53.9	53.9		30.1	74.2	74.2		10.6	10.6	8.4	8.4
Effective Green, g (s)	9.3	53.9	53.9		30.1	74.2	74.2		10.6	10.6	8.4	8.4
Actuated g/C Ratio	0.07	0.41	0.41		0.23	0.57	0.57		0.08	0.08	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	250	764	544		795	1073	877		148	130	105	115
v/s Ratio Prot	0.03	0.27			c0.14	c0.42			c0.06		c0.03	0.03
v/s Ratio Perm			0.02				0.01			0.02		
v/c Ratio	0.48	0.64	0.06		0.62	0.73	0.02		0.75	0.30	0.47	0.44
Uniform Delay, d1	58.0	30.4	22.8		44.8	20.5	12.1		58.4	56.2	58.6	58.5
Progression Factor	1.00	1.00	1.00		1.68	0.64	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	4.1	0.2		0.1	0.2	0.0		17.1	0.5	1.2	1.0
Delay (s)	59.0	34.5	23.0		75.5	13.4	12.1		75.5	56.7	59.8	59.5
Level of Service	E	C	C		E	B	B		E	E	E	E
Approach Delay (s)		37.5				36.8			60.2			58.5
Approach LOS		D				D			E			E
Intersection Summary												
HCM 2000 Control Delay			43.4			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			27.5			
Intersection Capacity Utilization			92.5%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

2046 Total Future PM Peak

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	85
Future Volume (vph)	85
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	89
RTOR Reduction (vph)	83
Lane Group Flow (vph)	6
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.4
Effective Green, g (s)	8.4
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	104
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.06
Uniform Delay, d1	57.1
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	57.2
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

2046 Total Future PM Peak

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	21	1120	468	784	1201	39	228	226	545	75	24
v/c Ratio	0.26	0.75	0.50	1.98	0.69	0.04	1.03	1.01	1.32	1.79	0.08
Control Delay	66.9	35.0	4.6	480.1	17.8	0.1	109.5	106.3	181.3	458.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.9	35.0	4.6	480.1	17.8	0.1	109.5	106.3	181.3	458.7	0.5
Queue Length 50th (ft)	17	397	12	~545	335	0	~212	~205	~403	~101	0
Queue Length 95th (ft)	46	470	76	m#620	m361	m0	m#354	m#348	m#628	#210	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	124	1606	967	396	1790	895	222	223	412	42	313
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.70	0.48	1.98	0.67	0.04	1.03	1.01	1.32	1.79	0.08
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

2046 Total Future PM Peak

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1064	445	745	1141	37	409	22	518	33	38	23
Future Volume (vph)	20	1064	445	745	1141	37	409	22	518	33	38	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1703	3539	1599	3433	3574	1615	1698	1712	1568		1857	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.21	1.00
Satd. Flow (perm)	1703	3539	1599	3433	3574	1615	1698	1712	1568		395	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	1120	468	784	1201	39	431	23	545	35	40	24
RTOR Reduction (vph)	0	0	256	0	0	20	0	0	208	0	0	21
Lane Group Flow (vph)	21	1120	212	784	1201	19	228	226	337	0	75	3
Heavy Vehicles (%)	6%	2%	1%	2%	1%	0%	1%	0%	3%	0%	0%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		4	4			3	
Permitted Phases			2			6			4	3		3
Actuated Green, G (s)	6.2	54.9	54.9	15.0	63.2	63.2	17.0	17.0	17.0		14.1	14.1
Effective Green, g (s)	6.2	54.9	54.9	15.0	63.2	63.2	17.0	17.0	17.0		14.1	14.1
Actuated g/C Ratio	0.05	0.42	0.42	0.12	0.49	0.49	0.13	0.13	0.13		0.11	0.11
Clearance Time (s)	8.5	6.0	6.0	8.0	6.0	6.0	8.0	8.0	8.0		7.0	7.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	3.0	3.0		2.5	2.5
Lane Grp Cap (vph)	81	1494	675	396	1737	785	222	223	205		42	166
v/s Ratio Prot	0.01	c0.32		c0.23	0.34		0.13	0.13				
v/s Ratio Perm			0.13			0.01			c0.22		c0.19	0.00
v/c Ratio	0.26	0.75	0.31	1.98	0.69	0.02	1.03	1.01	1.65		1.79	0.02
Uniform Delay, d1	59.7	31.7	25.0	57.5	25.9	17.4	56.5	56.5	56.5		58.0	51.8
Progression Factor	1.00	1.00	1.00	1.27	0.64	1.00	0.93	0.93	0.99		1.00	1.00
Incremental Delay, d2	0.6	3.5	1.2	446.5	1.4	0.0	57.7	53.9	305.3		433.1	0.0
Delay (s)	60.3	35.2	26.2	519.5	17.8	17.4	110.4	106.6	360.9		491.0	51.8
Level of Service	E	D	C	F	B	B	F	F	F		F	D
Approach Delay (s)		32.9			212.2			246.2			384.6	
Approach LOS		C			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			162.0									
HCM 2000 Volume to Capacity ratio			1.23									
Actuated Cycle Length (s)			130.0						29.5			
Intersection Capacity Utilization			87.6%									
Analysis Period (min)			15									
c Critical Lane Group												

2046 Total Future PM Peak
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1276	472	21	1485	555	218
v/c Ratio	0.67	0.44	0.23	0.68	1.11	0.39
Control Delay	11.2	1.0	64.3	15.8	118.0	14.7
Queue Delay	0.1	0.0	0.0	0.1	0.0	0.0
Total Delay	11.3	1.0	64.3	15.9	118.0	14.7
Queue Length 50th (ft)	171	8	17	331	~593	40
Queue Length 95th (ft)	m177	m13	m29	m336	#817	114
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	1892	1074	129	2309	499	556
Starvation Cap Reductn	65	0	0	153	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.44	0.16	0.69	1.11	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2046 Total Future PM Peak

4: Route 199 EB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1199	444	20	1396	522	205
Future Volume (vph)	1199	444	20	1396	522	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1599	1687	3574	1787	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1599	1687	3574	1787	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1276	472	21	1485	555	218
RTOR Reduction (vph)	0	231	0	0	0	114
Lane Group Flow (vph)	1276	241	21	1485	555	104
Heavy Vehicles (%)	2%	1%	7%	1%	1%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	66.3	66.3	4.9	79.2	36.3	36.3
Effective Green, g (s)	66.3	66.3	4.9	79.2	36.3	36.3
Actuated g/C Ratio	0.51	0.51	0.04	0.61	0.28	0.28
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1804	815	63	2177	498	442
v/s Ratio Prot	0.36		0.01	c0.42	c0.31	
v/s Ratio Perm		0.15				0.07
v/c Ratio	0.71	0.30	0.33	0.68	1.11	0.24
Uniform Delay, d1	24.4	18.4	61.0	17.0	46.9	36.1
Progression Factor	0.46	0.29	1.04	0.87	1.00	1.00
Incremental Delay, d2	1.0	0.4	2.2	1.2	75.5	0.6
Delay (s)	12.2	5.7	65.4	16.0	122.4	36.7
Level of Service	B	A	E	B	F	D
Approach Delay (s)	10.4			16.7	98.2	
Approach LOS	B			B	F	
Intersection Summary						
HCM 2000 Control Delay			29.6	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.88			
Actuated Cycle Length (s)			130.0	Sum of lost time (s)		22.5
Intersection Capacity Utilization			79.6%	ICU Level of Service		D
Analysis Period (min)			15			
c Critical Lane Group						

2046 Total Future PM Peak
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1042	420	153	929	580	84
v/c Ratio	0.71	0.47	0.71	0.43	1.14	0.17
Control Delay	13.8	2.5	72.1	14.4	127.8	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.8	2.5	72.1	14.4	127.8	14.6
Queue Length 50th (ft)	196	6	125	197	~604	15
Queue Length 95th (ft)	319	16	195	241	#830	57
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1482	894	269	2226	507	506
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	7	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.47	0.57	0.42	1.14	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

2046 Total Future PM Peak

5: Route 199 WB Ramps & Route 60 (Richmond Road)

HCM Signalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑	↑
Traffic Volume (vph)	1000	403	147	892	557	81
Future Volume (vph)	1000	403	147	892	557	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1553	1752	3574	1770	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1553	1752	3574	1770	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1042	420	153	929	580	84
RTOR Reduction (vph)	0	245	0	0	0	43
Lane Group Flow (vph)	1042	175	153	929	580	41
Heavy Vehicles (%)	2%	4%	3%	1%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	54.2	54.2	16.0	78.2	37.3	37.3
Effective Green, g (s)	54.2	54.2	16.0	78.2	37.3	37.3
Actuated g/C Ratio	0.42	0.42	0.12	0.60	0.29	0.29
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1475	647	215	2149	507	463
v/s Ratio Prot	c0.29		c0.09	0.26	c0.33	
v/s Ratio Perm		0.11				0.03
v/c Ratio	0.71	0.27	0.71	0.43	1.14	0.09
Uniform Delay, d1	31.3	24.9	54.8	13.9	46.4	33.9
Progression Factor	0.36	0.47	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.8	10.6	0.6	86.0	0.1
Delay (s)	13.6	12.6	65.4	14.6	132.4	34.0
Level of Service	B	B	E	B	F	C
Approach Delay (s)	13.3			21.8	119.9	
Approach LOS	B			C	F	
Intersection Summary						
HCM 2000 Control Delay			38.2		HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.86			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			85.4%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	104	31	31	78	302	617
Average Queue (ft)	45	8	6	22	242	290
95th Queue (ft)	82	27	24	55	381	946
Link Distance (ft)				701		1590
Upstream Blk Time (%)						3
Queuing Penalty (veh)						0
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)					24	14
Queuing Penalty (veh)					30	24

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	108	248	458	289	188	203	393	149	352	557	62	125
Average Queue (ft)	21	79	234	49	87	115	184	15	93	236	9	34
95th Queue (ft)	65	171	391	170	160	180	343	92	298	619	35	89
Link Distance (ft)			1319			1150	1150		3106	3106		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	5	0		0	7	0			0	0
Queuing Penalty (veh)		0	9	1		0	2	0			0	1

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	107
Average Queue (ft)	11
95th Queue (ft)	49
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	L	LT	R
Maximum Queue (ft)	116	433	500	325	410	415	691	347	68	294	832	1016
Average Queue (ft)	22	230	294	66	392	414	681	107	7	170	370	691
95th Queue (ft)	85	359	450	254	457	418	688	242	40	269	996	1269
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)							64	0			0	8
Queuing Penalty (veh)							612	0			2	38
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)	0	0			9	63	74	2	0	0	2	
Queuing Penalty (veh)	0	0			50	362	550	1	0	0	4	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	145	88
Average Queue (ft)	43	6
95th Queue (ft)	100	40
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	2	0
Queuing Penalty (veh)	1	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	182	227	118	230	722	726	1117	889
Average Queue (ft)	98	135	52	62	702	490	1102	877
95th Queue (ft)	160	198	91	220	762	906	1123	1600
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)					46	1	100	80
Queuing Penalty (veh)					334	5	0	0
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)				0	90			
Queuing Penalty (veh)				1	18			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	177	178	94	430	723	672	1043	1043
Average Queue (ft)	75	74	46	215	415	355	995	952
95th Queue (ft)	157	156	85	478	781	717	1160	1332
Link Distance (ft)	703	703			855	855	1011	1011
Upstream Blk Time (%)					5	2	92	88
Queuing Penalty (veh)					0	0	0	0
Storage Bay Dist (ft)			520	475				
Storage Blk Time (%)				0	17			
Queuing Penalty (veh)				2	24			

Network Summary

Network wide Queuing Penalty: 2069

2046 Future Saturday

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	38	334	11	14	324	136	7	2	30	4	181	5
Future Volume (Veh/h)	38	334	11	14	324	136	7	2	30	4	181	5
Sign Control	Free				Free				Stop			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	363	12	15	352	148	8	2	33	0	197	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked										0.00		
vC, conflicting volume	500			375			902	981	369	0	861	839
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	500			375			902	981	369	0	861	839
tC, single (s)	4.1			4.1			7.1	6.5	6.2	0.0	7.1	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	0.0	3.5	4.0
p0 queue free %	96			99			96	99	95	0	22	98
cM capacity (veh/h)	1075			1195			223	239	681	0	253	289
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	41	375	15	352	148	43	197	72				
Volume Left	41	0	15	0	0	8	197	0				
Volume Right	0	12	0	0	148	33	0	67				
cSH	1075	1700	1195	1700	1700	464	253	634				
Volume to Capacity	0.04	0.22	0.01	0.21	0.09	0.09	0.78	0.11				
Queue Length 95th (ft)	3	0	1	0	0	8	145	10				
Control Delay (s)	8.5	0.0	8.1	0.0	0.0	13.5	56.0	11.4				
Lane LOS	A		A			B	F	B				
Approach Delay (s)	0.8			0.2			13.5	44.1				
Approach LOS							B	E				
Intersection Summary												
Average Delay				10.4								
Intersection Capacity Utilization				48.5%		ICU Level of Service			A			
Analysis Period (min)				15								

2046 Future Saturday
1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	62
Future Volume (Veh/h)	62
Sign Control	
Grade	
Peak Hour Factor	0.92
Hourly flow rate (vph)	67
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	352
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	352
tC, single (s)	6.2
tC, 2 stage (s)	
tF (s)	3.3
p0 queue free %	90
cM capacity (veh/h)	696
Direction, Lane #	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	160	532	29	571	546	15	132	593	43	51	55
v/c Ratio	0.55	0.88	0.05	0.74	0.63	0.02	0.40	0.89	0.40	0.45	0.24
Control Delay	64.2	57.2	0.1	79.3	11.3	0.0	53.6	29.0	68.5	70.6	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	57.2	0.1	79.3	11.3	0.0	53.6	29.0	68.5	70.6	2.4
Queue Length 50th (ft)	68	428	0	257	111	0	98	116	37	44	0
Queue Length 95th (ft)	102	493	0	m295	m98	m0	#221	#403	77	88	0
Internal Link Dist (ft)		1290			1222		3082			438	
Turn Bay Length (ft)	365		290	260		230			115		115
Base Capacity (vph)	471	781	759	775	867	826	334	668	349	366	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.68	0.04	0.74	0.63	0.02	0.40	0.89	0.12	0.14	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2046 Future Saturday

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	152	505	28	28	515	519	14	26	100	563	46	44
Future Volume (vph)	152	505	28	28	515	519	14	26	100	563	46	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Lane Util. Factor	0.97	1.00	1.00		0.97	1.00	1.00		1.00	1.00	0.95	0.95
Frt	1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00
Satd. Flow (prot)	3502	1881	1615		3436	1881	1615		1843	1615	1715	1796
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00
Satd. Flow (perm)	3502	1881	1615		3436	1881	1615		1843	1615	1715	1796
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	160	532	29	29	542	546	15	27	105	593	48	46
RTOR Reduction (vph)	0	0	20	0	0	0	8	0	0	376	0	0
Lane Group Flow (vph)	160	532	9	0	571	546	7	0	132	217	43	51
Heavy Vehicles (%)	0%	1%	0%	0%	2%	1%	0%	10%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA	Perm	Split	NA	Perm	Split	NA
Protected Phases	5	2		1	1	6		3	3		4	4
Permitted Phases			2				6			3		
Actuated Green, G (s)	10.8	41.9	41.9		29.3	59.9	59.9		23.6	23.6	8.2	8.2
Effective Green, g (s)	10.8	41.9	41.9		29.3	59.9	59.9		23.6	23.6	8.2	8.2
Actuated g/C Ratio	0.08	0.32	0.32		0.23	0.46	0.46		0.18	0.18	0.06	0.06
Clearance Time (s)	7.5	6.0	6.0		7.0	6.0	6.0		6.5	6.5	7.5	7.5
Vehicle Extension (s)	2.5	4.0	4.0		2.0	4.0	4.0		2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	290	606	520		774	866	744		334	293	108	113
v/s Ratio Prot	0.05	c0.28			c0.17	0.29			0.07		0.03	c0.03
v/s Ratio Perm			0.01				0.00			c0.13		
v/c Ratio	0.55	0.88	0.02		0.74	0.63	0.01		0.40	0.74	0.40	0.45
Uniform Delay, d1	57.3	41.6	30.0		46.8	26.6	19.0		46.9	50.3	58.5	58.7
Progression Factor	1.00	1.00	1.00		1.59	0.34	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	16.4	0.1		2.1	1.1	0.0		0.3	8.5	0.9	1.0
Delay (s)	59.1	58.1	30.1		76.6	10.1	19.0		47.2	58.9	59.4	59.8
Level of Service	E	E	C		E	B	B		D	E	E	E
Approach Delay (s)		57.2				43.8			56.7			58.7
Approach LOS		E				D			E			E
Intersection Summary												
HCM 2000 Control Delay			51.6			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			27.5			
Intersection Capacity Utilization			103.6%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

2046 Future Saturday

2: Opportunity Way /Southern Mall Access & Centerville Road HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	52
Future Volume (vph)	52
Ideal Flow (vphpl)	1900
Total Lost time (s)	7.5
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1615
Flt Permitted	1.00
Satd. Flow (perm)	1615
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	55
RTOR Reduction (vph)	52
Lane Group Flow (vph)	3
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	8.2
Effective Green, g (s)	8.2
Actuated g/C Ratio	0.06
Clearance Time (s)	7.5
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	101
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.03
Uniform Delay, d1	57.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	57.2
Level of Service	E
Approach Delay (s)	
Approach LOS	
Intersection Summary	

2046 Future Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	52	1636	385	640	851	40	235	236	740	70	32
v/c Ratio	0.49	1.23	0.51	0.95	0.47	0.04	1.42	1.05	1.51	1.49	0.09
Control Delay	74.0	146.1	14.0	73.8	16.8	0.1	246.5	112.3	260.7	344.7	0.6
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	74.0	146.3	14.0	73.8	16.8	0.1	246.5	112.3	260.7	344.7	0.6
Queue Length 50th (ft)	43	~899	88	241	246	0	~281	~228	~625	~81	0
Queue Length 95th (ft)	87	#1038	185	m#339	m283	m0	m#403	m#348	m#834	#182	0
Internal Link Dist (ft)		1533			702			1222		432	
Turn Bay Length (ft)	565		450	415		210	300				95
Base Capacity (vph)	131	1331	751	686	1827	902	166	224	489	47	337
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	42	0	0	0	0	0	0	3	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	1.27	0.51	0.93	0.47	0.04	1.42	1.05	1.52	1.49	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2046 Future Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)

												
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	16	33	1554	366	608	808	38	2	409	36	703	42
Future Volume (vph)	16	33	1554	366	608	808	38	2	409	36	703	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Lane Util. Factor		1.00	0.95	1.00	0.97	0.95	1.00		0.95	0.95	1.00	
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	0.96	1.00	
Satd. Flow (prot)		1805	3574	1615	3433	3610	1615		1698	1718	1599	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.71	0.96	1.00	
Satd. Flow (perm)		1805	3574	1615	3433	3610	1615		1271	1718	1599	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	35	1636	385	640	851	40	2	431	38	740	44
RTOR Reduction (vph)	0	0	0	150	0	0	20	0	0	0	281	0
Lane Group Flow (vph)	0	52	1636	235	640	851	20	0	235	236	459	0
Heavy Vehicles (%)	0%	0%	1%	0%	2%	0%	0%	0%	1%	0%	1%	0%
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Perm	Split	NA	Perm	Perm
Protected Phases	5	5	2		1	6			4	4		
Permitted Phases				2			6	4			4	3
Actuated Green, G (s)		7.7	48.4	48.4	25.6	65.8	65.8		17.0	17.0	17.0	
Effective Green, g (s)		7.7	48.4	48.4	25.6	65.8	65.8		17.0	17.0	17.0	
Actuated g/C Ratio		0.06	0.37	0.37	0.20	0.51	0.51		0.13	0.13	0.13	
Clearance Time (s)		8.5	6.0	6.0	8.0	6.0	6.0		8.0	8.0	8.0	
Vehicle Extension (s)		2.0	4.0	4.0	2.0	4.0	4.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		106	1330	601	676	1827	817		166	224	209	
v/s Ratio Prot		0.03	c0.46		c0.19	0.24				0.14		
v/s Ratio Perm				0.15			0.01		0.18		c0.29	
v/c Ratio		0.49	1.23	0.39	0.95	0.47	0.02		1.42	1.05	2.20	
Uniform Delay, d1		59.2	40.8	30.0	51.5	20.7	16.1		56.5	56.5	56.5	
Progression Factor		1.00	1.00	1.00	1.03	0.76	1.00		0.92	0.91	1.14	
Incremental Delay, d2		1.3	110.3	1.9	18.9	0.7	0.0		208.1	62.7	548.6	
Delay (s)		60.6	151.1	31.9	72.1	16.4	16.1		260.1	114.2	613.0	
Level of Service		E	F	C	E	B	B		F	F	F	
Approach Delay (s)			126.7			39.7				447.3		
Approach LOS			F			D				F		
Intersection Summary												
HCM 2000 Control Delay			181.5			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.35									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)				29.5		
Intersection Capacity Utilization			108.2%			ICU Level of Service				G		
Analysis Period (min)			15									
c Critical Lane Group												

2046 Future Saturday

3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Road)



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	25	30
Future Volume (vph)	25	30
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	7.0	7.0
Lane Util. Factor	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.97	1.00
Satd. Flow (prot)	1842	1615
Flt Permitted	0.33	1.00
Satd. Flow (perm)	619	1615
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	26	32
RTOR Reduction (vph)	0	30
Lane Group Flow (vph)	70	2
Heavy Vehicles (%)	0%	0%
Turn Type	NA	Perm
Protected Phases	3	
Permitted Phases		3
Actuated Green, G (s)	10.0	10.0
Effective Green, g (s)	10.0	10.0
Actuated g/C Ratio	0.08	0.08
Clearance Time (s)	7.0	7.0
Vehicle Extension (s)	2.5	2.5
Lane Grp Cap (vph)	47	124
v/s Ratio Prot		
v/s Ratio Perm	0.11	0.00
v/c Ratio	1.49	0.02
Uniform Delay, d1	60.0	55.5
Progression Factor	1.00	1.00
Incremental Delay, d2	304.5	0.0
Delay (s)	364.5	55.5
Level of Service	F	E
Approach Delay (s)	267.6	
Approach LOS	F	
Intersection Summary		

2046 Future Saturday
4: Route 199 EB Ramps & Route 60 (Richmond Road)

Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1712	620	51	1045	438	213
v/c Ratio	0.89	0.54	0.44	0.45	1.03	0.42
Control Delay	16.3	0.6	69.1	10.3	100.4	15.5
Queue Delay	0.9	0.5	0.0	0.0	0.0	0.0
Total Delay	17.1	1.1	69.1	10.3	100.4	15.5
Queue Length 50th (ft)	264	0	40	222	~395	40
Queue Length 95th (ft)	m198	m0	m69	m254	#604	113
Internal Link Dist (ft)	702			698	1081	
Turn Bay Length (ft)		520	230			
Base Capacity (vph)	1932	1157	138	2332	424	503
Starvation Cap Reductn	65	207	0	0	0	0
Spillback Cap Reductn	34	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.65	0.37	0.45	1.03	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑
Traffic Volume (vph)	1609	583	48	982	412	200
Future Volume (vph)	1609	583	48	982	412	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1615	1805	3610	1752	1599
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1615	1805	3610	1752	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1712	620	51	1045	438	213
RTOR Reduction (vph)	0	292	0	0	0	116
Lane Group Flow (vph)	1712	328	51	1045	438	97
Heavy Vehicles (%)	1%	0%	0%	0%	3%	1%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	68.7	68.7	7.3	84.0	31.5	31.5
Effective Green, g (s)	68.7	68.7	7.3	84.0	31.5	31.5
Actuated g/C Ratio	0.53	0.53	0.06	0.65	0.24	0.24
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	5.0	5.0
Lane Grp Cap (vph)	1888	853	101	2332	424	387
v/s Ratio Prot	c0.48		0.03	c0.29	c0.25	
v/s Ratio Perm		0.20				0.06
v/c Ratio	0.91	0.38	0.50	0.45	1.03	0.25
Uniform Delay, d1	27.8	18.1	59.6	11.5	49.2	39.7
Progression Factor	0.54	0.33	1.02	0.84	1.00	1.00
Incremental Delay, d2	0.8	0.1	3.4	0.5	52.5	0.7
Delay (s)	15.7	6.1	64.1	10.2	101.7	40.4
Level of Service	B	A	E	B	F	D
Approach Delay (s)	13.2			12.7	81.7	
Approach LOS	B			B	F	
Intersection Summary						
HCM 2000 Control Delay			24.0		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.93			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			79.4%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

2046 Future Saturday
5: Route 199 WB Ramps & Route 60 (Richmond Road)

Queues



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1291	508	172	747	430	91
v/c Ratio	0.82	0.52	0.76	0.33	0.93	0.19
Control Delay	17.2	1.6	75.1	11.7	75.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	1.6	75.1	11.7	75.4	8.8
Queue Length 50th (ft)	286	2	140	147	351	2
Queue Length 95th (ft)	458	m7	218	184	#542	45
Internal Link Dist (ft)	698			807	993	
Turn Bay Length (ft)		520	475			
Base Capacity (vph)	1574	981	267	2284	479	493
Starvation Cap Reductn	2	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.52	0.64	0.33	0.90	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	1239	488	165	717	413	87
Future Volume (vph)	1239	488	165	717	413	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3574	1583	1736	3610	1805	1615
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3574	1583	1736	3610	1805	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1291	508	172	747	430	91
RTOR Reduction (vph)	0	284	0	0	0	66
Lane Group Flow (vph)	1291	224	172	747	430	25
Heavy Vehicles (%)	1%	2%	4%	0%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	57.3	57.3	17.0	82.3	33.2	33.2
Effective Green, g (s)	57.3	57.3	17.0	82.3	33.2	33.2
Actuated g/C Ratio	0.44	0.44	0.13	0.63	0.26	0.26
Clearance Time (s)	6.0	6.0	8.0	6.0	8.5	8.5
Vehicle Extension (s)	5.0	5.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	1575	697	227	2285	460	412
v/s Ratio Prot	c0.36		c0.10	0.21	c0.24	
v/s Ratio Perm		0.14				0.02
v/c Ratio	0.82	0.32	0.76	0.33	0.93	0.06
Uniform Delay, d1	31.8	23.7	54.5	11.0	47.3	36.6
Progression Factor	0.43	0.29	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	0.6	13.5	0.4	26.3	0.1
Delay (s)	16.2	7.4	68.0	11.4	73.6	36.7
Level of Service	B	A	E	B	E	D
Approach Delay (s)	13.7			22.0	67.2	
Approach LOS	B			C	E	
Intersection Summary						
HCM 2000 Control Delay			24.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.84			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	22.5
Intersection Capacity Utilization			85.0%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	UL	TR
Maximum Queue (ft)	32	29	6	53	148	53
Average Queue (ft)	9	3	0	21	62	26
95th Queue (ft)	29	18	4	45	114	46
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	139	364	732	264	260	505	342	26	3123	3133	45	126
Average Queue (ft)	45	156	419	45	178	226	101	2	2147	2288	6	38
95th Queue (ft)	112	354	799	199	276	408	239	14	3954	3815	27	89
Link Distance (ft)			1319			1150	1150		3106	3106		426
Upstream Blk Time (%)									37	36		
Queuing Penalty (veh)									0	0		
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	23	0	1	9	2				0	0
Queuing Penalty (veh)		1	42	1	2	26	0				0	0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	78
Average Queue (ft)	6
95th Queue (ft)	41
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	T	R	UL	LT	R
Maximum Queue (ft)	564	1595	1581	1590	407	414	655	566	107	279	1159	1223
Average Queue (ft)	214	1538	1548	1503	332	346	356	227	12	149	1065	1204
95th Queue (ft)	640	1726	1699	1927	473	487	754	541	61	260	1504	1275
Link Distance (ft)		1554	1554	1554			676	676			1150	1150
Upstream Blk Time (%)		52	78	78			3	0			2	51
Queuing Penalty (veh)		0	0	0			22	1			12	293
Storage Bay Dist (ft)	565				415	415			210	300		
Storage Blk Time (%)	0	68			3	15	11	3	0	0	3	
Queuing Penalty (veh)	1	33			12	60	68	1	0	0	6	

Intersection: 3: Centerville Road/Commercial Access & Route 60 (Richmond Highway)/Route 60 (Richmond Highway)

Movement	SB	SB
Directions Served	LT	R
Maximum Queue (ft)	143	77
Average Queue (ft)	42	6
95th Queue (ft)	102	41
Link Distance (ft)	417	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		95
Storage Blk Time (%)	2	0
Queuing Penalty (veh)	1	0

Intersection: 4: Route 199 EB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	372	406	182	178	262	216	794	561
Average Queue (ft)	181	215	74	49	131	94	464	190
95th Queue (ft)	315	349	140	106	223	174	901	679
Link Distance (ft)	676	676			703	703	1098	1098
Upstream Blk Time (%)							6	6
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)			520	230				
Storage Blk Time (%)		0	0	0	1			
Queuing Penalty (veh)		1	0	0	0			

Intersection: 5: Route 199 WB Ramps & Route 60 (Richmond Road)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	249	250	148	258	239	176	514	175
Average Queue (ft)	100	116	55	139	128	70	309	31
95th Queue (ft)	208	217	111	226	210	148	470	99
Link Distance (ft)	703	703			855	855	1011	1011
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			520	475				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 584

Appendix I

Signal Warrant Analysis

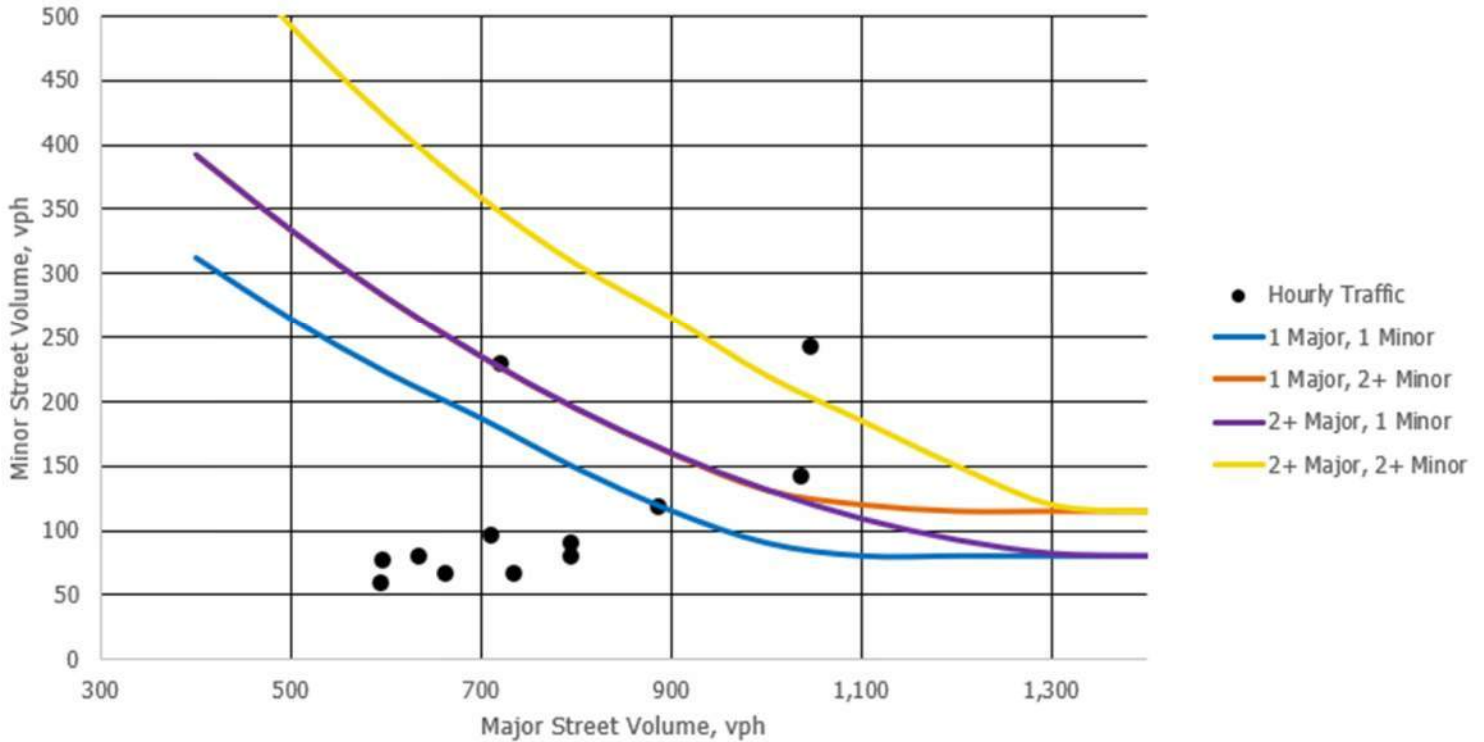
Weekday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	100% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		600	900	480	720
	Minor		150	75	120	60
7:00 AM - 8:00 AM	712	96	N	N	N	N
8:00 AM - 9:00 AM	795	89	N	N	N	Y
9:00 AM - 10:00 AM	736	66	N	N	N	Y
10:00 AM - 11:00 AM	598	77	N	N	N	N
11:00 AM - 12:00 PM	595	58	N	N	N	N
12:00 PM - 1:00 PM	635	80	N	N	N	N
1:00 PM - 2:00 PM	664	66	N	N	N	N
2:00 PM - 3:00 PM	795	79	N	N	N	Y
3:00 PM - 4:00 PM	887	118	N	N	N	Y
4:00 PM - 5:00 PM	1,037	141	N	Y	Y	Y
5:00 PM - 6:00 PM	1,047	242	Y	Y	Y	Y
6:00 PM - 7:00 PM	722	228	Y	N	Y	Y
# of Hours Warrant is Met			2	2	3	7
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			No	No	No	

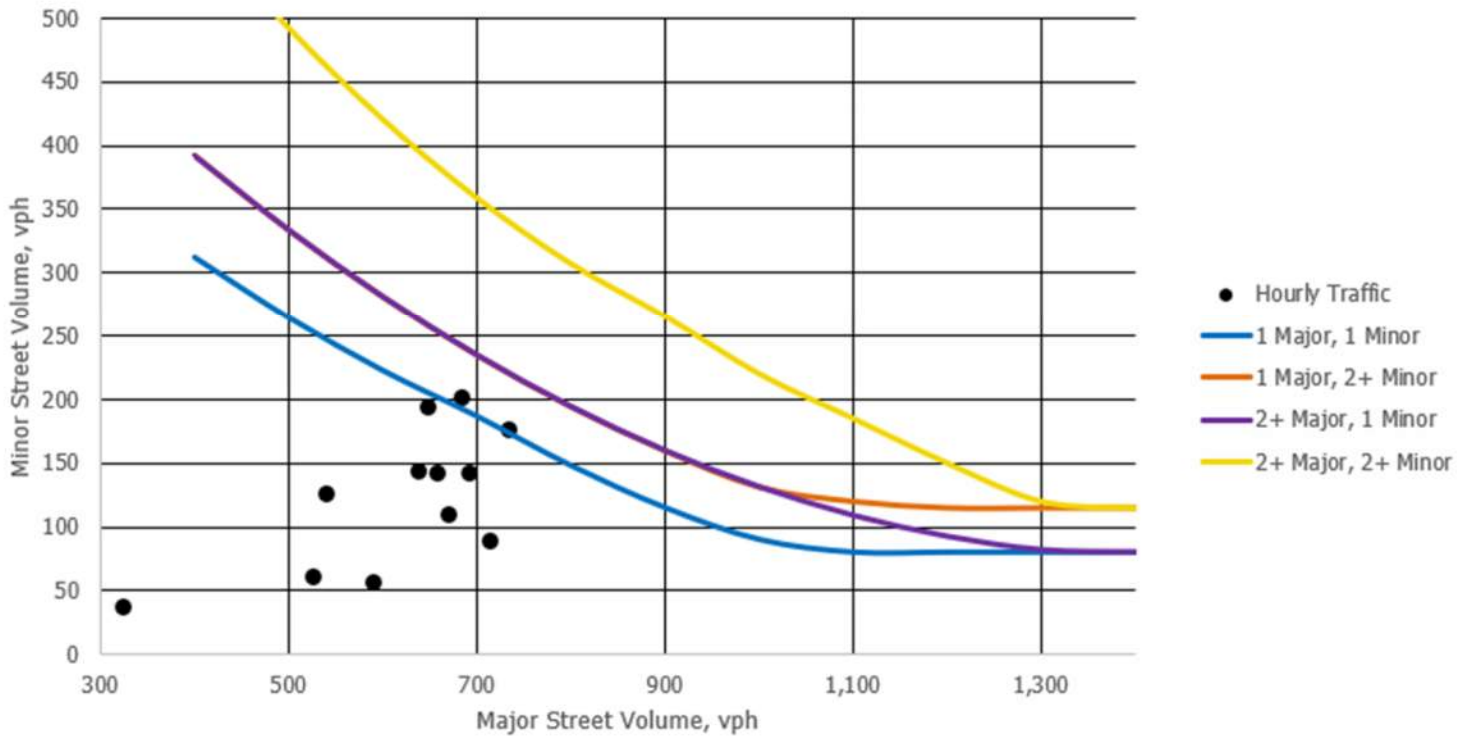
Saturday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	100% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		600	900	480	720
	Minor		150	75	120	60
7:00 AM - 8:00 AM	325	37	N	N	N	N
8:00 AM - 9:00 AM	528	60	N	N	N	N
9:00 AM - 10:00 AM	671	109	N	N	N	N
10:00 AM - 11:00 AM	649	193	Y	N	Y	N
11:00 AM - 12:00 PM	735	176	Y	N	Y	Y
12:00 PM - 1:00 PM	685	201	Y	N	Y	N
1:00 PM - 2:00 PM	694	142	N	N	Y	N
2:00 PM - 3:00 PM	715	88	N	N	N	N
3:00 PM - 4:00 PM	660	141	N	N	Y	N
4:00 PM - 5:00 PM	639	143	N	N	Y	N
5:00 PM - 6:00 PM	592	56	N	N	N	N
6:00 PM - 7:00 PM	542	125	N	N	Y	N
# of Hours Warrant is Met			3	0	7	1
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			No	No	No	

**Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume - 2025
Existing Weekday**



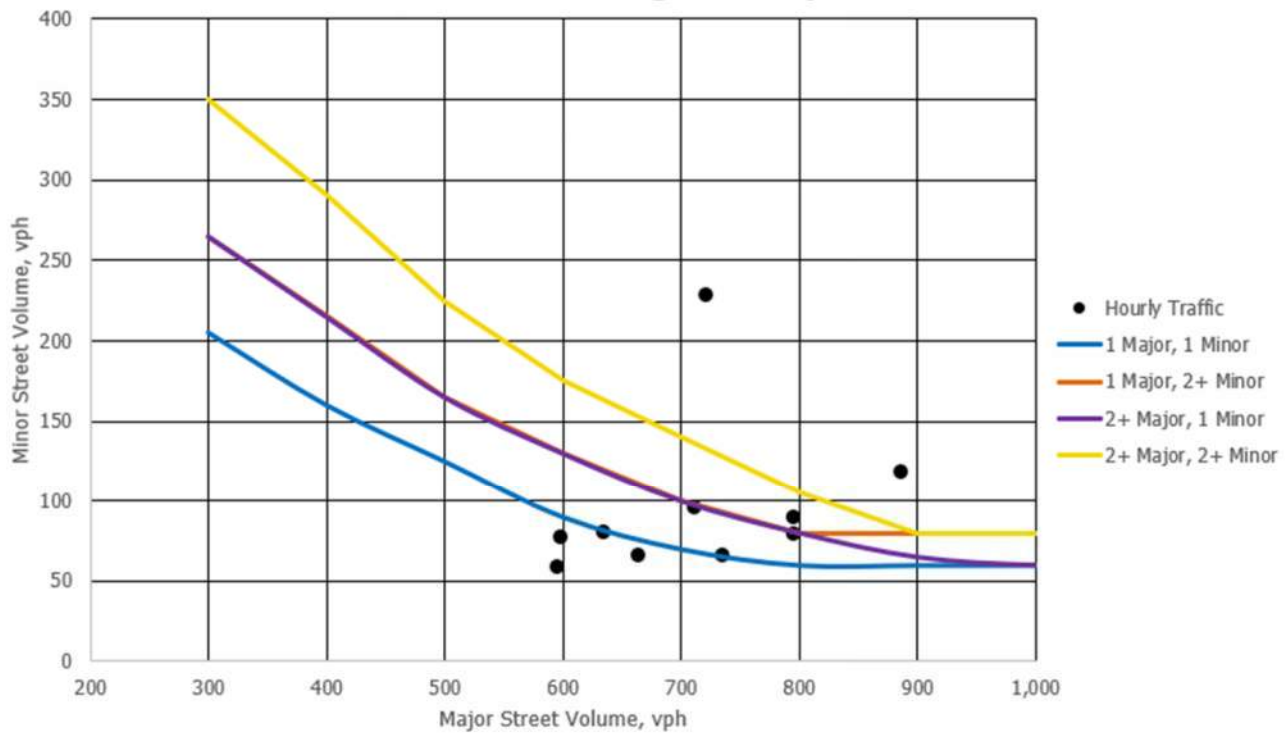
**Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume - 2025
Existing Weekend**



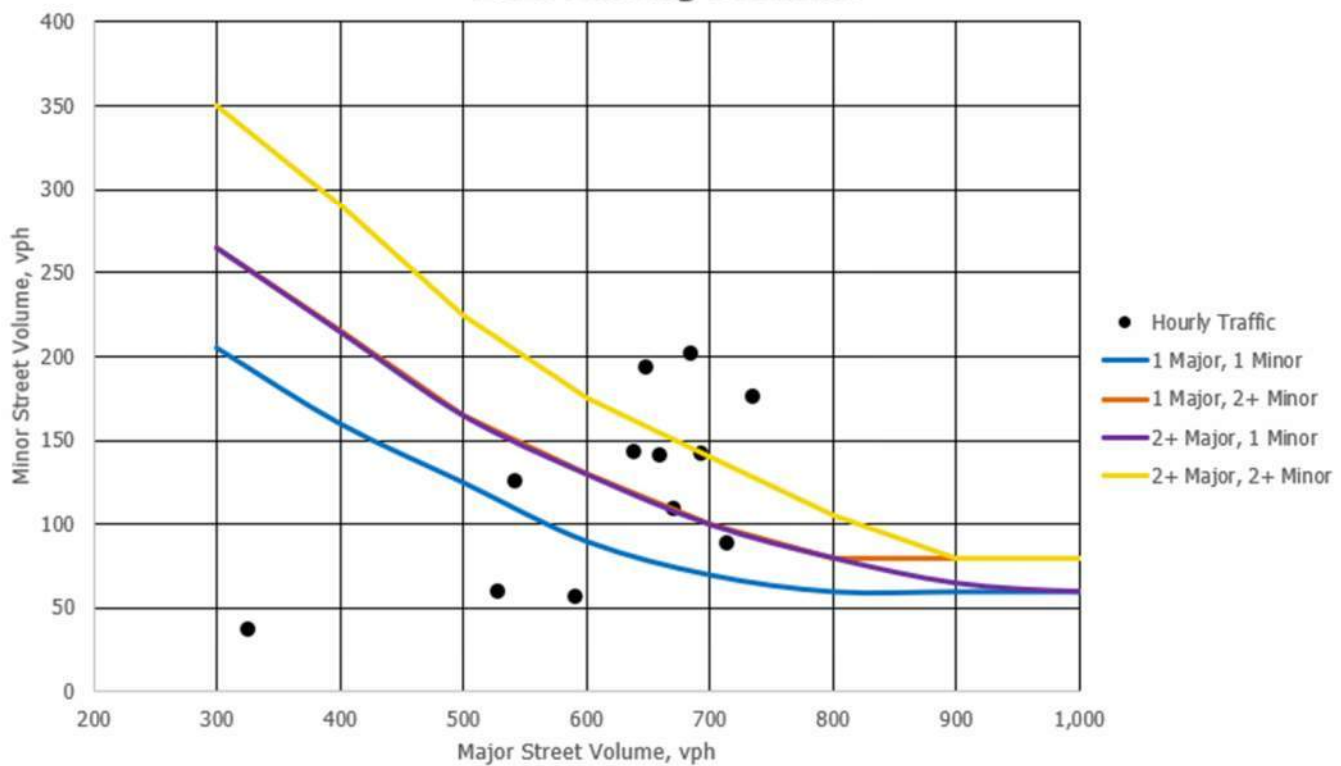
Weekday						
Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	70% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
Threshold	Major				Condition A	Condition B
	Minor		420	630	336	504
			105	53	84	42
7:00 AM - 8:00 AM	712	96	N	Y	Y	Y
8:00 AM - 9:00 AM	795	89	N	Y	Y	Y
9:00 AM - 10:00 AM	736	66	N	Y	N	Y
10:00 AM - 11:00 AM	598	77	N	N	N	Y
11:00 AM - 12:00 PM	595	58	N	N	N	Y
12:00 PM - 1:00 PM	635	80	N	Y	N	Y
1:00 PM - 2:00 PM	664	66	N	Y	N	Y
2:00 PM - 3:00 PM	795	79	N	Y	N	Y
3:00 PM - 4:00 PM	887	118	Y	Y	Y	Y
4:00 PM - 5:00 PM	1,037	141	Y	Y	Y	Y
5:00 PM - 6:00 PM	1,047	242	Y	Y	Y	Y
6:00 PM - 7:00 PM	722	228	Y	Y	Y	Y
# of Hours Warrant is Met			4	10	6	12
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			Yes	Yes	No	

Saturday						
Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	70% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
Threshold	Major				Condition A	Condition B
	Minor		420	630	336	504
			105	53	84	42
7:00 AM - 8:00 AM	325	37	N	N	N	N
8:00 AM - 9:00 AM	528	60	N	N	N	Y
9:00 AM - 10:00 AM	671	109	Y	Y	Y	Y
10:00 AM - 11:00 AM	649	193	Y	Y	Y	Y
11:00 AM - 12:00 PM	735	176	Y	Y	Y	Y
12:00 PM - 1:00 PM	685	201	Y	Y	Y	Y
1:00 PM - 2:00 PM	694	142	Y	Y	Y	Y
2:00 PM - 3:00 PM	715	88	N	Y	Y	Y
3:00 PM - 4:00 PM	660	141	Y	Y	Y	Y
4:00 PM - 5:00 PM	639	143	Y	Y	Y	Y
5:00 PM - 6:00 PM	592	56	N	N	N	Y
6:00 PM - 7:00 PM	542	125	Y	N	Y	Y
# of Hours Warrant is Met			8	8	9	11
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			Yes	Yes	Yes	

**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)
2025 Existing Weekday**



**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)
2025 Existing Weekend**



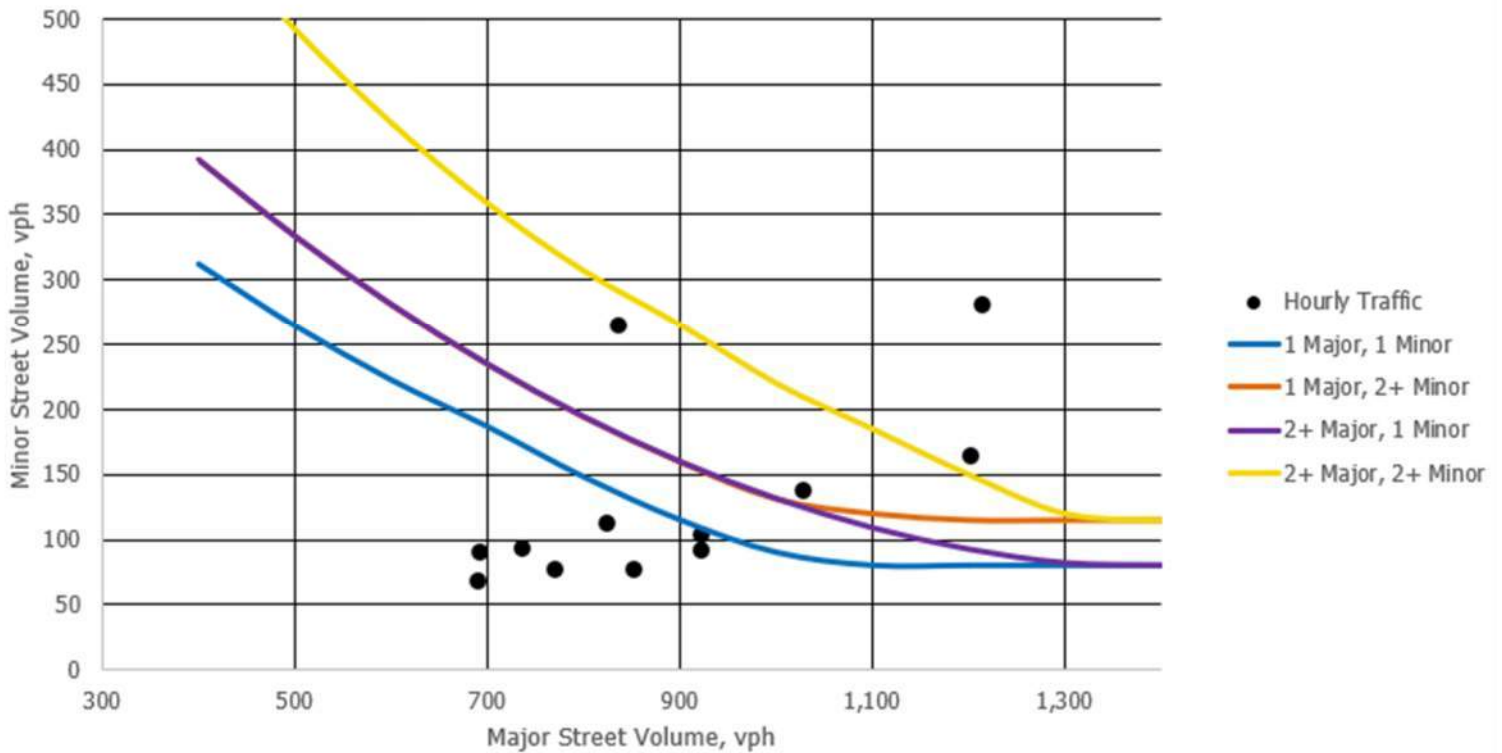
Weekday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	100% WARRANTS			
			# 1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		600	900	480	720
	Minor		150	75	120	60
7:00 AM - 8:00 AM	827	111	N	N	N	Y
8:00 AM - 9:00 AM	923	103	N	Y	N	Y
9:00 AM - 10:00 AM	854	77	N	N	N	Y
10:00 AM - 11:00 AM	694	89	N	N	N	N
11:00 AM - 12:00 PM	691	67	N	N	N	N
12:00 PM - 1:00 PM	737	93	N	N	N	Y
1:00 PM - 2:00 PM	771	77	N	N	N	Y
2:00 PM - 3:00 PM	923	92	N	Y	N	Y
3:00 PM - 4:00 PM	1,030	137	N	Y	Y	Y
4:00 PM - 5:00 PM	1,204	164	Y	Y	Y	Y
5:00 PM - 6:00 PM	1,216	281	Y	Y	Y	Y
6:00 PM - 7:00 PM	838	265	Y	N	Y	Y
# of Hours Warrant is Met			3	5	4	10
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			No	No	No	

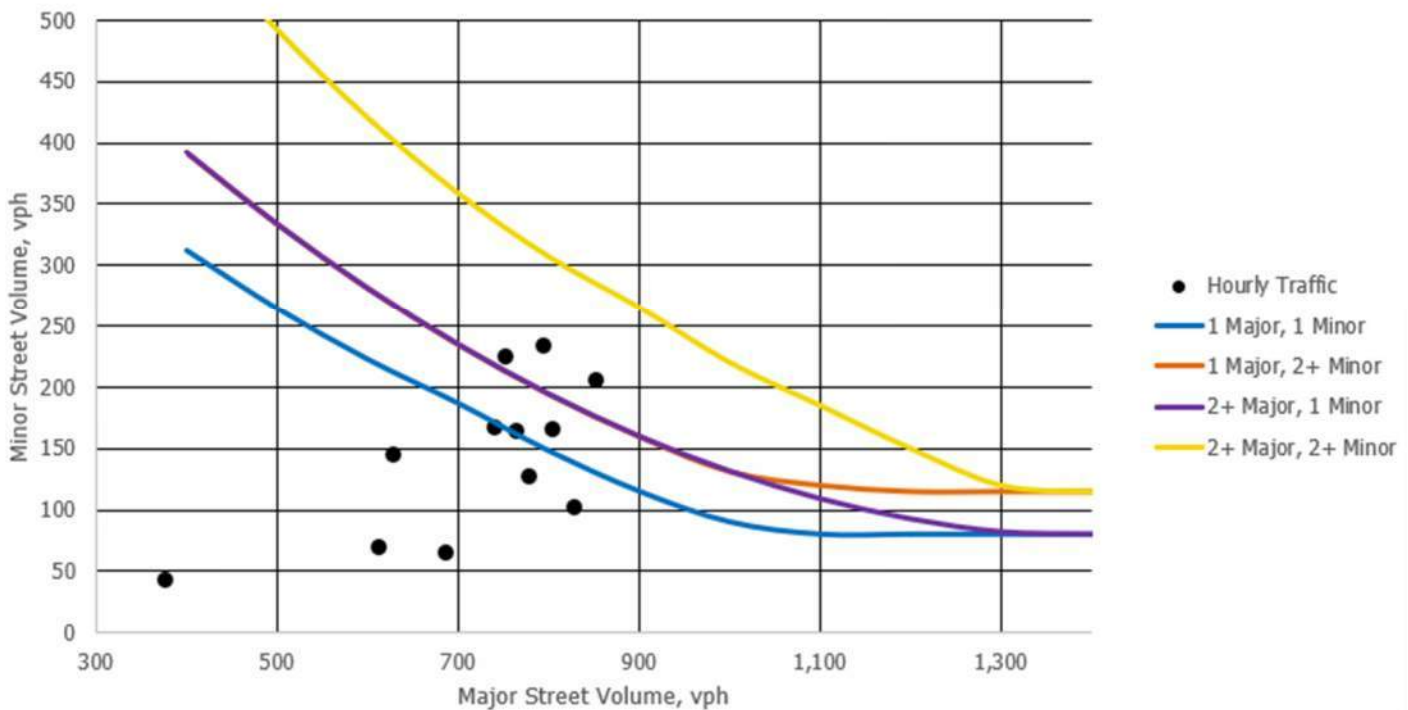
Saturday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	100% WARRANTS			
			# 1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		600	900	480	720
	Minor		150	75	120	60
7:00 AM - 8:00 AM	377	43	N	N	N	N
8:00 AM - 9:00 AM	613	70	N	N	N	N
9:00 AM - 10:00 AM	779	127	N	N	Y	Y
10:00 AM - 11:00 AM	753	224	Y	N	Y	Y
11:00 AM - 12:00 PM	853	204	Y	N	Y	Y
12:00 PM - 1:00 PM	795	233	Y	N	Y	Y
1:00 PM - 2:00 PM	806	165	Y	N	Y	Y
2:00 PM - 3:00 PM	830	102	N	N	N	Y
3:00 PM - 4:00 PM	766	164	Y	N	Y	Y
4:00 PM - 5:00 PM	742	166	Y	N	Y	Y
5:00 PM - 6:00 PM	687	65	N	N	N	N
6:00 PM - 7:00 PM	629	145	N	N	Y	N
# of Hours Warrant is Met			6	0	8	8
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			No	No	Yes	

**Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume - 2040
Background Weekday**



**Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume - 2040
Background Weekend**



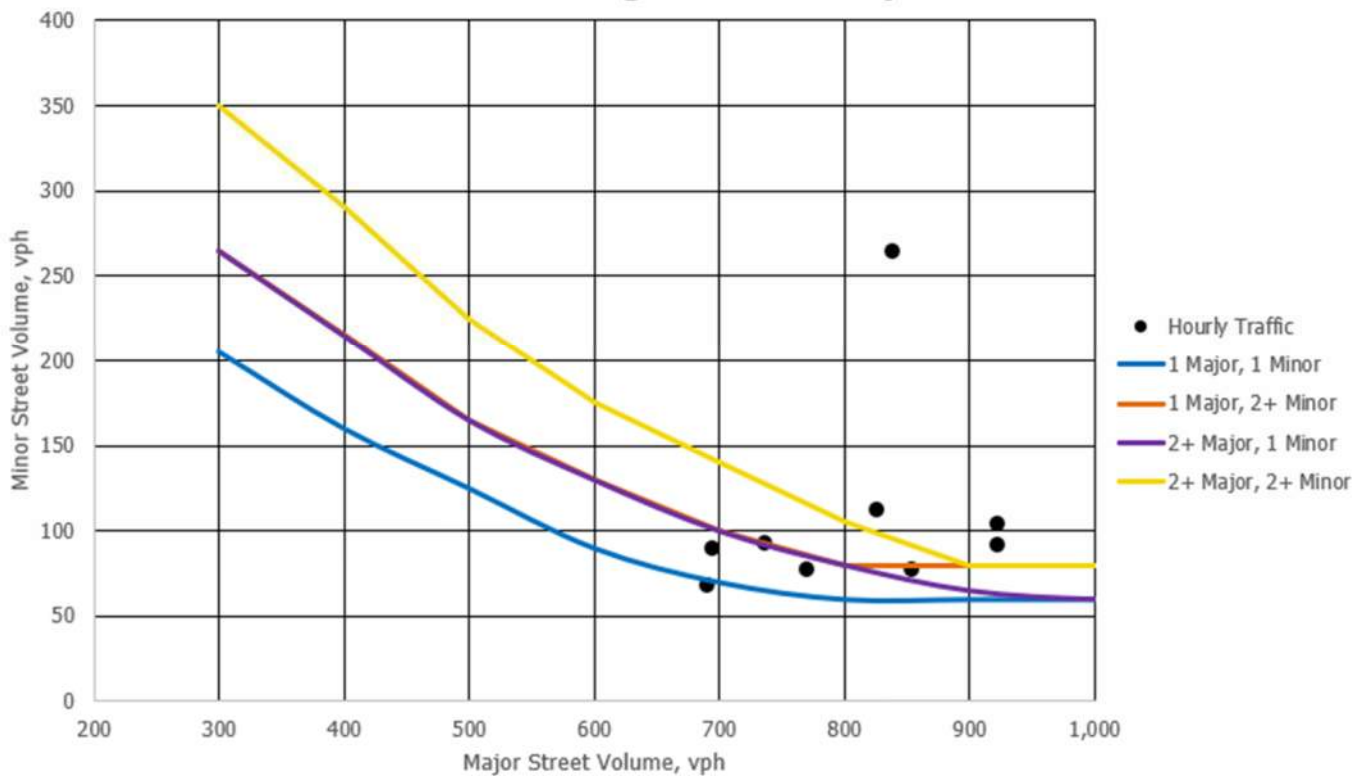
Weekday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	70% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		420	630	336	504
	Minor		105	53	84	42
7:00 AM - 8:00 AM	827	111	Y	Y	Y	Y
8:00 AM - 9:00 AM	923	103	N	Y	Y	Y
9:00 AM - 10:00 AM	854	77	N	Y	N	Y
10:00 AM - 11:00 AM	694	89	N	Y	Y	Y
11:00 AM - 12:00 PM	691	67	N	Y	N	Y
12:00 PM - 1:00 PM	737	93	N	Y	Y	Y
1:00 PM - 2:00 PM	771	77	N	Y	N	Y
2:00 PM - 3:00 PM	923	92	N	Y	Y	Y
3:00 PM - 4:00 PM	1,030	137	Y	Y	Y	Y
4:00 PM - 5:00 PM	1,204	164	Y	Y	Y	Y
5:00 PM - 6:00 PM	1,216	281	Y	Y	Y	Y
6:00 PM - 7:00 PM	838	265	Y	Y	Y	Y
# of Hours Warrant is Met			5	12	9	12
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			No	Yes	Yes	

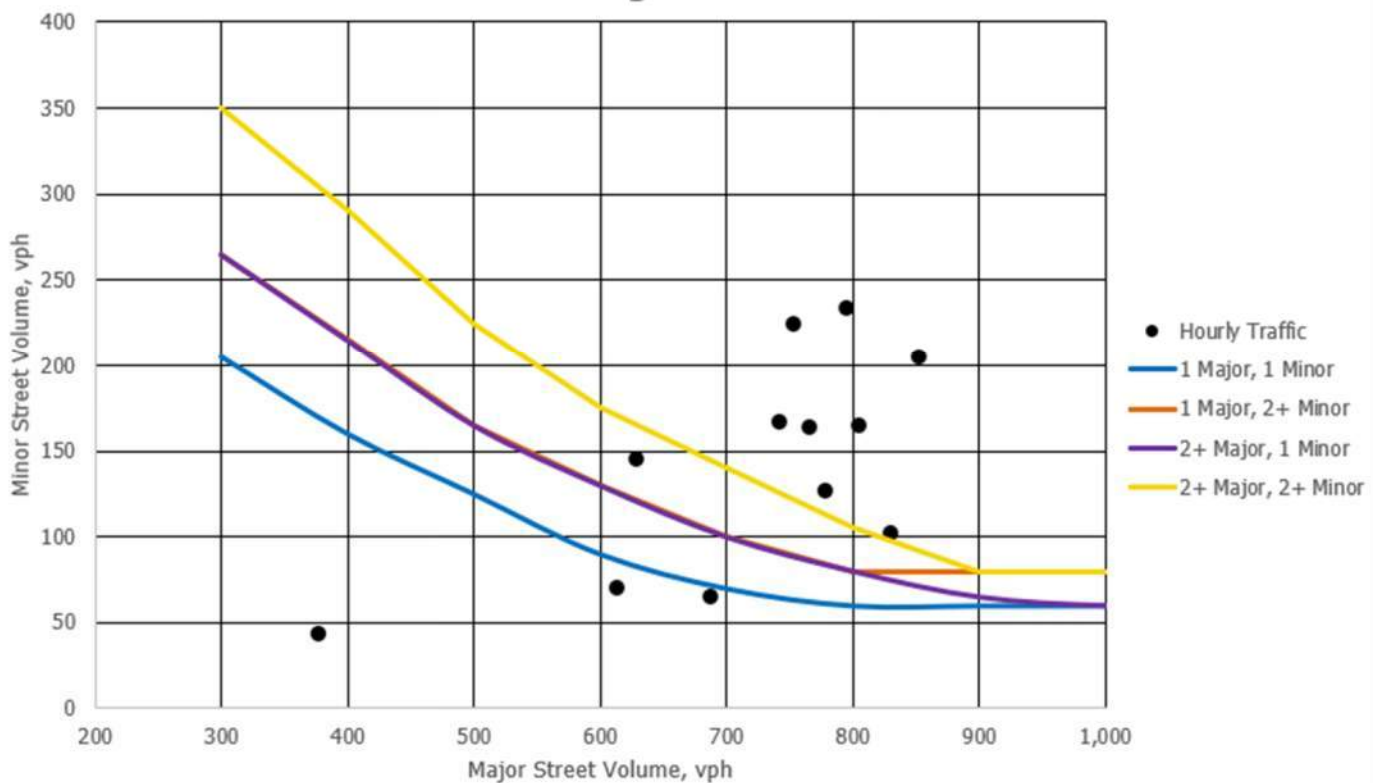
Saturday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	70% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		420	630	336	504
	Minor		105	53	84	42
7:00 AM - 8:00 AM	377	43	N	N	N	N
8:00 AM - 9:00 AM	613	70	N	N	N	Y
9:00 AM - 10:00 AM	779	127	Y	Y	Y	Y
10:00 AM - 11:00 AM	753	224	Y	Y	Y	Y
11:00 AM - 12:00 PM	853	204	Y	Y	Y	Y
12:00 PM - 1:00 PM	795	233	Y	Y	Y	Y
1:00 PM - 2:00 PM	806	165	Y	Y	Y	Y
2:00 PM - 3:00 PM	830	102	N	Y	Y	Y
3:00 PM - 4:00 PM	766	164	Y	Y	Y	Y
4:00 PM - 5:00 PM	742	166	Y	Y	Y	Y
5:00 PM - 6:00 PM	687	65	N	Y	N	Y
6:00 PM - 7:00 PM	629	145	Y	N	Y	Y
# of Hours Warrant is Met			8	9	9	11
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			Yes	Yes	Yes	

**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)
2040 Background Weekday**



**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)
2040 Background Weekend**



Weekday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	100% WARRANTS			
			# 1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		600	900	480	720
	Minor		150	75	120	60
7:00 AM - 8:00 AM	829	114	N	N	N	Y
8:00 AM - 9:00 AM	933	104	N	Y	N	Y
9:00 AM - 10:00 AM	878	88	N	N	N	Y
10:00 AM - 11:00 AM	714	105	N	N	N	N
11:00 AM - 12:00 PM	707	97	N	N	N	N
12:00 PM - 1:00 PM	763	111	N	N	N	Y
1:00 PM - 2:00 PM	792	89	N	N	N	Y
2:00 PM - 3:00 PM	939	116	N	Y	N	Y
3:00 PM - 4:00 PM	1,045	156	Y	Y	Y	Y
4:00 PM - 5:00 PM	1,211	186	Y	Y	Y	Y
5:00 PM - 6:00 PM	1,224	289	Y	Y	Y	Y
6:00 PM - 7:00 PM	847	274	Y	N	Y	Y
# of Hours Warrant is Met			4	5	4	10
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			No	No	No	

Saturday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	100% WARRANTS			
			# 1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		600	900	480	720
	Minor		150	75	120	60
7:00 AM - 8:00 AM	377	43	N	N	N	N
8:00 AM - 9:00 AM	613	70	N	N	N	N
9:00 AM - 10:00 AM	779	127	N	N	Y	Y
10:00 AM - 11:00 AM	753	224	Y	N	Y	Y
11:00 AM - 12:00 PM	853	204	Y	N	Y	Y
12:00 PM - 1:00 PM	795	233	Y	N	Y	Y
1:00 PM - 2:00 PM	806	165	Y	N	Y	Y
2:00 PM - 3:00 PM	830	102	N	N	N	Y
3:00 PM - 4:00 PM	766	164	Y	N	Y	Y
4:00 PM - 5:00 PM	742	166	Y	N	Y	Y
5:00 PM - 6:00 PM	687	65	N	N	N	N
6:00 PM - 7:00 PM	629	145	N	N	Y	N
# of Hours Warrant is Met			6	0	8	8
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			No	No	Yes	

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume - 2040 Future Weekday

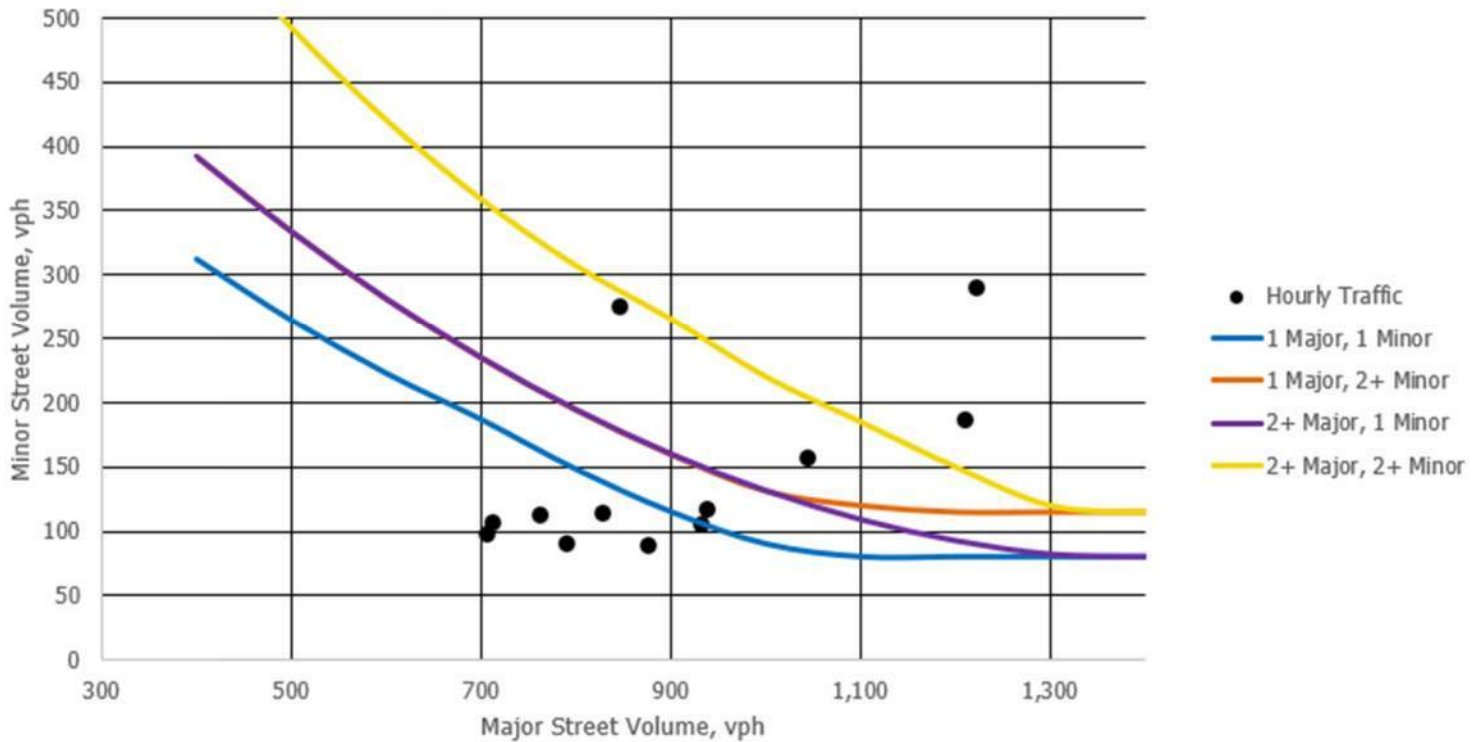
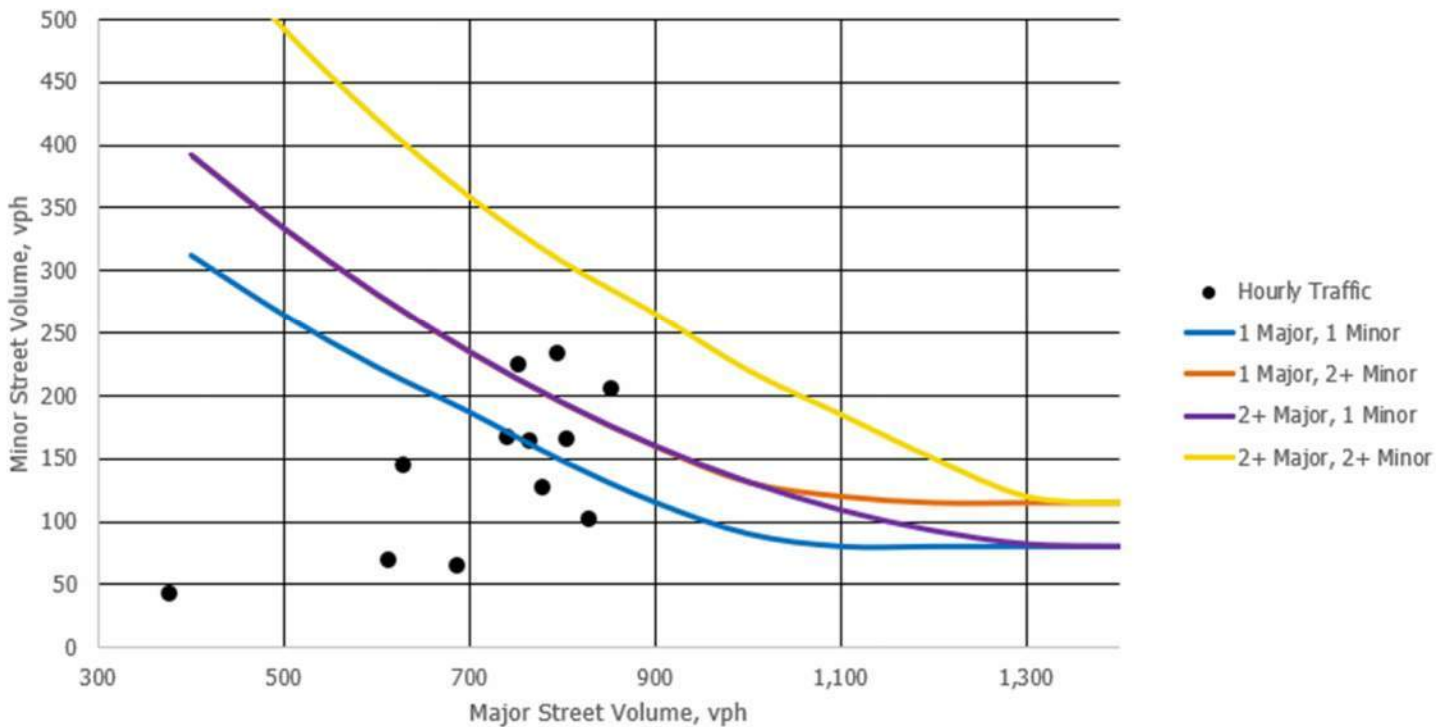


Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume - 2040 Future Weekend



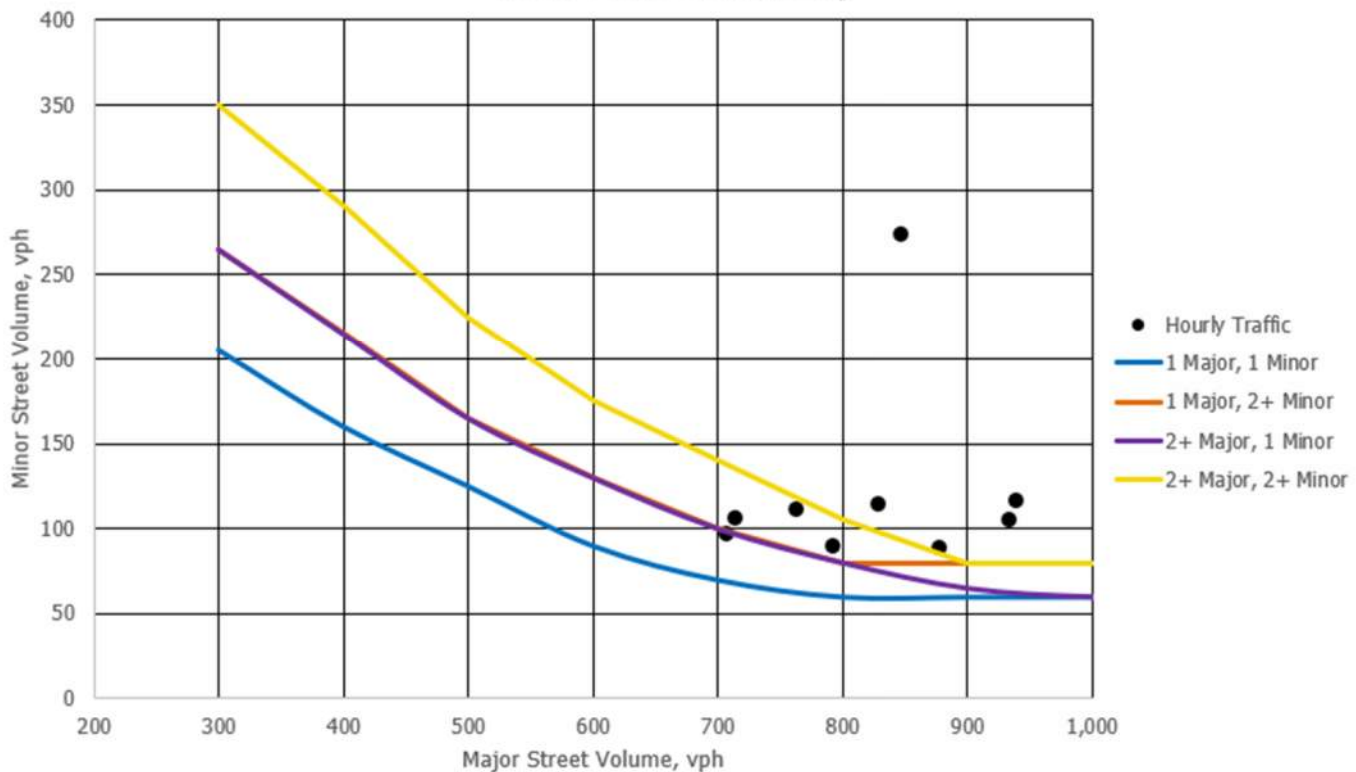
Weekday

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	70% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		420	630	336	504
	Minor		105	53	84	42
7:00 AM - 8:00 AM	829	114	Y	Y	Y	Y
8:00 AM - 9:00 AM	933	104	N	Y	Y	Y
9:00 AM - 10:00 AM	878	88	N	Y	Y	Y
10:00 AM - 11:00 AM	714	105	Y	Y	Y	Y
11:00 AM - 12:00 PM	707	97	N	Y	Y	Y
12:00 PM - 1:00 PM	763	111	Y	Y	Y	Y
1:00 PM - 2:00 PM	792	89	N	Y	Y	Y
2:00 PM - 3:00 PM	939	116	Y	Y	Y	Y
3:00 PM - 4:00 PM	1,045	156	Y	Y	Y	Y
4:00 PM - 5:00 PM	1,211	186	Y	Y	Y	Y
5:00 PM - 6:00 PM	1,224	289	Y	Y	Y	Y
6:00 PM - 7:00 PM	847	274	Y	Y	Y	Y
# of Hours Warrant is Met			8	12	12	12
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			Yes	Yes	Yes	

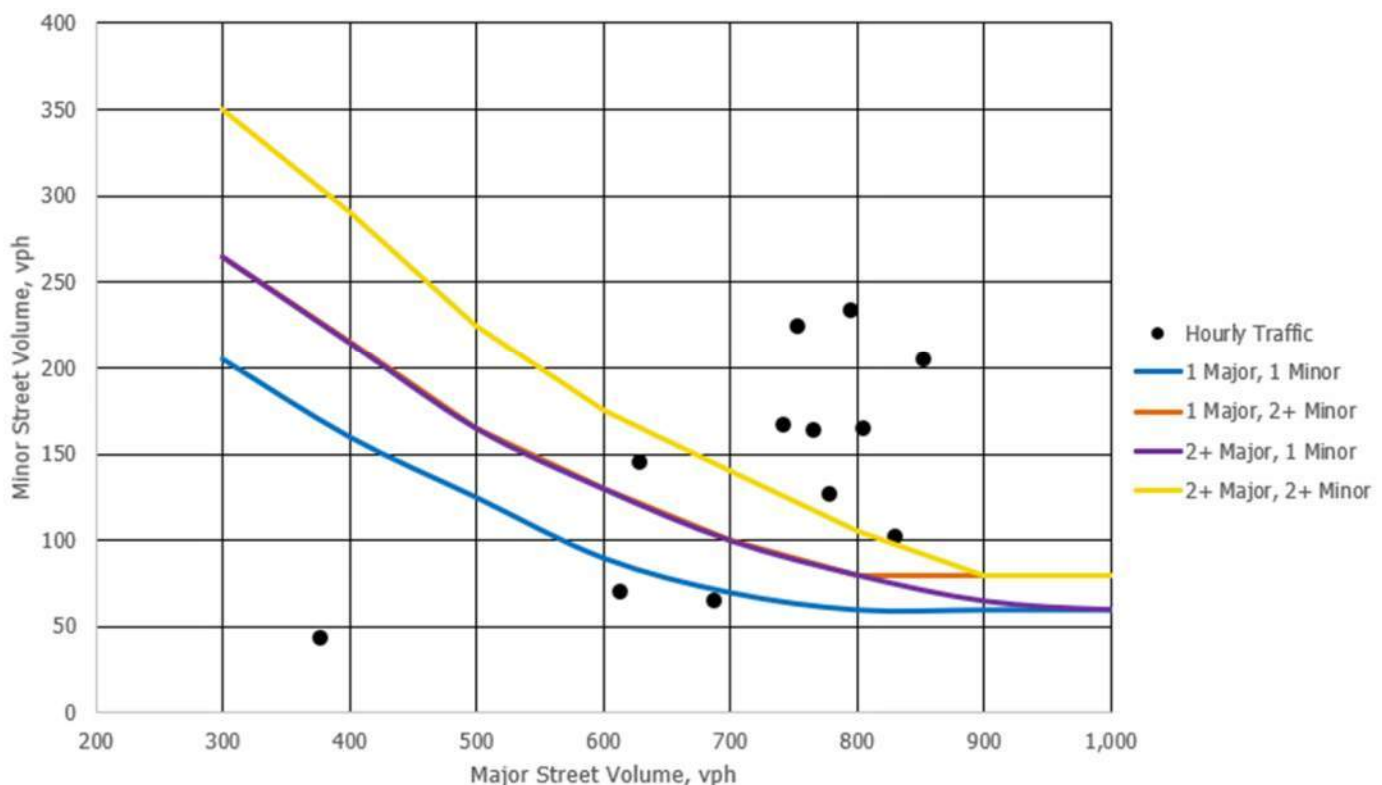
Weekend

Time Period	Major Street Volume	Minor Street Volume (Highest Approach)	70% WARRANTS			
			#1 (8-hour)			
			Condition A	Condition B	Combination	
					Condition A	Condition B
Threshold	Major		420	630	336	504
	Minor		105	53	84	42
7:00 AM - 8:00 AM	385	44	N	N	N	N
8:00 AM - 9:00 AM	625	71	N	N	N	Y
9:00 AM - 10:00 AM	795	129	Y	Y	Y	Y
10:00 AM - 11:00 AM	769	229	Y	Y	Y	Y
11:00 AM - 12:00 PM	870	208	Y	Y	Y	Y
12:00 PM - 1:00 PM	811	238	Y	Y	Y	Y
1:00 PM - 2:00 PM	822	168	Y	Y	Y	Y
2:00 PM - 3:00 PM	847	104	N	Y	Y	Y
3:00 PM - 4:00 PM	782	167	Y	Y	Y	Y
4:00 PM - 5:00 PM	757	169	Y	Y	Y	Y
5:00 PM - 6:00 PM	701	66	N	Y	N	Y
6:00 PM - 7:00 PM	642	148	Y	Y	Y	Y
# of Hours Warrant is Met			8	10	9	11
# of Hours Warrant is Required to be Met			8	8	8	8
Is Warrant Satisfied?			Yes	Yes	Yes	

**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)
2040 Future Weekday**



**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)
2040 Future Weekend**



Appendix B: VJuST Input and Results Worksheets

Instructions: Include the VJuST Input Worksheet, Results Worksheet, and worksheets for the alternatives considered.

The following alternatives must be considered in VJuST for all SJRs:

- Conventional signal
- Two-way stop control
- Roundabout

See the IIM for requirements and recommendations regarding analysis of other Innovative Intersection concepts.

VDOT Junction Screening Tool				
Input Worksheet				
Project Title:	Warhill Sports Complex AM Peak Total Future 2040			
E-W Facility:	Longhill Road			
N-S Facility:	Warhill Trail/Longhill Gate Road			
Date:	August 25, 2025			
Traffic Volume Demand				
Direction	Volume (veh/hr)			Truck Percent (%)
	U-Turn / Left	Through	Right	
Eastbound	60	388	0	2.60%
Westbound	12	283	91	5.60%
Northbound	8	6	28	2.80%
Southbound	88	3	21	1.10%
Adjustment Factor	0.80	0.95	0.85	
Suggested	U - 0.8	L - 0.95	0.85	
Truck to PCE Factor	Suggested = 2.00			2.00
Critical Lane Volume				1600
Equivalent Passenger Car Volume				
	Volume (pc/hr)			Approach
	U-Turn / Left	Through	Right	
Eastbound	62	398	0	460
Westbound	13	299	96	408
Northbound	8	6	29	43
Southbound	89	3	21	113
Notes:				
Left-turn Adjustment Factor	Conversion of left-turning vehicles to equivalent through vehicles			
Right-turn Adjustment Factor	Conversion of right-turning vehicles to equivalent through vehicles			
U-turn Adjustment Factor	Conversion of U-turning vehicles to equivalent through vehicles			
Truck to PCE Factor	1 truck = X Passenger Car Equivalents			
Critical Lane Volume Sum Limit	Saturation value for critical lane volume sum at an intersection			

VDOT Junction Screening Tool				
Possible Configurations				
Indicate with a "Y" or "N" if each intersection or interchange configuration should or should not be considered. Use the information links for guidance. Then, click the "Show/Hide Configurations button" to hide the worksheets for the configurations that will not be considered.				
#	Intersections	Information	Consider?	Justification
Signalized Intersections				
1	Conventional	-	Y	
2	Bowtie	Link	N	Not feasible for roadway facility type
3	Center Turn Overpass	Link	N	Not feasible for roadway facility type
4	Continuous Green-T	Link	N	Not feasible for roadway facility type
5	Echelon	Link	N	Not feasible for roadway facility type
6	Full Displaced Left Turn	Link	N	Right-of-way restrictions identified
7	Median U-Turn	Link	Y	
8	Partial Displaced Left Turn	Link	N	Right-of-way restrictions identified
9	Partial Median U-Turn	Link	N	Not feasible for roadway facility type
10	Quadrant Roadway N-E	Link	N	Right-of-way restrictions identified
11	Quadrant Roadway N-W	Link	N	Right-of-way restrictions identified
12	Quadrant Roadway S-E	Link	N	Right-of-way restrictions identified
13	Quadrant Roadway S-W	Link	N	Right-of-way restrictions identified
14	Restricted Crossing U-Turn	Link	N	Not feasible for roadway facility type
15	Single Loop	Link	N	Not feasible for roadway facility type
16	Split Intersection	Link	N	Not feasible for roadway facility type
17	Thru-Cut	Link	Y	
Unsignalized Intersections				
18	50 Mini Roundabout	Link	N	Unable to accommodate heavy vehicles
19	75 Mini Roundabout	Link	N	Unable to accommodate heavy vehicles
20	Roundabout	Link	Y	
21	Two-Way Stop Control	-	Y	
#	Interchanges	Information	Consider?	Justification
22	Traditional Diamond	Link	N	Not feasible for roadway facility type
23	Contraflow Left	Link	N	Not feasible for roadway facility type
24	Displaced Left Turn	Link	N	Not feasible for roadway facility type
25	Diverging Diamond	Link	N	Not feasible for roadway facility type
26	Double Roundabout	Link	N	Not feasible for roadway facility type
27	Michigan Urban Diamond	Link	N	Not feasible for roadway facility type
28	Partial Cloverleaf	Link	N	Not feasible for roadway facility type
29	Single Point	Link	N	Not feasible for roadway facility type
30	Single Roundabout	Link	N	Not feasible for roadway facility type

VDOT Junction Screening Tool		
Directional Questions and Base Lane Configurations		
Before entering a base number of through lanes for each direction, answer all applicable directional question for each intersection or interchange configuration selected for consideration. Navigate to the lane configuration worksheet for example diagrams, if provided.		
Intersections	Question	Direction
Bowtie	N/A	N/A
Continuous Green-T	N/A	N/A
Echelon	N/A	N/A
Median U-Turn	Select the roadway with the U-turns from the drop-down list.	EB-WB
Partial Displaced Left Turn	N/A	N/A
Partial Median U-Turn	N/A	N/A
Restricted Crossing U-Turn	N/A	N/A
Single Loop	N/A	N/A
Split Intersection	N/A	N/A
Thru-Cut	Select the roadway where through traffic is permitted from the drop-down list. See example diagrams.	EB-WB
Interchanges	Question	Direction
All	N/A	N/A
Base Number of Through Lanes		
Enter a base number of through lanes for each direction. The number of through lanes entered will populate on each non-roundabout lane configuration worksheet. This tool also allows the user to enter the number of through lanes on the lane configuration worksheets directly. This base number may be overwritten on individual lane configuration worksheets. Turn lanes, shared lanes, and channelized lanes must still be entered in each lane configuration worksheet.		
Eastbound	1	
Westbound	1	
Northbound	1	
Southbound	1	

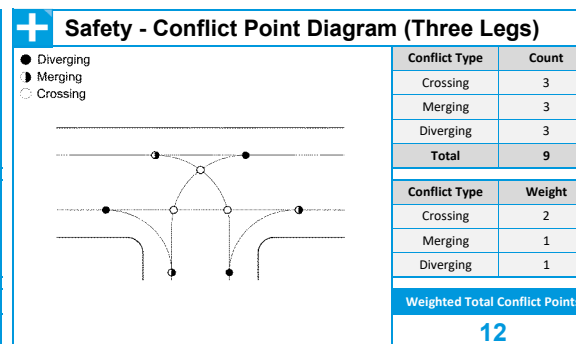
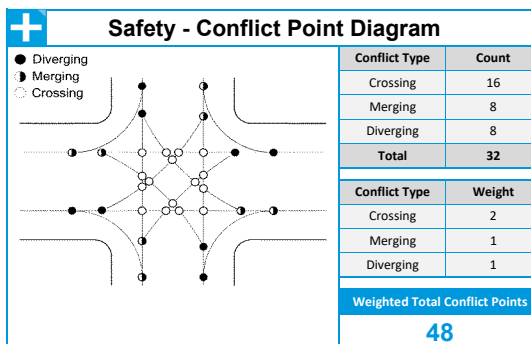
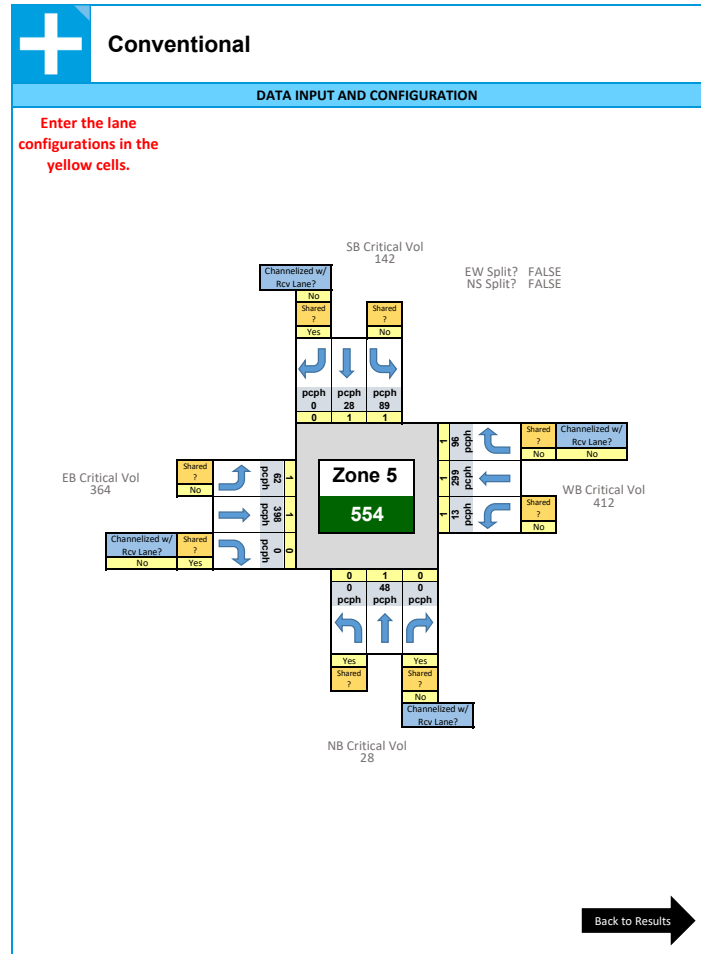
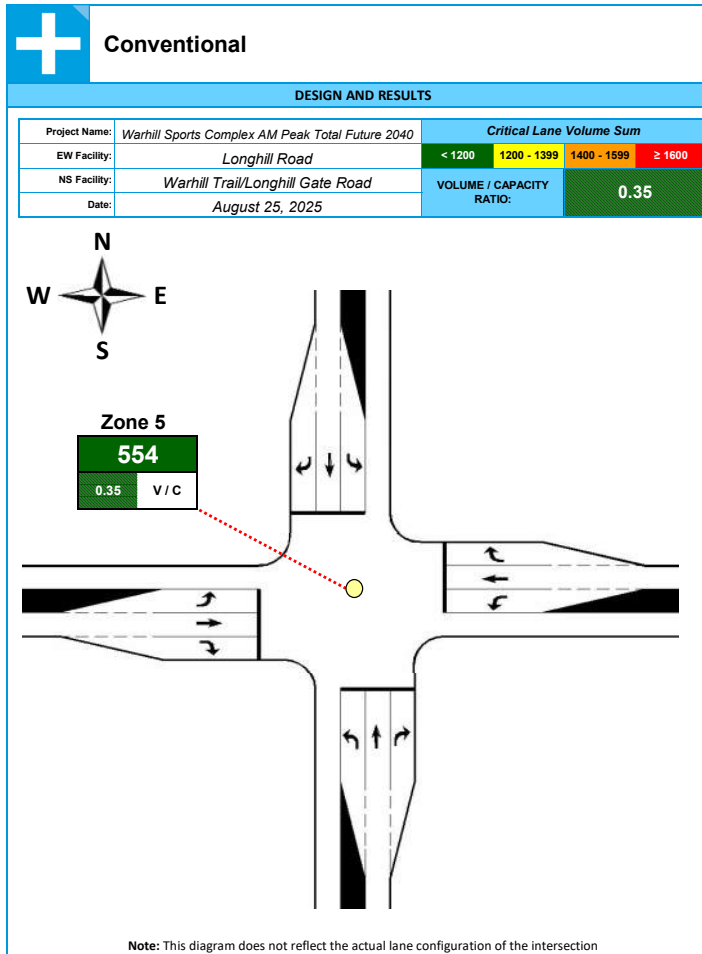
VDOT Junction Screening Tool																				
Results Worksheet																				
 VDOT Junction Screening Tool	<table border="1"> <thead> <tr> <th colspan="2">General Information</th> </tr> </thead> <tbody> <tr> <td>Project Title:</td> <td>Warhill Sports Complex AM Peak Total Future 2040</td> </tr> <tr> <td>EW Facility:</td> <td>Longhill Road</td> </tr> <tr> <td>NS Facility:</td> <td>Warhill Trail/Longhill Gate Road</td> </tr> <tr> <td>Date:</td> <td>August 25, 2025</td> </tr> </tbody> </table>	General Information		Project Title:	Warhill Sports Complex AM Peak Total Future 2040	EW Facility:	Longhill Road	NS Facility:	Warhill Trail/Longhill Gate Road	Date:	August 25, 2025									
	General Information																			
	Project Title:	Warhill Sports Complex AM Peak Total Future 2040																		
	EW Facility:	Longhill Road																		
	NS Facility:	Warhill Trail/Longhill Gate Road																		
Date:	August 25, 2025																			
<table border="1"> <thead> <tr> <th>Volumes (veh/hr)</th> <th>U-Turn / Left</th> <th>Through</th> <th>Right</th> </tr> </thead> <tbody> <tr> <td>Eastbound</td> <td>60</td> <td>388</td> <td>0</td> </tr> <tr> <td>Westbound</td> <td>12</td> <td>283</td> <td>91</td> </tr> <tr> <td>Northbound</td> <td>8</td> <td>6</td> <td>28</td> </tr> <tr> <td>Southbound</td> <td>88</td> <td>3</td> <td>21</td> </tr> </tbody> </table>	Volumes (veh/hr)	U-Turn / Left	Through	Right	Eastbound	60	388	0	Westbound	12	283	91	Northbound	8	6	28	Southbound	88	3	21
Volumes (veh/hr)	U-Turn / Left	Through	Right																	
Eastbound	60	388	0																	
Westbound	12	283	91																	
Northbound	8	6	28																	
Southbound	88	3	21																	
General Instructions: All intersection and interchange configurations have a default assumption of one exclusive lane per movement. No results shall be interpreted until the user has verified the lane configurations on each worksheet.																				

Intersection Results					
		Congestion	Pedestrian	Safety	Notes
Type	Dir	Maximum V/C	Accommodation Compared to Conventional	Weighted Total Conflict Points	
Conventional	-	0.35		48	
Median U-Turn	-	0.42	+	20	
Thru-Cut	-	0.33		28	
Roundabout	-	0.37		8	
Two-Way Stop Control	-	0.34		48	

*The continuous green-T is the only three-legged innovative intersection in this tool. To compare the continuous green-T to other innovative intersection conflicts corresponding with the fourth leg must be removed. This has been done for the conventional intersection. Conflict point diagrams for three-legged and four-legged conventional intersections have been provided on the conventional intersection worksheet for reference.

Interchange Results						
		Congestion		Pedestrian	Safety	Notes
Type	Dir	Maximum V/C	Accommodation Compared to Traditional Diamond	Weighted Total Conflict Points		

Information	
Congestion	The maximum v/c ratio represents the worst v/c of all zones that make up an intersection.
Pedestrian	Compares the potential of each design to accommodate pedestrians based on safety, wayfinding, and delay. Potential is qualitatively defined as better (+), similar (blank cell), or worse (-) than a conventional intersection or traditional diamond interchange.
Safety	Weighted Total = (2 x Crossing Conflicts) + Merging Conflicts + Diverging Conflicts



Median U-Turn Intersection

DESIGN AND RESULTS

Project Name: Warhill Sports Complex AM Peak Total Future 2		Critical Lane Volume Sum	
EW Facility:	Longhill Road	< 1200	1200 - 1399 1400 - 1599 ≥ 1600
NS Facility:	Warhill Trail/Longhill Gate Road	VOLUME / CAPACITY RATIO: 0.42	
Date:	August 25, 2025		

North arrow directions will appear once the directional question has been answered on the [Input Worksheet](#).

Zone 1

--
0.10 V / C

Zone 5

678
0.42 V / C

Zone 2

--
0.11 V / C

Note: This diagram does not reflect the actual lane configuration of the intersection

Median U-Turn Intersection

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.

Control Type (Zone 1)
Unsignalized

EB

pcph 0 398 62
3

Control Type (Zone 2)
Unsignalized

WB

pcph 70 1

Zone 5 must be signalized

Zone 5

678

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
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pcph 13 549
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pcph 13 549
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Control Type (Zone 1)
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pcph 13 549
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Control Type (Zone 2)
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WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

EB

pcph 13 549
1 1

Control Type (Zone 2)
Unsignalized

WB

pcph 13 299 96
2

Control Type (Zone 1)
Unsignalized

Thru-Cut

DESIGN AND RESULTS

Project Name:	Warhill Sports Complex AM Peak Total Future 2040	Critical Lane Volume Sum	
EW Facility:	Longhill Road	< 1200	1200 - 1399 1400 - 1599 ≥ 1600
NS Facility:	Warhill Trail/Longhill Gate Road	VOLUME / CAPACITY RATIO:	
Date:	August 25, 2025	0.33	

North arrow directions will appear once the directional question has been answered on the [Input Worksheet](#).

Zone 5

532

0.33 V / C

Note: This diagram does not reflect the actual lane configuration of the intersection

Thru-Cut

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.

SB

SB Critical Vol 120

Channelized w/ Rev Lane? No

EW Split? FALSE

NS Split? FALSE

WB

WB Critical Vol 412

Channelized w/ Rev Lane? No

EB

EB Critical Vol 364

Channelized w/ Rev Lane? No

NB

NB Critical Vol 12

Channelized w/ Rev Lane? No

Zone 5

532

[Back to Results](#)

Safety - Conflict Point Diagram

- Diverging
- Merging
- Crossing

Conflict Type	Count
Crossing	8
Merging	6
Diverging	6
Total	20

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

28

Assumptions

- Minor street through traffic does not need to re-enter the intersection from the major street to complete the desired movement. There are no u-turn crossover intersections on the major street.
- The original through volumes were split evenly to left-turns and right-turns.

Guidance

A thru-cut is a signalized intersection form best suited for location at which minor street through volumes are relatively low but overall minor street volumes are high enough to warrant a signal. Thru-Cuts are generally appropriate when the through volume on each minor street leg is less than 100 vehicles (per leg) in peak hour, but may be appropriate with minor street through volumes if the major street through volume is very high. This will often occur at locations where land uses served by each of the minor street legs are likely to generate only a small number of trips between them. VDOT envisions thru-cuts to predominantly be used as relatively low-cost improvements and not include the implementation of u-turn crossovers to facilitate minor street through movements. Thru-cuts will generally be implemented in locations where the surrounding road and/or driveway network already supports alternative routes for minor street through-movement trips. The following are additional design considerations for thru-cuts:

- The vehicular signal phasing does not accommodate a pedestrian crossing of the major street. A pedestrian phase -likely pedestrian only- is needed for designs including a major street pedestrian crossing. If the pedestrian phase is frequently actuated, then the operational benefits of the thru-cut will be diminished.
- Channelization is needed on the minor street to 1) align both left-turn movements so they can operate concurrently and 2) physically prevent through movements. This is similar to the channelization at an off-ramp at a single-point diamond interchange. Channelization may require some minor widening in the immediate vicinity of the intersection.
- Minor street right turns will generally be yield-controlled but could be signalized or stop-controlled.

The benefits of an unsignalized thru-cut are limited. The design would encourage concurrent minor street left turns and two-stage left turns with a stop in the median, which are not necessarily desirable. Additionally, minor street left-turn movements would still have conflict points with both directions of the major street.

Roundabout

DESIGN AND RESULTS

Project Name: **Warhill Sports Complex AM Peak Total Future 20** Critical Lane Volume Sum: **< 1200 1200 1309 1400 1509 ≥ 1600**

EW Facility: **Longhill Road**

NS Facility: **Warhill Trail/Longhill Gate Road**

Date: **August 25, 2025**

VOLUME / CAPACITY RATIO: **0.37**

Zone 1
Predicted approach capacity: Lane 1 0.11 V/C, Lane 2 V/C

Zone 2
Predicted approach capacity: Lane 1 0.05 V/C, Lane 2 V/C

Zone 3
Predicted approach capacity: Lane 1 0.37 V/C, Lane 2 V/C

Zone 4
Predicted approach capacity: Lane 1 0.32 V/C, Lane 2 V/C

Roundabout

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.

SB

Slip Lane?	Number of Entry Lanes	Slip Lane?
No	1	No

WB

Number of Circulating Lanes	Number of Circulating Lanes
1	1

NB

Number of Entry Lanes	Slip Lane?
1	No

EB

Number of Circulating Lanes	Number of Circulating Lanes
1	1

Back to Results

Roundabout

CAPACITY CALCULATIONS

SB

Through lane saturation flow	0.55
21	89
3	

WB

Lane Capacity	1	996
111	111	
0.11	1	

NB

Through lane saturation flow	0.55
6	29
8	

EB

Through lane saturation flow	0.55
62	86
0	

EQUATION: $A \times \exp(-B \times Q)$

Number of Entry Lanes	Number of Circulating Lanes	Lane	A	B
1	1	-	1380	0.00102
1	2	-	1420	0.00085
2	1	Left	1420	0.00091
2	1	Right	1420	0.00091
2	2	Left	1350	0.00092
2	2	Right	1420	0.00085

Safety - Conflict Point Diagram

Conflict Type	Count
Crossing	0
Merging	4
Diverging	4
Total	8

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points
8

Assumptions

- The number of circulating lanes in one quadrant is assumed to be equal to the number of exiting lanes in the next quadrant.
- The roundabout is limited to a maximum of two entry lanes and two circulating lanes.
- All left-turning vehicles are assumed to stay in the innermost lane until exiting the roundabout.
- This worksheet does not use the CLV methodology. The calculations are based on the HCM 6th Edition.

Two-Way Stop Control (TWSC)

DESIGN AND RESULTS

Project Name:	Warhill Sports Complex AM Peak Total Future 2040	Critical Lane Volume Sum	< 1200 1200 - 1339 1400 - 1599 ≥ 1600
Site Facility:	Longhill Road	VOLUME / CAPACITY	0.34
Site Facility:	Warhill Trail/Longhill Gate Road	RATIO:	
Date:	August 25, 2025		

Note: This diagram does not reflect the actual lane configuration of the intersection.

Two-Way Stop Control (TWSC)

DATA INPUT AND CONFIGURATION

Step 1: Identify which approaches are stop-controlled by selecting "Yes" from the drop-down box.

Step 2: Enter the lane configurations in the yellow cells.

Back to Results

Two-Way Stop Control (TWSC)

HCM 6 CALCULATIONS

Approach	Volume	Stop	Priority	Rank	Flow Rates	Lanes	Stalled?	Stop and Start?	Truck %
1	1000	2	1	1	1000	1	No	No	0.00%
2	1000	2	1	1	1000	1	No	No	0.00%
3	1000	2	1	1	1000	1	No	No	0.00%
4	1000	2	1	1	1000	1	No	No	0.00%
5	1000	2	1	1	1000	1	No	No	0.00%
6	1000	2	1	1	1000	1	No	No	0.00%
7	1000	2	1	1	1000	1	No	No	0.00%
8	1000	2	1	1	1000	1	No	No	0.00%
9	1000	2	1	1	1000	1	No	No	0.00%
10	1000	2	1	1	1000	1	No	No	0.00%
11	1000	2	1	1	1000	1	No	No	0.00%
12	1000	2	1	1	1000	1	No	No	0.00%
13	1000	2	1	1	1000	1	No	No	0.00%
14	1000	2	1	1	1000	1	No	No	0.00%
15	1000	2	1	1	1000	1	No	No	0.00%
16	1000	2	1	1	1000	1	No	No	0.00%
17	1000	2	1	1	1000	1	No	No	0.00%
18	1000	2	1	1	1000	1	No	No	0.00%
19	1000	2	1	1	1000	1	No	No	0.00%
20	1000	2	1	1	1000	1	No	No	0.00%
21	1000	2	1	1	1000	1	No	No	0.00%
22	1000	2	1	1	1000	1	No	No	0.00%
23	1000	2	1	1	1000	1	No	No	0.00%
24	1000	2	1	1	1000	1	No	No	0.00%
25	1000	2	1	1	1000	1	No	No	0.00%
26	1000	2	1	1	1000	1	No	No	0.00%
27	1000	2	1	1	1000	1	No	No	0.00%
28	1000	2	1	1	1000	1	No	No	0.00%
29	1000	2	1	1	1000	1	No	No	0.00%
30	1000	2	1	1	1000	1	No	No	0.00%
31	1000	2	1	1	1000	1	No	No	0.00%
32	1000	2	1	1	1000	1	No	No	0.00%
33	1000	2	1	1	1000	1	No	No	0.00%
34	1000	2	1	1	1000	1	No	No	0.00%
35	1000	2	1	1	1000	1	No	No	0.00%
36	1000	2	1	1	1000	1	No	No	0.00%
37	1000	2	1	1	1000	1	No	No	0.00%
38	1000	2	1	1	1000	1	No	No	0.00%
39	1000	2	1	1	1000	1	No	No	0.00%
40	1000	2	1	1	1000	1	No	No	0.00%
41	1000	2	1	1	1000	1	No	No	0.00%
42	1000	2	1	1	1000	1	No	No	0.00%
43	1000	2	1	1	1000	1	No	No	0.00%
44	1000	2	1	1	1000	1	No	No	0.00%
45	1000	2	1	1	1000	1	No	No	0.00%
46	1000	2	1	1	1000	1	No	No	0.00%
47	1000	2	1	1	1000	1	No	No	0.00%
48	1000	2	1	1	1000	1	No	No	0.00%
49	1000	2	1	1	1000	1	No	No	0.00%
50	1000	2	1	1	1000	1	No	No	0.00%
51	1000	2	1	1	1000	1	No	No	0.00%
52	1000	2	1	1	1000	1	No	No	0.00%
53	1000	2	1	1	1000	1	No	No	0.00%
54	1000	2	1	1	1000	1	No	No	0.00%
55	1000	2	1	1	1000	1	No	No	0.00%
56	1000	2	1	1	1000	1	No	No	0.00%
57	1000	2	1	1	1000	1	No	No	0.00%
58	1000	2	1	1	1000	1	No	No	0.00%
59	1000	2	1	1	1000	1	No	No	0.00%
60	1000	2	1	1	1000	1	No	No	0.00%
61	1000	2	1	1	1000	1	No	No	0.00%
62	1000	2	1	1	1000	1	No	No	0.00%
63	1000	2	1	1	1000	1	No	No	0.00%
64	1000	2	1	1	1000	1	No	No	0.00%
65	1000	2	1	1	1000	1	No	No	0.00%
66	1000	2	1	1	1000	1	No	No	0.00%
67	1000	2	1	1	1000	1	No	No	0.00%
68	1000	2	1	1	1000	1	No	No	0.00%
69	1000	2	1	1	1000	1	No	No	0.00%
70	1000	2	1	1	1000	1	No	No	0.00%
71	1000	2	1	1	1000	1	No	No	0.00%
72	1000	2	1	1	1000	1	No	No	0.00%
73	1000	2	1	1	1000	1	No	No	0.00%
74	1000	2	1	1	1000	1	No	No	0.00%
75	1000	2	1	1	1000	1	No	No	0.00%
76	1000	2	1	1	1000	1	No	No	0.00%
77	1000	2	1	1	1000	1	No	No	0.00%
78	1000	2	1	1	1000	1	No	No	0.00%
79	1000	2	1	1	1000	1	No	No	0.00%
80	1000	2	1	1	1000	1	No	No	0.00%
81	1000	2	1	1	1000	1	No	No	0.00%
82	1000	2	1	1	1000	1	No	No	0.00%
83	1000	2	1	1	1000	1	No	No	0.00%
84	1000	2	1	1	1000	1	No	No	0.00%
85	1000	2	1	1	1000	1	No	No	0.00%
86	1000	2	1	1	1000	1	No	No	0.00%
87	1000	2	1	1	1000	1	No	No	0.00%
88	1000	2	1	1	1000	1	No	No	0.00%
89	1000	2	1	1	1000	1	No	No	0.00%
90	1000	2	1	1	1000	1	No	No	0.00%
91	1000	2	1	1	1000	1	No	No	0.00%
92	1000	2	1	1	1000	1	No	No	0.00%
93	1000	2	1	1	1000	1	No	No	0.00%
94	1000	2	1	1	1000	1	No	No	0.00%
95	1000	2	1	1	1000	1	No	No	0.00%
96	1000	2	1	1	1000	1	No	No	0.00%
97	1000	2	1	1	1000	1	No	No	0.00%
98	1000	2	1	1	1000	1	No	No	0.00%
99	1000	2	1	1	1000	1	No	No	0.00%
100	1000	2	1	1	1000	1	No	No	0.00%

Safety - Conflict Point Diagram

Conflict Type	Count
Crossing	16
Merging	8
Diverging	8
Total	32

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

48

Assumptions

• This worksheet does not use the Cfr methodology. The calculations are based on the HCM, 6th Edition. The calculations are based on vehicles per hour.

VDOT Junction Screening Tool

7

VDOT Junction Screening Tool				
Input Worksheet				
Project Title:	Warhill Sports Complex PM Peak Total Future 2040			
E-W Facility:	Longhill Road			
N-S Facility:	Warhill Trail/Longhill Gate Road			
Date:	August 25, 2025			
Traffic Volume Demand				
Direction	Volume (veh/hr)			Truck Percent (%)
	U-Turn / Left	Through	Right	
Eastbound	156	424	9	2.90%
Westbound	27	473	241	2.20%
Northbound	7	6	17	0.00%
Southbound	156	12	104	0.00%
Adjustment Factor	0.80	0.95	0.85	
Suggested	U - 0.8	L - 0.95	0.85	
Truck to PCE Factor	Suggested = 2.00			2.00
Critical Lane Volume	1600			
Equivalent Passenger Car Volume				
Direction	Volume (pc/hr)			Approach
	U-Turn / Left	Through	Right	
Eastbound	161	436	9	606
Westbound	28	483	246	757
Northbound	7	6	17	30
Southbound	156	12	104	272
Notes:				
Left-turn Adjustment Factor	Conversion of left-turning vehicles to equivalent through vehicles			
Right-turn Adjustment Factor	Conversion of right-turning vehicles to equivalent through vehicles			
U-turn Adjustment Factor	Conversion of U-turning vehicles to equivalent through vehicles			
Truck to PCE Factor	1 truck = X Passenger Car Equivalents			
Critical Lane Volume Sum Limit	Saturation value for critical lane volume sum at an intersection			

VDOT Junction Screening Tool				
Possible Configurations				
Indicate with a "Y" or "N" if each intersection or interchange configuration should or should not be considered. Use the information links for guidance. Then, click the "Show/Hide Configurations button" to hide the worksheets for the configurations that will not be considered.				
#	Intersections	Information	Consider?	Justification
Signalized Intersections				
1	Conventional	-	Y	
2	Bowtie	Link	N	Not feasible for roadway facility type
3	Center Turn Overpass	Link	N	Not feasible for roadway facility type
4	Continuous Green-T	Link	N	Not feasible for roadway facility type
5	Echelon	Link	N	Not feasible for roadway facility type
6	Full Displaced Left Turn	Link	N	Right-of-way restrictions identified
7	Median U-Turn	Link	Y	
8	Partial Displaced Left Turn	Link	N	Right-of-way restrictions identified
9	Partial Median U-Turn	Link	N	Not feasible for roadway facility type
10	Quadrant Roadway N-E	Link	N	Right-of-way restrictions identified
11	Quadrant Roadway N-W	Link	N	Right-of-way restrictions identified
12	Quadrant Roadway S-E	Link	N	Right-of-way restrictions identified
13	Quadrant Roadway S-W	Link	N	Right-of-way restrictions identified
14	Restricted Crossing U-Turn	Link	N	Not feasible for roadway facility type
15	Single Loop	Link	N	Not feasible for roadway facility type
16	Split Intersection	Link	N	Not feasible for roadway facility type
17	Thru-Cut	Link	Y	
Unsignalized Intersections				
18	50 Mini Roundabout	Link	N	Unable to accommodate heavy vehicles
19	75 Mini Roundabout	Link	N	Unable to accommodate heavy vehicles
20	Roundabout	Link	Y	
21	Two-Way Stop Control	-	Y	
#	Interchanges	Information	Consider?	Justification
22	Traditional Diamond	Link	N	Not feasible for roadway facility type
23	Contraflow Left	Link	N	Not feasible for roadway facility type
24	Displaced Left Turn	Link	N	Not feasible for roadway facility type
25	Diverging Diamond	Link	N	Not feasible for roadway facility type
26	Double Roundabout	Link	N	Not feasible for roadway facility type
27	Michigan Urban Diamond	Link	N	Not feasible for roadway facility type
28	Partial Cloverleaf	Link	N	Not feasible for roadway facility type
29	Single Point	Link	N	Not feasible for roadway facility type
30	Single Roundabout	Link	N	Not feasible for roadway facility type

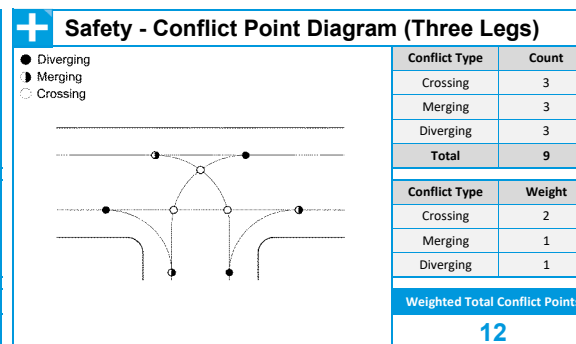
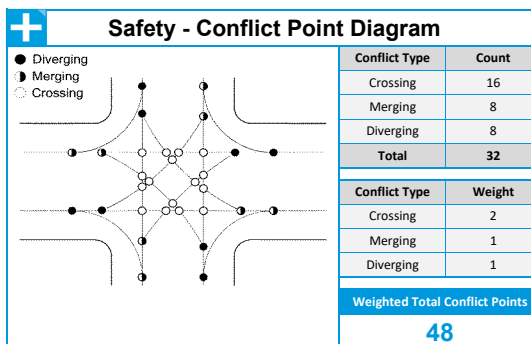
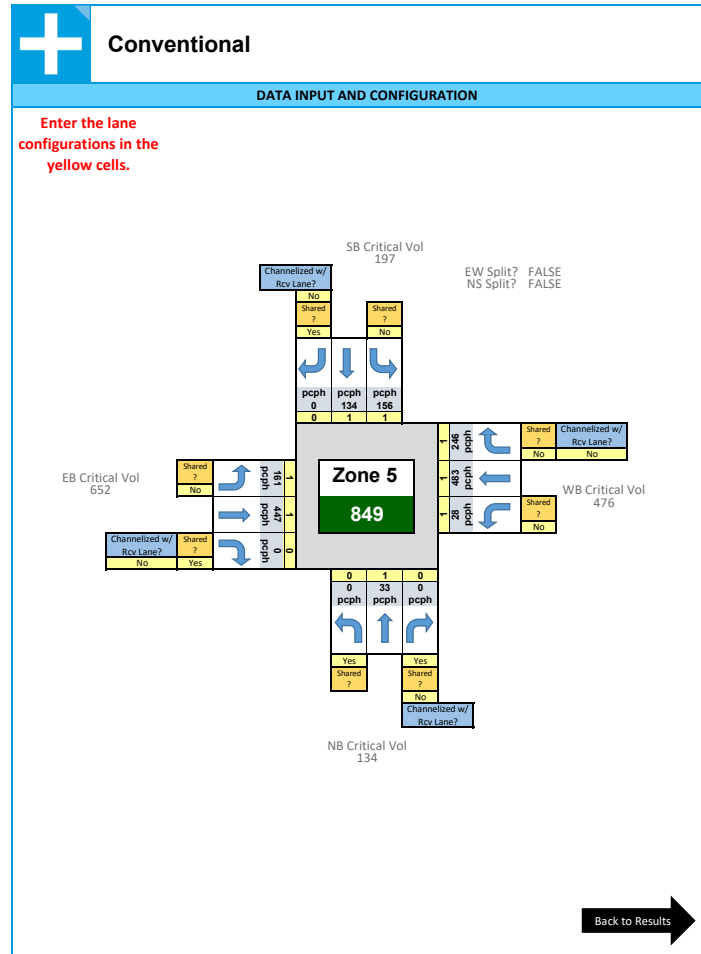
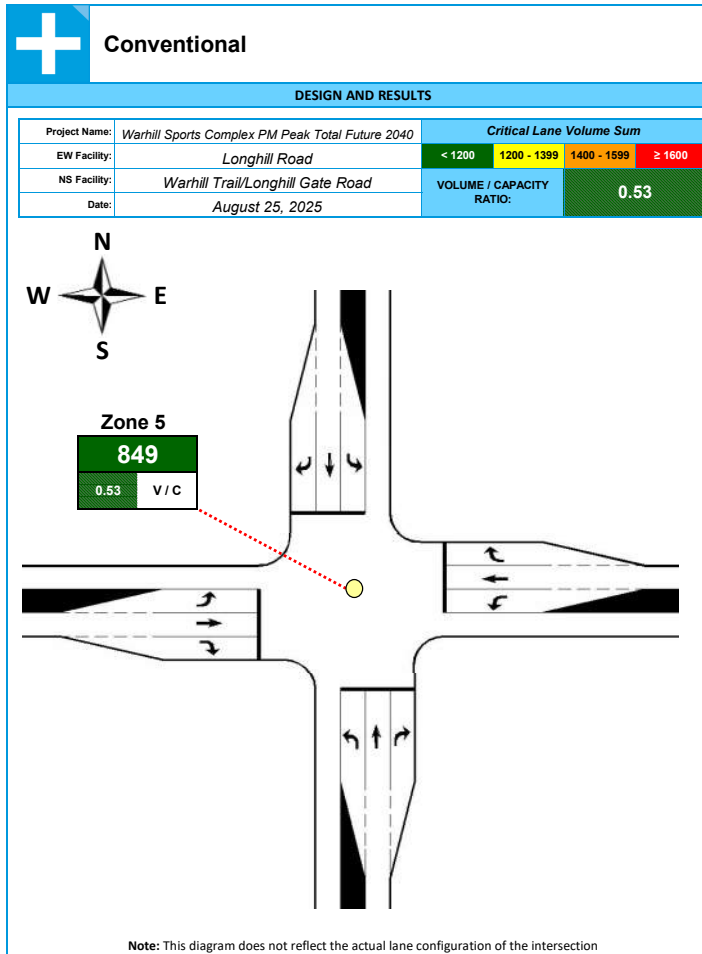
VDOT Junction Screening Tool		
Directional Questions and Base Lane Configurations		
Before entering a base number of through lanes for each direction, answer all applicable directional question for each intersection or interchange configuration selected for consideration. Navigate to the lane configuration worksheet for example diagrams, if provided.		
Intersections	Question	Direction
Bowtie	N/A	N/A
Continuous Green-T	N/A	N/A
Echelon	N/A	N/A
Median U-Turn	Select the roadway with the U-turns from the drop-down list.	EB-WB
Partial Displaced Left Turn	N/A	N/A
Partial Median U-Turn	N/A	N/A
Restricted Crossing U-Turn	N/A	N/A
Single Loop	N/A	N/A
Split Intersection	N/A	N/A
Thru-Cut	Select the roadway where through traffic is permitted from the drop-down list. See example diagrams.	EB-WB
Interchanges	Question	Direction
All	N/A	N/A
Base Number of Through Lanes		
Enter a base number of through lanes for each direction. The number of through lanes entered will populate on each non-roundabout lane configuration worksheet. This tool also allows the user to enter the number of through lanes on the lane configuration worksheets directly. This base number may be overwritten on individual lane configuration worksheets. Turn lanes, shared lanes, and channelized lanes must still be entered in each lane configuration worksheet.		
Eastbound	1	
Westbound	1	
Northbound	1	
Southbound	1	

VDOT Junction Screening Tool																				
Results Worksheet																				
 VDOT Junction Screening Tool	<table border="1"> <thead> <tr> <th colspan="2">General Information</th> </tr> </thead> <tbody> <tr> <td>Project Title:</td> <td>Warhill Sports Complex PM Peak Total Future 2040</td> </tr> <tr> <td>EW Facility:</td> <td>Longhill Road</td> </tr> <tr> <td>NS Facility:</td> <td>Warhill Trail/Longhill Gate Road</td> </tr> <tr> <td>Date:</td> <td>August 25, 2025</td> </tr> </tbody> </table>	General Information		Project Title:	Warhill Sports Complex PM Peak Total Future 2040	EW Facility:	Longhill Road	NS Facility:	Warhill Trail/Longhill Gate Road	Date:	August 25, 2025									
	General Information																			
	Project Title:	Warhill Sports Complex PM Peak Total Future 2040																		
	EW Facility:	Longhill Road																		
	NS Facility:	Warhill Trail/Longhill Gate Road																		
Date:	August 25, 2025																			
<table border="1"> <thead> <tr> <th>Volumes (veh/hr)</th> <th>U-Turn / Left</th> <th>Through</th> <th>Right</th> </tr> </thead> <tbody> <tr> <td>Eastbound</td> <td>156</td> <td>424</td> <td>9</td> </tr> <tr> <td>Westbound</td> <td>27</td> <td>473</td> <td>241</td> </tr> <tr> <td>Northbound</td> <td>7</td> <td>6</td> <td>17</td> </tr> <tr> <td>Southbound</td> <td>156</td> <td>12</td> <td>104</td> </tr> </tbody> </table>	Volumes (veh/hr)	U-Turn / Left	Through	Right	Eastbound	156	424	9	Westbound	27	473	241	Northbound	7	6	17	Southbound	156	12	104
Volumes (veh/hr)	U-Turn / Left	Through	Right																	
Eastbound	156	424	9																	
Westbound	27	473	241																	
Northbound	7	6	17																	
Southbound	156	12	104																	
General Instructions: All intersection and interchange configurations have a default assumption of one exclusive lane per movement. No results shall be interpreted until the user has verified the lane configurations on each worksheet.																				

Intersection Results					
		Congestion	Pedestrian	Safety	Notes
Type	Dir	Maximum V/C	Accommodation Compared to Conventional	Weighted Total Conflict Points	
Conventional	-	0.53		48	
Median U-Turn	-	0.66	+	20	
Thru-Cut	-	0.51		28	
Roundabout	-	0.66		8	
Two-Way Stop Control	-	1.37		48	
*The continuous green-T is the only three-legged innovative intersection in this tool. To compare the continuous green-T to other innovative intersections, conflicts corresponding with the fourth leg must be removed. This has been done for the conventional intersection. Conflict point diagrams for three-legged and four-legged conventional intersections have been provided on the conventional intersection worksheet for reference.					

Interchange Results					
		Congestion	Pedestrian	Safety	Notes
Type	Dir	Maximum V/C	Accommodation Compared to Traditional Diamond	Weighted Total Conflict Points	

Information	
Congestion	The maximum v/c ratio represents the worst v/c of all zones that make up an intersection.
Pedestrian	Compares the potential of each design to accommodate pedestrians based on safety, wayfinding, and delay. Potential is qualitatively defined as better (+), similar (blank cell), or worse (-) than a conventional intersection or traditional diamond interchange.
Safety	Weighted Total = (2 x Crossing Conflicts) + Merging Conflicts + Diverging Conflicts



Median U-Turn Intersection

DESIGN AND RESULTS

Project Name: Warhill Sports Complex PM Peak Total Future 2		Critical Lane Volume Sum	
EW Facility:	Longhill Road	< 1200	1200 - 1399
NS Facility:	Warhill Trail/Longhill Gate Road	1400 - 1599	≥ 1600
Date:	August 25, 2025	VOLUME / CAPACITY RATIO:	0.66

North arrow directions will appear once the directional question has been answered on the [Input Worksheet](#).

Zone 1

--
0.19
V / C

Zone 5

1059
0.66
V / C

Zone 2

--
0.23
V / C

Note: This diagram does not reflect the actual lane configuration of the intersection

Median U-Turn Intersection

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.

EB

pcph	pcph	pcph
9	436	161
3		

Control Type (Zone 1)
Unsignalized

Channelized w/ Rcv Lane? ☐ No

Shared? ☐ No

EB

pcph	pcph
37	753
1	

SB Critical Vol 518

Zone 5 must be signalized

NB

pcph	pcph
7	46
0	

Channelized w/ Rcv Lane? ☐ No

Shared? ☐ Yes

EW Split? FALSE

NS Split? FALSE

EB Critical Vol 306

Control Type (Zone 2)
Unsignalized

Zone 1

--
184
1

Zone 5

1059
518
407

Channelized w/ Rcv Lane? ☐ No

Shared? ☐ No

WB Critical Vol 26

WB

pcph	pcph
188	246
2	

NB Critical Vol 753

Channelized w/ Rcv Lane? ☐ No

Shared? ☐ No

WB

pcph	pcph
28	453
2	

[Back to Results](#)

Safety - Conflict Point Diagram

● Diverging

● Merging

○ Crossing

Conflict Type	Count
Crossing	4
Merging	6
Diverging	6
Total	16

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1
Weighted Total Conflict Points	20

Assumptions

- This worksheet uses the CLV methodology for calculations at signalized zones. These calculations are based on passenger cars per hour.
- This worksheet uses the HCM, 6th Edition methodology for calculations at unsignalized zones. These calculations are based on vehicles per hour.

Thru-Cut

DESIGN AND RESULTS

Project Name:	Warhill Sports Complex PM Peak Total Future 2040	Critical Lane Volume Sum	
EW Facility:	Longhill Road	< 1200	1200 - 1399 1400 - 1599 ≥ 1600
NS Facility:	Warhill Trail/Longhill Gate Road	VOLUME / CAPACITY RATIO:	
Date:	August 25, 2025	0.51	

North arrow directions will appear once the directional question has been answered on the [Input Worksheet](#).

Zone 5

823

0.51 V / C

Note: This diagram does not reflect the actual lane configuration of the intersection

Thru-Cut

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.

SB Critical Vol 171
Channelized w/ Rev Lane? No
EW Split? FALSE
NS Split? FALSE

WB Critical Vol 476
Channelized w/ Rev Lane? No
Shared? No

EB Critical Vol 652
Channelized w/ Rev Lane? No
Shared? No

NB Critical Vol 11
Channelized w/ Rev Lane? No

Zone 5 823

Back to Results

Safety - Conflict Point Diagram

- Diverging
- Merging
- Crossing

Conflict Type	Count
Crossing	8
Merging	6
Diverging	6
Total	20

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points

28

Assumptions

- Minor street through traffic does not need to re-enter the intersection from the major street to complete the desired movement. There are no u-turn crossover intersections on the major street.
- The original through volumes were split evenly to left-turns and right-turns.

Guidance

A thru-cut is a signalized intersection form best suited for location at which minor street through volumes are relatively low but overall minor street volumes are high enough to warrant a signal. Thru-Cuts are generally appropriate when the through volume on each minor street leg is less than 100 vehicles (per leg) in peak hour, but may be appropriate with minor street through volumes if the major street through volume is very high. This will often occur at locations where land uses served by each of the minor street legs are likely to generate only a small number of trips between them. VDOT envisions thru-cuts to predominantly be used as relatively low-cost improvements and not include the implementation of u-turn crossovers to facilitate minor street through movements. Thru-cuts will generally be implemented in locations where the surrounding road and/or driveway network already supports alternative routes for minor street through-movement trips. The following are additional design considerations for thru-cuts:

- The vehicular signal phasing does not accommodate a pedestrian crossing of the major street. A pedestrian phase -likely pedestrian only- is needed for designs including a major street pedestrian crossing. If the pedestrian phase is frequently actuated, then the operational benefits of the thru-cut will be diminished.
- Channelization is needed on the minor street to 1) align both left-turn movements so they can operate concurrently and 2) physically prevent through movements. This is similar to the channelization at an off-ramp at a single-point diamond interchange. Channelization may require some minor widening in the immediate vicinity of the intersection.
- Minor street right turns will generally be yield-controlled but could be signalized or stop-controlled.

The benefits of an unsignalized thru-cut are limited. The design would encourage concurrent minor street left turns and two-stage left turns with a stop in the median, which are not necessarily desirable. Additionally, minor street left-turn movements would still have conflict points with both directions of the major street.

Roundabout

DESIGN AND RESULTS

Project Name: **rhil Sports Complex PM Peak Total Future 20** Critical Lane Volume Sum
 EW Facility: **Longhill Road** **< 1200 1200 1399 1400 1409 ≥ 1400**
 NS Facility: **Warhill Trail/Longhill Gate Road** VOLUME / CAPACITY RATIO: **0.66**
 Date: **August 25, 2025**

Zone 1
 Predicted approach capacity
 Lane 1 0.33 V/C
 Lane 2 V/C

Zone 4
 Predicted approach capacity
 Lane 1 0.66 V/C
 Lane 2 V/C

Zone 3
 Predicted approach capacity
 Lane 1 0.54 V/C
 Lane 2 V/C

Zone 2
 Predicted approach capacity
 Lane 1 0.05 V/C
 Lane 2 V/C

Roundabout

DATA INPUT AND CONFIGURATION

Enter the lane configurations in the yellow cells.

SB

Slip Lane?	Number of Entry Lanes	Slip Lane?
No	1	No

WB

Slip Lane?	Number of Entry Lanes	Slip Lane?
No	1	No

NB

Slip Lane?	Number of Entry Lanes	Slip Lane?
No	1	No

EB

Slip Lane?	Number of Entry Lanes	Slip Lane?
No	1	No

Back to Results

Roundabout

CAPACITY CALCULATIONS

SB

Through Lane	Through Lane Capacity	Through Lane V/C Ratio
104	156	0.66

WB

Through Lane	Through Lane Capacity	Through Lane V/C Ratio
104	156	0.66

NB

Through Lane	Through Lane Capacity	Through Lane V/C Ratio
104	156	0.66

EB

Through Lane	Through Lane Capacity	Through Lane V/C Ratio
104	156	0.66

EQUATION: $A \times \exp(-B \times Q)$

Number of Entry Lanes	Number of Circulating Lanes	Lane	A	B
1	1	-	1380	0.00102
1	2	-	1420	0.00085
2	1	Left	1420	0.00091
2	1	Right	1420	0.00091
2	2	Left	1350	0.00092
2	2	Right	1420	0.00085

Safety - Conflict Point Diagram

Conflict Type	Count
Crossing	0
Merging	4
Diverging	4
Total	8

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points
8

Assumptions

- The number of circulating lanes in one quadrant is assumed to be equal to the number of exiting lanes in the next quadrant.
- The roundabout is limited to a maximum of two entry lanes and two circulating lanes.
- All left-turning vehicles are assumed to stay in the innermost lane until exiting the roundabout.
- This worksheet does not use the CLV methodology. The calculations are based on the HCM 6th Edition.

Safety - Conflict Point Diagram

- Diverging
- Merging
- Crossing

Conflict Type	Count
Crossing	16
Merging	8
Diverging	8
Total	32

Conflict Type	Weight
Crossing	2
Merging	1
Diverging	1

Weighted Total Conflict Points
48

● This worksheet does not take into account vehicle types or vehicle sizes. It is based on the HCM 2000 vehicle per hour.

assumptions

use the CSR methodology. The calculations
edition. The calculations are based on

[illegible]

Appendix C

Two-way Stop Control Analysis Results

2040 Future AM Peak

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	388	0	12	283	91	8	6	28	88	3	21
Future Volume (Veh/h)	60	388	0	12	283	91	8	6	28	88	3	21
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	422	0	13	308	99	9	7	30	96	3	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	407			422			910	985	422	920	886	308
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	407			422			910	985	422	920	886	308
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.0	3.4
p0 queue free %	94			99			96	97	95	57	99	97
cM capacity (veh/h)	1163			1096			221	233	636	224	266	723
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	65	422	13	308	99	46	96	26				
Volume Left	65	0	13	0	0	9	96	0				
Volume Right	0	0	0	0	99	30	0	23				
cSH	1163	1700	1096	1700	1700	390	224	604				
Volume to Capacity	0.06	0.25	0.01	0.18	0.06	0.12	0.43	0.04				
Queue Length 95th (ft)	4	0	1	0	0	10	50	3				
Control Delay (s)	8.3	0.0	8.3	0.0	0.0	15.5	32.6	11.2				
Lane LOS	A		A			C	D	B				
Approach Delay (s)	1.1		0.3			15.5	28.0					
Approach LOS						C	D					
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			45.3%		ICU Level of Service			A				
Analysis Period (min)			15									

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	48	28	12	59	82	52
Average Queue (ft)	14	3	1	24	37	16
95th Queue (ft)	38	16	6	49	69	42
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	L	L	T	R	LT	R	L	LT
Maximum Queue (ft)	37	123	422	290	198	212	228	33	177	203	10	85
Average Queue (ft)	7	45	223	52	104	130	83	3	67	91	1	24
95th Queue (ft)	27	97	353	182	178	199	193	16	132	165	5	66
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)			2	0		0	0					0
Queuing Penalty (veh)			3	1		0	0					0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	33
Average Queue (ft)	1
95th Queue (ft)	17
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

2040 Total Future PM Peak

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	424	9	27	473	241	7	6	17	156	12	104
Future Volume (Veh/h)	156	424	9	27	473	241	7	6	17	156	12	104
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	170	461	10	29	514	262	8	7	18	170	13	113
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	776			471			1498	1640	466	1394	1383	514
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	776			471			1498	1640	466	1394	1383	514
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	80			97			87	91	97	0	88	80
cM capacity (veh/h)	849			1101			62	79	601	90	113	564
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2				
Volume Total	170	471	29	514	262	33	170	126				
Volume Left	170	0	29	0	0	8	170	0				
Volume Right	0	10	0	0	262	18	0	113				
cSH	849	1700	1101	1700	1700	133	90	400				
Volume to Capacity	0.20	0.28	0.03	0.30	0.15	0.25	1.88	0.32				
Queue Length 95th (ft)	19	0	2	0	0	23	360	33				
Control Delay (s)	10.3	0.0	8.4	0.0	0.0	40.8	513.9	18.1				
Lane LOS	B		A			E	F	C				
Approach Delay (s)	2.7		0.3			40.8	302.9					
Approach LOS						E	F					
Intersection Summary												
Average Delay	52.4											
Intersection Capacity Utilization	58.8%			ICU Level of Service					B			
Analysis Period (min)	15											

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	L	TR
Maximum Queue (ft)	99	26	40	57	291	436
Average Queue (ft)	42	7	5	19	171	133
95th Queue (ft)	79	25	24	45	331	460
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)					11	7
Queuing Penalty (veh)					13	11

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	75	203	402	270	174	240	364	132	154	268	45	91
Average Queue (ft)	17	71	206	39	76	112	184	15	60	115	7	26
95th Queue (ft)	51	148	342	133	154	196	335	89	119	212	27	66
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	2	0	0	0	7	0				0
Queuing Penalty (veh)		0	4	0	0	0	2	0				0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	69
Average Queue (ft)	7
95th Queue (ft)	33
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

2040 Future Saturday

1: Longhill Gate Road/Warhill Trail & Longhill Road

HCM Unsignalized Intersection Capacity Analysis

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	
Lane Configurations													
Traffic Volume (veh/h)	36	315	10	13	305	128	7	2	28	3	171	5	
Future Volume (Veh/h)	36	315	10	13	305	128	7	2	28	3	171	5	
Sign Control	Free				Free				Stop				
Grade	0%				0%				0%				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	39	342	11	14	332	139	8	2	30	0	186	5	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None						None						
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked											0.00		
vC, conflicting volume	471			353			851	924	348	0	811	791	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	471			353			851	924	348	0	811	791	
tC, single (s)	4.1			4.1			7.1	6.5	6.2	0.0	7.1	6.5	
tC, 2 stage (s)													
tF (s)	2.2			2.2			3.5	4.0	3.3	0.0	3.5	4.0	
p0 queue free %	96			99			97	99	96	0	33	98	
cM capacity (veh/h)	1101			1217			245	259	700	0	276	309	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2					
Volume Total	39	353	14	332	139	40	186	68					
Volume Left	39	0	14	0	0	8	186	0					
Volume Right	0	11	0	0	139	30	0	63					
cSH	1101	1700	1217	1700	1700	481	276	652					
Volume to Capacity	0.04	0.21	0.01	0.20	0.08	0.08	0.67	0.10					
Queue Length 95th (ft)	3	0	1	0	0	7	111	9					
Control Delay (s)	8.4	0.0	8.0	0.0	0.0	13.2	41.4	11.2					
Lane LOS	A			A			B	E	B				
Approach Delay (s)	0.8			0.2			13.2	33.3					
Approach LOS							B	D					
Intersection Summary													
Average Delay			8.1										
Intersection Capacity Utilization			46.8%		ICU Level of Service				A				
Analysis Period (min)			15										

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	WB	WB	NB	SB	SB
Directions Served	L	L	R	LTR	UL	TR
Maximum Queue (ft)	34	24	7	49	124	56
Average Queue (ft)	10	3	0	20	60	26
95th Queue (ft)	31	17	6	45	100	48
Link Distance (ft)				701		1590
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225	280	255		315	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	R	UL	L	T	R	LT	R	L	LT
Maximum Queue (ft)	134	365	821	290	258	523	483	65	1116	1118	47	118
Average Queue (ft)	41	151	375	42	184	262	142	4	932	1003	6	37
95th Queue (ft)	99	340	790	185	281	544	436	36	1556	1444	27	91
Link Distance (ft)			1322			1150	1150		1094	1094		426
Upstream Blk Time (%)			1			0	0		78	80		
Queuing Penalty (veh)			0			0	1		0	0		
Storage Bay Dist (ft)	365	365		290	260			230			115	
Storage Blk Time (%)		0	20	0	1	11	2	0			0	0
Queuing Penalty (veh)		1	33	1	1	32	0	0			0	0

Intersection: 2: Opportunity Way /Southern Mall Access & Centerville Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	99
Average Queue (ft)	6
95th Queue (ft)	41
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	115
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Appendix D

Conventional Signal Analysis Results

2040 Future AM Peak
1: Longhill Gate Road/Warhill Trail & Longhill Road

Conventional Signal
Queues

								
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	65	422	13	308	99	46	96	26
v/c Ratio	0.15	0.55	0.05	0.58	0.18	0.17	0.31	0.09
Control Delay	9.2	13.9	16.4	22.5	4.1	16.6	25.9	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.2	13.9	16.4	22.5	4.1	16.6	25.9	13.0
Queue Length 50th (ft)	11	87	3	90	0	5	29	1
Queue Length 95th (ft)	31	174	15	180	24	34	78	21
Internal Link Dist (ft)		1878		1955		659		1560
Turn Bay Length (ft)	225		280		255		315	
Base Capacity (vph)	469	1643	664	1323	1220	600	663	589
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.26	0.02	0.23	0.08	0.08	0.14	0.04
Intersection Summary								

2040 Future AM Peak
1: Longhill Gate Road/Warhill Trail & Longhill Road

Conventional Signal
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	388	0	12	283	91	8	6	28	88	3	21
Future Volume (vph)	60	388	0	12	283	91	8	6	28	88	3	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.91		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)	1805	1845		1641	1776	1599		1670		1805	1565	
Flt Permitted	0.35	1.00		0.52	1.00	1.00		0.99		0.95	1.00	
Satd. Flow (perm)	661	1845		891	1776	1599		1670		1805	1565	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	422	0	13	308	99	9	7	30	96	3	23
RTOR Reduction (vph)	0	0	0	0	0	70	0	26	0	0	19	0
Lane Group Flow (vph)	65	422	0	13	308	29	0	20	0	96	7	0
Heavy Vehicles (%)	0%	3%	2%	10%	7%	1%	14%	0%	0%	0%	0%	6%
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2			6		3	3		4	4	
Permitted Phases	2			6		6						
Actuated Green, G (s)	24.5	24.5		15.9	15.9	15.9		7.6		9.1	9.1	
Effective Green, g (s)	24.5	24.5		15.9	15.9	15.9		7.6		9.1	9.1	
Actuated g/C Ratio	0.45	0.45		0.29	0.29	0.29		0.14		0.17	0.17	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	381	826		258	516	464		232		300	260	
v/s Ratio Prot	0.01	c0.23			c0.17			c0.01		c0.05	0.00	
v/s Ratio Perm	0.06			0.01		0.02						
v/c Ratio	0.17	0.51		0.05	0.60	0.06		0.09		0.32	0.03	
Uniform Delay, d1	9.3	10.8		14.0	16.6	14.0		20.5		20.1	19.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.5		0.1	1.9	0.1		0.2		0.6	0.0	
Delay (s)	9.5	11.3		14.0	18.5	14.1		20.7		20.7	19.1	
Level of Service	A	B		B	B	B		C		C	B	
Approach Delay (s)		11.1			17.3			20.7			20.4	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			15.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			54.7				Sum of lost time (s)			18.0		
Intersection Capacity Utilization			49.0%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	T	R	LTR	L	TR
Maximum Queue (ft)	76	186	41	167	58	61	95	53
Average Queue (ft)	28	91	8	80	26	23	42	14
95th Queue (ft)	59	155	31	140	51	53	83	40
Link Distance (ft)		1920		1995		701		1590
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	225		280		255		315	
Storage Blk Time (%)		0						
Queuing Penalty (veh)		0						

2040 Future PM Peak
1: Longhill Gate Road/Warhill Trail & Longhill Road

Conventional Signal
Queues

								
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	170	471	29	514	262	33	170	126
v/c Ratio	0.45	0.47	0.09	0.77	0.35	0.17	0.58	0.35
Control Delay	12.2	11.9	16.0	29.2	3.6	25.4	39.9	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.2	11.9	16.0	29.2	3.6	25.4	39.9	11.6
Queue Length 50th (ft)	35	118	9	203	0	6	73	5
Queue Length 95th (ft)	70	207	26	333	42	37	160	55
Internal Link Dist (ft)		1878		1955		659		1560
Turn Bay Length (ft)	225		280		255		315	
Base Capacity (vph)	392	1404	540	1063	1032	388	388	442
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.34	0.05	0.48	0.25	0.09	0.44	0.29
Intersection Summary								

2040 Future PM Peak
1: Longhill Gate Road/Warhill Trail & Longhill Road

Conventional Signal
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	424	9	27	473	241	7	6	17	156	12	104
Future Volume (vph)	156	424	9	27	473	241	7	6	17	156	12	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.93		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)	1805	1823		1805	1845	1599		1739		1805	1644	
Flt Permitted	0.19	1.00		0.49	1.00	1.00		0.99		0.95	1.00	
Satd. Flow (perm)	370	1823		937	1845	1599		1739		1805	1644	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	461	10	29	514	262	8	7	18	170	13	113
RTOR Reduction (vph)	0	1	0	0	0	166	0	16	0	0	95	0
Lane Group Flow (vph)	170	470	0	29	514	96	0	17	0	170	31	0
Heavy Vehicles (%)	0%	4%	0%	0%	3%	1%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2			6		3	3		4	4	
Permitted Phases	2			6		6						
Actuated Green, G (s)	40.9	40.9		27.2	27.2	27.2		7.5		12.0	12.0	
Effective Green, g (s)	40.9	40.9		27.2	27.2	27.2		7.5		12.0	12.0	
Actuated g/C Ratio	0.55	0.55		0.37	0.37	0.37		0.10		0.16	0.16	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	383	1008		344	679	588		176		293	266	
v/s Ratio Prot	0.06	c0.26			c0.28			c0.01		c0.09	0.02	
v/s Ratio Perm	0.19			0.03		0.06						
v/c Ratio	0.44	0.47		0.08	0.76	0.16		0.10		0.58	0.12	
Uniform Delay, d1	11.0	9.9		15.2	20.5	15.7		30.1		28.6	26.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.3		0.1	4.8	0.1		0.2		2.9	0.2	
Delay (s)	11.9	10.3		15.3	25.3	15.8		30.4		31.5	26.6	
Level of Service	B	B		B	C	B		C		C	C	
Approach Delay (s)		10.7			21.8			30.4			29.4	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			19.2				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			73.9				Sum of lost time (s)			18.0		
Intersection Capacity Utilization			60.1%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	T	R	LTR	L	TR
Maximum Queue (ft)	125	199	48	284	183	51	159	101
Average Queue (ft)	58	96	14	141	55	18	78	43
95th Queue (ft)	101	165	40	234	132	45	129	82
Link Distance (ft)		1920		1995		701		1590
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	225		280		255		315	
Storage Blk Time (%)		0		0	0			
Queuing Penalty (veh)		0		1	0			

2040 Future Weekend
1: Longhill Gate Road/Warhill Trail & Longhill Road

Conventional Signal
Queues

								
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	39	353	14	332	139	40	189	68
v/c Ratio	0.10	0.54	0.04	0.60	0.24	0.16	0.55	0.15
Control Delay	12.3	17.3	18.4	24.3	5.4	18.0	28.5	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	17.3	18.4	24.3	5.4	18.0	28.5	8.4
Queue Length 50th (ft)	8	86	3	80	0	3	48	1
Queue Length 95th (ft)	28	187	18	228	38	34	149	31
Internal Link Dist (ft)		1878		1955		659		1560
Turn Bay Length (ft)	225		280		255		315	
Base Capacity (vph)	387	1493	682	1204	1092	517	643	792
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.24	0.02	0.28	0.13	0.08	0.29	0.09
Intersection Summary								

2040 Future Weekend
1: Longhill Gate Road/Warhill Trail & Longhill Road

Conventional Signal
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	36	315	10	13	305	128	7	2	28	3	171	5
Future Volume (vph)	36	315	10	13	305	128	7	2	28	3	171	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.90			1.00	0.86
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.95	1.00
Satd. Flow (prot)	1805	1821		1805	1845	1599		1691			1804	1636
Flt Permitted	0.31	1.00		0.55	1.00	1.00		0.99			0.73	1.00
Satd. Flow (perm)	596	1821		1044	1845	1599		1691			1388	1636
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	342	11	14	332	139	8	2	30	3	186	5
RTOR Reduction (vph)	0	1	0	0	0	99	0	26	0	0	0	48
Lane Group Flow (vph)	39	352	0	14	332	40	0	14	0	0	189	20
Heavy Vehicles (%)	0%	4%	0%	0%	3%	1%	0%	0%	0%	2%	0%	0%
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA		Perm	Split	NA
Protected Phases	5	2			6		3	3			4	4
Permitted Phases	2			6		6				4		
Actuated Green, G (s)	24.0	24.0		17.3	17.3	17.3		7.9			14.3	14.3
Effective Green, g (s)	24.0	24.0		17.3	17.3	17.3		7.9			14.3	14.3
Actuated g/C Ratio	0.40	0.40		0.29	0.29	0.29		0.13			0.24	0.24
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	284	732		302	534	463		223			332	391
v/s Ratio Prot	0.01	c0.19			c0.18			c0.01				0.01
v/s Ratio Perm	0.05			0.01		0.03					c0.14	
v/c Ratio	0.14	0.48		0.05	0.62	0.09		0.06			0.57	0.05
Uniform Delay, d1	11.7	13.2		15.3	18.4	15.4		22.7			20.0	17.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	0.2	0.5		0.1	2.3	0.1		0.1			2.2	0.1
Delay (s)	11.9	13.7		15.3	20.6	15.5		22.8			22.2	17.5
Level of Service	B	B		B	C	B		C			C	B
Approach Delay (s)		13.6			19.0			22.8				21.0
Approach LOS		B			B			C				C
Intersection Summary												
HCM 2000 Control Delay			17.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			59.7				Sum of lost time (s)			18.0		
Intersection Capacity Utilization			50.6%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

2040 Future Weekend
1: Longhill Gate Road/Warhill Trail & Longhill Road

Conventional Signal
HCM Signalized Intersection Capacity Analysis

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	58
Future Volume (vph)	58
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	T	R	LTR	UL	TR
Maximum Queue (ft)	55	160	33	184	83	51	148	59
Average Queue (ft)	20	82	9	86	32	17	74	23
95th Queue (ft)	47	140	29	153	65	42	124	49
Link Distance (ft)		1920		1995		701		1590
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	225		280		255		315	
Storage Blk Time (%)				0	0			
Queuing Penalty (veh)				0	0			

Appendix E

Thru-Cut Signal Analysis Results

2040 Future AM Peak
1: Longhill Gate Road/Warhill Trail & Longhill Road

Thru-Cut Signal
Queues

								
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	65	425	13	308	105	46	96	26
v/c Ratio	0.11	0.45	0.04	0.50	0.17	0.11	0.23	0.03
Control Delay	4.2	6.8	10.8	14.3	3.8	4.8	16.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.2	6.8	10.8	14.3	3.8	4.8	16.9	0.1
Queue Length 50th (ft)	5	41	2	58	0	0	19	0
Queue Length 95th (ft)	16	91	11	126	23	15	57	0
Internal Link Dist (ft)	1878		1955		659		1560	
Turn Bay Length (ft)	225	280		255		315		
Base Capacity (vph)	802	1843	887	1770	1594	1132	1230	1234
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.23	0.01	0.17	0.07	0.04	0.08	0.02
Intersection Summary								

2040 Future AM Peak
1: Longhill Gate Road/Warhill Trail & Longhill Road

Thru-Cut Signal
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	388	3	12	283	97	8	0	34	88	0	24
Future Volume (vph)	60	388	3	12	283	97	8	0	34	88	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.89		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)	1805	1843		1641	1776	1599		1633		1805	1524	
Flt Permitted	0.40	1.00		0.51	1.00	1.00		0.99		0.95	1.00	
Satd. Flow (perm)	759	1843		889	1776	1599		1633		1805	1524	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	422	3	13	308	105	9	0	37	96	0	26
RTOR Reduction (vph)	0	0	0	0	0	70	0	36	0	0	20	0
Lane Group Flow (vph)	65	425	0	13	308	35	0	10	0	96	6	0
Heavy Vehicles (%)	0%	3%	2%	10%	7%	1%	14%	0%	0%	0%	0%	6%
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2			6		3!	3!		3!	3!	
Permitted Phases	2			6		6						
Actuated Green, G (s)	21.4	21.4		13.1	13.1	13.1		8.5		8.5	8.5	
Effective Green, g (s)	21.4	21.4		13.1	13.1	13.1		8.5		8.5	8.5	
Actuated g/C Ratio	0.55	0.55		0.34	0.34	0.34		0.22		0.22	0.22	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	519	1013		299	598	538		356		394	333	
v/s Ratio Prot	0.01	c0.23			c0.17			0.01		c0.05	0.00	
v/s Ratio Perm	0.06			0.01		0.02						
v/c Ratio	0.13	0.42		0.04	0.52	0.07		0.03		0.24	0.02	
Uniform Delay, d1	4.5	5.1		8.7	10.4	8.7		12.0		12.5	11.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.3		0.1	0.8	0.1		0.0		0.3	0.0	
Delay (s)	4.6	5.4		8.7	11.1	8.8		12.0		12.9	11.9	
Level of Service	A	A		A	B	A		B		B	B	
Approach Delay (s)		5.3			10.5			12.0			12.7	
Approach LOS		A			B			B			B	

Intersection Summary

HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	38.9	Sum of lost time (s)	13.5
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	T	R	LTR	L	TR
Maximum Queue (ft)	57	126	46	126	59	49	88	46
Average Queue (ft)	24	56	9	55	26	17	34	12
95th Queue (ft)	51	103	32	103	50	41	69	36
Link Distance (ft)		1920		1995		701		1590
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	225		280		255		315	
Storage Blk Time (%)								
Queuing Penalty (veh)								

2040 Future PM Peak
1: Longhill Gate Road/Warhill Trail & Longhill Road

Thru-Cut Signal
Queues

								
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	170	484	29	514	268	33	170	126
v/c Ratio	0.33	0.41	0.08	0.71	0.34	0.09	0.49	0.19
Control Delay	6.1	6.4	12.3	21.4	3.2	2.8	28.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	6.4	12.3	21.4	3.2	2.8	28.7	0.6
Queue Length 50th (ft)	18	62	6	142	0	0	52	0
Queue Length 95th (ft)	49	147	22	282	38	8	132	0
Internal Link Dist (ft)		1878		1955		659		1560
Turn Bay Length (ft)	225		280		255		315	
Base Capacity (vph)	569	1767	817	1629	1443	695	702	904
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.27	0.04	0.32	0.19	0.05	0.24	0.14
Intersection Summary								

2040 Future PM Peak
1: Longhill Gate Road/Warhill Trail & Longhill Road

Thru-Cut Signal
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	424	21	27	473	247	7	0	23	156	0	116
Future Volume (vph)	156	424	21	27	473	247	7	0	23	156	0	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85		0.90		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)	1805	1817		1805	1845	1599		1685		1805	1615	
Flt Permitted	0.24	1.00		0.49	1.00	1.00		0.99		0.95	1.00	
Satd. Flow (perm)	447	1817		926	1845	1599		1685		1805	1615	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	461	23	29	514	268	8	0	25	170	0	126
RTOR Reduction (vph)	0	2	0	0	0	161	0	27	0	0	101	0
Lane Group Flow (vph)	170	482	0	29	514	107	0	6	0	170	25	0
Heavy Vehicles (%)	0%	4%	0%	0%	3%	1%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA		Split	NA	
Protected Phases	5	2			6		3!	3!		3!	3!	
Permitted Phases	2			6		6						
Actuated Green, G (s)	37.6	37.6		23.1	23.1	23.1		11.3		11.3	11.3	
Effective Green, g (s)	37.6	37.6		23.1	23.1	23.1		11.3		11.3	11.3	
Actuated g/C Ratio	0.65	0.65		0.40	0.40	0.40		0.20		0.20	0.20	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	524	1179		369	736	637		328		352	315	
v/s Ratio Prot	0.06	c0.27			c0.28			0.00		c0.09	0.02	
v/s Ratio Perm	0.15			0.03		0.07						
v/c Ratio	0.32	0.41		0.08	0.70	0.17		0.02		0.48	0.08	
Uniform Delay, d1	6.0	4.8		10.8	14.5	11.2		18.8		20.7	19.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.2		0.1	2.9	0.1		0.0		1.0	0.1	
Delay (s)	6.4	5.1		10.9	17.4	11.3		18.8		21.8	19.1	
Level of Service	A	A		B	B	B		B		C	B	
Approach Delay (s)		5.4			15.2			18.8			20.6	
Approach LOS		A			B			B			C	

Intersection Summary

HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	57.9	Sum of lost time (s)	13.5
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	T	R	LTR	L	TR
Maximum Queue (ft)	107	172	44	236	166	48	146	89
Average Queue (ft)	50	67	15	116	47	16	66	35
95th Queue (ft)	88	129	38	201	100	41	119	69
Link Distance (ft)		1920		1995		701		1590
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	225		280		255		315	
Storage Blk Time (%)		0		0	0			
Queuing Penalty (veh)		0		0	0			

2040 Future Weekend
1: Longhill Gate Road/Warhill Trail & Longhill Road

Thru-Cut Signal
Queues

								
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	39	358	14	332	141	41	189	68
v/c Ratio	0.07	0.43	0.04	0.49	0.21	0.08	0.38	0.08
Control Delay	5.4	8.0	10.9	13.7	3.8	3.5	16.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.4	8.0	10.9	13.7	3.8	3.5	16.7	0.2
Queue Length 50th (ft)	4	40	1	37	0	0	25	0
Queue Length 95th (ft)	15	98	13	151	29	12	103	0
Internal Link Dist (ft)	1878		1955		659		1560	
Turn Bay Length (ft)	225		280		255		315	
Base Capacity (vph)	725	1817	1021	1813	1574	1080	1137	1239
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.20	0.01	0.18	0.09	0.04	0.17	0.05
Intersection Summary								

2040 Future Weekend
1: Longhill Gate Road/Warhill Trail & Longhill Road

Thru-Cut Signal
HCM Signalized Intersection Capacity Analysis

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	36	315	15	13	305	130	7	0	30	3	171	0
Future Volume (vph)	36	315	15	13	305	130	7	0	30	3	171	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.95	1.00
Satd. Flow (prot)	1805	1818		1805	1845	1599		1677			1804	1615
Flt Permitted	0.38	1.00		0.55	1.00	1.00		0.99			0.95	1.00
Satd. Flow (perm)	727	1818		1040	1845	1599		1677			1804	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	342	16	14	332	141	8	0	33	3	186	0
RTOR Reduction (vph)	0	3	0	0	0	91	0	30	0	0	0	50
Lane Group Flow (vph)	39	355	0	14	332	50	0	11	0	0	189	18
Heavy Vehicles (%)	0%	4%	0%	0%	3%	1%	0%	0%	0%	2%	0%	0%
Turn Type	pm+pt	NA		Perm	NA	Perm	Split	NA		Split	Split	NA
Protected Phases	5	2			6		3!	3!		3!	3!	3!
Permitted Phases	2			6		6						
Actuated Green, G (s)	20.8	20.8		14.2	14.2	14.2		10.6			10.6	10.6
Effective Green, g (s)	20.8	20.8		14.2	14.2	14.2		10.6			10.6	10.6
Actuated g/C Ratio	0.51	0.51		0.35	0.35	0.35		0.26			0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	430	936		365	648	562		440			473	423
v/s Ratio Prot	0.00	c0.20			c0.18			0.01			c0.10	0.01
v/s Ratio Perm	0.04			0.01		0.03						
v/c Ratio	0.09	0.38		0.04	0.51	0.09		0.02			0.40	0.04
Uniform Delay, d1	5.3	5.9		8.6	10.4	8.8		11.1			12.3	11.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	0.1	0.3		0.0	0.7	0.1		0.0			0.6	0.0
Delay (s)	5.4	6.2		8.7	11.0	8.8		11.1			12.8	11.2
Level of Service	A	A		A	B	A		B			B	B
Approach Delay (s)		6.1			10.3			11.1				12.4
Approach LOS		A			B			B				B

Intersection Summary

HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	40.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	63
Future Volume (vph)	63
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	68
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection: 1: Longhill Gate Road/Warhill Trail & Longhill Road

Movement	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	T	R	LTR	UL	TR
Maximum Queue (ft)	50	132	27	132	59	46	110	52
Average Queue (ft)	18	56	7	59	29	15	53	19
95th Queue (ft)	44	102	26	108	52	39	93	44
Link Distance (ft)		1920		1995		701		1590
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	225		280		255		315	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Appendix F

Roundabout Signal Analysis Results

LANE SUMMARY

 **Site: 1 [Longhill Rd & Longhill Gate Rd/Warhill Trl 2040 AM
(Site Folder: General)]**

Warhill Sports Complex
2040 Future Conditions
AM Peak Hour
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[Total veh/h	HV] %						[Veh	Dist] ft				
South: Longhill Gate Rd (NB)													
Lane 1 ^d	46	2.7	541	0.084	100	7.7	LOS A	0.3	8.2	Full	1600	0.0	0.0
Approach	46	2.7		0.084		7.7	LOS A	0.3	8.2				
East: Longhill Rd (WB)													
Lane 1 ^d	420	5.7	985	0.426	100	8.5	LOS A	2.6	68.6	Full	1600	0.0	0.0
Approach	420	5.7		0.426		8.5	LOS A	2.6	68.6				
North: Warhill Trl (SB)													
Lane 1 ^d	122	1.1	738	0.165	100	6.7	LOS A	0.7	18.1	Full	1600	0.0	0.0
Approach	122	1.1		0.165		6.7	LOS A	0.7	18.1				
West: Longhill Rd (EB)													
Lane 1 ^d	488	2.6	976	0.500	100	9.8	LOS A	3.5	88.9	Full	1600	0.0	0.0
Approach	488	2.6		0.500		9.8	LOS A	3.5	88.9				
Intersection	1075	3.6		0.500		8.8	LOS A	3.5	88.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Longhill Gate Rd (NB)										
Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	9	7	30	46	2.7	541	0.084	100	NA	NA
Approach	9	7	30	46	2.7	0.084				
East: Longhill Rd (WB)										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	13	308	99	420	5.7	985	0.426	100	NA	NA
Approach	13	308	99	420	5.7	0.426				
North: Warhill Trl (SB)										

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	96	3	23	122	1.1	738	0.165	100	NA	NA
Approach	96	3	23	122	1.1		0.165			
West: Longhill Rd (EB)										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	65	422	1	488	2.6	976	0.500	100	NA	NA
Approach	65	422	1	488	2.6		0.500			
Total %HV Deg. Satn (v/c)										
Intersection	1075	3.6		0.500						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Longhill Gate Rd (NB) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: Longhill Rd (WB) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: Warhill Trl (SB) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: Longhill Rd (EB) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

LANE SUMMARY

 **Site: 1 [Longhill Rd & Longhill Gate Rd/Warhill Trl 2040 PM
(Site Folder: General)]**

Warhill Sports Complex
2040 Future Conditions
PM Peak Hour
Site Category: (None)
Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[Total veh/h	HV] %						[Veh	Dist] ft				
South: Longhill Gate Rd (NB)													
Lane 1 ^d	33	0.0	422	0.077	100	9.6	LOS A	0.3	7.1	Full	1600	0.0	0.0
Approach	33	0.0		0.077		9.6	LOS A	0.3	7.1				
East: Longhill Rd (WB)													
Lane 1 ^d	805	2.2	898	0.897	100	31.7	LOS D	34.3	874.1	Full	1600	0.0	0.0
Approach	805	2.2		0.897		31.7	LOS D	34.3	874.1				
North: Warhill Trl (SB)													
Lane 1 ^d	296	0.0	575	0.514	100	15.3	LOS C	3.5	86.9	Full	1600	0.0	0.0
Approach	296	0.0		0.514		15.3	LOS C	3.5	86.9				
West: Longhill Rd (EB)													
Lane 1 ^d	640	2.9	862	0.742	100	18.9	LOS C	13.9	354.8	Full	1600	0.0	0.0
Approach	640	2.9		0.742		18.9	LOS C	13.9	354.8				
Intersection	1774	2.1		0.897		23.9	LOS C	34.3	874.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Longhill Gate Rd (NB)										
Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	8	7	18	33	0.0	422	0.077	100	NA	NA
Approach	8	7	18	33	0.0	0.077				
East: Longhill Rd (WB)										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	29	514	262	805	2.2	898	0.897	100	NA	NA
Approach	29	514	262	805	2.2	0.897				
North: Warhill Trl (SB)										

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	170	13	113	296	0.0	575	0.514	100	NA	NA
Approach	170	13	113	296	0.0		0.514			
West: Longhill Rd (EB)										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	170	461	10	640	2.9	862	0.742	100	NA	NA
Approach	170	461	10	640	2.9		0.742			
Total %HV Deg. Satn (v/c)										
Intersection	1774	2.1		0.897						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Longhill Gate Rd (NB) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Longhill Rd (WB) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Warhill Trl (SB) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Longhill Rd (EB) Merge Type: Not Applied												
Full Length Lane	1	Merge Analysis not applied.										

 Site: 1 [Longhill Rd & Longhill Gate Rd/Warhill Trl 2040 Weekend (Site Folder: General)]

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[Total veh/h	HV] %						[Veh	Dist] ft				
South: Longhill Gate Rd (NB)													
Lane 1 ^d	40	0.0	562	0.072	100	7.3	LOS A	0.3	7.0	Full	1600	0.0	0.0
Approach	40	0.0		0.072		7.3	LOS A	0.3	7.0				
East: Longhill Rd (WB)													
Lane 1 ^d	485	2.3	1054	0.460	100	8.6	LOS A	3.2	82.3	Full	1600	0.0	0.0
Approach	485	2.3		0.460		8.6	LOS A	3.2	82.3				
North: Warhill Trl (SB)													
Lane 1 ^d	258	0.0	737	0.349	100	9.2	LOS A	1.8	44.2	Full	1600	0.0	0.0
Approach	258	0.0		0.349		9.2	LOS A	1.8	44.2				
West: Longhill Rd (EB)													
Lane 1 ^d	392	3.5	861	0.456	100	9.9	LOS A	2.7	69.4	Full	1600	0.0	0.0
Approach	392	3.5		0.456		9.9	LOS A	2.7	69.4				
Intersection	1175	2.1		0.460		9.1	LOS A	3.2	82.3				

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if $v/c > 1$ irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Longhill Gate Rd (NB)										
Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	8	2	30	40	0.0	562	0.072	100	NA	NA
Approach	8	2	30	40	0.0	0.072				
East: Longhill Rd (WB)										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	14	332	139	485	2.3	1054	0.460	100	NA	NA
Approach	14	332	139	485	2.3	0.460				
North: Warhill Trl (SB)										

Mov.	U	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit:	N	E	S	W			Cap. veh/h	v/c	%	%	
Lane 1	3	186	5	63	258	0.0	737	0.349	100	NA	NA
Approach	3	186	5	63	258	0.0	0.349				
West: Longhill Rd (EB)											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From W To Exit:	N	E	S				Cap. veh/h	v/c	%	%	
Lane 1	39	342	11	392	3.5		861	0.456	100	NA	NA
Approach	39	342	11	392	3.5		0.456				
Total %HV Deg. Satn (v/c)											
Intersection	1175	2.1	0.460								

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Longhill Gate Rd (NB) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
East Exit: Longhill Rd (WB) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
North Exit: Warhill Trl (SB) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: Longhill Rd (EB) Merge Type: Not Applied											
Full Length Lane	1	Merge Analysis not applied.									

Unapproved Minutes of December 3, 2025 Planning Commission Regular Meeting

1. SUP-25-0015. 4900 Stadium Road General Services Headquarters

Ms. Sarah Propst, Principal Planner, addressed the Commission stating that Andrew McKinley of VIA Design had applied for an SUP on behalf of James City County for the development of an approximately 60,500 square foot General Services Headquarters. Ms. Propst explained that an SUP is required in any zoning district for a governmental institution or office building exceeding 30,000 square feet of floor area.

Ms. Propst stated that the General Services Headquarters would provide office space, a large meeting room, workshop space, and equipment storage, for General Services Administration, Capital Projects, Environmental Sustainability, Facilities, Grounds, and Solid Waste divisions. Ms. Propst noted that the complex would be located primarily on 4900 Stadium Road with some clearing and grading occurring on 4620 Opportunity Way. Ms. Propst stated that the property was zoned Public Lands and is designated Federal State or County Land on the Comprehensive Plan.

Ms. Propst explained to the Commission the proposed proffers and conditions regarding the traffic, sustainable building policy, and stormwater master plan.

Ms. Propst stated that Staff found this proposal to be compatible with surrounding development and consistent with Comprehensive Plan and Zoning Ordinance. Ms. Propst noted that Staff recommends that the Planning Commission recommend approval of this application to the Board of Supervisors, subject to the proposed conditions and recommends that in accordance with 15.2-2232 of the Virginia Code, the Planning Commission finds the proposed development location, character, and extent are in compliance with the Comprehensive Plan.

Mr. Haldeman opened the Public Hearing.

Mr. Shawn Gordon addressed the Commission with a presentation about the proposed project.

Mr. Rodgers asked if there were any considerations to combine the General Services headquarters with the proposed Government Center.

Mr. Gordon explained that the operations of General Services was too large to combine with the Government Center.

Mr. Polster asked if there would be electrical charging stations on site.

Mr. Gordon stated that was correct.

Mr. Polster discussed the proposed Stormwater conditions with the Commission and stated that he would like a condition added stating that the Planning and General Services staff will commit to reducing the water treatment by 25%, matching the figure used for the Powhatan Watershed plan.

Discussion ensued.

Mr. Haldeman opened the Public Hearing.

Mr. Andrew Huckabee, 115 Deerwood Drive, addressed the Commission and requested that a webpage about the proposed headquarters with links to the studies be added to the website.

Mr. Haldeman closed the Public Hearing.

Mr. Polster made a comment about the current General Services offices and stated he was in support of the project and commended the staff on their work on this project.

Mr. Polster made a motion that SUP-25-0015. 4900 Stadium Road General Services Headquarters is consistent with the Comprehensive Plan and applicable parts thereof.

On a roll call vote, the Commission voted to find the application consistent. (6-0)

Mr. Polster made a motion to recommend approval of SUP-25-0015. 4900 Stadium Road General Services Headquarters to the Board of Supervisors with conditions.

On a roll call vote, the Commission voted to recommend approval. (6-0)