PLANNING COMMISSION REGULAR MEETING

Tuesday, February 20, 2024 at 7:00 PM

AGENDA

CALL TO ORDER AND ESTABLISHMENT OF A QUORUM.

ADOPTION OF MINUTES.

1. January 16, 2024 Draft Regular Meeting Minutes

HEARING OF PUBLIC HEARING ITEMS.

2. *Continuation of December Public Hearing:* ZOTA 2023-01 A Zoning Ordinance Text Amendment to Reduce the Setback Requirement for Telecommunication Towers in the PSP (Public Semi Public) Zoning District. Zoning Ordinance Section 9-18.10 - *Setbacks* requires that all telecommunication towers in all zoning districts be set back from property lines at a distance no less than the height of the tower. The applicant is requesting that the setback requirement be reduced within the PSP – Public Semi Public Zoning District to allow a setback that is less than the height of the tower, with certification provided from an engineer that a lesser setback is appropriate due to the design of the tower. Arcola Towers LLC (Applicant)/James P. Downey (Representative)

NEW BUSINESS.

3. 2023 Draft Planning Commission Annual Report

WORKSESSION ITEMS.

4. SUP 2023-04 Taylor Middle School - The Applicant is requesting a Special Use Permit for an expansion to an existing middle school. The property is zoned Public-Semi Public (PSP) on approximately 39.18 acres. The site includes Brumfield Elementary. Article 3-4.9.3 of the Town of Warrenton's Zoning Ordinance allows school expansion to existing facilities equal to or over 10,000 square feet with the approval a SUP by Town Council.

COMMENTS FROM THE COMMISSION.

5. APA-VA Conference Training

6. 2024 Planning Commission Goals

COMMENTS FROM THE STAFF.

ADJOURN.

PLANNING COMMISSION REGULAR MEETING

21 Main Street

Tuesday, January 16, 2024, at 7:00 PM

MINUTES

A REGULAR MEETING OF THE PLANNING COMMISSION OF THE TOWN OF WARRENTON, VIRGINIA, WAS HELD ON January 16, 2024, at 7:00 PM

Regular Meeting

PRESENT	Mr. Ryan Stewart, Chair; Mr. Terry Lasher, Vice Chair; Ms. Darine Barbour, Secretary; Mr. James Lawrence; Mr. Steve Ainsworth; Mr. Frank Cassidy, Town Manager; Mr. Martin Crim, Town Attorney; Mr. Rob Walton, Community Development Director; Ms. Denise Harris, Planning Manager; and Mr. Steven Friend, Assistant Director Public Works.
ABSENT	None

The minutes laid out will be a brief recap of the agenda items. Please see recorded video for more in-depth information.

REGULAR MEETING - 7:00 PM

At 7:00 PM on Tuesday, January 16, 2024. The Planning Commission meeting was called to order by the Planning Manager and a quorum was established.

NEW BUSINESS

Ms. Denise Harris asked for a motion to nominate the Chair of the Planning Commission to serve until December 31, 2024.

Commissioner Lawrence nominated Commissioner Stewart as Chair of the Planning Commission for 2024.

Commissioner Ainsworth seconded the nomination.

Vote 4-0-1 (Stewart abstained)

Chair Stewart took over the meeting and asked for a motion to nominate the Vice Chair of the Planning Commission to serve until December 31, 2024.

Commissioner Lawrence nominated Commissioner Lasher as Vice Chair of the Planning Commission for 2024.

Commissioner Barbour seconded the motion.

Vote 4-0-1 (Lasher abstained)

Chair Stewart asked for a motion to nominate the Secretary of the Planning Commission to serve until December 31, 2024.

Commissioner Ainsworth nominated Commissioner Barbour to serve as Secretary of the Planning Commission for 2024.

Commissioner Lawernce seconded the motion.

Vote 4-0-1 (Barbour abstained)

APPROVAL OF THE MINUTES.

Commissioner Lawrence motioned to adopt the December 19, 2023, Planning Commission Minutes.

Commissioner Barbour seconded the motion.

Vote 5-0 to approve.

PUBLIC HEARINGS.

1. ZOTA 2023-03 FDP - Zoning Ordinance Text Amendment Article 3-5.1 of the Town of Warrenton Zoning Ordinance and Floodplain Maps to reflect the Federal Emergency Management Agency's model ordinance and map changes. A Letter of Final Determination was issued to the Town of Warrenton on October 25, 2023, from FEMA which provides notification that the floodplain changes will take effect on April 25, 2024. Adoption of the changes allows the Town to maintain eligibility in the National Flood Insurance Program.

Mr. Rob Walton gave an overview of the application.

Chair Stewart opened the Public Hearing at 7:10 PM.

No one from the public spoke to the application.

Chair Stewart closed the Public Hearing at 7:10 PM.

Commissioner Lawrence moved to recommend approval of ZOTA 2023-03 to Town Council; the motion was seconded by Commissioner Ainsworth.

Ayes: Mr. Ryan Stewart, Chair; Mr. Terry Lasher, Vice Chair; Ms. Darine Barbour, Secretary; Mr. James Lawrence; Mr. Steve Ainsworth

Nays: ***N/A***

Abstention: ***N/A***

Absent: N/A

The motion passed.

WORKSESSION ITEMS.

1. Public Utilities will present to the Planning Commission an update on water and sewer facilities.

Town Manager Frank Cassidy and Assistant Director of Public Utilities Steven Friend gave a presentation on the public facilities infrastructure.

Commissioner Lawrence inquired about capacity vs aging infrastructure.

Mr. Cassidy explained the operational permit, the reserve requirements, modernizing of infrastructure, and the need for planning to be able to serve all Town parcels.

Chair Stewart inquired about what the capacity estimates take into account.

Mr. Cassidy explained Plan Warrenton 2040 lays out a vision with capacity accounting for existing and anticipated needs using reasonable assumptions.

Commissioner Lasher asked how utilities are funded.

Mr. Cassidy explained the Enterprise Fund and there is a user system that requires user rates to cover maintenance of the systems. All rates and maintenance needs go through the annual Town Council budgeting and Capital Improvement Program approval process.

Commissioner Ainsworth asked if the plan covers life cycle costs.

Mr. Cassidy stated the Facilities Maintenance Department is new and will be incorporating this moving forward.

Chair Stewart asked about how infrastructure is designated between maintenance and new.

Mr. Cassidy and Mr. Friend explained how the Capital Improvement Plan incorporates projects.

Commissioner Ainsworth asked if projects will take into account a new DEQ permit at 3.0 mgd.

Mr. Cassidy explained capacity is not the main driver and there is limited space for expansion on the existing Town property.

Mr. Friend explained that while infrastructure is being replaced for maintenance, the goal is to do it once since it will take six years to complete.

Commissioner Lawrence asked if this means fix the infrastructure while allowing for potential future growth.

Mr. Cassidy indicated yes.

Vice Chair Lasher asked if the infrastructure would be capped at 3 mgd regardless.

Mr. Cassidy stated yes, if DEQ approves a permit. He went on to encourage tours of the facilities for anyone who is interested.

Commissioner Lawrence asked if the water utility infrastructure is alright.

Mr. Cassidy stated it is in better shape than the sewer infrastructure; however the Town is dealing with the clear well, dam inspections, water main breaks, and I&I needs.

Vice Chair Lasher asked if the state monitors the dam.

Mr. Cassidy said yes and indicated that projects being in the Capital Improvement Plan enables the Town to pursue grants as well.

2. The Planning Commission will receive an overview from the Town Attorney regarding the Virginia Commission on Local Governments and State Code 15.2 - 3203.

   Town Attorney Martin Crim gave a briefing on how boundary line adjustments and annexations are addressed in the Virginia State Code. Mr. Crim pointed out the distinction between counties, cities, and towns. He walked through the concepts of Voluntary Settlement Agreements and Citizen Initiated Annexation applications. Mr. Crim explained the process of a three-judge panel entering an order with requirements. Counties and Towns are defendants in Citizen Initiated Annexations where ultimately the court makes a decision based on items like land use, utilities, cost sharing, length of agreements, and zoning.

   Chair Stewart asked if proffers between a County and an applicant are revisited.
   Mr. Crim indicated the court is limited in rewriting proffers. All parties would have to agree.
   Commissioner Lawrence asked about the public process.
   Mr. Crim stated the Commission on Local Government holds public hearings and anyone with standing could intervene in the courts.
   Commissioner Lawrence asked if there is a role for the Planning Commission in a Citizen Initiated Annexation.
   Mr. Crim indicated there is no formal role.
   Commissioner Lawrence inquired about the role of the Planning Commission in boundary line adjustments.
   Mr. Crim indicated the role for the Planning Commission occurs after the land is brought under its jurisdiction by amending the comprehensive plan and Future Land Use map.
   Commissioner Lawrence explained the reason for this work session is to clear up any confusion surrounding the Planning Commissions role in a Citizen Initiated Annexation application like the Arrington property located in the county.
   Chair Stewart asked about the resolutions passed by the County and the Town regarding Arrington.
   Mr. Crim indicated the property owner requested the resolutions before moving forward with the Commission on Local Government. However, there is an opportunity in the future if the Town decides to reject it.
   Chair Stewart reiterated that there is no role for the Planning Commission.
   Mr. Crim stated this was correct.

COMMENTS FROM THE COMMISSION.

The Planning Commission reviewed its 2024 meeting schedule.

Commissioner Lawrence moved to adopt the meeting dates and cancel the January work session.

Vice Chair Lasher seconded the motion.

The motion passed unanimously.

The Planning Commission reviewed its draft goals for 2024 and determined they would like more time for edits.

Chair Stewart disclosed he and Commissioner Lawrence met with the applicant for Warrenton Village SUP.

COMMENTS FROM THE STAFF.

Staff reviewed the work surrounding the Historic District survey, the upcoming National Register public meeting, and the goal to align the existing local and national districts.

Staff provided an update on the procurement process for the Zoning Ordinance update.

Staff reviewed the current land use applications in process.

ADJOURN.

Commissioner Lawrence moved to adjourn, seconded by Commissioner Ainsworth . Chair Stewart, with no further business, this meeting was adjourned at 8:45 PM.

I hereby certify that this is a true and exact record of actions taken by the Planning Commission of the Town of Warrenton on January 16, 2024.

Darine Barbour, Secretary
Planning Commission

STAFF REPORT

Planning Commission Meeting Date:	February 20, 2024
Agenda Title:	ZOTA-23-1 Zoning Ordinance Text Amendment to Reduce the Setback Requirement for Telecommunication Towers in the PSP (Public Semi Public) Zoning District
Requested Action:	Hold a Public Hearing and Make a Recommendation
Department / Agency Lead:	Community Development
Staff Lead:	Heather Jenkins, Zoning Administrator

EXECUTIVE SUMMARY

Article 9, Section 9-18 *Telecommunications Facilities*, regulates the height, location and appearance of telecommunication towers within Town boundaries. Section 9-18.10 *Setbacks*, requires that all towers be set back a distance of at least one hundred (100) percent of the height of the tower from the boundaries of the property on which the tower is located.

Mr. James Downey, on behalf of his client Arcola Towers, LLC (the Applicant), is requesting that Ordinance Section 9-18.10 *Setbacks* be revised so that the setback requirement is reduced for telecommunication towers located in the Public-Semi-Public (PSP) District, so as to require less than 100 percent of the height of the tower to the property boundary. The Applicant has proposed that the required setback for telecommunication towers in the PSP District be 100 percent of the *certified fall zone*, where the minimum setback for a tower would be certified by a Virginia licensed Professional Engineer as less than the full height of the tower.

The specific site where Arcola Towers, LLC would like to establish a telecommunication tower is located within the public right-of-way area at the intersection of the Eastern Bypass, US 17 Spur, East Lee Highway and Lee Highway. However, should a text amendment to Section 9-18.10 *Setbacks* be adopted by Town Council, the setback reduction would apply to all properties located within the PSP District.

BACKGROUND

The Applicant is proposing to construct a 150-foot tall telecommunication tower on a parcel of land leased from the Virginia Department of Transportation (VDOT), within the Eastern Bypass U.S. Route 17 Spur. The proposed location for the tower, adjacent to an existing stormwater management facility that is maintained by VDOT, will not meet the required 100-percent setback requirement that is equal to the height of the 150-foot tower. A copy of the application documents have been included with this staff report as Attachment A.

Telecommunication towers are allowed in all Zoning Districts as a Permissible Use that requires the approval of a Special Use Permit by Town Council following a public hearing before both the Planning Commission and Town Council. Zoning Ordinance Section 9-18 *Telecommunications Facilities* regulates towers that are constructed within the Town boundaries, and includes both minimum standards that all towers must meet, as well as factors that must be considered as a part of all Special Use Permits for towers. A copy of Section 9-18 of the Ordinance has been included with this staff report as Attachment B.

Zoning Ordinance Section 9-18.10 *Setbacks* requires that a tower be located no closer to any property line than the full height of the tower. This fall zone ensures that a tower collapse will be completely contained within the property boundaries. The fall zone setback required by Section 9-18.10 cannot currently be waived or modified by Town Council as a part of the Special Use Permit process.

Local jurisdictions in the area differ in setback requirements for telecommunications facilities, as shown in the table below. Generally speaking, about half of local jurisdictions require a setback equal to the full height of the tower without the ability to reduce the setback; about half of jurisdictions surveyed allow for a setback that is less than the full height of the tower, most often with engineering certification provided to demonstrate the actual fall zone radius. The applicant has provided a copy of a fall zone certification letter prepared by an engineer as an example of the engineering certification that could be provided as a part of an application to justify a fall zone that is less than 100% of the tower height, included with this staff report as Attachment C.

Telecommunications Facilities – Setback Requirements
Setback reduction allowed to less than the full height of the tower.

Jurisdiction	Setback Reduction Allowed	Setback Requirements
Fairfax City	Yes	Minimum setback equal to 110% of the tower height, except for monopoles certified by an engineer where the setback is reduced to the minimum setback for the district.
Fauquier County	Yes	Towers must be set back a distance equal to the height of the tower, except where the setback is reduced to no less than the fall zone as determined by an engineering design as a part of the legislative approval process.
Culpeper County	No	Towers must be designed to collapse within the lot lines.
Town of Culpeper	No	Towers must be set back at least the minimum setback for the district, and must be designed to fall within the boundaries of the property, except where a permanent easement is obtained from an adjoining property owner. No habitable structure shall be located within the fall zone.
Prince William County	No	Setback of twice the tower height for all property lines that abut residential or agricultural properties; minimum setback of 200 feet from all public streets, with an additional setback equal to the tower height for all towers over 200 feet in height. The tower must be designed to collapse within the property boundaries.
Rappahannock County	No	For any tower over 50 feet in height, a minimum setback equal to 110% of the tower height is required, and must be contained entirely within the subject property. Within the setback, the property owner may erect structures at their own risk.
Spotsylvania County	Yes	Towers must be set back from property lines at least the minimum setback for the district. A certified engineering statement must be provided to specify the tower design, including breakpoints.
Loudoun County	Yes	Public towers must be set back equal to the height of the tower. Commercial monopoles and towers must be set back 1 foot for every 5 feet of tower height.

The Applicant has requested that the proposed text amendment apply solely to those properties that are located within the Public-Semi-Public Institutional District. The Ordinance describes the intent of this district in Section 3-4.9.1 *Legislative Intent* as:

This district is intended to provide for major public, semi-public, and institutional uses, to facilitate future growth of such uses within the district in accordance with the objectives, policies and proposals of the Comprehensive Plan, including the encouragement of convenient and safe nearby residential neighborhoods, and to provide evidence on the Zoning Map of the nature of land use planned for this district.

Ordinance Section 3-4.9 includes a list of *Permitted Uses* (by-right) and *Permissible Uses* (by special use permit upon approval of the Town Council) that are allowable in the PSP district. The listed uses include child care centers, community buildings, nursing homes, parks, governmental buildings, hospitals, schools and treatment plants; a full list of Permitted and Permissible uses is included as Attachment D.

The Comprehensive Plan, Plan Warrenton 2020, includes both Public/Semi-Public Non-Intensive and Public/Semi-Public Intensive as designations on the Future Land Use Map. The Comprehensive Plan describes Public/Semi-Public Uses as land and facilities owned by Town Council, The Fauquier County Board of Supervisors, the Fauquier County School Board, the Commonwealth of Virginia or the Fauquier Hospital, and generally planned for school, library, government, recreation, and health facility uses and expansions, to include municipal parking lots, court buildings, public parks and the cemetery.

The Town currently contains 499.24 acres of land zoned to the PSP district; of this total area, there are 86 parcels consisting of 405.13 acres of tax parcel land. The majority of parcels currently zoned to the PSP district are developed with structures or uses, with some limited area for future expansion. A map showing the location of tax parcels zoned to the PSP district has been included with this staff report as Attachment E. Given that the text amendment proposed by the Applicant will apply to all PSP-zoned land within the Town, a setback reduction to less than the total height of the tower has the potential to affect all PSP-zoned parcels and land, all properties abutting the district boundary, as well as the improvements located therein.

Zoning Ordinance Section 9-18.10 *Setback*s states:

Towers shall be set back a distance of at least one hundred (100) percent of the height of the tower from the boundaries of the property on which the tower is located.

The Applicant has proposed new language for Section 9-18.10, where the tower setback from property lines shall be equal to the certified fall zone, to state:

Towers shall be set back a distance of at least one hundred (100) percent of the height of the tower from the boundaries of the property on which the tower is located. On properties located in a PSP District (Public-Semi-Public Institutional District), towers shall only be required to be setback a distance of at least one hundred (100) percent of the certified fall zone, as certified by a Virginia Professional Engineer in a letter which includes the Professional Engineer's signature and seal.

A *fall zone* is the maximum distance that a tower will fall as measured from the center point of the tower, or, the largest expected radius in which a telecommunication tower could potentially collapse in the event of a failure. A *certified fall zone* is determined by a Professional Engineer, where the Engineer determines that due to the physical properties of the tower, that in the case of a failure the tower will collapse within a radius that is smaller than the full height of the tower.

The proposed text language as proposed by the Applicant includes the statement "*towers shall only be required to be setback a distance of at least one hundred (100) percent of the certified fall zone"*. This "shall" statement would in effect *require* that Town Council allow a setback less than the full height of the tower upon approval of a Special Use Permit application that includes a fall zone certified by an engineer.

AGENCY REVIEW

The specific location where the Applicant desires to construct a telecommunications tower is located on property associated with the U.S. Route 17 Spur, owned by VDOT. VDOT has reviewed the proposed tower, and approved a location adjacent to an existing stormwater management facility. The tower location as approved by VDOT will not allow the proposed 150-foot tall telecommunications tower to meet the setback as required by Ordinance Section 9-18.10 – *Setbacks*. The proposed tower is located 75 feet away from the north-eastern property boundary, which equals a setback from the property line of 50% of the tower height. A map showing the tower location approved by VDOT overlain on aerial imagery data is included as Attachment F.

The requested text amendment as well as the drawings depicting the specific location where the Applicant desires to construct a telecommunications facility was provided for review to both the Town of Warrenton Public Works Department and to the VDOT Warrenton Residency Office. Responses as provided from both agencies have been included with this staff report as Attachment G.

Responses provided by the local VDOT office and the Town Public Works Department are advisory in nature, and will apply to future approvals should this text amendment be adopted by Town Council. Should the text amendment be adopted, the telecommunications facility will be required to obtain the approval of a Special Use Permit from Town Council per Ordinance Section 3-4.9.3 *Permissible Uses* and the standards found in Section 9-18 *Telecommunications Facilities*, followed by approval of a Site Development Plan per Ordinance Article 10 *Site Development Plans*, and Building, Zoning and Land Disturbing Permits to authorize construction.

The Applicant has provided a letter prepared by Alexander J. Leadore, P.E. of Morris and Ritchie Associates, Inc., dated December 11, 2023 that certifies that the proposed 150-foot tall tower has been designed so as to fail at the midpoint of the tower, creating a certified fall zone of 75 feet from the center point of the tower. This letter, which includes a description of how the tower has been designed to break and fall in on itself, has been included with this staff report as Attachment H.

PROCESS

Planning Commission Work Session – November 28, 2023
During the November 28, 2023 work session, the Applicant provided testimony to the Commission regarding the importance of cell phone service during recovery following natural disasters such as hurricanes, as well as attested to the general safety of telecommunication towers. The Applicant stated that a certified fall zone, in comparison to a setback equal to the full height of the tower, achieves the same safety goal but allows more properties to be available for tower placement.

The Planning Commission members asked the Applicant for additional information regarding codes and standards regulating tower construction, such as regulations for towers to withstand wind speeds and vehicle strikes. The Applicant stated that he could provide information from the American National Standards Institute/ANSI and American Society of Civil Engineers/ASCE regarding engineering requirements for tower design.

Given the Applicant's statements regarding the safety of towers and the rarity of collapse, the Commission asked the applicant whether they could provide information on failure rate tracking at a national level, as well as the percentage of jurisdictions nation-wide that allow for setbacks or certified fall zones of less than the full height of the tower. The Applicant stated that he was not aware of a tracking system but would research this matter.

Commission members expressed concerns about noise associated with telecommunication towers, such as generators, and asked the Applicant whether the tower compound would include a generator. The Applicant stated that telecommunication facilities generally include emergency generators that operate during power outages as well as for weekly testing. In response to the Commission's concerns regarding noise, the Applicant stated that generators typically produce a noise level of about 60 decibels at the property line.

At the close of discussion, the Planning Commission inquired about the possibility of having a third-party assessment of fall zone criteria provided for their consideration.

Planning Commission Public Hearing – December 19, 2023
Following the November 28, 2023 work session, the telecommunications consultant CityScape Consultants, Inc. was retained to provide a third-party assessment of fall zone setbacks and regulatory impacts. A copy of the memo prepared by CityScape dated December 13, 2023, has been included with this staff report as Attachment I.

The CityScape memo discusses five questions about reduced fall-zone setbacks through the use of engineering technology, where these questions were posed by Planning Commission members during the November 28, 2023 work session. The five questions, along with a brief synopsis of the responses provided by CityScape are:

1. *What percent of localities allow "breakpoint" technology in their zoning regulations?*
   A firm number on how many local jurisdictions allow the use of breakpoint technology cannot be provided, however CityScape routinely recommends the inclusion of breakpoint technology when drafting proposed zoning ordinances. Additionally, the memo states that CityScape provided breakpoint provisions during their drafting of a revised telecommunications ordinance for Fauquier County.

2. *Is it legal to allow "breakpoint" technology in one zoning district and not others where towers are allowed?*
   The CityScape memo includes a brief discussion of federal law and how this could be applied to questions of discrimination. The memo includes a recommendation that the Town consider allowing the use of this technology in all zoning districts.

3. *Breakpoint technology design parameters, specifically when and how the communications facility was to fail, including instances where a vehicle was to strike a wireless communications facility.*
   This section of the memo refers to a definition for breakpoint technology included as a part of the response to question #4.

4. *What are the typical standards/best practices that jurisdictions include in their zoning ordinances for "breakpoint" technology?*
   The CityScape memo provides a proposed definition for Breakpoint design technology, which includes designing a structure so that one point of the structure is at least 5% more susceptible to failure, so that should a failure occur, that point of the structure should be the specific area that fails and not at the base of the tower. This section includes two new standards for inclusion in the Zoning Ordinance, regarding setbacks for telecommunications structures that both do and do not include the use of breakpoint technology, where a reduced setback would be appropriate for those towers that have been certified by a Professional Engineer to have a designated failure point that is less than the full height of the tower.

5. *Generally, when, and where is "breakpoint" technology appropriate or not appropriate for wireless infrastructure?*

The memo states that breakpoint technology is generally utilized for failures that involve wind forces and blowing debris, but is not effective in cases of vehicular collision with the base of the tower structure. Additionally, the CityScape memo notes that breakpoint and similar technologies are best suited for monopole structures, as opposed to other types of telecommunication towers or structures.

As a part of the December 19, 2023 public hearing, the Planning Commission members noted that they had not received the CityScape memo sufficiently prior to the meeting so as to thoroughly review the memo. The Commission members indicated that they would like to defer action on the requested text amendment so as to have adequate time to review the memo. At the applicant's request, the text amendment was deferred from the regularly scheduled meeting in January to the public meeting on February 20, 2024, as the applicant had prior commitments and could not be present for the January meeting. Given this, the Planning Commission moved to defer action and leave the public hearing open until the February meeting.

STAFF RECOMMENDATION

Pattern motions of approval and denial have been provided as attachments to this staff report.

Staff recommends that should the Planning Commission issue a recommendation of approval for this text amendment, that the proposed text language should be revised to allow approval of a tower with a reduced setback based upon a certified fall zone *only where this is appropriate* given the surrounding conditions as determined by Town Council. As proposed, the text amendment language provided by the Applicant would *require* that Town Council allow a setback of less than the full height of the tower when provided with a fall zone certified by a Professional Engineer, regardless of the location or surrounding conditions.

Staff suggests the following language for Planning Commission consideration:

Towers shall be set back a distance of at least one hundred (100) percent of the height of the tower from the boundaries of the property on which the tower is located. On properties located in a PSP District (Public-Semi-Public Institutional District), towers ~~shall only be required to~~ may be setback a distance of at least one hundred (100) percent of the certified fall zone, ~~as certified~~ upon certification by a Virginia Professional Engineer in a letter which includes the Professional Engineer's signature and seal, and where Town Council makes a finding that a setback of less than one hundred (100) percent of the tower height is appropriate for the location of the facility.

Staff is requesting that the Commission hold a public hearing to discuss the proposed text amendment and the contents of the CityScape memo. Per Section 11-3.9.7 *Planning Commission Review*, the planning commission must make a recommendation to Town Council within 100 days following the first work session, which falls on Thursday, March 7, 2024. Given this, the Planning Commission must make a recommendation of approval or denial to Town Council as a part of the February 20, 2024 meeting. Alternatively, the applicant may formally request a deferral of up to 90 days, acknowledging that the 100-day deadline for Planning Commission action is waived.

Three resolutions have been provided as attachments to this staff report for consideration by the Planning Commission:

- A recommendation of Approval to Town Council for the Applicant's proposed language.
- A recommendation of Approval to Town Council for Staff's alternative language.
- A recommendation of Denial to Town Council.

Service Level / Collaborative Impact

None

Fiscal Impact

A fiscal impact analysis has not been conducted.

Legal Impact

Any amendment to the setback requirement found in Section 9-18.10 will apply to all properties within the Town, unless specifically restricted to the PSP District as a part of the amended ordinance language.

A reduction in the required setback to property boundaries to less than 100-percent of the tower height may impact neighboring properties and roadways that are located within the 100-percent setback area.

Telecommunication towers are listed as a Permissible Use in all zoning districts, where towers require the approval of a Special Use Permit from Town Council, according to the standards found in Ordinance Section 9-18 *Telecommunications Facilities* and Section 11-3.10 *Special Use Permits and Waivers*, to include the 32 *Evaluation Criteria* listed in Section 11-3.10.3. Should the proposed text amendment be adopted by Town Council, all applications for a telecommunication tower will require the approval of a Special Use Permit, where the details of the specific tower and location will be evaluated for suitability.

ATTACHMENTS

1. Attachment A: Application Documents
2. Attachment B: Zoning Ordinance Section 9-18 Telecommunications Facilities
3. Attachment C: Example Fall Zone Certification Letter
4. Attachment D: Ordinance Section 3-4.9 – Permitted and Permissible Uses
5. Attachment E: Location Map - PSP-Zoned Tax Parcels
6. Attachment F: Plan Showing Tower Location Overlain on GIS Aerial Imagery
7. Attachment G: Agency Review Comments – VDOT & Public Works
8. Attachment H: Certified Fall Zone Letter, Proposed Tower Site, December 11, 2023
9. Attachment I: CityScape Memo Regarding Breakpoint Regulations, December 13, 2023

JD
James P. Downey, P.C.
Attorney and Counselor At Law

May 24, 2023

Rob Walton
Director of Community Development
Town of Warrenton
21 Main Street
Warrenton, Virginia 20186

Re: Arcola Towers, LLC; cell tower approval

Dear Mr. Walton:

I hereby apply for a text amendment to the Town ordinance to change the setback limits for telecommunications towers ("cell towers") in the PSP District.

A letter of justification and proposed text are attached, together with exhibits. While the proposal would affect a specific parcel, which is identified in these materials, the proposal would apply to all PSP-zoned parcels in the Town.

Very truly yours,

James P. Downey

Enclosures
cc: Jonathan L. Yates, Esq.
Hon. Heather D. Sutphin
JPD/cmh

JD
James P. Downey, P.C.
Attorney and Counselor At Law

May 24, 2023

Rob Walton
Director of Community Development
Town of Warrenton
21 Main Street
Warrenton, Virginia 20186

Re: Letter of Justification

Dear Mr. Walton:

This letter of justification is submitted in support of the proposed ordinance amendment submitted herewith on behalf of Arcola Towers, LLC, for reduction of the setback requirement for telecommunications towers in the PSP zoning district.

This proposed amendment arises from a proposal for construction of a 150-foot telecommunications tower on a parcel of land leased from the Virginia Department of Transportation boundary shown on the enclosed plat and diagram. This site is within the cloverleaf of highways known as the Bypass on the Northeast side of Town, in an area that will allow for expanded cellular coverage.

The existing setback rules would require setbacks of 150' from the property boundary. A setback requirement of 100% of the height of the tower is unduly restrictive and would prevent construction of the tower on the subject parcel. The site is not large enough to accommodate such a depth of setback. Construction and design technology that will be applied to the construction of this tower will ensure that in the rare instance of the tower falling, the certified fall zone would be sufficient protection against any segment of the tower falling outside the property boundary lines.

Engineering and construction standards and experience demonstrate that it is not necessary to have a setback of 150' for a tower of that height. A sample of the kind of letter that can be supplied, to demonstrate a certified fall zone as the satisfactory setback, is attached.

Reduction of the setback to coincide with the actual fall zone radius would be consistent with the public health, safety and welfare and would be reasonably related to the valid objective of protecting the public from the hazards of a fall of the telecommunications tower in this location.

The proposed text amendment would allow construction of the telecommunications tower in the PSP zone to a height to conform with the certified fall zone distance.

Very truly yours,

James P. Downey

Enclosures
JPD/cmh

ARCOLA TOWERS

FirstNet

AT&T

ARCOLA TOWERS
VDOT WARRENTON
RT 17 NORTH RAMP
WARRENTON, VA 20187

MONOPOLE 150'

entrex
communication services, inc.
6100 Executive Blvd., Suite 430
Rockville, MD 20852
PHONE: (202)408-8860

SUBMITTALS

DATE	DESCRIPTION	REV
08-02-22	CONCEPT PLAN REVIEW	
08-08-22	CONCEPT PLAN REVIEW	
10-20-22	CONCEPT PLAN REVIEW	
10-20-22	ARCOLA TOWERS COMMENTS	

SEAL:

ARCOLA TOWERS

PROJECT NO: 1154.014
DESIGNER: M.A.
ENGINEER: M.M.

SCALE:
SCALE AS NOTED

ARCOLA TOWERS SITE
VDOT WARRENTON
RT 17 NORTH RAMP
WARRENTON, VA 20187

TITLE:
TITLE SHEET

SHEET NUMBER:
T-1

GENERAL NOTES

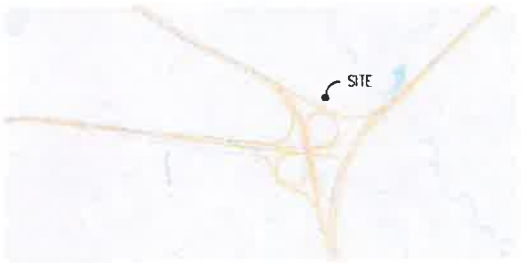
1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAS MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE CONSTRUCTION MANAGER OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWING/CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATION UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDA OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
11. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
12. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
13. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
14. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL THE CONFLICT IS RESOLVED BY THE CONSTRUCTION MANAGER.
15. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE PROJECT.

BUILDING CODE

2018 INTERNATIONAL BUILDING CODE

REFERENCING:
2017 NATIONAL ELECTRIC CODE WITH LOCAL AMENDMENTS
2018 INTERNATIONAL MECHANICAL CODE
TIA- 222-G (2018) STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS

VICINITY MAP



SYMBOLS AND ABBREVIATIONS

ADJ	ADJUSTABLE	MECH	MECHANICAL
APPROX	APPROXIMATE	MFR	MANUFACTURER
CAB	CABINET	MGB	MAIN GROUND BAR
CLG	CEILING	MIN	MINIMUM
CONC	CONCRETE	MTL	METAL
CONT	CONTINUOUS	NIC	NOT IN CONTRACT
CJ	CONSTRUCTION JOINT	NTS	NOT TO SCALE
DIA	DIAMETER	OC	ON CENTER
DWG	DRAWING	OPP	OPPOSITE
EGB	EQUIPMENT GROUND BAR	SF	SQUARE FOOT
EA	EACH	SHT	SHEET
ELEC	ELECTRICAL	SIM	SIMILAR
EL	ELEVATION	SS	STAINLESS STEEL
EQ	EQUAL	STL	STEEL
EQUIP	EQUIPMENT	TOC	TOP OF CONCRETE
EXT	EXTERIOR	TOM	TOP OF MASONRY
FF	FINISHED FLOOR	TOS	TOP OF STEEL
GA	GAGE	TYP	TYPICAL
GALV	GALVANIZED	VIF	VERIFY IN FIELD
GB	GROUND BAR	UON	UNLESS OTHERWISE NOTED
GC	GENERAL CONTRACTOR	WWF	WELDED WIRE FABRIC
GRND	GROUND	W/	WITH
LG	LONG	&	AND
LLH	LONG LEG HORIZONTAL	@	AT
MAX	MAXIMUM		

SPOT ELEVATION
CENTERLINE
PLATE
DETAIL NUMBER / SHEET NUMBER
GROUND WIRE
ANTENNA

811 Call Before You Dig

SHEET INDEX

PROJECT DESCRIPTION

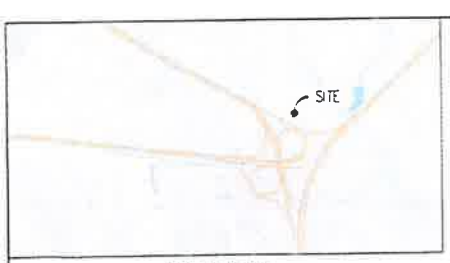
SCOPE OF WORK:
1. INSTALL EROSION AND SEDIMENT CONTROLS.
2. CLEAR AND GRADE SITE TO FINAL SUBGRADE ELEVATION.
3. INSTALL MONOPOLE FOUNDATION AND (50' HIGH MONOPOLE.
4. INSTALL EQUIPMENT FRAME AND EQUIPMENT.
5. INSTALL GROUNDING, NEW CABINET BASE, UTILITY WHERWAY.
6. INSTALL ELECTRICAL AND TELEPHONE CONDUIT AND HAND HOLES.
7. INSTALL FENCE AND SITE IMPROVEMENTS.
8. INSTALL AT&T PLATFORM, CABLES AND EQUIPMENT SHELTER AND GENERATOR.

PROJECT INFORMATION

PROPERTY OWNER: COMMONWEALTH OF VIRGINIA
1221 E BROAD ST
RICHMOND, VA 23218

APPLICANT: ARCOLA TOWERS
116 N WASHINGTON ST. #203
MIDDLEBURG, VA 20117
(571) 985 3880

LATITUDE: 38° 43' 43.81" N
LONGITUDE: 77° 48' 53.71" W
GROUND ELEVATION: 448' AMSL
JURISDICTION: TOWN OF WARRENTON
FIPS: N/A
CURRENT ZONING: PSF
USE: COMMERCIAL
PROPOSED USE: COMMERCIAL/TELECOM



VICINITY MAP
SCALE: 1"=1000'

TRUE NORTH

CONCEPT PLAN NOTES

1) SITE NAME: ARCOLA TOWERS SITE: VDOT WARRENTON RT 17 NORTH RAMP

2) THIS IS NOT A BOUNDARY SURVEY AND IS NOT TO BE USED FOR THE TRANSFER OF PROPERTY.

3) THE SUBJECT PARCEL INFORMATION:

OWNER: COMMONWEALTH OF VIRGINIA
PROPERTY ADDRESS: RT 17 NORTH RAMP
WARRENTON, VA 20187

JURISDICTION: TOWN OF WARRENTON
PIN: N/A
ZONING: PSP

4) THE LOCATION OF THE PROPOSED MONOPOLE IS AS FOLLOWS. THE VALUES LISTED BELOW ARE WITHIN ±50' HORIZONTAL AND ±20' VERTICAL.

LATITUDE: 38° 42' 43.81" (GOOGLE EARTH)
LONGITUDE: 77° 46' 53.71" (GOOGLE EARTH)
ELEVATION: 394' AT BASE (GOOGLE EARTH)

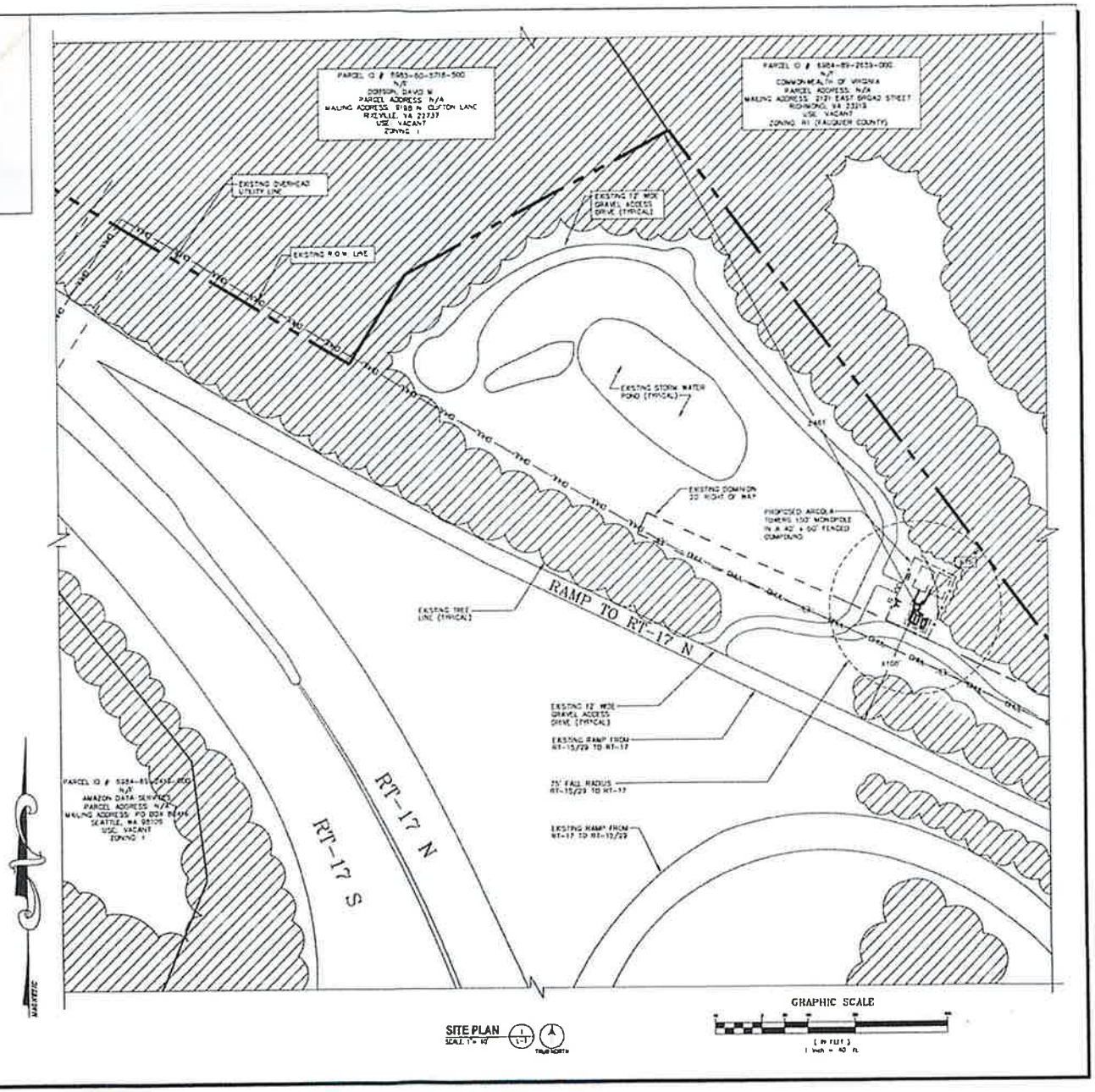
LEGEND

- FOUND PROPERTY CORNER
- BENCH MARKS
- UTILITY POLE
- SIGN
- LIGHT POLE
- TELEPHONE PEDESTAL
- PERSONAL TREE - DECIDUOUS

LINE TYPES

- PROPERTY LINE
- RIGHT OF WAY BOUNDARY
- EDGE OF ASPHALT
- EDGE OF CONCRETE
- FENCE LINE - CHAIN
- TREE OR VEGETATION LINE

MONOPOLE SETBACKS	REQUIRED	PROPOSED
FRONT YARD (SOUTHEAST)	N/A	N/A
REAR YARD (NORTHEAST)	N/A	N/A
SIDE YARD (SOUTHWEST)	N/A	N/A
SIDE YARD (NORTHWEST)	N/A	>461'
CLOSEST HOUSE	N/A	>1,142'
CLOSEST ROAD	N/A	>329'



SITE PLAN
SCALE: 1" = 40'

GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft.

entrex
communication services, inc.
8100 Boone Blvd., Suite 430
Rockville, MD 20833
PHONE: (202)408-0660

SUBMITTALS		
DATE	DESCRIPTION	REV
09-01-22	CONCEPT PLAN REVIEW	
09-09-22	CONCEPT PLAN REVIEW	
10-20-22	CONCEPT PLAN REVIEW	
10-20-22	ARCOLA TOWERS COMMENTS	

SEAL

ARCOLA TOWERS

PROJECT NO	1164.014
DESIGNER	M.A.
ENGINEER	M.M.

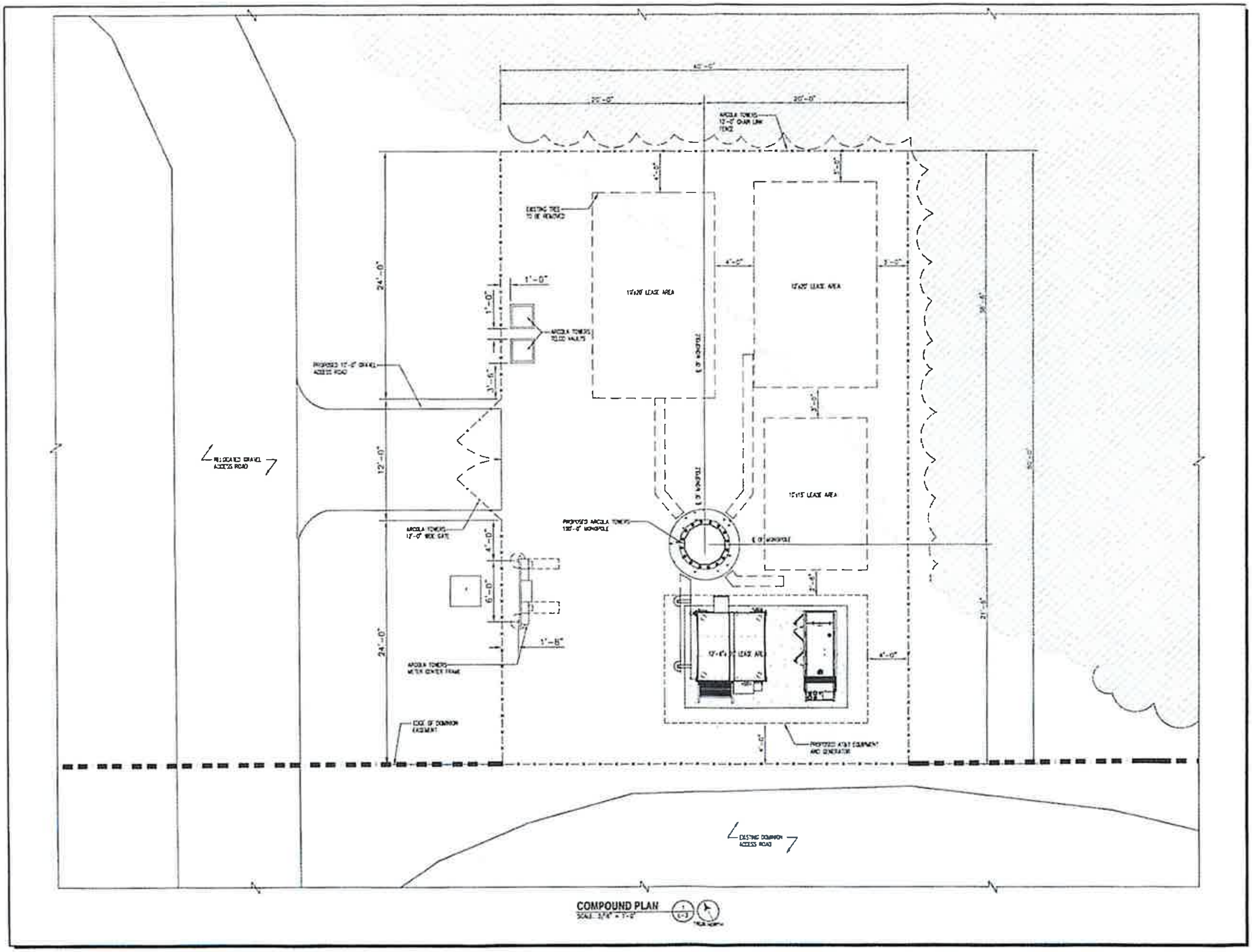
SCALE
SCALE AS NOTED

ARCOLA TOWERS SITE
VDOT WARRENTON
RT 17 NORTH RAMP
WARRENTON, VA 20187

TITLE
SITE PLAN

SHEET NUMBER
L-1

RAMP TO RT-17 N
PARTIAL SITE PLAN
GRAPHIC SCALE
ARCOLA TOWERS SITE
VDOT WARRENTON
RT 17 NORTH RAMP
WARRENTON, VA 20187
PARTIAL SITE PLAN
L-2
SUBMITTALS
entrex
communication service, inc



COMPOUND PLAN

SCALE: 3/4" = 1'-0"

entrex
communication services, Inc.
4100 Executive Blvd., Suite 450
Rockville, MD 20852
PHONE: (202)408-0960

SUBMITTALS		
DATE	DESCRIPTION	REV
08-02-22	CONCEPT PLAN REVIEW	
09-08-22	CONCEPT PLAN REVIEW	
10-20-22	CONCEPT PLAN REVIEW	
10-20-22	ARCOLA TOWERS COMMENTS	

SEAL:

ARCOLA
TOWERS

PROJECT NO. 1164.014
DESIGNER: C.S.
ENGINEER: M.M

SCALE:
SCALE AS NOTED

ARCOLA TOWERS SITE
VDOT WARRENTON
RT 17 NORTH RAMP
WARRENTON, VA 20187

TITLE:

PARTIAL
SITE PLAN

SHEET NUMBER
L-3

MONOPOLE ELEVATION
VIEW LOOKING EAST
MONOPOLE ELEVATION
L-4
ARCOLA TOWERS SITE
VDOT WARRENTON
RT 17 NORTH RAMP
WARRENTON, VA 20187
SCALE AS NOTED
entrex
ARCOLA TOWERS

PROPOSED TEXT AMENDMENT TO 9-18 TELECOMMUNICATIONS FACILITY

EXISTING LANGUAGE

9-18.10 Setbacks

Towers shall be set back a distance of at least one hundred (100) percent of the height of the tower from the boundaries of the property on which the tower is located.

PROPOSED LANGUAGE

9-18.10 Setbacks

Towers shall be set back a distance of at least one hundred (100) percent of the height of the tower from the boundaries of the property on which the tower is located. On properties located in a PSP District (Public-Semi-Public Institutional District), towers shall only be required to be setback a distance of at least one hundred (100) percent of the certified fall zone, as certified by a Virginia Professional Engineer in a letter which includes the Professional Engineer's signature and seal.

9-18 Telecommunications Facilities

9-18.1. Use Regulations for Telecommunications Towers.

The purpose of these provisions is to establish requirements for the siting of towers and antennas and to: (i) avoid the location of towers in residential areas and minimize the total number of towers and tower sites throughout the Town; (ii) encourage the joint use of new and existing tower sites; (iii) encourage users of towers and antennas to locate them, to the extent possible, in areas where the adverse impact on the community is minimal; (iv) encourage users of towers and antennas to configure or camouflage them in a way that minimizes adverse visual impact of the towers and antennas; and (v) determine adequate sites for the provision of telecommunication services with minimal negative impact on the resources of the Town.

9-18.2. Applicability.

9-18.2.1. District location and height limitations. The requirements set forth in this section shall govern the location and height of all telecommunications towers and antennas within the Town. All towers or antennas shall also comply with applicable Federal and State regulations. Amateur radio towers and antennas shall be regulated by the Town under existing State law and applicable Town regulations.

9-18.2.2. Existing structures and towers. The placement of an antenna on an existing structure such as a building, sign, light pole, water tank, or other free-standing nonresidential structure or existing municipal, utility or commercially owned tower or pole may be permitted with the approval of a special use permit so long as the height of the tower or structure is not increased and the addition of the antenna shall not add more than fifteen (15) feet in height to the structure or tower. If the use includes the placement of additional buildings or supporting equipment used in connection with the antennas, the building or equipment shall be placed within the existing structure and shall be screened from view. Existing or proposed structures shall not be altered to circumvent this provision.

9-18.3. General requirements.

9-18.3.1. Principal or accessory use. Antennas and towers may be considered either principal or accessory uses when determining area requirements on a given parcel of land. A different existing use or an existing structure on the same lot shall not preclude the installation of an antenna or tower on such lot. For purposes of determining whether the installation of a tower or antenna complies with district development regulations, and other applicable requirements, the dimensions of the entire lot shall control, even though the

antennas or towers may be located on leased areas within such lots.

9-18.3.2. Inventory of existing sites. Each applicant for an antenna and/or tower shall provide to the Zoning Administrator an inventory of its existing and potential future facilities that are either within the Town or surrounding jurisdictions or within five (5) miles of the border thereof, including specific information about the location, height, and design of each tower and/or antenna. Information submitted to the Town may be shared with other applicants applying for approvals or special exception permits under this provision or other entities seeking to locate towers or antennas within the Town. By sharing such information, the Zoning Administrator is not in any way representing or warranting that such sites are available or suitable for tower or antenna use.

9-18.3.3. A Commission Permit in accord with Section 15.2-2232 of the Code of Virginia is required for any tower or antenna prior to or in conjunction with any Special Use Permit approvals, if any, that may be required by the district regulations of this Ordinance.

9-18.4. Appearance; lighting.

The guidelines set forth in this section shall govern the appearance, location and installation of all towers and antennas governed by this Ordinance.

9-18.4.1. Towers shall either maintain a galvanized steel finish or, subject to any applicable standards of FAA, be painted a neutral color, to reduce visual appearance and obtrusiveness and to blend in with the surrounding environment. Dish antennas and covers will be of a neutral, nonreflective color with no logos or other markings.

9-18.4.2. At a facility site, the design of any buildings and related structures must use materials, colors, textures, screening, and landscaping that will blend the tower facilities to the natural setting and the surrounding environment.

9-18.4.3. If an antenna is installed on a structure other than a tower, the antenna and supporting electrical and mechanical equipment must be of a neutral color that is the same as the color of the supporting structure so as to make the antenna and related equipment visually unobtrusive and blend with the surrounding environment.

9-18.4.4. Towers shall not be artificially lighted, unless required by the FAA or other applicable governing authority. If lighting is required, the Town Council may review the available lighting alternatives in conjunction with a Special Use Permit application and approve the lighting design that would cause the least disturbance to the surrounding views and properties.

9-18.4.5. No advertising of any type may be placed on a tower or accompanying facility unless it is part of retrofitting a pre-existing, lawful sign structure.

9-18.5. Federal and state requirements.

All towers must meet or exceed current standards and regulations of the FAA, the FCC, and any other agency of the federal or state governments with the authority to regulate towers and antennas. If such standards and regulations are changed, then the owners of the towers and antennas governed by this division shall bring such towers and antennas into compliance with such revised standards as required. Failure to bring towers and antennas into compliance with such revised standards and regulations shall constitute grounds for the removal of the tower or antenna at the owner's expense. All towers and antennas constructed on property owned or leased by the federal or state government but used by non-governmental, commercial companies or operators, must comply with all requirements of the Town Zoning Ordinance.

9-18.6. Building Codes.

To ensure the structural and operating integrity of antennas and towers, the owner of an antenna or tower shall ensure that it, and any supporting buildings and structures, are constructed and maintained in compliance with standards contained in applicable federal, state and local buildings codes and regulations.

9-18.7. Information Required.

Each applicant requesting a special use permit under this section shall submit a scaled site plan and a scaled elevation view and other supporting drawings, calculations, and other documentation, signed and sealed by appropriate licensed professionals in the Commonwealth of Virginia, showing the location and dimensions of all improvements, including information concerning topography, existing vegetation, proposed clearing and grading, radio frequency coverage, tower height and antenna location requirements, setbacks, ingress/egress, parking, fencing, landscaping, adjacent uses, and other information deemed by the Town Planning Commission or Town Staff to be necessary to assess compliance with this division. Additionally the applicant shall provide actual photographs of the site from designated relevant views that include a simulated photographic image of the proposed tower and antennas. The photograph with the simulated image shall include the foreground, the mid-ground and the background of the site.

9-18.7.1. An engineering report, certifying that the proposed antenna or tower is compatible for co-location when more than one user is proposed for the same tower, must be submitted by the applicant.

9-18.7.2. The applicant shall pay all costs associated with notifying adjoining property owners and other nearby residents by certified letter concerning the project prior to public hearings before the Planning Commission and/or, on appeal, the Town Council.

9-18.7.3. The applicant shall provide copies of its co-location policy. The applicant shall provide copies of propagation maps using proposed antenna tilt demonstrating that antennas and sites for possible co-locator antennas are no higher in elevation than necessary to serve the intended area.

9-18.7.4 The applicant shall provide a report and drawings identifying its coverage area within the Town and surrounding 10-mile area.

9-18.8. Factors to be Considered in Granting Special Use Permits for New Towers and Antennas

The Town Council shall consider the following factors, in addition to others herein, in determining whether to approve a Special Use Permit:

9-18.8.1. Height of the proposed tower: No tower shall ever exceed 199 feet.

9-18.8.2. Proximity of the tower or pole to residential structures and residential district boundaries, historic structures and districts, or other manmade or unique natural areas within or adjacent to the Town

9-18.8.3. Nature of the adjacent uses and nearby properties.

9-18.8.4. Surrounding topography.

9-18.8.5. Impact on surrounding tree coverage and foliage. Impacts shall be kept to the minimum for the installation of the facility.

9-18.8.6. Design of tower or pole, with particular reference to design characteristics that have the effect of reducing or eliminating visual obtrusiveness.

9-18.8.7. Proposed ingress and egress.

9-18.8.8. Compliance with the Town's co-location policy.

9-18.8.9. Consistency with the Comprehensive Plan and the purposes of the zoning district of the facility and areas from which the antenna or tower will be visible.

9-18.8.10. Availability of suitable existing towers and other structures as provided for in Section 9-18.9 herein.

The Council may waive or modify one (1) or more of these criteria if the Council concludes that the goals of this Ordinance are better served by the facility as it is proposed by the applicant.

9-18.9. Availability of Suitable Existing Towers or Other Structures.

Co-location is the preferred solution to the need for additional antennas. No new tower shall be permitted unless the applicant demonstrates that no existing tower or structure can accommodate the applicant's proposed antenna. Evidence to be considered in determining whether existing towers or structures cannot accommodate the applicant's proposed antenna include the following:

9-18.9.1. No existing towers or structures are located within the geographic area required to meet applicant's engineering and coverage requirements under the Telecommunications Act (TCA).

9-18.9.2. Existing towers or structures are not of sufficient height to meet applicant's engineering and coverage requirements under the Telecommunications Act (TCA).

9-18.9.3. Existing towers or structures do not have sufficient structural strength to support applicant's proposed antenna and related equipment and cannot be made or reconstructed to support additional antennas.

9-18.9.4. The applicant's proposed antenna would cause electromagnetic interference with the antenna on the existing towers or structures, or the antenna on the existing tower or structures would cause interference with the applicant's proposed antenna.

A written statement of justification with supporting documentation is required from any applicant claiming that no existing facility can accommodate its antenna. The Town Council may use its own staff, it's own consultants or other independent authorities to review and verify information submitted by the applicant.

9-18.10. Setbacks.

Towers shall be set back a distance of at least one hundred (100) percent of the height of the tower from the boundaries of the property on which the tower is located.

9-18.11. Security fencing.

Towers shall be enclosed by security fencing not less than six (6) feet in height and shall be equipped with an anti-climbing device.

9-18.12. Landscaping.

The following requirements shall govern the landscaping surrounding towers.

9-18.12.1. Tower facilities shall be landscaped with a mix of deciduous and evergreen trees that effectively screens the view of the support buildings from adjacent property. The standard buffer shall consist of a landscaped strip of at least ten (10) feet wide outside the perimeter of the facility compound.

9-18.12.2. Existing mature tree growth and natural land forms on the site shall be preserved to the maximum extent possible.

9-18.13. Removal of abandoned antennas and towers.

Any antenna or tower that is not operated for a continuous period of two (2) years shall be considered abandoned, and the owner of such antenna or tower shall remove same within ninety (90) days of receipt of notice from the Zoning Administrator notifying the owner of such removal requirement. Removal includes the removal of the tower, all tower and fence footers, underground cables and support buildings.

If there are two (2) or more users of a single tower, then this provision shall not become effective until all users cease using the tower. If the tower is not removed per this section, the Town may require the landowner to have it removed.

entrex
communication services, inc.

6100 Executive Blvd., Suite 430 • Rockville, MD 20852 • Tel: 202.408.0960

July 25, 2022

Ms. Kristen Stelzer
Arcola Towers
PO Box 2150
Middleburg, VA 20118

Re: Proposed 195' Monopole for Mt. Jackson, VA Site

Dear Ms. Stelzer,

The monopole for this site shall be designed in accordance with the Telecommunications Industry Association Standard ANSI/TIA-222-H "Structural Standard for Antenna Supporting Structures and Antennas" by a tower manufacturer to meet a 45 ft fall radius.

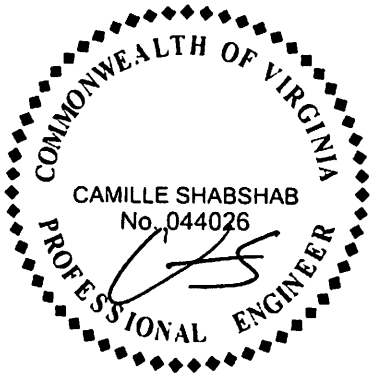
When designed according to this standard, the wind pressures and steel strength capacities include several safety factors, resulting in an overall minimum safety factor of 25%. Therefore, it is highly unlikely that the monopole will fail structurally in a wind event where the design wind speed is exceeded within the range of the built-in safety factors.

Should the wind speed increase beyond the capacity of the built-in safety factors, to the point of failure of one or more structural elements, the most likely location of the failure would be within the monopole shaft, above the base plate. Assuming that the wind pressure profile is similar to that used to design the monopole, the monopole will buckle at the location of the highest combined stress ratio within the monopole shaft, resulting in the portion of the monopole above leaning over and remaining in a permanently deformed condition. The monopole shall be designed such that the shaft section at elevation 150 ft will buckle before any other section on the monopole resulting in a fall zone of 45 ft

Please note that this letter only applies to the above referenced monopole.

Sincerely,

Camille Shabshab, PE
Vice President



3-4.9 PSP Public-Semi-Public Institutional District

3-4.9.1. Legislative Intent

This district is intended to provide for major public, semi-public, and institutional uses, to facilitate future growth of such uses within the district in accordance with the objectives, policies, and proposals of the Comprehensive Plan, including the encouragement of convenient and safe nearby residential neighborhoods, and to provide evidence on the Zoning map of the nature of land use planned for this district.

3-4.9.2. **Permitted Uses** (by-right)

- Accessory buildings and uses, including dwellings accessory to a permitted use
- Cemeteries
- Child care center, day care center, or nursery school
- Churches
- Community buildings
- Fairgrounds, showgrounds, or exhibition center
- Family care homes, foster homes, or group homes
- Hospitals, nursing homes, and clinics
- Institutional uses
- Offices for business or professional use
- Off-street parking for permitted uses subject to Article 7
- Open space subject to Article 9
- Parks and playgrounds
- Public or governmental buildings
- Rescue squad or volunteer fire company
- Schools
- Senior citizen center
- Signs subject to Article 6
- Utilities related to and necessary for service within the Town, including poles, wires, transformers, telephone booths, and the like for electrical power distribution or communication service, and underground pipelines or conduits for local electrical, gas, sewer, or water service, but not those facilities listed as requiring a special use permit
- Yard sale or other special sale or event conducted on the premises of and for the benefit of a permitted use in the district

3-4.9.3. **Permissible Uses** (by special use permit upon approval of the Town Council)

- Emergency housing
- Gift Shops
- Health and Fitness Facilities
- Museums
- Single Family Dwellings
- Visitor Centers
- Active and passive recreation and recreational facilities.
- Treatment plants, water storage tanks, major transmission lines or pipelines, pumping or regulator stations, communications towers, storage yards and substations, and cable television facilities and accessory buildings

3-4.9.4. Lot and Yard Regulations

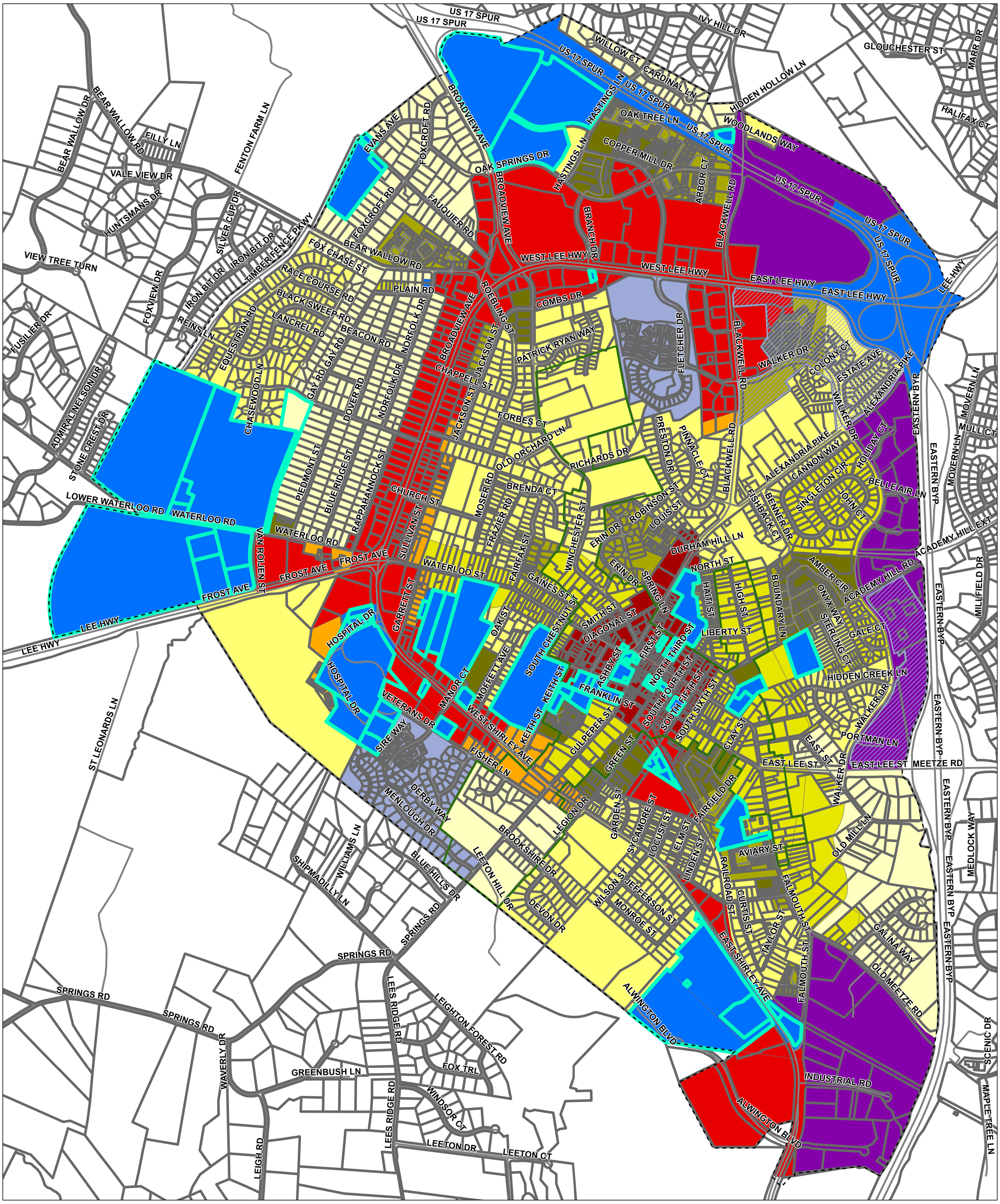
Use	Minimum Lot Size (sq. ft.)	Minimum Lot Frontage (at front setback)	Maximum Lot Coverage (impervious surfaces)	Minimum Setbacks		
				Front	Side	Rear
All Permitted and Permissible Uses	6,000	60 ft.	65%	25 ft.	15 ft.	35 ft.

3-4.9.5. Building Regulations

Use	Maximum Height*
All buildings	35 feet
Accessory buildings	Within 20 feet of any lot line shall not exceed 15 feet in height. All accessory buildings shall be less than the main building in height.

*A public or institutional building or church may be erected to a height of sixty (60) feet from grade provided that required front, side, and rear yards shall be increased one (1) foot for each foot in height over thirty-five (35) feet.

TOWN OF WARRENTON
Zoning District PSP Parcels



Legend

- Town of Warrenton Boundary
- Roads
- Tax Parcel
- PSP Parcels
- Historic District Overlay
- IPUD Overlay

Zoning District

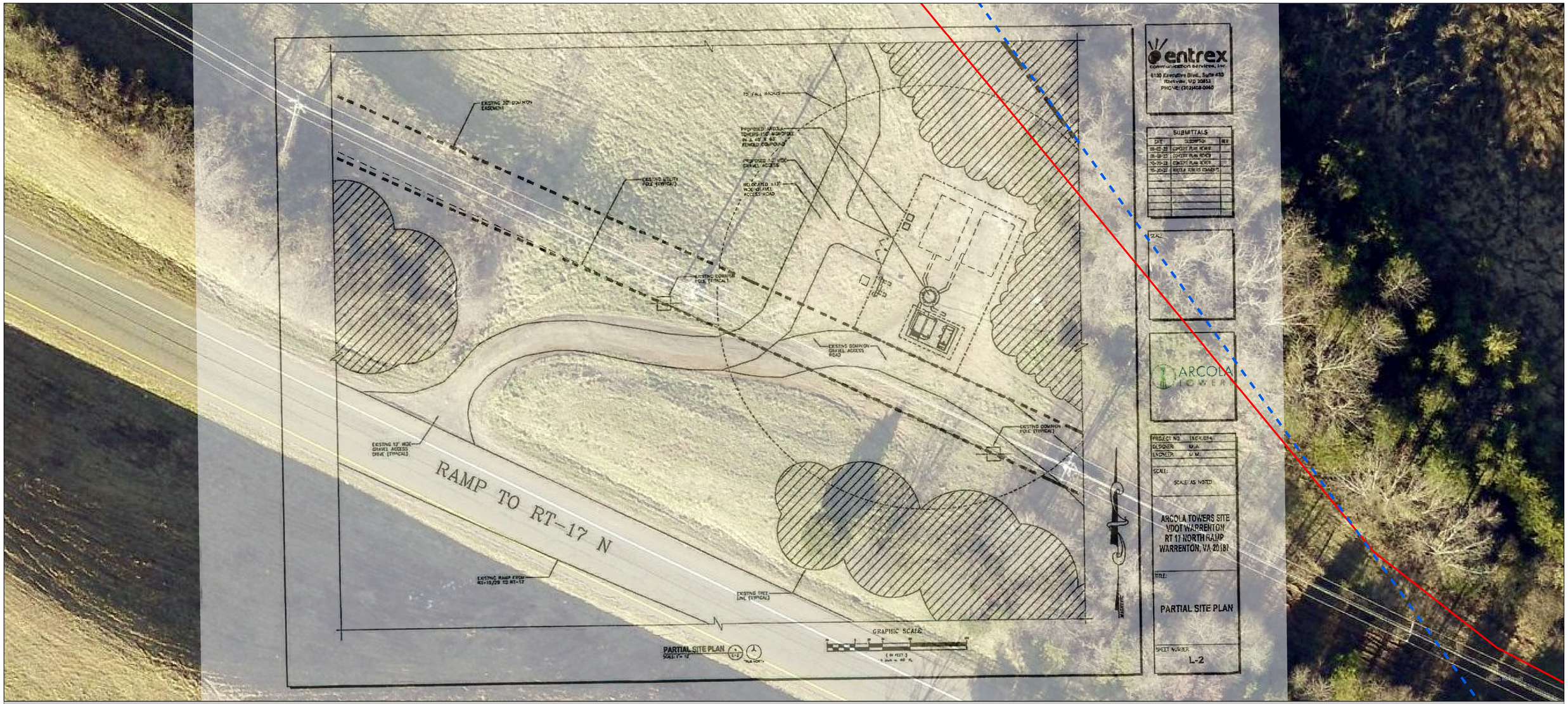
- R-15
- R-10
- R-6
- RT
- RMF
- RO
- PSP
- C
- CBD
- I
- PUD

October 3, 2023

Sources: Town of Warrenton & Fauquier County

0 0.25 0.5 Miles

TOWN OF WARRENTON
ARCOLA Cell Towers Plat Page 3



Legend

- - - - Town of Warrenton Boundary

▭ Tax Parcel

July 21, 2023

Source: Town of Warrenton & Fauquier County

0 0.01 0.01 Miles

COMMONWEALTH of VIRGINIA
DEPARTMENT OF TRANSPORTATION
457 East Shirley Avenue
Warrenton, Virginia 20186

Stephen C. Brich, P.E.
Commissioner

Date: September 22, 2022

To: Gregory Primeau – Site-AC, Inc.

cc: Randy Norris, VDOT, Travis Estes, VDOT, Denise Harris, Town of Warrenton

Re: **Initial Feasibility Inquiry-Locality Approval-New Cellular Monopole Tower**

Dear Mr. Primeau:

The above referenced Plan of Development (POD) prepared by Piedmont Land Consulting LLC with a Cover Sheet date of June 22, 2022 and received by VDOT date of August 18, 2022 has been reviewed.

General:

1. Based on the site visit conducted by the Culpeper District Staff, location #1 and #2 per the attached sketch are not recommended based on their location to the existing storm water facility that is located on the proposed site. (VDOT)
2. Future maintenance of the principal spillway pipe (excavation and/or replacement) would be complicated by a tower site at location #1 and #2. (VDOT)
3. Location #3 per the attached sketch is VDOTs preferred location. This location appears to be with in Limited Access Right of Way and would require VDOTs Chief Engineer approval. (VDOT)
4. It will be the responsible of permittee to demonstrate that the proposed Monopole Tower will not adversely impact VDOT ROW and the existing Stormwater facility.
5. A VDOT LUP-SUWSS (Single-Use Permit – Wireless Support Structure) will be required along with all the supporting information and payment/surety. (VDOT)
6. The structure will have to have a third-party inspector in place to inspect the structure and its construction. (VDOT)
7. If the cell tower will be operated by a private entity, the Town will review the project (Commission Permit, Special Use Permit, Site Plan, Building Permit, and Land Disturbing permit if required). The applicant should review Section 9-18 of the Town's Zoning Ordinance regarding the regulations that apply to the tower. Staff doesn't feel the tower meets the setback requirements stated in Section 9-18.10. (Town of Warrenton)
8. If the tower is used for a public purpose (i.e. emergency communications), then the tower is exempt from the Town's review. (Town of Warrenton).

VDOT did not receive any comments from Fauquier County.

Please contact me at 540-229-1164 or craig.simpson@vdot.virginia.gov if there are any questions or concerns.

Sincerely,

Craig Simpson, P.E.
Area Land Use Engineer
Warrenton Residency

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

REGION	STATE	FEDERAL AID PROJECT	ROUTE	SHEET
3	VA.		17	6017 - 03

N 65° 02' 27" W
Const. ℄
℄ E
Vepco ±E056
6-25
6-17
7-8
Exist. Utility Easement
Vepco ±E078
FE-WI Req'd.
N 35° 27' W
(35° 27' W)
Bag Asphalt Curb & Backup Material Sta. 21+70
Prop. Limited Access Line
Prop. Utility Ease
80.19'
+34.44
107.15'
+32.59
171.08'
+28.53
383.53'
+75.48
E.C. 2 END
S 22° 01' 03" W
388.91
389.00
SWM #30011
SWM Pond 71-1
See Sheet 20
7-9
7-10
Prop. R/W
EXIST. R/W & Limited Access
PROP. R/W
FAUQUIER COUNTY
TOWN OF WARRENTON CORP. LIMITS
VDOT PREFERRED LOCATION FOR ARCOLA TOWERS SITE
COORDINATED W/ TRAVIS ESTES.
8/17/22

PLAN	SPECIAL PROVISIONS	NOTE BOOK	MISC. DESIGN

SUPERVISED BY:
DESIGNED BY:
CADD OPERATOR:
REVISED BY:
08/23/94 ALSAS

PLAN NO.	PROJECT	SHEET
A	6017-030-F08	69

Land Use Permit
LUP-SUWSS

Single-Use Permit - Wireless Support Structure

June 28, 2019

The installation of wireless support structures and associated facilities on highway right-of-way is authorized under Section 24VAC30-151-350 of the Land Use Permit Regulations.

Applicant Agreement for Land Use Permit Issuance

I the undersigned hereby acknowledge that I am fully cognizant of and, in my individual capacity and as a duly authorized representative of the entity applying for this permit, agree to all of the following requirements associated with the issuance of a single use permit authorizing the installation and maintenance of a wireless support structure and associated facilities located within state maintained right-of-way:

Type or Print Clearly

Name of Applicant: _____

Applicant's Tax ID No.: _____

Applicant's Mailing Address: _____

City: _____ **State:** _____ **Zip Code:** _____

Primary Telephone No.: (_____) _____ - _____ **24-Hour Telephone No.:** (_____) _____ - _____

Fax No.: (_____) _____ - _____ **E-mail Address:** _____

Name of Agent/contractor: _____

Agent/Contractor Tax ID No.: _____

Agent's Mailing Address: _____

City: _____ **State:** _____ **Zip Code:** _____

Primary Telephone No.: (_____) _____ - _____ **24-Hour Telephone No.:** (_____) _____ - _____

Fax No.: (_____) _____ - _____ **E-mail Address:** _____

Work Description: _____

_____

_____

Locality: _____

Route Name & Number: _____

Nearest Intersecting Route (Name and Number): _____

Coordinates: Latitude _____ **Longitude** _____

Name of Applicant's Duly Authorized Representative: _____

Representative's Title: _____

Representative's Signature: _____

Name of Agent's/Contractor's Duly Authorized Representative: _____

Agent's Title: _____

Agent's Signature: _____

VDOT Land Use Permit Required by Law

The General Rules and Regulations of the Commonwealth Transportation Board provide that no work of any nature shall be performed on any real property under the ownership, control, or jurisdiction of VDOT until written permission has been obtained from VDOT. Written permission is granted for the above-referenced activity through the issuance of a land use permit.

By issuing a permit, VDOT is giving permission only for whatever rights it has in the right-of-way; the Permittee is solely responsible for determining all entities that may have a property interest of any kind or nature in the right-of-way and for obtaining permission from all such entities for the Permittee's use of the right-of-way and shall be solely liable for any failure to obtain from any and all entities having a property interest in the right-of-way.

The Permittee will be civilly liable to the Commonwealth for expenses and damages incurred by VDOT as a result of violation of any of the rules and regulations of **24VAC30-151**. Violators shall be guilty of a misdemeanor and, upon conviction, shall be punished as provided for in §**33.2-210** of the Code of Virginia.

Application Requirements

Application for a land use permit authorizing the installation, maintenance, and operation of wireless support structures located within state maintained right-of-way shall be made through the local residency permit office where the activity is to take place.

The permit application shall include plan/sketches showing distances from edge of pavement, existing and proposed right-of-way line, depths below and above existing and proposed grades, depths below ditch line or underground drainage structures, or other relevant features. Any existing utilities within close proximity of the applicant's work shall be shown. Location of poles, guys, pedestals, relief valves, vent pipes, etc. shall be shown. Height of wires or cables above the crown of the roadway shall also be shown.

Additionally, a Radio Frequency Emissions Compliance Report; an Intermodulation Study showing no expected impact with existing Commonwealth of Virginia, toll agency, Departments of Energy and Homeland Security, and locality equipment (if within radius of impact of such equipment); and a Structural Evaluation (including design of the support structure, all connections and splices, foundation design, and any boring logs) consistent with the

building code showing that the wireless facilities can be safely located on the support structure shall also be provided. These documents shall be stamped and sealed by an engineer licensed to practice in Virginia in accordance with regulations issued by the Virginia Department of Professional and Occupational Regulation.

The applicant shall provide a notarized affidavit certifying compliance with the registration and notification requirements outlined in § 2.2-1151.1 of the Code of Virginia, a work area protection plan (if necessary), and approval from the locality (if appropriate).

Contact Information

A list of counties with their corresponding VDOT district offices and contact information may be obtained at http://www.virginiadot.org/about/districts.asp. Contact information for residency offices is available at http://www.virginiadot.org/about_vdot/residencies.asp.

Permit Term and Fees

1. The land use permit term is 10 years, with three 5 year extensions, but may be terminated earlier for cause or by mutual agreement.

2. The land use permit application shall include payment in the amount of $110.00 for processing the request.

3. The amount of the annual wireless support structure public rights-of-way use fee shall be (check height that applies and insert square footage, if applicable):

□ 1. $270 for any wireless support structure at or below 50 feet in height with a small cell installation;
□ 2. $1,000 for any other wireless support structure at or below 50 feet in height;
□ 3. $3,000 for any wireless support structure above 50 feet and at or below 120 feet in height;
□ 4. $5,000 for any wireless support structure above 120 feet in height; and
___sqft 5. $1 per square foot for any other equipment, shelter, or associated facilities constructed on the ground.

(If the fee limiting provision of the FCC Declaratory Action of September 26, 2018, is overturned then the annual fees set out in §56-484.32 shall apply to structures at or below 50 feet with small cell installations.)

No later than June 30 of each year, the wireless services provider or wireless infrastructure provider shall remit directly to the Virginia Department of Transportation the public rights-of-way use fees for wireless support structures for any site which has a current permit.

Wireless Support Structure Use Fees paid by check or money order shall be drawn payable to the Treasurer of Virginia and shall be submitted to:

VDOT Office of Land Use
1401 East Broad Street
Richmond, Virginia 23219

A summary of the recurring structure inspection reports for each support structure permit that is covered by the submitted amount shall be provided by the permittee to the Department concurrently with the annual payment. Additionally, the emergency (24/7) contact phone number for the permittee's poles and towers shall be sent concurrently with the annual payment as verification that the posted numbers have not changed.

The annual fees shall be adjusted every five (5) years based upon the United States Average Consumer Price Index for all items, all urban consumers (CPI-U), as published by the Bureau of Labor Statistics of the U.S. Department of Labor. Upon the quinquennial adjustment, VDOT shall notify the permittee of the new user fee for the upcoming fiscal year.

Surety Requirement

A surety in the amount of ten-thousand dollars ($10,000.00) per structure is required to ensure that the right-of-way is restored in the event that work on the wireless structure is started but not completed or the right-of way is damaged. This surety may be in the form of cash or check, a LUP-SB surety bond, or an LUP-LC irrevocable letter of credit bank agreement.

Upon completion of construction, a continuous surety for the Permittee's structures must be provided or held by VDOT in the amount of ten-thousand dollars ($10,000.00) per county, and is intended to ensure that the right-of-way is restored in the event of limited facility failure. The continuous surety may be in the form of cash, check or **LUP-SB** surety bond.

Cash Surety Refund

Applicants owing the Internal Revenue Service or the Commonwealth of Virginia may not receive a refund of the cash surety provided for the issuance of a VDOT land use permit unless the amount owed is less than the amount of cash surety provided. Applicants providing cash surety for the issuance of a VDOT land use permit must provide an executed copy of the Commonwealth of Virginia's Substitute Form **W9-COV** to receive a refund of the cash surety provided for the issuance of a VDOT land use permit.

Insurance Requirements

The Permittee or their agent shall secure and maintain Commercial General Liability (CGL) insurance, per form ISO CGL 00 01 or equivalent, to protect against liability for personal injury and property damage that may arise from the activities performed under the authority of a land use permit and from the operation of the permitted activity with a policy limit of one million dollars ($ 1,000,000) each occurrence to protect the Board members and the Department's agents or employees. Permittee shall include Board members and the Department's agents or employees as additional insureds with respect to the required CGL insurance, which must be obtained prior to start of the permitted work and shall remain valid through the permit completion date. VDOT staff may require a valid certificate or letter of insurance from the issuing insurance agent or agency prior to issuing the land use permit.

General Requirements

1) Permittee acceptance and use of a Virginia Department of Transportation (VDOT) land use permit is prima facie evidence that the permittee has read, is fully cognizant of, and agrees to all required permit provisions, applicable traffic control plans and associated construction standards to be employed. All applicants to whom permits are issued shall at all times indemnify and save harmless the Commonwealth Transportation Board, members of the Board, the Commonwealth, and all Commonwealth employees, agents, and officers, from responsibility, damage, or liability arising out of claims, suits, demands, or causes of action as a result of the permit process, granted permit, construction, erection of wireless facilities, location, performance, operation, maintenance, repair, installation, replacement, removal, unintended consequences, or restoration of the wireless facility in the public right-of-way, and any other privileges granted in such permit to the extent allowed by law including any sums ordered to be paid or expended by VDOT by any governmental entity as a fine, penalty or damages for any violation of any applicable environmental law, or to remediate any hazardous or other material, including illicit discharge into VDOT maintained storm sewer systems.
2) The Permittee shall obtain all necessary federal, state, and local approvals, licenses, certificates, and permits (including building permits) prior to beginning construction at the requested site.
3) The Permittee or their agent shall adhere to the terms and conditions as stipulated in the permit assembly without exception. Any deviation may result in the temporary revocation of the land use permit for a term not less than 30 days.
4) The issuance of a single use permit is in no way to be inferred as a conveyance of any interest in real estate property or facilities owned in whole or part by the Virginia Department of Transportation.
5) The communications structure and associated facilities shall meet all applicable building code requirements of all appropriate governmental authorities.

6) The Permittee or their agent must contact (800) 552-7001 to have any/all existing underground utilities located prior to commencing with any excavation within state maintained rights-of-way.

7) The Permittee or their agent should immediately contact the nearest local residency permit office with any interpretive questions or if the permittee, their agent, and/or permittee's facility or equipment is involved in a crash at the work site.

8) The Permittee or their agent shall provide notification, including permit number, locality name, route number, latitude/longitude coordinates, and approximate construction dates, to the local residency permit office prior to initiating activities at the site and immediately after concluding activities at the site.

9) The single-use permit issued for the original installation allows the wireless services provider or wireless infrastructure provider to repair, replace, or perform routine maintenance operations to wireless cell facilities/tower located within non-limited access state maintained right-of-way without impeding traffic more than 15 minutes. A separate land use permit is required each time the wireless services or infrastructure provider desires to repair, replace, or perform routine maintenance operations on such facilities within limited access right-of-way, if site access is from the limited access highway. Application for routine maintenance operations on limited access right-of-way shall be through the submission of a **LUP-A** along with appropriate supplemental documents describing the work.

10) A copy of the VDOT land use permit shall be maintained at the work site and made readily available for inspection when requested by authorized VDOT personnel.

11) The Permittee or their agent must contact the VDOT Customer Service Center at 1-800-367-7623 a minimum of 48 hours prior to initiating any planned excavation within 1,000 feet of a signalized intersection and/or near VDOT ITS infrastructure. Excavation activities may proceed only after the VDOT regional utility location agent has notified the Permittee that the utility marking has been completed. Additional information can be found at:

    http://www.virginiadot.org/business/resources/IIM/TE-383_Request_for_Marking_VDOT_Utility_Location.pdf

    Alternately, within all localities in the Northern Virginia Construction District, including the Counties of Arlington, Fairfax, Loudoun & Prince William, the Cities of Alexandria, Fairfax, Falls Church, Manassas and Manassas Park, and the Towns of Clifton, Dumfries, Hamilton, Haymarket, Herndon, Hillsboro, Leesburg, Lovettsville, Middleburg, Occoquan, Purcellville, Quantico, Round Hill and Vienna, and on Interstate 95 in the counties of Stafford, Spotsylvania and Caroline, the permittee may request VDOT regional utility marking at: **http://www.vdotutilitymarking.virginia.gov**

    Failure to carry out this requirement may result in permit revocation.

12) Within the limits of a VDOT construction project it is the responsibility of the permit applicant to obtain the contractor's consent in writing prior to permit issuance. Information regarding current and/or planned VDOT construction and maintenance activities can be obtained at: **http://www.virginiaroads.org/**.

13) Wireless cell facilities or related equipment installed over a sidewalk shall provide at least 7 feet clearance or, if installed over a road, at least 18 feet clearance (21 feet in limited access right of way), measured vertically from the bottom of the wireless cell facility or equipment to the crown (or a line extended horizontally from the crown) of the paved surface.

14) Wireless cell facilities or related ground equipment shall be installed outside the clear zone.

15) Any and all highway signs, right-of-way markers, etc., disturbed as a result of work performed under the auspices of a land use permit shall be accurately reset by the Permittee immediately following the work in the vicinity of the disturbed facility. The services of a certified land surveyor with experience in route surveying may be required.

16) A permanent tag, label, or sign in accordance with FCC and OSHA guidance shall be attached to, or adjacent to, each installation and shall include:

a. A readily visible identifying alphanumeric code;
b. Maximum operating voltage and maximum radio frequency;
c. RF exposure warning;
d. 24 hours a day/7 days a week emergency contact phone number.

The Permittee shall update the tag, label, or sign within 10 business days of any changes.

17) The Permittee shall make provisions for lowering RF or turning off service while Department officers, agents, employees, volunteers, contractors, or permittees are performing work within the vicinity of the wireless equipment. The Department will give the Permittee three calendar days' notice if wireless radio frequency exposure must be reduced or power turned off due to planned, non-emergency work by VDOT around the structure. In the event of an emergency or unscheduled work, the Department will call the emergency contact phone number on the tag/label/sign to notify the Permittee of any action taken.

18) If any FCC, State, or other governmental license or any other governmental approval to provide communication services is ever revoked to the Permittee or any site permitted or authorized by the Department, the Permittee shall inform the Department of the revocation within 30 days of receiving notice of such revocation and provide a timeline for removal of the wireless facilities or transfer of ownership to a licensed successor who shall assume all obligations and responsibilities of the Permittee.

19) The Permittee shall provide VDOT with a copy of the "as built" plans in an electronic format acceptable to VDOT.

20) The LUP-GWG provides guidance for the permit application process, design submittal, installation requirements, and associated VDOT review of the wireless equipment facilities to be located within the Department's right-of-way.

Traffic Control & Safety

1) The Permittee shall at all time give strict attention to the safety and rights of the traveling public and all other persons on the right-of-way. Any permit may be suspended when in the opinion of the local residency permit office, the safety, use, or maintenance of the highway so requires.

2) In accordance with the Virginia Department of Transportation (VDOT) Road and Bridge Specifications, Special Provision 105.14, all activities performed under the auspices of a VDOT Land Use Permit involving the installation, maintenance and removal of work zone traffic control devices must have an individual on-site who, at a minimum, is accredited by VDOT in Basic Work Zone Traffic Control. The accredited person must have their VDOT Work Zone Traffic Control accreditation card in their possession.

3) The individual accredited in Basic Work Zone Traffic Control is responsible for the placement, maintenance and removal of work zone traffic control devices within the project limits in compliance with the permit requirements and conditions, the approved plans and specifications, the Virginia Work Area Protection Manual, and the Manual of Uniform Traffic Control Devices.

4) A person accredited by VDOT in Intermediate Work Zone Traffic Control must be on-site to provide supervision for adjustment to the approved layout or implementation of any standard Typical Traffic Control (TTC) layouts outlined in the Virginia Work Area Protection Manual.

5) All traffic control plans shall be prepared by a person accredited by VDOT in Advanced Work Zone Traffic Control.

6) Individuals responsible for implementation of work zone traffic control measures shall provide evidence of their accreditation upon request from VDOT personnel.

7) The permittee shall be exempt from the requirements of Virginia Department of Transportation (VDOT) Road and Bridge Specifications, Special Provision 105.14 if the authorized activity does not involve the installation, maintenance and removal of work zone traffic control devices and is not within the roadway (as defined in 24VAC30-151) of a state maintained highway.

8) Non-compliance with the requirements outlined in VDOT Road and Bridge Specifications, Special Provision 105.14 may result in a stop work order and / or permit suspension.

9) All activities that require the disruption (stoppage) of traffic shall utilize VDOT certified flaggers or other VDOT-approved traffic control. Flaggers shall be provided in sufficient number and locations as necessary for control and protection of vehicular and pedestrian traffic in accordance with the Virginia Work Area Protection Manual. All flaggers must have their certification card in their possession when performing flagging operations within state maintained right-of-way. Any flaggers found not in possession of their certification card shall be removed from the work site and the local residency permit office will suspend all permitted activities.

10) Any VDOT certified flagger found to be performing their duties improperly shall have their certification revoked.

11) The Permittee shall immediately correct any situation that may arise as a result of these activities that the local residency permit office deems hazardous to the traveling public, including, but not limited to, removing, relocating, or adjusting the power of permitted facilities if such facilities impact the operation of government traffic equipment or systems.

12) During authorized activities, the permittee shall furnish all necessary signs, flaggers, and other devices to provide for the protection of traffic and workers in accordance with the Virginia Work Area Protection Manual or as directed by the local residency permit office.

13) All signs shall be in accordance with the current edition of the Manual of Uniform Traffic Control Devices (MUTCD) and the Virginia Supplement to the MUTCD.

14) Traffic shall not be blocked or detoured without permission, documented in writing or electronic communication, being granted by the local residency permit office.

15) If directed by the district, requests for the implementation of temporary lane closures must be entered into the VDOT Lane Closure Advisory Management System (LCAMS) and VaTraffic a minimum of one (1) week prior to the planned execution of lane closure activities on state maintained highways. The permittee or their contractor(s) may enter their requests directly or provide written requests to the VDOT Regional Operations Center as follows:

- Lane closure requests in all the counties listed below are within the Northern Region and shall be sent to: **nrolaneclosurerequests@vdot.virginia.gov**

  Counties: Arlington, Fairfax, Loudoun, Prince William, Spotsylvania, Stafford

- Lane closure requests in all the counties listed below are within the Northwest Region and shall be sent to: **StauntonTrafficManagementCenter@vdot.virginia.gov**

  Counties: Albemarle, Alleghany, Augusta, Bath, Clarke, Culpeper, Fauquier, Fluvanna, Frederick, Greene, Highland, Louisa, Madison, Orange Page, Rappahannock, Rockbridge, Rockingham, Shenandoah, Warren

- Lane closure requests in all the counties listed below are within the Southwest Region and shall be sent to: **SalemSmartTrafficCenter@VDOT.Virginia.gov**

  Counties: Amherst, Appomattox, Bedford, Bland, Botetourt, Buchanan, Buckingham, Campbell, Carroll, Charlotte, Craig, Cumberland, Dickenson, Floyd, Franklin, Giles, Grayson, Halifax, Henry, Lee, Montgomery, Nelson, Patrick, Pittsylvania Prince Edward, Pulaski, Roanoke, Russell, Scott, Smyth, Tazewell, Washington, Wise, Wythe

- Lane closure requests in all the counties listed below are within the Eastern Region and shall be sent to: **HamptonRoadsTOCControllers@VDOT.Virginia.gov**

  Counties: Accomack, Greensville, Isle of Wight, James City, Northampton, Southampton, Surry, Sussex, York

- Lane closure requests in all the counties listed below are within the Central Region and shall be sent to: **RichmondDist.SmartTraffic@vdot.virginia.gov**

  Counties: Amelia, Brunswick, Caroline, Charles City, Chesterfield, Dinwiddie, Essex, Gloucester, Goochland, Hanover, Henrico, King and Queen, King George, King William, Lancaster, Lunenburg,

Mathews, Mecklenburg, Middlesex, New Kent, Northumberland, Nottoway, Powhatan, Prince George, Richmond, Westmoreland

Written requests for implementation of temporary lane closures must be submitted to the appropriate VDOT Regional Operations Center by close of business on the preceding Wednesday for the upcoming week's planned lane closures. All requests being directly input into LCAMS and VaTraffic must be entered no later than 2:00 pm on the preceding Thursday for the upcoming week's lane closure activities. Any conflicts with other roadway work must be resolved by close of business on Thursday the week prior to the scheduled lane closure activities with documented resolution sent to the VDOT point of contact provided by the regional traffic operation center LCAMS Administrator. Any requests received after these time limitations will not be approved and the proposed work within VDOT right of way requiring lane closures must be rescheduled.

Lane closure requestors wanting direct access to LCAMS and VaTraffic must complete **ITD-35E** & **ITD-36E** forms and return to Ms. Carlene McWhirt at **Carlene.McWhirt@VDOT.Virginia.gov.** Online training is available for LCAMS and VaTraffic and VDOT can accommodate any additional training needs. Please contact Ms. McWhirt at (571) 350-2078 to schedule training.

Environmental

1) In accordance with the Virginia Department of Transportation (VDOT) Road and Bridge Specification 107.16 (a), all contractors performing regulated land disturbing activities within VDOT right-of-way must have at least one (1) employee that has successfully completed the VDOT Erosion & Sediment Control Contractor Certification training. This person shall be on site during all land disturbance activities and will be responsible for insuring compliance with all applicable local, state and federal erosion and sediment control regulations during land disturbance activities. This person must have their certification card with them while on the project site. The land use permit will be suspended if proof of certification cannot be provided. Regulated land disturbing activities are defined as those activities that disturb greater than 2,500 square feet in locally designated Chesapeake Bay Preservation Areas in counties, cities and towns defined as "Tidewater Virginia" in the Chesapeake Bay Preservation Act (62.1-44.15:68, Code of Virginia) or 10,000 square feet or greater in all other areas of the State. The Department will require evidence of this certification with any Land Use Permit application that involves possible land disturbance. Improper installation, maintenance and removal of erosion and sediment control devices may result in revocation of VDOT Erosion & Sediment Control Contractor Certification.

2) The Permittee is responsible for pursuing and obtaining any and all environmental permits which may be required to pursue the proposed activity prior to any work beginning within state maintained right-of-way.

3) In the event hazardous materials or underground storage tanks are encountered within state maintained right-of-way during authorized activities, the Permittee shall suspend all work immediately then notify the local residency permit office and other responsible parties, i.e., the local fire department, emergency services, Department of Environmental Quality, etc. The Permittee is responsible for coordination and completion of all required remediation necessary to complete the permitted activities within the state maintained right-of-way, and shall provide evidence of such compliance to the local residency permit office prior to recommencement of permitted activities.

4) In the event cultural resources, archaeological, paleontological, and/or rare minerals are encountered within the right of way during authorized activities, the Permittee shall suspend all work immediately then notify the local residency permit office and the proper state authority charged with the responsibility for investigation and evaluation of such finds. The Permittee will meet all necessary requirements for resolving any conflicts prior to continuing with the proposed activities within the state maintained right-of-way, and shall provide evidence of such compliance to the local residency permit office.

5) Roadway drainage shall not be blocked or diverted. The shoulders, ditches, roadside, drainage facilities and pavement shall be kept in an operable condition satisfactory to the Department. Necessary precautions shall be taken by the Permittee to insure against siltation of adjacent properties, streams, etc., in accordance with

VDOT's current standards or as prescribed by the Department's Environmental Manual and the local residency permit office.

Inspection of the Work

All activities authorized under the auspices of a VDOT land use permit may be subject to inspection by authorized VDOT personnel or contractors. When warranted, any/all reasonable costs associated with said inspections shall be borne by the Permittee.

Recurring Inspection

The wireless support structure shall be inspected to determine its structural condition by the permittee at least once every four years, or more frequently if necessary based upon structure type and condition, to ensure public safety. Such inspection shall be by or under the supervision of an engineer licensed to practice in Virginia. A report setting out the results of the inspection shall be stamped and signed by the engineer in accordance with regulations issued by the Virginia Department of Professional and Occupational Regulation, and the report shall be retained by the permittee for the duration of the permit. The report(s) shall be provided to the Department within two weeks of the submission of a request. A summary of the most recent inspection shall be submitted by the permittee concurrently with the annual payment. The summary shall include:

- Structure permit number
- Date of most recent inspection
- Name of engineer who conducted or supervised the inspection
- Short, general description of the structure's condition and any major deficiencies found
- A minimum of two photographs (one showing the overall structure and the other a close-up elevation view), with additional photos of deficiencies if deficiencies are detected.

Emergency Repair

In the event of an emergency situation that requires immediate action to protect persons or property, work may proceed within the right-of-way without authorization from the local residency permit office; however, the wireless service provider or wireless infrastructure provider must contact the VDOT Emergency Operations Center as soon as reasonably possible but no later than 48 hours after the end of the emergency situation.

Permittee Notice

The preceding provisions are intentionally condensed in format and should not be loosely interpreted by the Permittee without consultation with the central office permit manager and affirmation from the **Land Use Permit Regulations**.

Termination or Relocation

This permit may be terminated by VDOT or a relocation required in accordance with **§56-484.30** of the Code of Virginia. VDOT shall provide at least 180 days' notice of termination or relocation required as a consequence of a construction project, upon termination of the permit, the Permittee shall have 30 days to remove the wireless support structure and associated facilities and restore the right-of-way to its pre-permit condition.

Heather Jenkins

From: Paul Bernard
Sent: Thursday, July 6, 2023 4:33 PM
To: Denise Harris; Heather Jenkins; Amber Heflin
Cc: Rob Walton; Grainne Mazon-Shafer; Dina Hermoso
Subject: RE: RE: ZTOA-23-1 - Arcola Towers, LLC; Cell tower - APPLICATION - for a Text Amendment to the TOW Ordinance to change setback limits for ("cell towers") in the PSP District.
Attachments: ZOTA-23-1 - Plat - location.pdf; ZOTA-23-1 - Letter of Justification.pdf

Denise/ Heather,

Although I can't read the details or words on the attached drawings, I have no real issues with this application from Public Works & Utilities perspective.

I understand that they have issues with the setback related to the potential fall zone of the proposed Tower. First, I believe this communications tower can be designed and constructed so the fall zone would be less than the 150-foot tower height. Secondly, the setback from the road access ramp appears to be around 100 feet. And all the property near this is State property.

The only other comment I have at this time is that if they do improvements on more than 10,000 square feet, they will need to incorporate Stormwater Management into their design. Since this property was set aside for SWM and Erosion Control for the interchange, this should not be a major problem.

Sincerely,

Paul A. Bernard, P.E.
Town Engineer
Town of Warrenton
540-347-1101; Ext 244

From: Grainne Mazon-Shafer <gmazonshafer@warrentonva.gov>
Sent: Wednesday, June 7, 2023 4:28 PM
To: Denise Harris <dharris@warrentonva.gov>; Paul Bernard <pbernard@warrentonva.gov>; Heather Jenkins <hjenkins@warrentonva.gov>; Amber Heflin <aheflin@warrentonva.gov>; kevin.swain@warrentonfire.org
Cc: Rob Walton <rwalton@warrentonva.gov>
Subject: RE: ZTOA-23-1 - Arcola Towers, LLC; Cell tower - APPLICATION - for a Text Amendment to the TOW Ordinance to change setback limits for ("cell towers") in the PSP District.
Importance: High

Good afternoon,

Please find attached ZTOA-23-1- Arcola Towers, LLC; Cell tower - APPLICATION - for a Text Amendment to the TOW Ordinance to change setback limits for ("cell towers") in the PSP District.
-
There is only 1 hardcopy so please review the attachments and the link below.

Comments are due to Ms. Heather Jenkins by 6/29/2023.

LINK

Have a nice day!

Very Respectfully,

Gràinne Mazon-Shafer
Permit Technician

21 Main Street
Warrenton, VA 20186
(540) 347-2405 x106
warrentonva.gov

MORRIS & RITCHIE ASSOCIATES, INC.

ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS,
AND LANDSCAPE ARCHITECTS

December 11, 2023

Mr. Ryan Foltz
Arcola Towers
116 West Washington St, Suite 203
Middleburg, Virginia 20117

Re: Site Name: VDOT Warrenton
Rt 17 North Ramp
Warrenton, Virginia 22405 (Fauquier County)
MRA Job No. 21853.012

Dear Ryan:

The purpose of this letter is to certify that the proposed 150'-0" steel monopole structure will be designed by the manufacturer to meet the requirements of the 2018 Virginia Uniform Statewide Building Code (2018 VUSBC), ASCE 7-16, and the ANSI/TIA-222-H-2017 "Structural Standard for Antenna Supporting Structures and Antennas" Standard.

Per the TIA-222-H Standard and 2018 VUSBC requirements, the monopole shall be designed under the following minimum loading conditions:

TIA-222-H: 112 mph Wind (3-second gust) + No Ice
TIA-222-H: 30 mph Wind (3-second gust) + 1" Radial Ice

Note: The monopole shall also be designed to resist seismic loading, if required, per TIA-222-H in conjunction with site specific soil parameters determined from a geotechnical investigation.

In addition to the minimum loading conditions above, we note that the monopole shall also be designed by the manufacturer such that should failure of the monopole occur under extreme weather conditions, the maximum "fall zone" radius will not exceed **75'-0"** from the center of the monopole's base. While failure is extremely rare in any kind of tower, it is especially so for monopoles. In order to minimize damage to the surroundings below, a common industry practice is to design the monopoles such that in the rare event the monopole fails, the upper portion of the pole, which is supporting all of the proposed wind loading, would collapse onto itself and therefore minimize the "fall zone" radius and damage to the surroundings below.

Manufacturers facilitate this failure method by first designing the pole per all required code parameters noted above and ensuring that both the steel pole structure and concrete foundation are adequate to support the code required loading. Once the pole and foundation are designed per code required loadings, the manufacturer establishes the "fall point" which establishes the location that the pole would "break" under extreme loading conditions beyond code requirements. Once the "fall point" is established, the portion of the steel monopole below the "fall point" is then strengthened beyond the design parameters to ensure that the ultimate failure point is located precisely as intended. In the event of loading parameters above and beyond the design code-

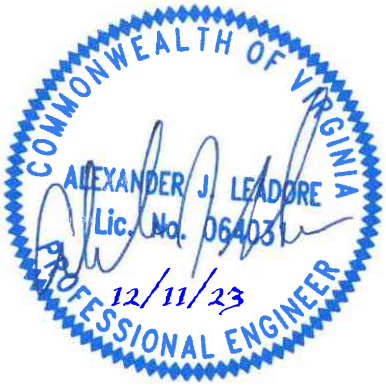
required loading, which represent the equivalent loading of a 700-year wind event, the ultimate failure method of the pole would resemble the pole folding on itself at the "fall point".

Based on the documentation made available from the manufacturer at this time, the proposed monopole shall be designed by the manufacturer such that if failure were to occur, it would occur in the upper portion of the monopole to meet the maximum "fall zone" radius requirement previously defined.

We also note that in addition to the above, the monopole will be designed to support a maximum of four (4) wireless carriers.

Monopole design documents shall be submitted from the manufacturer as part of the Building Permit submission. If you should have any questions or require any additional information, please do not hesitate to call our office.

Sincerely,
MORRIS & RITCHIE ASSOCIATES, INC.



Alexander J. Leadore, P.E.
Senior Structural Engineer

V:\bg_PROJECTS\21800-21899\21853 - Arcola Towers\21853.012 - VDOT Warrenton\Letters\VDOT Warrenton Monopole Fall Letter_AJL.doc

CityScape CONSULTANTS, INC.
2423 S. Orange Avenue, #317
Orlando, FL 32806
Tel: 877.438.2851 Fax: 877.220.4593

December 13, 2023

Martin Crim, Esq.
Town Attorney
Town of Warrenton, Virginia
21 Main Street
Warrenton, VA 20186
Via email only to: mcrim@sandsanderson.com

PRIVILEGED AND CONFIDENTIAL – Attorney/Client Communications

RE: Proposed Zoning Ordinance Amendment to Modify Wireless Infrastructure Fall Zones

Dear Mr. Crim:

On behalf of our mutual client, the Town of Warrenton, VA, (the "Town"), CityScape Consultants, Inc. ("CityScape") has been asked to render to you as Town Attorney information regarding a request by Arcola Towers to amend the Town's existing Zoning Ordinance to change the current required "fall zone" for wireless communications towers in the Public-Semi Public (PSP) zoning district from a "1 to 1" fall zone (e.g. a 90 foot tower would require a 90 foot fall zone) to a calculation that takes into account a designed "breakpoint" in wireless communications towers. In the event of a catastrophic event, a "breakpoint" causes a tower to "fail" at a specific elevation, thus reducing the linear amount of infrastructure that would fall in the event of a tower failure.

Specifically, the Town's Planning Commission has requested information and opinions on the following subjects:

1. What percent of localities allow "breakpoint" technology in their zoning regulations?
2. Is it legal to allow "breakpoint" technology in one zoning district and not others where towers are allowed?
3. Breakpoint technology design parameters, specifically when and how the communications facility was to fail, including instances where a vehicle was to strike a wireless communications facility.
4. What are the typical standards/best practices that jurisdictions include in their zoning ordinances for "breakpoint" technology?
5. Generally, when, and where is "breakpoint" technology appropriate or not appropriate for wireless infrastructure?

The Town certainly can regulate wireless infrastructure based on both aesthetic concerns and physical safety issues, including but not limited to setbacks from residences and roadways, wind loading standards, etc., which is generally where regulations incorporating "breakpoint" technology are incorporated to facilitate placement of wireless infrastructure within a community

(which is required by 47 USC §332) and avoid having regulations that "prohibit or have the effect of prohibiting the provision of personal wireless services."[1]

As to the specific requests above, addressing them in numeric order:

1. Insofar as providing information on what percentage of communities incorporate "breakpoint" provisions in their zoning regulations, while it would be impossible for us to quantify that number either across Virginia or the United States as a whole, we can, however, indicate that in all communities that Cityscape provides proposed regulations for wireless infrastructure, we recommend inclusion of "breakpoint" technology provisions in all zoning regulations and that CityScape's recommendation is generally adopted. We provided "breakpoint" provisions when we were engaged for wireless communications regulations adopted by Buckingham and Fauquier counties as well as diverse municipalities across the United States such as Coconut Creek and Coral Springs, Florida; Chapel Hill, North Carolina; Sedona, Arizona; Springdale, Utah and Worcester, Massachusetts.

2. Concerning the question regarding the selective implementation of "breakpoint" regulations in one zoning district versus other zoning districts where wireless infrastructure is also permitted, again federal law constrains you somewhat as the 1996 Telecommunications Act also states local governments shall not "unreasonably discriminate among providers of functionally equivalent services".[2] Thus, if you were to permit "breakpoint" technology in one zoning district where wireless towers were allowed but not in another zoning district where wireless towers are also allowed, that *could* have the potential to discriminate between providers (depending on their deployment models). However, if such a regulation were uniformly applied to all applicants on a forward-looking basis and properly based on findings by the Town that such regulations were necessary to protect the physical safety of its residents, there is a strong basis for support of that regulation. Nevertheless, a pre-existing wireless provider who had to site their facility with significant setbacks (generally meaning leasing a larger parcel with more cost) could have the basis of a claim of "discrimination" under 47 USC §332 by allowing a competitor provider to construct a similar facility using "breakpoint" technology with smaller setbacks. While that scenario is remote, it is a possibility. CityScape recommends the Town take this opportunity to expand the Applicant's request for the text amendment in the PSP District and add the provision for "breakpoint" technology in all zoning districts, and that the Town condition its utilization of any new free-standing tower in residential districts to parcels that do not contain any residential structures (e.g. parks, public property, religious institutions, etc.)

3. Typical design parameters for "breakpoint" technology include engineering the structure to have a particular elevation that is more susceptible to failure than any other point on the structure, as better expressed in the "Definition" illustration below.

[1] 47 USC §332(c)(7)(B)(i)(II)
[2] 47 USC §332(c)(7)(B)(i)(I)

4. Typical provisions/best practices in such regulations are to include a definition, such as:

Breakpoint design technology - The engineering design of a monopole, or any applicable support structure, wherein a specified point on the monopole is designed to have stresses concentrated so that the point is at least five percent (5%) more susceptible to failure than any other point along the monopole, or any applicable support structure, so that in the event of a structural failure, the failure will occur at the breakpoint rather than at the base plate, anchor bolts or any other point on the monopole, or any applicable support structure.

After defining the term, the inclusion of language like the below in the applicable setback sections of your regulations should be included:

Setbacks. New towers shall be subject to the setbacks described below for breakpoint technology:

(a) If the proposed tower has been constructed using breakpoint design technology (see 'Definitions'), the minimum setback distance shall be equal to 110 percent (110%) of the distance from the top of the structure to the breakpoint level of the structure, or the minimum side and rear yard requirements, whichever is greater. Certification by a registered professional engineer licensed by the Commonwealth of Virginia of the breakpoint design and the design's fall radius must be provided together with the other information required herein from an applicant. (For example, on a 100-foot-tall monopole with a breakpoint at eighty (80) feet, the minimum setback distance would be twenty-two (22) feet (110 percent of twenty (20) feet, the distance from the top of the monopole to the breakpoint) plus the minimum side or rear yard setback requirements for that zoning district.).

(b) If the tower is not constructed using breakpoint design technology, the minimum setback distance shall be equal to the height of the proposed tower.

In discussions with Warrenton staff, if "breakpoint" technology is added to the Town's Code, then it was suggested that the standard setback be the breakpoint distance PLUS the applicable setback for that zoning district from a public right of way.

5. In determining when and where the inclusion of "breakpoint" technology is appropriate for particular types of wireless infrastructure, several factors come into play. First, it should be noted that "breakpoint" is generally utilized to facilitate a failure of a structure arising from external wind forces across the entire structure or flying debris striking the structure. It would not, in most instances, be an effective solution to the scenario of a vehicle crashing into the base of a wireless facility, which *could* result in the failure of the entire length of the structure, albeit an unlikely event given that the tower base is typically the strongest and most resistant point of the entire structure since it is where it is affixed to concrete base/footers in the earth. With the understanding that the "breakpoint" is best utilized as a means to prevent large pieces of tower infrastructure from falling off a tower impacted by a wind event of some kind, and reducing the overall area of falling debris, such technology is best implemented for "monopole" type design facilities since the monopole design generally presents the broadest "face" of structure to atmospheric winds pushing up against it. Other types of structures, such as lattice towers, present a much smaller "face" to the wind and thus

are less likely to suffer wind-related failure, minimizing the need for "breakpoint" technology, although it is still a useful tool to implement for that type of technology. Additionally, the location of the proposed infrastructure is a factor in utilizing "breakpoint" technology. For example, a community may want a more stringent standard for allowable setbacks employing "breakpoint" in residential districts, given the greater possibility of harm from a designed failure, than in industrial/commercial districts, where the possibility of harm from a designed failure is less given population density.

In summary, it is our opinion that the adoption of "breakpoint" technology regulations by the Town is a worthy exercise and will facilitate the Town's statutory obligation to allow the deployment of wireless services to its residents. Such regulations should, however, be tailored to accomplish the desired goal while still protecting the Town's residents from physical danger from the admittedly rare, but not impossible, failure of a wireless infrastructure facility.

We would be happy to review the above analysis and conclusions with the Planning Commission if desired via a virtual appearance.

Respectfully submitted,

Anthony T. Lepore, Esq.
CityScape Consultants, Inc.

February 20, 2023
Planning Commission
Public Hearing

A RESOLUTION TO RECOMMEND APPROVAL OF TEXT AMENDMENT ZOTA-23-1 PURSUANT TO SECTION 11-3.9.2 OF THE ZONING ORDINANCE OF THE TOWN OF WARRENTON FOR A ZONING ORDINANCE TEXT AMENDMENT TO ARTICLE 9, SECTION 9-18 TELECOMMUNICATIONS FACILITIES, SECTION 9-18.10 SETBACKS TO PERMIT A SETBACK LESS THAN ONE HUNDRED (100) PERCENT OF THE TOWER HEIGHT IN THE PSP – PUBLIC-SEMI-PUBLIC DISTRICT WITH THE CERTIFICATION OF A PROFESSIONAL ENGINEER

WHEREAS, Warrenton, VA (Hereinafter "the Town") is a municipal corporation located within the County of Fauquier; and

WHEREAS, the Warrenton Town Council may, by ordinance, amend, supplement, or change the regulations of the Zoning Ordinance of the Town whenever the public necessity, convenience, general welfare or good zoning practice may require such an amendment; and

WHEREAS, Zoning Ordinance Article 3, Section 3-4.9 PSP Public-Semi-Public Institutional District allows communications towers as a Permissible Use with the approval of a Special Use Permit by Town Council; and

WHEREAS, Zoning Ordinance Article 9, Section 9-18 Telecommunications Facilities, Section 9-18.10 Setbacks, requires that all telecommunications towers be set back from property lines a distance equal to one hundred (100) percent of the tower height; and

WHEREAS, the Applicant, Arcola Towers, LLC and their Representative Mr. James Downey, submitted an application to initiate a Text Amendment to the Zoning Ordinance in accordance with the procedures set forth in Article 11, Section 11-3.9 Zoning Amendments on June 7, 2023; and

WHEREAS, the Applicant is requesting that the setback requirement for telecommunications towers in the PSP Public-Semi-Public Institutional District be reduced to less than one hundred (100) percent of the tower height, to equal the height of the certified fall zone as attested by a Virginia licensed Professional Engineer; and

WHEREAS, the Warrenton Planning Commission held a work session to discuss amending Zoning Ordinance Section 9-18.10 Setbacks on November 28, 2023 and heard testimony from the Applicant and Representative; and

WHEREAS, the Warrenton Planning Commission held a public hearing on this matter on December 19, 2023, and February 20, 2024; and

WHEREAS, the Warrenton Planning Commission finds that per the Code of Virginia Section 15.2-2286.A.7, the text amendment is for the good of public necessity, convenience, general welfare, and good zoning practice; and

NOW THEREFORE BE IT RESOLVED, that the Warrenton Planning Commission recommends to the Warrenton Town Council for their review and decision proposed ordinance language as set forth herein.

Votes:
Ayes:
Nays:
Absent from Vote:
Absent from Meeting:

For Information:
Community Development Director,
Town Attorney

ATTEST: _____
Town Recorder

Article 9
Supplemental Use Regulations

9-18 Telecommunications Facilities

9-18.10. Setbacks.

Towers shall be set back a distance of at least one hundred (100) percent of the height of the tower from the boundaries of the property on which the tower is located. On properties located in a PSP District (Public-Semi-Public Institutional District), towers shall only be required to be setback a distance of at least one hundred (100) percent of the certified fall zone, as certified by a Virginia Professional Engineer in a letter which includes the Professional Engineer's signature and seal.

February 20, 2024
Planning Commission
Public Hearing

A RESOLUTION TO RECOMMEND APPROVAL OF TEXT AMENDMENT ZOTA-23-1 PURSUANT TO SECTION 11-3.9.2 OF THE ZONING ORDINANCE OF THE TOWN OF WARRENTON FOR A ZONING ORDINANCE TEXT AMENDMENT TO ARTICLE 9, SECTION 9-18 TELECOMMUNICATIONS FACILITIES, SECTION 9-18.10 SETBACKS TO PERMIT A SETBACK LESS THAN ONE HUNDRED (100) PERCENT OF THE TOWER HEIGHT IN THE PSP – PUBLIC-SEMI-PUBLIC DISTRICT WITH THE CERTIFICATION OF A PROFESSIONAL ENGINEER

WHEREAS, Warrenton, VA (Hereinafter "the Town") is a municipal corporation located within the County of Fauquier; and

WHEREAS, the Warrenton Town Council may, by ordinance, amend, supplement, or change the regulations of the Zoning Ordinance of the Town whenever the public necessity, convenience, general welfare or good zoning practice may require such an amendment; and

WHEREAS, Zoning Ordinance Article 3, Section 3-4.9 PSP Public-Semi-Public Institutional District allows communications towers as a Permissible Use with the approval of a Special Use Permit by Town Council; and

WHEREAS, Zoning Ordinance Article 9, Section 9-18 Telecommunications Facilities, Section 9-18.10 Setbacks, requires that all telecommunications towers be set back from property lines a distance equal to one hundred (100) percent of the tower height; and

WHEREAS, the Applicant, Arcola Towers, LLC and their Representative Mr. James Downey, submitted an application to initiate a Text Amendment to the Zoning Ordinance in accordance with the procedures set forth in Article 11, Section 11-3.9 Zoning Amendments on June 7, 2023; and

WHEREAS, the Applicant is requesting that the setback requirement for telecommunications towers in the PSP Public-Semi-Public Institutional District be reduced to less than one hundred (100) percent of the tower height, to equal the height of the certified fall zone as attested by a Virginia licensed Professional Engineer; and

WHEREAS, the Warrenton Planning Commission held a work session to discuss amending Zoning Ordinance Section 9-18.10 Setbacks on November 28, 2023 and heard testimony from the Applicant and Representative; and

WHEREAS, the Warrenton Planning Commission held a public hearing on this matter on December 19, 2023, and February 20, 2024; and

WHEREAS, the Warrenton Planning Commission finds that per the Code of Virginia Section 15.2-2286.A.7, the text amendment is for the good of public necessity, convenience, general welfare, and good zoning practice; and

NOW THEREFORE BE IT RESOLVED, that the Warrenton Planning Commission recommends to the Warrenton Town Council for their review and decision proposed ordinance language as set forth herein.

Votes:
Ayes:
Nays:
Absent from Vote:
Absent from Meeting:

For Information:
Community Development Director,
Town Attorney

ATTEST: _____
Town Recorder

Article 9
Supplemental Use Regulations

9-18 Telecommunications Facilities

9-18.10. Setbacks.

Towers shall be set back a distance of at least one hundred (100) percent of the height of the tower from the boundaries of the property on which the tower is located. On properties located in a PSP District (Public-Semi-Public Institutional District), towers ~~shall only be required to~~ may be setback a distance of at least one hundred (100) percent of the certified fall zone, ~~as certified~~ upon certification by a Virginia Professional Engineer in a letter which includes the Professional Engineer's signature and seal, and where Town Council makes a finding that a setback of less than one hundred (100) percent of the tower height is appropriate for the location of the facility

February 20, 2024
Planning Commission
Public Hearing

A RESOLUTION TO RECOMMEND DENIAL OF TEXT AMENDMENT ZOTA-23-1 PURSUANT TO SECTION 11-3.9.2 OF THE ZONING ORDINANCE OF THE TOWN OF WARRENTON FOR A ZONING ORDINANCE TEXT AMENDMENT TO ARTICLE 9, SECTION 9-18 TELECOMMUNICATIONS FACILITIES, SECTION 9-18.10 SETBACKS TO PERMIT A SETBACK LESS THAN ONE HUNDRED (100) PERCENT OF THE TOWER HEIGHT IN THE PSP – PUBLIC-SEMI-PUBLIC DISTRICT WITH THE CERTIFICATION OF A PROFESSIONAL ENGINEER

WHEREAS, Warrenton, VA (Hereinafter "the Town") is a municipal corporation located within the County of Fauquier; and

WHEREAS, the Warrenton Town Council may, by ordinance, amend, supplement, or change the regulations of the Zoning Ordinance of the Town whenever the public necessity, convenience, general welfare or good zoning practice may require such an amendment; and

WHEREAS, Zoning Ordinance Article 3, Section 3-4.9 PSP Public-Semi-Public Institutional District allows communications towers as a Permissible Use with the approval of a Special Use Permit by Town Council; and

WHEREAS, Zoning Ordinance Article 9, Section 9-18 Telecommunications Facilities, Section 9-18.10 Setbacks, requires that all telecommunications towers be set back from property lines a distance equal to one hundred (100) percent of the tower height; and

WHEREAS, the Applicant, Arcola Towers, LLC and their Representative Mr. James Downey, submitted an application to initiate a Text Amendment to the Zoning Ordinance in accordance with the procedures set forth in Article 11, Section 11-3.9 Zoning Amendments on June 7, 2023; and

WHEREAS, the Applicant is requesting that the setback requirement for telecommunications towers in the PSP Public-Semi-Public Institutional District be reduced to less than one hundred (100) percent of the tower height, to equal the height of the certified fall zone as attested by a Virginia licensed Professional Engineer; and

WHEREAS, the Warrenton Planning Commission held a work session to discuss amending Zoning Ordinance Section 9-18.10 Setbacks on November 28, 2023 and heard testimony from the Applicant and Representative; and

WHEREAS, the Warrenton Planning Commission held a public hearing on this matter on December 19, 2023, and February 20, 2024; and

WHEREAS, the Warrenton Planning Commission finds that per the Code of Virginia Section 15.2-2286.A.7, that the public necessity, convenience, general welfare, and good zoning practice are not satisfied by this amendment to the Zoning Ordinance of the Town of Warrenton; and

NOW THEREFORE BE IT RESOLVED, that on this day, February 20, 2024, that the Warrenton Planning Commission forwards a recommendation of denial to the Warrenton Town Council.

Votes:
Ayes:
Nays:
Absent from Vote:
Absent from Meeting:

For Information:
Community Development Director,
Town Attorney

ATTEST: _____
Town Recorder

ZOTA-23-1 – Telecommunication Tower Setbacks in the PSP District

Planning Commission Public Hearing
February 20, 2024

Request – Zoning Ordinance Text Amendment
Reduce the setback requirement for telecommunication towers in the Public-Semi-Public (PSP) District to less than 100% of the tower height.

Zoning Ordinance Article 9, Section 9-18 - Telecommunications Facilities

- Section 9-18.10 – Setbacks

Towers shall be set back a distance of at least one hundred (100) percent of the height of the tower from the boundaries of the property on which the tower is located.

Applicant - Proposed Text Language:

Towers shall be set back a distance of at least one hundred (100) percent of the height of the tower from the boundaries of the property on which the tower is located. On properties located in a PSP District (Public-Semi-Public Institutional District), towers shall only be required to be setback a distance of at least one hundred (100) percent of the certified fall zone, as certified by a Virginia Professional Engineer in a letter which includes the Professional Engineer's signature and seal.

Zoning Ordinance Requirements - Communications Towers

Article 3 – Section 3-4 - *Requirements for Base Zoning Districts*

- Communications Towers are allowed in all Zoning Districts with the approval of a Special Use Permit by Town Council.
- Historic District – Certificate of Appropriateness.

Article 9 – Section 9-18 – *Telecommunications Facilities*

- Standards for lighting, screening, fencing, setbacks.

Article 11 – Section 11-3.10 – *Special Use Permits and Waivers*

- Application process, evaluation criteria.

Article 10 – *Site Development Plans*

- Administrative application & approval process, minimum standards required – landscaping, screening, lighting, fencing, access, bonding.

Article 11 – *Zoning, Building & Land Disturbing Permits*

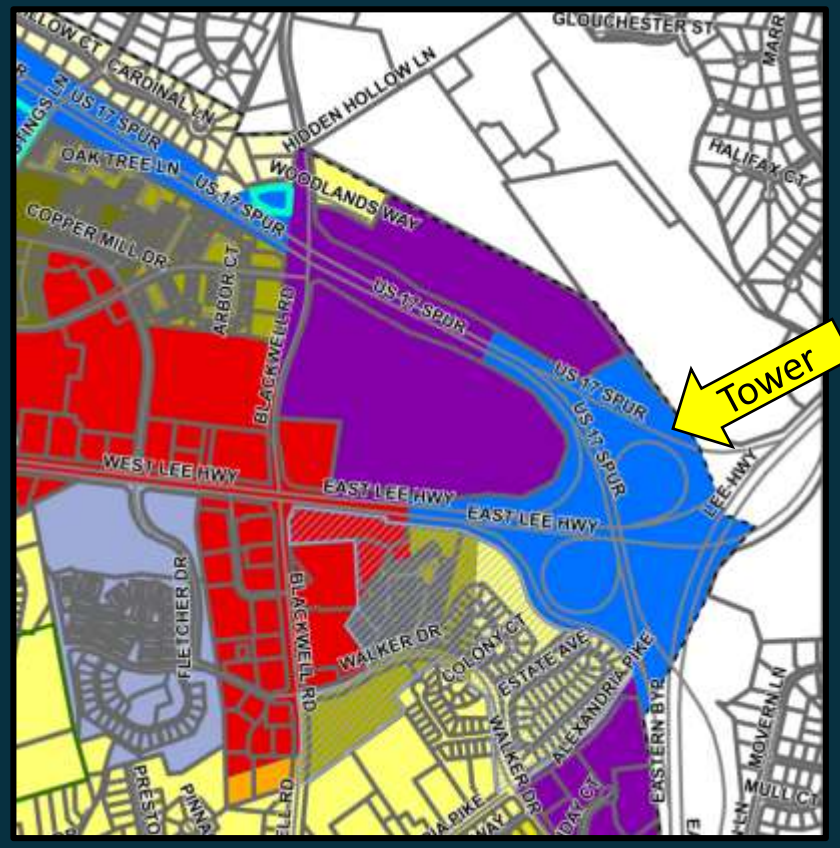
- Administrative application & approval process, standards for issuance.

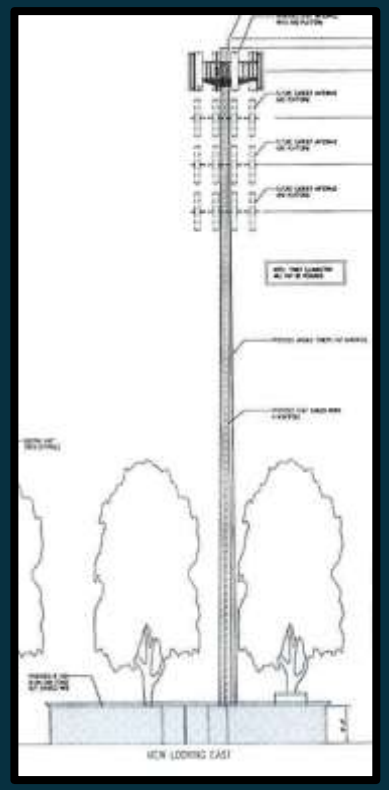
Fall Zone – The maximum distance that a tower could potentially collapse, as measured from the center point of a tower.

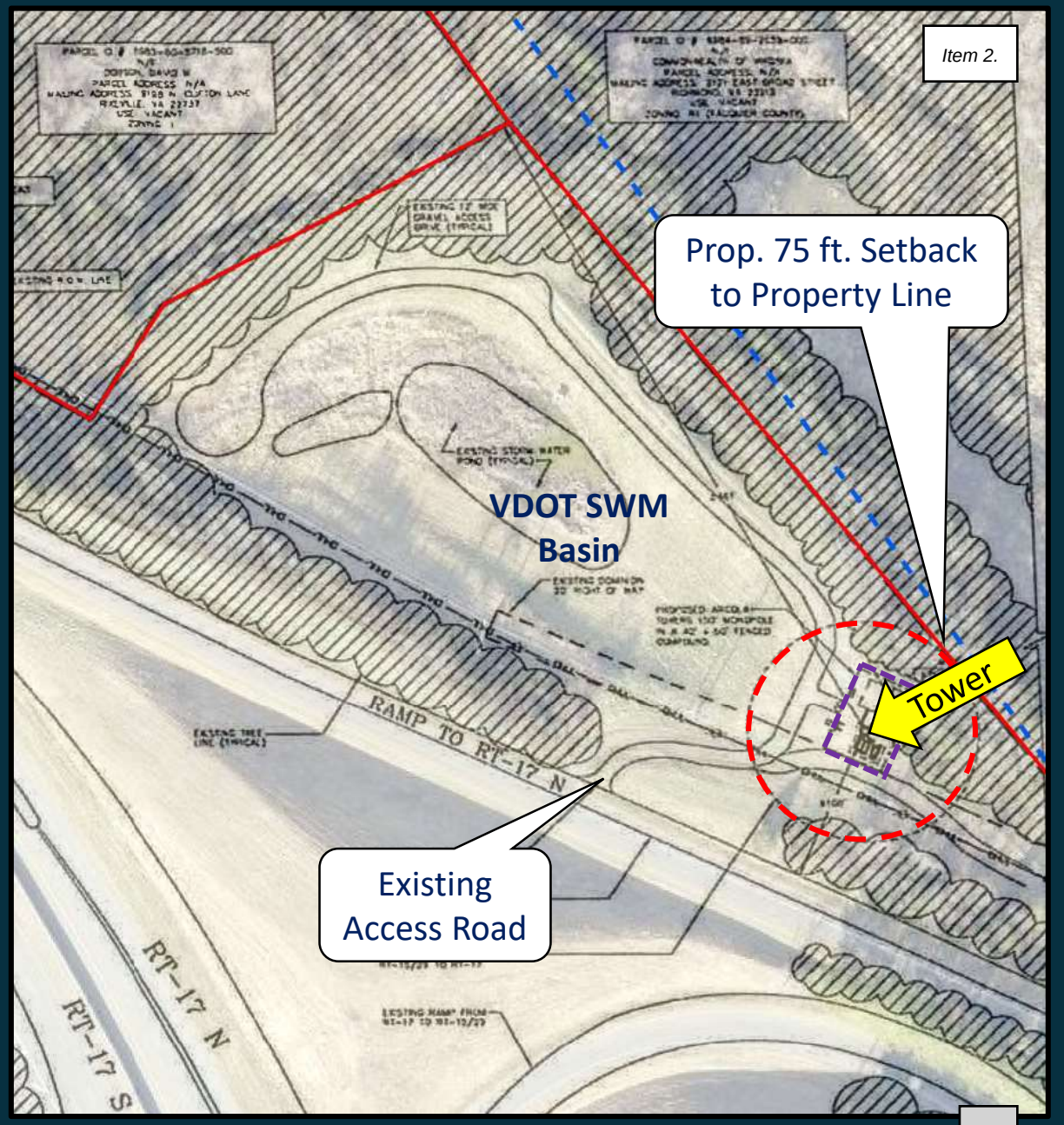
Certified Fall Zone – The maximum distance that a tower could potentially collapse, as certified by a Professional Engineer, that is generally less that the full height of the tower due to the physical properties of the tower.

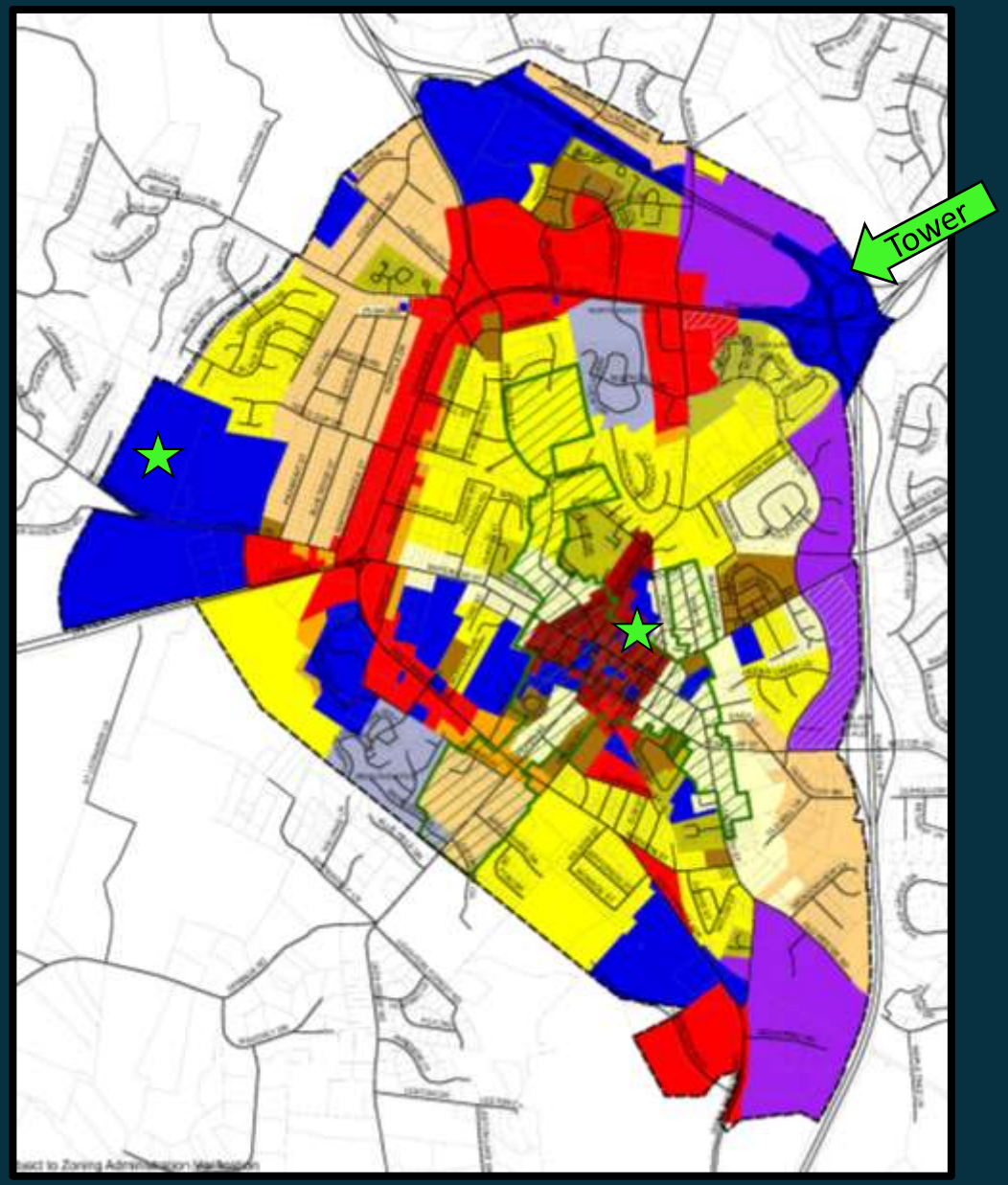
Break-Point Technology – A method of designing a tower where a point of failure is chosen, and then that point is designed to be more susceptible to failure, or, the tower structure from that selected point down to the foundation is strengthened, so that in either case should the tower fail due to wind or other conditions, the tower will fold over on itself at that breaking point.

Applicant: Arcola Towers, LLC
Representative: James Downey
Proposed Tower Site: 17 Spur; PSP District
Proposed Tower Height: 150 foot Monopole
Proposed Tower Setback: 75 feet









★ Existing Tower Locations

- Fauquier High School
- Horner/N. 4th Street Water Tower

Zoning Ordinance Article 3, Section 3-4.9 – PSP District
Section 3-4.9.3 – Permissible Uses – Communications Towers

- Requires approval of a Special Use Permit by Town Council

Zoning Ordinance Article 9, Section 9-18 – Telecommunications Facilities

- Governs appearance, lighting, security, landscaping, setbacks, other
- Section 9-18.10 – Setbacks – requires a setback equal to the full height of the tower.

Text Amendment Process:

- Text Amendment Initiated by Citizen Request – June 7, 2023
- Planning Commission – 1st Work Session – November 28, 2023
- Planning Commission – 1st Public Hearing – December 19, 2023
  - 100 Day Clock (November 28, 2023 – March 7, 2024)
- Town Council
  - Work Session or Public Hearing – as directed
  - Final Decision on ordinance language

Potential Actions:

- Denial
  - Pattern motion of denial provided.
- Approval
  - Pattern motion of approval provided to state Applicant's proposed language.
  - Pattern motion of approval provided to state Staff's proposed language.
- Deferral
  - 100-day deadline for action ends March 7, 2024.
  - The Commission may grant a further deferral if formally requested by the Applicant, where the applicant waives the 100-day action deadline.

EXPERIENCE WARRENTON VIRGINIA EST. 1810

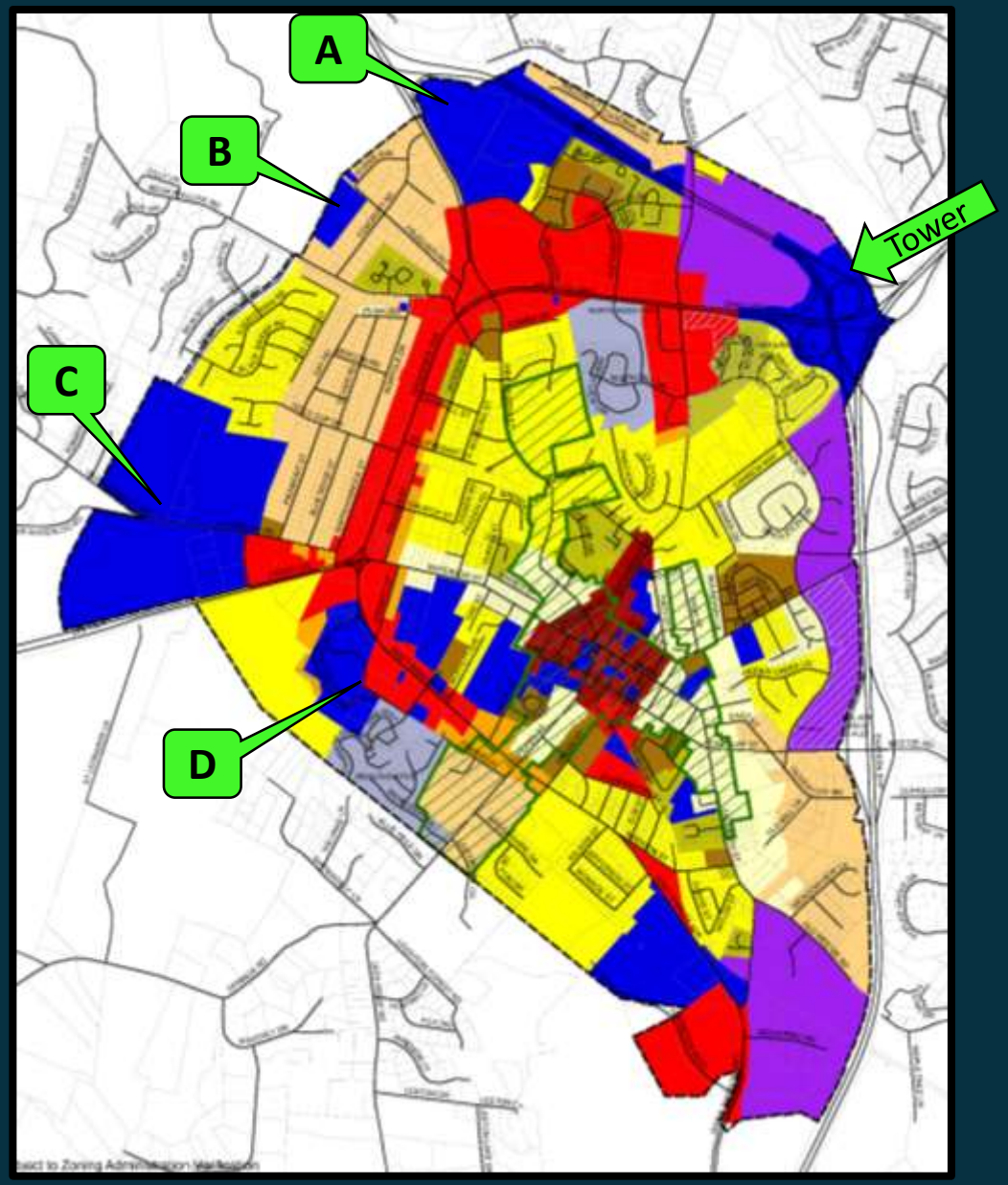
ZOTA-23-1 – Telecommunication Tower Setbacks in the PSP District

Planning Commission Public Hearing
February 20, 2024

Telecommunications Facilities – Setback Requirements

Setback reduction allowed to less than the full height of the tower.

Jurisdiction	Setback Reduction Allowed	Setback Requirements
Fairfax City	Yes	Minimum setback equal to 110% of the tower height, except for monopoles certified by an engineer where the setback is reduced to the minimum setback for the district.
Fauquier County	Yes	Towers must be set back a distance equal to the height of the tower, except where the setback is reduced to no less than the fall zone as determined by an engineering design as a part of the legislative approval process.
Culpeper County	No	Towers must be designed to collapse within the lot lines.
Town of Culpeper	No	Towers must be set back at least the minimum setback for the district, and must be designed to fall within the boundaries of the property, except where a permanent easement is obtained from an adjoining property owner. No habitable structure shall be located within the fall zone.
Prince William County	No	Setback of twice the tower height for all property lines that abut residential or agricultural properties; minimum setback of 200 feet from all public streets, with an additional setback equal to the tower height for all towers over 200 feet in height. The tower must be designed to collapse within the property boundaries.
Rappahannock County	No	For any tower over 50 feet in height, a minimum setback equal to 110% of the tower height is required, and must be contained entirely within the subject property. Within the setback, the property owner may erect structures at their own risk.
Spotsylvania County	Yes	Towers must be set back from property lines at least the minimum setback for the district. A certified engineering statement must be provided to specify the tower design, including breakpoints.
Loudoun County	Yes	Public towers must be set back equal to the height of the tower. Commercial monopoles and towers must be set back 1 foot for every 5 feet of tower height.



PSP Zoning District Locations

499.24 Acres
405.13 Acres Tax Parcel Land (Less R-O-W Areas)

A

597 Broadview Ave. – Highland School, 40.9 ac (total – 2 parcels)
674 Bradley School Rd. – CM Bradley Elementary, 21. 3 ac
800 Blackwell Rd. – Residential Use (Brittle), 0.8 ac

B

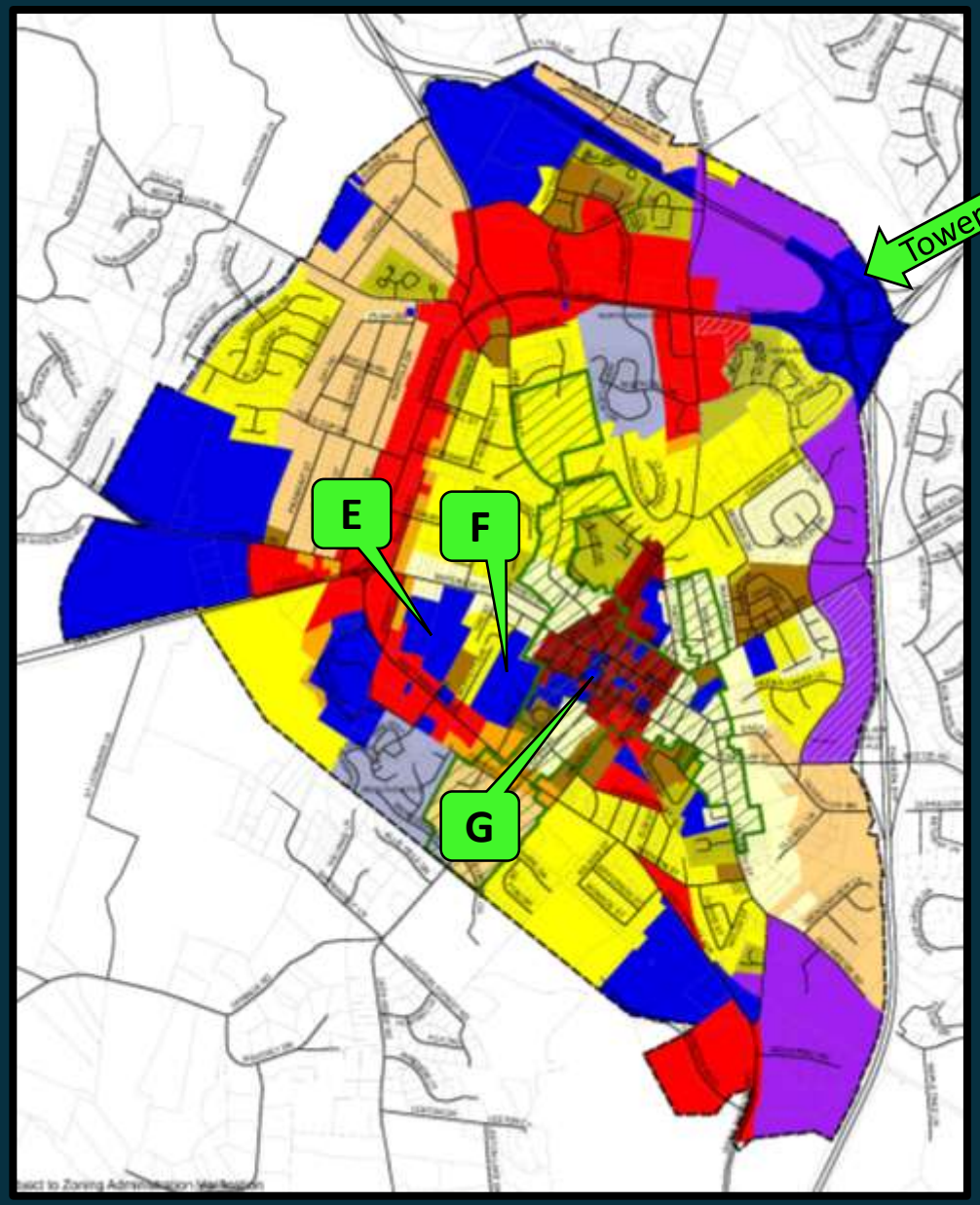
550 Evans Dr. – Town of Warrenton, 0.4 ac
540 Evans Dr. – Rady Park, 7.2 ac
366 Norfolk Dr. – Town of Warrenton, 0.3 ac

C

705 Waterloo Rd. – Fauquier High School, 93.5 ac (total – 4 parcels)
692 Waterloo Rd. – The Armory (State), 5 ac
675 Van Roijen St. – State Gov., 2.6 ac
731 Frost Ave. – Sewage Treatment Plant, 8.2 ac (total – 2 parcels)
800 Waterloo Rd. – WARF, Athletic Fields, 64.5 ac

D

167 W. Shirley Ave. – Warrenton Rescue Squad, 1.4 ac (total – 6 parcels)
330 Hospital Dr. – Health Department, 0.7 ac
340 Hospital Dr. – Mental Health Center, 1 ac
500 Hospital Dr. – Fauquier Medical Center, 28.3 ac (total – 4 parcels)
555 Hospital Dr. – Medical Office (Tophatt Properties LLC), 1.3 ac
224 W. Shirley Ave. – State Gov., 0.4 ac
333 Carriage House Ln. – Warrenton Police Dept., 1.2 ac



PSP Zoning District Locations

499.24 Acres
405.13 Acres Tax Parcel Land (Less R-O-W Areas)

E

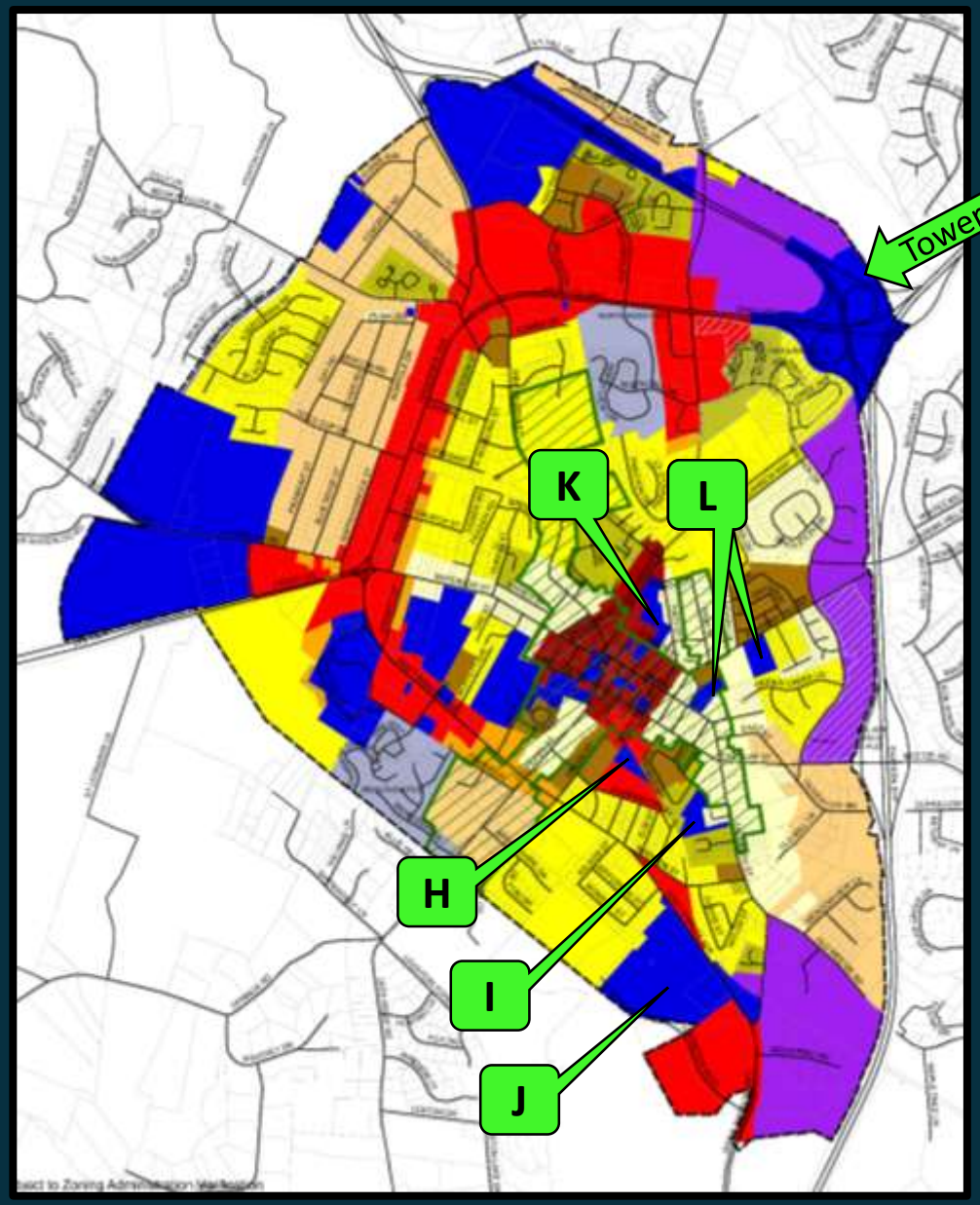
47 Garrett St. – Fauquier/Greater Piedmont Realtors, 0.4 ac
39 Garrett St. – Commercial (39 Garrett St. LLC), 0.35 ac
244 Waterloo St. – Warrenton Middle School, 22 ac (total – 3 parcels)
167 W. Shirley Ave. – Warrenton Volunteer Fire, 1 ac

F

510 W. Lee St. – Warrenton Cemetery, 9.5 ac

G

85 Keith St. – Fauquier Family Shelter Services Inc., 0.4 ac
Keith St. – Fauquier Board of Supervisors, 2 ac
62 A W. Lee St. – Fauquier Sheriff Communications, 1 ac
50 W. Lee St. – Fauquier Detention Center, 0.5 ac
W. Lee St. - Municipal Parking Lot A, 0.8 ac
62 & 70 Culpeper St. – Fauquier County Gov., 1.2 ac
40 Culpeper St. – Circuit Court/Warren Green, 1.2 ac (total - 2 parcels)
18 Court St. – Town of Warrenton, 0.09 ac
6 Court St. – District Court/Jail Museum, 0.3 ac
14 Main St. – Juvenile & Domestic Court, 0.2 ac
S. 2nd/S. 3rd St. – Municipal Lot B, 0.4 ac (total - 3 parcels)
31 Second St. – Commercial (Harris), 0.1 ac
26 S. Third St. – The Warrenton Meeting Place Inc., 0.1 ac
S. 3rd/S. 4th St. – Municipal Lot C, 0.4 ac (total – 2 parcels)
E. Lee St./S. 5th St. – Municipal Lot D, 0.7 ac



PSP Zoning District Locations

499.24 Acres
405.13 Acres Tax Parcel Land (Less R-O-W Areas)

H
103 S. Fifth St. – Dog Park/Utility, 1.17 ac (total – 4 parcels)

I
360 Falmouth St. – Public Works Facility, 5.2 ac

J
455 E. Shirley Ave. – VDOT, 2.3 ac (total – 2 parcels)
276 E. Shirley Ave. – Commercial (CLNB LLC), 0.2 ac
350 E. Shirley Ave. – Taylor Middle/Brumfield Elementary, 39.1 ac
430 E. Shirley Ave. – Community Center, 5.1 ac

K
123 Alexandria Pike – Eva Walker Park, 5.7 ac
First St. – Parking Lot, 0.2 ac
N. Third St. – Parking Lot, 0.8 ac

L
33 N. Calhoun St. – Old Visitor's Center, 1.6 ac
173 Main St. – Residential (Goolsby), 1.3 ac
167 Academy Hill Rd. – Academy Hill Park, 4.7 ac

Proposed Tower Site – Public Right-of-Way, 58.3 ac
Existing Public Uses – Access/Roadway, Stormwater Management, Drainage

EXPERIENCE WARRENTON VIRGINIA

PLANNING COMMISSION

Annual Report 2023

PLANNING COMMISSION MEMBERS

Left-to-right: Darine Barbour, Steve Ainswth, James Lawrence, Ryan Stewart, & Terrance Lasher

James Lawrence, *Chair*	Serving Since 2018
Ryan Stewart, *Vice Chair*	Serving Since 2017
Steve Ainsworth, *Secretary*	Serving Since 2021
Darine Barbour	Serving Since 2023
Terrance Lasher	Serving Since 2023

7
Public Hearings

9
Work Sessions

MEETING HIGHLIGHTS

JANUARY
Code of Virginia Annual Report

FEBRUARY
SUP 2006-08 Chick Fil A Amendment WORK SESSION
Certified Planning Commissioner Training

APRIL
SUP 2023-01 St. John Catholic Church WORK SESSION

MAY
SUP 2006-08 Chick Fil A Amendment PUBLIC HEARING
SUP 2023-01 St. John Catholic Church PUBLIC HEARING

JUNE
SUP 2023-01 St. John Catholic Church PUBLIC HEARING

AUGUST
ZOTA 2023-02 Assembly Uses in the Industrial District WORK SESSION

SEPTEMBER
SUP Amendment to SUP #10-04 Wal-Mart WORK SESSION
ZOTA 2023-02 Assembly Uses in the Industrial District WORK SESSION

OCTOBER- MEETING CANCELLED AS TOWN HALL CLOSED
SUP Amendment to SUP #10-04 Wal-Mart PUBLIC HEARING
ZOTA 2023-02 Assembly Uses in the Industrial District PUBLIC HEARING
ZOTA 2023-01 Reduce the Setback Requirement for Telecommunication Towers in the PSP (Public Semi Public) Zoning District WORK SESSION

NOVEMBER
SUP Amendment to SUP #10-04 Wal-Mart PUBLIC HEARING
ZOTA 2023-02 Assembly Uses in the Industrial District PUBLIC HEARING
ZOTA 2023-01 Reduce the Setback Requirement for Telecommunication Towers in the PSP (Public Semi Public) Zoning District WORK SESSION
SUP 2023-03 226 E. Lee Street Accessory Dwelling Unit (ADU) WORK SESSION

DECEMBER
ZOTA 2023-01 Reduce the Setback Requirement for Telecommunication Towers in the PSP (Public Semi Public) Zoning District PUBLIC HEARING
SUP 2023-03 226 E. Lee Street Accessory Dwelling Unit (ADU) PUBLIC HEARING

LEGEND
ZOTA | *Zoning Text Amendment* ***SUP*** | *Special Use Permit*

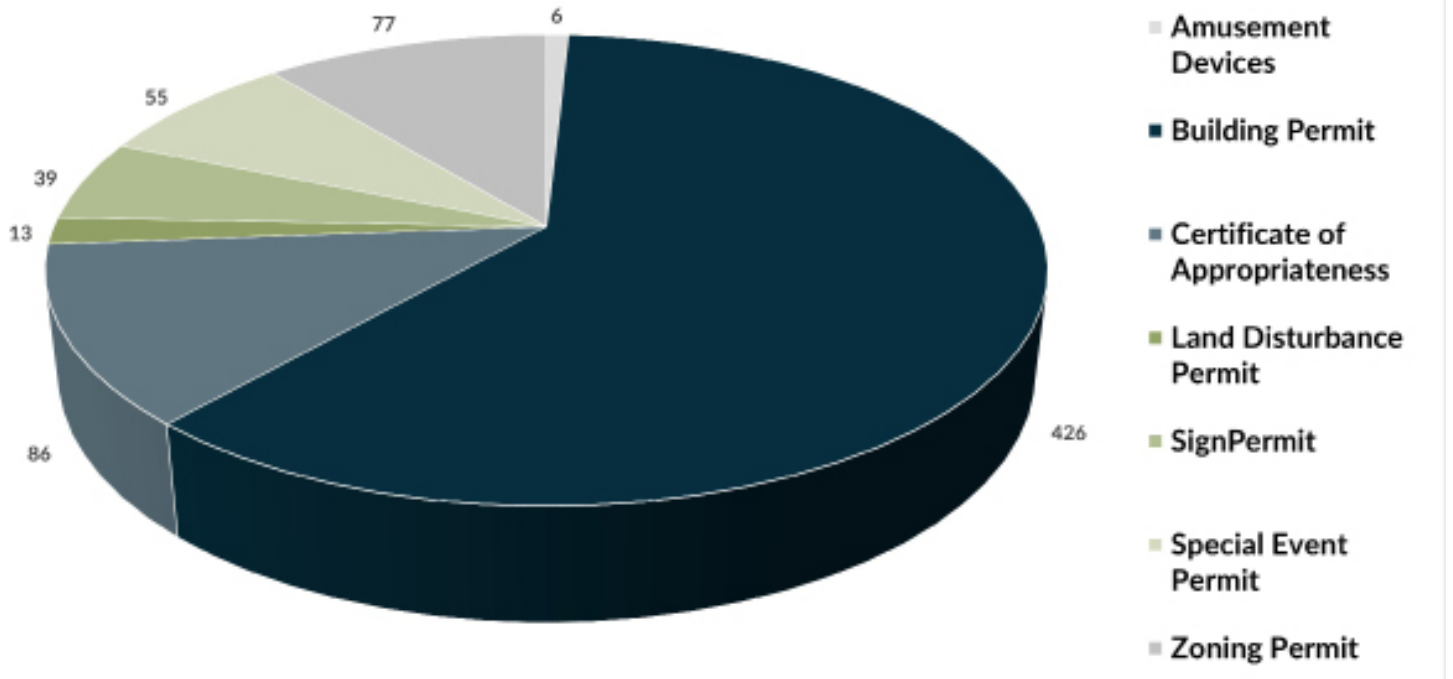
2023 Planning Commission Goals

- **Provide the Town Council with recommendations on land use applications, policies, and plans that will result in balanced, equitable, orderly growth.**
- **Ensure recommendations are well informed and legally defensible.**
- **Be transparent and open to the public on all matters related to land use.**
- **Base recommendations on the adopted policy and plans that set forth the vision for the Town.**
- **Develop a best practice process for the adoption of the Capital Improvement Program.**
- **Be engaged and informed on the Comprehensive Plan goals in reviewing current land use applications.**
- **Continue to examine and attend training seminars, as permitted under current Health Advisory.**
- **Collaborate with adjacent Planning Commissions, as permitted under current Health Advisory.**
- **Perform site visits, as appropriate, for land use applications.**
- **Be engaged and informed on the activities of the Architectural Review Board.**
- **Learn from the success stories of other jurisdictions that are applicable to Warrenton.**

PERMIT PROCESSING

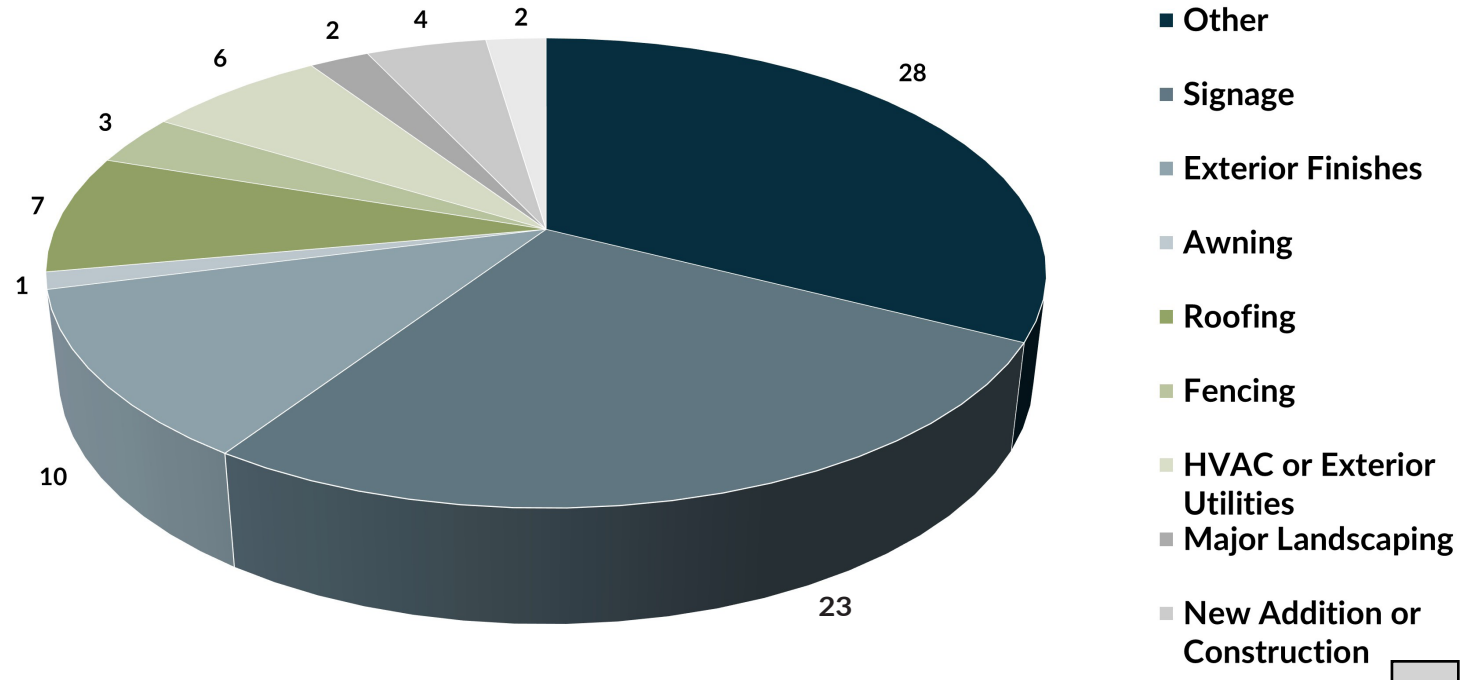
2023 Permit Applications

702 TOTAL



2023 Certificates of Appropriateness

86 TOTAL



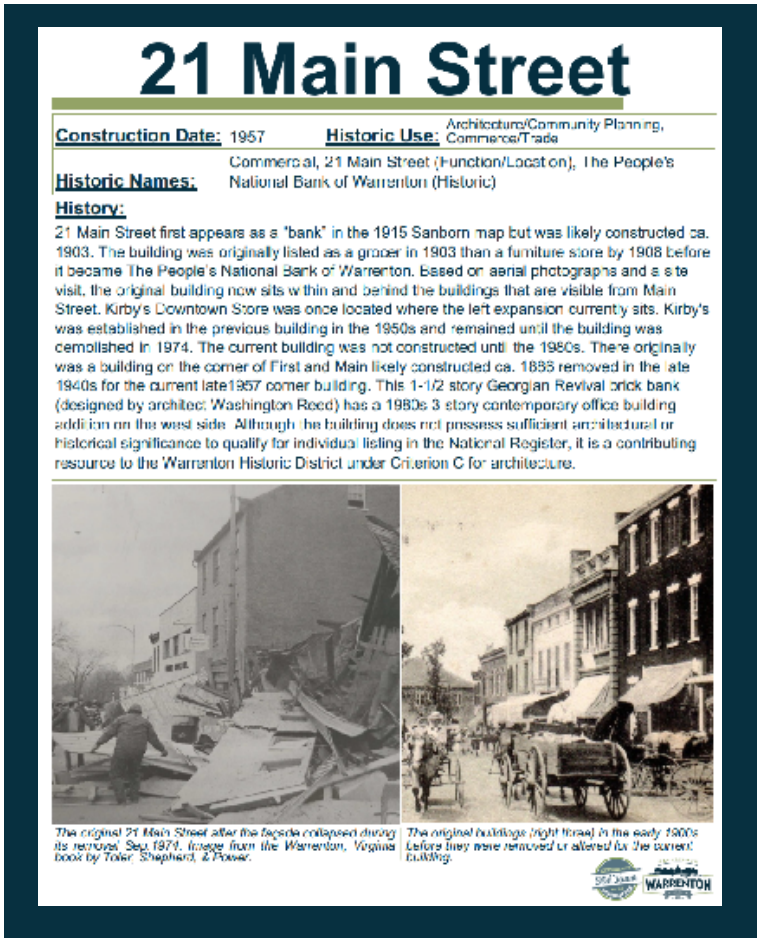
PLANNING COMMISSIONER CERTIFIED TRAINING

A key goal of the Planning Commission is to receive ongoing training in Virginia land use laws and Town of Warrenton regulations. In 2023 this included a customized workshop conducted by Dr. Michael Chandler who served as Director of Education for the Land Use education Program at Virginia Tech where he conducted the award-winning Certified Planning Commissioner training for almost 30 years. Topics covered included:

- The Role of the Planning Commission
- Planning Commission Powers & Duties
- Effectiveness and Leadership
- Planning Commission Ethics
- Deliberation and Decision Making
- Comprehensive Plan Implementation

PLAN WARRENTON 2040 IMPLEMENTATION

Two of the metrics in the Historic Resources of the comprehensive plan continued to make forward progress when the Town was awarded a grant from the Virginia Department of Historic Resources to survey structures located within the Town's local historic district, yet outside the National Register of Historic Places. A public meeting was held to inform property owners and the survey was conducted in the summer of 2023. During the fall, an updated nomination was submitted to the state and ultimately the National Park Service in an effort to successfully match the local and national historic district boundaries. If successful, this will result in local property owners being eligible for state and federal rehabilitation tax credits.



21 Main Street

Construction Date: 1957 **Historic Use:** Architecture/Community Planning, Commerce/Trade

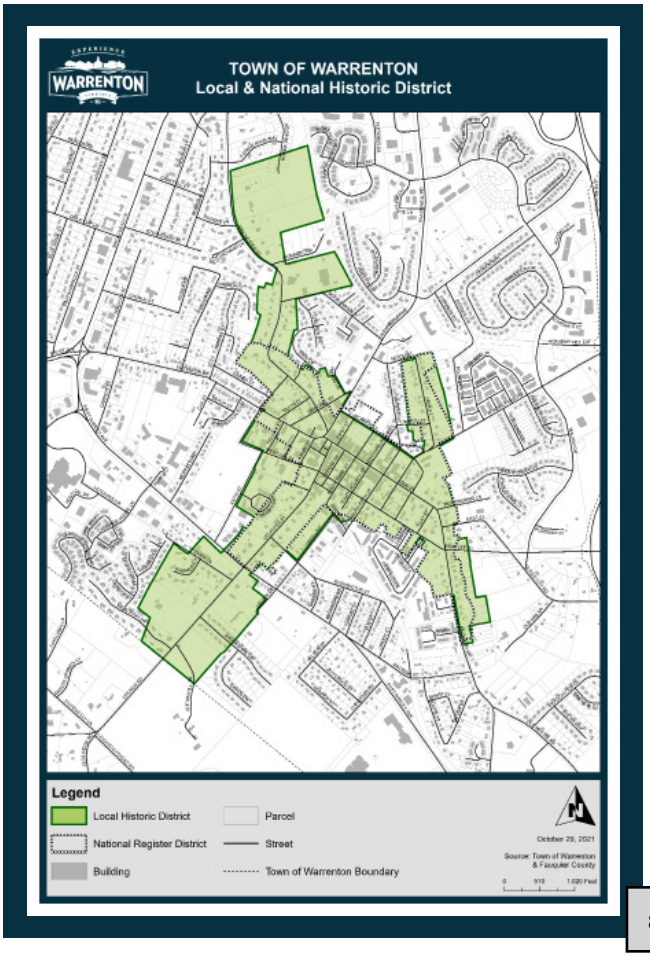
Historic Names: Commercial, 21 Main Street (Function/Location), The People's National Bank of Warrenton (Historic)

History:

21 Main Street first appears as a "bank" in the 1915 Sanborn map but was likely constructed ca. 1903. The building was originally listed as a grocer in 1903 than a furniture store by 1908 before it became The People's National Bank of Warrenton. Based on aerial photographs and a site visit, the original building now sits within and behind the buildings that are visible from Main Street. Kirby's Downtown Store was once located where the left expansion currently sits. Kirby's was established in the previous building in the 1950s and remained until the building was demolished in 1974. The current building was not constructed until the 1980s. There originally was a building on the corner of First and Main likely constructed ca. 1855 removed in the late 1940s for the current late1957 corner building. This 1-1/2 story Georgian Revival brick bank (designed by architect Washington Reed) has a 1980s 3 story contemporary office building addition on the west side. Although the building does not possess sufficient architectural or historical significance to qualify for individual listing in the National Register, it is a contributing resource to the Warrenton Historic District under Criterion C for architecture.

The original 21 Main Street after the facade collapsed during its removal, Sep 1974. Image from the Warrenton, Virginia book by Toler, Shepherd, & Power.

The original buildings (right three) in the early 1900s before they were removed or altered for the current building.



Town of Warrenton

Community Development Department
21 Main Street
Warrenton, VA 20186
(540) 347-1101

TIMMONS GROUP

20110 Ashbrook Place
Suite 100
Ashburn, VA 20147

P 703.554.6700
F 703.726.1345
www.timmons.com

Statement of Justification
Taylor Middle School Addition & Renovation
Special Use Permit SUP# 23-4

GPIN 6983-48-7973-500

Owner/Applicant: County School Board of Fauquier County

September 08, 2023
Revised 01/12/24

Introduction:

Fauquier County Public Schools is seeking approval of a Special Use Permit, as required by Article 3-4.9.3 of the Town of Warrenton 2006 Zoning Ordinance, for the expansion of Taylor Middle School located on GPIN 6983-48-7973-500 within the limits of the Town of Warrenton. Approval of the Special Use Permit is requested as the application proposes a renovation of the existing school facility as well as additions to the existing building that are approximately 70,000 SF, which exceeds the 10,000 SF maximum as defined by Article 3-4.9.3. This application also proposes to improve and expand the site parking facilities, vehicular and pedestrian travel ways, emergency vehicle access, and the existing physical education field located on the site.

(1) Consistency with Comprehensive Plan

The parcel is located within the Public-Semi Public district in the Future Land Use Map of Plan Warrenton 2040. The Special Use Permit is consistent with the Comprehensive Plan as the proposed improvements plan to promote the following key points of the current Comprehensive Plan:

- As further explained below, the renovation of the existing building strives to reuse and preserve the historic nature of the existing building.
    - William C. Taylor was the first high school to serve African American students in the Warrenton area and has a strong history and roots within the local community. Additions to Taylor Middle School match the overall scale of the existing building and use similar materials to blend the new with the old. The design intent of the additions is not to match the existing building completely, but rather to compliment it with more functional and energy efficient spaces. Renovations to the existing envelope will be limited and will mostly involve replacement of existing fenestrations. Where possible, we will implement similar exterior details on the existing building to further tie the old and new sections together.
    - The existing auditorium was host to many well-known artists throughout its early years and is a particularly important space for members of the W.C. Taylor High School Alumni Committee. As such, the auditorium is being maintained as much as possible. The finishes

will be updated to give the space a fresh look while honoring its history with images of the various performers over the years. Additionally, wall graphics throughout the building will include graphic and literary references to the history of William C. Taylor High School. A statue of William C. Taylor is also anticipated to be donated to the project by the W.C. Taylor High School Alumni Committee.

The improvements proposed with the Special Use Permit helps to achieve further integration of County facilities into the fabric of the Town and provides high-quality, equitable, and accessible community facilities that meet the Town's service requirements and support a high quality of life for the community. The application proposes improved pedestrian and bicycle facilities with additional sidewalks proposed along the frontage and throughout the site as well as an improved connection for users to access the site via the Warrenton Greenway Trail.

(2) Safety from Fire Hazards:

As part of the school renovation and addition project, the building will be fully sprinklered and will comply with 2018 Virginia Statewide Fire Prevention Code and 2014 NFPA 70. Building areas comply with allowable area per 2018 VCC. Fire extinguishers will be found throughout the school.

The proposed improvements reflected on the Special Use Permit plan meet the requirement for "Fire Lanes" where required, providing access to the building on all sides. This includes the construction of a dedicated emergency access lane on the north side of the building providing access around the building that does not currently exist. New fire hydrants will be provided throughout the site to provide coverage as required.

(3) Noise Impact:

The project site currently operates as a middle school. The improvements are not anticipated to generate additional sources of noise from what exists today. The proposed improvements will comply with the noise standards under Article 9-14.2 of the Town of Warrenton Zoning Ordinance.

(4) Lighting Impact:

The applicant will prepare a detailed lighting plan in conformance with 9-8 of the Town of Warrenton Zoning Ordinance at the time of Site Plan and will install lighting in accordance with the plan. All fixtures on site will conform to current lighting standards and be properly shielded. A photometric plan has been provided for reference only with the Special Use Permit Plan and will be updated and finalized at the time of Site Plan. Note that there is no existing or proposed lighting for the existing ball fields.

(5) Signage:

The project includes the replacement of the existing monument sign at the site frontage. All signage will be provided in accordance with Article 6 of the Town of Warrenton Zoning Ordinance and will be submitted with the Site Plan Process.

(6) Land Use and Compatibility with Existing and Proposed Uses Adjacent and in the Vicinity and Economic Impact:

Taylor Middle School is located on a 39.18-acre parcel identified in the Fauquier County Land Records as PIN #6983-48-7973-500, zoned as Public-Semi Public Institutional District. The parcel also includes Brumfield Elementary School. Based on the current zoning and Article 3-4.9.2, "Public Building" is a by right use.

The Taylor Middle School parcel is surrounded by a mix of commercial, Public-Semi Public, and Residential uses as defined below:

To the north: Trinity Lutheran Church, Zoned R10 and PSP and a Residential District Zoned R-10
To the east: Waterloo Motors, Zoned Commercial and Warrenton Branch Greenway Trail, Zoned PSP
To the south: The Warrenton Community Center, Zoned PSP and Walmart, Zoned Commercial
To the west: A residential district zoned R-10, the Gathering Place zoned R10, as well as currently vacant property located within the County of Fauquier.

The proposed Special Use Permit is considered compatible with the existing uses in the vicinity as the site is currently an existing middle school, is by right based on current Zoning, and ultimately serves the community and adjacent residential properties.

(7) Site Conditions, buildings etc.:

Taylor Middle School is located on a 39.18-acre parcel further identified in the Fauquier County Land Records as PIN #6983-48-7973-500, 305 E. Shirley Avenue, in Ward 3 of the Town of Warrenton. The existing middle school shares the parcel with James G. Brumfield Elementary School, located to the southwest of the existing middle school. The existing topography surrounding Taylor Middle School generally slopes from the east to the west with a significant grade change of approximately 35 feet. Stormwater runoff from the northern half of the site which includes the building, bus loop, rear parking area, and the exiting gravel track drains to the existing waterway located just west of the existing gravel track. Stormwater from the existing parking area on the southern half of the parcel, adjacent to the community center, is collected by a storm drainage system that outfalls at the western boundary of the community center property. From there drainage flows via overland westward towards the entrance of James G. Brumfield Elementary School and Alwington Blvd. All existing and proposed improvements can be found on the concept development plan.

(8) Landscaping:

Required landscaping and buffering will be provided at the time of Site Plan in accordance with Article 8 of the Town of Warrenton Zoning Ordinance.

(9) Construction Timeline:

The project construction will not be phased and has an anticipated duration of 36 months. Due to the scale of the renovations and extensive work associated with this project, students have been relocated to other facilities until the new Construction is issued a certificate of occupancy.

The site is served by Town of Warrenton's public water and sanitary sewer system. The project site does contain wetlands and 500yr floodplain (Flood plain X).

(10, 16, & 21) Impact on Existing Features:

The Design Team has conducted a detailed wetland survey and has identified several site features for avoidance if feasible. Along the north and northwestern side of the site there are existing PFO and PSS wetlands that appears to convey storm water runoff from the east side of Shirley Highway through the project site. At the time of site plan, it is the Project Teams intent to make all efforts to avoid wetland impacts. However, should impacts be required, the appropriate permits will be obtained through the required agencies.

A portion of the site does contain a 500yr floodplain (Zone X, 0.2% annual chance of flood) pursuant to FEMA Flood Insurance Rate Map 51061C0308C. This application does propose improvements within the Zone X floodplain with the improvements to the baseball/softball field, secondary access to Alwington Blvd, and the parent drop off/emergency access at the northwest side of the Middle School building. Note that while the existing building is within the limits of the Zone X floodplain, no new building additions are planned within the limits of the floodplain.

The project landscape architect and arborist performed a detailed tree assessment for the existing vegetation located on the site, primarily along the frontage of E Shirley Ave and the northern and northwestern side of the site. As identified with the exhibit provided with this application, there are several large trees within the noted study area. While it is the intent of the Project Team to preserve these tree's where possible, as noted on the tree preservation plan, removal of some of these trees will be required to accommodate the proposed building addition, bus loop reconfiguration, and the extension of the emergency access and Town Pump Station Access at the north side of the site.

Regarding the historical nature of the existing building, it is planned for the additions to Taylor Middle School match the overall scale of the existing building and use similar materials to blend the new with the old. The design intent of the additions is not to match the existing building completely, but rather to compliment it with more functional and energy efficient spaces. Renovations to the existing envelope will be limited and will mostly involve replacement of existing fenestrations. Where possible, the design team will implement similar exterior details on the existing building to further tie the old and new sections together.

Interior to the building, the existing auditorium is being maintained as much as possible. The finishes will be updated to give the space a fresh look while honoring its history with images of the various performers over the years. Additionally, wall graphics throughout the building will include graphic and literary

references to the history of William C. Taylor High School. A statue of William C. Taylor is also anticipated to be donated to the project by the W.C. Taylor High School Alumni Committee.

(11) Walkability, Public Welfare and Convenience:

The proposed project improvements include providing a dedicated bus entry/exit to the site as well two separate passenger vehicle entrances, one from E. Shirley Avenue and one to Alwington Blvd. By separating the bus and passenger vehicles, the current congestion that occurs during drop off and pick up will be alleviated so that there is no impact to the traffic within the public right of way. Additionally, a second entrance to the site from Alwington Blvd provides for an alternate access point for first responders in the case of emergency and will be used as the designated access for the parent drop off/pickup.

Pursuant to the current Town of Warrenton Comprehensive Plan, East Shirley Ave is identified as a "Signature Street". Based on the recommendations of the "Complete Streets Manual", dated September 2017 this application for Special Use Permit proposes to provide curb and gutter and sidewalk along the majority of the frontage of the subject parcel. In addition, the site improvements will include a new sidewalk that will provide a point of connection to the Greenway Trail along the site frontage. The sidewalk will also provide access to the main entry of the middle school as well as the other site features of the school site, including the baseball/softball field, running track, rectangular physical education field, and tennis courts. To further improve the future walkability of the area, this application proposes to construct a portion of Shared Use Path (SUP) that will provide a connection to the Greenway Trail. The SUP will extend south along Shirley Avenue and will terminate at a sidewalk connection to the site. From there a public access easement will be dedicated that will extend to the southern property boundary with the County Owned community center. A second public access easement will be dedicated for the future extension of a SUP at the pipe stem area between the Community center property and the Walmart property, that will extend to the ROW of Allwington BLVD. Placing the future SUP alignment on the outer boundary of the school property will provide sufficient separation from the occupied school building/facilities and public users of the trail, thus enhancing safety to the students and staff.

As noted above, the improvements proposed with this application improve the walkability, welfare and convenience for students, staff, as well as the residents within the Town of Warrenton when compared to the current existing conditions of the site.

(12) Traffic:

As detailed in the provided traffic impact analysis dated September 8, 2023, the site does not have any adverse impacts to the surrounding roadway network and no improvements are required at the study intersections.

It is noted that the Arrington Development received approval of a rezoning case (REZ 22-017978). The SUP concept plan includes an exhibit to show how the proposed Alwington Blvd Improvements interact with the proposed access road between Taylor MS and Brumfield ES.

(13) Safe and Orderly Road Development:

All proposed travel ways are located outside the Town and or VDOT Right of Way. Travel way dimensions and radii will be designed to Town and VDOT standards to allow for efficient maneuvering for the School users. As currently proposed, the site vehicular access points separate bus traffic from staff/public personal vehicles to limit conflict and to provide for a more efficient site. Furthermore, a secondary access to Alwington Blvd is proposed, which will further increase the efficiency of the internal transportation network. It should be noted that Middle School hours start at 7:30am and ends at 2:25pm, while Elementary School hours are from 8:35 am to 3:20 pm. While the secondary entrance shares the entrance to the bus loop of Brumfield Elementary School, the hour difference between the two class times will allow more than adequate time for parents to drop/off pick up at Taylor Middle School before bus traffic begins utilizing the loop at Brumfield ES.

(14) Code Requirements:

Building is not changing use. The renovations and additions will meet the Town of Warrenton code requirements.

(15) Impact on Public Facilities:

Emergency Services:
The existing middle school relies on Town Services such as fire, rescue, and police services. As the site is currently a middle school, it is assumed that there would be no additional impact to the above noted services. Furthermore, the improvements proposed within the building as well as the site will provide for a safer building for occupants as well as first responders as the new construction will be compliant with current building codes and regulations. A sheet is provided within the Special Use Permit plan to illustrate that a fire truck has sufficient turning radii to maneuver through the site with out any conflict with obstructions (parking spaces, curbs, other fixed objects, etc.).

Traffic**:**
As detailed in the provided traffic impact analysis dated September 8, 2023, the site does not have any adverse impacts to the surrounding roadway network and no improvements are required at the study intersections.

Water/Sewer:
Based on VDH Waterworks regulations water and sanitary sewer usage for a school use can be calculated based on an average of 16 gpd / occupant within the building. Based on a total max occupant load (proposed max 850 students, 100 staff, and 25 visitors for a total design occupant load of 975), the total anticipated average water demand would be as follows:

975 occupants * 16 gpd/occupant = 15,600 gpd average daily flow * 1.75 peaking factor = 27,300 gpd peak or +/-19 gpm.

Similarly, the average daily flow for sanitary sewer wastewater generated is approximately 15,600 gpd or 0.0156 mgd. Assuming a peaking factor of 2.5 as specified by SCAT Regulations, the peak daily flow for

sanitary sewer generated that would ultimately flow to the existing sanitary sewer pump station is approximately 0.039 mgd.

Schools:

The proposed improvements at Taylor Middle School are needed to improve the learning environment and meet the demands of the growing student population within the Town of Warrenton and surrounding areas and is necessary for Fauquier County Public Schools.

(17) Employment / Economic Impacts:

This project will provide desirable employment opportunities for teachers who are looking for an improved educational environment. This project has the potential to attract highly qualified teachers from neighboring localities who may choose to call Warrenton home.

(18) Affordable Shelter Opportunities for Residents:

Not Applicable to this application.

(19) Location of Outdoor Storage Areas:

There are no outdoor storage areas proposed with this application.

(20) Use of Open Space:

This application proposes to improve the existing diamond physical education field to provide for a more useable field for the school and public and to maintain access to the existing gravel track and tennis courts. Use of the existing and proposed sports fields will also be utilized by Parks and Recreation after school hours and events. The remainder of the existing open space will largely remain the same as it exists today.

(22) Non-conforming Uses and Structures:

There are no non-conforming uses or structures existing or proposed with this application.

(23) Fuel/Fuel Storage:

Not Applicable to this application as there is no fueling areas or fuel storage areas proposed.

(24) Accessory Uses and Structures:

There are no accessory structures proposed with this application.

(25) Area of each Proposed Use:

As illustrated on the concept development plan, there is only one proposed use (Public Building / Institutional) that is proposed to be +/- 148,943 SF.

(26) Hours of Operation:

The school will follow the Fauquier County Public Schools published calendar with teachers, staff and students occupying the building from August to June from 7am-5pm with some evening and weekend events.

(27) Location and Screening of Parking and Loading Spaces/Areas:

Proposed parking is distributed through the site, with most of the parking being located on the south side of the middle school in the same general area where existing parking is located. There will be visitor and ADA parking located adjacent to the bus loop for use outside of the hours of pickup and drop off as well as standard and ADA parking located at the rear or west of the school building. Parking will be screened in accordance with Article 8 of the current Ordinance. Based on the current Zoning Ordinance Article 7-4 for "School, Middle", parking is required at the following rate:

1 space per 15 students + 1 space per employee calculated for the work period containing the largest number of employees.

1 space per 15 students * 850 max students = 57 spaces required
Plus 1 space per employee * 100 employees = 100 spaces required
Total number of spaces required = 157 spaces

At the time of site plan the intent is to meet the minimum number of spaces identified above. Also, it is understood that patrons of the community center utilize the existing parking lot for the middle school. It has been identified by Fauquier County Public Schools that there is no shard parking agreement with the County Board of Supervisors for use by the Community Center. In addition, the existing parking lot between the two uses has a total of +/- 62 spaces. The proposed parking lot with this application will likely provide nearly double the amount of parking than currently exists between the two uses.

(28) Proposed Security Features and Provisions:

A secured vestibule will be provided for visitors to gain access to the main office where they will check in before being granted access to the rest of the school facility.

(29) Number of Employees:

The proposed facility is designed to accommodate the following occupant loads - 850 students, 100 staff, and 25 visitors for a total design occupant load of 975.

(30) Existing and Proposed Infrastructure:

This application proposes significant site utility and infrastructure improvements as required for the renovated and expanded middle school facility. These include upgrades to onsite water and sanitary sewer lines, grading and drainage for storm water management and best management practice systems, telecommunication and power supply, vehicular and pedestrian access, parking to include ADA spaces, sidewalks, emergency access lanes, signage, physical education fields, and landscaping. These improvements will be provided pursuant to the Town of Warrenton design and construction standards to provide an improve the learning environment and meet the demands due of the growing student

population within the Town of Warrenton and surrounding areas and is necessary for Fauquier County Public Schools.

(31) Odors:

There is no proposed change in use and there are no major sources of odors resulting from the proposed improvements.

(32) Refuse/Service Areas:

The loading and refuse/service areas are located at the southwest corner of the proposed building and the mechanical yard where the generator transformer and chillers are located on the west side of the building as shown on the Special Use Permit plan. All screening will be provided in accordance with Section Article 8-8.2.3 of the current Ordinance.

Modifications:

This application is seeking relief from Section 2-19.4 of the Town of Warrenton 2006 Zoning Ordinance that requires "Retaining walls to not exceed a height of six (6) feet in any zoning district unless approved by the Planning Director." Exceeding the maximum height of 6' for retaining walls will be required as part of this application for the following reasons:

1. To avoid/minimize impact to existing wetlands and to minimize clearing at the north/northwest side of the building adjacent to the proposed emergency access road.
2. The proximity of the existing building and slopes on the west side down to the existing gravel track and diamond field. In order to maintain these existing elements (and improve the diamond field), retaining walls in excess of 6' will be required.

SPECIAL USE PERMIT (SUP 23-4)
TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VIRGINIA 20186

CENTER MAGISTERIAL DISTRICT
TOWN OF WARRENTON, VIRGINIA
PARCEL ID: 6983-48-7973-500

VICINITY MAP
SCALE: 1" = 2,000'

Sheet List Table

Sheet Number	Sheet Title
C0.00	COVER SHEET
C1.01	GENERAL NOTES
C1.02	OVERALL & ADJACENT OWNERS
C2.01	EXISTING CONDITIONS PLAN
C2.02	EXISTING CONDITIONS PLAN
C3.00	OVERALL SPECIAL USE PERMIT PLAN
C3.01	SPECIAL USE PERMIT PLAN
C3.02	SPECIAL USE PERMIT PLAN
C3.02A	SPECIAL USE PERMIT PLAN - FUTURE ARRINGTON PLANS
C3.03	SPECIAL USE PERMIT PLAN - AUTO-TURN
C3.04	SPECIAL USE PERMIT PLAN - AUTO-TURN
L1.03	SPECIAL USE PERMIT - TREE PRESERVATION
L1.04	SPECIAL USE PERMIT - TREE PRESERVATION
L1.05	SPECIAL USE PERMIT - TREE PRES NOTES AND DETAILS
E-401B	SPECIAL USE PERMIT - ELECTRICAL SITE PLAN
E-402B	SPECIAL USE PERMIT - ELECTRICAL SITE PLAN PHOTOMETRICS
SU-201	SPECIAL USE PERMIT - OVERALL EXTERIOR ELEVATIONS
SU-202	SPECIAL USE PERMIT - OVERALL EXTERIOR ELEVATIONS

OWNER: COUNTY SCHOOL BOARD
OF FAUQUIER COUNTY
320 HOSPITAL DRIVE, SUITE 40
WARRENTON, VA 20186
CONTACT: DAVID GRAHAM
PHONE: 540-422-7017

ARCHITECT: RRMM
115 SOUTH 15TH STREET, SUITE 502
RICHMOND, VA 23219
CONTACT: DOUG COFER, ARCHITECT
PHONE: 804-277-8987

ENGINEER: TIMMONS GROUP
20110 ASHBROOK PLACE, SUITE 100
ASHBURN, VIRGINIA 20147
CONTACT: LUKE FETCHO, PE
EMAIL: LUKE.FETCHO@TIMMONS.COM
PHONE: 703-544-6712

MARK	DATE	BY	REVISIONS
1	01/12/2024	TG	SUP 2ND SUB

DATE	09/07/2023
PROJECT	21352-00
DESIGNED	TIMMONS
DRAWN	TIMMONS
CHECKED	PVN

RRMM ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

IFB: TBD
VIRGINIA DEPARTMENT OF EDUCATION: 030-47-00-101

PROJECT: TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186

DRAWING: COVER SHEET

SHEET
C0.00

PROJECT NARRATIVE

THIS SITE PLAN PROPOSES A CORE ADDITION AND A CLASSROOM ADDITION, ALONG WITH RENOVATIONS TO THE EXISTING TAYLOR MIDDLE SCHOOL BUILDING. ALL EXISTING UTILITIES AND STORM DRAINAGE WILL BE RELOCATED AS NECESSARY.

SITE INFORMATION

APPLICANT:
COUNTY SCHOOL BOARD OF FAUQUIER COUNTY
320 HOSPITAL DR STE 40
WARRENTON VA, 20186

PREPARERS:
TIMMONS GROUP
20110 ASHBROOK PLACE, SUITE 100
ASHBURN, VIRGINIA 20147
(703) 554-6712

RRMM ARCHITECTS
115 SOUTH 15TH STREET, SUITE 502
RICHMOND, VA 23219
(804) 277-8987

1. THE SUBJECT PARCEL SHOWN HEREON IS LOCATED IN TOWN OF WARRENTON:

OWNER	PIN #	ACRES	ZONING	USE
COUNTY SCHOOL BOARD OF FAUQUIER COUNTY	6983-48-7973-500	39.18	PSP	MIDDLE SCHOOL

2. THIS TOPOGRAPHIC SURVEY WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF JEFFREY A. SMERALDO FROM AN ACTUAL GROUND SURVEY MADE UNDER MY SUPERVISION; THAT THE ORIGINAL DATA WAS OBTAINED IN MARCH, 2023. THIS PLAT, MAP AND DIGITAL GEOSPATIAL DATA INCLUDING METADATA MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.
3. SUBSURFACE UTILITIES WERE LOCATED ON MARCH 9 & 10, 2023 BY THIS FIRM.
4. THE BOUNDARY INFORMATION SHOWN HEREON PER RECORD DESCRIPTIONS AND DOES NOT CONSTITUTE A BOUNDARY SURVEY AS DEFINED BY THE COMMONWEALTH OF VIRGINIA.
5. PHYSICAL FEATURES ARE SHOWN BASED ON CONVENTIONAL SURVEYING METHODS AND AERIAL MAPPING PROVIDED BY TUCK MAPPING SOLUTIONS, INC. FROM IMAGERY DATED MARCH 8, 2023.
6. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT.
7. BASED ON FEMA FLOOD INSURANCE RATE MAP (FIRM) 51061C308C, EFFECTIVE DATE FEBRUARY 6, 2008, THE PROPERTY LIES IN UNSHADED ZONE X, AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, SHADED ZONE X, AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THIN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1%ANNUAL CHANCE FLOOD, AND ZONE A, SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD, NO BASE FLOOD ELEVATIONS DETERMINED.
8. BASIS OF MERIDIAN: VCS NAD83 (2011)
9. VERTICAL DATUM: NAVD88
10. DATUM AND MERIDIAN WERE ESTABLISHED BY GPS OBSERVATIONS.
11. TOPOGRAPHIC FIELD WORK COMPLETED MARCH 27, 2023.
12. SOILS INFORMATION SHOWN HEREON IS TAKEN FROM THE 2007 FAUQUIER COUNTY SOIL SURVEY AND THE USDA WEB SOIL SURVEY, ORIGINAL SCALE 1" = 1000'.

ZONING TABULATIONS

ZONING REQUIREMENTS (ARTICLE 3-4.9)	EXISTING/REQUIRED	PROPOSED
ZONING DISTRICT:	PUBLIC-SEMI-PUBLIC INSTITUTIONAL (PSP)	PSP (SPECIAL USE PERMIT) TO ALLOW SCHOOLS WITH EXPANSIONS TO SCHOOL FACILITIES EQUAL TO/OVER 10,000 SF (ARTICLE 3-4.9.3)
LOT AND YARD REGULATIONS (ARTICLE 3-4.9.4)	REQUIRED	PROPOSED
MINIMUM LOT SIZE:	NONE	39.18 AC
MINIMUM LOT FRONTAGE:	50 FEET	1,202 FEET (EAST SHIRLEY AVE)
MAXIMUM LOT COVERAGE:	85%	36% (85% MAX)
FRONT YARD SETBACK (ADJACENT TO C, PSP, R-10, I DISTRICT)	NONE WHEN ADJACENT/ ACROSS FROM C, CBD, I DISTRICTS; 25' WHEN ADJACENT/ACROSS R DISTRICTS	5 FEET/30 FEET*
RIGHT SIDE YARD SETBACK (ADJACENT TO R-10 DISTRICT)	NONE WHEN ADJACENT/ ACROSS FROM C, CBD, I DISTRICTS; 15' WHEN ADJACENT/ACROSS R DISTRICTS	20 FEET*
LEFT SIDE YARD SETBACK (ADJACENT TO C, DISTRICT)	NONE WHEN ADJACENT/ ACROSS FROM C, CBD, I DISTRICTS; 15' WHEN ADJACENT/ACROSS R DISTRICTS	5 FEET*
REAR YARD SETBACK (ADJACENT TO C, RA DISTRICT LOCATED IN FAUQUIER COUNTY)	NONE WHEN ADJACENT/ ACROSS FROM C, CBD, I DISTRICTS; 35' WHEN ADJACENT/ACROSS R DISTRICTS	5 FEET*

*FIVE (5) ADDITIONAL FEET ADDED TO MINIMUM SETBACK REQUIREMENTS BASED ON PROPOSED HEIGHT OF BUILDING (INCREASE OF ONE FOOT FOR EACH FOOT IN HEIGHT OVER 35 FEET)

BUILDING REGULATIONS (ARTICLE 3-4.9.5)	REQUIRED	PROPOSED
MAXIMUM HEIGHT*	35 FEET*	±40 FEET**

*A PUBLIC OR INSTITUTIONAL BUILDING OR CHURCH MAY BE ERECTED TO A HEIGHT OF 60 FEET FROM GRADE PROVIDED THAT REQUIRED FRONT, SIDE, AND REAR YARDS SHALL BE INCREASED BY ONE FOOT FOR EACH FOOT IN HEIGHT OVER 35 FEET.

**EXISTING AND PROPOSED BUILDING HEIGHT OF 38 FEET IS REFERENCED FROM AVERAGE ELEVATION OF GROUND SURFACE ALONG FRONT OF BUILDING (ARTICLE 12). NOTE BUILDING HEIGHT EXCLUDES HEIGHT OF MOUNTED ROOFTOP MECHANICAL EQUIPMENT AND ASSOCIATED SCREENS.

BUILDING INFORMATION

EXISTING BUILDING GROSS AREA (PRE-DEMOLITION):	87,692 SF GFA
EXISTING BUILDING GROSS AREAS (POST-DEMOLITION):	80,794 SF GFA
PROPOSED CORE ADDITION GROSS AREA:	47,353 SF GFA
PROPOSED CLASSROOM ADDITION GROSS AREA:	20,796 SF GFA
COMBINED PROPOSED ADDITIONS GROSS AREA:	68,149 SF GFA
TOTAL MIDDLE SCHOOL GROSS AREA:	148,943 SF GFA

OPEN SPACE CALCULATION (ARTICLE 3-4.9.4)

MAXIMUM LOT COVERAGE:	85%
TOTAL SITE AREA:	39.1805 AC = 1,706,702.58 SF
EXISTING BUILDING AREA POST-DEMOLITION (TAYLOR MIDDLE SCHOOL):	48,970 SF
PROPOSED CORE ADDITION BUILDING AREA:	34,310 SF
PROPOSED CLASSROOM ADDITION BUILDING AREA:	6,900 SF
COMBINED PROPOSED ADDITIONS BUILDING AREA:	41,210 SF
TOTAL TAYLOR MIDDLE SCHOOL BUILDING AREA:	90,180 SF
ROAD AND PARKING LOT:	208,500 SF
EXISTING BUILDING AREA (JAMES G. BRUMFIELD ELEMENTARY SCHOOL):	81,100 SF
OTHER TOTAL EXISTING IMPERVIOUS AREA:	235,000 SF
PROPOSED LOT COVERAGE:	614,780 SF/1,706,702.58 SF = 36% (MAX 85%)

PARKING STANDARDS FOR INSTITUTIONAL AND COMMUNITY SERVICES USE (ARTICLE 7-4)
1 SPACE PER 15 STUDENTS + 1 SPACE PER EMPLOYEE CALCULATED FOR THE WORK PERIOD CONTAINING THE LARGEST NUMBER OF EMPLOYEES

TOTAL STUDENTS =	850 STUDENTS	
TOTAL EMPLOYEES =	100 EMPLOYEES	
TOTAL SPACES REQUIRED = 1 SPACE/15 STUDENTS * 850 STUDENTS =		57 SPACES
1 SPACE/1 EMPLOYEE * 100 EMPLOYEES =		100 SPACES
		157 SPACES

ADA PARKING SPACES REQUIRED (ARTICLE 7-19.4) = 6 (AT LEAST 1 VAN ACCESSIBLE SPACE)	
TOTAL EXISTING SPACES =	134 SPACES (INCLUDES 5 ADA SPACES)
TOTAL SPACES PROVIDED =	166 SPACES (INCLUDES 6 ADA SPACES)

LOADING SPACES REQUIRED PER FAUQUIER COUNTY ZONING ORDINANCE 7-203:
STANDARD F (SCHOOLS) - 1 SPACE FOR THE FIRST 10,000 SF GFA, PLUS 1 SPACE FOR EACH ADDITIONAL 100,000 SF GFA OR MAJOR FRACTION THEREOF.
1 SPACE + ((148,943 SF - 10,000 SF)/100,000 SF) = 2.39 SPACES = 2 SPACES REQUIRED (MAJOR FRACTION)

LOADING SPACES PROVIDED = 2

SOIL INFORMATION

MAP. UNIT SYMBOL SOIL NAME SLOPE	SOIL DESCRIPTION	General Characteristics: SOIL FEATURES				K_{Sat}	LAND POTENTIALS	DEVELOPMENT POTENTIAL AND PROBLEMS USING: CENTRAL WATER AND CENTRAL SEWER	DEVELOPMENT POTENTIAL AND PROBLEMS USING: CONVENTIONAL SEPTIC TANK AND DRAINFIELD
12A Rohrersville loam	Very deep, somewhat poorly drained, brownish-yellow loam soils with intermittent high water tables in drainageways; developed in recent greenstone colluvium/alluvium	Slope (%)	0 - 2	Erosional Hazard Potential:	Slight	Surface: Moderate	**AGRICULTURE**	VERY POOR May be within l00-year floodplain; frequent flooding; high water table; concentrated runoff from higher areas; overland flow-significant destructive potential during flooding events	NOT SUITED High water table
		Bedrock Depth (in.):	> 60	K Factor (surface):	0.37	Subsoil: low	SECONDARY PASTURE		
		Watertable Depth (in.):	10 - 20	K Factor (subsoil):	0.32	Substratum: Moderate			
		Shrink-Swell Potential:	Mod.	Hydrologic Group:	D		**FORESTRY (HARDWOOD)**		
	May have Hydric Soil inclusions	Bearing Capacity:	low				MODERATE		
17B Middleburg loam	Very deep, well drained, brown loamy soils in concave swales and along small drainageways; developed in recent colluvium and local wash from crystalline uplands	Slope (%)	2 - 7	Erosional Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	POOR Frequent flooding; intermittent high water table; concentrated runoff from higher areas; low bearing capacity when wet	NOT SUITED Landscape position
		Bedrock Depth (in.):	> 60	K Factor (surface):	0.37	Subsoil: Moderate	PRIME CROPLAND		
		Watertable Depth (in.):	> 40	K Factor (subsoil):	0.32	Substratum: Moderate			
		Shrink-Swell Potential:	low	Hydrologic Group:	B		**FORESTRY (HARDWOOD)**		
	May have Hydric Soil inclusions	Bearing Capacity:	Mod.				HIGH		
40C Myersville silt loam	Deep, well drained, strong brown silty soils on rolling summits and strongly sloping backslopes; developed in residuum from greenstone and chloritic schist	Slope (%)	7 - 15	Erosional Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	FAIR Shallow to rock	MARGINAL Shallow to rock
		Bedrock Depth (in.):	40 - 60	K Factor (surface):	0.37	Subsoil: Moderate	SECONDARY CROPLAND		
		Watertable Depth (in.):	> 40	K Factor (subsoil):	0.32	Substratum: Moderate			
		Shrink-Swell Potential:	low	Hydrologic Group:	B	Weathered Bedrock: Impermeable	**FORESTRY (HARDWOOD)**		
		Bearing Capacity:	Mod.				MODERATELY HIGH		
43C Alanthus silt loam	Very deep, well drained, yellowish-red silty soils on strongly sloping backslopes; developed in residuum from greenstone and chloritic schist	Slope (%)	7 - 15	Erosional Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	GOOD	GOOD
		Bedrock Depth (in.):	> 60	K Factor (surface):	0.37	Subsoil: Moderate	SECONDARY CROPLAND		
		Watertable Depth (in.):	> 40	K Factor (subsoil):	0.32	Substratum: Moderate			
		Shrink-Swell Potential:	low	Hydrologic Group:	B		**FORESTRY (HARDWOOD)**		
		Bearing Capacity:	Mod.				HIGH		
45B Fauquier silt loam	Very deep, well drained, red clayey soils on undulating summits and gently sloping backslopes; developed in residuum from massive greenstone and chloritic schist	Slope (%)	2 - 7	Erosional Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	GOOD	MARGINAL Slow percolation
		Bedrock Depth (in.):	> 60	K Factor (surface):	0.32	Subsoil: Moderate	PRIME CROPLAND		
		Watertable Depth (in.):	> 40	K Factor (subsoil):	0.28	Substratum: Moderate			
		Shrink-Swell Potential:	Mod.	Hydrologic Group:	C		**FORESTRY (HARDWOOD)**		
		Bearing Capacity:	Mod.				HIGH		
45C Fauquier silt loam	Very deep, well drained, red clayey soils on strongly sloping backslopes; developed in residuum from massive greenstone and chloritic schist	Slope (%)	7 - 15	Erosional Hazard Potential:	Mod.	Surface: Moderate	**AGRICULTURE**	GOOD	MARGINAL Slow percolation
		Bedrock Depth (in.):	> 60	K Factor (surface):	0.32	Subsoil: Moderate	SECONDARY CROPLAND		
		Watertable Depth (in.):	> 40	K Factor (subsoil):	0.28	Substratum: Moderate			
		Shrink-Swell Potential:	Mod.	Hydrologic Group:	C		**FORESTRY (HARDWOOD)**		
		Bearing Capacity:	Mod.				HIGH		

Item 4.

1	01/12/2024	TG	SUP 2ND SUB
MARK	DATE	BY	DES
REVISIONS			

DATE	PROJECT	DESIGNED	DRAWN	CHECKED
09/07/2023	21352-00	TIMMONS	TIMMONS	PVN

RRMM® ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

IFB: TBD

PROJECT: TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186
VIRGINIA DEPARTMENT OF EDUCATION: 030-87-00-101

DRAWING: GENERAL NOTES

SHEET
C1.01

SCALE 1"=100'
0 100' 200'

SHEETS C2.02

SHEETS C2.01

MATCHLINE

ADJACENT PARCELS:

1. COMMONWEALTH OF VIRGINIA
   PIN: 6983-68-0594-000
   USE: STATE GOVERNMENT
   ZONE: PSP
2. COMMONWEALTH OF VIRGINIA, DEPARTMENT OF TRANSPORTATION
   PIN: 6983-58-8813-000
   USE: STATE GOVERNMENT
   ZONE: PSP
3. FAUQUIER COUNTY BOARD OF SUPERVISORS
   PIN: 6983-58-5700-000
   USE: GOVERNMENT
   ZONE: PSP
4. TOWN OF WARRENTON
   PIN: 6983-59-5252-000
   USE: TOWN
   ZONE: PSP
5. LOWERY, DANIEL M; LOWERY, LINDA T.
   PIN: 6983-59-2711-000
   USE: COMMERCIAL
   ZONE: C
6. LOWERY, DANIEL M; LOWERY, LINDA T.
   USF: 6983-59-0992-000
   USE: COMMERCIAL
   ZONE: C
7. BOWER FAMILY HOLDINGS LLC
   PIN: 6983-40-9127-000
   USE: COMMERCIAL
   ZONE: C
8. CLNB LLC
   PIN: 6984-40-8014-000
   USE: SINGLE FAMILY URBAN
   ZONE: R-10
9. CLNB LLC
   PIN: 6984-40-7006-000
   USE: SINGLE FAMILY URBAN
   ZONE: R-10
10. HEITMAN, JODY ELIZABETH
    PIN: 6943-49-6963-000
    USE: SINGLE FAMILY URBAN
    ZONE: R-10
11. HAWKINS, CHERYL D; HAWKINS, ROBERT J JR
    PIN: 6983-49-5896-000
    USE: SINGLE FAMILY URBAN
    ZONE: R-10
12. OLINGER, CARRELL L
    PIN: 6983-49-5728-000
    USE: SINGLE FAMILY URBAN
    ZONE: R-10
13. SCHREHER, CHRISTOPHER L; SCHREHER, THERESA L
    PIN: 6983-49-4752-000
    USE: SINGLE FAMILY URBAN
    ZONE: R-10
14. TRUESDALE, BENJAMIN F
    PIN: 6983-49-3685-000
    USE: SINGLE FAMILY URBAN
    ZONE: R-10
15. JOHNSON, JULIE LAWS; JOHNSON, KENNETH D
    PIN: 6983-49-1144-000
    USE: SINGLE FAMILY URBAN
    ZONE: R-10
16. ALWINGTON FARM LLC
    PIN: 6983-44-5875-000
    USE: AGRICULTURE
    ZONE: RA
17. VABFT LLC
    PIN: 6983-48-7006-000
    USE: COMMERCIAL
    ZONE: C
18. COUNTY SCHOOL BOARD OF FAUQUIER COUNTY
    PIN: 6983-48-7973-000
    USE: SCHOOL
    ZONE: PSP
19. WAL-MART REAL ESTATE BUSINESS TRUST
    PIN: 6983-57-7857-000
    USE: COMMERCIAL
    ZONE: C
20. WAL-MART REAL ESTATE BUSINESS TRUST
    PIN: 6983-58-5289-000
    USE: COMMERCIAL
    ZONE: C

JAMES G. BRUMFIELD ELEMENTARY SHCOOL

ALWINGTON BLVD

PIN: 6983-48-7973-500
COUNTY SCHOOL BOARD OF FAUQUIER COUNTY
D.B. 162, PG. 184
D.B. 813, PG. 1000
35.84459 AC.
ZONE: PSP, PUBLIC-SEMI-PUBLIC INSTITUTIONAL DISTRICT
350 E. SHIRLEY AVE.

3747
538.06
CPP NAIL

WARRENTON COMMUNITY CENTER

TAYLOR MIDDLE SCHOOL

CLEVELAND ST.

EAST SHIRLEY AVE
VARIABLE WIDTH

WARRENTON BRANCH GREENWAY

FALMOUTH ST

1	01/12/2024	TG	SUP 2ND SUB
MARK	DATE	BY	DES
REVISIONS			

DATE	09/07/2023
PROJECT	21352-00
DESIGNED	TIMMONS
DRAWN	TIMMONS
CHECKED	PVN

RRMM®
ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

PROJECT TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186
VIRGINIA DEPARTMENT OF EDUCATION 030-87-00-101
IFB: TBD

DRAWING OVERALL & ADJACENT OWNERS

SHEET
C1.02

MATCHLINE - SEE SHEET C2.02

SCALE 1"=40'
0 40' 80'

LEGEND
- PROPERTY BOUNDARY
- SOIL BOUNDARY
- 54 B SOIL IDENTIFICATION
- WETLAND BOUNDARY

LEGEND:
- MONUMENT FOUND
- PROPERTY CORNER FOUND
- SIGN / UTILITY MARKER
- FLAGPOLE
- BOLLARD
- TRASH CAN
- HANDICAP PARKING
- DECIDUOUS TREE
- STORM MANHOLE
- STORM GRATE
- SANITARY MANHOLE
- CLEANOUT
- YARD LIGHT
- LIGHT POLE
- UTILITY POLE
- GUY WIRE ANCHOR
- ELECTRIC METER
- TELECOMM PEDESTAL
- FIRE HYDRANT
- WATER METER
- WATER VALVE
- GAS VALVE
- UTILITY VAULT
- EDGE OF PAVEMENT
- CURB & GUTTER
- FENCE LINE
- STORM PIPE
- SANITARY LINE
- FEMA FLOOD ZONE X
- OVERHEAD UTILITY LINE
- OVERHEAD POWER LINE
- UNDERGROUND POWER LINE
- UNDERGROUND TELECOMM LINE
- UNDERGROUND FIBER OPTIC LINE
- UNDERGROUND GAS LINE
- UNDERGROUND WATER LINE
- UNDERGROUND UTILITY LINE

MARK	DATE	REVISIONS
1	01/12/2024	SUP 2ND SUB
	TG	BY DES

DATE	PROJECT	DESIGNED	DRAWN	CHECKED
09/07/2023	21352-00	TIMMONS	TIMMONS	PVN

RRMM®
ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

IFB: TBD
030-470-00-101

PROJECT
TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186
VIRGINIA DEPARTMENT OF EDUCATION

DRAWING
EXISTING CONDITIONS PLAN

SHEET
C2.01

BOUNDARY BETWEEN TOWN OF WARRENTON AND FAUQUIER COUNTY

PIN: 6983-48-7006-000
N/F
VABFT LLC
D.B. 1513, PG. 1796
4.31 AC
ZONE: C, COMMERCIAL DISTRICT

PIN: 6983-38-7973-000
N/F
SCHOOL BOARD OF FAUQUIER COUNTY
D.B. 813, PG. 1000
0.81 AC
ZONE: C, COMMERCIAL DISTRICT

ALWINGTON BLVD

12A (HSG C/D)

45B (HSG B)

17B (HSG A)

45B (HSG B)

ZONE X

SCALE 1"=40'
0 40' 80'

LEGEND
- PROPERTY BOUNDARY
- SOIL BOUNDARY
- SOIL IDENTIFICATION (54 B)
- WETLAND BOUNDARY

LEGEND:
- MONUMENT FOUND
- PROPERTY CORNER FOUND
- SIGN / UTILITY MARKER
- FLAGPOLE
- BOLLARD
- TRASH CAN
- HANDICAP PARKING
- DECIDUOUS TREE
- STORM MANHOLE
- STORM GRATE
- SANITARY MANHOLE
- CLEANOUT
- YARD LIGHT
- LIGHT POLE
- UTILITY POLE
- GUY WIRE ANCHOR
- ELECTRIC METER
- TELECOMM PEDESTAL
- FIRE HYDRANT
- WATER METER
- WATER VALVE
- GAS VALVE
- UTILITY VAULT
- EDGE OF PAVEMENT
- CURB & GUTTER
- FENCE LINE
- STORM PIPE
- SANITARY LINE
- FEMA FLOOD ZONE X
- OVERHEAD UTILITY LINE
- OVERHEAD POWER LINE
- UNDERGROUND POWER LINE
- UNDERGROUND TELECOMM LINE
- UNDERGROUND FIBER OPTIC LINE
- UNDERGROUND GAS LINE
- UNDERGROUND WATER LINE
- UNDERGROUND UTILITY LINE

MATCHLINE - SEE SHEET C2.01

APPROX. LOCATION OF EX. MH (TAKEN FROM PLANS OF RECORD)

72" RCP

CONC. HEADWALL: 72" RCP (INV. = 517.07')

SANITARY PUMP STATION (LOCKED-INACCESSIBLE)

PIN: 6983-49-6156-000
N/F
TOWN OF WARRENTON
D.B. 214, PG. 219
0.08 AC
ZONE: PSP, PUBLIC-SEMI-PUBLIC INSTITUTIONAL DISTRICT
USE: PUBLIC-SEMI-PUBLIC NON-INTENSIVE

SANITARY MANHOLE
TOP = 534.27'
8" TC INV. IN (SE) = 527.82'
8" TC INV. IN (SSE) = 527.87'
8" TC INV. OUT = 527.72'

SANITARY MANHOLE
TOP = 532.13'
8" TC INV. IN (N) = 525.71'
8" TC INV. IN (SE) = 525.48'
8" TC INV. OUT = 525.24'

18" CMP
INV. IN = 531.26'
INV. OUT = 531.23'

18" CMP
INV. IN = 531.05'
INV. OUT = 531.20'

1	01/12/2024
MARK	DATE
REVISIONS	
SUP 2ND SUB	
TG	BY
	DES

DATE	09/07/2023
PROJECT	21352-00
DESIGNED	TIMMONS
DRAWN	TIMMONS
CHECKED	PVN

RRMM®
ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

IFB: TBD
03047-00-101

PROJECT
TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186
VIRGINIA DEPARTMENT OF EDUCATION: 03047-00-101

DRAWING
EXISTING CONDITIONS PLAN

SHEET
C2.02

SCALE 1"=75'
0 75' 150'

JAMES G. BRUMFIELD
ELEMENTARY SHCOOL

ALWINGTON BLVD

APPROXIMATE LOCATION OF 12' WIDE PUBLIC ACCESS EASEMENT FOR FUTURE EXTENSION OF 10' WIDE SHARED USE PATH. EASEMENT TO EXTEND FROM THE EAST SHIRLEY AVE ROW TO ALWINGTON BLVD ROW. FINAL CONFIGURATION OF THE EASEMENT TO BE DETERMINED AND APPROVED AT THE TIME OF SITE PLAN.

WARRENTON
COMMUNITY
CENTER

TAYLOR MIDDLE SCHOOL

EAST SHIRLEY AVE
VARIABLE WIDTH

CLEVELAND ST

3747
530.06'
CPP NAIL

MARK	DATE	REVISIONS
1	01/12/2024	SUP 2ND SUB
	TG	BY DES

DATE	09/07/2023
PROJECT	21352-00
DESIGNED	TIMMONS
DRAWN	TIMMONS
CHECKED	PVN

RRMM®
ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

PROJECT
TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186
IFB: TBD
VIRGINIA DEPARTMENT OF EDUCATION: 030-67-00-101

DRAWING
OVERALL SPECIAL USE PERMIT PLAN

SHEET
C3.00

MATCHLINE - SEE SHEET C3.02

SWM QUALITY STRUCTURE

SWM UNDERGROUND FACILLITY

EX. TOWN OF WARRENTON PUMP STATION

PIN: 6983-49-6156-000
N/F
TOWN OF WARRENTON
D.B. 214, PG. 210
0.08 AC
ZONE: PSP, PUBLIC-SEMI-PUBLIC INSTITUTIONAL DISTRICT
USE: PUBLIC/SEMI-PUBLIC NON-INTENSIVE

DELIVERY TRUCK EGRESS ROUTE

CONNECT TO EX GAS

±64,800 SF BASEBALL/SOFTBALL FIELD (FINAL DESIGN AND CONFIGURATION TO BE DETERMINED AT TIME OF SITE PLAN)

RETAINING WALL MAX. HEIGHT APPROX. 12'

PIN: 6983-48-7973-500
COUNTY SCHOOL BOARD OF FAUQUIER COUNTY
D.B. 162, PG. 184
D.B. 813, PG. 1000
35.84459 AC.
ZONE: PSP, PUBLIC/SEMI-PUBLIC INSTITUTIONAL DISTRICT
350 E. SHIRLEY AVE.

PARENT DROPOFF ENTRANCE TO ALWINGTON BLVD

42" FENCE

RETAINING WALL MAX. HEIGHT APPROX. 6'

INFIELD TO BE CONVERTED TO BASEBALL WITH 90' BASES

CONNECT TO EXISTING 8" W/L

42" FENCE

PIN: 6983-58-5700-000
N/F
BOARD OF SUPERVISORS OF FAUQUIER COUNTY
D.B. 911, PG. 1600
5.76 AC
ZONE: PSP,PUBLIC/SEMI-PUBLIC INSTITUTIONAL DISTRICT
USE: PUBLIC/SEMI-PUBLIC NON-INTENSIVE

SCHOOL STAFF TO CLOSE ACCESS ROAD WITH GATE DURING SCHOOL HOURS AND WILL BE OPEN FOR PICK UP AND DROP OFF ONLY

RETAINING WALL MAX. HEIGHT APPROX. 8'

APPROX. LIMITS OF SIDEWALK FOR TRACK ACCESS

42" FENCE

CONNECT TO EX UGT

RETAINING WALL MAX. HEIGHT APPROX. 12'

APPROX. LIMITS OF SIDWALK RAMP FOR FIELD ACCESS

HANDRAILS (TYP.)

STOP BAR

CG-12 TYPE B

LOADING SPACE

GREASE TRAP CONNECT TO BLDG

LOADING AREA (APPROX. 684 SF)

LOADING AREA (APPROX. 1750 SF)

PROPOSED SANITARY LINE CONNECT TO BLDG

COVERED OUTDOOR CLASSROOM APPROX. ±4,300 SF

SCREEN WALL MAX HEIGHT APPROX. 10'
± 2200 SF OUTDOOR LEARNING SPACE (FINAL DESIGN TO BE DETERMINED AT TIME OF SITE PLAN)

±34,310 SF CORE ADDITION

RETAINING WALL MAX. HEIGHT APPROX. 12'
42" FENCE

PROPOSED WATERLINE

42" FENCE

STAIRS

5' SETBACK

30' SETBACK

MOUNTABLE CURB

EMERGENCY ACCESS CUT THROUGH

CONNECT TO EX POLE

CONNECT TO EX MANHOLE

RETAINING WALL MAX. HEIGHT APPROX. 12'
PROPOSED SANITARY LINE

RELOCATED TELECOM BOX

PUMP STATION & TENNIS COURT ACCESS DRIVE

CONNECT TO EX UFO

RETAINING WALL MAX. HEIGHT APPROX. 12'

EMERGENCY ACCESS GATE

42" FENCE

RAMP

HANDRAILS (TYP.)

SCREEN FENCE MAX HEIGHT APPROX 10'

CONNECT TO BLDG

±6,900 SF CLASSROOM ADDITION

FIRE LINE
DOMESTIC SERVICE

PROPOSED WATERLINE

PROPOSED SANITARY LINE

CONNECT TO EX SANITARY LATERAL

PARENT DROPOFF/PICKUP
CONNECT TO EX SANITARY LATERAL

±1,200 SF PICNIC AREA (FINAL DESIGN AND CONFIGURATION TO BE DETERMINED AT TIME OF SITE PLAN)

25' BUFFERYARD

20' SETBACK

RELOCATED FIBER BOX

EXISTING 2-STORY BRICK WILLIAM C. TAYLOR MIDDLE SCHOOL 53,925 SF

FF ELEV.= 547.82'

FF ELEV.= 550.60'

FF ELEV.= 563.08'

FF ELEV.= 559.89'

CONNECT TO EX GAS METER

PIPE W/GAS METER GAS REGULATOR

(1) WALL MOUNTED FDC

16 STACKED BUSES

CG-12 TYPE B

FH1

FH2

FH3

FH4

FH5

RELOCATED GAS LINE

5' SETBACK

CONNECT TO EX

EMERGENCY ACCESS GATE
CG-12 TYPE B

FUTURE ALIGNMENT OF 10' SHARED USE PATH

NOSE DOWN CURB

STAFF PARKING/PARENT DROPOFF ACCESS

1' EDGE MILL
PUBLIC ACCESS EASEMENT FOR FUTURE EXTENSION OF SHARED USE PATH

CONNECT TO EX 8" W/L
CONNECT TO EX GAS MAIN

BUS/VISITOR EXIT

VISITOR PARKING TO BE CLOSED DURING SCHOOL PICKUP & DROP OFF

REPLACE WITH NEW MONUMENT SIGN

CONNECT TO EX GAS MAIN

1' EDGE MILL

EAST SHIRLEY AVE
VARIABLE WIDTH

F.O. LINE MARKED BY OTHERS

CONNECT TO EX W/L
BUS/VISITORS ENTRANCE

1' EDGE MILL

NOSE DOWN CURB

PIN: 6983-59-5813-000
N/F
COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION
D.B. 1230, PG. 486
0.62 AC
ZONE: PSP,PUBLIC/SEMI-PUBLIC INSTITUTIONAL DISTRICT
USE: PUBLIC/SEMI-PUBLIC INTENSIVE

WARRENTON BRANCH GREENWAY

PIN: 6983-59-5252-000
N/F
TOWN OF WARRENTON
D.B. 776, PG. 184
4.60 AC
ZONE: PSP,PUBLIC/SEMI-PUBLIC INSTITUTIONAL DISTRICT
USE: PUBLIC/SEMI-PUBLIC INTENSIVE

PIN: 6983-59-7096-000
N/F
DEBORAH PHILIPS & DANE RECTOR & MARY RECTOR & RONALD RECTOR & WAYNE RECTOR
D.B. 177, PG. 1297
D.B. 232, PG. 442
0.50 AC
ZONE: R10-RESIDENTIAL
USE: MEDIUM DENSITY RESIDENTIAL

PIN: 6983-59-6245-000
N/F
ANITA RECTOR & DANE RECTOR
D.B. 1652, PG. 1561
0.39 AC
ZONE: R-10, RESIDENTIAL DISTRICT
USE: MEDIUM DENSITY RESIDENTIAL

PIN: 6983-59-5376-000
N/F
ALMA RECTOR & RONALD RECTOR
D.B. 431, PG. 558
0.23 AC
ZONE: R-10, RESIDENTIAL DISTRICT
USE: MEDIUM DENSITY RESIDENTIAL

PIN: 6983-59-5418-000
N/F
ANTJWAN BLAND & SHERELLE SMITH
D.B. 278, PG. 2311
0.38 AC
ZONE: R-10, RESIDENTIAL DISTRICT
USE: MEDIUM DENSITY RESIDENTIAL

PIN: 6983-59-4578-000
N/F
JOHN CROCKER & MELISSA CROCKER
D.B. 1730, PG. 862
0.25 AC
ZONE: R-10, RESIDENTIAL DISTRICT
USE: MEDIUM DENSITY RESIDENTIAL

PIN: 6983-59-2711-000
N/F
DANIEL LOWERY & LINDA LOWERY
D.B. 494, PG. 748
0.73 AC
ZONE: C, COMMERCIAL DISTRICT
USE: GREENWAY AND WELLNESS MIXED USE

PIN: 6983-59-0992-000
N/F
DANIEL LOWERY & LINDA LOWERY
D.B. 494, PG. 748
1.01 AC
ZONE: C, COMMERCIAL DISTRICT
USE: GREENWAY AND WELLNESS MIXED USE

PIN: 6983-40-9127-000
N/F
BOWER FAMILY HOLDINGS LLC
D.B. 1522, PG. 803
1.92 AC
ZONE: C, COMMERCIAL DISTRICT
USE: COMMERCIAL USE

PIN: 6983-49-5896-000
N/F
CHERYL & ROBERT G HAWKINS JR
D.B. 1254, PG. 1913
0.57 AC
ZONE: R10-RESIDENTIAL
USE: LOW DENSITY RESIDENTIAL

PIN: 6983-49-6983-000
N/F
JODY HEITMAN
D.B. 1529, PG. 1776
0.58 AC
ZONE: R10-RESIDENTIAL
USE: LOW DENSITY RESIDENTIAL

PIN: 6984-40-7006-000
N/F
CLNB LLC
D.B. 1552, PG. 23
0.82 AC
ZONE: R10-RESIDENTIAL
USE: LOW DENSITY RESIDENTIAL

PIN: 6984-40-8014-000
N/F
CLNB LLC
D.B. 1552, PG. 1327
0.19 AC
ZONE: R10-RESIDENTIAL
USE: LOW DENSITY RESIDENTIAL

NOTE:

1 - NO SPORTS FIELD LIGHTING IS PROPOSED WITH THIS APPLICATION.

2 - PROPOSED SITE LIGHTING WILL BE PROVIDED IN ACCORDANCE WITH REQUIREMENTS SET FORTH BY THE TOWN OF WARRENTON ZONING ORDINANCE. SPECIFIC DETAILS WILL BE PROVIDED AT THE TIME OF SITE PLAN.

3 - PROPOSED SIGNAGE WILL BE PROVIDED IN ACCORDANCE WITH REQUIREMENTS SET FORTH BY THE TOWN OF WARRENTON ZONING ORDINANCE. SPECIFIC DETAILS WILL BE PROVIDED AT THE TIME OF SITE PLAN.

4 - PROPOSED LANDSCAPING WILL BE PROVIDED IN ACCORDANCE WITH REQUIREMENTS SET FORTH BY THE TOWN OF WARRENTON ZONING ORDINANCE. SPECIFIC DETAILS WILL BE PROVIDED AT THE TIME OF SITE PLAN.

SCALE 1"=40'
0 40' 80'

LEGEND

- PROPERTY BOUNDARY
- SITE LIGHTING
- BUILDING LIGHTING
- SCREEN FENCE
- REVERSE CURB
- TRANSITION CURB
- WATERLINE
- FIRE HYDRANT
- SANITARY SEWER
- SANITARY SEWER MANHOLE
- UNDERGROUND POWER
- GAS LINE
- UNDERGROUND TELECOMMUNICATIONS
- SIDEWALK
- HEAVY DUTY ASPHALT PAVEMENT
- LIGHT DUTY ASPHALT PAVEMENT
- HEAVY DUTY CONCRETE PAVEMENT
- EDGE MILL
- SHARED USE PATH
- AVERAGE DAILY TRAFFIC

REVISIONS	DATE	BY	DES
1	01/12/2024	TG	SUP 2ND SUB

DATE	PROJECT	DESIGNED	DRAWN	CHECKED
09/07/2023	21352-00	TIMMONS	TIMMONS	PVN

RRMM®
ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

PROJECT
TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186

IFR: TBD
VIRGINIA DEPARTMENT OF EDUCATION: 030-47-00-101

DRAWING
SPECIAL USE PERMIT PLAN

SHEET
C3.01

BOUNDARY BETWEEN TOWN OF WARRENTON AND FAUQUIER COUNTY

PIN: 6983-48-7006-000
N/F
VABFT LLC
D.B. 1513, PG. 1796
4.31 AC
ZONE: C, COMMERCIAL DISTRICT

SEE SHEETC3.02A FOR FUTURE ALWINGTON BLVD ROAD PLANS PART OF ARRINGTON PLAN, REZN-22-017978 (IMPROVEMENTS NOT PART OF THIS APPLICATION, FOR REFERENCE ONLY)

ALWINGTON BLVD

SCHOOL STAFF TO CLOSE ACCESS ROAD WITH GATE DURING SCHOOL HOURS AND WILL BE OPEN FOR PICK UP AND DROP OFF ONLY

24'

PIN: 6983-48-7973-000
N/F
SCHOOL BOARD OF FAUQUIER COUNTY
D.B. 813, PG. 1000
0.81 AC
ZONE: C, COMMERCIAL DISTRICT

MATCHLINE - SEE SHEET C3.01

SWM QUALITY STRUCTURE

SWM UNDERGROUND FACILLITY

24'

PIN: 6983-49-6156-000
N/F
TOWN OF WARRENTON
D.B. 214, PG. 210
0.08 AC
ZONE: PSP, PUBLIC-SEMI-PUBLIC INSTITUTIONAL DISTRICT
USE: PUBLIC/SEMI-PUBLIC NON-INTENSIVE

DELIVERY TRUCK EGRESS ROUTE

CONNECT TO EX GAS

±64,800 SF BASEBALL/SOFTBALL FIELD

LEGEND

- PROPERTY BOUNDARY
- SITE LIGHTING
- BUILDING LIGHTING
- SCREEN FENCE
- REVERSE CURB
- TRANSITION CURB
- W — WATERLINE
- FIRE HYDRANT
- SAN — SANITARY SEWER
- SANITARY SEWER MANHOLE
- UGP — UNDERGROUND POWER
- G — GAS LINE
- UGT / UFO / UCATV — UNDERGROUND TELECOMMUNICATIONS
- SIDEWALK
- HEAVY DUTY ASPHALT PAVEMENT
- LIGHT DUTY ASPHALT PAVEMENT
- HEAVY DUTY CONCRETE PAVEMENT
- EDGE MILL
- SHARED USE PATH
- 850 AVERAGE DAILY TRAFFIC

SCALE 1"=40'
0 40' 80'

MARK	DATE	REVISIONS
1	01/12/2024	SUP 2ND SUB
TG		BY
		DES

DATE	09/07/2023
PROJECT	21352-00
DESIGNED	TIMMONS
DRAWN	TIMMONS
CHECKED	PVN

RRMM® ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

PROJECT
TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186

VIRGINIA DEPARTMENT OF EDUCATION: 030-67-00-101
IFB: TBD

DRAWING
SPECIAL USE PERMIT PLAN

SHEET
C3.02

FUTURE ALWINGTON BLVD ROAD PLANS
PART OF ARRINGTON PLAN, REZN-22-017978
(TOWN PROVIDED INFORMATION,
IMPROVEMENTS NOT PART OF THIS
APPLICATION, FOR REFERENCE ONLY)

PIN: 6983-44-5827-000
N/F
ALWINGTON FARM LLC
D.B. 1328, PG. 1
431.32 AC
ZONE: AGRICULTURE DISTRICT

FAUQUIER COUNTY
TOWN OF WARRENTON

BOUNDARY BETWEEN TOWN OF
WARRENTON AND FAUQUIER COUNTY

PIN: 6983-48-7006-000
N/F
VABFT LLC
D.B. 1513, PG. 1796
4.31 AC
ZONE: C, COMMERCIAL DISTRICT

ALWINGTON BLVD

SCHOOL STAFF TO CLOSE
ACCESS ROAD WITH GATE
DURING SCHOOL HOURS
AND WILL BE OPEN FOR PICK
UP AND DROP OFF ONLY

24'

24'

SWM QUALITY
STRUCTURE

SWM UNDERGROUND FACILLITY

LEGEND

- PROPERTY BOUNDARY
- SITE LIGHTING
- BUILDING LIGHTING
- SCREEN FENCE
- REVERSE CURB
- TRANSITION CURB
- W — WATERLINE
- FIRE HYDRANT
- SAN — SANITARY SEWER
- SANITARY SEWER MANHOLE
- UGP — UNDERGROUND POWER
- G — GAS LINE
- UGT / UFO / UCATV — UNDERGROUND TELECOMMUNICATIONS
- SIDEWALK
- HEAVY DUTY ASPHALT PAVEMENT
- LIGHT DUTY ASPHALT PAVEMENT
- HEAVY DUTY CONCRETE PAVEMENT
- EDGE MILL
- SHARED USE PATH
- 850 AVERAGE DAILY TRAFFIC

SCALE 1"=40'
0 40' 80'

MARK	DATE	REVISIONS	BY	DES
1	01/12/2024	SUP 2ND SUB	TG	

DATE	PROJECT	DESIGNED	DRAWN	CHECKED
09/07/2023	21352-00	TIMMONS	TIMMONS	PVN

RRMM®
ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

PROJECT
TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186
VIRGINIA DEPARTMENT OF EDUCATION 030-87-00-101
IFB: TBD

DRAWING
SPECIAL USE PERMIT PLAN - FUTURE ARRINGTON PLANS

SHEET
C3.02A

SCALE 1"=40'
0 40' 80'

LEGEND
PROPERTY BOUNDARY

PIN: 6983-49-6156-000
N/F
TOWN OF WARRENTON
D.B. 214, PG. 210
0.08 AC.
ZONE: PSP, PUBLIC-SEMI-PUBLIC INSTITUTIONAL DISTRICT
USE: PUBLIC/SEMI-PUBLIC NON-INTENSIVE

PIN: 6983-48-7973-500
COUNTY SCHOOL BOARD OF FAUQUIER COUNTY
D.B. 162, PG. 184
D.B. 813, PG. 1000
35.84459 AC.
ZONE: PSP, PUBLIC-SEMI-PUBLIC INSTITUTIONAL DISTRICT
350 E. SHIRLEY AVE.

PIN: 6983-58-5700-000
N/F
BOARD OF SUPERVISORS OF FAUQUIER COUNTY
D.B. 911, PG. 1680
5.76 AC.
ZONE: PSP PUBLIC/ SEMI-PUBLIC INSTITUTIONAL DISTRICT
USE: PUBLIC/SEMI-PUBLIC NON-INTENSIVE

PIN: 6983-58-5613-000
N/F
COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION
D.B. 1730, PG. 486
0.62 AC.
ZONE - PSP PUBLIC/SEMI-PUBLIC INSTITUTIONAL DISTRICT
USE: PUBLIC/SEMI-PUBLIC INTENSIVE

EXISTING 2-STORY BRICK
WILLIAM C. TAYLOR MIDDLE SCHOOL
53,925 SF

FF ELEV.= 548.61'
FF ELEV.= 550.50'
FF ELEV.= 547.82'
FF ELEV.= 550.60'
FF ELEV.= 563.38'
FF ELEV.= 559.89'
FF ELEV.= 550.47'
PIPE W/GAS METER
GAS REGULATOR

OLINGER
D.B. 887, PG. 1072
0.57 AC
ZONE: R10-RESIDENTIAL
USE: LOW DENSITY RESIDENTIAL

PIN: 6983-49-5896-000
N/F
CHERYL & ROBERT J.J. HAWKINS, JR
D.B. 1254, PG. 1913
0.57 AC
ZONE: R10-RESIDENTIAL
USE: LOW DENSITY RESIDENTIAL

PIN: 6983-49-6963-000
N/F
JODY SEITMAN
D.B. 1529, PG. 1776
0.59 AC
ZONE: R10-RESIDENTIAL
USE: LOW DENSITY RESIDENTIAL

PIN: 6984-40-8014-000
N/F
CLNB LLC
D.B. 1588, PG. 2321
0.19 AC
ZONE: R10-RESIDENTIAL
USE: LOW DENSITY RESIDENTIAL

PIN: 6983-59-7096-000
N/F
DEBORAH PHILIPS & DANE RECTOR & MARY RECTOR & RONALD RECTOR & WAYNE RECTOR
D.B. 177, PG. 1297
D.B. 232, PG. 442
0.50 AC
ZONE: R10-RESIDENTIAL
USE: MEDIUM DENSITY RESIDENTIAL

PIN: 6983-59-6245-000
N/F
ANITA RECTOR & DANE RECTOR
D.B. 1652, PG. 1561
0.39 AC
ZONE: R-10, RESIDENTIAL DISTRICT
USE: MEDIUM DENSITY RESIDENTIAL

PIN: 6983-59-5376-000
N/F
ALMA RECTOR & RONALD RECTOR
D.B. 431, PG. 558
0.23 AC
ZONE: R-10, RESIDENTIAL DISTRICT
USE: MEDIUM DENSITY RESIDENTIAL

WARRENTON BRANCH GREENWAY

PIN: 6983-59-5252-000
N/F
TOWN OF WARRENTON
D.B. 778, PG. 184
4.60 AC
ZONE: PSP,PUBLIC/SEMI-PUBLIC INSTITUTIONAL DISTRICT
USE: PUBLIC/SEMI-PUBLIC INTENSIVE

PIN: 6983-59-5418-000
N/F
ANTJWAN BLAND & SHERELLE SMITH
D.B. 278, PG. 2311
0.38 AC
ZONE: R-10, RESIDENTIAL DISTRICT
USE: MEDIUM DENSITY RESIDENTIAL

PIN: 6983-59-4578-000
N/F
JOHN CROCKER & MELISSA CROCKER
D.B. 1730, PG. 862
0.25 AC
ZONE: R-10, RESIDENTIAL DISTRICT
USE: MEDIUM DENSITY RESIDENTIAL

PIN: 6983-59-2711-000
N/F
DANIEL LOWERY & LINDA LOWERY
D.B. 494, PG. 748
0.73 AC
ZONE: C, COMMERCIAL DISTRICT
USE: GREENWAY AND WELLNESS MIXED USE

PIN: 6983-59-0992-000
N/F
DANIEL LOWERY & LINDA LOWERY
D.B. 494, PG. 748
1.01 AC
ZONE: C, COMMERCIAL DISTRICT
USE: GREENWAY AND WELLNESS MIXED USE

PIN: 6983-40-9127-00
N/F
BOWER FAMILY HOLDINGS LLC
D.B. 1522, PG. 803
1.92 AC
ZONE: C, COMMERCI DISTRICT
USE: COMMERCIAL U

EAST SHIRLEY AVE
VARIABLE WIDTH

F.O. LINE
MARKED BY OTHERS

NYS ⌀8

MARK	DATE	REVISIONS
1	01/12/2024	SUP 2ND SUB
TG		BY
		DES

DATE	09/07/2023
PROJECT	21352-00
DESIGNED	TIMMONS
DRAWN	TIMMONS
CHECKED	PVN

RRMM®
ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

PROJECT
TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186
VIRGINIA DEPARTMENT OF EDUCATION: 030-87-00-101

DRAWING
SPECIAL USE PERMIT PLAN - AUTO-TURN

IFB: TBD

SHEET
C3.03

MATCHLINE - SEE THIS SHEET FOR INSET

MATCHLINE - SEE THIS SHEET

SCALE 1"=40'
0 40' 80'

LEGEND

PROPERTY BOUNDARY

PARENT DROP OFF STACKING - 81 CARS

DROP OFF/PICKUP ZONE

SCHOOL STAFF TO BLOCK ACCESS TO THE PARENT DROP OFF/PICK UP LANE DURING THE HOURS OF DROP OFF AND PICK UP

PIN: 6983-48-7973-500
COUNTY SCHOOL BOARD OF FAUQUIER COUNTY
D.B. 162, PG. 184
D.B. 813, PG. 1000
35.84459 AC.
ZONE: PSP, PUBLIC-SEMI-PUBLIC INSTITUTIONAL DISTRICT
350 E. SHIRLEY AVE.

PIN: 6983-49-6156-000
N/F
TOWN OF WARRENTON
D.B. 214, PG. 210
0.08 AC
ZONE: PSP, PUBLIC-SEMI-PUBLIC INSTITUTIONAL DISTRICT
USE: PUBLIC/SEMI-PUBLIC NON-INTENSIVE

PIN: 6983-58-5700-000
N/F
BOARD OF SUPERVISORS OF FAUQUIER COUNTY
D.B. 911, PG. 1600
5.16 AC
ZONE: PSP PUBLIC SEMI-PUBLIC INSTITUTIONAL DISTRICT
USE: PUBLIC/SEMI-PUBLIC NON-INTENSIVE

PIN: 6983-58-5813-000
N/F
COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION
D.B. 1280, PG. 486
0.62 AC
ZONE: PSP PUBLIC/SEMI-PUBLIC INSTITUTIONAL DISTRICT
USE: PUBLIC/SEMI-PUBLIC INTENSIVE

EXISTING 2-STORY BRICK
WILLIAM C. TAYLOR MIDDLE SCHOOL
53,925 SF

FF ELEV.= 563.38'
FF ELEV.= 559.89'
FF ELEV.= 550.47'
FF ELEV.= 547.82'
FF ELEV.= 550.50'
FF ELEV.= 548.61'
FF ELEV.= 550.60'

PIPE WIGAS METER
GAS REGULATOR

PIN: 6984-40-7752-000
N/F
CHRISTOPHER & THERESA SCHREHER
D.B. 812, PG. 658
0.56 AC
ZONE: R10-RESIDENTIAL
USE: LOW DENSITY RESIDENTIAL

3747
538.06
CPP NAIL

PIN: 6983-49-5728-000
N/F
CARRELL OLINGER
D.B. 887, PG. 1072
0.57 AC
ZONE: R10-RESIDENTIAL
USE: LOW DENSITY RESIDENTIAL

PIN: 6983-49-5896-000
N/F
CHERYL & ROBERT HAWKINS, JR
D.B. 1254, PG. 1913
0.57 AC
ZONE: R10-RESIDENTIAL
USE: LOW DENSITY RESIDENTIAL

PIN: 6984-40-8014-000
N/F
CLNB LLC
D.B. 1555, PG. 2321
0.19 AC
ZONE: R10-RESIDENTIAL
USE: LOW DENSITY RESIDENTIAL

EAST SHIRLEY AVE
VARIABLE WIDTH

MARK	DATE	REVISIONS
1	01/12/2024	SUP 2ND SUB
	TG	BY DES

DATE	09/07/2023
PROJECT	21352-00
DESIGNED	TIMMONS
DRAWN	TIMMONS
CHECKED	PVN

RRMM®
ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

PROJECT
TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186

IFB: TBD
VIRGINIA DEPARTMENT OF EDUCATION: 030-67-00-101

DRAWING
SPECIAL USE PERMIT PLAN - AUTO-TURN

SHEET
C3.04

MATCHLINE - SEE SHEET L1.04

LEGEND

- PROPERTY BOUNDARY
- PROPOSED CONTOUR
- SILT FENCE
- TP — TREE PROTECTION FENCING
- EXISTING TREELINE
- PROPOSED TREELINE
- ROOT PRUNING
- AREA OF ROOT IMPACT
- *CRITICAL ROOT ZONE (CRZ)*
- *EX. TREE*
- *TREE TO BE REMOVED*

SCALE 1"=40'
0 40' 80'

EXISTING RUNNING TRACK

SOFTBALL FIELD TO BE CONVERTED TO BASEBALL FIELD

BUILDING ADDITION

BUILDING ADDITION

EXISTING SCHOOL BUILDING

EAST SHIRLEY AVE
VARIABLE WIDTH

WARRENTON BRANCH GREENWAY

PIN: 6983-49-6156-000 N/F TOWN OF WARRENTON D.B. 214, PG. 210 0.08 AC. ZONE: PSP, PUBLIC-SEMI-PUBLIC INSTITUTIONAL DISTRICT USE: PUBLIC/SEMI-PUBLIC NON-INTENSIVE

PIN: 6983-48-7973-500 COUNTY SCHOOL BOARD OF FAUQUIER COUNTY D.B. 162, PG. 184 D.B. 813, PG. 1000 35.84459 AC. ZONE: PSP, PUBLIC-SEMI-PUBLIC INSTITUTIONAL DISTRICT 350 E. SHIRLEY AVE.

PIN: 6983-58-5700-000 N/F BOARD OF SUPERVISORS OF FAUQUIER COUNTY D.B. 911, PG. 1600 5.16 AC. ZONE: PSP PUBLIC SEMI-PUBLIC INSTITUTIONAL DISTRICT USE: PUBLIC/SEMI-PUBLIC NON-INTENSIVE

PIN: 6983-58-5813-000 N/F COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION D.B. 1380, PG. 486 0.62 AC. ZONE: PSP PUBLIC/SEMI-PUBLIC INSTITUTIONAL DISTRICT USE: PUBLIC/SEMI-PUBLIC INTENSIVE

PIN: 6983-59-7096-000 N/F DEBORAH PHILIPS & DANE RECTOR & MARY RECTOR & RONALD RECTOR & WAYNE RECTOR D.B. 177, PG. 1297 D.B. 232, PG. 442 0.50 AC

PIN: 6983-59-6245-000 N/F ANITA RECTOR & DANE RECTOR D.B. 1652, PG. 1561 0.39 AC. ZONE: R-10, RESIDENTIAL DISTRICT

PIN: 6983-59-5376-000 N/F ALMA RECTOR & RONALD RECTOR D.B. 431, PG. 558 0.23 AC. ZONE: R-10, RESIDENTIAL DISTRICT

PIN: 6983-59-5252-000 N/F TOWN OF WARRENTON D.B. 778, PG. 184 4.60 AC

PIN: 6983-59-5418-000 N/F ANTJWAN BLAND & SHERELLE SMITH D.B. 278, PG. 2311 0.38 AC. ZONE: R-10, RESIDENTIAL

PIN: 6983-59-4578-000 N/F

PIN: 6983-59-2711-000 N/F DANIEL LOWERY & LINDA LOWERY D.B. 494, PG. 748 0.73 AC. ZONE: C, COMMERCIAL DISTRICT USE: GREENWAY AND WELLNESS MIXED USE

PIN: 6983-59-0992-000 N/F DANIEL LOWERY & LINDA LOWERY D.B. 494, PG. 748 1.01 AC. ZONE: C, COMMERCIAL DISTRICT USE: GREENWAY AND WELLNESS MIXED USE

PIN: 6983-40-9127-000 N/F BOWER FAMILY HOLDINGS LLC D.B. 1522, PG. 803 1.92 AC. ZONE: C, COMMERCIAL DISTRICT USE: COMMERCIAL USE

PIN: 6983-49-5728-000 N/F CARRELL OLINGER D.B. 887, PG. 1072 0.57 AC ZONE: R10-RESIDENTIAL USE: LOW DENSITY RESIDENTIAL

PIN: 6983-49-5896-000 N/F CHERYL & ROBERT HAWKINS, JR D.B. 1254, PG. 1913 0.57 AC ZONE: R10-RESIDENTIAL USE: LOW DENSITY RESIDENTIAL

PIN: 6983-49-6982-000 N/F JODY HEITMAN D.B. 1529, PG. 1776 0.58 AC ZONE: R10-RESIDENTIAL USE: LOW DENSITY RESIDENTIAL

PIN: 6984-40-7006-000 N/F CLNB LLC D.B. 1552, PG. 23 0.82 AC ZONE: R10-RESIDENTIAL USE: LOW DENSITY RESIDENTIAL

PIN: 6984-40-8014-000 N/F CLNB LLC D.B. 1558, PG. 2321 0.19 AC ZONE: R10-RESIDENTIAL USE: LOW DENSITY RESIDENTIAL

3747
538.06
CPP NAIL

DATE	09/07/2023
PROJECT	21352-00
DESIGNED	TIMMONS
DRAWN	TIMMONS
CHECKED	PVN

MARK	DATE	REVISIONS
1	01/12/2024	SUP 2ND SUB
	TG	BY
		DES

RRMM® ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

PROJECT
TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186

IFB: TBD
VIRGINIA DEPARTMENT OF EDUCATION - 030-47-00-101

DRAWING
SPECIAL USE PERMIT - TREE PRESERVATION

SHEET
L1.03

BOUNDARY BETWEEN TOWN OF WARRENTON AND FAUQUIER COUNTY

PIN: 6983-48-7006-000
N/F
VABFT LLC
D.B. 1513, PG. 1796
4.31 AC
ZONE: C, COMMERCIAL DISTRICT

ALWINGTON BLVD

83-48-7973-000
N/F
OL BOARD OF
IER COUNTY
13, PG. 1000
0.81 AC
COMMERCIAL
STRICT

POTENTIAL SWM AREA

MATCHLINE - SEE SHEET L1.03

LEGEND

- PROPERTY BOUNDARY
- PROPOSED CONTOUR
- SILT FENCE
- TREE PROTECTION FENCING (TP)
- EXISTING TREELINE
- PROPOSED TREELINE
- ROOT PRUNING
- AREA OF ROOT IMPACT
- CRITICAL ROOT ZONE (CRZ)
- EX. TREE
- TREE TO BE REMOVED

SCALE 1"=40'
0 40' 80'

MARK	DATE	REVISIONS	BY	DES
1	01/12/2024	SUP 2ND SUB	TG	

DATE	09/07/2023
PROJECT	21352-00
DESIGNED	TIMMONS
DRAWN	TIMMONS
CHECKED	PVN

RRMM®
ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

PROJECT
TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186
VIRGINIA DEPARTMENT OF EDUCATION: 030-87-00-101
IFB: TBD

DRAWING
SPECIAL USE PERMIT - TREE PRESERVATION

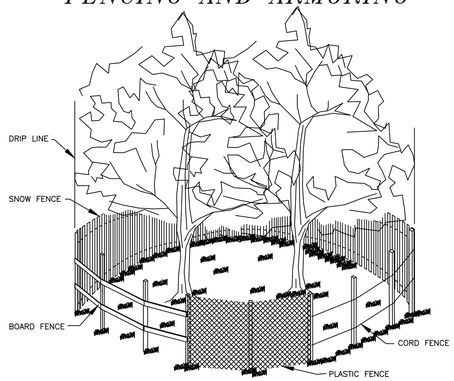
SHEET
L1.04

TREE INVENTORY AND CONDITION ANALYSIS

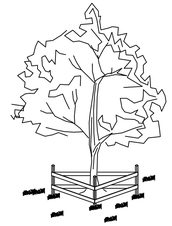
TREE NO.	BOTANICAL NAME	COMMON NAME	D.B.H. (in.)*	CONDITION	CRZ (SF)	CRZ IMPACT (SF)	CRZ IMPACT %	DISPOSITION	STATUS CHECK
1	Quercus alba	White oak	17	70	2,043	358	17.52	SAVE	
2	Quercus alba	White oak	23	100	3,739	1,075	28.75	SAVE	
3	Cornus florida	Flowering dogwood	6	70	254	254	99.82	REMOVE	
4	Quercus alba	White oak	23	70	3,739	3,739	99.99	REMOVE	
5	Quercus alba	White oak	18	70	2,290	2,290	99.99	REMOVE	
6	Prunus spp.	Ornamental Cherry	7.8421936	70	435	435	100.06	REMOVE	
7	Prunus spp.	Ornamental Cherry	10.511898	70	781	781	99.99	REMOVE	
8	Prunus spp.	Ornamental Cherry	11.224972	70	891	891	100.04	REMOVE	
9	Quercus alba	White oak	37	100	9,677	9,677	100.00	REMOVE	
10	Quercus alba	White oak	22	70	3,421	3,132	91.55	REMOVE	
11	Quercus alba	White oak	34	40	8,171	7,549	92.38	REMOVE	
12	Quercus alba	White oak	25	100	4,418	4,418	100.00	REMOVE	
13	Juglans nigra	Black walnut	14	100	1,385	1,385	99.97	REMOVE	
14	Quercus alba	White oak	36	70	9,161	9,161	100.00	REMOVE	
15	Quercus alba	White oak	27	70	5,153	5,153	100.00	REMOVE	
16	Quercus alba	White oak	32	70	7,238	7,238	100.00	REMOVE	
17	Prunus spp.	Ornamental Cherry	20	100	2,827	2,827	99.98	REMOVE	
18	Pinus strobus	Eastern white pine	24	100	4,072	4,072	100.01	REMOVE	
19	Pinus strobus	Eastern white pine	19.026298	100	2,559	2,559	100.01	REMOVE	
20	Pinus strobus	Eastern white pine	23	100	3,739	3,739	99.99	REMOVE	
21	Pinus strobus	Eastern white pine	35	100	8,659	8,659	100.00	REMOVE	
22	Pinus strobus	Eastern white pine	33	100	7,698	7,698	100.00	REMOVE	
23	Lagerstroemia indica	Crape Myrtle	20	100	2,827	624	22.07	SAVE	
24	Pyrus calleryana	Callery pear	20	70	2,827	2,827	99.98	REMOVE	
25	Quercus alba	White oak	31	100	6,793	1,375	20.24	SAVE	
26	Prunus spp.	Ornamental Cherry	8	70	452	452	99.91	REMOVE	
27	Quercus alba	White oak	25.019992	70	4,425	820	18.53	SAVE	
28	Prunus spp.	Ornamental Cherry	12	70	1,018	356	34.97	REMOVE	
29	Cornus florida	Flowering dogwood	6	70	254	43	16.90	SAVE	
30	Ilex opaca	American holly	18	70	2,290	678	29.60	SAVE	

ROOT PRUNING	CROWN REDUCTION	WATERING	FERTILIZING	MULCHING	OTHER
✓		✓	✓	✓	
✓		✓	✓	✓	
✓		✓	✓	✓	

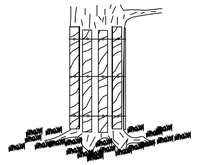
FENCING AND ARMORING



CORRECT METHODS OF TREE FENCING



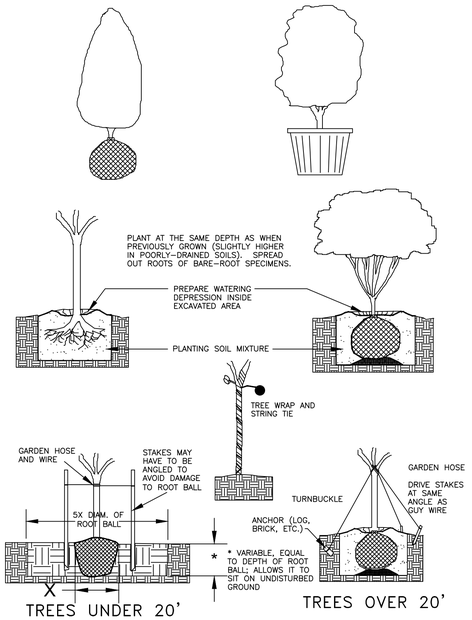
TRIANGULAR BOARD FENCE



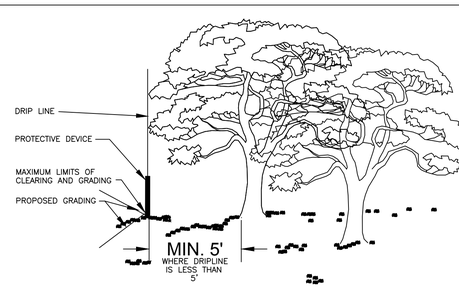
CORRECT TRUNK ARMORING

Source: Va. DSCW — Plate 3.38-2

PLANTING BALLED-&-BURLAPPED & CONTAINER-GROWN TREES

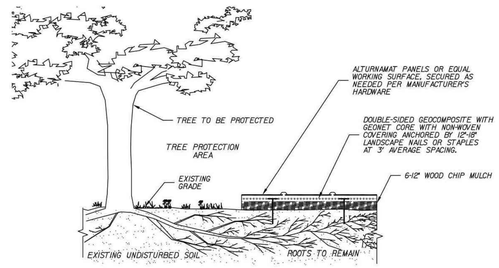


SOURCE: VA. DEPTARTMENT OF FORESTRY — PLATE 3.37-5



CONSTRUCTION OPERATIONS RELATIVE TO THE LOCATION OF PROTECTED TREES

Source: Public Facilities Manual, Vol. III, Fairfax Co., Va., 1976 — Plate 3.38-1



NOTES:
1. MATTING MATERIAL SHALL BE DOUBLE SIDED GEOCOMPOSITE WITH GEONET CORE WITH NON-WOVEN COVERING OR APPROVED EQUIVALENT.
2. RPM SHALL BE INSTALLED BY A CERTIFIED ARBORIST.
3. REQUIRED MULCH DEPTH TO BE DETERMINED BY CERTIFIED ARBORIST.
4. TO BE USED FOR TEMPORARY AND SHORT-TERM CONSTRUCTION ACCESS AND STOCKPILE AREAS.
5. FOR HEAVY TRAFFIC AREAS, REFER TO HEAVY DUTY ROOT PROTECTION MATTING DETAIL.
6. ADDITIONAL LAYERS OF GEOTEXTILE MAY BE NEEDED DEPENDING ON LOADING AND SITE SOIL CHARACTERISTICS.

TEMP. LIGHT-DUTY ROOT PROTECTION MATTING w/ WOOD CHIPS (TYP)
SCALE:NTS

TEMPORARY ROOT PROTECTION MATTING DETAIL (LIGHT DUTY)

** REFER TO PROJECT SPECIFICATIONS FOR TREE PROTECTION MATERIALS **

Sheet #:	
Scale: NTS	
Date:	

Wetland Studies and Solutions, Inc. — a GAI company
1131 Benfield Boulevard, Suite L
Millersville, MD 21108
Phone: 410-672-5990 • Fax: 410-672-5993
www.wetlands.com

	MARK	DATE	REVISIONS
1	TG	01/12/2024	SUP 2ND SUB
	BY		DES

DATE	09/07/2023
PROJECT	21352-00
DESIGNED	TIMMONS
DRAWN	TIMMONS
CHECKED	PVN

RRMM® ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

PROJECT
TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186
VIRGINIA DEPARTMENT OF EDUCATION: 033-67-00-101
IFB: TBD

DRAWING
SPECIAL USE PERMIT - TREE PRES NOTES AND DETAILS

SHEET
L1.05
L1.05

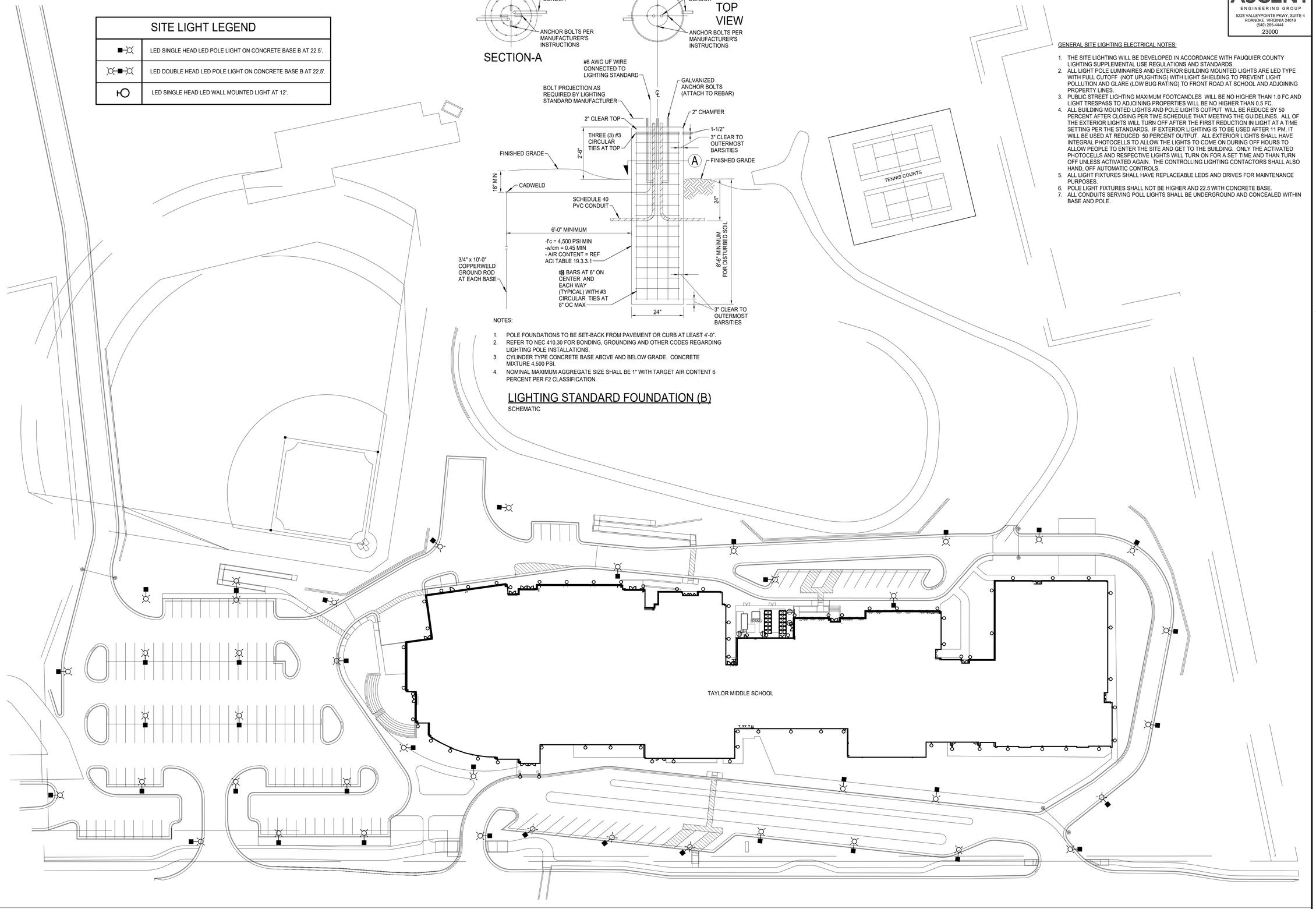
SITE LIGHT LEGEND	
■-☼	LED SINGLE HEAD LED POLE LIGHT ON CONCRETE BASE B AT 22.5'.
☼-■-☼	LED DOUBLE HEAD LED POLE LIGHT ON CONCRETE BASE B AT 22.5'.
⊢○	LED SINGLE HEAD LED WALL MOUNTED LIGHT AT 12'.

NOTES:

1. POLE FOUNDATIONS TO BE SET-BACK FROM PAVEMENT OR CURB AT LEAST 4'-0".
2. REFER TO NEC 410.30 FOR BONDING, GROUNDING AND OTHER CODES REGARDING LIGHTING POLE INSTALLATIONS.
3. CYLINDER TYPE CONCRETE BASE ABOVE AND BELOW GRADE. CONCRETE MIXTURE 4,500 PSI.
4. NOMINAL MAXIMUM AGGREGATE SIZE SHALL BE 1" WITH TARGET AIR CONTENT 6 PERCENT PER F2 CLASSIFICATION.

LIGHTING STANDARD FOUNDATION (B)

SCHEMATIC



GENERAL SITE LIGHTING ELECTRICAL NOTES:

1. THE SITE LIGHTING WILL BE DEVELOPED IN ACCORDANCE WITH FAUQUIER COUNTY LIGHTING SUPPLEMENTAL USE REGULATIONS AND STANDARDS.
2. ALL LIGHT POLE LUMINAIRES AND EXTERIOR BUILDING MOUNTED LIGHTS ARE LED TYPE WITH FULL CUTOFF (NOT UPLIGHTING) WITH LIGHT SHIELDING TO PREVENT LIGHT POLLUTION AND GLARE (LOW BUG RATING) TO FRONT ROAD AT SCHOOL AND ADJOINING PROPERTY LINES.
3. PUBLIC STREET LIGHTING MAXIMUM FOOTCANDLES WILL BE NO HIGHER THAN 1.0 FC AND LIGHT TRESPASS TO ADJOINING PROPERTIES WILL BE NO HIGHER THAN 0.5 FC.
4. ALL BUILDING MOUNTED LIGHTS AND POLE LIGHTS OUTPUT WILL BE REDUCE BY 50 PERCENT AFTER CLOSING PER TIME SCHEDULE THAT MEETING THE GUIDELINES. ALL OF THE EXTERIOR LIGHTS WILL TURN OFF AFTER THE FIRST REDUCTION IN LIGHT AT A TIME SETTING PER THE STANDARDS. IF EXTERIOR LIGHTING IS TO BE USED AFTER 11 PM, IT WILL BE USED AT REDUCED 50 PERCENT OUTPUT. ALL EXTERIOR LIGHTS SHALL HAVE INTEGRAL PHOTOCELLS TO ALLOW THE LIGHTS TO COME ON DURING OFF HOURS TO ALLOW PEOPLE TO ENTER THE SITE AND GET TO THE BUILDING. ONLY THE ACTIVATED PHOTOCELLS AND RESPECTIVE LIGHTS WILL TURN ON FOR A SET TIME AND THAN TURN OFF UNLESS ACTIVATED AGAIN. THE CONTROLLING LIGHTING CONTACTORS SHALL ALSO HAND, OFF AUTOMATIC CONTROLS.
5. ALL LIGHT FIXTURES SHALL HAVE REPLACEABLE LEDS AND DRIVES FOR MAINTENANCE PURPOSES.
6. POLE LIGHT FIXTURES SHALL NOT BE HIGHER AND 22.5 WITH CONCRETE BASE.
7. ALL CONDUITS SERVING POLL LIGHTS SHALL BE UNDERGROUND AND CONCEALED WITHIN BASE AND POLE.

ASCENT
ENGINEERING GROUP
5228 VALLEYPOINTE PKWY, SUITE 4
ROANOKE, VIRGINIA 24019
(540) 265-4444
23000

MARK	DATE	REVISIONS	BY	DES
1	01/12/2024	SUP 2ND SUB		

DATE	09/07/2023
PROJECT	21352-00
DESIGNED	ROS
DRAWN	ROS
CHECKED	ROS

RRMM®
ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

PROJECT
TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186

IFB: TBD
VIRGINIA DEPARTMENT OF EDUCATION: 030-67-00-101

DRAWING
SPECIAL USE PERMIT - ELECTRICAL SITE PLAN

SHEET
E-401B

1/32" = 1'-0" | 1/16" = 1'-0" | 3/32" = 1'-0" | 1/8" = 1'-0" | 1/4" = 1'-0" | 3/8" = 1'-0" | 1/2" = 1'-0" | 3/4" = 1'-0" | 1" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0" | 6" = 1'-0"

PHOTOMETRICS

LOCATION	AVERAGE	MAXIMUM	MINIMUM	MAX/MIN RATIO	AVERAGE/MIN RATIO
BACK LOT	1.2 FC	2.4 FC	0.4 FC	6.0 : 1	3.0 : 1
EAST DRIVE	1.6 FC	3.5 FC	1.0 FC	3.5 : 1	1.6 : 1
FRONT LOT	1.8 FC	5.1 FC	0.4 FC	12.8 : 1	4.5 : 1
FRONT ROADWAY LINE	0.1 FC	0.8 FC	0.0 FC	N/A	N/A
FRONT SIDE WALK	1.0 FC	1.7 FC	0.2 FC	8.5 : 1	5.0 : 1
LARGE WEST LOT	1.4 FC	3.6 FC	0.1 FC	36.0 : 1	14.0 : 1
NORTH WEST DRIVE	1.0 FC	3.2 FC	0.2 FC	16.0 : 1	5.0 : 1
RESIDENTIAL LINE	0.0 FC	0.1 FC	0.0 FC	N/A	N/A
BACK SIDE ZERO LT LEVELS	0.0 FC	0.9 FC	0.0 FC	N/A	N/A
FRONT SIDE ZERO LT LEVELS	0.0 FC	0.1 FC	0.0 FC	N/A	N/A
LEFT SIDE ZERO LT LEVELS	0.0 FC	0.3 FC	0.0 FC	N/A	N/A
RIGHT SIDE ZERO LT LEVELS	0.0 FC	0.0 FC	0.0 FC	N/A	N/A

GENERAL NOTE THIS SHEET:

1. SEE SHEET E401B FOR POLE LIGHT AND BUILDING MOUNTED LIGHT LOCATIONS.

1/32" = 1'-0" | 1/16" = 1'-0" | 3/32" = 1'-0" | 1/8" = 1'-0" | 1/4" = 1'-0" | 3/8" = 1'-0" | 1/2" = 1'-0" | 3/4" = 1'-0" | 1" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0" | 6" = 1'-0"

ASCENT
ENGINEERING GROUP
5228 VALLEYPOINTE PKWY, SUITE 4
ROANOKE, VIRGINIA 24019
(540) 265-4444
23000

MARK	DATE	REVISIONS	BY	DES
1	01/12/2024	SUP 2ND SUB		

DATE 09/07/2023
PROJECT 21352-00
DESIGNED
DRAWN
CHECKED

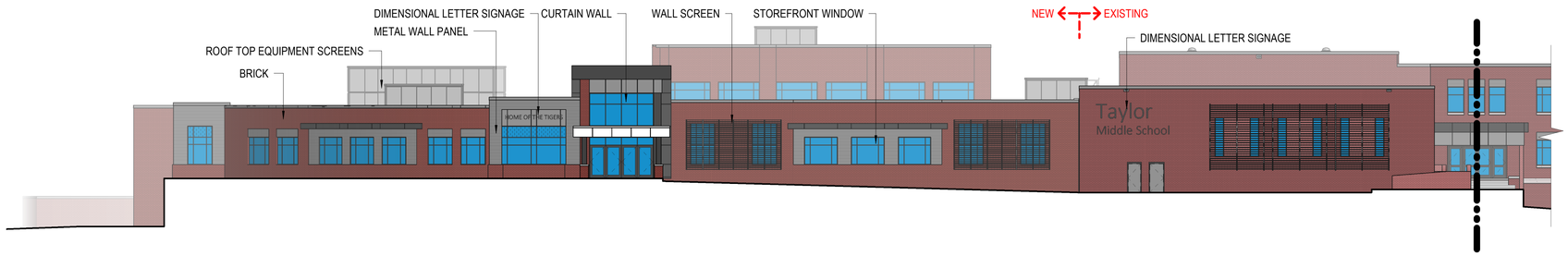
RRMM®
ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

PROJECT TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186
VIRGINIA DEPARTMENT OF EDUCATION: 030-67-00-101
IFB: TBD

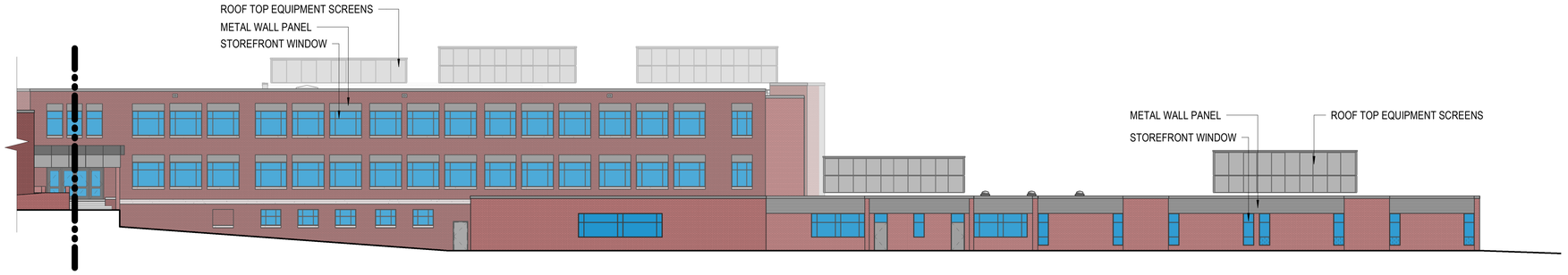
DRAWING SPECIAL USE PREMIT - ELECTRICAL SITE PLAN
PHOTOMETRICS

SHEET
E-402B



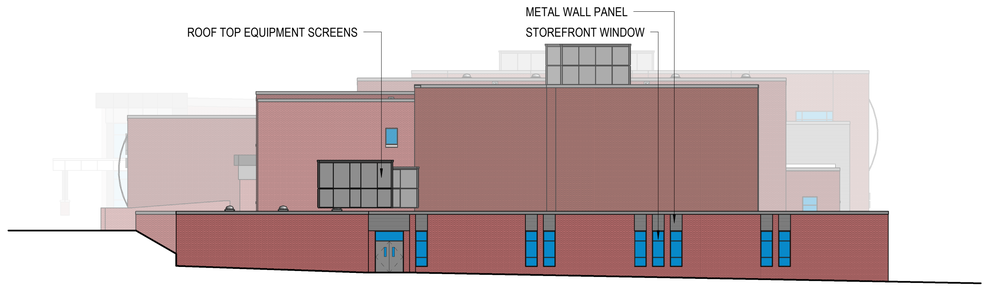
D1 SU-201 PLAN SOUTH ELEVATION (TRUE NORTH-EAST)

SCALE: 1/16" = 1'-0"



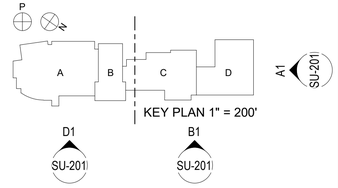
B1 SU-201 PLAN SOUTH ELEVATION (TRUE NORTH-EAST)

SCALE: 1/16" = 1'-0"



A1 SU-201 PLAN EAST ELEVATION (TRUE NORTH-WEST)

SCALE: 1/16" = 1'-0"



1/32" = 1'-0" | 1/16" = 1'-0" | 3/32" = 1'-0" | 1/8" = 1'-0" | 1/4" = 1'-0" | 3/8" = 1'-0" | 1/2" = 1'-0" | 3/4" = 1'-0" | 1" = 1'-0" | 1 1/2" = 1'-0" | 3" = 1'-0" | 6" = 1'-0"

Autodesk Docs://21352-00 FCPS Taylor Middle School/21352-00 v23 FCPS Taylor MS - ARCH.rvt

1/11/2024 8:26:27 PM

Item 4.

MARK	DATE	REVISIONS
1	01/12/2024	RRMM SUP 2ND SUB

BY	DES

DATE	09/07/2023
PROJECT	21352-00
DESIGNED	RRMM
DRAWN	RRMM
CHECKED	JAH

RRMM®
ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

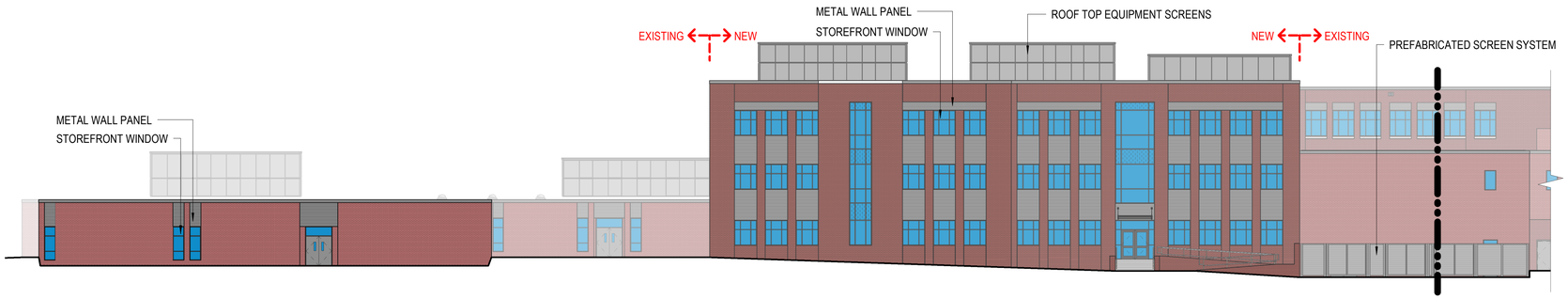
NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

PROJECT TAUGHER MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186

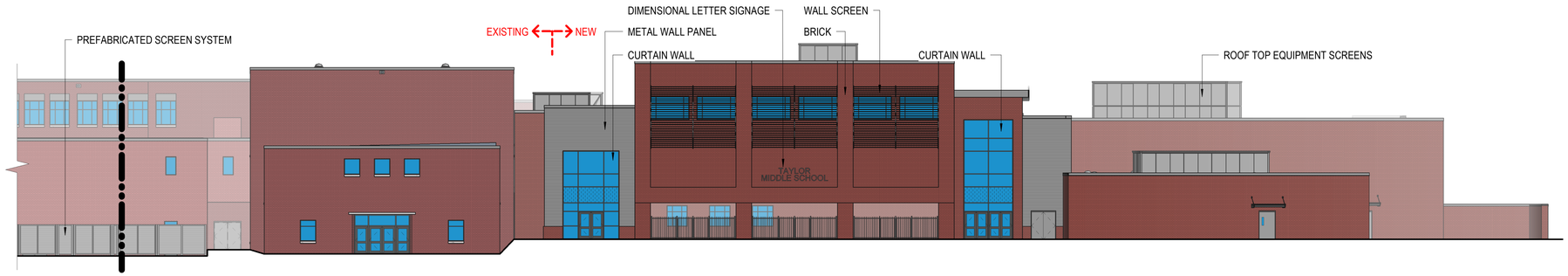
IFB: TBD
VIRGINIA DEPARTMENT OF EDUCATION: 030-67-00-101

DRAWING SPECIAL USE PERMIT - OVERALL EXTERIOR ELEVATIONS

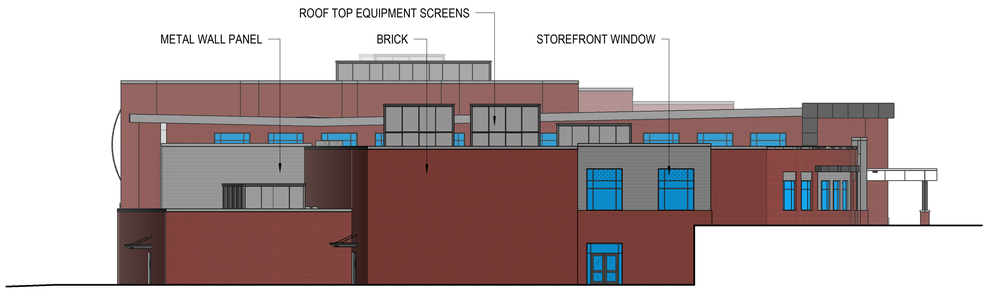
SHEET
SU-201



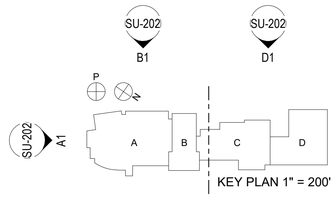
D1 SU-202 **PLAN NORTH ELEVATION (TRUE SOUTH-WEST)**
SCALE: 1/16" = 1'-0"



B1 SU-202 **PLAN NORTH ELEVATION (TRUE SOUTH-WEST)**
SCALE: 1/16" = 1'-0"



A1 SU-202 **PLAN WEST ELEVATION (TRUE SOUTH-EAST)**
SCALE: 1/16" = 1'-0"



MARK	DATE	REVISIONS
1	01/12/2024	SUP 2ND SUB
	RRMM	BY
		DES

DATE	09/07/2023		
PROJECT	21352-00		
DESIGNED	RRMM		
DRAWN	RRMM		
CHECKED	JAH		

RRMM®
ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8987

NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION

PROJECT TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186
IFB: TBD
VIRGINIA DEPARTMENT OF EDUCATION: 030-67-00-101

DRAWING SPECIAL USE PERMIT - OVERALL EXTERIOR ELEVATIONS

SHEET
SU-202

TIMMONS GROUP

Taylor Middle School Addition

Traffic Impact Analysis

September 8, 2023

Revised January 12, 2024

Submitted to:
Town of Warrenton, Virginia

Steve Schmidt, PE, PTOE
Project Manager

804-200-6502
Steve.Schmidt@Timmons.com

1001 Boulders Parkway, Suite 300
Richmond, VA 23225

Taylor Middle School – Addition
Traffic Impact Analysis

350 E Shirley Avenue, Warrenton, VA 20186

Prepared By:

Timmons Group
1001 Boulders Parkway, Suite 300
Richmond, VA 23225

Project Manager – Steve Schmidt, PE, PTOE
Analyst – Julie Strunk

September 2023
Revised January 2024

TABLE OF CONTENTS

APPENDICIES

LIST OF TABLES

LIST OF FIGURES

1 EXECUTIVE SUMMARY

This report presents the findings of the revised traffic impact analysis (TIA) prepared for the proposed expansion of Taylor Middle School in the Town of Warrenton, Virginia. The original TIA was submitted in September 2023 and the Town issued comments in November 2023. This revised TIA has been prepared to address those comments.

1.1 PROJECT OVERVIEW

The site is generally located south of E Shirley Street, north of Alwington Boulevard, and east of Culpeper Street as shown in Figure 1-1 (all figures are located at the end of their respective chapter).

The existing site encompasses Taylor Middle School and James G. Brumfield Elementary School. The middle school currently accommodates 510 students. The proposed expansion of the middle school will accommodate an increase of 340 students for a total of 850 students.

Access will be provided via three existing entrances on E Shirley Avenue and one new entrance via a connecting road to the existing elementary school and out to Alwington Boulevard. A conceptual plan is shown on Figure 1-2.

For the purposes of this analysis, the expansion was assumed to be complete and occupied by 2026.

When complete, the expansion will generate an increase of 145 AM peak hour trips (84 in and 61 out), 101 School PM peak hour trips (40 in and 61 out), 42 PM peak hour trips (30 in ands 12 out) and 714 average daily trips.

Based on the trips generated by the site and the rezoning application, a traffic study is required by the Town of Warrenton, but a VDOT Chapter 527 TIA is not required.

The purpose of this analysis is to determine the impact of the proposed expansion of the middle school on the surrounding roadway network. The scope of this study was developed in conjunction with the Town of Warrenton and the Virginia Department of Transportation (VDOT). 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 seven (7) existing intersections:

1. Shirley Avenue/Culpeper Street (signalized);
2. E Shirley Avenue/Site Entrance #1 (unsignalized);
3. E Shirley Avenue/Site Entrance #2 (signalized);
4. E Shirley Avenue/Site Entrance #3 (unsignalized);
5. E Shirley Avenue/Route 15 (roundabout);
6. E Shirley Avenue/Alwington Boulevard (signalized); and
7. Alwington Boulevard/Elementary School Entrance (unsignalized).

It is noted that the Shirley Avenue/Culpeper Street signal is maintained by the Town while the E Shirley Avenue/Alwington Boulevard signal is maintained by VDOT.

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

1. 2023 Existing Traffic Conditions;
2. 2026 Background Traffic Conditions (without proposed expansion of the site);
3. 2026 Future Traffic Conditions (with proposed expansion of the site);
4. 2032 Background Traffic Conditions (without proposed expansion of the site); and
5. 2032 Future Traffic Conditions (with proposed expansion of the site).

The analysis examines the AM peak hour (when the school peak coincides with the commuter peak), the school PM peak hour, and the commuter PM peak hour. It is noted the commuter PM peak hour is referred to as the "PM peak hour" and the school PM peak hour is referred to as the "School PM peak hour" in this analysis.

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

1. Data Collection – Existing AM (6-9 AM) and PM (2-6 PM) peak hour traffic counts were collected at the existing study intersections on May 16 and May 18, 2023.

2. Traffic Growth – As agreed upon in the scoping document, a 1% annual growth rate was applied to existing traffic volumes to account for development outside the study area.

3. Other Developments – The traffic from the approved Arrington Development was accounted for in the 2032 scenarios only.

4. Trip Generation – Traffic generated by the proposed development was estimated using the existing traffic counts at the school driveways (peak hours) and the 11th edition of the Institute of Transportation Engineers' *Trip Generation Manual* (average daily traffic).

5. 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.

6. Site Traffic Projections – Future traffic volumes were determined by combining the 2026 and 2032 background traffic volumes with proposed new trips generated by the site to create the 2026 and 2032 total traffic volumes used in the analysis.

7. 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 and SIDRA version 9 for the roundabout.

8. Queuing Analysis – The 95th percentile queue lengths (Synchro) and maximum queues (SimTraffic) were reviewed at the intersections listed above.

9. Turn Lane Warrant Analysis – The need for turn lanes at the site entrances on E Shirley Avenue will be analyzed under 2026 and 2032 future traffic conditions.

10. Access Management Review – An evaluation of the access management spacing standards for the site entrances on E Shirley Avenue will be conducted for the reconfigured site entrances.

1.3 PRINCIPAL FINDINGS

Based on the analysis contained herein, the following principal findings are offered:

Under 2023 existing conditions:

1. The East Shirley/Culpeper Street intersection currently operates an overall LOS C in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns.

2. The school entrances along East Shirley Avenue operate at LOS C or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C or better in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

Under 2026 background conditions, all intersections experience similar levels of service, delay, and queueing as under existing conditions. Specifically:

1. The East Shirley/Culpeper Street intersection will operate an overall LOS C in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns.

2. The school entrances along East Shirley Avenue operate at LOS C or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

Under 2026 total future conditions, with buildout of the proposed development, all intersections experience similar levels of service compared to 2026 background conditions. Specifically:

1. The East Shirley/Culpeper Street intersection will operate an overall LOS C in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns.

2. The school entrances along East Shirley Avenue operate at LOS C or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

6. The expansion of the middle school will have minimal impact on the external surrounding roadway network and no improvements are required at the study intersections.
    a. The expansion will provide a link between the elementary school and the middle school during school pick up and drop off times only. During all other times, the connection between the schools will be gated.

Under 2032 background conditions, all intersections experience similar levels of service, delay, and queueing as under 2026 background conditions. Specifically:

1. The East Shirley/Culpeper Street intersection will operate an overall LOS C or D in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns with the exception of the eastbound left approach which will operate at LOS E in both PM peaks.
    a. It is noted that the traffic signal is running under "free" operations and is likely giving more time to the mainline through movements which results in the LOS E. The delays are less than the overall cycle length of the intersection indicating that the average traffic waits at most one cycle length to traverse the intersection.

2. The school entrances along East Shirley Avenue operate at LOS D or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A or B in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

Under 2032 total future conditions, with buildout of the proposed development, all intersections experience similar levels of service compared to 2026 background conditions. Specifically:

1. The East Shirley/Culpeper Street intersection will operate an overall LOS C or D in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns with the exception of the eastbound left approach which will operate at LOS E in both PM peaks.
    a. It is noted that the traffic signal is running under "free" operations and is likely giving more time to the mainline through movements which results in the LOS E. The delays are less than the overall cycle length of the intersection indicating that the average traffic waits at most one cycle length to traverse the intersection.

2. The school entrances along East Shirley Avenue operate at LOS D or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A or B in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

6. The expansion of the middle school will have minimal impact on the external surrounding roadway network and no improvements are required at the study intersections.
    a. The expansion will provide a link between the elementary school and the middle school during school pick up and drop off times only. During all other times, the connection between the schools will be gated.

1.4 RECOMMENDATIONS

The expansion of the middle school will have minimal to no impact on the surrounding roadway network and no improvements are required at the study intersections.

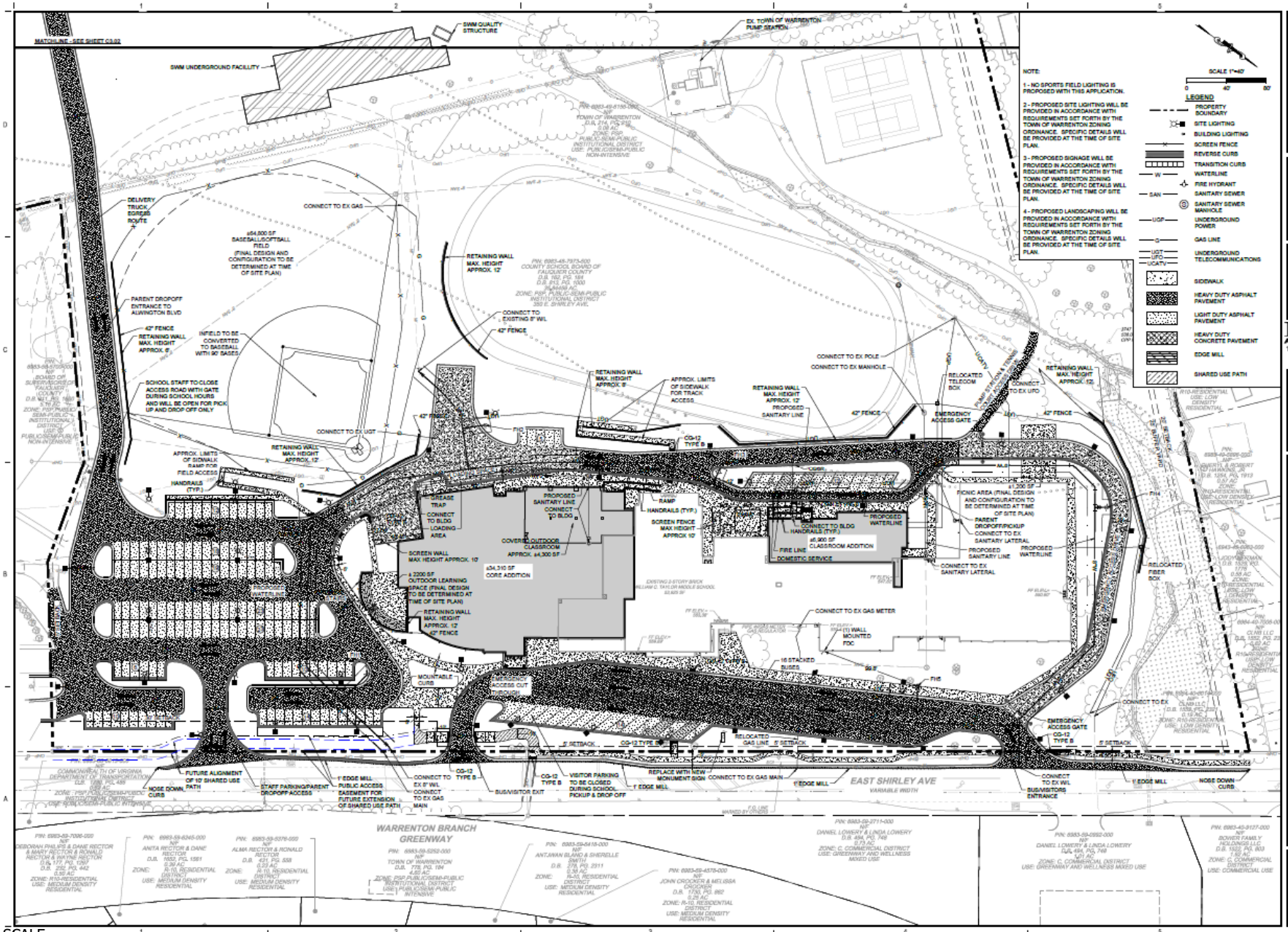
The expansion will provide a link between the elementary school and the middle school during school pick up and drop off times only. During all other times, the connection between the schools will be gated.

The traffic control at internal intersections to the school site was not reviewed as part of this study and will the specifics (signage, pavement markings, etc.) will be designed at the time of site plan approval.

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Site Location and Study Intersections
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 1-1



NOTE:

1 - NO SPORTS FIELD LIGHTING IS PROPOSED WITH THIS APPLICATION.

2 - PROPOSED SITE LIGHTING WILL BE PROVIDED IN ACCORDANCE WITH REQUIREMENTS SET FORTH BY THE TOWN OF WARRENTON ZONING ORDINANCE. SPECIFIC DETAILS WILL BE PROVIDED AT THE TIME OF SITE PLAN.

3 - PROPOSED SIGNAGE WILL BE PROVIDED IN ACCORDANCE WITH REQUIREMENTS SET FORTH BY THE TOWN OF WARRENTON ZONING ORDINANCE. SPECIFIC DETAILS WILL BE PROVIDED AT THE TIME OF SITE PLAN.

4 - PROPOSED LANDSCAPING WILL BE PROVIDED IN ACCORDANCE WITH REQUIREMENTS SET FORTH BY THE TOWN OF WARRENTON ZONING ORDINANCE. SPECIFIC DETAILS WILL BE PROVIDED AT THE TIME OF SITE PLAN.

NOT TO SCALE

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Site Layout
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 1-2

2 BACKGROUND INFORMATION

2.1 DESCRIPTION OF ON-SITE DEVELOPMENT

The site is generally located south of E Shirley Street, north of Alwington Boulevard, and east of Culpeper Street as shown in Figure 1-1 (all figures are located at the end of their respective chapter).

The existing site encompasses Taylor Middle School and James G. Brumfield Elementary School. The middle school currently accommodates 510 students. The proposed expansion of the middle school will accommodate an increase of 340 students for a total of 850 students. Access will be provided via three existing entrances on E Shirley Avenue and one new entrance via a connecting road to the existing elementary school and out to Alwington Boulevard. A conceptual plan is shown on Figure 1-2.

For the purposes of this analysis, the expansion was assumed to be complete and occupied by 2026.

When complete, the expansion will generate an increase of 145 AM peak hour trips (84 in and 61 out), 101 School PM peak hour trips (40 in and 61 out), 42 PM peak hour trips (30 in ands 12 out) and 714 average daily trips.

Based on the trips generated by the site and the rezoning application, a traffic study is required by the Town of Warrenton, but a VDOT Chapter 527 TIA is not required.

The purpose of this analysis is to determine the impact of the proposed expansion of the middle school on the surrounding roadway network. The scope of this study was developed in conjunction with the Town of Warrenton and the Virginia Department of Transportation (VDOT). 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 seven (7) existing intersections:

1. Shirley Avenue/Culpeper Street (signalized);
2. E Shirley Avenue/Site Entrance #1 (unsignalized);
3. E Shirley Avenue/Site Entrance #2 (signalized);
4. E Shirley Avenue/Site Entrance #3 (unsignalized);
5. E Shirley Avenue/Route 15 (roundabout);
6. E Shirley Avenue/Alwington Boulevard (signalized); and
7. Alwington Boulevard/Elementary School Entrance (unsignalized).

2.3 EXISTING ROADWAY NETWORK

E Shirley Avenue (Route 17) is a two-lane, undivided, minor arterial with a posted speed limit of 40 mph from Culpeper Street to Route 15 and 25 mph from Route 15 to Alwington Boulevard. The 2021 VDOT traffic data shows that Route 17 carries approximately 15,000 vehicles per day between Culpeper Street and Route 15. The 2021 Virginia Roads traffic data shows that Route 17 carries approximately 9,7000 vehicles per day between the Town of Warrenton Line and the James Madison Highway/Bus US 15 interchange.

An existing school zone speed limit of 25 mph is present on E Shirley Avenue approximately 255 ft west of school entrance #1 and approximately 650 ft east of school entrance #3. It was assumed that the school zone speed limit was active in this area during the AM and school PM peak hour of this analysis.

Falmouth Street (Route 15) is a two-lane, undivided, minor arterial with a posted speed limit of 25 mph within the site vicinity. The 2021 VDOT traffic data shows that Route 15 carries approximately 4,300 vehicles per day between Route 17 and Mockingbird Lane.

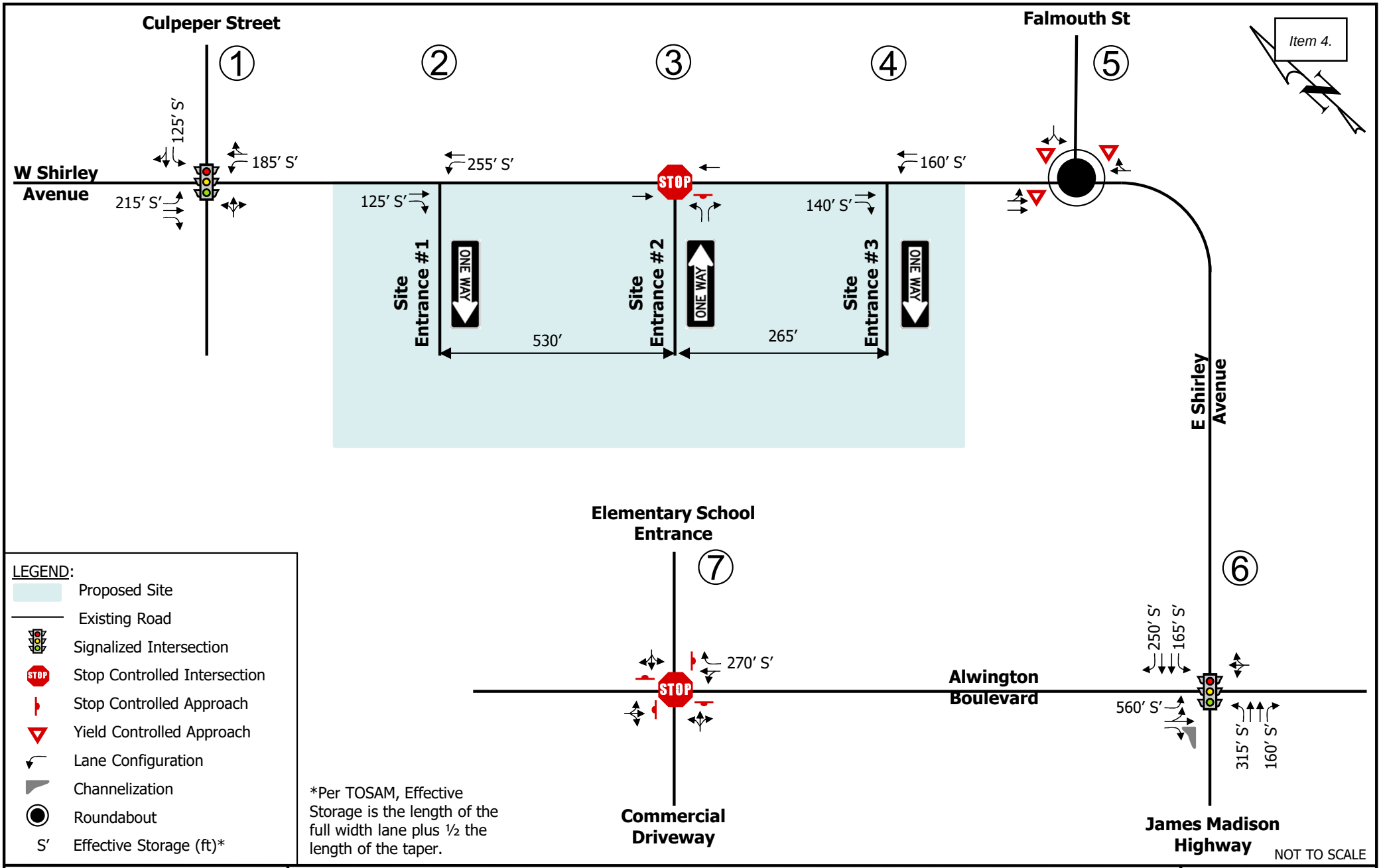
Culpeper Street is a two-lane, undivided, major collector to the west and a minor arterial to the east of E Shirley Avenue, with a posted speed limit of 25 mph within the site vicinity. The 2021 VDOT traffic data shows that Culpeper Street carries approximately 3,300 vehicles per day between Shirley Avenue and Hotel Street.

Alwington Boulevard is a four-lane, divided, local road with a posted speed limit of 35 mph. No VDOT traffic data available for Alwington Boulevard. The 2016 Virginia Roads traffic data shows that Alwington Boulevard carries approximately 7,000 vehicles per day.

The existing lane use and traffic control at the study intersections is shown on Figure 2-1.

2.4 FUTURE IMPROVEMENTS

There are no improvements at the study intersections that will occur within the timeframe analyzed in the study except the realignment of the Alwington Boulevard/Elementary School Entrance/Commercial Driveway intersection. This improvement is a realignment only and will not impact the capacity of the intersection.



TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Existing Roadway Geometry and Stop Control
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 2-1

3 2023 EXISTING CONDITIONS

3.1 EXISTING TRAFFIC VOLUMES

Directional turning movement counts (TMCs) were collected during the AM (6:00-9:00) and PM (2:00-6:00) peak traffic hours. The counts were conducted on May 16, 2023, at intersections 2 through 7 and on May 18, 2023, at intersection 1 on a typical weekday when public schools were in session. The TMCs included heavy vehicles by movement and pedestrian/bicycles counts, where applicable. A copy of the count data is included in Appendix B.

The peak hours analyzed in this report align with the highest traffic volumes of the roadway network. The morning peak hour (7:15-8:15 AM), school PM peak hour (2:15-3:15 PM), and commuter PM peak hour (4:30-5:30 PM) were determined by the highest hour of total traffic on the study area road network. The 2023 existing bus peak hour volumes are shown on Figure 3-1 and the 2023 existing vehicle (no-bus) peak hour volumes are shown on Figure 3-2. Figures 3-1 and 3-2 were added together to yield the 2023 total existing peak hour volumes as shown on Figure 3-3.

Existing signal timings for the Shirley Avenue/Culpeper Street intersection was provided by the Town of Warrenton and the E Shirley Avenue/Alwington Boulevard intersection was provided by VDOT. A copy of the signal timings included in Appendix C.

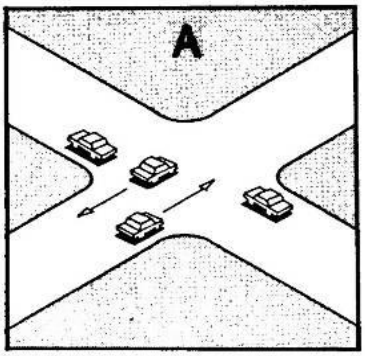
It is noted that both signals operate under "free" operations and are not coordinated with any other traffic signals.

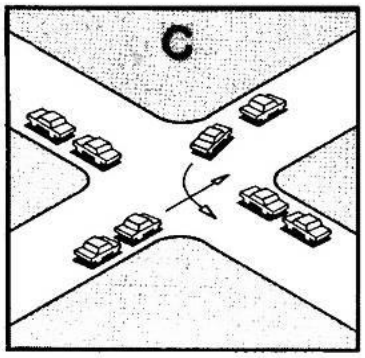
3.2 CAPACITY ANALYSIS

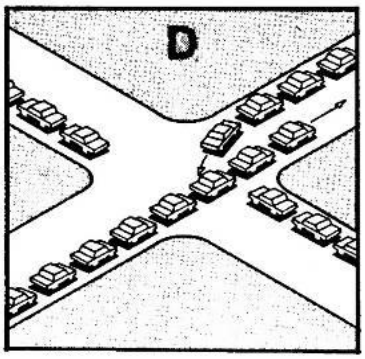
Capacity analysis allows traffic engineers to determine the impacts of traffic on the surrounding roadway network. The Transportation Research Board's (TRB) *Highway Capacity Manual* (HCM) methodologies govern how the capacity analyses are conducted and how the results are interpreted. There are six 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.

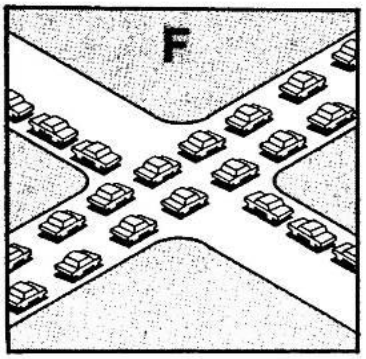
Table 3-1: Level of Service Definitions

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 invloves delay to all motorists due to congestion.	Very long queues may create lengthly 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 ares 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 (2023), background (2026 and 2032), and future (2026 and 2032) operational conditions. The signalized and unsignalized intersections were analyzed using SYNCHRO Version 11 and the roundabout was analyzed using SIDRA Version 9.0. All intersections were analyzed based on HCM 2000 methodologies except the all-way stop-control intersection (Alwington Boulevard/Elementary School Entrance/Commercial Entrance) which was based on HCM 6th edition. All analysis uses the 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;
- Grades as obtained through Google Earth;
- Turning movements into or out of the school will have a peak hour factor of 0.50;
- Heavy vehicle percentage as determined by the traffic counts (by movement); and
- Traffic signals timing data provided by the Town of Warrenton and VDOT.

Queuing analyses were conducted using both the HCM 2000 Edition methodology (as calculated by SYNCHRO/SIDRA) 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.

The signals operate under "free" operations and therefore all splits were optimized in each analysis scenario.

Additionally, the roundabout was modeled in Synchro for simulation purposes only, but all roundabout analysis results were obtained from SIDRA.

3.3 EXISTING CONDITIONS CAPACITY ANALYSIS RESULTS

Table 3-3 summarizes the 2023 existing intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the 2023 existing intersection geometry (Figure 2-1), peak hour traffic volumes shown on Figure 3-3 and the existing signal timings as provided by the Town of Warrenton and 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 numbers used in the SYNCHRO models and report figures.

As shown in Table 3-3, under 2023 existing conditions:

1. The East Shirley/Culpeper Street intersection currently operates an overall LOS C in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns.

2. The school entrances along East Shirley Avenue operate at LOS C or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C or better in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

Table 3-3: 2023 Existing Traffic
Intersection Level of Service and Delay Summary

Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				SCHOOL PM PEAK HOUR				COMMUTER PM PEAK HOUR			
			Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[(2)] (ft)	Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[(2)] (ft)	Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[(2)] (ft)
1. Shirley Avenue (E-W) at	EB Left	215	43.2	D	45	115	52.9	D	61	149	45.5	D	56	200
Culpeper Street (N-S)	EB Thru		22.7	C	260	253	26.6	C	438	357	30.8	C	#474	374
Signalized	EB Right		17.6	B	0	66	17.1	B	11	73	20.5	C	46	98
	EB Approach		*23.3*	*C*	--	--	*26.8*	*C*	--	--	*29.3*	*C*	--	--
	WB Left	185	38.8	D	47	140	41.4	D	61	173	40.1	D	50	150
	WB Thru/Right		23.8	C	#424	362	22.1	C	437	400	25.9	C	#475	347
	WB Approach		*24.8*	*C*	--	--	*23.5*	*C*	--	--	*26.8*	*C*	--	--
	NB Left/Thru/Right		42.3	D	207	231	44.5	D	199	218	42.3	D	178	190
	NB Approach		*42.3*	*D*	--	--	*44.5*	*D*	--	--	*42.3*	*D*	--	--
	SB Left	125	39.0	D	29	55	40.6	D	43	78	35.8	D	48	105
	SB Thru/Right		40.6	D	55	85	43.6	D	89	118	40.5	D	139	179
	SB Approach		*40.2*	*D*	--	--	*42.9*	*D*	--	--	*39.6*	*D*	--	--
	Overall		**28.4**	**C**	**--**	**--**	**29.1**	**C**	**--**	**--**	**31.2**	**C**	**--**	**--**
2. E Shirley Avenue (E-W) at	EB Thru		†	†	0	4	†	†	0	--	†	†	0	--
Site Entrance #1 (N-S)	EB Right	125	†	†	0	6	†	†	0	2	†	†	0	--
Unsignalized	*EB Approach*		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	WB Left	255	8.3	A	4	56	8.5	A	1	31	8.5	A	1	20
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		*0.8*	*A*	--	--	*0.2*	*A*	--	--	*0.1*	*A*	--	--
3. E Shirley Avenue (E-W) at	EB Thru		†	†	0	2	†	†	0	2	†	†	0	--
Site Entrance #2 (N-S)	*EB Approach*		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
Unsignalized	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	NB Left		17.8	C	12	74	23.3	C	16	82	19.5	C	5	42
	NB Right		10.7	B	7	75	13.1	B	10	84	11.6	B	0	27
	NB Approach		*13.9*	*B*	--	--	*17.3*	*C*	--	--	*18.3*	*C*	--	--
4. E Shirley Avenue (E-W) at	EB Thru		†	†	0	--	†	†	0	--	†	†	0	--
Site Entrance #3 (N-S)	EB Right	140	†	†	0	2	†	†	0	5	†	†	0	5
Unsignalized	*EB Approach*		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	WB Left	160	8.0	A	2	38	8.7	A	1	37	8.7	A	2	42
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		*0.4*	*A*	--	--	*0.3*	*A*	--	--	*0.4*	*A*	--	--
5. E Shirley Avenue (E-W) at	*EB Approach*		*1.8*	*A*	*21*	--	*1.9*	*A*	*30*	--	*1.9*	*A*	*30*	--
Falmouth Street (N)	*WB Approach*		*10.5*	*B*	*120*	--	*9.2*	*A*	*100*	--	*12.7*	*B*	*176*	--
Roundabout*	*SB Approach*		*8.7*	*A*	*34*	--	*7.0*	*A*	*31*	--	*7.8*	*A*	*37*	--
	Overall		**7.2**	**A**	**--**	**--**	**5.7**	**A**	**--**	**--**	**7.7**	**A**	**--**	**--**
6. E Shirley Avenue/ (N-S)	EB Left	560	34.1	C	63	126	36.7	D	123	154	38.6	D	128	159
James Madison Highway at	EB Left/Thru		34.1	C	63	87	36.9	D	130	120	38.6	D	129	114
Alwington Boulevard (E-W)	EB Right[(3)]		0.1	A	0	14	0.2	A	0	47	0.2	A	0	54
Signalized	*EB Approach*		*21.2*	*C*	--	--	*22.1*	*C*	--	--	*21.8*	*C*	--	--
	WB Left/Thru/Right		33.0	C	0	52	34.9	C	26	63	37.1	D	0	52
	WB Approach		*33.0*	*C*	--	--	*34.9*	*C*	--	--	*37.1*	*D*	--	--
	NB Left	315	17.6	B	99	165	18.1	B	95	142	18.5	B	102	168
	NB Thru		18.4	B	143	192	18.0	B	83	139	18.2	B	92	157
	NB Right	160	15.8	B	0	19	16.8	B	0	44	16.7	B	0	31
	NB Approach		*18.1*	*B*	--	--	*18.0*	*B*	--	--	*18.3*	*B*	--	--
	SB Left	165	15.2	B	11	49	16.2	B	17	57	16.0	B	15	67
	SB Thru		24.1	C	71	103	25.6	C	129	162	26.9	C	138	161
	SB Right	250	16.9	B	15	87	15.5	B	9	85	15.3	B	0	82
	SB Approach		*20.6*	*C*	--	--	*22.5*	*C*	--	--	*24.4*	*C*	--	--
	Overall		**19.4**	**B**	**--**	**--**	**21.2**	**C**	**--**	**--**	**21.7**	**C**	**--**	**--**
7. Alwington Boulevard (E-W) a	EB Left/Thru/Right		7.3	A	0	8	7.4	A	0	20	7.3	A	3	8
Elementary School Entrance	*EB Approach*		*7.3*	*A*	--	--	*7.4*	*A*	--	--	*7.3*	*A*	--	--
Commercial Entrance (N-S)	WB Left/Thru		8.7	A	10	76	8.8	A	3	63	8.9	A	3	64
Unsignalized**	WB Right	270	7.1	A	10	64	6.9	A	5	57	6.7	A	3	55
	WB Approach		*7.8*	*A*	--	--	*7.4*	*A*	--	--	*7.8*	*A*	--	--
	NB Left/Thru/Right		6.9	A	3	86	6.6	A	3	60	6.6	A	3	54
	NB Approach		*6.9*	*A*	--	--	*6.6*	*A*	--	--	*6.6*	*A*	--	--
	SB Left/Thru/Right		7.8	A	3	52	7.4	A	0	29	7.4	A	3	29
	NB Approach		*7.8*	*A*	--	--	*7.4*	*A*	--	--	*7.4*	*A*	--	--

[1] *Overall intersection LOS and delay reported for signalized intersections and roundabouts only.*

[2] SimTraffic Queues are average maximum queues after 10 runs of 60 minutes each.

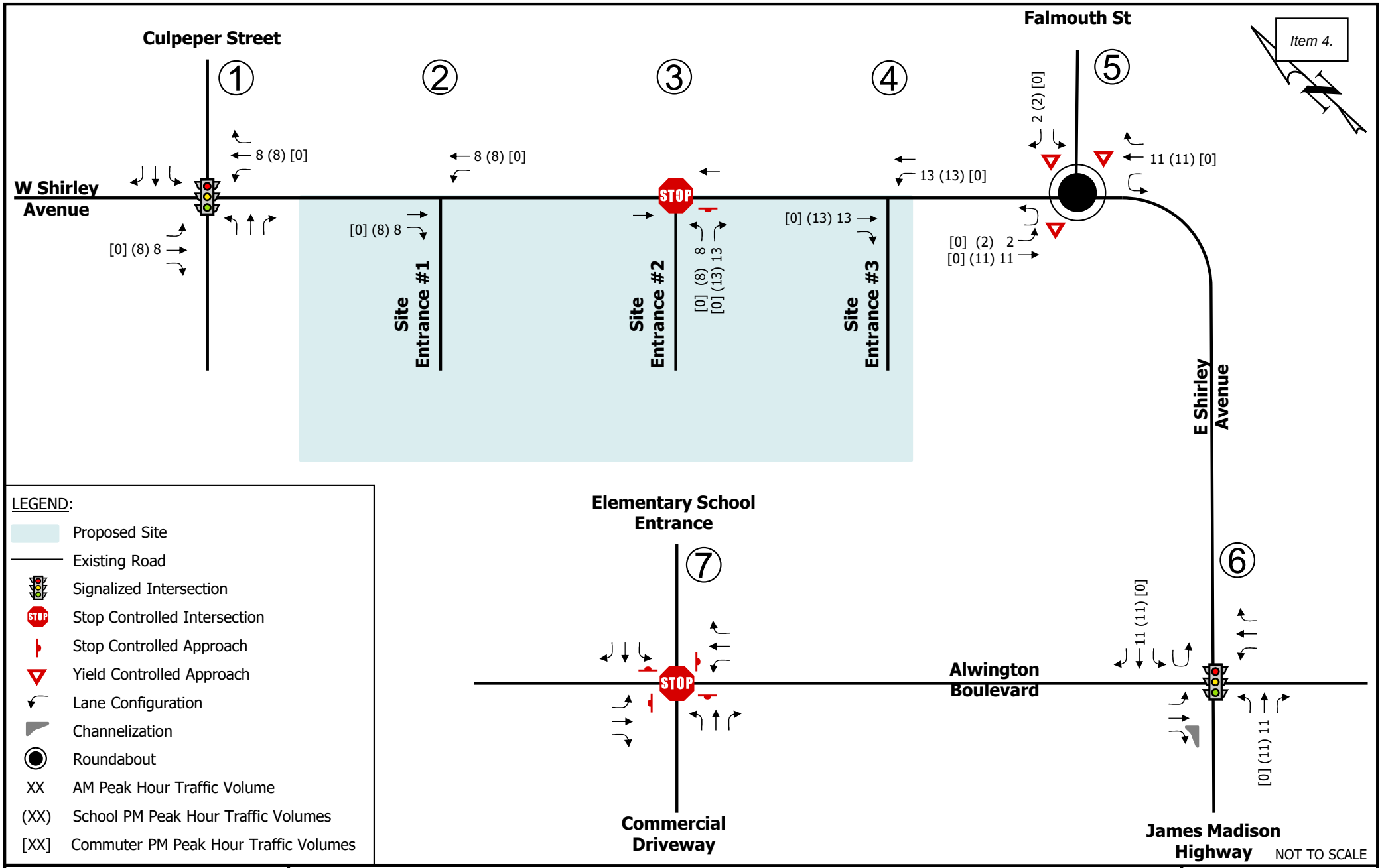
[3] *Channelized right turn not controlled by the signal.*

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

† SYNCHRO does not provide level of service or delay for unsignalized movements with no conflicting volumes.

* Note: SIDRA was used to analyze the roundabout at intersection 5.

** Note: HCM 6th Edition was used to analyze the all way stop controlled intersection at intersection 7.

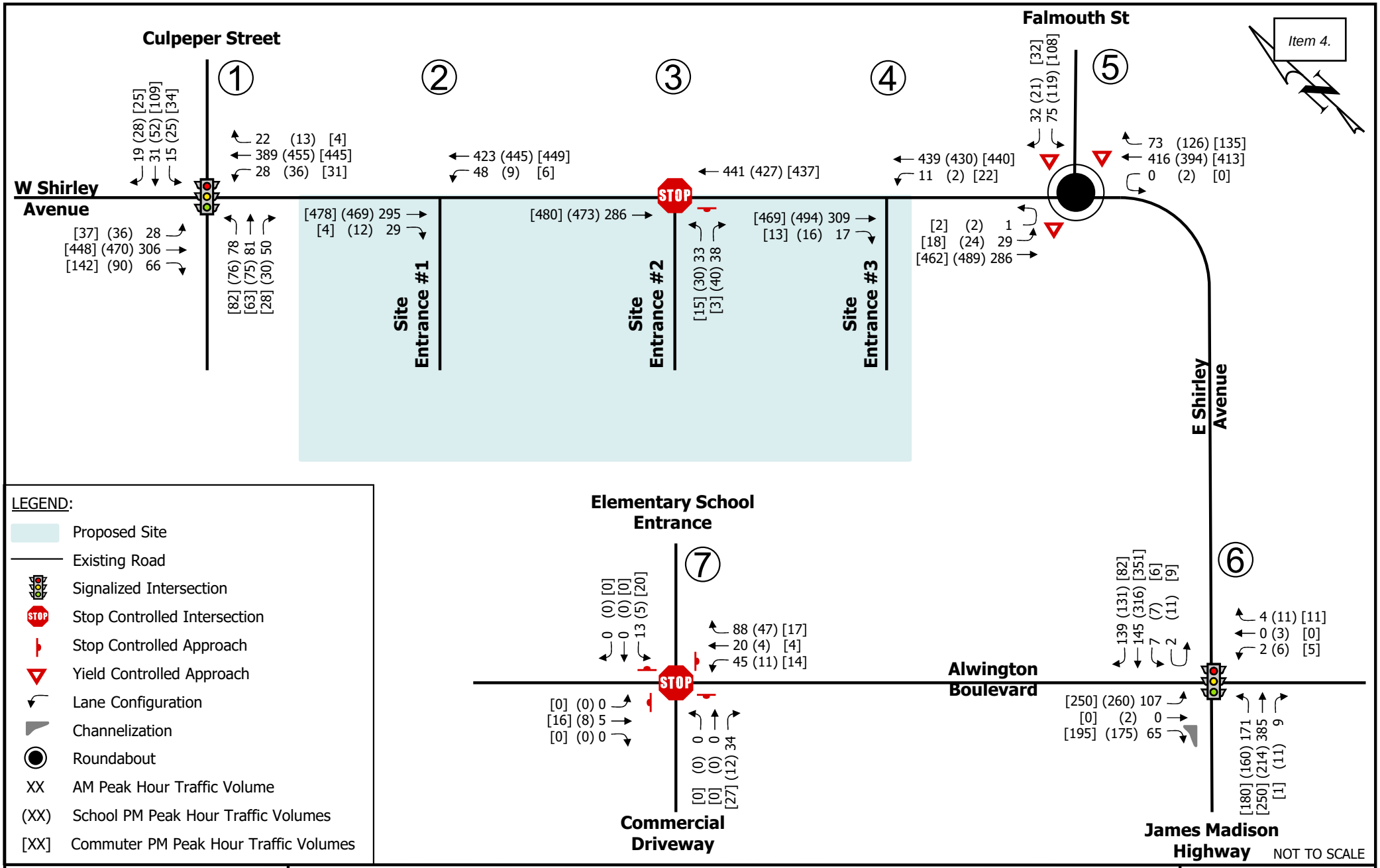


NOT TO SCALE

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

2023 Existing Bus Peak Hour Volumes
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 3-1



LEGEND:

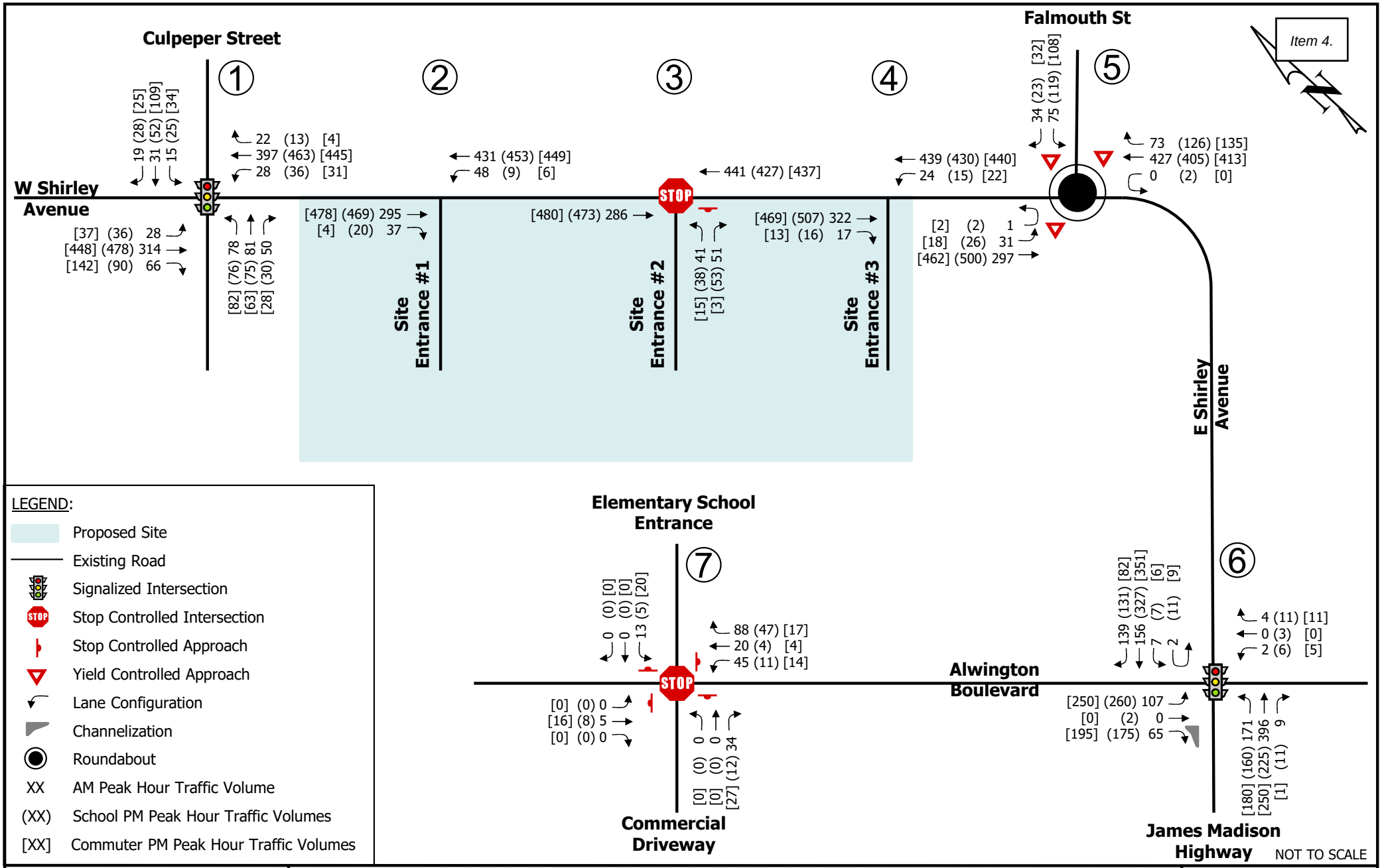
- Proposed Site
- Existing Road
- Signalized Intersection
- Stop Controlled Intersection
- Stop Controlled Approach
- Yield Controlled Approach
- Lane Configuration
- Channelization
- Roundabout
- XX AM Peak Hour Traffic Volume
- (XX) School PM Peak Hour Traffic Volumes
- [XX] Commuter PM Peak Hour Traffic Volumes

NOT TO SCALE

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

2023 Existing Vehicles (Non-Bus) Peak Hour Volumes
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 3-2



LEGEND:

- Proposed Site
- Existing Road
- Signalized Intersection
- Stop Controlled Intersection
- Stop Controlled Approach
- Yield Controlled Approach
- Lane Configuration
- Channelization
- Roundabout
- XX AM Peak Hour Traffic Volume
- (XX) School PM Peak Hour Traffic Volumes
- [XX] Commuter PM Peak Hour Traffic Volumes

NOT TO SCALE

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

2023 Total Existing Peak Hour Volumes
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 3-3

4 2026 BACKGROUND CONDITIONS

The background 2026 volumes were analyzed assuming existing intersection geometry in conjunction with projected background traffic volumes, which consists of general traffic growth in the area.

4.1 GENERAL TRAFFIC GROWTH

The background volumes were based on a 1.0% annual growth rate and applied to all movements except the turns into and out of the existing school entrances. The growth rate was compounded annually for the three-year period from 2023 to 2026 and was applied to all movements at the study intersections. The resulting 2026 vehicle background (existing + growth) volumes are shown on Figure 4-1.

4.2 BACKGROUND 2026 CAPACITY ANALYSIS RESULTS

Table 4-1 summarizes the 2026 background intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the intersection geometry (Figure 2-1), 2026 background peak hour traffic volumes shown on Figure 4-1 and the existing signal timings as provided by the Town of Warrenton and VDOT. 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 numbers used in the SYNCHRO models and report figures.

As shown in Table 4-1, under 2026 background conditions, all intersections experience similar levels of service, delay, and queueing as under existing conditions. Specifically:

1. The East Shirley/Culpeper Street intersection will operate an overall LOS C in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns.

2. The school entrances along East Shirley Avenue operate at LOS C or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

Table 4-1: 2026 Background Conditions
Intersection Level of Service and Delay Summary

Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				SCHOOL PM PEAK HOUR				COMMUTER PM PEAK HOUR			
			Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[2] (ft)	Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[2] (ft)	Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[2] (ft)
1. Shirley Avenue (E-W) at Culpeper Street (N-S) Signalized	EB Left	215	46.4	D	50	105	54.0	D	62	186	52.0	D	63	213
	EB Thru		21.9	C	267	264	27.5	C	452	410	29.0	C	423	342
	EB Right		17.3	B	0	67	17.3	B	12	69	19.8	B	43	79
	EB Approach		*22.9*	*C*	--	--	*27.5*	*C*	--	--	*28.2*	*C*	--	--
	WB Left	185	40.2	D	50	149	41.8	D	61	183	43.1	D	56	173
	WB Thru/Right		22.0	C	380	331	2.7	A	449	401	24.4	C	420	362
	WB Approach		*23.2*	*C*	--	--	*24.0*	*C*	--	--	*25.6*	*C*	--	--
	NB Left/Thru/Right		44.0	D	220	222	45.0	D	204	227	45.4	D	195	206
	NB Approach		*44.0*	*D*	--	--	*45.0*	*D*	--	--	*45.4*	*D*	--	--
	SB Left	125	40.3	D	30	53	40.8	D	44	84	37.5	D	53	124
	SB Thru/Right		42.0	D	59	90	44.0	D	92	130	42.9	D	153	198
	SB Approach		*41.6*	*D*	--	--	*43.3*	*D*	--	--	*41.8*	*D*	--	--
	Overall		**28.0**	**C**	**--**	**--**	**29.7**	**C**	**--**	**--**	**31.0**	**C**	**--**	**--**
2. E Shirley Avenue (E-W) at Site Entrance #1 (N-S) Unsignalized	EB Thru		†	†	0	5	†	†	0	--	†	†	0	--
	EB Right	125	†	†	0	9	†	†	0	--	†	†	0	--
	EB Approach		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	WB Left	255	8.6	A	7	75	8.6	A	1	33	8.5	A	1	24
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		*1.4*	*A*	--	--	*0.3*	*A*	--	--	*0.2*	*A*	--	--
3. E Shirley Avenue (E-W) at Site Entrance #2 (N-S) Unsignalized	EB Thru		†	†	0	2	†	†	0	10	†	†	0	--
	EB Approach		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	NB Left		19.6	C	24	83	25.0	C	30	83	20.5	C	10	38
	NB Right		11.1	B	13	74	13.7	B	19	88	11.7	B	1	27
	NB Approach		*14.9*	*B*	--	--	*18.4*	*C*	--	--	*19.0*	*C*	--	--
4. E Shirley Avenue (E-W) at Site Entrance #3 (N-S) Unsignalized	EB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	EB Right	140	†	†	0	4	†	†	0	--	†	†	0	--
	EB Approach		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	WB Left	160	8.2	A	3	43	8.8	A	2	33	8.8	A	4	53
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		*0.7*	*A*	--	--	*0.5*	*A*	--	--	*0.7*	*A*	--	--
5. E Shirley Avenue (E-W) at Falmouth Street (N) Roundabout*	*EB Approach*		*1.8*	*A*	*21*	--	*2.0*	*A*	*31*	--	*1.9*	*A*	*31*	--
	WB Approach		*10.9*	*B*	*128*	--	*9.5*	*A*	*107*	--	*13.4*	*B*	*190*	--
	SB Approach		*8.9*	*A*	*36*	--	*7.2*	*A*	*32*	--	*8.1*	*A*	*39*	--
	Overall		**7.5**	**A**	**--**	**--**	**5.9**	**A**	**--**	**--**	**8.0**	**A**	**--**	**--**
6. E Shirley Avenue/ (N-S) James Madison Highway at Alwington Boulevard (E-W) Signalized	EB Left	560	34.0	C	64	124	37.0	D	132	146	38.5	D	130	152
	EB Left/Thru		34.0	C	64	87	37.3	D	133	116	38.5	D	130	113
	EB Right[3]		0.1	A	0	10	0.2	A	0	61	0.2	A	0	46
	EB Approach		*21.2*	*C*	--	--	*22.3*	*C*	--	--	*21.7*	*C*	--	--
	WB Left/Thru/Right		32.6	C	0	57	35.2	D	27	68	34.9	C	0	50
	WB Approach		*32.6*	*C*	--	--	*35.2*	*D*	--	--	*34.9*	*C*	--	--
	NB Left	315	17.4	B	99	162	18.3	B	99	135	18.1	B	106	169
	NB Thru		18.3	B	143	194	18.1	B	87	134	17.7	B	93	164
	NB Right	160	15.8	B	0	19	16.9	B	0	39	16.3	B	0	27
	NB Approach		*18.0*	*B*	--	--	*18.2*	*B*	--	--	*17.9*	*B*	--	--
	SB Left	165	15.1	B	11	43	16.3	B	18	40	15.8	B	15	59
	SB Thru		23.7	C	70	119	25.9	C	135	162	25.8	C	141	159
	SB Right	250	16.7	B	15	93	15.5	B	9	84	15.4	B	0	79
	SB Approach		*20.3*	*C*	--	--	*22.6*	*C*	--	--	*23.6*	*C*	--	--
	Overall		**19.3**	**B**	**--**	**--**	**21.4**	**C**	**--**	**--**	**21.3**	**C**	**--**	**--**
7. Alwington Boulevard (E-W) at Elementary School Entrance/ Commercial Entrance (N-S) Unsignalized**	EB Left/Thru/Right		7.3	A	0	10	7.4	A	0	22	7.2	A	3	8
	EB Approach		*7.3*	*A*	--	--	*7.4*	*A*	--	--	*7.2*	*A*	--	--
	WB Left/Thru		8.7	A	10	82	8.7	A	3	66	8.9	A	3	69
	WB Right	270	7.1	A	10	72	6.8	A	5	64	6.7	A	3	56
	WB Approach		*7.8*	*A*	--	--	*7.3*	*A*	--	--	*7.8*	*A*	--	--
	NB Left/Thru/Right		6.9	A	3	89	6.5	A	0	59	6.6	A	3	58
	NB Approach		*6.9*	*A*	--	--	*6.5*	*A*	--	--	*6.6*	*A*	--	--
	SB Left/Thru/Right		7.8	A	3	48	7.3	A	0	29	7.4	A	3	29
	NB Approach		*7.8*	*A*	--	--	*7.3*	*A*	--	--	*7.4*	*A*	--	--

[1] *Overall intersection LOS and delay reported for signalized intersections and roundabouts only.*

[2] SimTraffic Queues are average maximum queues after 10 runs of 60 minutes each.

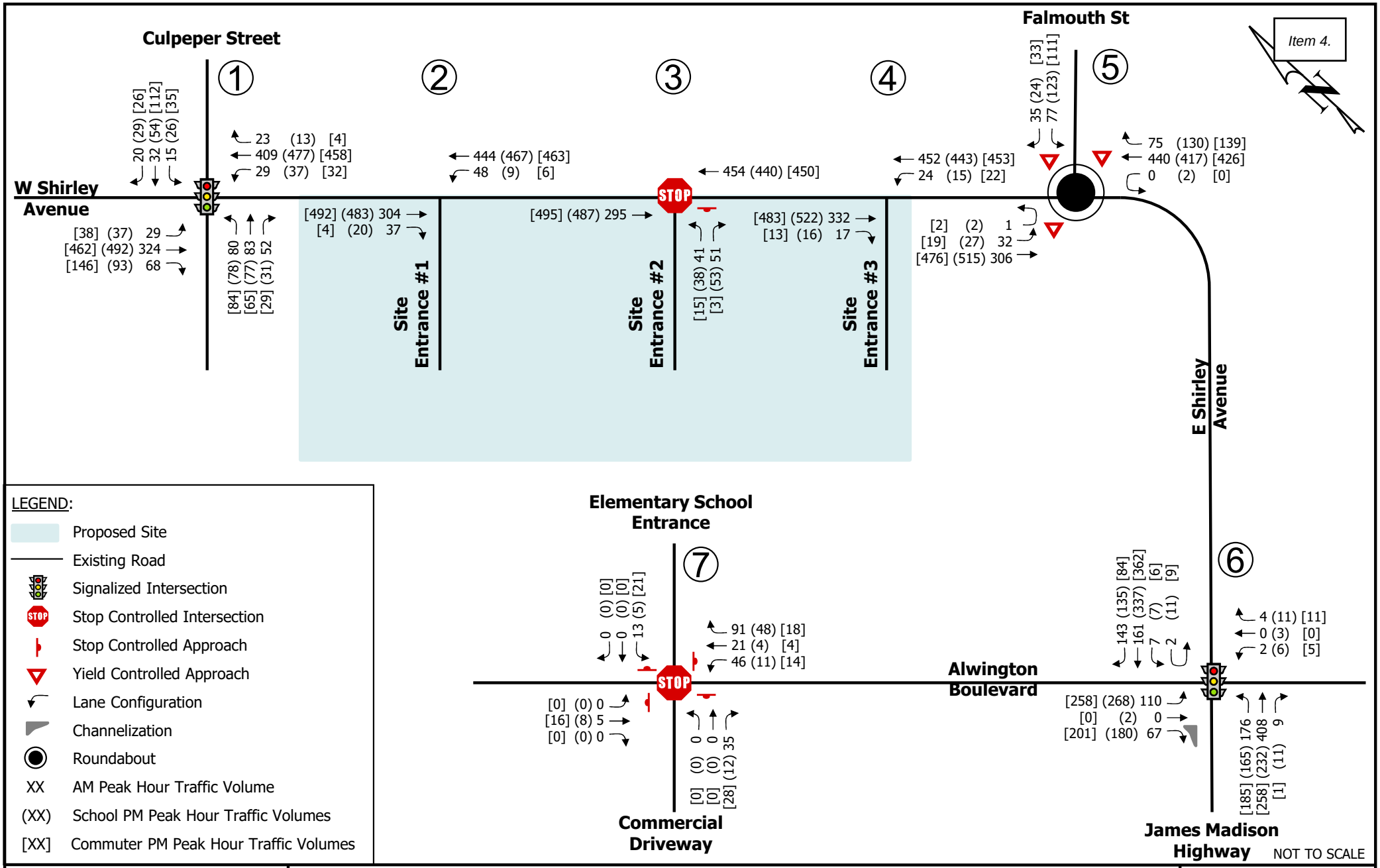
[3] *Channelized right turn not controlled by the signal.*

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

† SYNCHRO does not provide level of service or delay for unsignalized movements with no conflicting volumes.

* Note: SIDRA was used to analyze the roundabout at intersection 5.

** Note: HCM 6th Edition was used to analyze the all way stop controlled intersection at intersection 7.



LEGEND:

- Proposed Site
- Existing Road
- Signalized Intersection
- Stop Controlled Intersection
- Stop Controlled Approach
- Yield Controlled Approach
- Lane Configuration
- Channelization
- Roundabout
- XX AM Peak Hour Traffic Volume
- (XX) School PM Peak Hour Traffic Volumes
- [XX] Commuter PM Peak Hour Traffic Volumes

NOT TO SCALE

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

2026 Total Background Peak Hour Volumes
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 4-1

5 TRIP GENERATION

For purposes of this analysis, the proposed expansion of the middle school will accommodate an increase of 340 students and anticipated to occur by 2026.

Access to the site will be provided via three existing entrances into the site from E Shirley Avenue and one new alternate access from Alwington Boulevard. A site layout is shown on Figure 1-2.

With the expansion, the access to the site will be reworked as shown in Figure 5-1. The two western entrances on East Shirley Avenue will be a bus loop only and the eastern entrance will serve all other vehicles. The new entrance off of Alwington Boulevard will service passenger vehicles.

It is anticipated that passenger vehicle traffic from the south on East Shirley Avenue will use the entrance off Alwington Boulevard while all other traffic will use the entrances on East Shirley Avenue.

5.1 ACCESS MANAGEMENT REVIEW

As noted above, the expanded Middle School will utilize the existing three entrances points along E Shirley Avenue under a reworked access scenario. No new access points are proposed on E Shirley Avenue.

As shown on Figure 2-1, the western access point (bus entrance only) is located approximately 530 feet from the middle entrance (bus out only). The middle entrance is spaces approximately 265 feet from the eastern entrance (vehicle in and out).

In accordance with VDOT's Road Design Manual, Appendix F, Table 2-2, on a roadway like E Shirley Avenue (minor arterial with a posted 40 mph speed limit), a Type 3 (full access) entrance requires 470 feet of spacing to other signalized or full access intersections. A Type 4 (partial access) requires 250 feet of spacing from all other intersections.

Since the eastern and middle entrance are Type 4 (partial access), 250 feet of spacing is required between each of the entrances.

The spacing between each entrance exceeds 250 feet and therefore all access management standards are met at the entrances.

5.2 REROUTED TRAFFIC

As noted above, with the expansion, the site driveways will be changed as shown in Figure 5-1. As a result, the existing traffic entering and exiting the school will be rerouted to the new entrances as shown on Figure 5-2 (bus trips) and Figure 5-3 (vehicle trips).

5.3 SITE TRIP GENERATION

The peak hour site-generated traffic volumes shown in Table 5-1 were estimated using existing driveway counts at the school pro-rated for the expansion in students. The average daily traffic was estimated using the 11th Edition of the Institute of Transportation Engineers' (ITE) *Trip Generation Manual* .

Table 5-1: Trip Generation Summary

Land Use	Size	Units	Land Use Code	School AM Peak Hour (1) In	School AM Peak Hour (1) Out	School AM Peak Hour (1) Total	School PM Peak (1) In	School PM Peak (1) Out	School PM Peak (1) Total	Commuter PM Peak Hour (1) In	Commuter PM Peak Hour (1) Out	Commuter PM Peak Hour (1) Total	Average Daily Trips (2)
Existing Capacity													
Middle School	510	Students	522	126	92	218	60	91	151	45	18	63	1071
New Capacity													
Middle School	850	Students	522	210	153	363	100	152	252	75	30	105	1785
Increase	340	Students		84	61	145	40	61	101	30	12	42	714

Note: (1) Peak hour counts based on existing driveway counts conducted for the site for the existing school capacity. New capacity trips pro-rated based on the existing counts and the percent increase in students.

(2) Average Daily Trips based on the Institute of Transportation Engineers Trip Generation, 11th Edition. Assumes General Urban/Suburban land use category.

As shown in Table 5-1, the overall expansion will generate an increase of 145 AM peak hour trips (84 in and 61 out), 101 School PM peak hour trips (40 in and 61 out), 42 PM peak hour trips (30 in ands 12 out) and 714 average daily trips.

5.4 External Trip Distributions

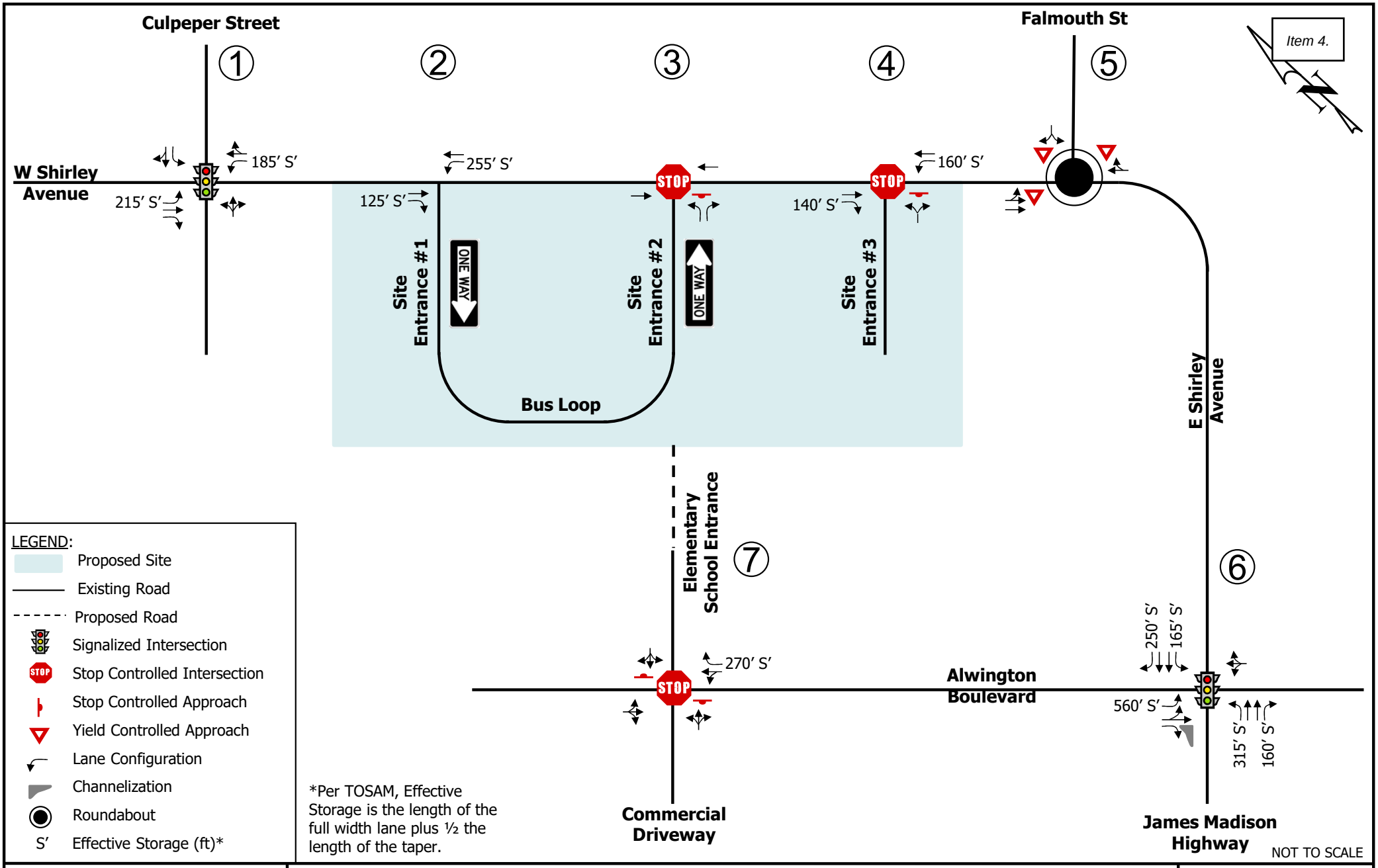
The distribution of trips generated by the proposed developed was based on other traffic studies in the area, the existing traffic volumes, the nature of the use, the school attendance map and local knowledge.

The following directional distributions were assumed for the site:

- 40% from the west on East Shirley Avenue;
- 10% from the north on Falmouth Street; and
- 50% from the south on East Shirley Avenue.

5.5 Traffic Assignment

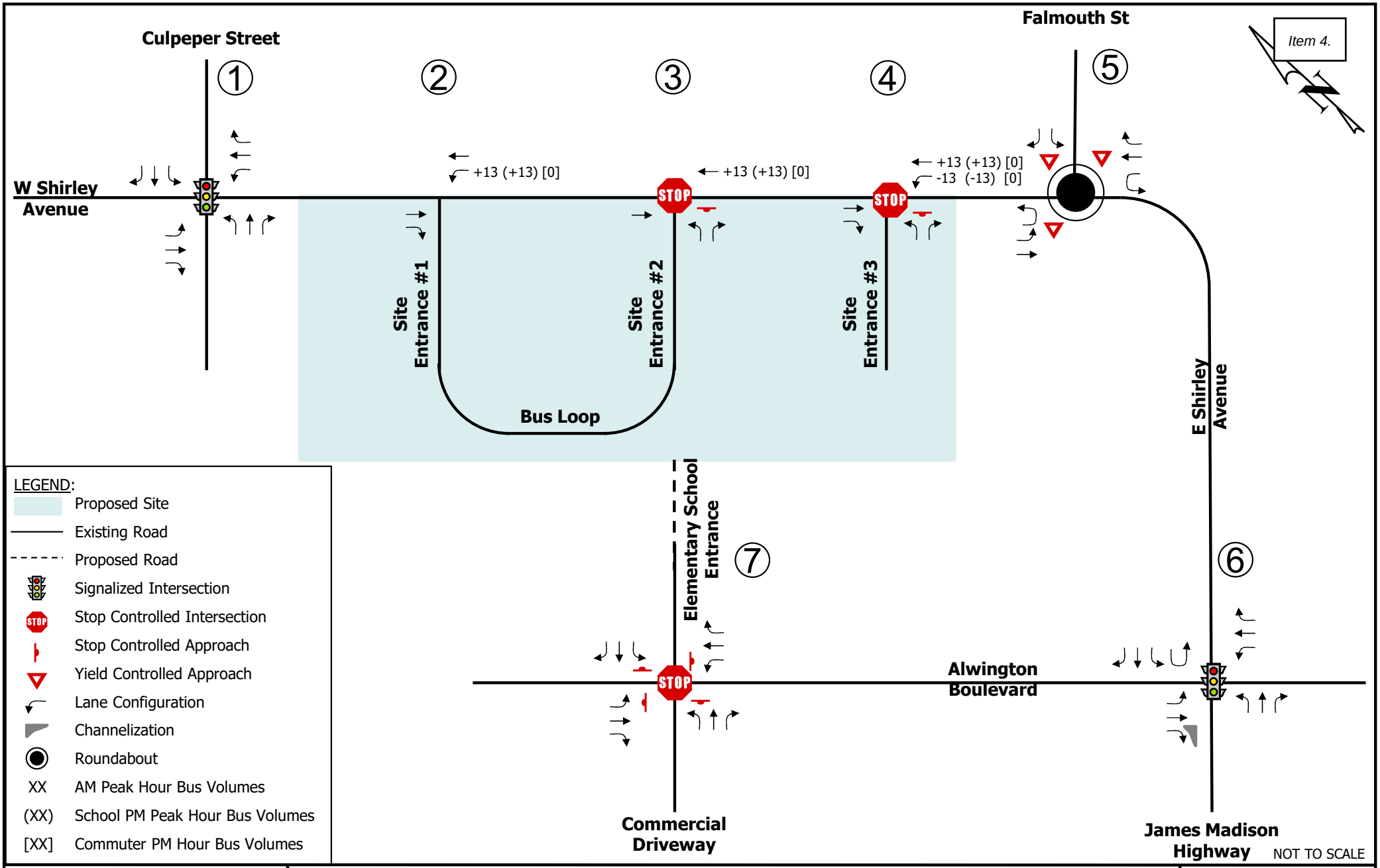
The trip distribution percentages for the new traffic generated by the site were applied to the site driveways as shown in Figure 5-4 (bus trips) and Figure 5-5 (vehicle trips). The distributions were then applied to the new trips shown in Table 5-1 and the resulting new external trips are shown in Figure 5-6 (bus trips) and Figure 5-7 (vehicle trips).



TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Future Geometry and Stop Control
Taylor Middle School – Addition
Town of Warrenton, Virginia

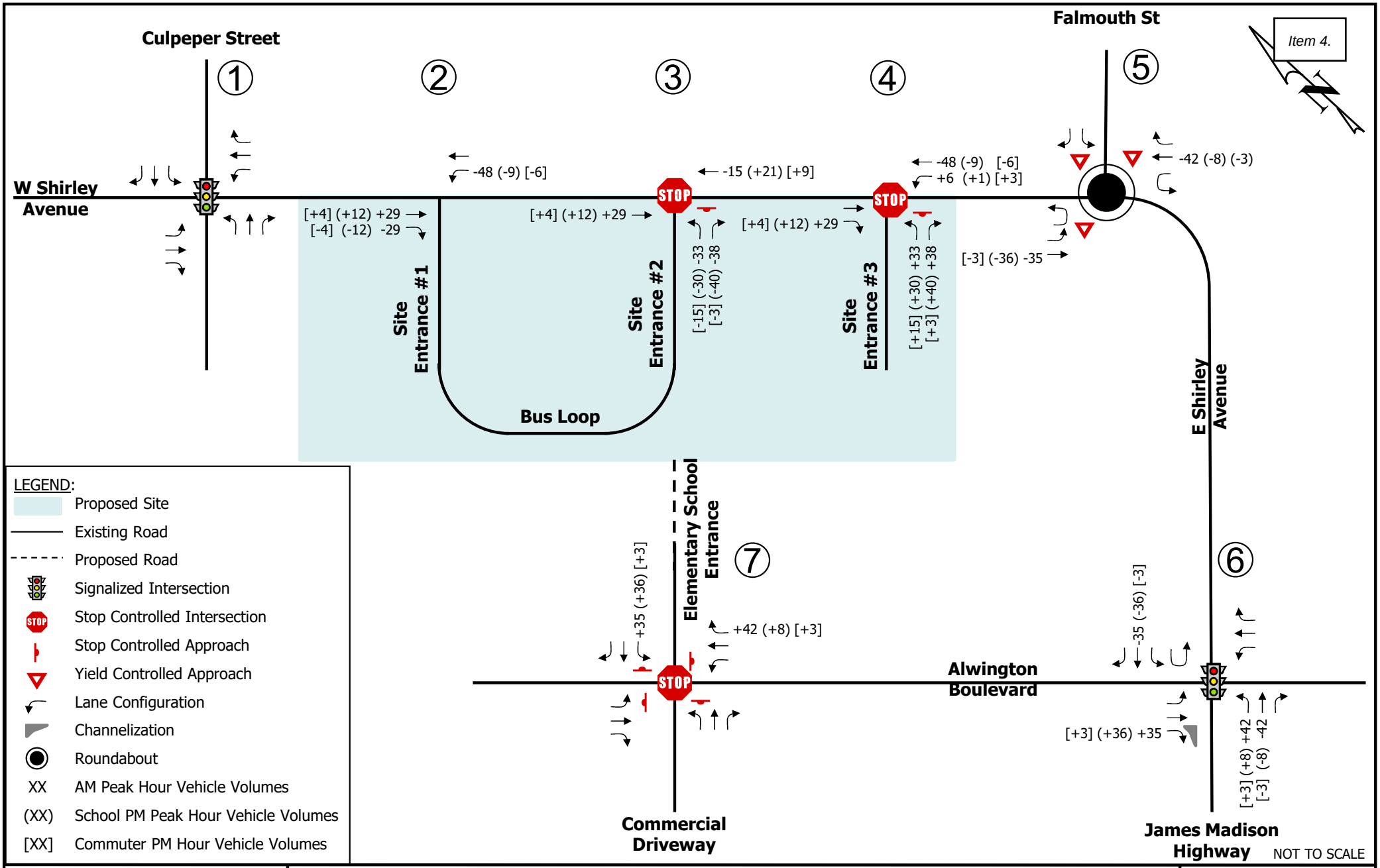
Figure 5-1



TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Rerouted Existing Buses
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 5-2



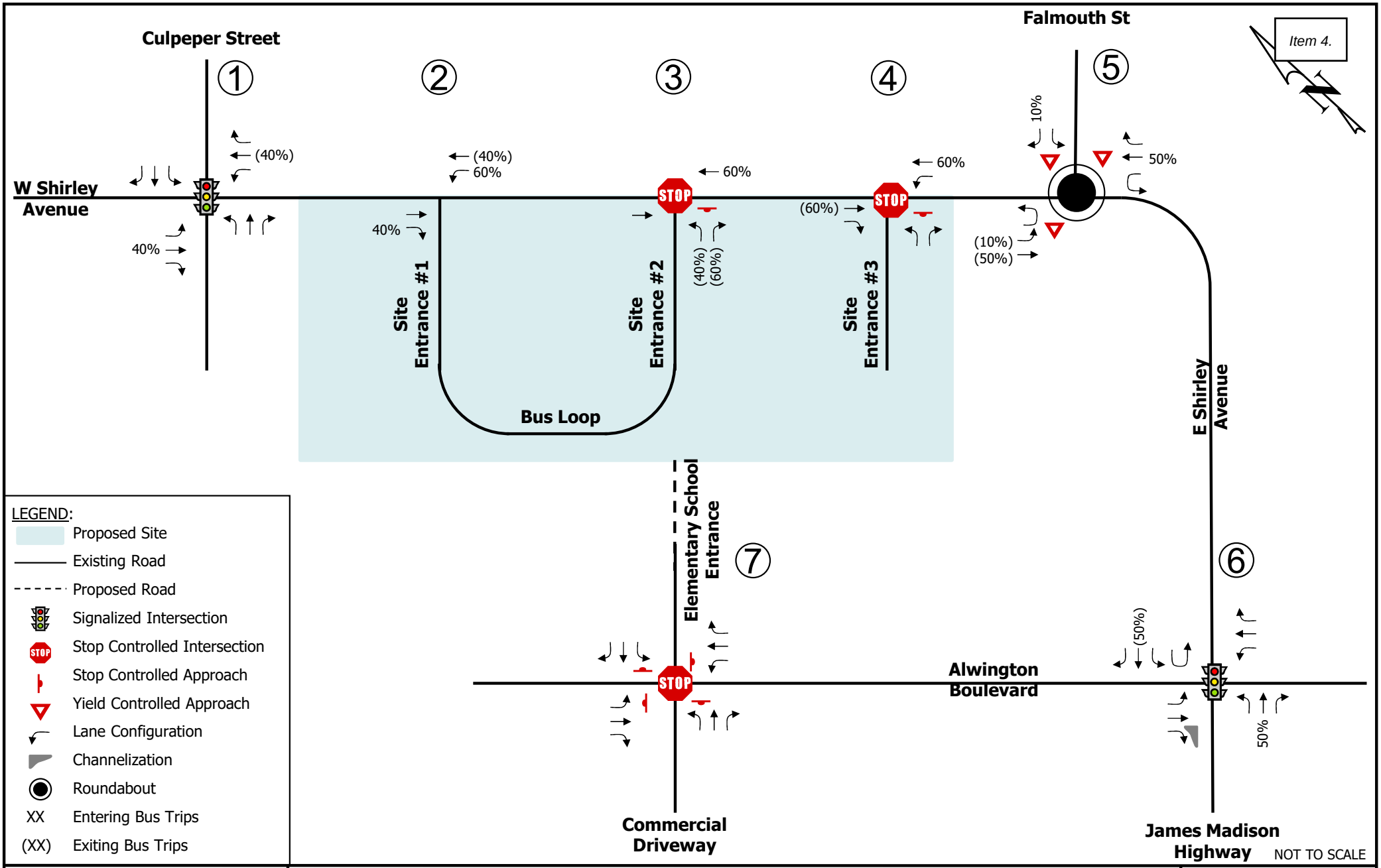
LEGEND:

- Proposed Site
- Existing Road
- Proposed Road
- Signalized Intersection
- Stop Controlled Intersection
- Stop Controlled Approach
- Yield Controlled Approach
- Lane Configuration
- Channelization
- Roundabout
- XX AM Peak Hour Vehicle Volumes
- (XX) School PM Peak Hour Vehicle Volumes
- [XX] Commuter PM Hour Vehicle Volumes

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Rerouted Existing Vehicles (Non-Bus)
Taylor Middle School – Addition
Town of Warrenton, Virginia

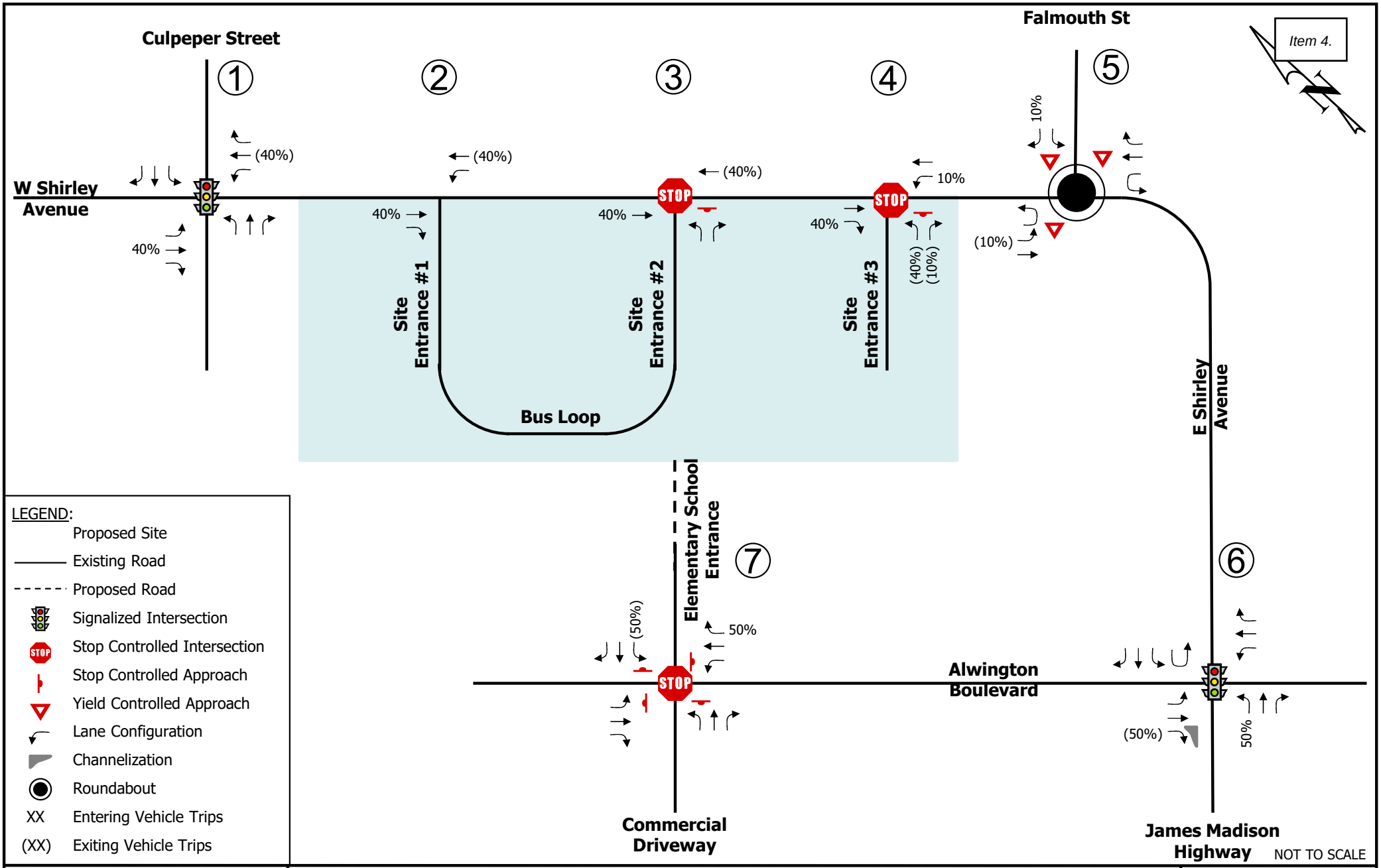
Figure 5-3



TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Additional Bus Trip Distributions
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 5-4

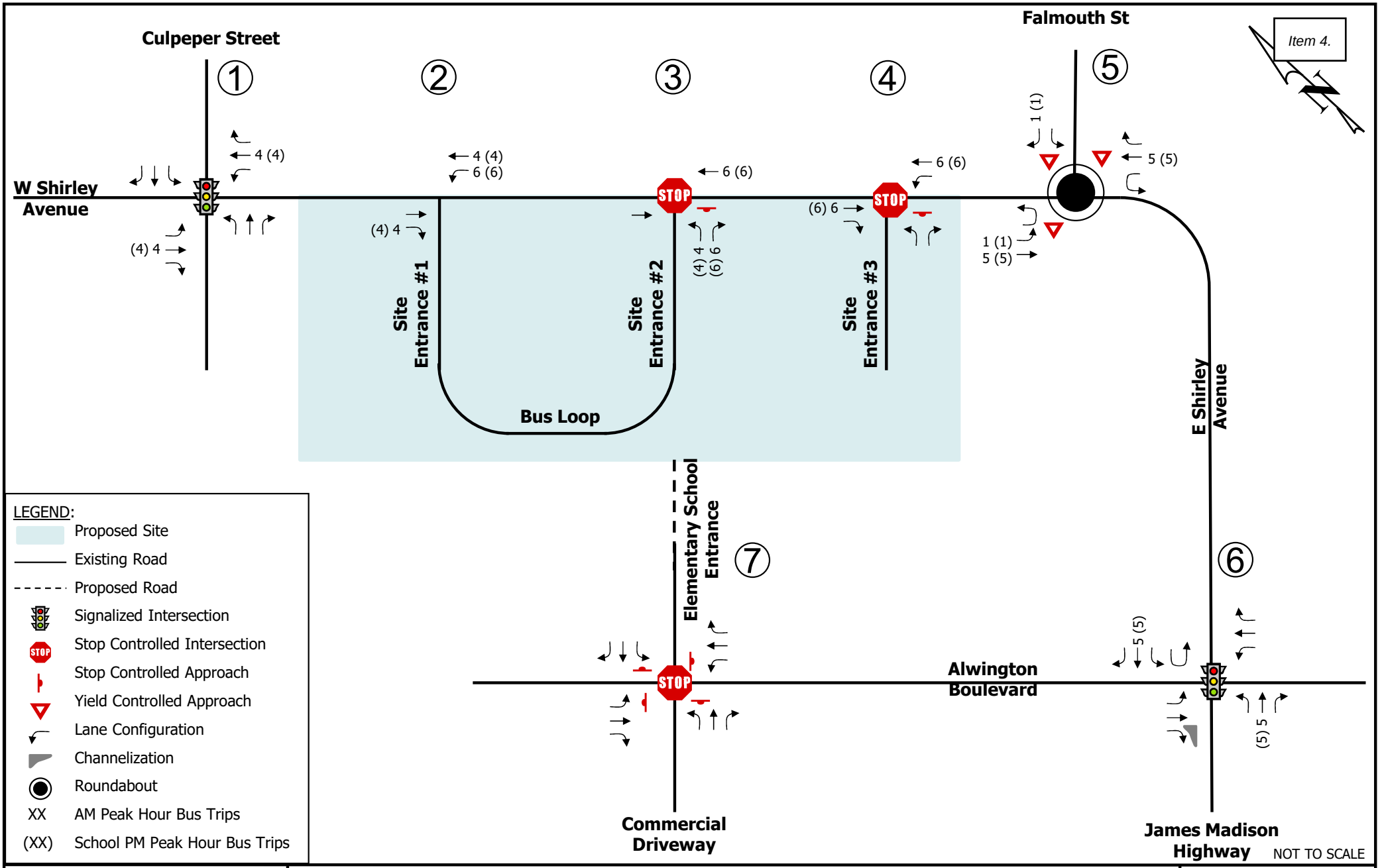


NOT TO SCALE

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Additional Vehicle (Non-Bus) Trip Distributions
Taylor Middle School – Addition
Town of Warrenton, Virginia

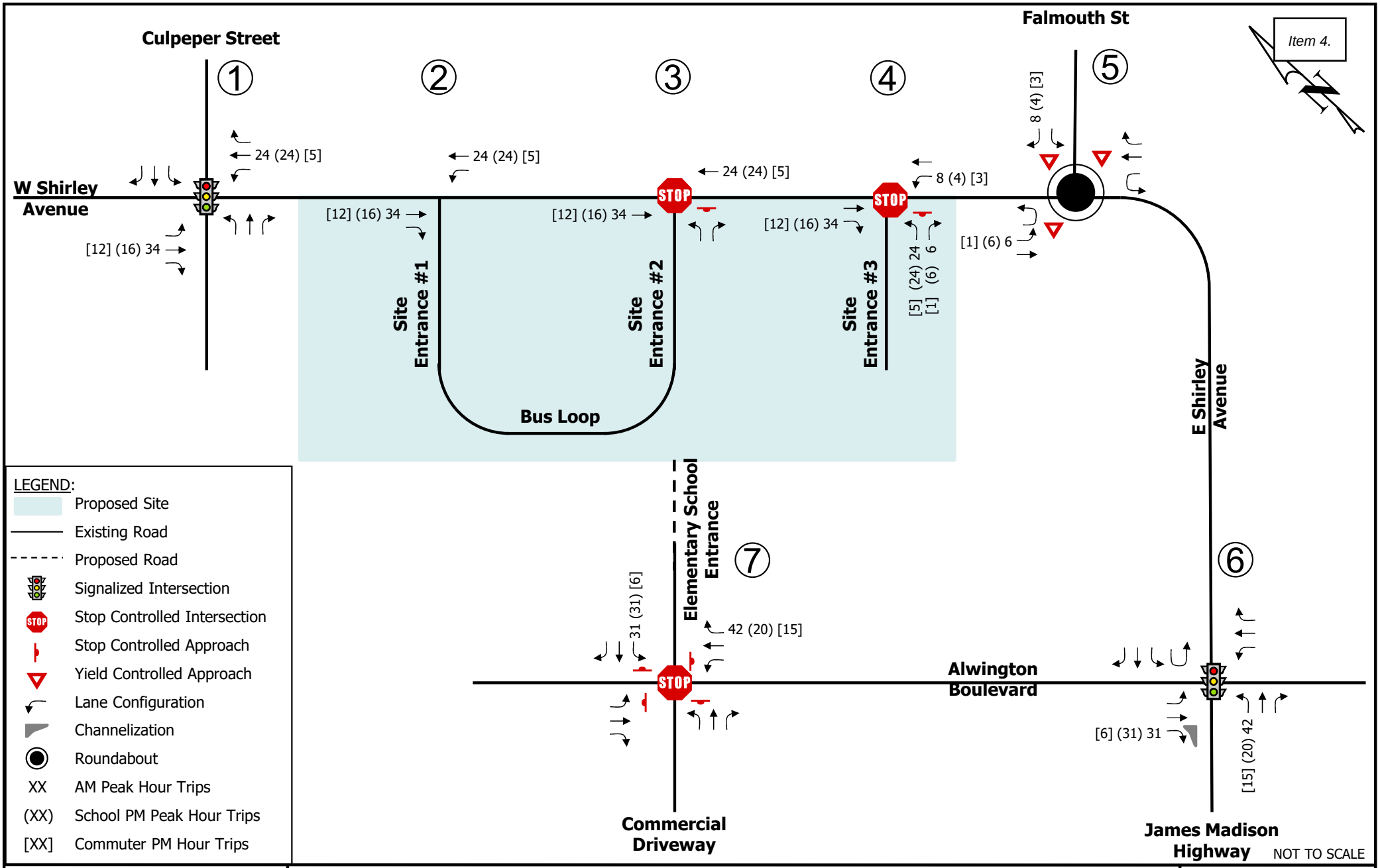
Figure 5-5



TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Site Generated Additional Bus Trips
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 5-6



NOT TO SCALE

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Site Generated Additional Vehicle (Non-Bus) Trips
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 5-7

6 2026 TOTAL FUTURE CONDITIONS

To complete the analysis of 2026 total conditions (with the proposed development), the estimated site trips were added to the background 2026 traffic volumes. The projected volumes were then used to complete the capacity analysis.

6.1 TOTAL FUTURE TRAFFIC VOLUMES

The rerouted existing trips shown on Figures 5-2 and 5-3 and site generated trips shown on Figures 5-6 and 5-7 were added to the 2026 background traffic volumes (Figure 4-1) to yield the 2026 total future traffic volumes shown in Figure 6-1.

6.2 2026 FUTURE CONDITIONS ANALYSIS RESULTS

Table 6-1 summarizes the 2026 future intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the future intersection geometry (Figure 5-1), 2026 future peak hour traffic volumes shown on Figure 6-1 and the existing signal timings as provided by the Town of Warrenton and 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 numbers used in the SYNCHRO models and report figures.

As shown in Table 6-1, under 2026 future conditions, all intersections experience similar levels of service, delay, and queueing as under 2026 background conditions. Specifically:

1. The East Shirley/Culpeper Street intersection will operate an overall LOS C in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns.

2. The school entrances along East Shirley Avenue operate at LOS C or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

6. The expansion of the middle school will have minimal impact on the external surrounding roadway network and no improvements are required at the study intersections.

    a. The expansion will provide a link between the elementary school and the middle school during school pick up and drop off times only. During all other times, the connection between the schools will be gated.

Table 6-1: 2026 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				SCHOOL PM PEAK HOUR				COMMUTER PM PEAK HOUR			
			Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[2] (ft)	Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[2] (ft)	Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[2] (ft)
1. Shirley Avenue (E-W) at	EB Left	215	47.0	D	50	98	54.3	D	62	186	52.1	D	63	214
Culpeper Street (N-S)	EB Thru		22.6	C	297	280	28.5	C	#509	401	29.5	C	438	363
Signalized	EB Right		17.0	B	0	64	17.3	B	12	74	19.7	B	43	89
	EB Approach		*23.3*	*C*	--	--	*28.3*	*C*	--	--	*28.7*	*C*	--	--
	WB Left	185	40.7	D	50	172	42.1	D	61	161	43.2	D	56	164
	WB Thru/Right		22.6	C	406	378	23.8	C	#522	397	24.5	C	426	344
	WB Approach		*23.7*	*C*	--	--	*25.0*	*C*	--	--	*25.7*	*C*	--	--
	NB Left/Thru/Right		45.4	D	#239	212	45.6	D	204	225	45.7	D	195	215
	NB Approach		*45.4*	*D*	--	--	*45.6*	*D*	--	--	*45.7*	*D*	--	--
	SB Left	125	40.8	D	30	52	41.0	D	44	86	37.6	D	53	106
	SB Thru/Right		42.5	D	59	99	44.3	D	92	147	43.1	D	153	184
	SB Approach		*42.1*	*D*	--	--	*43.5*	*D*	--	--	*42.0*	*D*	--	--
	Overall		**28.4**	**C**	**--**	**--**	**30.3**	**C**	**--**	**--**	**31.2**	**C**	**--**	**--**
2. E Shirley Avenue (E-W) at	EB Thru		†	†	0	--	†	†	0	--	†	†	0	--
Site Entrance #1 (N-S)	EB Right	125	†	†	0	--	†	†	0	--	†	†	0	--
Unsignalized	*EB Approach*		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	WB Left	255	8.5	A	3	46	8.7	A	3	40	†	†	0	--
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		*0.6*	*A*	--	--	*0.6*	*A*	--	--	*†*	*†*	--	--
3. E Shirley Avenue (E-W) at	EB Thru		†	†	0	--	†	†	0	--	†	†	0	--
Site Entrance #2 (N-S)	*EB Approach*		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
Unsignalized	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	NB Left		18.7	C	7	66	23.2	C	9	54	†	†	0	--
	NB Right		11.1	B	5	72	12.8	B	6	69	†	†	0	--
	NB Approach		*14.0*	*B*	--	--	*16.8*	*C*	--	--	*†*	*†*	--	--
4. E Shirley Avenue (E-W) at	EB Thru		†	†	0	--	†	†	0	0	†	†	0	3
Site Entrance #3 (N-S)	EB Right	140	†	†	0	27	†	†	0	4	†	†	0	4
Unsignalized	*EB Approach*		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	WB Left	160	8.6	A	4	40	8.9	A	1	31	9.0	A	5	60
	WB Thru		†	†	0	--	*†*	*†*	--	--	*†*	*†*	--	--
	WB Approach		*0.9*	*A*	--	--	*0.2*	*A*	--	--	*0.9*	*A*	--	--
	NB Left-Right		17.4	C	27	79	22.4	C	37	91	21.9	C	9	46
	NB Approach		*17.4*	*C*	--	--	*22.4*	*C*	--	--	*21.9*	*C*	--	--
5. E Shirley Avenue (E-W) at	*EB Approach*		*1.8*	*A*	*20*	--	*1.9*	*A*	*30*	--	*1.9*	*A*	*30*	--
Falmouth Street (N)	*WB Approach*		*10.3*	*B*	*111*	--	*9.6*	*A*	*106*	--	*13.3*	*B*	*188*	--
Roundabout*	*SB Approach*		*8.7*	*A*	*37*	--	*7.3*	*A*	*34*	--	*8.2*	*A*	*40*	--
	Overall		**7.1**	**A**	**--**	**--**	**6.0**	**A**	**--**	**--**	**8.0**	**A**	**--**	**--**
6. E Shirley Avenue/ (N-S)	EB Left	560	35.6	D	68	144	37.0	D	130	165	36.7	D	125	157
James Madison Highway at	EB Left/Thru		35.6	D	68	78	37.3	D	132	114	36.7	D	125	111
Alwington Boulevard (E-W)	EB Right[3]		0.2	A	0	22	0.3	A	0	52	0.2	A	0	46
Signalized	*EB Approach*		*16.2*	*B*	--	--	*19.5*	*B*	--	--	*20.3*	*C*	--	--
	WB Left/Thru/Right		34.1	C	0	61	35.2	D	26	70	34.8	C	0	53
	WB Approach		*34.1*	*C*	--	--	*35.2*	*D*	--	--	*34.8*	*C*	--	--
	NB Left	315	18.2	B	146	210	18.7	B	115	167	19.0	B	122	190
	NB Thru		17.4	B	129	198	18.1	B	86	128	18.1	B	95	139
	NB Right	160	15.3	B	0	23	16.9	B	0	43	16.7	B	0	32
	NB Approach		*17.7*	*B*	--	--	*18.4*	*B*	--	--	*18.5*	*B*	--	--
	SB Left	165	14.6	B	11	45	16.3	B	18	39	16.2	B	15	80
	SB Thru		25.1	C	63	102	25.9	C	123	160	25.8	C	140	166
	SB Right	250	18.1	B	0	114	15.8	B	9	81	15.1	B	1	72
	SB Approach		*21.2*	*C*	--	--	*22.6*	*C*	--	--	*23.5*	*C*	--	--
	Overall		**18.3**	**B**	**--**	**--**	**20.4**	**C**	**--**	**--**	**20.9**	**C**	**--**	**--**
7. Alwington Boulevard (E-W) at	EB Left/Thru/Right		7.6	A	0	8	7.6	A	0	23	7.3	A	3	11
Elementary School Entrance/	*EB Approach*		*7.6*	*A*	--	--	*7.6*	*A*	--	--	*7.3*	*A*	--	--
Commercial Entrance (N-S)	WB Left/Thru		9.0	A	10	76	8.9	A	3	64	8.9	A	3	64
Unsignalized**	WB Right	270	7.9	A	20	86	7.2	A	8	62	6.8	A	3	67
	WB Approach		*8.2*	*A*	--	--	*7.5*	*A*	--	--	*7.5*	*A*	--	--
	NB Left/Thru/Right		7.2	A	3	88	6.7	A	0	60	6.6	A	3	57
	NB Approach		*7.2*	*A*	--	--	*6.7*	*A*	--	--	*6.6*	*A*	--	--
	SB Left/Thru/Right		8.5	A	10	70	7.8	A	8	53	7.5	A	3	43
	NB Approach		*8.5*	*A*	--	--	*7.8*	*A*	--	--	*7.5*	*A*	--	--

[1] *Overall intersection LOS and delay reported for signalized intersections and roundabouts only.*

[2] SimTraffic Queues are average maximum queues after 10 runs of 60 minutes each.

[3] *Channelized right turn not controlled by the signal.*

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

† SYNCHRO does not provide level of service or delay for unsignalized movements with no conflicting volumes.

* Note: SIDRA was used to analyze the roundabout at intersection 5.

** Note: HCM 6th Edition was used to analyze the all way stop controlled intersection at intersection 7.

6.3 2026 TURN LANE WARRANT ANALYSIS

As shown in Figures 2-1 and 5-1, the following right and left turn lanes are present under existing conditions at the site entrances on E Shirley Avenue:

Western Site Entrance (Bus Ingress Only)

Eastbound right turn lane with 125 feet of storage

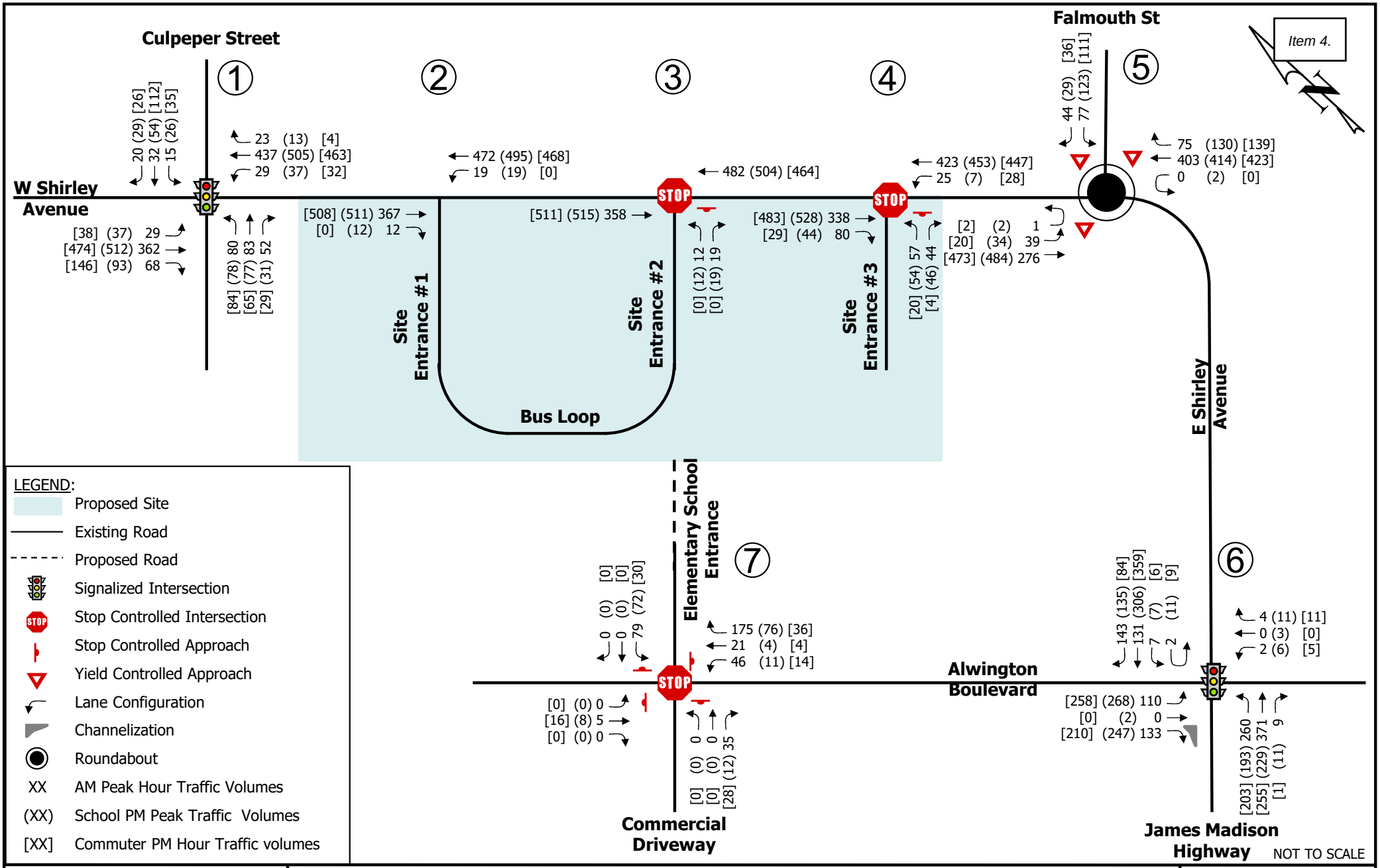
Westbound left turn lane with 255 feet of storage

Eastern Site Entrance (Vehicle Ingress and Egress)

Eastbound right turn lane with 140 feet of storage

Westbound left turn lane with 160 feet of storage

As shown in Table 6-1, under 2026 future conditions, the 95th percentile and maximum queues at the site entrances will be contained within the existing available storage. No additional storage is required.



LEGEND:

- Proposed Site
- Existing Road
- Proposed Road
- Signalized Intersection
- Stop Controlled Intersection
- Stop Controlled Approach
- Yield Controlled Approach
- Lane Configuration
- Channelization
- Roundabout
- XX AM Peak Hour Traffic Volumes
- (XX) School PM Peak Traffic Volumes
- [XX] Commuter PM Hour Traffic volumes

NOT TO SCALE

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

2026 Total Future Peak Hour Volumes
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 6-1

7 2032 BACKGROUND CONDITIONS

The background 2032 volumes were analyzed assuming existing intersection geometry in conjunction with projected background traffic volumes, which consists of general traffic growth and growth due to an approved and the neighboring Arrington development.

7.1 General Traffic Growth

The background volumes were based on a 1.0% annual growth rate. The growth rate was compounded annually for the nine-year period from 2023 to 2032 and was applied to all movements at the study intersections. The resulting 2032 vehicle background (existing + growth) volumes are shown on Figure 7-1.

7.2 Approved Background Developments

Per coordination with the Town of Warrenton, the traffic associated with the approved Arrington Development was included in the 2032 background conditions analysis.

The generated site trips were included in the approved Arrington Development TIA were extracted and applied to the study area intersections and are shown on Figure 7-2. Note that the study area for the Arrington Development TIA is south of the study area for this report. As a result, the distributions were assigned to the study area road network according to existing travel patterns, the nature of the use, the 2023 existing traffic volumes, and local knowledge.

7.3 2032 Total Background

The Arrington development trips shown on Figure 7-2 were added to the existing + growth traffic shown on Figure 7-1 to yield the total 2032 background traffic forecasts which are shown on Figure 7-3.

7.4 Background 2032 Capacity Analysis Results

Table 7-1 summarizes the 2032 background intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the existing intersection geometry (Figure 2-1), 2032 background peak hour traffic volumes shown on Figure 7-3 and the existing signal timings as provided by the Town of Warrenton and 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 numbers used in the SYNCHRO models and report figures.

As shown in Table 7-1, under 2032 background conditions, all intersections experience similar levels of service, delay, and queueing as under 2026 background conditions. Specifically:

1. The East Shirley/Culpeper Street intersection will operate an overall LOS C or D in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns with the exception of the eastbound left approach which will operate at LOS E in both PM peaks.
    a. It is noted that the traffic signal is running under "free" operations and is likely giving more time to the mainline through movements which results in the LOS E. The delays are less than the overall cycle length of the intersection indicating that the average traffic waits at most one cycle length to traverse the intersection.

2. The school entrances along East Shirley Avenue operate at LOS D or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A or B in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

Table 7-1: 2032 Background Conditions
Intersection Level of Service and Delay Summary

Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				SCHOOL PM PEAK HOUR				COMMUTER PM PEAK HOUR			
			Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[2] (ft)	Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[2] (ft)	Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[2] (ft)
1. Shirley Avenue (E-W) at	EB Left	215	48.9	D	53	172	58.6	E	64	204	56.5	E	67	214
Culpeper Street (N-S)	EB Thru		22.5	C	296	326	32.0	C	#601	486	36.4	D	#613	504
Signalized	EB Right		17.1	B	0	58	17.3	B	15	76	19.9	B	49	80
	EB Approach		*23.4*	*C*	--	--	*31.4*	*C*	--	--	*34.1*	*C*	--	--
	WB Left	185	41.9	D	53	178	43.9	D	64	184	45.5	D	58	184
	WB Thru/Right		24.6	C	#507	434	25.8	C	#597	479	27.5	C	#561	417
	WB Approach		*25.6*	*C*	--	--	*26.9*	*C*	--	--	*28.5*	*C*	--	--
	NB Left/Thru/Right		49.3	D	#264	230	48.4	D	#228	235	49.7	D	209	210
	NB Approach		*49.3*	*D*	--	--	*48.4*	*D*	--	--	*49.7*	*D*	--	--
	SB Left	125	41.8	D	31	56	42.5	D	45	87	39.2	D	55	116
	SB Thru/Right		43.6	D	62	109	46.2	D	97	144	46.1	D	163	186
	SB Approach		*43.2*	*D*	--	--	*45.3*	*D*	--	--	*44.7*	*D*	--	--
	Overall		**30.0**	**C**	**--**	**--**	**32.8**	**C**	**--**	**--**	**35.1**	**D**	**--**	**--**
2. E Shirley Avenue (E-W) at	EB Thru		†	†	0	8	†	†	0	--	†	†	0	--
Site Entrance #1 (N-S)	EB Right	125	†	†	0	13	†	†	0	--	†	†	0	2
Unsignalized	*EB Approach*		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	WB Left	255	8.8	A	8	65	8.8	A	1	34	8.9	A	1	21
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		*1.2*	*A*	--	--	*0.3*	*A*	--	--	*0.2*	*A*	--	--
3. E Shirley Avenue (E-W) at	EB Thru		†	†	0	--	†	†	0	5	†	†	0	--
Site Entrance #2 (N-S)	*EB Approach*		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
Unsignalized	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	NB Left		24.1	C	31	96	32.4	D	40	77	26.6	D	13	46
	NB Right		11.6	B	14	73	14.9	B	22	102	12.8	B	1	32
	NB Approach		*17.2*	*C*	--	--	*22.2*	*C*	--	--	*24.3*	*C*	--	--
4. E Shirley Avenue (E-W) at	EB Thru		†	†	0	--	†	†	0	--	†	†	0	--
Site Entrance #3 (N-S)	EB Right	140	†	†	0	6	†	†	0	--	†	†	0	--
Unsignalized	*EB Approach*		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	WB Left	160	8.3	A	3	35	9.0	A	3	40	9.3	A	4	54
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		*0.6*	*A*	--	--	*0.5*	*A*	--	--	*0.7*	*A*	--	--
5. E Shirley Avenue (E-W) at	*EB Approach*		*1.9*	*A*	*25*	--	*2.1*	*A*	*37*	--	*2.2*	*A*	*40*	--
Falmouth Street (N)	*WB Approach*		*14.6*	*B*	*209*	--	*11.3*	*B*	*149*	--	*18.6*	*B*	*330*	--
Roundabout*	*SB Approach*		*11.0*	*B*	*49*	--	*8.3*	*A*	*42*	--	*10.6*	*B*	*60*	--
	Overall		**9.9**	**A**	**--**	**--**	**6.9**	**A**	**--**	**--**	**10.7**	**B**	**--**	**--**
6. E Shirley Avenue/ (N-S)	EB Left	560	35.3	D	88	156	38.2	D	151	178	40.4	D	154	188
James Madison Highway at	EB Left/Thru		35.6	D	88	110	38.6	D	153	130	40.5	D	155	144
Alwington Boulevard (E-W)	EB Right[3]		0.1	A	0	11	0.2	A	0	77	0.2	A	0	60
Signalized	*EB Approach*		*23.8*	*C*	--	--	*23.8*	*C*	--	--	*23.8*	*C*	--	--
	WB Left/Thru/Right		33.7	C	0	53	35.6	D	29	70	36.2	D	0	56
	WB Approach		*33.7*	*C*	--	--	*35.6*	*D*	--	--	*36.2*	*D*	--	--
	NB Left	315	18.0	B	110	176	19.0	B	105	176	19.3	B	119	193
	NB Thru		19.2	B	172	219	19.7	B	99	159	19.5	B	111	160
	NB Right	160	16.1	B	0	20	18.1	B	0	43	17.6	B	0	17
	NB Approach		*18.8*	*B*	--	--	*19.4*	*B*	--	--	*19.4*	*B*	--	--
	SB Left	165	15.5	B	12	45	16.7	B	19	68	16.4	B	17	107
	SB Thru		24.8	C	82	115	26.9	C	150	186	27.9	C	174	205
	SB Right	250	16.8	B	20	116	15.5	B	16	96	15.7	B	12	112
	SB Approach		*20.8*	*C*	--	--	*23.2*	*C*	--	--	*24.6*	*C*	--	--
	Overall		**20.4**	**C**	**--**	**--**	**22.4**	**C**	**--**	**--**	**22.9**	**C**	**--**	**--**
7. Alwington Boulevard (E-W) at	EB Left/Thru/Right		7.6	A	5	23	7.6	A	5	47	7.6	A	5	24
Elementary School Entrance/	*EB Approach*		*7.6*	*A*	--	--	*7.6*	*A*	--	--	*7.6*	*A*	--	--
Commercial Entrance (N-S)	WB Left/Thru		8.9	A	13	69	8.8	A	8	72	9.4	A	13	79
Unsignalized**	WB Right	270	7.2	A	10	68	6.9	A	5	58	6.8	A	3	59
	WB Approach		*8.0*	*A*	--	--	*7.8*	*A*	--	--	*8.9*	*A*	--	--
	NB Left/Thru/Right		7.1	A	3	85	6.7	A	0	60	6.9	A	3	58
	NB Approach		*7.1*	*A*	--	--	*6.7*	*A*	--	--	*6.9*	*A*	--	--
	SB Left/Thru/Right		8.0	A	3	54	7.5	A	0	31	7.7	A	3	33
	NB Approach		*8.0*	*A*	--	--	*7.5*	*A*	--	--	*7.7*	*A*	--	--

[1] *Overall intersection LOS and delay reported for signalized intersections and roundabouts only.*

[2] SimTraffic Queues are average maximum queues after 10 runs of 60 minutes each.

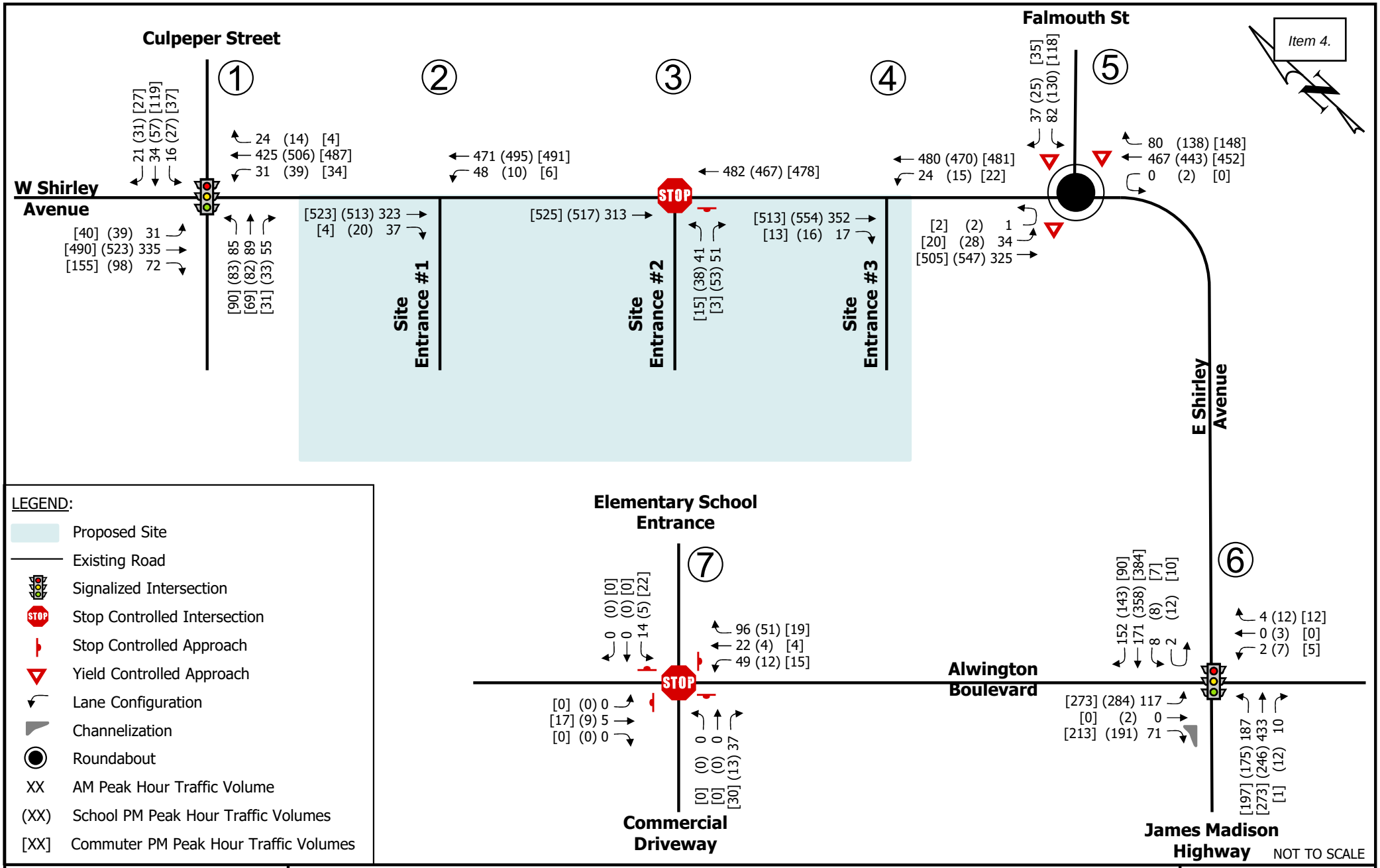
[3] *Channelized right turn not controlled by the signal.*

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

† SYNCHRO does not provide level of service or delay for unsignalized movements with no conflicting volumes.

* Note: SIDRA was used to analyze the roundabout at intersection 5.

** Note: HCM 6th Edition was used to analyze the all way stop controlled intersection at intersection 7.



LEGEND:

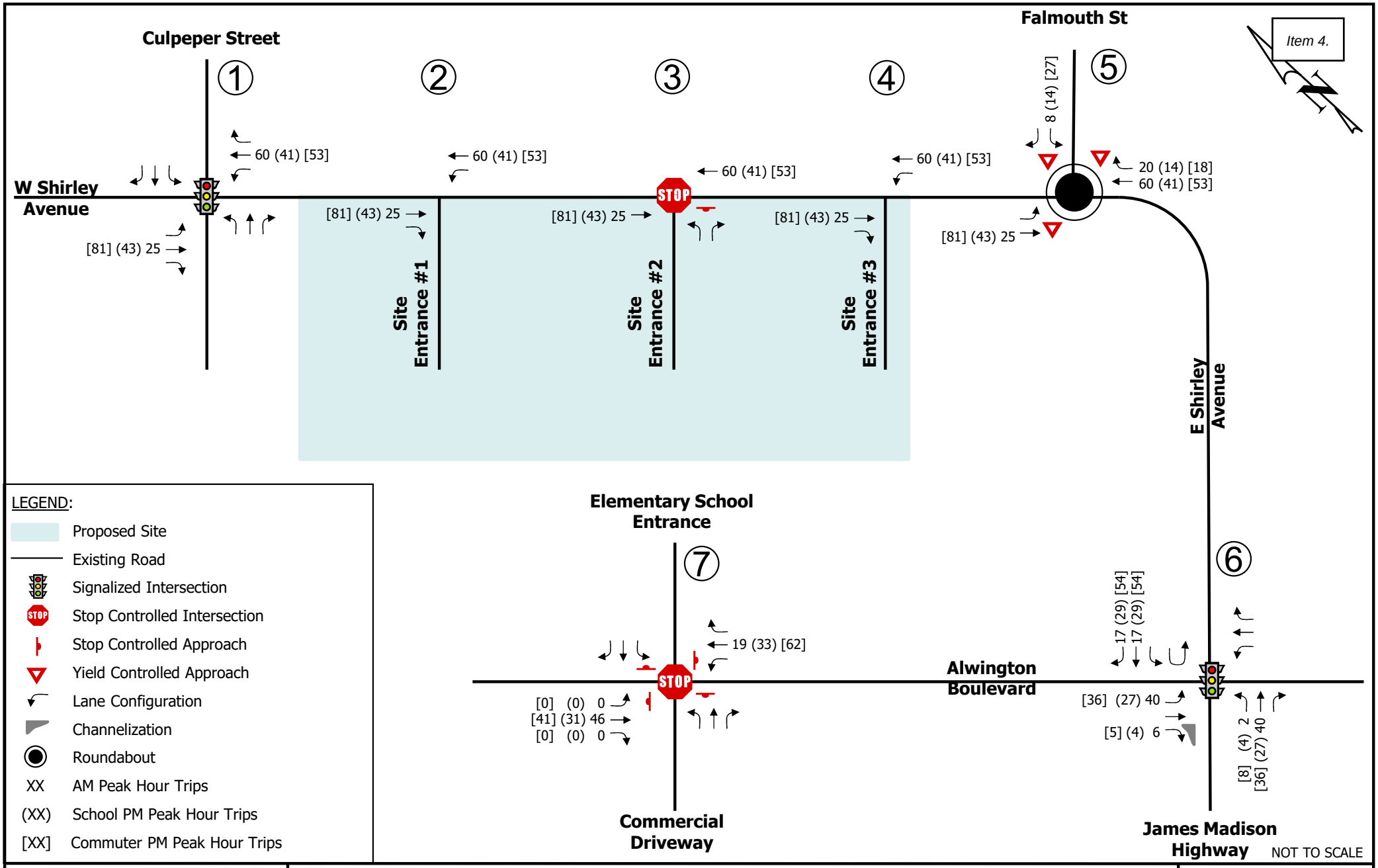
- Proposed Site
- Existing Road
- Signalized Intersection
- Stop Controlled Intersection
- Stop Controlled Approach
- Yield Controlled Approach
- Lane Configuration
- Channelization
- Roundabout
- XX AM Peak Hour Traffic Volume
- (XX) School PM Peak Hour Traffic Volumes
- [XX] Commuter PM Peak Hour Traffic Volumes

NOT TO SCALE

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

2032 Existing + Growth Peak Hour Volumes
Taylor Middle School – Addition
Town of Warrenton, Virginia

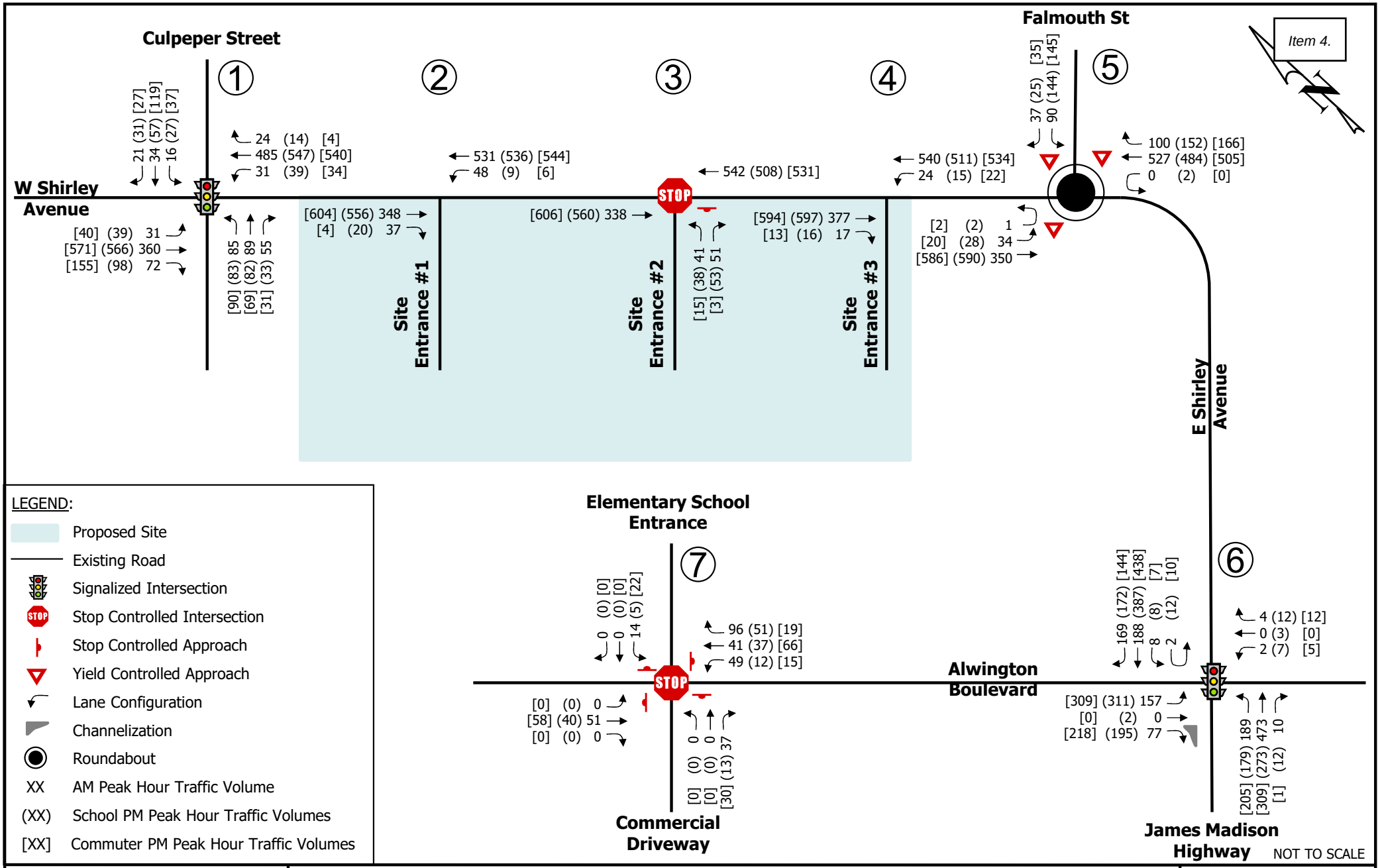
Figure 7-1



TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Arrington Development Trips
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 7-2



LEGEND:

- Proposed Site
- Existing Road
- Signalized Intersection
- Stop Controlled Intersection
- Stop Controlled Approach
- Yield Controlled Approach
- Lane Configuration
- Channelization
- Roundabout
- XX AM Peak Hour Traffic Volume
- (XX) School PM Peak Hour Traffic Volumes
- [XX] Commuter PM Peak Hour Traffic Volumes

NOT TO SCALE

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

2032 Total Background Peak Hour Volumes
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 7-3

8 2032 TOTAL FUTURE CONDITIONS

To complete the analysis of 2032 total conditions (with the proposed expansion), the estimated site trips were added to the background 2032 traffic volumes. The projected volumes were then used to complete the capacity analysis.

8.1 2032 TOTAL FUTURE TRAFFIC VOLUMES

The rerouted existing trips shown on Figure 5-2 and Figure 5-3 and The site generated trips shown on Figures 5-6 and 5-7 were added to the 2032 total background traffic volumes (Figure 7-3) to yield the 2032 total future traffic volumes shown in Figure 8-1.

8.2 2032 FUTURE CONDITIONS ANALYSIS RESULTS

Table 8-1 summarizes the 2032 future intersection LOS, delay, 95th percentile queue lengths (Synchro), and maximum queue lengths (SimTraffic) based on the future intersection geometry (Figure 5-1), 2032 future peak hour traffic volumes shown on Figure 8-1 and the existing signal timings as provided by the Town of Warrenton and 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 numbers used in the SYNCHRO models and report figures.

As shown in Table 8-1, under 2032 future conditions, all intersections experience similar levels of service, delay, and queueing as under 2032 background conditions. Specifically:

1. The East Shirley/Culpeper Street intersection will operate an overall LOS C or D in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns with the exception of the eastbound left approach which will operate at LOS E in both PM peaks.
    a. It is noted that the traffic signal is running under "free" operations and is likely giving more time to the mainline through movements which results in the LOS E. The delays are less than the overall cycle length of the intersection indicating that the average traffic waits at most one cycle length to traverse the intersection.

2. The school entrances along East Shirley Avenue operate at LOS D or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A or B in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

6. The expansion of the middle school will have minimal impact on the external surrounding roadway network and no improvements are required at the study intersections.

a. The expansion will provide a link between the elementary school and the middle school during school pick up and drop off times only. During all other times, the connection between the schools will be gated.

2032 TURN LANE WARRANT ANALYSIS

As shown in Figures 2-1 and 5-1, the following right and left turn lanes are present under existing conditions at the site entrances on E Shirley Avenue:

Western Site Entrance (Bus Ingress Only)

Eastbound right turn lane with 125 feet of storage

Westbound left turn lane with 255 feet of storage

Eastern Site Entrance (Vehicle Ingress and Egress)

Eastbound right turn lane with 140 feet of storage

Westbound left turn lane with 160 feet of storage

As shown in Table 8-1, under 2032 future conditions, the 95th percentile and maximum queues at the site entrances will be contained within the existing available storage. No additional storage is required.

Table 8-1: 2032 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				SCHOOL PM PEAK HOUR				COMMUTER PM PEAK HOUR			
			Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[(2)] (ft)	Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[(2)] (ft)	Delay [1] (sec/veh)	LOS [1]	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length[(2)] (ft)
1. Shirley Avenue (E-W) at	EB Left	215	48.9	D	53	164	58.8	E	64	214	57.4	E	67	214
Culpeper Street (N-S)	EB Thru		23.8	C	335	325	33.8	C	#636	551	37.7	D	#634	548
Signalized	EB Right		17.1	B	0	61	17.3	B	15	77	20.0	B	51	111
	EB Approach		*24.4*	*C*	--	--	*32.9*	*C*	--	--	*35.2*	*D*	--	--
	WB Left	185	41.9	D	53	170	44.1	D	64	177	45.8	D	58	184
	WB Thru/Right		26.3	C	#555	444	27.3	C	#645	578	27.8	C	#569	467
	WB Approach		*27.2*	*C*	--	--	*28.3*	*C*	--	--	*28.8*	*C*	--	--
	NB Left/Thru/Right		49.3	D	#264	251	48.5	D	#228	248	49.8	D	209	246
	NB Approach		*49.3*	*D*	--	--	*48.5*	*D*	--	--	*49.8*	*D*	--	--
	SB Left	125	41.8	D	31	47	42.7	D	45	82	39.4	D	55	114
	SB Thru/Right		43.6	D	62	86	46.3	D	97	147	46.3	D	163	199
	SB Approach		*43.2*	*D*	--	--	*45.5*	*D*	--	--	*44.9*	*D*	--	--
	Overall		**30.7**	**C**	**--**	**--**	**33.9**	**C**	**--**	**--**	**35.7**	**D**	**--**	**--**
2. E Shirley Avenue (E-W) at	EB Thru		†	†	0	--	†	†	0	--	†	†	0	--
Site Entrance #1 (N-S)	EB Right	125	†	†	0	6	†	†	0	--	†	†	0	--
Unsignalized	*EB Approach*		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	WB Left	255	8.6	A	3	44	9.0	A	3	44	†	†	0	--
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		*0.5*	*A*	--	--	*0.5*	*A*	--	--	*†*	*†*	--	--
3. E Shirley Avenue (E-W) at	EB Thru		†	†	0	2	†	†	0	--	†	†	0	--
Site Entrance #2 (N-S)	*EB Approach*		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
Unsignalized	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	NB Left		22.1	C	8	64	24.5	C	10	50	†	†	0	--
	NB Right		11.5	B	5	68	13.7	B	7	65	†	†	0	--
	NB Approach		*15.6*	*C*	--	--	*17.9*	*C*	--	--	*†*	*†*	--	--
4. E Shirley Avenue (E-W) at	EB Thru		†	†	0	7	†	†	0	--	†	†	0	--
Site Entrance #3 (N-S)	EB Right	140	†	†	0	12	†	†	0	6	†	†	0	--
Unsignalized	*EB Approach*		*†*	*†*	--	--	*†*	*†*	--	--	*†*	*†*	--	--
	WB Left	160	8.7	A	4	45	9.2	A	1	33	9.5	A	5	52
	WB Thru		†	†	0	--	*†*	*†*	--	--	*†*	*†*	--	--
	WB Approach		*0.7*	*A*	--	--	*0.2*	*A*	--	--	*0.8*	*A*	--	--
	NB Left-Right		20.6	C	33	82	28.2	D	49	100	28.5	D	12	50
	NB Approach		*20.6*	*C*	--	--	*28.2*	*D*	--	--	*28.5*	*D*	--	--
5. E Shirley Avenue (E-W) at	*EB Approach*		*1.8*	*A*	*24*	--	*2.1*	*A*	*35*	--	*2.2*	*A*	*40*	--
Falmouth Street (N)	*WB Approach*		*13.6*	*B*	*179*	--	*11.5*	*B*	*148*	--	*18.4*	*B*	*325*	--
Roundabout*	*SB Approach*		*10.6*	*B*	*50*	--	*8.4*	*A*	*43*	--	*10.7*	*B*	*61*	--
	Overall		**9.3**	**A**	**--**	**--**	**7.1**	**A**	**--**	**--**	**10.7**	**B**	**--**	**--**
6. E Shirley Avenue/ (N-S)	EB Left	560	37.3	D	90	175	38.1	D	151	173	41.3	D	155	161
James Madison Highway at	EB Left/Thru		37.4	D	91	129	38.5	D	153	141	41.4	D	156	124
Alwington Boulevard (E-W)	EB Right[(3)]		0.2	A	0	36	0.3	A	0	84	0.2	A	0	63
Signalized	*EB Approach*		*19.7*	*B*	--	--	*21.0*	*C*	--	--	*23.9*	*C*	--	--
	WB Left/Thru/Right		35.1	D	0	60	35.8	D	29	78	36.3	D	0	52
	WB Approach		*35.1*	*D*	--	--	*35.8*	*D*	--	--	*36.3*	*D*	--	--
	NB Left	315	19.3	B	160	219	19.4	B	120	196	19.6	B	128	185
	NB Thru		18.4	B	157	203	19.7	B	98	165	19.3	B	109	178
	NB Right	160	15.7	B	0	23	18.1	B	0	50	17.5	B	0	31
	NB Approach		*18.7*	*B*	--	--	*19.5*	*B*	--	--	*19.4*	*B*	--	--
	SB Left	165	15.1	B	12	65	16.7	B	19	56	16.2	B	17	68
	SB Thru		26.3	C	75	119	27.6	C	142	175	28.0	C	173	189
	SB Right	250	18.3	B	3	122	16.2	B	18	100	15.9	B	13	99
	SB Approach		*22.0*	*C*	--	--	*23.6*	*C*	--	--	*24.7*	*C*	--	--
	Overall		**19.8**	**B**	**--**	**--**	**21.6**	**C**	**--**	**--**	**22.9**	**C**	**--**	**--**
7. Alwington Boulevard (E-W) at	EB Left/Thru/Right		8.0	A	5	20	7.9	A	5	42	7.6	A	5	23
Elementary School Entrance/	*EB Approach*		*8.0*	*A*	--	--	*7.9*	*A*	--	--	*7.6*	*A*	--	--
Commercial Entrance (N-S)	WB Left/Thru		9.2	A	13	80	9.1	A	8	73	9.4	A	13	77
Unsignalized**	WB Right	270	8.1	A	23	79	7.2	A	8	72	6.9	A	3	66
	WB Approach		*8.5*	*A*	--	--	*7.9*	*A*	--	--	*8.6*	*A*	--	--
	NB Left/Thru/Right		7.4	A	3	74	6.9	A	0	64	7.0	A	3	61
	NB Approach		*7.4*	*A*	--	--	*6.9*	*A*	--	--	*7.0*	*A*	--	--
	SB Left/Thru/Right		8.8	A	10	65	8.0	A	8	59	7.8	A	3	41
	NB Approach		*8.8*	*A*	--	--	*8.0*	*A*	--	--	*7.8*	*A*	--	--

[1] *Overall intersection LOS and delay reported for signalized intersections and roundabouts only.*

[2] SimTraffic Queues are average maximum queues after 10 runs of 60 minutes each.

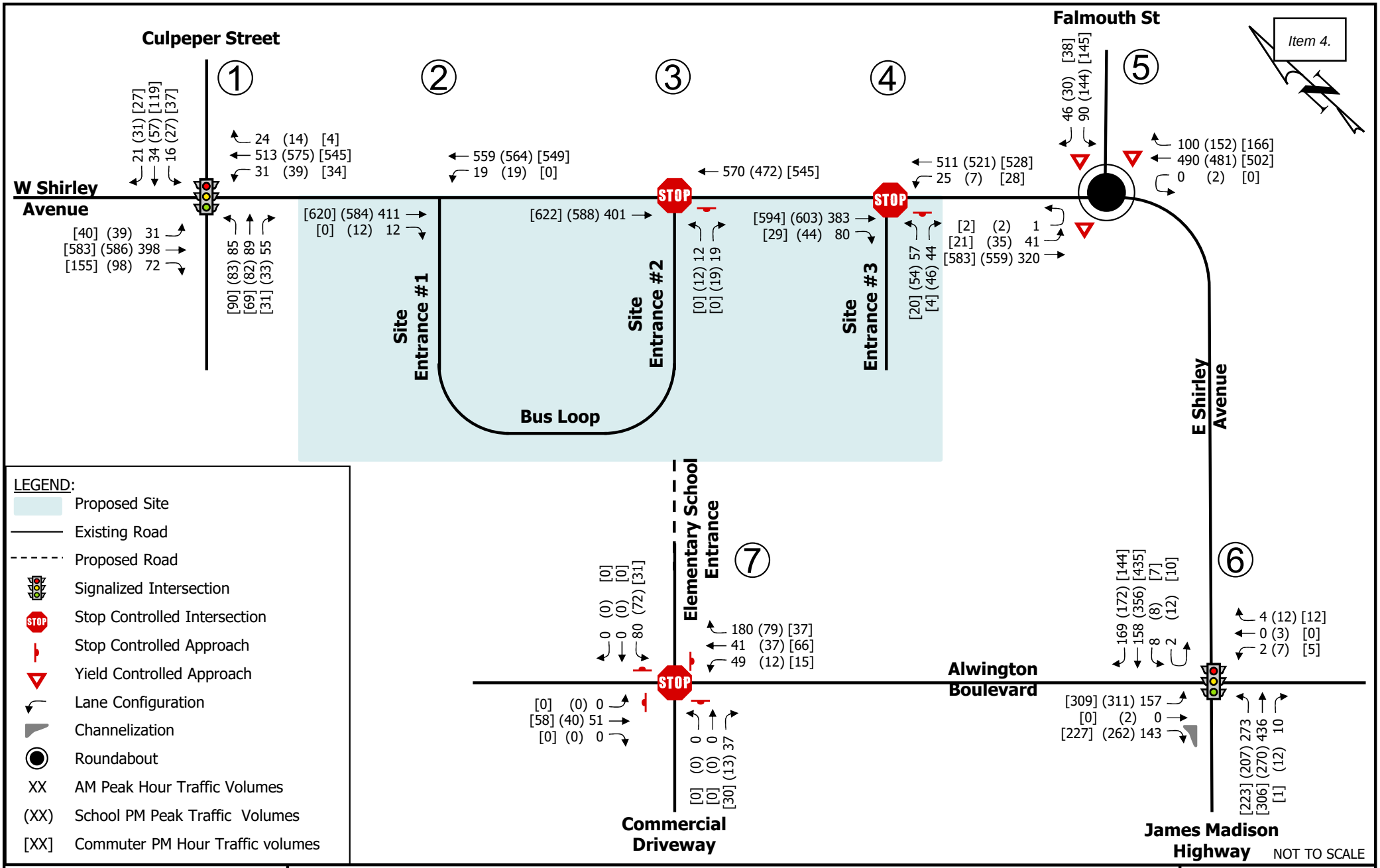
[3] *Channelized right turn not controlled by the signal.*

- 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

† SYNCHRO does not provide level of service or delay for unsignalized movements with no conflicting volumes.

* Note: SIDRA was used to analyze the roundabout at intersection 5.

** Note: HCM 6th Edition was used to analyze the all way stop controlled intersection at intersection 7.



LEGEND:

- Proposed Site
- Existing Road
- Proposed Road
- Signalized Intersection
- Stop Controlled Intersection
- Stop Controlled Approach
- Yield Controlled Approach
- Lane Configuration
- Channelization
- Roundabout
- XX AM Peak Hour Traffic Volumes
- (XX) School PM Peak Traffic Volumes
- [XX] Commuter PM Hour Traffic volumes

NOT TO SCALE

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

2032 Total Future Peak Hour Volumes
Taylor Middle School – Addition
Town of Warrenton, Virginia

Figure 8-1

9 CONCLUSIONS

9.1 PRINCIPAL FINDINGS

Based on the analysis contained herein, the following principal findings are offered:

Under 2023 existing conditions:

1. The East Shirley/Culpeper Street intersection currently operates an overall LOS C in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns.

2. The school entrances along East Shirley Avenue operate at LOS C or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C or better in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

Under 2026 background conditions, all intersections experience similar levels of service, delay, and queueing as under existing conditions. Specifically:

1. The East Shirley/Culpeper Street intersection will operate an overall LOS C in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns.

2. The school entrances along East Shirley Avenue operate at LOS C or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

Under 2026 total future conditions, with buildout of the proposed development, all intersections experience similar levels of service compared to 2026 background conditions. Specifically:

1. The East Shirley/Culpeper Street intersection will operate an overall LOS C in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns.

2. The school entrances along East Shirley Avenue operate at LOS C or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

6. The expansion of the middle school will have minimal impact on the external surrounding roadway network and no improvements are required at the study intersections.
    a. The expansion will provide a link between the elementary school and the middle school during school pick up and drop off times only. During all other times, the connection between the schools will be gated.

Under 2032 background conditions, all intersections experience similar levels of service, delay, and queueing as under 2026 background conditions. Specifically:

1. The East Shirley/Culpeper Street intersection will operate an overall LOS C or D in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns with the exception of the eastbound left approach which will operate at LOS E in both PM peaks.
    a. It is noted that the traffic signal is running under "free" operations and is likely giving more time to the mainline through movements which results in the LOS E. The delays are less than the overall cycle length of the intersection indicating that the average traffic waits at most one cycle length to traverse the intersection.

2. The school entrances along East Shirley Avenue operate at LOS D or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A or B in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

Under 2032 total future conditions, with buildout of the proposed development, all intersections experience similar levels of service compared to 2026 background conditions. Specifically:

1. The East Shirley/Culpeper Street intersection will operate an overall LOS C or D in each of the peak hours. Each of the approaches operates at LOS D or better with no queueing concerns with the exception of the eastbound left approach which will operate at LOS E in both PM peaks.
    a. It is noted that the traffic signal is running under "free" operations and is likely giving more time to the mainline through movements which results in the LOS E. The delays are less than the overall cycle length of the intersection indicating that the average traffic waits at most one cycle length to traverse the intersection.

2. The school entrances along East Shirley Avenue operate at LOS D or better in each of the peak hours. The queues at the left and right turns into the school are contained within the available storage.

3. The roundabout at East Shirley Avenue/Route 15 (Falmouth Street) operates at LOS A or B in each of the peak hours with no queuing concerns.

4. The East Shirley Avenue/Alwington Boulevard intersections operates at LOS C in each of the peak hours. Each of the approaches operates at LOS D or better. Each of the queues are contained within the available storage.

5. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.

6. The expansion of the middle school will have minimal impact on the external surrounding roadway network and no improvements are required at the study intersections.
    a. The expansion will provide a link between the elementary school and the middle school during school pick up and drop off times only. During all other times, the connection between the schools will be gated.

9.2 RECOMMENDATIONS

The expansion of the middle school will have minimal to no impact on the surrounding roadway network and no improvements are required at the study intersections.

The expansion will provide a link between the elementary school and the middle school during school pick up and drop off times only. During all other times, the connection between the schools will be gated.

The traffic control at internal intersections to the school site was not reviewed as part of this study and will the specifics (signage, pavement markings, etc.) will be designed at the time of site plan approval.

Appendix A
Scoping Agreement

VDOT Virginia Department of Transportation

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: Tele: E-mail:	Steve Schmidt 804.200.6502 steve.schmidt@timmons.com			
Developer/Owner Name: Tele: E-mail:				
Project Information				
Project Name:	Taylor Middle School Expansion	Locality/County:	Town of Warrenton	
Project Location: (Attach regional and site specific location map)	The site is generally located south of Buisness 17 (East Shirley Avenue) and north of Alwington Boulevard in the Town of Warrenton as shown in Figure 1.			
Submission Type	Comp Plan ☐	Rezoning ☐	SUP Site Plan ☒	Subd Plat ☐
Project Description: (Including details on the land use, acreage, phasing, access location, etc. Attach additional sheet if necessary)	The expansion of the existing Taylor Middle School will add a total of 69,000 sf of additional building area to increase the capacity of the school from 510 students to 850 students. Site improvements also include a dedicated loop for school buses, a separate loop for parent drop off, as well as parking lot improvements. Access to the site is proposed via the three (3) existing entrances to Taylor Middle School (on Business 17) and one new access via Alwington Boulevard via the James Brumfield Elementary School access road. See Figure 2 for the conceptual plan and Tables 1/2 for the trip generation table for traffic generated by the site. Table 1 shows the trip generation based on the existing driveway counts and Table 2 shows the trip generation based on ITE rates/equations. It is proposed to use the local counts (Table 1) as they represent actual operations at the school.			
Proposed Use(s): (Check all that apply; attach additional pages as necessary)	Residential ☐	Commercial ☐	Mixed Use ☐	Other ☒

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.

	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): 522 Independent Variable(s): Students	
Total Peak Hour Trip Projection:	Less than 100 ☐	100 – 499 ☒	500 – 999 ☐	1,000 or more ☐

Traffic Impact Analysis Assumptions

Study Period	Existing Year: 2023	Build-out Year: 2026	Design Year: 2032
Study Area Boundaries (Attach map)	North: Route 17	South: Alwington Boulevard	
	East: Alwington Boulevard	West: Cleveland Street	
External Factors That Could Affect Project (Planned road improvements, other nearby developments)	1. The traffic generated by the Arrington development will be included in all future analyses. 2. With the Arrington development, the elementary school entrances will be reconfigured. This will be assumed in all future analyses. 3. VDOT Pipeline Study on Route 17 - this will be discussed in the report but not analyzed in any scenario as the improvements are not funded.		
Consistency With Comprehensive Plan (Land use, transportation plan)	The site is currently a middle school and there is no change in land use		
Available Traffic Data (Historical, forecasts)	VDOT AADT Data, AM (6-9AM) and PM (2-6PM) counts conducted in May '23 prior to school letting out.		
Trip Distribution (Attach sketch)	Road Name: see Figure 3 and notes	Road Name:	
	Road Name:	Road Name:	
Annual Vehicle Trip Growth Rate:	1%	Peak Period for Study (check all that apply)	☒ AM ☒ PM ☐ SAT
		Peak Hour of the Generator	PM School Peak
Study Intersections and/or Road Segments (Attach additional sheets as necessary)	1.Culpeper St/Shirley Ave	6.Route 17 and Alwington Boulevard	
	2.Site Entrance 1 and Route 17	7.Alwington Boulevard and ES School Entrance	
	3.Site Entrance 2 and Route 17	8.	

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.

	4.Site Entrance 3 and Route 17	9.
	5.Route 17 and Route 15	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)	Existing Signals: Culpeper St/Shirley Ave and Route 17/Alwington Boulevard	
Improvement(s) Assumed or to be Considered	1. The traffic generated by the Arrington development will be included in all future analyses. 2. With the Arrington development, the elementary school entrances will be reconfigured. This will be assumed in all future analyses. 3. VDOT Pipeline Study on Route 17 - this will be discussed in the report but not analyzed in any scenario as the improvements are not funded.	
Background Traffic Studies Considered	TIA for the Arrington Development will be used to compare traffic counts, growth rates, etc.	
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 Turn Lane Warrant Analysis	

NOTES on ASSUMPTIONS: See Tables 1/2 for the trip generation table for traffic generated by the site. Table 1 shows the trip generation based on the existing driveway counts and Table 2 shows the trip generation based on ITE rates/equations. It is proposed to use the local counts (Table 1) as they represent actual operations at the school and are generally in line with ITE rates/equations.

The overall site trip distributions are shown on Figure 3 and are based on the existing traffic counts at the school driveways and the County school attendance map for Taylor Middle School.

Turn lane warrant analyses will be completed for all site entrances

Study will include a review of Access Management Spacing Standards.

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.

SIGNED: _____ DATE: 08/28/23
Applicant or Consultant

PRINT NAME: Steve Schmidt
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.

SCOPE OF WORK MEETING CONCLUSIONS

ADDITIONS TO THE VDOT REQUIRED ELEMENTS, CHANGES TO THE METHODOLOGY OR STANDARD ASSUMPTIONS, AND SIGNATURE PAGE

Any additions to the VDOT Required Elements or changes to the Methodology or Standard Assumptions due to special circumstances that are approved by VDOT:

The applicant will contact VDOT and the locality prior to the preparation of the traffic impact analysis study in the event there are any substantial changes in the existing conditions that will affect the scope of the study.

AGREED: _____ DATE: 08/28/23
Applicant or Consultant

PRINT NAME: Steve Schmidt
Applicant or Consultant

SIGNED: _____ DATE: _____
VDOT Representative

PRINT NAME: _____
VDOT Representative

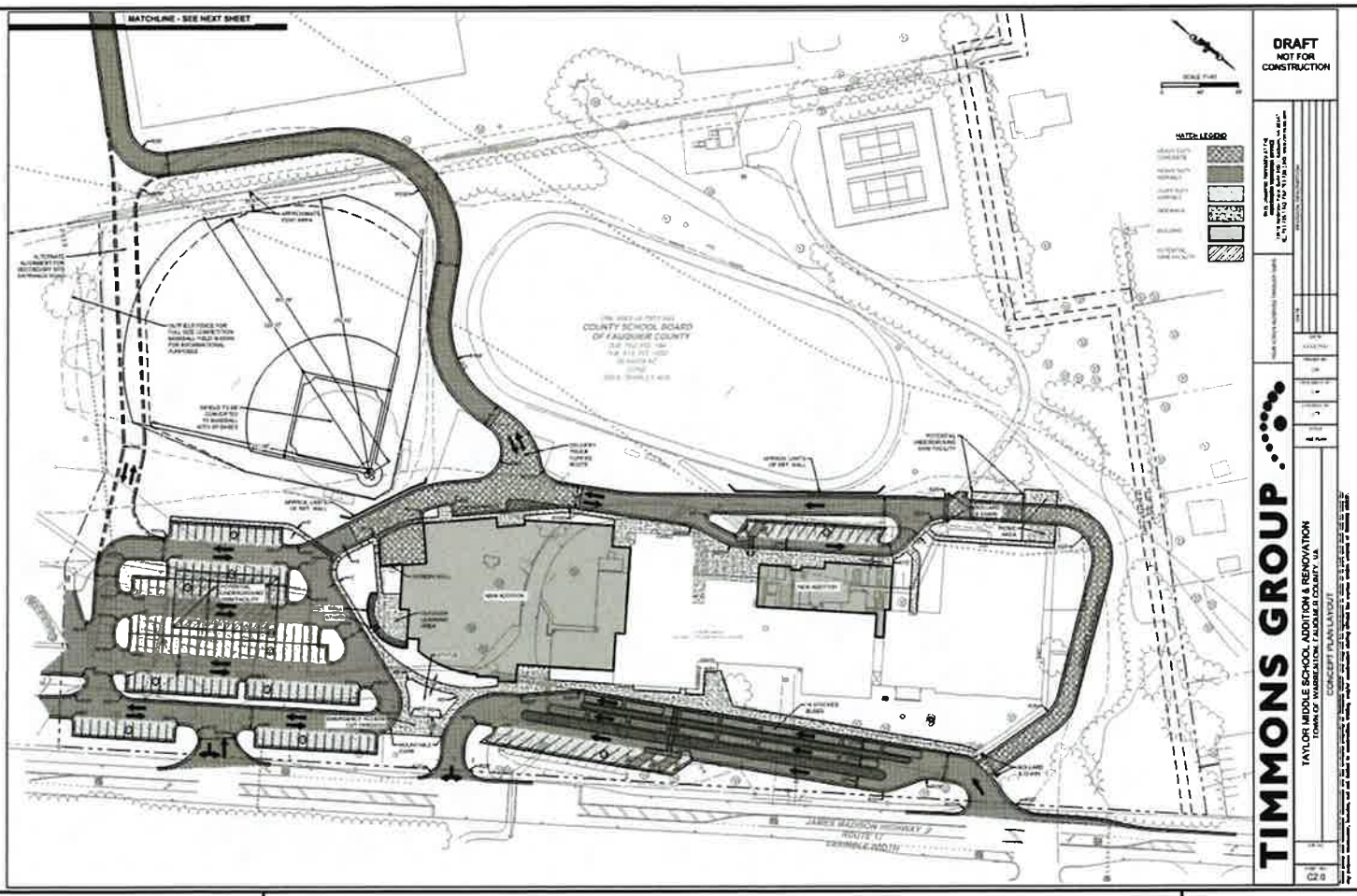
SIGNED: Denise Harris DATE: 8/29/23
Local Government Representative

PRINT NAME: Denise Harris
Local Government Representative

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Surrounding Roadway Network and Site Location
Taylor Middle School Addition
Town of Warrenton, Virginia

Figure
1



TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Conceptual Plan
Taylor Middle School Addition
Town of Warrenton, Virginia

Figure
2

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

Proposed Overall Site Distributions
Taylor Middle School – Addition & Renovation
Town of Warrenton, Virginia

Figure 3

Table 1
Taylor Middle School Addition
Existing Counts as Basis For Trip Generation

Land Use	Size	Units	Land Use Code	School AM Peak Hour [1] In	Out	Total	School PM Peak [1] In	Out	Total	Commuter PM Peak Hour [1] In	Out	Total	Average Daily Trips [2]
Existing Capacity Middle School	510	Students	522	126	92	218	60	91	151	45	18	63	1071
New Capacity Middle School	850	Students	522	210	153	363	100	152	252	75	30	105	1785
Increase	340	Students		84	61	145	40	61	101	30	12	42	714

Note: (1) Peak hour counts based on existing driveway counts conducted for the site for the existing school capacity. New capacity trips pro-rated based on the existing counts and the percent increase in students.
(2) Average Daily Trips based on the Institute of Transportation Engineers Trip Generation, 11th Edition. Assumes General Urban/Suburban land use category.

Table 2
Taylor Middle School Addition
ITE Trip Generation as Basis for Trip Generation

Land Use	Size	Units	Land Use Code	School AM Peak Hour In	Out	Total	School PM Peak In	Out	Total	Commuter PM Peak Hour In	Out	Total	Average Daily Trips
Existing Capacity Middle School	510	Students	522	233	190	423	91	107	198	37	40	77	1071
New Capacity Middle School	850	Students	522	354	290	644	143	167	310	61	67	128	1785
Increase	340	Students		121	100	221	52	60	112	24	27	51	714

Note: (1) Based on the Institute of Transportation Engineers Trip Generation, 11th Edition. Assumes General Urban/Suburban land use category.

Appendix B
Traffic Count Data

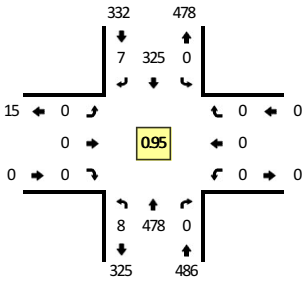
Type of peak hour being reported: Intersection Peak

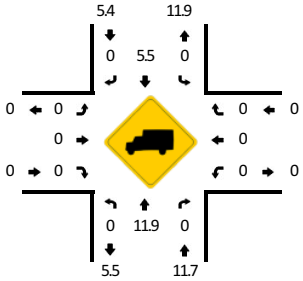
Method for determining peak hour: Total Entering

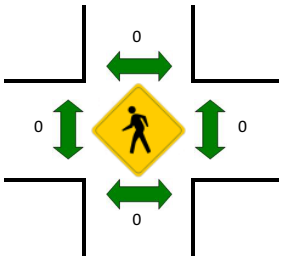
LOCATION: Rte 17 Bus -- Western Dwy
CITY/STATE: Warrenton, VA

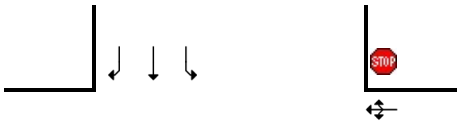
QC JOB #: 16218101
DATE: Tue, May 16 2023

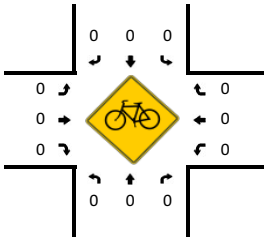
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

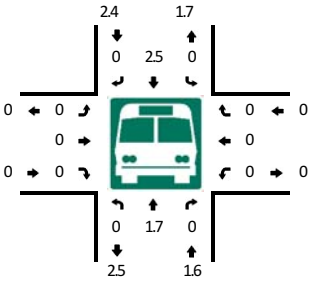


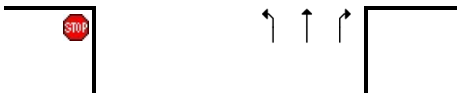


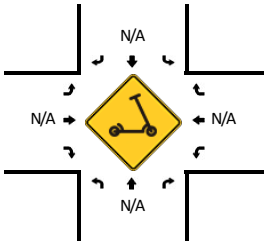












15-Min Count Period Beginning At	Rte 17 Bus (Northbound)				Rte 17 Bus (Southbound)				Western Dwy (Eastbound)				Western Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	25	0	0	0	26	1	0	0	0	0	0	0	0	0	0	52	
6:15 AM	0	28	0	0	0	28	0	0	0	0	0	0	0	0	0	0	56	
6:30 AM	2	51	0	0	0	35	1	0	0	0	0	0	0	0	0	0	89	
6:45 AM	7	65	0	0	0	63	7	0	0	0	0	0	0	0	0	0	142	339
7:00 AM	26	59	0	0	0	58	14	0	0	0	0	0	0	0	0	0	157	444
7:15 AM	32	109	0	0	0	58	24	0	0	0	0	0	0	0	0	0	223	611
7:30 AM	13	90	0	0	0	65	9	0	0	0	0	0	0	0	0	0	177	699
7:45 AM	1	125	0	0	0	74	3	0	0	0	0	0	0	0	0	0	203	760
8:00 AM	2	107	0	0	0	98	1	0	0	0	0	0	0	0	0	0	208	811
8:15 AM	3	128	0	0	0	84	1	0	0	0	0	0	0	0	0	0	216	804
8:30 AM	2	118	0	0	0	69	2	0	0	0	0	0	0	0	0	0	191	818
8:45 AM	1	102	0	0	0	83	2	0	0	0	0	0	0	0	0	0	188	803

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	512	0	0	0	336	4	0	0	0	0	0	0	0	0	0	864
Heavy Trucks	0	48	0		0	16	0		0	0	0		0	0	0		64
Buses	0	20	0		0	4	0		0	0	0		0	0	0		24
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/22/2023 10:52 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

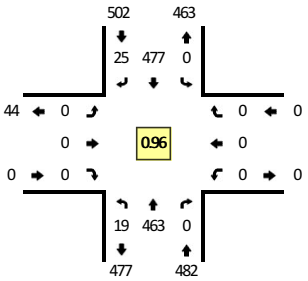
Type of peak hour being reported: Intersection Peak

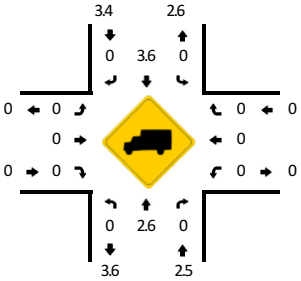
Method for determining peak hour: Total Entering

LOCATION: Rte 17 Bus -- Western Dwy
CITY/STATE: Warrenton, VA

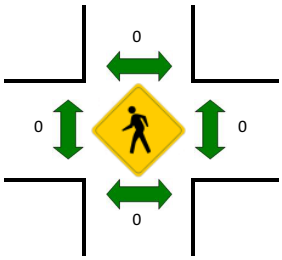
QC JOB #: 16218102
DATE: Tue, May 16 2023

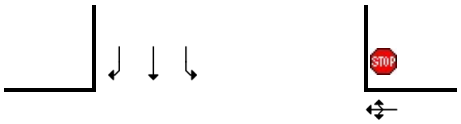
Peak-Hour: 2:00 PM -- 3:00 PM
Peak 15-Min: 2:15 PM -- 2:30 PM

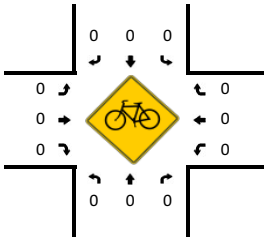


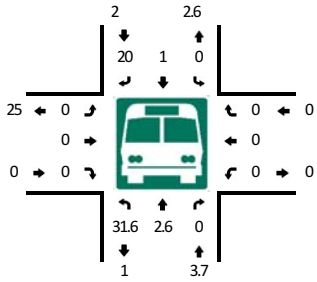


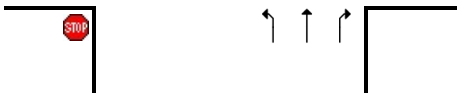
TRUE DATA TO IMPROVE MOBILITY

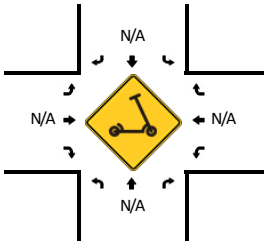












15-Min Count Period Beginning At	Rte 17 Bus (Northbound)				Rte 17 Bus (Southbound)				Western Dwy (Eastbound)				Western Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	10	108	0	0	0	128	5	0	0	0	0	0	0	0	0	0	251	
2:15 PM	5	124	0	0	0	113	13	0	0	0	0	0	0	0	0	0	255	
2:30 PM	4	124	0	0	0	121	3	0	0	0	0	0	0	0	0	0	252	
2:45 PM	0	107	0	0	0	115	4	0	0	0	0	0	0	0	0	0	226	984
3:00 PM	0	98	0	0	0	120	0	0	0	0	0	0	0	0	0	0	218	951
3:15 PM	2	96	0	0	0	124	0	0	0	0	0	0	0	0	0	0	222	918
3:30 PM	2	150	0	0	0	131	0	0	0	0	0	0	0	0	0	0	283	949
3:45 PM	0	111	0	0	0	103	1	0	0	0	0	0	0	0	0	0	215	938
4:00 PM	1	101	0	0	0	120	2	0	0	0	0	0	0	0	0	0	224	944
4:15 PM	1	99	0	0	0	119	1	0	0	0	0	0	0	0	0	0	220	942
4:30 PM	3	118	0	0	0	144	0	0	0	0	0	0	0	0	0	0	265	924
4:45 PM	1	102	0	0	0	126	4	0	0	0	0	0	0	0	0	0	233	942
5:00 PM	1	105	0	0	0	95	0	0	0	0	0	0	0	0	0	0	201	919
5:15 PM	1	124	0	0	0	113	0	0	0	0	0	0	0	0	0	0	238	937
5:30 PM	0	107	0	0	0	106	1	0	0	0	0	0	0	0	0	0	214	886
5:45 PM	0	82	0	0	0	73	1	0	0	0	0	0	0	0	0	0	156	809

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	20	496	0	0	0	452	52	0	0	0	0	0	0	0	0	0	1020
Heavy Trucks	0	12	0		0	16	0		0	0	0		0	0	0		28
Buses	0	12	0		0	0	4		0	0	0		0	0	0		16
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/22/2023 10:52 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

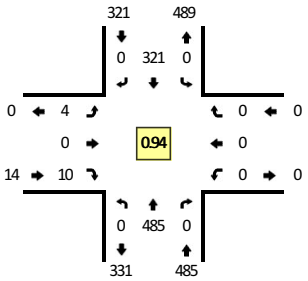
Type of peak hour being reported: Intersection Peak

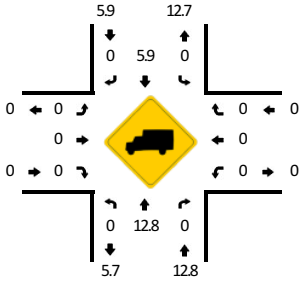
Method for determining peak hour: Total Entering

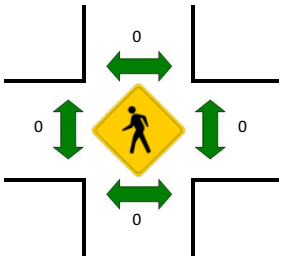
LOCATION: Rte 17 Bus -- Center Dwy
CITY/STATE: Warrenton, VA

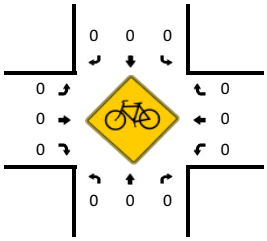
QC JOB #: 16218103
DATE: Tue, May 16 2023

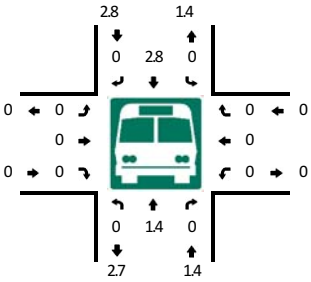
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

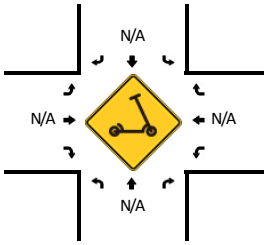












15-Min Count Period Beginning At	Rte 17 Bus (Northbound)				Rte 17 Bus (Southbound)				Center Dwy (Eastbound)				Center Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	25	0	0	0	25	1	0	0	0	0	0	0	0	0	0	51	
6:15 AM	0	26	0	0	0	26	0	0	2	0	0	0	0	0	0	0	54	
6:30 AM	0	53	0	0	0	37	1	0	0	0	2	0	0	0	0	0	93	
6:45 AM	0	72	0	0	0	60	0	0	0	0	1	0	0	0	0	0	133	331
7:00 AM	0	74	0	0	0	61	0	0	12	0	21	0	0	0	0	0	168	448
7:15 AM	0	113	0	0	0	58	0	0	28	0	31	0	0	0	0	0	230	624
7:30 AM	0	92	0	0	0	62	0	0	11	0	16	0	0	0	0	0	181	712
7:45 AM	0	128	0	0	0	73	0	0	0	0	3	0	0	0	0	0	204	783
8:00 AM	0	108	0	0	0	93	0	0	2	0	1	0	0	0	0	0	204	819
8:15 AM	0	129	0	0	0	86	0	0	2	0	2	0	0	0	0	0	219	808
8:30 AM	0	120	0	0	0	69	0	0	0	0	4	0	0	0	0	0	193	820
8:45 AM	0	99	0	0	0	79	0	0	1	0	2	0	0	0	0	0	181	797

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	516	0	0	0	344	0	0	8	0	8	0	0	0	0	0	876
Heavy Trucks	0	48	0		0	8	0		0	0	0		0	0	0		56
Buses	0	20	0		0	8	0		0	0	0		0	0	0		28
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/22/2023 10:52 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

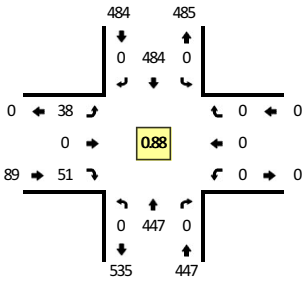
Type of peak hour being reported: Intersection Peak

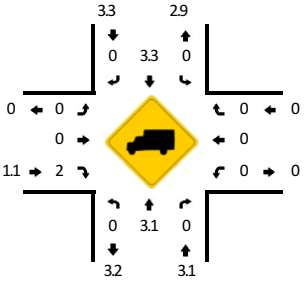
Method for determining peak hour: Total Entering

LOCATION: Rte 17 Bus -- Center Dwy
CITY/STATE: Warrenton, VA

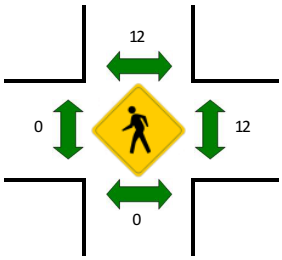
QC JOB #: 16218104
DATE: Tue, May 16 2023

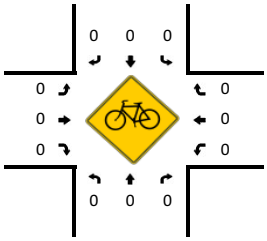
Peak-Hour: 2:00 PM -- 3:00 PM
Peak 15-Min: 2:30 PM -- 2:45 PM

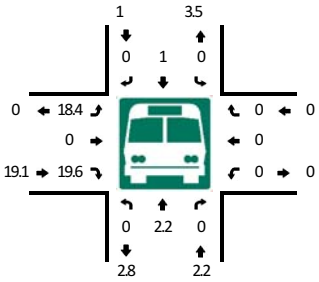


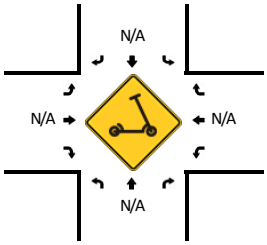


TRUE DATA TO IMPROVE MOBILITY









15-Min Count Period Beginning At	Rte 17 Bus (Northbound)				Rte 17 Bus (Southbound)				Center Dwy (Eastbound)				Center Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	0	117	0	0	0	135	0	0	3	0	2	0	0	0	0	0	257	
2:15 PM	0	124	0	0	0	100	0	0	5	0	6	0	0	0	0	0	235	
2:30 PM	0	105	0	0	0	131	0	0	23	0	30	0	0	0	0	0	289	
2:45 PM	0	101	0	0	0	118	0	0	7	0	13	0	0	0	0	0	239	1020
3:00 PM	0	97	0	0	0	124	0	0	3	0	4	0	0	0	0	0	228	991
3:15 PM	0	97	0	0	0	120	0	0	2	0	3	0	0	0	0	0	222	978
3:30 PM	0	148	0	0	0	132	0	0	4	0	2	0	0	0	0	0	286	975
3:45 PM	0	97	0	0	0	101	0	0	3	0	4	0	0	0	0	0	205	941
4:00 PM	2	98	0	0	0	126	0	0	1	0	2	0	0	0	0	0	229	942
4:15 PM	0	103	0	0	0	118	0	0	0	0	6	0	0	0	0	0	227	947
4:30 PM	0	113	0	0	0	137	0	0	8	0	2	0	0	0	0	0	260	921
4:45 PM	0	96	0	0	0	133	0	0	4	0	0	0	0	0	0	0	233	949
5:00 PM	0	104	0	0	0	98	0	0	2	0	0	0	0	0	0	0	204	924
5:15 PM	0	124	0	0	0	112	1	0	1	0	1	0	0	0	0	0	239	936
5:30 PM	0	105	0	0	0	103	2	0	1	0	1	0	0	0	0	0	212	888
5:45 PM	0	83	0	0	0	75	0	0	0	0	1	0	0	0	0	0	159	814

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	420	0	0	0	524	0	0	92	0	120	0	0	0	0	0	1156
Heavy Trucks	0	8	0		0	28	0		0	0	0		0	0	0		36
Buses	0	8	0		0	8	0		8	0	20		0	0	0		44
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/22/2023 10:53 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

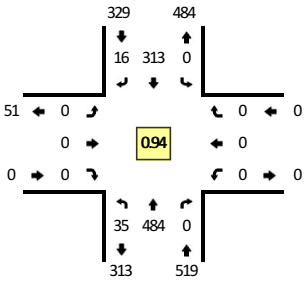
Type of peak hour being reported: Intersection Peak

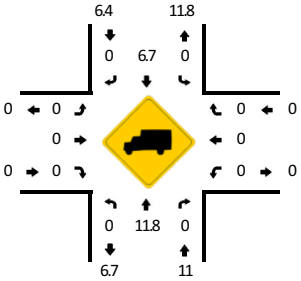
Method for determining peak hour: Total Entering

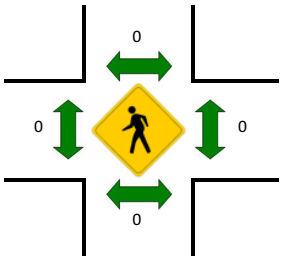
LOCATION: Rte 17 Bus -- Eastern Dwy
CITY/STATE: Warrenton, VA

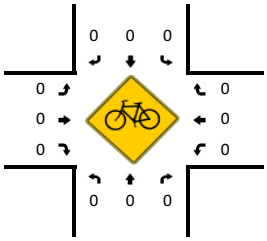
QC JOB #: 16218105
DATE: Tue, May 16 2023

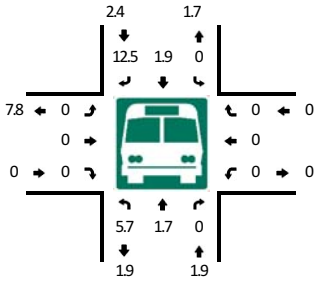
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

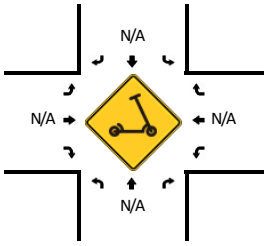












15-Min Count Period Beginning At	Rte 17 Bus (Northbound)				Rte 17 Bus (Southbound)				Eastern Dwy (Eastbound)				Eastern Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	25	0	0	0	23	3	0	0	0	0	0	0	0	0	0	51	
6:15 AM	3	25	0	0	0	26	1	0	0	0	0	0	0	0	0	0	55	
6:30 AM	2	53	0	0	0	38	1	0	0	0	0	0	0	0	0	0	94	
6:45 AM	10	71	0	0	0	58	1	0	0	0	0	0	0	0	0	0	140	340
7:00 AM	12	73	0	0	0	74	7	0	0	0	0	0	0	0	0	0	166	455
7:15 AM	6	109	0	0	0	80	9	0	0	0	0	0	0	0	0	0	204	604
7:30 AM	3	97	0	0	0	77	4	0	0	0	0	0	0	0	0	0	181	691
7:45 AM	9	125	0	0	0	70	1	0	0	0	0	0	0	0	0	0	205	756
8:00 AM	6	108	0	0	0	95	3	0	0	0	0	0	0	0	0	0	212	802
8:15 AM	8	130	0	0	0	83	4	0	0	0	0	0	0	0	0	0	225	823
8:30 AM	12	121	0	0	0	65	8	0	0	0	0	0	0	0	0	0	206	848
8:45 AM	7	99	0	0	0	75	6	0	0	0	0	0	0	0	0	0	187	830

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	32	520	0	0	0	332	16	0	0	0	0	0	0	0	0	0	900
Heavy Trucks	0	44	0		0	12	0		0	0	0		0	0	0		56
Buses	0	20	0		0	4	0		0	0	0		0	0	0		24
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/22/2023 10:53 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

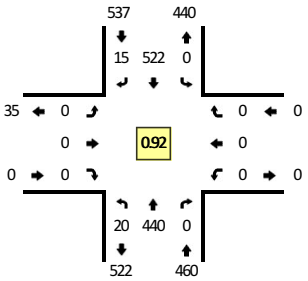
Type of peak hour being reported: Intersection Peak

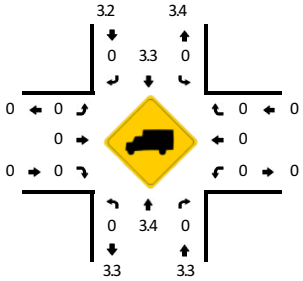
Method for determining peak hour: Total Entering

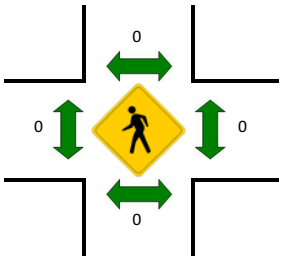
LOCATION: Rte 17 Bus -- Eastern Dwy
CITY/STATE: Warrenton, VA

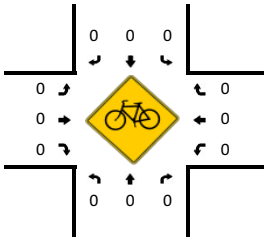
QC JOB #: 16218106
DATE: Tue, May 16 2023

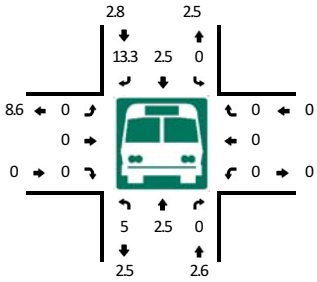
Peak-Hour: 2:00 PM -- 3:00 PM
Peak 15-Min: 2:30 PM -- 2:45 PM

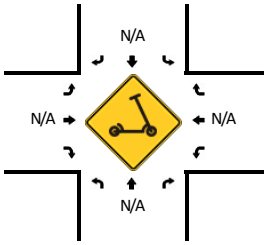












15-Min Count Period Beginning At	Rte 17 Bus (Northbound)				Rte 17 Bus (Southbound)				Eastern Dwy (Eastbound)				Eastern Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	5	110	0	0	0	139	2	0	0	0	0	0	0	0	0	0	256	
2:15 PM	6	131	0	0	0	97	4	0	0	0	0	0	0	0	0	0	238	
2:30 PM	4	100	0	0	0	159	7	0	0	0	0	0	0	0	0	0	270	
2:45 PM	5	99	0	0	0	127	2	0	0	0	0	0	0	0	0	0	233	997
3:00 PM	0	100	0	0	0	124	3	0	0	0	0	0	0	0	0	0	227	968
3:15 PM	4	98	0	0	0	125	5	0	0	0	0	0	0	0	0	0	232	962
3:30 PM	3	147	0	0	0	128	3	0	0	0	0	0	0	0	0	0	281	973
3:45 PM	5	86	0	0	0	95	2	0	0	0	0	0	0	0	0	0	188	928
4:00 PM	2	101	0	0	0	133	2	0	0	0	0	0	0	0	0	0	238	939
4:15 PM	2	101	0	0	0	120	3	0	2	0	0	0	0	0	0	0	228	935
4:30 PM	6	113	0	0	0	135	4	0	0	0	1	0	0	0	0	0	259	913
4:45 PM	10	101	0	0	0	126	3	0	0	0	1	0	0	0	0	0	241	966
5:00 PM	3	99	0	0	0	94	5	0	0	0	0	0	0	0	0	0	201	929
5:15 PM	3	127	0	0	0	114	1	0	1	0	0	0	0	0	0	0	246	947
5:30 PM	3	106	0	0	0	104	1	0	0	0	0	0	0	0	0	0	214	902
5:45 PM	2	79	0	0	0	74	1	0	1	0	0	0	0	0	0	0	157	818

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	400	0	0	0	636	28	0	0	0	0	0	0	0	0	0	1080
Heavy Trucks	0	12	0		0	24	0		0	0	0		0	0	0		36
Buses	0	8	0		0	40	4		0	0	0		0	0	0		52
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/22/2023 10:53 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

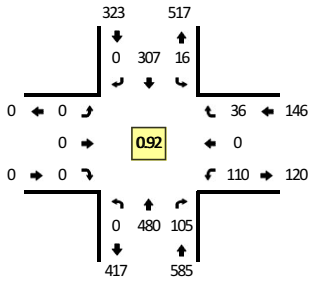
Type of peak hour being reported: Intersection Peak

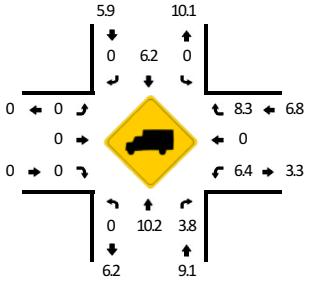
Method for determining peak hour: Total Entering

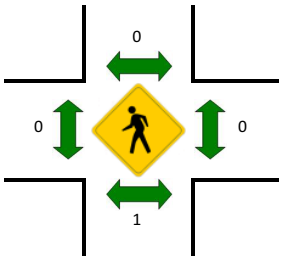
LOCATION: Rte 17 Bus -- Rte 15 Bus
CITY/STATE: Warrenton, VA

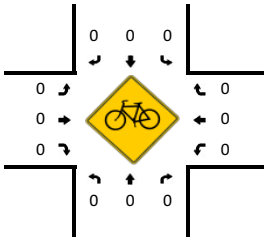
QC JOB #: 16218107
DATE: Tue, May 16 2023

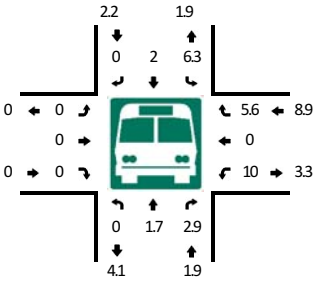
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

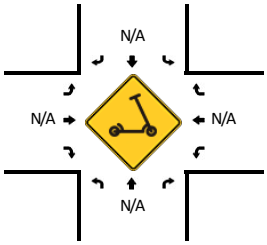












15-Min Count Period Beginning At	Rte 17 Bus (Northbound)				Rte 17 Bus (Southbound)				Rte 15 Bus (Eastbound)				Rte 15 Bus (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	25	4	0	1	22	0	0	0	0	0	0	6	0	0	0	58	
6:15 AM	0	24	3	1	2	22	0	0	0	0	0	0	8	0	1	0	61	
6:30 AM	0	54	10	0	1	32	0	0	0	0	0	0	4	0	2	0	103	
6:45 AM	0	72	14	0	1	55	0	0	0	0	0	0	10	0	5	0	157	379
7:00 AM	0	81	14	0	8	61	0	0	0	0	0	0	13	0	10	0	187	508
7:15 AM	0	99	14	0	11	72	0	0	0	0	0	0	10	0	13	0	219	666
7:30 AM	0	94	17	0	9	70	0	0	0	0	0	0	13	0	4	0	207	770
7:45 AM	0	124	24	0	9	63	0	0	0	0	0	0	26	0	12	0	258	871
8:00 AM	0	110	18	0	2	92	0	1	0	0	0	0	26	0	5	0	254	938
8:15 AM	0	129	30	0	1	83	0	0	0	0	0	0	36	0	6	0	285	1004
8:30 AM	0	117	33	0	3	69	0	0	0	0	0	0	22	0	13	0	257	1054
8:45 AM	0	95	15	1	12	66	0	0	0	0	0	0	15	0	6	0	210	1006

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	516	120	0	4	332	0	0	0	0	0	0	144	0	24	0	1140
Heavy Trucks	0	36	4		0	4	0		0	0	0		16	0	0		60
Buses	0	20	0		0	4	0		0	0	0		20	0	0		44
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/22/2023 10:53 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

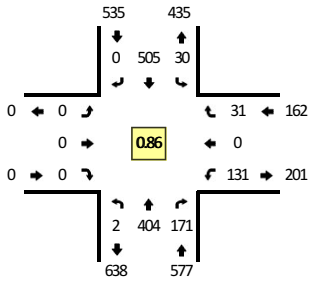
Type of peak hour being reported: Intersection Peak

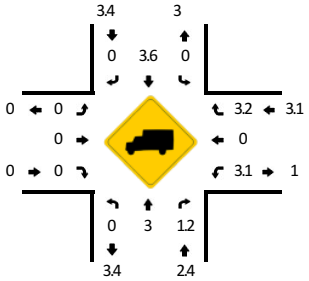
Method for determining peak hour: Total Entering

LOCATION: Rte 17 Bus -- Rte 15 Bus
CITY/STATE: Warrenton, VA

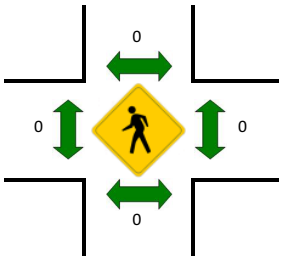
QC JOB #: 16218108
DATE: Tue, May 16 2023

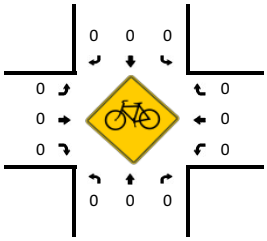
Peak-Hour: 2:45 PM -- 3:45 PM
Peak 15-Min: 3:30 PM -- 3:45 PM

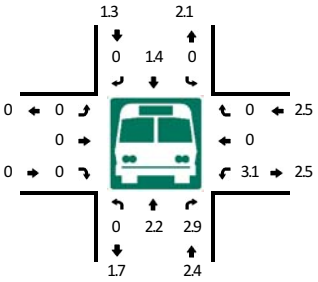


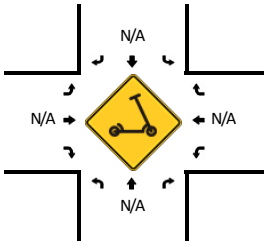


TRUE DATA TO IMPROVE MOBILITY









15-Min Count Period Beginning At	Rte 17 Bus (Northbound)				Rte 17 Bus (Southbound)				Rte 15 Bus (Eastbound)				Rte 15 Bus (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	0	101	23	0	6	133	0	0	0	0	0	0	31	0	5	0	299	
2:15 PM	0	131	30	0	4	97	0	1	0	0	0	0	27	0	5	0	295	
2:30 PM	0	89	22	1	12	149	0	1	0	0	0	0	21	0	6	0	301	
2:45 PM	0	94	40	0	4	124	0	0	0	0	0	0	34	0	7	0	303	1198
3:00 PM	0	91	34	1	6	130	0	0	0	0	0	0	37	0	5	0	304	1203
3:15 PM	0	88	42	1	8	121	0	0	0	0	0	0	26	0	9	0	295	1203
3:30 PM	0	131	55	0	12	130	0	0	0	0	0	0	34	0	10	0	372	1274
3:45 PM	0	86	47	1	7	99	0	0	0	0	0	0	28	0	11	0	279	1250
4:00 PM	0	100	29	0	8	133	0	0	0	0	0	0	19	0	6	0	295	1241
4:15 PM	0	93	25	0	2	121	0	1	0	0	0	0	24	0	7	0	273	1219
4:30 PM	0	107	38	0	7	127	0	1	0	0	0	0	31	0	7	0	318	1165
4:45 PM	0	97	38	0	2	143	0	0	0	0	0	0	29	0	11	0	320	1206
5:00 PM	0	88	32	0	5	86	0	0	0	0	0	0	24	0	9	0	244	1155
5:15 PM	0	121	27	0	4	106	0	1	0	0	0	0	24	0	5	0	288	1170
5:30 PM	0	109	17	0	2	109	0	0	0	0	0	0	20	0	6	0	263	1115
5:45 PM	0	71	26	0	6	64	0	0	0	0	0	0	24	0	7	0	198	993

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	524	220	0	48	520	0	0	0	0	0	0	136	0	40	0	1488
Heavy Trucks	0	12	0		0	16	0		0	0	0		0	0	4		32
Buses	0	20	8		0	8	0		0	0	0		4	0	0		40
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/22/2023 10:53 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

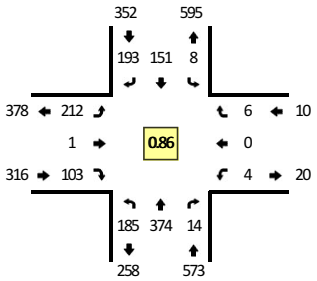
Type of peak hour being reported: Intersection Peak

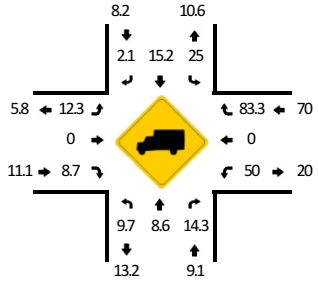
Method for determining peak hour: Total Entering

LOCATION: Rte 17 Bus -- Alwington Boulevard
CITY/STATE: Warrenton, VA

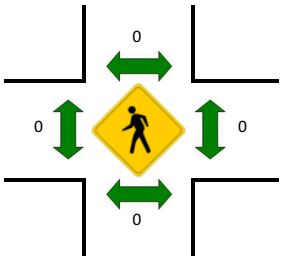
QC JOB #: 16218109
DATE: Tue, May 16 2023

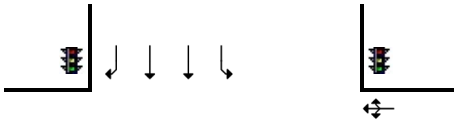
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

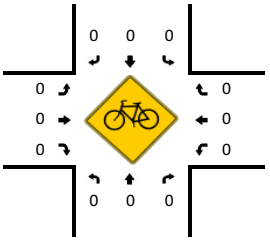


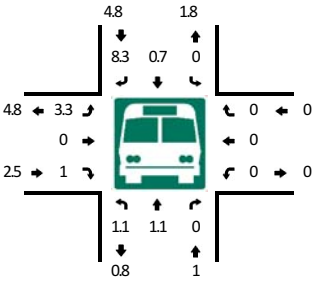


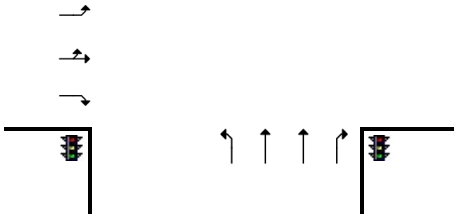
TRUE DATA TO IMPROVE MOBILITY

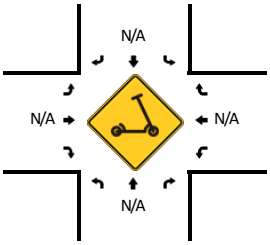












15-Min Count Period Beginning At	Rte 17 Bus (Northbound)				Rte 17 Bus (Southbound)				Alwington Boulevard (Eastbound)				Alwington Boulevard (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	12	23	3	0	1	17	6	0	3	0	9	0	3	0	2	0	79	
6:15 AM	11	28	0	0	0	19	5	0	4	0	6	0	2	0	0	0	75	
6:30 AM	17	54	0	0	0	15	13	0	12	0	11	0	2	0	0	0	124	
6:45 AM	26	96	3	0	2	25	16	0	12	1	10	0	0	0	1	0	192	470
7:00 AM	36	84	0	0	2	42	21	0	11	1	20	0	0	0	0	0	217	608
7:15 AM	37	101	1	0	1	41	26	1	18	0	15	0	0	0	0	0	241	774
7:30 AM	44	78	0	0	1	43	26	0	26	0	21	0	0	0	1	0	240	890
7:45 AM	47	131	5	0	1	32	40	0	32	0	17	0	2	0	0	0	307	1005
8:00 AM	43	86	3	0	4	40	47	1	31	0	12	0	0	0	3	0	270	1058
8:15 AM	45	88	3	0	0	41	71	2	74	0	41	0	0	0	0	0	365	1182
8:30 AM	50	69	3	0	0	38	35	0	75	1	33	0	2	0	3	0	309	1251
8:45 AM	33	74	1	0	1	34	26	1	34	0	24	0	1	0	0	0	229	1173

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	180	352	12	0	0	164	284	8	296	0	164	0	0	0	0	0	1460
Heavy Trucks	20	40	0		0	36	4		4	0	16		0	0	0		120
Buses	4	0	0		0	0	24		20	0	4		0	0	0		52
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/22/2023 10:53 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

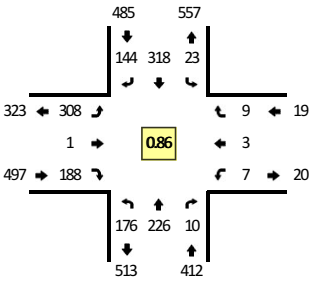
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering

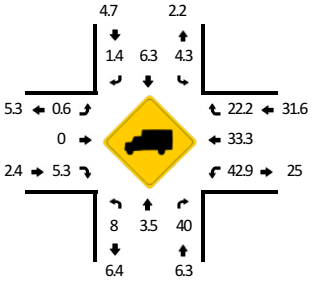
LOCATION: Rte 17 Bus -- Alwington Boulevard
CITY/STATE: Warrenton, VA

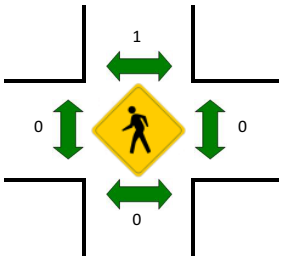
QC JOB #: 16218110
DATE: Tue, May 16 2023

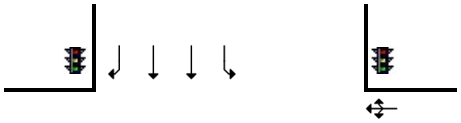
Peak-Hour: 2:45 PM -- 3:45 PM
Peak 15-Min: 3:30 PM -- 3:45 PM

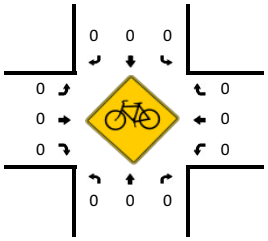


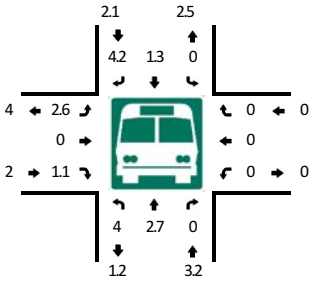
TRUE DATA TO IMPROVE MOBILITY

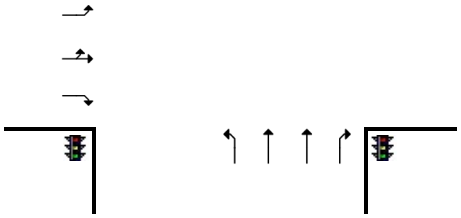


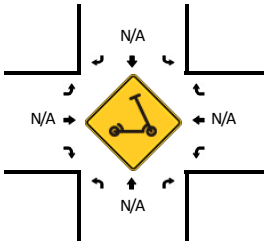












15-Min Count Period Beginning At	Rte 17 Bus (Northbound)				Rte 17 Bus (Southbound)				Alwington Boulevard (Eastbound)				Alwington Boulevard (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	48	55	3	0	2	76	34	2	71	0	46	0	2	1	2	0	342	
2:15 PM	34	64	1	0	2	65	29	6	76	1	41	0	0	0	3	0	322	
2:30 PM	41	46	2	0	1	101	31	1	62	0	47	0	0	1	1	0	334	
2:45 PM	42	58	6	0	2	89	31	2	60	0	43	0	3	2	4	0	342	1340
3:00 PM	43	57	2	0	2	72	40	2	62	1	44	0	3	0	3	0	331	1329
3:15 PM	48	58	0	0	1	71	36	1	72	0	44	0	0	0	0	0	331	1338
3:30 PM	43	53	2	0	4	86	37	9	114	0	57	0	1	1	2	0	409	1413
3:45 PM	47	58	3	0	1	76	20	2	70	0	51	0	3	0	3	0	334	1405
4:00 PM	38	36	2	0	4	88	20	5	75	0	66	0	1	1	3	0	339	1413
4:15 PM	38	49	1	0	1	74	23	3	65	0	42	0	3	1	2	0	302	1384
4:30 PM	47	60	0	0	2	95	17	3	67	0	48	0	2	0	4	0	345	1320
4:45 PM	52	54	0	0	3	99	26	4	69	0	42	0	0	0	2	0	351	1337
5:00 PM	43	58	1	0	0	77	22	1	59	0	53	0	2	0	3	0	319	1317
5:15 PM	38	78	0	0	1	80	17	1	55	0	52	0	1	0	2	0	325	1340
5:30 PM	37	66	2	0	1	81	12	2	48	0	53	0	1	2	2	0	307	1302
5:45 PM	33	51	1	0	0	52	8	0	50	0	42	0	4	0	1	0	242	1193

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	172	212	8	0	16	344	148	36	456	0	228	0	4	4	8	0	1636
Heavy Trucks	24	4	4		4	16	0		4	0	4		4	0	0		64
Buses	12	4	0		0	0	12		24	0	4		0	0	0		56
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/22/2023 10:53 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

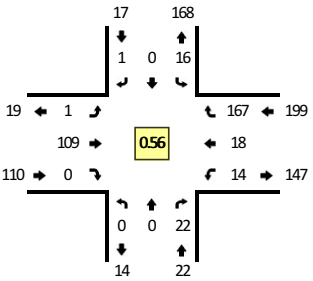
Type of peak hour being reported: Intersection Peak

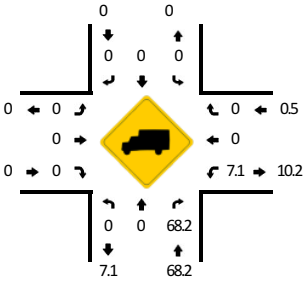
Method for determining peak hour: Total Entering

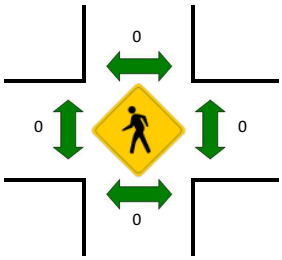
LOCATION: Elementary School Entrance -- Alwington Blvd
CITY/STATE: Warrenton, VA

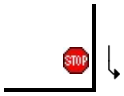
QC JOB #: 16218111
DATE: Tue, May 16 2023

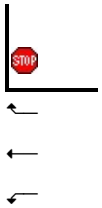
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 8:15 AM -- 8:30 AM

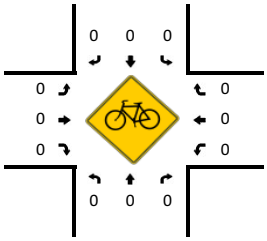


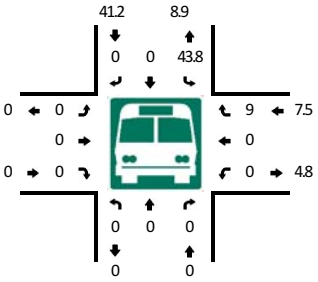


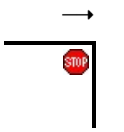


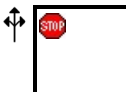


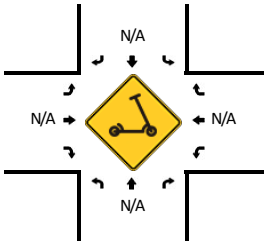












15-Min Count Period Beginning At	Elementary School Entrance (Northbound)				Elementary School Entrance (Southbound)				Alwington Blvd (Eastbound)				Alwington Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	0	0	0	3	0	0	0	0	2	0	0	0	2	2	0	9	
6:15 AM	0	0	0	0	2	0	0	0	0	0	0	0	3	1	2	0	8	
6:30 AM	0	0	0	0	3	0	0	0	0	0	0	0	1	0	3	0	7	
6:45 AM	0	0	0	0	2	0	0	0	0	0	0	0	19	2	1	0	24	48
7:00 AM	0	0	1	0	1	0	0	0	0	0	0	0	21	0	11	0	34	73
7:15 AM	0	0	6	0	6	0	0	0	0	1	0	0	21	1	11	0	46	111
7:30 AM	0	0	10	0	2	0	0	0	0	2	0	0	14	8	12	0	48	152
7:45 AM	0	0	12	0	3	0	0	0	0	1	0	0	3	7	31	0	57	185
8:00 AM	0	0	6	0	2	0	0	0	0	1	0	0	7	4	34	0	54	205
8:15 AM	0	0	2	0	8	0	1	0	0	65	0	0	2	6	72	0	156	315
8:30 AM	0	0	2	0	3	0	0	0	1	42	0	0	2	1	30	0	81	348
8:45 AM	0	0	4	0	3	0	0	0	0	7	0	0	5	1	8	0	28	319

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	8	0	32	0	4	0	0	260	0	0	8	24	288	0	624
Heavy Trucks	0	0	8		0	0	0		0	0	0		0	0	0		8
Buses	0	0	0		24	0	0		0	0	0		0	0	24		48
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/22/2023 10:53 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

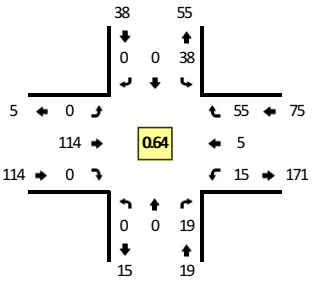
Type of peak hour being reported: Intersection Peak

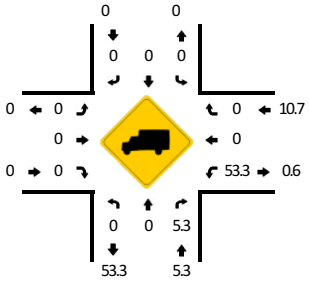
Method for determining peak hour: Total Entering

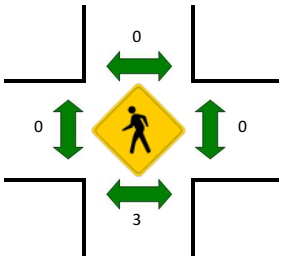
LOCATION: Elementary School Entrance -- Alwington Blvd
CITY/STATE: Warrenton, VA

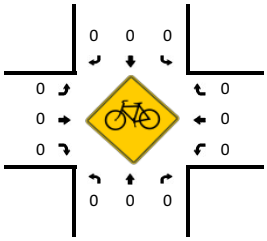
QC JOB #: 16218112
DATE: Tue, May 16 2023

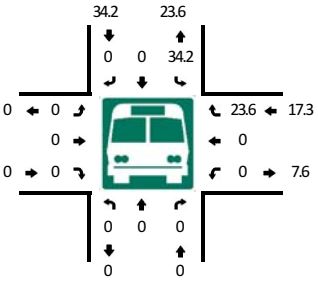
Peak-Hour: 3:15 PM -- 4:15 PM
Peak 15-Min: 3:30 PM -- 3:45 PM

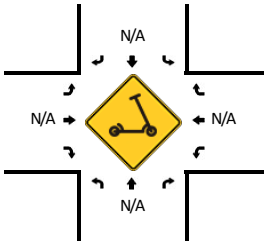












15-Min Count Period Beginning At	Elementary School Entrance (Northbound)				Elementary School Entrance (Southbound)				Alwington Blvd (Eastbound)				Alwington Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	0	0	2	0	5	0	0	0	0	7	0	0	3	0	3	0	20	
2:15 PM	0	0	3	0	1	0	0	0	0	3	0	0	3	2	4	0	16	
2:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	3	0	11	0	16	
2:45 PM	0	0	4	0	3	0	0	0	0	2	0	0	1	1	13	0	24	76
3:00 PM	0	0	5	0	1	0	0	0	0	1	0	0	4	1	19	0	31	87
3:15 PM	0	0	4	0	4	0	0	0	0	30	0	0	3	2	28	0	71	142
3:30 PM	0	0	4	0	8	0	0	0	0	57	0	0	6	1	20	0	96	222
3:45 PM	0	0	3	0	14	0	0	0	0	13	0	0	4	1	4	0	39	237
4:00 PM	0	0	8	0	12	0	0	0	0	14	0	0	2	1	3	0	40	246
4:15 PM	0	0	6	0	5	0	0	0	0	4	0	0	4	1	3	0	23	198
4:30 PM	0	0	6	0	6	0	0	0	0	7	0	0	3	2	5	0	29	131
4:45 PM	0	0	7	0	5	0	0	0	0	3	0	0	4	1	7	0	27	119
5:00 PM	0	0	8	0	6	0	0	0	0	5	0	0	5	0	4	0	28	107
5:15 PM	0	0	6	0	3	0	0	0	0	1	0	0	2	1	1	0	14	98
5:30 PM	0	0	5	0	3	0	0	0	0	1	0	0	1	0	5	0	15	84
5:45 PM	0	0	10	0	2	0	0	0	0	0	0	0	1	0	1	0	14	71

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	16	0	32	0	0	0	0	228	0	0	24	4	80	0	384
Heavy Trucks	0	0	0		0	0	0		0	0	0		20	0	0		20
Buses	0	0	0		32	0	0		0	0	0		0	0	20		52
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/22/2023 10:53 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

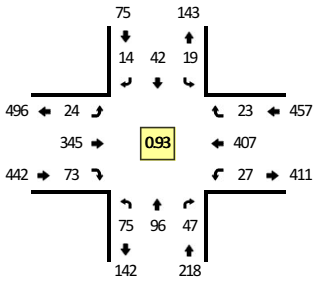
Type of peak hour being reported: Intersection Peak

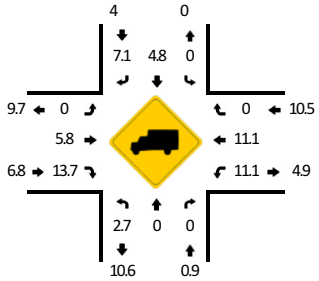
Method for determining peak hour: Total Entering

LOCATION: Culpeper St -- W Shirley Ave
CITY/STATE: Warrenton, VA

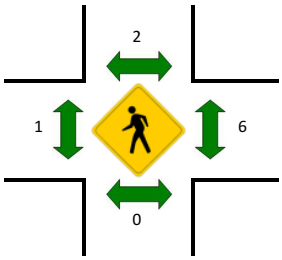
QC JOB #: 16218113
DATE: Thu, May 18 2023

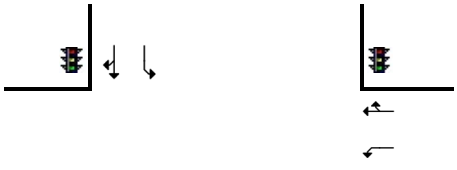
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

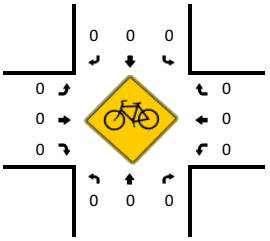


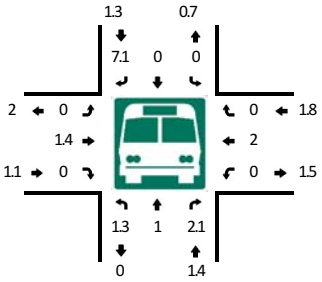


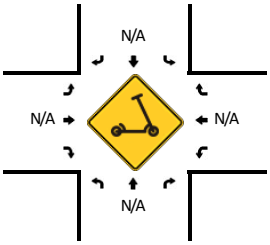
TRUE DATA TO IMPROVE MOBILITY











15-Min Count Period Beginning At	Culpeper St (Northbound)				Culpeper St (Southbound)				W Shirley Ave (Eastbound)				W Shirley Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	9	12	1	0	3	1	0	0	0	21	5	0	0	25	0	0	77	
6:15 AM	14	15	1	0	0	5	0	0	1	39	11	0	3	31	2	0	122	
6:30 AM	10	26	1	0	1	2	2	0	4	34	4	0	4	48	0	0	136	
6:45 AM	16	12	4	0	0	2	1	0	2	76	9	0	1	79	4	0	206	541
7:00 AM	17	21	9	0	4	6	4	0	5	65	11	0	1	79	2	0	224	688
7:15 AM	24	15	17	0	4	5	6	0	4	87	14	0	7	100	3	0	286	852
7:30 AM	14	21	6	0	3	4	5	0	7	69	17	0	7	94	6	0	253	969
7:45 AM	29	24	9	0	6	13	3	0	9	72	20	0	9	121	5	0	320	1083
8:00 AM	11	21	18	0	2	9	5	0	8	86	15	0	5	82	8	0	270	1129
8:15 AM	24	35	12	0	6	9	3	0	3	90	18	0	8	93	6	0	307	1150
8:30 AM	11	16	8	0	5	11	3	0	4	97	20	0	5	111	4	0	295	1192
8:45 AM	20	18	6	0	3	10	2	0	6	72	14	0	7	93	4	0	255	1127

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	116	96	36	0	24	52	12	0	36	288	80	0	36	484	20	0	1280
Heavy Trucks	4	0	0		0	4	0		0	16	4		0	64	0		92
Buses	4	0	0		0	0	0		0	4	0		0	0	0		8
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/22/2023 10:53 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

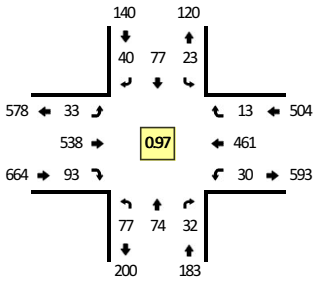
Type of peak hour being reported: Intersection Peak

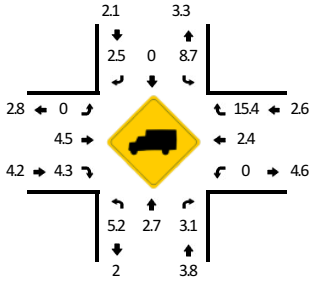
Method for determining peak hour: Total Entering

LOCATION: Culpeper St -- W Shirley Ave
CITY/STATE: Warrenton, VA

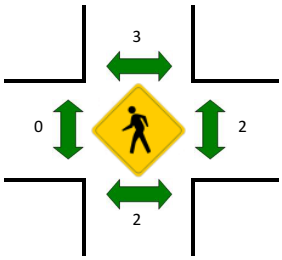
QC JOB #: 16218114
DATE: Thu, May 18 2023

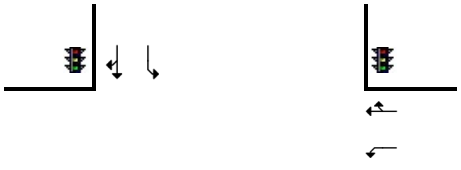
Peak-Hour: 3:00 PM -- 4:00 PM
Peak 15-Min: 3:00 PM -- 3:15 PM

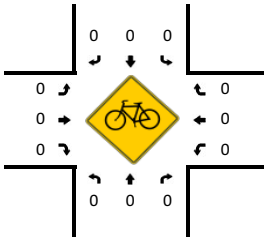


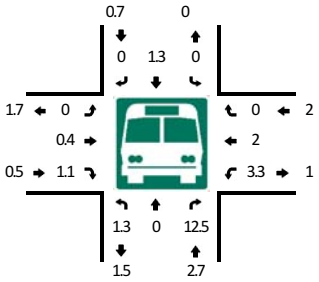


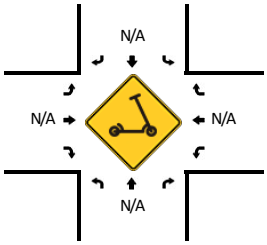
TRUE DATA TO IMPROVE MOBILITY











15-Min Count Period Beginning At	Culpeper St (Northbound)				Culpeper St (Southbound)				W Shirley Ave (Eastbound)				W Shirley Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	24	15	12	0	5	15	9	0	5	113	18	0	3	123	1	0	343	
2:15 PM	17	24	6	0	5	12	6	0	5	124	28	0	7	110	1	0	345	
2:30 PM	19	21	6	0	9	10	3	0	8	113	22	0	14	131	5	0	361	
2:45 PM	24	11	6	0	7	9	7	0	15	104	17	0	9	97	4	0	310	1359
3:00 PM	16	19	12	0	4	21	12	0	8	137	23	0	6	125	3	0	386	1402
3:15 PM	24	20	8	0	9	17	9	0	9	152	19	0	5	98	3	0	373	1430
3:30 PM	22	17	4	0	5	15	8	0	10	130	16	0	13	116	2	0	358	1427
3:45 PM	15	18	8	0	5	24	11	0	6	119	35	0	6	122	5	0	374	1491
4:00 PM	19	18	8	0	6	19	8	0	8	130	25	0	4	115	5	0	365	1470
4:15 PM	21	15	9	0	8	29	3	0	8	105	29	0	7	92	3	0	329	1426
4:30 PM	18	16	8	0	17	19	12	0	14	129	37	0	8	106	1	0	385	1453
4:45 PM	22	17	4	0	5	34	3	0	9	115	40	0	10	107	0	0	366	1445
5:00 PM	21	14	10	0	5	24	5	0	7	112	30	0	9	130	2	0	369	1449
5:15 PM	21	16	6	0	7	32	5	0	7	92	35	0	4	102	1	0	328	1448
5:30 PM	16	16	7	0	5	23	3	0	4	110	31	0	8	91	1	0	315	1378
5:45 PM	14	13	10	0	4	13	7	0	3	100	22	0	6	111	3	0	306	1318

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	64	76	48	0	16	84	48	0	32	548	92	0	24	500	12	0	1544
Heavy Trucks	0	4	0		0	0	0		0	8	4		0	16	0		32
Buses	0	0	4		0	0	0		0	4	0		0	0	0		8
Pedestrians		0				8				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/22/2023 10:53 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Appendix C
Traffic Signal Timings

15-17-29BusJames Madison&1105 Alwington

Phase Timing

9/1/2023 10:30:10 AM

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Min Green	7	12	7	7	7	12	0	0	0	0	0	0	0	0	0	0
Veh Ext	4.0	5.0	4.0	5.0	4.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Green 1	15	30	20	15	15	30	0	0	0	0	0	0	0	0	0	0
Max Green 2	15	30	20	15	15	30	0	0	0	0	0	0	0	0	0	0
Max Green 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Ext	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow	4.8	4.8	4.1	3.2	4.8	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clr	3.9	3.9	4.7	3.1	3.9	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adv Flash	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bike MG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sol DW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Early Wlk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Wlk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reduce After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TTReduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Max Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Revert	4.0	4.0	4.0	4.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Neg Ped	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AP Disc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Ped Clr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Return Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

15-17-29BusJames Madison&1105 Alwington

Phase Options

9/1/2023 10:30:10 AM

Phases	1-8								9-16							
Min Recalls		2	3			6										
Max Recalls																
Ped Recalls																
Soft Recall																
Dual Entry																
Red Rest																
Walk Rest																
Walk Expand																
Ped Recycle																
Sim Ped Term																
PC Thru Clr																
Guar Passage																
No Simult Gap																
Yel Lock		2				6										
Red Lock																
PhaseNext Lock	1	2	3	4	5	6										
No Term Call	1	2	3	4	5	6										
Cond Serv																
CS Enable																
Cond Reserve																
Reserve																
Veh Omit							7	8								
Ped Omit																
Perm Phase																
Protect Calls																
Protect Calls 2																
Flash Entry																
Flash Exit																
Flash Exit Yel																
Flash Exit Red																
Ped Scramble																
No Min Yel																
No Min Red Rev																
Max Scramble Walk																
Flash Yellow		2				6										
Flash FYA																
CNA 1																
CNA 2																

15-17-29BusJames Madison&1105 Alwington

Phase Startup Options

9/1/2023 10:30:10 AM

Startup Flash	0	Mode	Yel->Red
Startup All Red	0	Yellow	0.0

Phases	1-8							9-16							
Startup Phases		2				6										
Startup Yellow																
Startup Red																
Startup No Walk																
Startup Next																
Startup Yel Fls																
Startup FYA																
No Veh Call							7	8								
No Ped Call																

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	4.0	Ped Protect	No	AdvFls in Flash	No

15-17-29BusJames Madison&1105 Alwington

Ring Sequence / Conflicting Phases

9/1/2023 10:30:10 AM

Ringgroup 1

Ring 1	1	2	3	4	0	0	0	0	0	0	0	0	0	0	0	0
Ring 2	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ringgroup 2

Custom Sequences

Seq 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Conflicting Phases

	1-8							9-16							
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															

15-17-29BusJames Madison&1105 Alwington

MCE Options

9/1/2023 10:30:10 AM

Phases	1-8								9-16							
MCE Ped Protect																
MCE Veh Call		2		4		6										
MCE Ped Call																
MCE Veh Omit																
MCE Ped Omit																
MCE Veh Sync		2		4		6										
MCE Ped Sync																
MCE Halt Don't Walk																

LRV Phases	1-8							
MCE LRV Term Early								

15-17-29BusJames Madison&1105 Alwington

FYA/FRA

9/1/2023 10:30:10 AM

FYA	1	2	3	4	5	6	7	8
Prot Phs	1	0	0	0	5	0	0	0
Opp Thru	2	0	0	0	6	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	3.0	0.0	0.0	0.0	3.0	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		

15-17-29BusJames Madison&1105 Alwington

Overlap 2

9/1/2023 10:30:10 AM

Min Green	0.0	Trail Green	0.0	Trail Green 2	0.0	Delay Green	0.0
Yellow	0.0	Red	0.0	Red Revert	0.0		
Walk	0	Ped Clearance	0	Solid DW	0.0	Early Wlk	0.0

Delay Wlk 0.0

Phases	1-8								9-16							
Parents			3													
Negative Green																
Start Next																
Trail Enable																
Trail Ena Next																
Trail Ena 2																
Trail Next 2																
Delay Enable																
Negative Veh																
Negative Ped																
Negative Olap																
Walk Rest																
Walk Thru																
Walk Halt																
Ped Recycle																
Overlap Start																
Overlap Ped Start																
Phase Calls																

Pmt Green	0	Walk	0	Ped Clr	0	
PP Phase	0	PP Delay	0.0			
Min FR	0.0	FR Hold	0.0	FR Delay	0.0	

LRV Start Enable

LRV Enable

Phases	1-8								9-16							
Perm Phases																
Prot Phases																
FR Ena Phases																
FR Grn Phases																
FR Ped Conf																
FR OLPed Conf																

15-17-29BusJames Madison&1105 Alwington

Coordination Options

9/1/2023 10:30:10 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	Crd Grp End	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		

15-17-29BusJames Madison&1105 Alwington

Hardwire Plans

9/1/2023 10:30:10 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

15-17-29BusJames Madison&1105 Alwington

Soft Interconnect

9/1/2023 10:30:10 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		

15-17-29BusJames Madison&1105 Alwington

Preempt Inputs

9/1/2023 10:30:10 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

15-17-29BusJames Madison&1105 Alwington

Preempt 1 (Configuration)

9/1/2023 10:30:10 AM

Enabled	No	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
Enable Phases		
Preempt Inputs		

	1-8		
LRV Disable		Max	0
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		
Dwell Ped Phases		
Dwell Olap		
Dwell Olap Ped		
Exit Veh Phases		
Exit Ped Phases		
Exit Olap		
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		

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	0
Reserve Inh Same	0		
Reserve Inh All	0		
Delay	0		

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		

15-17-29BusJames Madison&1105 Alwington

Preempt 2 (Configuration)

9/1/2023 10:30:10 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
Enable Phases		
Preempt Inputs	2	

	1-8		
LRV Disable		Max	0
LRV Dwell Flash			
LRV Omit		Delay	0
LRV No Yel			

Preempt 2 (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	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		
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	5	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	5	Min Duration	0
Dwell Extend	0		
Max Dwell	180	Max Call	0
Reserve Inh Same	0		
Reserve Inh All	0		
Delay	0		

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	1	

15-17-29BusJames Madison&1105 Alwington

Preempt 3 (Configuration)

9/1/2023 10:30:10 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
Enable Phases		
Preempt Inputs	3	

	1-8		
LRV Disable		Max	0
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		
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	5	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	5	Min Duration	0
Dwell Extend	0		
Max Dwell	180	Max Call	0
Reserve Inh Same	0		
Reserve Inh All	0		
Delay	0		

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		

15-17-29BusJames Madison&1105 Alwington

Preempt 4 (Configuration)

9/1/2023 10:30:10 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
Enable Phases		
Preempt Inputs	4	

	1-8		
LRV Disable		Max	0
LRV Dwell Flash			
LRV Omit		Delay	0
LRV No Yel			

Preempt 4 (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	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		
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	5	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	5	Min Duration	0
Dwell Extend	0		
Max Dwell	180	Max Call	0
Reserve Inh Same	0		
Reserve Inh All	0		
Delay	0		

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		

15-17-29BusJames Madison&1105 Alwington

Preempt 5 (Configuration)

9/1/2023 10:30:10 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
Enable Phases		
Preempt Inputs	5	

	1-8		
LRV Disable		Max	0
LRV Dwell Flash			
LRV Omit		Delay	0
LRV No Yel			

Preempt 5 (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		
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	5	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	5	Min Duration	0
Dwell Extend	0		
Max Dwell	180	Max Call	0
Reserve Inh Same	0		
Reserve Inh All	0		
Delay	0		

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	5	

15-17-29BusJames Madison&1105 Alwington

Preempt 6 (Configuration)

9/1/2023 10:30:10 AM

Enabled	No	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
Enable Phases		
Preempt Inputs		

	1-8		
LRV Disable		Max	0
LRV Dwell Flash			
LRV Omit		Delay	0
LRV No Yel			

Preempt 6 (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		
Dwell Ped Phases		
Dwell Olap		
Dwell Olap Ped		
Exit Veh Phases		
Exit Ped Phases		
Exit Olap		
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		

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	0
Reserve Inh Same	0		
Reserve Inh All	0		
Delay	0		

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		

15-17-29BusJames Madison&1105 Alwington

Preempt 7 (Configuration)

9/1/2023 10:30:10 AM

Enabled	No	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
Enable Phases		
Preempt Inputs		

	1-8		
LRV Disable		Max	0
LRV Dwell Flash			
LRV Omit		Delay	0
LRV No Yel			

Preempt 7 (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		
Dwell Ped Phases		
Dwell Olap		
Dwell Olap Ped		
Exit Veh Phases		
Exit Ped Phases		
Exit Olap		
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		

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	0
Reserve Inh Same	0		
Reserve Inh All	0		
Delay	0		

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		

15-17-29BusJames Madison&1105 Alwington

Preempt 8 (Configuration)

9/1/2023 10:30:10 AM

Enabled	No	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
Enable Phases		
Preempt Inputs		

	1-8		
LRV Disable		Max	0
LRV Dwell Flash			
LRV Omit		Delay	0
LRV No Yel			

Preempt 8 (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		
Dwell Ped Phases		
Dwell Olap		
Dwell Olap Ped		
Exit Veh Phases		
Exit Ped Phases		
Exit Olap		
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		

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	0
Reserve Inh Same	0		
Reserve Inh All	0		
Delay	0		

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		

15-17-29BusJames Madison&1105 Alwington

Preempt 9 (Configuration)

9/1/2023 10:30:10 AM

Enabled	No	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
Enable Phases		
Preempt Inputs		

	1-8		
LRV Disable		Max	0
LRV Dwell Flash			
LRV Omit		Delay	0
LRV No Yel			

Preempt 9 (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		
Dwell Ped Phases		
Dwell Olap		
Dwell Olap Ped		
Exit Veh Phases		
Exit Ped Phases		
Exit Olap		
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		

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	0
Reserve Inh Same	0		
Reserve Inh All	0		
Delay	0		

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		

15-17-29BusJames Madison&1105 Alwington

Preempt 10 (Configuration)

9/1/2023 10:30:10 AM

Enabled	No	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
Enable Phases		
Preempt Inputs		

	1-8		
LRV Disable		Max	0
LRV Dwell Flash			
LRV Omit		Delay	0
LRV No Yel			

Preempt 10 (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		
Dwell Ped Phases		
Dwell Olap		
Dwell Olap Ped		
Exit Veh Phases		
Exit Ped Phases		
Exit Olap		
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		

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	0
Reserve Inh Same	0		
Reserve Inh All	0		
Delay	0		

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		

15-17-29BusJames Madison&1105 Alwington

Preempt 1 (Delay)

9/1/2023 10:30:10 AM

Delay Mode: Normal

Delay LRV:

TC1 End: 0

Phases/Overlaps	1-8	9-16
Delay Phases		
Delay Peds		
Delay Olaps		
Delay Olap Peds		
Guar Olaps		

Preempt 2 (Delay)

Delay Mode: Normal

Delay LRV:

TC1 End: 0

Phases/Overlaps	1-8	9-16
Delay Phases		
Delay Peds		
Delay Olaps		
Delay Olap Peds		
Guar Olaps		

Preempt 3 (Delay)

Delay Mode: Normal

Delay LRV:

TC1 End: 0

Phases/Overlaps	1-8	9-16
Delay Phases		
Delay Peds		
Delay Olaps		
Delay Olap Peds		
Guar Olaps		

15-17-29BusJames Madison&1105 Alwington

Preempt 4 (Delay)

9/1/2023 10:30:10 AM

Delay Mode: Normal

Delay LRV:

TC1 End: 0

Phases/Overlaps	1-8	9-16
Delay Phases		
Delay Peds		
Delay Olaps		
Delay Olap Peds		
Guar Olaps		

Preempt 5 (Delay)

Delay Mode: Normal

Delay LRV:

TC1 End: 0

Phases/Overlaps	1-8	9-16
Delay Phases		
Delay Peds		
Delay Olaps		
Delay Olap Peds		
Guar Olaps		

Preempt 6 (Delay)

Delay Mode: Normal

Delay LRV:

TC1 End: 0

Phases/Overlaps	1-8	9-16
Delay Phases		
Delay Peds		
Delay Olaps		
Delay Olap Peds		
Guar Olaps		

15-17-29BusJames Madison&1105 Alwington

Preempt 7 (Delay)

9/1/2023 10:30:10 AM

Delay Mode: Normal

Delay LRV:

TC1 End: 0

Phases/Overlaps	1-8	9-16
Delay Phases		
Delay Peds		
Delay Olaps		
Delay Olap Peds		
Guar Olaps		

Preempt 8 (Delay)

Delay Mode: Normal

Delay LRV:

TC1 End: 0

Phases/Overlaps	1-8	9-16
Delay Phases		
Delay Peds		
Delay Olaps		
Delay Olap Peds		
Guar Olaps		

Preempt 9 (Delay)

Delay Mode: Normal

Delay LRV:

TC1 End: 0

Phases/Overlaps	1-8	9-16
Delay Phases		
Delay Peds		
Delay Olaps		
Delay Olap Peds		
Guar Olaps		

15-17-29BusJames Madison&1105 Alwington

Preempt 10 (Delay)

9/1/2023 10:30:10 AM

Delay Mode: Normal

Delay LRV:

TC1 End: 0

Phases/Overlaps	1-8	9-16
Delay Phases		
Delay Peds		
Delay Olaps		
Delay Olap Peds		
Guar Olaps		

15-17-29BusJames Madison&1105 Alwington

TOD Pattern Events

9/1/2023 10:30:10 AM

	Time	DOW							Holidays								Mode	Pattern	Offset
Event 1	00:00																Sched	0	0
Event 2	00:00																Sched	0	0
Event 3	00:00																Sched	0	0
Event 4	00:00																Sched	0	0
Event 5	00:00																Sched	0	0
Event 6	00:00																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

15-17-29BusJames Madison&1105 Alwington

Holidays

9/1/2023 10:30:10 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

15-17-29BusJames Madison&1105 Alwington

Control / Config

9/1/2023 10:30:10 AM

Pattern Mode: Free

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

	1-8	9-16
Maint Phs Recalls		
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

Programmed EPAC Data

11/23/20
2:09:23PM

Item 4.

Intersection Name: Culpeper & E.Shirley **Intersection Alias:** culesh

Access Code: 9999 Channel: 1 Address: 7 Revision: 3.33b

Access Data

Port 2 Comm :19200 Baud
Port 3 Comm :1200 Baud

Phase Data

Vehical Basic Timings

Phase	Min_Grn	Passage	Max1	Max2	Yellow	All Red
1	8	4.0	30	30	4.0	2.0
2	30	4.0	45	50	4.0	2.0
3	8	4.0	30	30	4.0	2.0
4	8	4.0	30	50	4.0	2.0
5	8	4.0	30	30	4.0	2.0
6	30	4.0	45	50	4.0	2.0

Vehical Density Timings

Added Initial	Max_Initial	Time B4 Reduction	Cars Before	Time To Reduce	Min_Gap
0.0	0	0	0	0	0.0
0.0	0	0	0	0	0.0
0.0	0	0	0	0	0.0
0.0	0	0	0	0	0.0
0.0	0	0	0	0	0.0
0.0	0	0	0	0	0.0

Pedestrian Timing

Phase	Walk	Ped Clear	Flashing Walk	Extended Actuated Ped Clear	Rest in Walk
1	0	0	No	0	No
2	0	0	No	0	No
3	7	12	No	0	No
4	7	12	No	0	No
5	0	0	No	0	No
6	7	12	No	0	No

General Control

Initialize	Non-Act Response	Veh Recall	Ped Recall	Recall Delay
Inactive	None	Min	None	0
Green	NonActI	Min	None	0
Inactive	None	None	None	0
Inactive	NonActII	None	None	0
Inactive	None	None	None	0
Green	NonActI	Min	None	0

Miscellaneous

Non Lock	Dual Entry	Last Car Passage	Conditional Service	No Simultaneous Gap Out
Yes	No	No	No	No
No	No	No	No	No
No	No	No	No	No
No	No	No	No	No
Yes	No	No	No	No
No	No	No	No	No

Special Sequence
Default Data

Vehical Detector Phase Assignment

Assigned Phase	Mode	Switched Phase	Extend	Delay

Default Data

Pedestrian Detector
Default Data

Special Detector Phase Assignment

Assign Phase	Mode	Switched Phase	Extend	Delay

:
Default Data

Unit Data

General Control

Startup Time: 5sec Startup State: Flash Red Revert: 4sec
Auto Ped Clear: No Stop Time Reset: No Alternate Sequence: 0
ABC connector Input Modes: 0
ABC connector Output Modes: 0
D connector Input Modes: 0
D connector Output Modes: 0

Ring	Input Respons	Output Selection
1	Ring 1	Ring 1
2	Ring 2	Ring 2
3	None	None
4	None	None

Remote Flash
Test A = Flash

Phase	Flash Entry Phase	Flash Exit Phase

Default Data - No Flash

Channel	Flash Color	Flash Alternat

Default Data - No Flash

Overlaps

Overlaps

Phase(s)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trail Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trail Yellow	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Trail Red	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Plus Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minus Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring

Phase	Ring	Next Phase
1	1	2
2	1	3
3	1	4
4	1	1
5	2	6
6	2	7

Phase(s)

Concurrent Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1	2	3	4	1	1	3	3	9	10	11	12	13	14	15	16
	5	5	7	7	2	2	4	4								
	6	6	8	8	5	6	7	8								

Alternate Sequences

Alternate Sequences

No Alternate Sequences

Port 1 Data

BIU Addr	Port Status	Message 40

Default Data

Phase Pair(s)

Channel Assignment

Control	Channel	Hardware Pin Set		Control	Channel	Hardware Pin Set		Control	Channel	Hardware Pin Set	
Ph.1 Veh	1	1 - Ph.1 RYG	1	Ph.2 Veh	2	2 - Ph.2 RYG	2	Ph.3 Veh	3	3 - Ph.3 RYG	3
Ph.4 Veh	4	4 - Ph.4 RYG	4	Ph.5 Veh	5	5 - Ph.5 RYG	5	Ph.6 Veh	6	6 - Ph.6 RYG	6
Ph.7 Veh	7	7 - Ph.7 RYG	7	Ph.8 Veh	8	8 - Ph.8 RYG	8	Ph.2 Ped	9	10 - Ph.2 DPW	10
Ph.4 Ped	10	12 - Ph.4 DPW	12	Ph.6 Ped	11	14 - Ph.6 DPW	14	Ph.8 Ped	12	16 - Ph.8 DPW	16
Ph.1 OLP	13	17 - Ph.1 RYG	17	Ph.2 OLP	14	18 - Ph.2 RYG	18	Ph.3 OLP	15	19 - Ph.3 RYG	19
Ph.4 OLP	16	20 - Ph.4 RYG	20	Ph.1 Ped	17	9 - Ph.1 DPW	9	Ph.3 Ped	18	11 - Ph.3 DPW	11
Ph.5 Ped	19	13 - Ph.5 DPW	13	Ph.7 Ped	20	15 - Ph.7 DPW	15				

Coordination Data

Dial/Split Cycle

/

General Coordination Data

Operation Mode: 0=Free
Coordination Mode: 0=Permissive
Maximun Mode: 2=Max 2
Correction Mode: 0=Dwell

Offset Mode: 0=Beg Grn
Force Mode: 0=Plan
Max Dwell Time: 0
Yield Period: 0

Manual Dial: 1
Manual Split: 1
Manual Offset: 1

Split Times and Phase Mode:

Dial / Split

Ph.	Splits	Ph. Mode	Ph.	Splits	Ph. Mode	Ph.	Splits	Ph. Mode	Ph.	Splits	Ph. Mode

Traffic Plan Data

Plan: // Offset Time: Alt. Sequence: Mode: Rg 2 Lag Time: Rg 3 Lag Time: Rg 4 Lag Time:

Local TBC Data

Start of Daylight Saving Month: 0 Week: 0 Cycle Zero Reference Hours: 0 Min: 0

End of Daylight Saving Month: 0 Week: 0

Source Day	Equate Days 1	2	3	4	5	6	7

Traffic Data

PHASE FUNCTION

Event	Day	Time :	D/S/O //	flash	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

AUX. Events

Item 4.

Event	Program Day	Hour	Min.	Aux Ouputs 1	2	3	Det. Diag. D1	Det. Rpt. D2	Det. Mult100 D3	Dimming	Special Function Outputs 1	2	3	4	5	6	7	8
				☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Default Data - No Special Day(s) or Week(s) Programmed

Special Functions

Function	SF1	SF2	SF3	SF4	SF5	SF6	SF7	SF8
Special Function 1	X							
Special Function 2		X						
Special Function 3			X					
Special Function 4				X				
Special Function 5					X			
Special Function 6						X		
Special Function 7							X	
Special Function 8								X

Phase Function

Phase Function Map	PF1	PF2	PF3	PF4	PF5	PF6	PF7	PF8	PF9	PF10	PF11	PF12	PF13	PF14	PF15	PF16
Phase 1 Max2	X															
Phase 2 Max2		X														
Phase 3 Max2			X													
Phase 4 Max2				X												
Phase 5 Max2					X											
Phase 6 Max2						X										
Phase 7 Max2							X									
Phase 8 Max2								X								
Phase 1 Phase Omit									X							
Phase 2 Phase Omit										X						
Phase 3 Phase Omit											X					
Phase 4 Phase Omit												X				
Phase 5 Phase Omit													X			
Phase 6 Phase Omit														X		
Phase 7 Phase Omit															X	
Phase 8 Phase Omit																X

Dimming Data

Channel	Red	Yellow	Green	Alternate
	☐	☐	☐	☐

Default Data - No Dimming Programmed

Preemption Data

General Preemption Data

Ring	Min Grn/Walk Time
1	10
2	10
3	10
4	10

Flash > Preepmt 1 Preepmt 2 = Preempt 3 Preepmt 4 = Preempt 5
Preepmt 1 > Preempt 2 Preepmt 3 = Preempt 4 Preepmt 5 = Preempt 6

Preempt Timers

Preempt	Non-Locking	Link to Preempt	Delay	Extend	Duration	MaxCall	Lock-Out	Select Ped Clear	Select Yel	Select Red	Track Grn	Track Ped	Track Yel	Track Red	Dwell Green	Return Ped Clear	Return Yel	Return Red
1	No	0	0	0	0	0	0	0	0.0	0.0	0	0	0.0	0.0	6	0	0.0	0.0
2	No	0	0	0	0	0	0	0	0.0	0.0	0	0	0.0	0.0	6	0	0.0	0.0
3	No	0	0	0	0	0	0	0	0.0	0.0	0	0	0.0	0.0	6	0	0.0	0.0
4	No	0	0	0	0	0	0	0	0.0	0.0	0	0	0.0	0.0	6	0	0.0	0.0
5	No	0	0	0	0	0	0	8	4.0	2.0	10	8	4.0	2.0	10	8	4.0	2.0
6	No	0	0	0	0	0	0	8	4.0	2.0	10	8	4.0	2.0	10	8	4.0	2.0

Preempt 1

Phase	Exit Phase	Exit Calls
1	No	Yes
2	Yes	No
6	Yes	Yes

Preempt 2

Phase	Exit Phase	Exit Calls
2	Yes	No
4	No	Yes
6	Yes	No

Preempt 3

Phase	Exit Phase	Exit Calls
2	Yes	Yes
5	No	Yes
6	Yes	No

Preempt 4

Phase	Exit Phase	Exit Calls
2	Yes	No
3	No	Yes
6	Yes	No

Preempt 5

Phase	Exit Phase	Exit Calls
1	No	Yes
2	No	Yes
3	No	Yes
4	No	Yes
5	No	Yes
6	No	Yes
7	No	Yes
8	No	Yes

Preempt 6

Phase	Exit Phase	Exit Calls
1	No	Yes
2	No	Yes
3	No	Yes
4	No	Yes
5	No	Yes
6	No	Yes
7	No	Yes
8	No	Yes

Priority Timers

Priority	Non-Locking	Delay	Extend	Duration	Dwell	Max_Call	Lock-Out	Skip Phases
1	No	0	0	0	0	0	0	0=Do not Skip Phases
2	No	0	0	0	0	0	0	0=Do not Skip Phases
3	No	0	0	0	0	0	0	0=Do not Skip Phases
4	No	0	0	0	0	0	0	0=Do not Skip Phases
5	No	0	0	0	0	0	0	0=Do not Skip Phases
6	No	0	0	0	0	0	0	0=Do not Skip Phases

Priority 1

Phase	Exit Phase	Exit Calls

Priority 2

Phase	Exit Phase	Exit Calls

Priority 3

Phase	Exit Phase	Exit Calls

Priority 4

Phase	Exit Phase	Exit Calls

Priority 5

Phase	Exit Phase	Exit Calls

Priority 6

Phase	Exit Phase	Exit Calls

Preempt 1

Vehical Phases

Ph.	Track	Dwell	Cycle
1	Red	Green	No
6	Red	Green	No

Pedestrian Phases

Ph	Track	Dwell	Cycle

Default Data

Overlaps

Ovlp	Track	Dwell	Cycle

Default Data

Preempt 2

Vehical Phases

Ph.	Track	Dwell	Cycle
4	Red	Green	No

Pedestrian Phases

Ph.	Track	Dwell	Cycle

Default Data

Overlaps

Ovlp.	Track	Dwell	Cycle

Default Data

Preempt 3

Vehical Phases

Ph.	Track	Dwell	Cycle
2	Red	Green	No
5	Red	Green	No

Pedestrian Phases

Ph.	Track	Dwell	Cycle

Default Data

Overlaps

Ovlp.	Track	Dwell	Cycle

Default Data

Preempt 4

Vehical Phases

Ph.	Track	Dwell	Cycle
3	Red	Green	No

Pedestrian Phases

Ph.	Track	Dwell	Cycle

Default Data

Overlaps

Ovlp.	Track	Dwell	Cycle

Default Data

Preempt 5

Vehical Phases

Ph.	Track	Dwell	Cycle

Default Data

Pedestrian Phases

Ph.	Track	Dwell	Cycle

Default Data

Overlaps

Ovlp.	Track	Dwell	Cycle

Default Data

Preempt 6

Vehical Phases

Ph.	Track	Dwell	Cycle

Default Data

Pedestrian Phases

Ph.	Track	Dwell	Cycle

Default Data

Overlaps

Ovlp.	Track	Dwell	Cycle

Default Data

System/Detectors Data

Local Critical Alarms

Revert to Backup: 15 1st Phone:

Local Free: No Cycle Failure: No Coord Failure: No Conflict Flash: No Remote Flash: No 2nd Phone:

Local Fash: No Cycle Fault: No Coord Fault: No Premption: No Voltage Monitor: No

Special Status 1: No Special Status 2: No Special Status 3: No Special Status 4: No Special Status 5: No Special Status 6: No

Traffic Responsive

System Detector	Detector Channel	Veh/Hr	Average Time(mins)	Occupancy Correction/10	Min Volume %	Queue 1 Detectors	System Detectors	Weight Factor	Queue 2 Detectors	System Detectors	Weight Factor

Default Data

Sample Interval:

Default Data

Queue: 1 Input Selection: 0=Average

Detector Failed Level : 0

Queue: 2 Input Selection: 0=Average

Detector Failed Level : 0

Default Data

Queue:

Level	Enter	Leave	Dial / Split / Offset
			/ /

Default Data

Vehical Detector

Diagnostic Value 0

Detector	Max Presence	No Activity	Erratic Count

Default Data - Diag 0 Values

Vehical Detector

Diagnostic Value 1

Detector	Max Presence	No Activity	Erratic Count

Default Data - No Diag 1 Values

Special Detector

Diagnostic Value 0

Detector	Max Presence	No Activity	Erratic Count

Default Data - No Diag 0 Valu

Pedestrian Detector

Diagnostic Value 0

Detector	Max Presence	No Activity	Erratic Count

Default Data - No Diag 0 Values

Pedestrian Detector

Diagnostic Value 1

Detector	Max Presence	No Activity	Erratic Count

Default Data - No Diag 1 Values

Special Detector

Diagnostic Value 1

Detector	Max Presence	No Activity	Erratic Count

Default Data - No Diag 1 Values

Speed Trap Data

Speed Trap:

Measurement:

Detector 1	Detector_2	Distance :

Default Data

Speed Trap Low Treshold	Speed Trap High Treshold

Dial/Split/Offset

//

Default Data

Volume Detector Data

Report Interval

Volume Detector Number	Controller Detector Channel

Default Data

Appendix D
Existing Analysis Worksheets

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	0	45	20	88	0	0	34	13	0	0
Future Vol, veh/h	0	5	0	45	20	88	0	0	34	13	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
Heavy Vehicles, %	0	0	0	24	0	7	0	0	65	8	0	0
Mvmt Flow	0	6	0	50	22	98	0	0	38	14	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.3	7.8	6.9	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	69%	0%	100%
Vol Thru, %	0%	100%	31%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	34	5	65	88	13
LT Vol	0	0	45	0	13
Through Vol	0	5	20	0	0
RT Vol	34	0	0	88	0
Lane Flow Rate	38	6	72	98	14
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.039	0.007	0.107	0.106	0.019
Departure Headway (Hd)	3.718	4.215	5.35	3.895	4.675
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	969	840	671	920	770
Service Time	1.719	2.285	3.073	1.617	2.676
HCM Lane V/C Ratio	0.039	0.007	0.107	0.107	0.018
HCM Control Delay	6.9	7.3	8.7	7.1	7.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0	0.4	0.4	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	32	357	75	32	476	238	17	57
v/c Ratio	0.17	0.56	0.11	0.20	0.64	0.69	0.09	0.29
Control Delay	40.8	27.6	0.3	42.9	29.3	43.4	38.7	30.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	27.6	0.3	42.9	29.3	43.4	38.7	30.3
Queue Length 50th (ft)	17	163	0	17	239	116	9	19
Queue Length 95th (ft)	45	260	0	47	#424	207	29	55
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	409	853	821	157	745	399	397	396
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	0.42	0.09	0.20	0.64	0.60	0.04	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	314	66	28	397	22	78	81	50	15	31	19
Future Volume (vph)	28	314	66	28	397	22	78	81	50	15	31	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99			0.97		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1823	1761	1539	1667	1720			1736		1769	1690	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1823	1761	1539	1667	1720			1736		1769	1690	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	32	357	75	32	451	25	89	92	57	17	35	22
RTOR Reduction (vph)	0	0	46	0	1	0	0	10	0	0	20	0
Lane Group Flow (vph)	32	357	29	32	475	0	0	228	0	17	37	0
Heavy Vehicles (%)	0%	9%	6%	11%	13%	0%	6%	2%	4%	0%	3%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	5.0	34.1	34.1	8.1	37.2			16.5		7.0	7.0	
Effective Green, g (s)	5.0	34.1	34.1	8.1	37.2			16.5		7.0	7.0	
Actuated g/C Ratio	0.06	0.38	0.38	0.09	0.41			0.18		0.08	0.08	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	101	669	585	150	713			319		138	131	
v/s Ratio Prot	0.02	0.20		c0.02	c0.28			c0.13		0.01	c0.02	
v/s Ratio Perm			0.02									
v/c Ratio	0.32	0.53	0.05	0.21	0.67			0.72		0.12	0.28	
Uniform Delay, d1	40.7	21.6	17.6	37.8	21.2			34.4		38.5	39.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	2.5	1.0	0.0	1.0	2.6			7.9		0.5	1.6	
Delay (s)	43.2	22.7	17.6	38.8	23.8			42.3		39.0	40.6	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		23.3			24.8			42.3			40.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	89.7	Sum of lost time (s)	24.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	295	37	48	431	0	0
Future Volume (Veh/h)	295	37	48	431	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	324	41	53	474	0	0
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			365		904	324
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			365		904	324
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			95		100	100
cM capacity (veh/h)			1135		295	722

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	324	41	53	474
Volume Left	0	0	53	0
Volume Right	0	41	0	0
cSH	1700	1700	1135	1700
Volume to Capacity	0.19	0.02	0.05	0.28
Queue Length 95th (ft)	0	0	4	0
Control Delay (s)	0.0	0.0	8.3	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.8	
Approach LOS				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	286	0	0	441	41	51
Future Volume (Veh/h)	286	0	0	441	41	51
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	321	0	0	496	46	57
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			321		817	321
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			321		817	321
tC, single (s)			4.1		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.4
p0 queue free %			100		86	92
cM capacity (veh/h)			1250		327	689

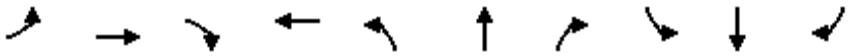
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	321	496	46	57
Volume Left	0	0	46	0
Volume Right	0	0	0	57
cSH	1700	1700	327	689
Volume to Capacity	0.19	0.29	0.14	0.08
Queue Length 95th (ft)	0	0	12	7
Control Delay (s)	0.0	0.0	17.8	10.7
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	13.9	
Approach LOS			B	

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	322	17	24	439	0	0
Future Volume (Veh/h)	322	17	24	439	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	339	18	25	462	0	0
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			357		851	339
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			357		851	339
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	100
cM capacity (veh/h)			1213		327	708

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	339	18	25	462
Volume Left	0	0	25	0
Volume Right	0	18	0	0
cSH	1700	1700	1213	1700
Volume to Capacity	0.20	0.01	0.02	0.27
Queue Length 95th (ft)	0	0	2	0
Control Delay (s)	0.0	0.0	8.0	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.4	
Approach LOS				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	26.4%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	62	62	76	7	199	460	10	10	181	162
v/c Ratio	0.37	0.37	0.06	0.02	0.45	0.33	0.01	0.03	0.35	0.28
Control Delay	36.0	36.0	0.1	0.2	17.2	17.5	0.0	12.3	29.9	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	36.0	0.1	0.2	17.2	17.5	0.0	12.3	29.9	2.6
Queue Length 50th (ft)	27	27	0	0	53	65	0	2	37	0
Queue Length 95th (ft)	63	63	0	0	99	143	0	11	71	15
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	251	251	1291	336	546	1429	837	393	876	667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.25	0.06	0.02	0.36	0.32	0.01	0.03	0.21	0.24

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	107	0	65	2	0	4	171	396	9	2	7	156
Future Volume (vph)	107	0	65	2	0	4	171	396	9	2	7	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.90		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.99		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1316	1316	1291		1003		1674	3409	1647		1436	3103
Flt Permitted	0.95	0.95	1.00		0.99		0.64	1.00	1.00		0.49	1.00
Satd. Flow (perm)	1316	1316	1291		1003		1123	3409	1647		736	3103
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.92	0.86	0.86
Adj. Flow (vph)	124	0	76	2	0	5	199	460	10	2	8	181
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	6	0	0	0
Lane Group Flow (vph)	62	62	76	0	1	0	199	460	4	0	10	181
Heavy Vehicles (%)	27%	0%	22%	50%	0%	75%	10%	8%	0%	0%	29%	14%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	9.3	9.3	79.2		7.0		30.4	29.2	29.2		30.4	19.4
Effective Green, g (s)	9.3	9.3	79.2		7.0		30.4	29.2	29.2		30.4	19.4
Actuated g/C Ratio	0.12	0.12	1.00		0.09		0.38	0.37	0.37		0.38	0.24
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	154	154	1291		88		507	1256	607		293	760
v/s Ratio Prot	c0.05	0.05			0.00		c0.05	c0.13			0.00	0.06
v/s Ratio Perm			c0.06				0.10		0.00		0.01	
v/c Ratio	0.40	0.40	0.06		0.01		0.39	0.37	0.01		0.03	0.24
Uniform Delay, d1	32.4	32.4	0.0		32.9		17.1	18.2	15.8		15.1	24.0
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.7	1.7	0.1		0.0		0.5	0.2	0.0		0.0	0.2
Delay (s)	34.1	34.1	0.1		33.0		17.6	18.4	15.8		15.2	24.1
Level of Service	C	C	A		C		B	B	B		B	C
Approach Delay (s)		21.2			33.0			18.1				20.6
Approach LOS		C			C			B				C

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	79.2	Sum of lost time (s)	32.5
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	139
Future Volume (vph)	139
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1426
Flt Permitted	1.00
Satd. Flow (perm)	1426
Peak-hour factor, PHF	0.86
Adj. Flow (vph)	162
RTOR Reduction (vph)	103
Lane Group Flow (vph)	59
Heavy Vehicles (%)	11%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	28.7
Effective Green, g (s)	28.7
Actuated g/C Ratio	0.36
Clearance Time (s)	6.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	516
v/s Ratio Prot	0.01
v/s Ratio Perm	0.03
v/c Ratio	0.11
Uniform Delay, d1	16.8
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	16.9
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	115	253	66	140	362	231	55	85
Average Queue (ft)	25	122	23	28	152	104	12	31
95th Queue (ft)	70	210	51	88	301	186	38	65
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	1		0	5			0
Queuing Penalty (veh)	0	0		0	1			0

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement	EB	EB	WB
Directions Served	T	R	L
Maximum Queue (ft)	4	6	56
Average Queue (ft)	0	0	11
95th Queue (ft)	3	4	40
Link Distance (ft)	3093		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		125	255
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement	EB	NB	NB
Directions Served	T	L	R
Maximum Queue (ft)	2	74	75
Average Queue (ft)	0	30	33
95th Queue (ft)	2	66	67
Link Distance (ft)	505	382	382
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	EB	WB
Directions Served	R	L
Maximum Queue (ft)	2	38
Average Queue (ft)	0	8
95th Queue (ft)	2	31
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	140	160
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	B17	SB
Directions Served	ULT	TR	T	L>
Maximum Queue (ft)	111	186	4	88
Average Queue (ft)	26	27	0	28
95th Queue (ft)	83	105	4	68
Link Distance (ft)	393	351	787	742
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	126	87	14	52	165	192	140	19	49	96	103	87
Average Queue (ft)	49	17	0	6	71	96	29	2	7	46	37	43
95th Queue (ft)	103	57	8	32	130	168	94	11	28	84	80	77
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)							0					
Queuing Penalty (veh)							0					

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	8	76	64	86	52
Average Queue (ft)	1	35	34	34	11
95th Queue (ft)	6	66	57	77	37
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 2

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	16	0	14	4	17	0	0	27	20	0	0
Future Vol, veh/h	0	16	0	14	4	17	0	0	27	20	0	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	0	0	0	57	0	18	0	0	7	0	0	0
Mvmt Flow	0	19	0	17	5	20	0	0	32	24	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.3	7.8	6.6	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	78%	0%	100%
Vol Thru, %	0%	100%	22%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	27	16	18	17	20
LT Vol	0	0	14	0	20
Through Vol	0	16	4	0	0
RT Vol	27	0	0	17	0
Lane Flow Rate	32	19	21	20	24
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.031	0.022	0.036	0.022	0.028
Departure Headway (Hd)	3.421	4.129	5.967	3.907	4.228
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	1036	865	601	917	841
Service Time	1.476	2.164	3.688	1.628	2.28
HCM Lane V/C Ratio	0.031	0.022	0.035	0.022	0.029
HCM Control Delay	6.6	7.3	8.9	6.7	7.4
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1	0.1	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	39	477	151	33	477	184	36	143
v/c Ratio	0.22	0.77	0.24	0.19	0.63	0.63	0.14	0.54
Control Delay	43.5	38.9	5.6	43.6	31.4	45.0	36.3	42.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.5	38.9	5.6	43.6	31.4	45.0	36.3	42.5
Queue Length 50th (ft)	21	242	0	18	243	94	18	72
Queue Length 95th (ft)	56	#474	46	50	#475	178	48	139
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	361	620	628	356	752	377	370	380
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	0.11	0.77	0.24	0.09	0.63	0.49	0.10	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	448	142	31	445	4	82	63	28	34	109	25
Future Volume (vph)	37	448	142	31	445	4	82	63	28	34	109	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1823	1863	1584	1796	1889			1774		1769	1780	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1823	1863	1584	1796	1889			1774		1769	1780	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	39	477	151	33	473	4	87	67	30	36	116	27
RTOR Reduction (vph)	0	0	98	0	0	0	0	7	0	0	8	0
Lane Group Flow (vph)	39	477	53	33	477	0	0	177	0	36	135	0
Heavy Vehicles (%)	0%	3%	3%	3%	3%	0%	2%	2%	4%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	5.5	33.1	33.1	8.8	36.4			14.8		13.2	13.2	
Effective Green, g (s)	5.5	33.1	33.1	8.8	36.4			14.8		13.2	13.2	
Actuated g/C Ratio	0.06	0.35	0.35	0.09	0.39			0.16		0.14	0.14	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	106	656	558	168	732			279		248	250	
v/s Ratio Prot	c0.02	c0.26		0.02	c0.25			c0.10		0.02	c0.08	
v/s Ratio Perm			0.03									
v/c Ratio	0.37	0.73	0.10	0.20	0.65			0.64		0.15	0.54	
Uniform Delay, d1	42.5	26.5	20.4	39.3	23.6			37.0		35.4	37.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	2.9	4.3	0.1	0.8	2.3			5.3		0.4	3.0	
Delay (s)	45.5	30.8	20.5	40.1	25.9			42.3		35.8	40.5	
Level of Service	D	C	C	D	C			D		D	D	
Approach Delay (s)		29.3			26.8			42.3			39.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	93.9	Sum of lost time (s)	24.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	478	4	6	449	0	0
Future Volume (Veh/h)	478	4	6	449	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	543	5	7	510	0	0
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			548		1067	543
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			548		1067	543
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1032		246	544

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	543	5	7	510
Volume Left	0	0	7	0
Volume Right	0	5	0	0
cSH	1700	1700	1032	1700
Volume to Capacity	0.32	0.00	0.01	0.30
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.0	0.0	8.5	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.1	
Approach LOS				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	480	0	0	437	15	3
Future Volume (Veh/h)	480	0	0	437	15	3
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	533	0	0	486	17	3
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			533		1019	533
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			533		1019	533
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	99
cM capacity (veh/h)			1045		265	551

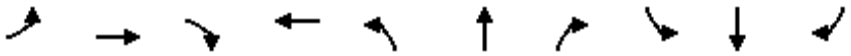
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	533	486	17	3
Volume Left	0	0	17	0
Volume Right	0	0	0	3
cSH	1700	1700	265	551
Volume to Capacity	0.31	0.29	0.06	0.01
Queue Length 95th (ft)	0	0	5	0
Control Delay (s)	0.0	0.0	19.5	11.6
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	18.3	
Approach LOS			C	

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	469	13	22	440	0	0
Future Volume (Veh/h)	469	13	22	440	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	515	14	24	484	0	0
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			529		1047	515
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			529		1047	515
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			98		100	100
cM capacity (veh/h)			1004		249	564

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	515	14	24	484
Volume Left	0	0	24	0
Volume Right	0	14	0	0
cSH	1700	1700	1004	1700
Volume to Capacity	0.30	0.01	0.02	0.28
Queue Length 95th (ft)	0	0	2	0
Control Delay (s)	0.0	0.0	8.7	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.4	
Approach LOS				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	28.0%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	131	132	205	17	189	263	1	15	369	86
v/c Ratio	0.49	0.50	0.13	0.05	0.43	0.18	0.00	0.04	0.54	0.13
Control Delay	38.8	38.9	0.2	0.2	17.5	17.0	0.0	12.9	32.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	38.9	0.2	0.2	17.5	17.0	0.0	12.9	32.3	0.4
Queue Length 50th (ft)	65	65	0	0	57	40	0	4	90	0
Queue Length 95th (ft)	128	129	0	0	102	92	0	15	138	0
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	325	325	1529	379	482	1472	489	409	855	719
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.41	0.13	0.04	0.39	0.18	0.00	0.04	0.43	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	250	0	195	5	0	11	180	250	1	9	6	351
Future Volume (vph)	250	0	195	5	0	11	180	250	1	9	6	351
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.90		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.99		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1655	1655	1529		1502		1721	3541	824		1328	3369
Flt Permitted	0.95	0.95	1.00		0.99		0.53	1.00	1.00		0.59	1.00
Satd. Flow (perm)	1655	1655	1529		1502		964	3541	824		824	3369
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)	263	0	205	5	0	12	189	263	1	9	6	369
RTOR Reduction (vph)	0	0	0	0	16	0	0	0	1	0	0	0
Lane Group Flow (vph)	131	132	205	0	1	0	189	263	0	0	15	369
Heavy Vehicles (%)	1%	0%	3%	20%	0%	9%	7%	4%	100%	0%	83%	5%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	13.0	13.0	87.6		7.1		35.0	33.5	33.5		35.0	23.6
Effective Green, g (s)	13.0	13.0	87.6		7.1		35.0	33.5	33.5		35.0	23.6
Actuated g/C Ratio	0.15	0.15	1.00		0.08		0.40	0.38	0.38		0.40	0.27
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	5.0	5.0			4.0		4.0	5.0	5.0		4.0	5.0
Lane Grp Cap (vph)	245	245	1529		121		483	1354	315		337	907
v/s Ratio Prot	0.08	c0.08			0.00		c0.05	0.07			0.00	c0.11
v/s Ratio Perm			c0.13				0.11		0.00		0.02	
v/c Ratio	0.53	0.54	0.13		0.01		0.39	0.19	0.00		0.04	0.41
Uniform Delay, d1	34.5	34.5	0.0		37.0		17.7	18.0	16.7		16.0	26.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.1	4.1	0.2		0.1		0.7	0.1	0.0		0.1	0.6
Delay (s)	38.6	38.6	0.2		37.1		18.5	18.2	16.7		16.0	26.9
Level of Service	D	D	A		D		B	B	B		B	C
Approach Delay (s)		21.8			37.1			18.3				24.4
Approach LOS		C			D			B				C

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	87.6	Sum of lost time (s)	32.5
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	82
Future Volume (vph)	82
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1439
Flt Permitted	1.00
Satd. Flow (perm)	1439
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	86
RTOR Reduction (vph)	50
Lane Group Flow (vph)	36
Heavy Vehicles (%)	10%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	36.6
Effective Green, g (s)	36.6
Actuated g/C Ratio	0.42
Clearance Time (s)	6.3
Vehicle Extension (s)	5.0
Lane Grp Cap (vph)	601
v/s Ratio Prot	0.01
v/s Ratio Perm	0.02
v/c Ratio	0.06
Uniform Delay, d1	15.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	15.3
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	200	371	98	150	347	190	105	179
Average Queue (ft)	43	199	38	31	179	91	25	77
95th Queue (ft)	133	329	71	97	304	161	65	142
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	7		0	9		0	2
Queuing Penalty (veh)	0	3		0	3		0	1

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement	WB
Directions Served	L
Maximum Queue (ft)	20
Average Queue (ft)	2
95th Queue (ft)	13
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	255
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	42	27
Average Queue (ft)	13	4
95th Queue (ft)	39	20
Link Distance (ft)	382	382
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	EB	WB
Directions Served	R	L
Maximum Queue (ft)	5	42
Average Queue (ft)	0	7
95th Queue (ft)	5	30
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	140	160
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	SB
Directions Served	ULT	TR	L>
Maximum Queue (ft)	173	126	66
Average Queue (ft)	56	18	24
95th Queue (ft)	136	81	56
Link Distance (ft)	393	351	742
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	159	114	54	52	168	157	110	31	67	150	161	82
Average Queue (ft)	80	41	4	11	78	67	17	2	10	83	90	32
95th Queue (ft)	133	96	26	36	137	126	60	15	40	135	146	67
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)							0			0		
Queuing Penalty (veh)							0			0		

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	8	64	55	54	29
Average Queue (ft)	3	19	15	20	13
95th Queue (ft)	10	56	45	46	36
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 6

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

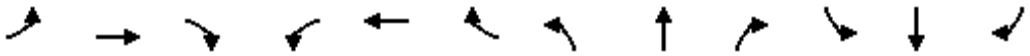
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	8	0	11	4	47	0	0	12	5	0	0
Future Vol, veh/h	0	8	0	11	4	47	0	0	12	5	0	0
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	0	13	0	55	2	7	0	0	35	0	0	0
Mvmt Flow	0	11	0	16	6	67	0	0	17	7	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.4	7.4	6.6	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	73%	0%	100%
Vol Thru, %	0%	100%	27%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	8	15	47	5
LT Vol	0	0	11	0	5
Through Vol	0	8	4	0	0
RT Vol	12	0	0	47	0
Lane Flow Rate	17	11	21	67	7
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.017	0.014	0.035	0.072	0.008
Departure Headway (Hd)	3.474	4.327	5.849	3.881	4.283
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	1019	826	615	926	829
Service Time	1.534	2.357	3.559	1.591	2.344
HCM Lane V/C Ratio	0.017	0.013	0.034	0.072	0.008
HCM Control Delay	6.6	7.4	8.8	6.9	7.4
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0	0.1	0.2	0

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	40	525	99	40	523	199	27	88
v/c Ratio	0.27	0.74	0.14	0.25	0.62	0.67	0.14	0.40
Control Delay	48.7	32.9	1.5	48.0	26.9	47.3	41.6	37.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.7	32.9	1.5	48.0	26.9	47.3	41.6	37.8
Queue Length 50th (ft)	23	271	0	23	270	105	15	37
Queue Length 95th (ft)	61	438	11	61	437	199	43	89
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	149	834	783	159	868	377	355	389
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	0.27	0.63	0.13	0.25	0.60	0.53	0.08	0.23

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	478	90	36	463	13	76	75	30	25	52	28
Future Volume (vph)	36	478	90	36	463	13	76	75	30	25	52	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1642	1828	1539	1745	1816			1713		1638	1719	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1642	1828	1539	1745	1816			1713		1638	1719	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	40	525	99	40	509	14	84	82	33	27	57	31
RTOR Reduction (vph)	0	0	59	0	1	0	0	7	0	0	20	0
Lane Group Flow (vph)	40	525	40	40	522	0	0	192	0	27	68	0
Heavy Vehicles (%)	11%	5%	6%	6%	7%	0%	8%	4%	7%	8%	4%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	4.3	38.2	38.2	8.2	42.1			15.4		8.3	8.3	
Effective Green, g (s)	4.3	38.2	38.2	8.2	42.1			15.4		8.3	8.3	
Actuated g/C Ratio	0.05	0.41	0.41	0.09	0.45			0.16		0.09	0.09	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	75	742	624	152	812			280		144	151	
v/s Ratio Prot	c0.02	c0.29		0.02	c0.29			c0.11		0.02	c0.04	
v/s Ratio Perm			0.03									
v/c Ratio	0.53	0.71	0.06	0.26	0.64			0.69		0.19	0.45	
Uniform Delay, d1	43.9	23.3	17.0	40.1	20.2			37.1		39.8	40.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	9.0	3.3	0.1	1.3	2.0			7.4		0.9	2.9	
Delay (s)	52.9	26.6	17.1	41.4	22.1			44.5		40.6	43.6	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		26.8			23.5			44.5			42.9	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	94.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	469	20	9	453	0	0
Future Volume (Veh/h)	469	20	9	453	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	504	22	10	487	0	0
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			526		1011	504
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			526		1011	504
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1051		265	572

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	504	22	10	487
Volume Left	0	0	10	0
Volume Right	0	22	0	0
cSH	1700	1700	1051	1700
Volume to Capacity	0.30	0.01	0.01	0.29
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.0	0.0	8.5	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.2	
Approach LOS				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	473	0	0	427	38	53
Future Volume (Veh/h)	473	0	0	427	38	53
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	550	0	0	497	44	62
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			550		1047	550
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			550		1047	550
tC, single (s)			4.1		6.5	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.5
p0 queue free %			100		82	88
cM capacity (veh/h)			1030		241	507

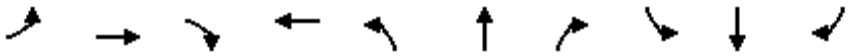
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	550	497	44	62
Volume Left	0	0	44	0
Volume Right	0	0	0	62
cSH	1700	1700	241	507
Volume to Capacity	0.32	0.29	0.18	0.12
Queue Length 95th (ft)	0	0	16	10
Control Delay (s)	0.0	0.0	23.2	13.1
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	17.3	
Approach LOS			C	

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	507	16	15	430	0	0
Future Volume (Veh/h)	507	16	15	430	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	563	18	17	478	0	0
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			581		1075	563
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			581		1075	563
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	100
cM capacity (veh/h)			1003		242	530

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	563	18	17	478
Volume Left	0	0	17	0
Volume Right	0	18	0	0
cSH	1700	1700	1003	1700
Volume to Capacity	0.33	0.01	0.02	0.28
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.0	0.0	8.7	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.3	
Approach LOS				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	134	136	180	20	165	232	11	18	337	135
v/c Ratio	0.53	0.54	0.12	0.14	0.40	0.17	0.02	0.04	0.55	0.20
Control Delay	38.5	38.6	0.2	26.9	17.7	17.3	0.1	13.6	32.5	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	38.6	0.2	26.9	17.7	17.3	0.1	13.6	32.5	1.3
Queue Length 50th (ft)	60	61	0	4	46	33	0	5	75	0
Queue Length 95th (ft)	128	130	0	26	95	83	0	17	129	9
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	369	370	1485	156	472	1378	632	512	889	763
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.37	0.12	0.13	0.35	0.17	0.02	0.04	0.38	0.18

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	260	2	175	3	6	11	160	225	11	11	7	327
Future Volume (vph)	260	2	175	3	6	11	160	225	11	11	7	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.93		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.99		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1655	1661	1485		1339		1737	3474	1211		1678	3276
Flt Permitted	0.95	0.95	1.00		0.99		0.55	1.00	1.00		0.61	1.00
Satd. Flow (perm)	1655	1661	1485		1339		1003	3474	1211		1072	3276
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	268	2	180	3	6	11	165	232	11	11	7	337
RTOR Reduction (vph)	0	0	0	0	10	0	0	0	7	0	0	0
Lane Group Flow (vph)	134	136	180	0	10	0	165	232	4	0	18	337
Heavy Vehicles (%)	1%	0%	6%	33%	33%	27%	6%	6%	36%	0%	14%	8%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	11.6	11.6	82.6		7.3		31.2	30.0	30.0		31.2	21.4
Effective Green, g (s)	11.6	11.6	82.6		7.3		31.2	30.0	30.0		31.2	21.4
Actuated g/C Ratio	0.14	0.14	1.00		0.09		0.38	0.36	0.36		0.38	0.26
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	232	233	1485		118		465	1261	439		413	848
v/s Ratio Prot	0.08	c0.08			0.01		c0.04	c0.07			0.00	c0.10
v/s Ratio Perm			c0.12				0.09		0.00		0.02	
v/c Ratio	0.58	0.58	0.12		0.08		0.35	0.18	0.01		0.04	0.40
Uniform Delay, d1	33.2	33.2	0.0		34.6		17.7	17.9	16.8		16.2	25.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.5	3.7	0.2		0.3		0.5	0.1	0.0		0.0	0.3
Delay (s)	36.7	36.9	0.2		34.9		18.1	18.0	16.8		16.2	25.6
Level of Service	D	D	A		C		B	B	B		B	C
Approach Delay (s)		22.1			34.9			18.0				22.5
Approach LOS		C			C			B				C

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	82.6	Sum of lost time (s)	32.5
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	131
Future Volume (vph)	131
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1507
Flt Permitted	1.00
Satd. Flow (perm)	1507
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	135
RTOR Reduction (vph)	81
Lane Group Flow (vph)	54
Heavy Vehicles (%)	5%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	33.0
Effective Green, g (s)	33.0
Actuated g/C Ratio	0.40
Clearance Time (s)	6.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	602
v/s Ratio Prot	0.01
v/s Ratio Perm	0.02
v/c Ratio	0.09
Uniform Delay, d1	15.4
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	15.5
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	149	357	73	173	400	218	78	118
Average Queue (ft)	39	191	28	39	176	105	20	51
95th Queue (ft)	106	313	57	114	316	187	55	98
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	5		0	8		0	0
Queuing Penalty (veh)	0	2		0	3		0	0

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement	EB	WB
Directions Served	R	L
Maximum Queue (ft)	2	31
Average Queue (ft)	0	3
95th Queue (ft)	0	19
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	255
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement	EB	NB	NB
Directions Served	T	L	R
Maximum Queue (ft)	2	82	84
Average Queue (ft)	0	30	35
95th Queue (ft)	2	67	68
Link Distance (ft)	505	382	382
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	EB	WB
Directions Served	R	L
Maximum Queue (ft)	5	37
Average Queue (ft)	0	5
95th Queue (ft)	5	25
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	140	160
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	SB
Directions Served	ULT	UTR	L>
Maximum Queue (ft)	252	119	93
Average Queue (ft)	69	22	30
95th Queue (ft)	182	83	70
Link Distance (ft)	393	351	742
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	154	120	47	63	142	139	72	44	57	146	162	85
Average Queue (ft)	82	41	3	16	68	67	14	5	10	80	84	38
95th Queue (ft)	137	98	22	49	121	119	52	24	35	133	139	73
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)										0		
Queuing Penalty (veh)										0		

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	20	63	57	60	29
Average Queue (ft)	2	14	24	12	6
95th Queue (ft)	11	48	49	44	24
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 5

MOVEMENT SUMMARY

Site: 101 [Taylor Middle School Addition - AM Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.547	10.2	LOS B	4.5	120.3	0.28	0.12	0.28	24.3
6	T1	427	10.0	469	10.0	0.547	10.5	LOS B	4.5	120.3	0.28	0.12	0.28	23.2
16	R2	73	11.0	80	11.0	0.547	10.6	LOS B	4.5	120.3	0.28	0.12	0.28	22.6
Approach		501	10.1	551	10.1	0.547	10.5	LOS B	4.5	120.3	0.28	0.12	0.28	23.1
North: Falmouth Street														
7	L2	75	21.0	82	21.0	0.202	8.9	LOS A	1.2	34.3	0.67	0.57	0.67	23.2
14	R2	34	9.0	37	9.0	0.202	8.1	LOS A	1.2	34.3	0.67	0.57	0.67	22.3
Approach		109	17.3	120	17.3	0.202	8.7	LOS A	1.2	34.3	0.67	0.57	0.67	22.9
West: E Shirley Avenue														
5u	U	1	0.0	1	0.0	0.131	4.6	LOS A	0.8	20.5	0.33	0.17	0.33	25.4
5	L2	31	19.0	34	19.0	0.131	5.4	LOS A	0.8	20.5	0.33	0.17	0.33	24.7
2	T1	297	9.0	326	9.0	0.131	1.4	LOS A	0.8	20.5	0.09	0.05	0.09	25.5
Approach		329	9.9	362	9.9	0.131	1.8	LOS A	0.8	20.5	0.11	0.06	0.11	25.4
All Vehicles		939	10.9	1032	10.9	0.547	7.2	LOS A	4.5	120.3	0.27	0.15	0.27	23.8

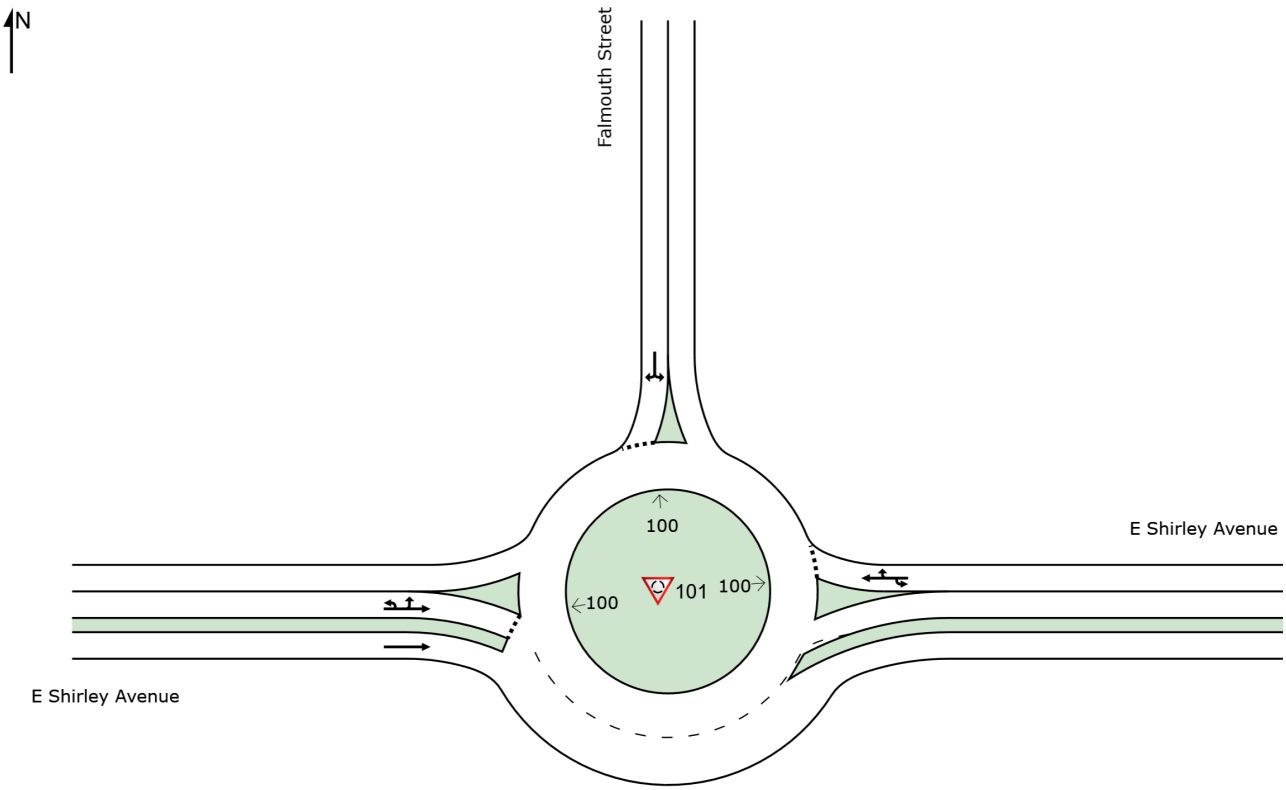
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [Taylor Middle School Addition - AM Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [Taylor Middle School Addition - Commuter PM Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.622	12.2	LOS B	6.2	175.5	0.25	0.09	0.25	23.7
6	T1	413	21.0	454	21.0	0.622	12.9	LOS B	6.2	175.5	0.25	0.09	0.25	22.6
16	R2	135	4.0	148	4.0	0.622	12.3	LOS B	6.2	175.5	0.25	0.09	0.25	22.1
Approach		549	16.8	603	16.8	0.622	12.7	LOS B	6.2	175.5	0.25	0.09	0.25	22.5
North: Falmouth Street														
7	L2	108	1.0	119	1.0	0.222	7.7	LOS A	1.4	36.7	0.69	0.57	0.69	23.3
14	R2	32	9.0	35	9.0	0.222	8.2	LOS A	1.4	36.7	0.69	0.57	0.69	22.4
Approach		140	2.8	154	2.8	0.222	7.8	LOS A	1.4	36.7	0.69	0.57	0.69	23.1
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.185	5.2	LOS A	1.1	29.3	0.37	0.21	0.37	25.5
5	L2	18	11.0	20	11.0	0.185	5.7	LOS A	1.1	29.3	0.37	0.21	0.37	24.8
2	T1	462	5.0	508	5.0	0.185	1.7	LOS A	1.1	29.3	0.12	0.07	0.12	25.4
Approach		482	5.2	530	5.2	0.185	1.9	LOS A	1.1	29.3	0.13	0.07	0.13	25.4
All Vehicles		1171	10.3	1287	10.3	0.622	7.7	LOS A	6.2	175.5	0.25	0.14	0.25	23.7

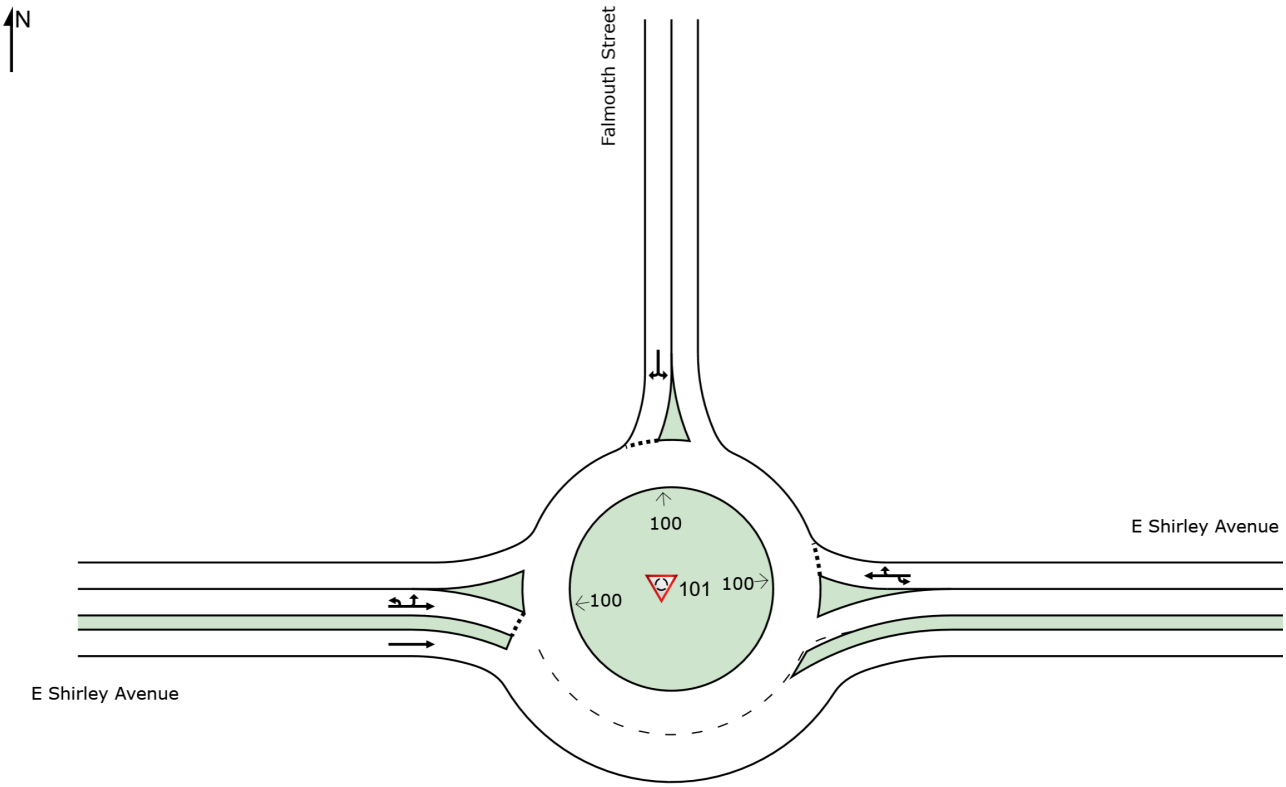
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [Taylor Middle School Addition - Commuter PM Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:34:22 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Existing\Taylor MS 2023 Existing.sip9

MOVEMENT SUMMARY

Site: 101 [Taylor Middle School Addition - School PM Peak (Site Folder: General)]

School PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	2	0.0	2	0.0	0.501	9.0	LOS A	3.9	100.3	0.23	0.09	0.23	24.6
6	T1	405	4.0	409	4.0	0.501	9.2	LOS A	3.9	100.3	0.23	0.09	0.23	23.5
16	R2	126	6.0	127	6.0	0.501	9.2	LOS A	3.9	100.3	0.23	0.09	0.23	22.9
Approach		533	4.5	538	4.5	0.501	9.2	LOS A	3.9	100.3	0.23	0.09	0.23	23.3
North: Falmouth Street														
7	L2	119	7.0	120	7.0	0.194	7.1	LOS A	1.2	30.6	0.61	0.47	0.61	23.5
14	R2	23	0.0	23	0.0	0.194	6.7	LOS A	1.2	30.6	0.61	0.47	0.61	22.5
Approach		142	5.9	143	5.9	0.194	7.0	LOS A	1.2	30.6	0.61	0.47	0.61	23.3
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.189	5.4	LOS A	1.1	29.8	0.39	0.23	0.39	25.4
5	L2	26	23.0	26	23.0	0.189	6.3	LOS A	1.1	29.8	0.39	0.23	0.39	24.7
2	T1	500	5.0	505	5.0	0.189	1.7	LOS A	1.1	29.8	0.11	0.07	0.11	25.4
Approach		528	5.9	533	5.9	0.189	1.9	LOS A	1.1	29.8	0.13	0.08	0.13	25.4
All Vehicles		1203	5.2	1215	5.2	0.501	5.7	LOS A	3.9	100.3	0.23	0.13	0.23	24.2

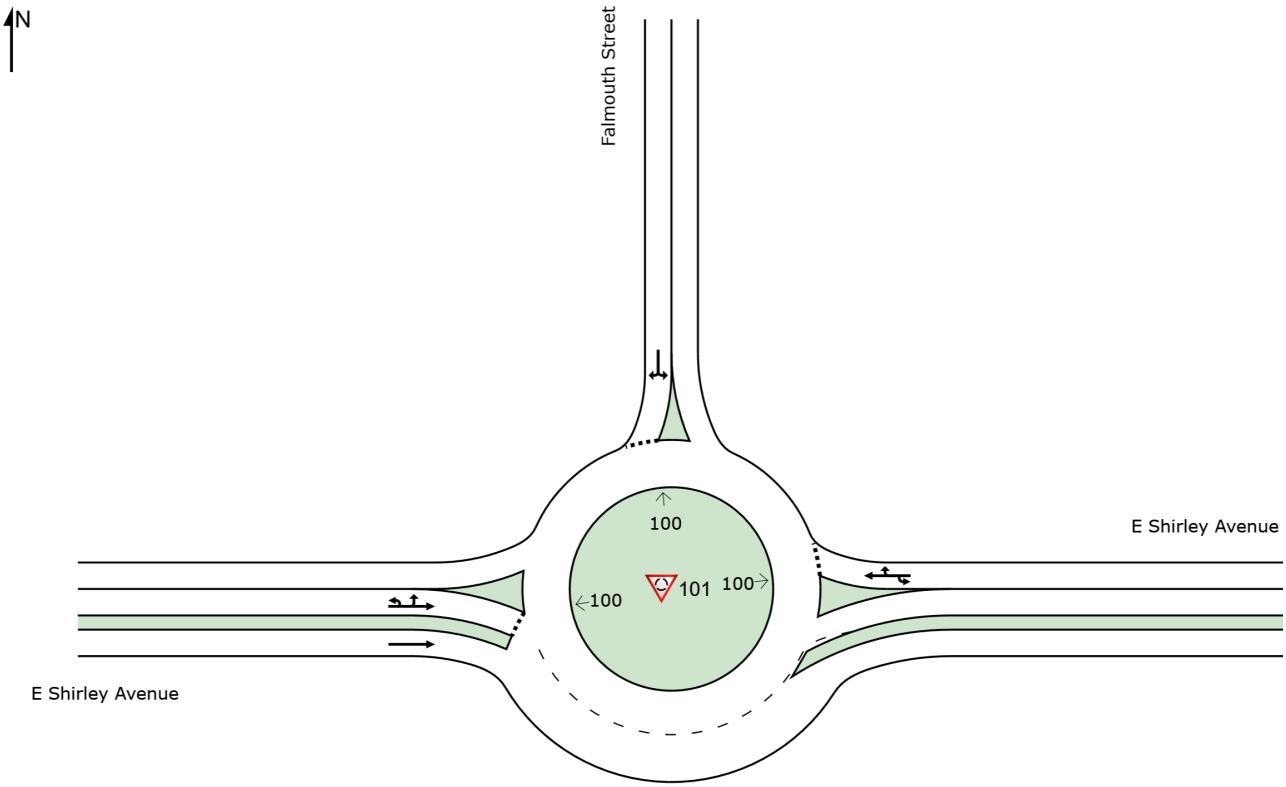
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [Taylor Middle School Addition - School PM Peak (Site Folder: General)]

School PM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:35:41 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Existing\Taylor MS 2023 Existing.sip9

Appendix E
2026 Background Analysis Worksheets

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	0	46	21	91	0	0	35	13	0	0
Future Vol, veh/h	0	5	0	46	21	91	0	0	35	13	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
Heavy Vehicles, %	0	0	0	24	0	7	0	0	65	8	0	0
Mvmt Flow	0	5	0	50	23	99	0	0	38	14	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.3	7.8	6.9	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	69%	0%	100%
Vol Thru, %	0%	100%	31%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	5	67	91	13
LT Vol	0	0	46	0	13
Through Vol	0	5	21	0	0
RT Vol	35	0	0	91	0
Lane Flow Rate	38	5	73	99	14
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.039	0.006	0.108	0.107	0.018
Departure Headway (Hd)	3.719	4.216	5.347	3.895	4.677
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	969	840	672	921	770
Service Time	1.719	2.284	3.067	1.615	2.678
HCM Lane V/C Ratio	0.039	0.006	0.109	0.107	0.018
HCM Control Delay	6.9	7.3	8.7	7.1	7.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0	0.4	0.4	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	32	352	74	32	470	234	16	57
v/c Ratio	0.19	0.53	0.11	0.21	0.60	0.70	0.09	0.29
Control Delay	45.0	26.5	0.3	45.7	26.5	45.2	41.2	32.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.0	26.5	0.3	45.7	26.5	45.2	41.2	32.0
Queue Length 50th (ft)	17	161	0	17	235	116	9	19
Queue Length 95th (ft)	50	267	0	50	380	220	30	59
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	168	793	774	153	822	410	388	387
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	0.19	0.44	0.10	0.21	0.57	0.57	0.04	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	324	68	29	409	23	80	83	52	15	32	20
Future Volume (vph)	29	324	68	29	409	23	80	83	52	15	32	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99			0.97		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1823	1761	1539	1667	1720			1735		1769	1690	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1823	1761	1539	1667	1720			1735		1769	1690	
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)	32	352	74	32	445	25	87	90	57	16	35	22
RTOR Reduction (vph)	0	0	45	0	2	0	0	11	0	0	20	0
Lane Group Flow (vph)	32	352	29	32	468	0	0	223	0	16	37	0
Heavy Vehicles (%)	0%	9%	6%	11%	13%	0%	6%	2%	4%	0%	3%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	4.4	36.6	36.6	8.2	40.4			16.6		7.1	7.1	
Effective Green, g (s)	4.4	36.6	36.6	8.2	40.4			16.6		7.1	7.1	
Actuated g/C Ratio	0.05	0.40	0.40	0.09	0.44			0.18		0.08	0.08	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	86	696	608	147	751			311		135	129	
v/s Ratio Prot	0.02	0.20		c0.02	c0.27			c0.13		0.01	c0.02	
v/s Ratio Perm			0.02									
v/c Ratio	0.37	0.51	0.05	0.22	0.62			0.72		0.12	0.28	
Uniform Delay, d1	42.7	21.1	17.2	39.2	20.2			35.7		39.8	40.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	3.7	0.8	0.0	1.0	1.8			8.2		0.5	1.7	
Delay (s)	46.4	21.9	17.3	40.2	22.0			44.0		40.3	42.0	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		22.9			23.2			44.0			41.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	92.5	Sum of lost time (s)	24.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	304	37	48	444	0	0
Future Volume (Veh/h)	304	37	48	444	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	330	74	96	483	0	0
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			404		1005	330
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			404		1005	330
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			91		100	100
cM capacity (veh/h)			1098		246	716

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	330	74	96	483
Volume Left	0	0	96	0
Volume Right	0	74	0	0
cSH	1700	1700	1098	1700
Volume to Capacity	0.19	0.04	0.09	0.28
Queue Length 95th (ft)	0	0	7	0
Control Delay (s)	0.0	0.0	8.6	0.0
Lane LOS			A	
Approach Delay (s)	0.0		1.4	
Approach LOS				

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	295	0	0	454	41	51
Future Volume (Veh/h)	295	0	0	454	41	51
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	321	0	0	493	82	102
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			321		814	321
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			321		814	321
tC, single (s)			4.1		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.4
p0 queue free %			100		75	85
cM capacity (veh/h)			1250		328	689

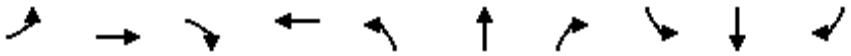
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	321	493	82	102
Volume Left	0	0	82	0
Volume Right	0	0	0	102
cSH	1700	1700	328	689
Volume to Capacity	0.19	0.29	0.25	0.15
Queue Length 95th (ft)	0	0	24	13
Control Delay (s)	0.0	0.0	19.6	11.1
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	14.9	
Approach LOS			B	

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	332	17	24	452	0	0
Future Volume (Veh/h)	332	17	24	452	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.95	0.50	0.50	0.95	0.95	0.95
Hourly flow rate (vph)	349	34	48	476	0	0
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			383		921	349
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			383		921	349
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	100
cM capacity (veh/h)			1187		291	699

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	349	34	48	476
Volume Left	0	0	48	0
Volume Right	0	34	0	0
cSH	1700	1700	1187	1700
Volume to Capacity	0.21	0.02	0.04	0.28
Queue Length 95th (ft)	0	0	3	0
Control Delay (s)	0.0	0.0	8.2	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.7	
Approach LOS				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	60	60	73	6	191	443	10	10	175	155
v/c Ratio	0.36	0.36	0.06	0.02	0.43	0.32	0.01	0.03	0.33	0.26
Control Delay	35.8	35.8	0.1	0.2	16.9	17.3	0.0	12.2	29.2	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	35.8	0.1	0.2	16.9	17.3	0.0	12.2	29.2	2.4
Queue Length 50th (ft)	26	26	0	0	50	62	0	2	35	0
Queue Length 95th (ft)	64	64	0	0	99	143	0	11	70	15
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	271	271	1291	349	528	1413	830	396	841	689
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.22	0.06	0.02	0.36	0.31	0.01	0.03	0.21	0.22

Intersection Summary

Item 4.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	110	0	67	2	0	4	176	408	9	2	7	161
Future Volume (vph)	110	0	67	2	0	4	176	408	9	2	7	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.91		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1316	1316	1291		1015		1674	3409	1647		1436	3103
Flt Permitted	0.95	0.95	1.00		0.98		0.64	1.00	1.00		0.50	1.00
Satd. Flow (perm)	1316	1316	1291		1015		1130	3409	1647		749	3103
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)	120	0	73	2	0	4	191	443	10	2	8	175
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	6	0	0	0
Lane Group Flow (vph)	60	60	73	0	1	0	191	443	4	0	10	175
Heavy Vehicles (%)	27%	0%	22%	50%	0%	75%	10%	8%	0%	0%	29%	14%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	9.0	9.0	78.5		7.0		30.0	28.7	28.7		30.0	19.4
Effective Green, g (s)	9.0	9.0	78.5		7.0		30.0	28.7	28.7		30.0	19.4
Actuated g/C Ratio	0.11	0.11	1.00		0.09		0.38	0.37	0.37		0.38	0.25
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	150	150	1291		90		505	1246	602		297	766
v/s Ratio Prot	c0.05	0.05			0.00		c0.05	c0.13			0.00	0.06
v/s Ratio Perm			c0.06				0.09		0.00		0.01	
v/c Ratio	0.40	0.40	0.06		0.01		0.38	0.36	0.01		0.03	0.23
Uniform Delay, d1	32.2	32.2	0.0		32.6		16.9	18.2	15.8		15.1	23.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.7	1.7	0.1		0.0		0.5	0.2	0.0		0.0	0.2
Delay (s)	34.0	34.0	0.1		32.6		17.4	18.3	15.8		15.1	23.7
Level of Service	C	C	A		C		B	B	B		B	C
Approach Delay (s)		21.2			32.6			18.0				20.3
Approach LOS		C			C			B				C

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	78.5	Sum of lost time (s)	32.5
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	143
Future Volume (vph)	143
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1426
Flt Permitted	1.00
Satd. Flow (perm)	1426
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	155
RTOR Reduction (vph)	99
Lane Group Flow (vph)	56
Heavy Vehicles (%)	11%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	28.4
Effective Green, g (s)	28.4
Actuated g/C Ratio	0.36
Clearance Time (s)	6.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	515
v/s Ratio Prot	0.01
v/s Ratio Perm	0.03
v/c Ratio	0.11
Uniform Delay, d1	16.6
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	16.7
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	105	264	67	149	331	222	53	90
Average Queue (ft)	25	122	24	31	145	100	13	35
95th Queue (ft)	70	226	54	98	275	182	40	75
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	1		0	4			0
Queuing Penalty (veh)	0	0		0	1			0

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement	EB	EB	WB
Directions Served	T	R	L
Maximum Queue (ft)	5	9	75
Average Queue (ft)	0	0	14
95th Queue (ft)	5	5	49
Link Distance (ft)	3093		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		125	255
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement	EB	NB	NB
Directions Served	T	L	R
Maximum Queue (ft)	2	83	74
Average Queue (ft)	0	29	30
95th Queue (ft)	2	68	64
Link Distance (ft)	505	382	382
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	EB	WB
Directions Served	R	L
Maximum Queue (ft)	4	43
Average Queue (ft)	0	6
95th Queue (ft)	3	26
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	140	160
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	B17	SB
Directions Served	ULT	TR	T	L>
Maximum Queue (ft)	121	174	4	80
Average Queue (ft)	22	26	0	25
95th Queue (ft)	77	103	3	63
Link Distance (ft)	393	351	787	742
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	124	87	10	57	162	194	144	19	43	119	114	93
Average Queue (ft)	52	18	0	6	72	96	29	2	5	49	43	43
95th Queue (ft)	103	59	7	33	132	166	90	12	25	92	92	81
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)							0			0		
Queuing Penalty (veh)							0			0		

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	10	82	72	89	48
Average Queue (ft)	1	37	35	32	11
95th Queue (ft)	7	68	59	76	37
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 2

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

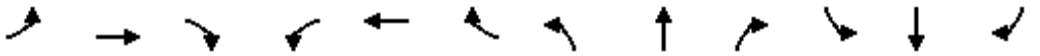
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	16	0	14	4	18	0	0	28	21	0	0
Future Vol, veh/h	0	16	0	14	4	18	0	0	28	21	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	57	0	18	0	0	7	0	0	0
Mvmt Flow	0	17	0	15	4	20	0	0	30	23	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.2	7.8	6.6	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	78%	0%	100%
Vol Thru, %	0%	100%	22%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	28	16	18	18	21
LT Vol	0	0	14	0	21
Through Vol	0	16	4	0	0
RT Vol	28	0	0	18	0
Lane Flow Rate	30	17	20	20	23
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.029	0.02	0.032	0.021	0.027
Departure Headway (Hd)	3.411	4.121	5.96	3.9	4.217
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	1040	867	602	918	844
Service Time	1.462	2.154	3.681	1.621	2.265
HCM Lane V/C Ratio	0.029	0.02	0.033	0.022	0.027
HCM Control Delay	6.6	7.2	8.9	6.7	7.4
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1	0.1	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	40	491	155	34	491	189	37	147
v/c Ratio	0.26	0.74	0.23	0.22	0.61	0.65	0.15	0.57
Control Delay	49.8	35.4	4.8	49.2	28.7	48.8	39.3	46.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	35.4	4.8	49.2	28.7	48.8	39.3	46.0
Queue Length 50th (ft)	23	258	0	19	257	101	19	77
Queue Length 95th (ft)	63	423	43	56	420	195	53	153
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	154	791	762	152	838	364	357	366
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	0.26	0.62	0.20	0.22	0.59	0.52	0.10	0.40

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	462	146	32	458	4	84	65	29	35	112	26
Future Volume (vph)	38	462	146	32	458	4	84	65	29	35	112	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1823	1863	1584	1796	1889			1774		1769	1780	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1823	1863	1584	1796	1889			1774		1769	1780	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	40	491	155	34	487	4	89	69	31	37	119	28
RTOR Reduction (vph)	0	0	96	0	0	0	0	7	0	0	8	0
Lane Group Flow (vph)	40	491	59	34	491	0	0	182	0	37	139	0
Heavy Vehicles (%)	0%	3%	3%	3%	3%	0%	2%	2%	4%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	4.4	37.0	37.0	8.1	40.7			15.2		13.6	13.6	
Effective Green, g (s)	4.4	37.0	37.0	8.1	40.7			15.2		13.6	13.6	
Actuated g/C Ratio	0.04	0.38	0.38	0.08	0.42			0.16		0.14	0.14	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	81	704	598	148	785			275		245	247	
v/s Ratio Prot	c0.02	c0.26		0.02	c0.26			c0.10		0.02	c0.08	
v/s Ratio Perm			0.04									
v/c Ratio	0.49	0.70	0.10	0.23	0.63			0.66		0.15	0.56	
Uniform Delay, d1	45.7	25.7	19.7	42.0	22.6			38.9		37.1	39.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	6.3	3.3	0.1	1.1	1.8			6.5		0.4	3.6	
Delay (s)	52.0	29.0	19.8	43.1	24.4			45.4		37.5	42.9	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		28.2			25.6			45.4			41.8	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	97.9	Sum of lost time (s)	24.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	492	4	6	463	0	0
Future Volume (Veh/h)	492	4	6	463	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	535	8	12	503	0	0
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			543		1062	535
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			543		1062	535
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1036		247	549

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	535	8	12	503
Volume Left	0	0	12	0
Volume Right	0	8	0	0
cSH	1700	1700	1036	1700
Volume to Capacity	0.31	0.00	0.01	0.30
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.0	0.0	8.5	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.2	
Approach LOS				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	495	0	0	450	15	3
Future Volume (Veh/h)	495	0	0	450	15	3
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	538	0	0	489	30	6
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			538		1027	538
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			538		1027	538
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		89	99
cM capacity (veh/h)			1040		262	547

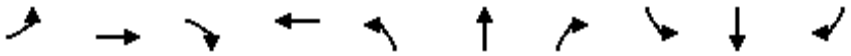
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	538	489	30	6
Volume Left	0	0	30	0
Volume Right	0	0	0	6
cSH	1700	1700	262	547
Volume to Capacity	0.32	0.29	0.11	0.01
Queue Length 95th (ft)	0	0	10	1
Control Delay (s)	0.0	0.0	20.5	11.7
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	19.0	
Approach LOS			C	

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	483	13	22	453	0	0
Future Volume (Veh/h)	483	13	22	453	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	525	26	44	492	0	0
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			551		1105	525
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			551		1105	525
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			96		100	100
cM capacity (veh/h)			985		225	557

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	525	26	44	492
Volume Left	0	0	44	0
Volume Right	0	26	0	0
cSH	1700	1700	985	1700
Volume to Capacity	0.31	0.02	0.04	0.29
Queue Length 95th (ft)	0	0	4	0
Control Delay (s)	0.0	0.0	8.8	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.7	
Approach LOS				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	136	136	212	17	195	272	1	15	381	88
v/c Ratio	0.56	0.56	0.14	0.05	0.47	0.19	0.00	0.04	0.59	0.14
Control Delay	40.3	40.3	0.2	0.2	18.2	16.8	0.0	12.9	32.6	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	40.3	0.2	0.2	18.2	16.8	0.0	12.9	32.6	0.4
Queue Length 50th (ft)	63	63	0	0	55	38	0	4	87	0
Queue Length 95th (ft)	130	130	0	0	106	93	0	15	141	0
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	343	343	1529	386	464	1455	487	395	949	722
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.40	0.14	0.04	0.42	0.19	0.00	0.04	0.40	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	258	0	201	5	0	11	185	258	1	9	6	362
Future Volume (vph)	258	0	201	5	0	11	185	258	1	9	6	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.90		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.99		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1655	1655	1529		1502		1721	3541	824		1328	3369
Flt Permitted	0.95	0.95	1.00		0.99		0.53	1.00	1.00		0.58	1.00
Satd. Flow (perm)	1655	1655	1529		1502		953	3541	824		817	3369
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)	272	0	212	5	0	12	195	272	1	9	6	381
RTOR Reduction (vph)	0	0	0	0	16	0	0	0	1	0	0	0
Lane Group Flow (vph)	136	136	212	0	1	0	195	272	0	0	15	381
Heavy Vehicles (%)	1%	0%	3%	20%	0%	9%	7%	4%	100%	0%	83%	5%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	11.3	11.3	83.3		7.1		32.4	31.2	31.2		32.4	22.0
Effective Green, g (s)	11.3	11.3	83.3		7.1		32.4	31.2	31.2		32.4	22.0
Actuated g/C Ratio	0.14	0.14	1.00		0.09		0.39	0.37	0.37		0.39	0.26
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	224	224	1529		128		466	1326	308		325	889
v/s Ratio Prot	c0.08	0.08			0.00		c0.05	c0.08			0.00	c0.11
v/s Ratio Perm			c0.14				0.11		0.00		0.02	
v/c Ratio	0.61	0.61	0.14		0.01		0.42	0.21	0.00		0.05	0.43
Uniform Delay, d1	33.9	33.9	0.0		34.9		17.5	17.6	16.3		15.7	25.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.6	4.6	0.2		0.0		0.6	0.1	0.0		0.1	0.3
Delay (s)	38.5	38.5	0.2		34.9		18.1	17.7	16.3		15.8	25.8
Level of Service	D	D	A		C		B	B	B		B	C
Approach Delay (s)		21.7			34.9			17.9				23.6
Approach LOS		C			C			B				C

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	83.3	Sum of lost time (s)	32.5
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	84
Future Volume (vph)	84
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1439
Flt Permitted	1.00
Satd. Flow (perm)	1439
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	88
RTOR Reduction (vph)	53
Lane Group Flow (vph)	35
Heavy Vehicles (%)	10%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	33.3
Effective Green, g (s)	33.3
Actuated g/C Ratio	0.40
Clearance Time (s)	6.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	575
v/s Ratio Prot	0.01
v/s Ratio Perm	0.02
v/c Ratio	0.06
Uniform Delay, d1	15.4
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	15.4
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	213	342	79	173	362	206	124	198
Average Queue (ft)	45	193	37	35	179	98	30	84
95th Queue (ft)	131	311	66	106	306	176	77	154
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	6		0	8		0	3
Queuing Penalty (veh)	0	2		0	3		0	1

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement	WB
Directions Served	L
Maximum Queue (ft)	24
Average Queue (ft)	2
95th Queue (ft)	13
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	255
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	38	27
Average Queue (ft)	10	4
95th Queue (ft)	35	19
Link Distance (ft)	382	382
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	WB
Directions Served	L
Maximum Queue (ft)	53
Average Queue (ft)	7
95th Queue (ft)	30
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	160
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	B17	SB
Directions Served	ULT	TR	T	L>
Maximum Queue (ft)	188	150	2	68
Average Queue (ft)	57	17	0	28
95th Queue (ft)	145	79	2	59
Link Distance (ft)	393	351	787	742
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	152	113	46	50	169	164	127	27	59	155	159	79
Average Queue (ft)	82	41	4	11	77	70	18	1	10	87	91	31
95th Queue (ft)	134	96	23	36	131	129	69	14	38	140	145	66
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)							0			0		
Queuing Penalty (veh)							0			0		

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	8	69	56	58	29
Average Queue (ft)	3	18	14	21	12
95th Queue (ft)	9	55	43	48	36
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 6

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

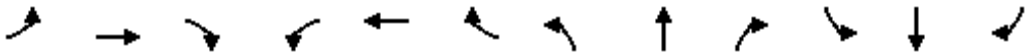
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	8	0	11	4	48	0	0	12	5	0	0
Future Vol, veh/h	0	8	0	11	4	48	0	0	12	5	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	13	0	55	2	7	0	0	35	0	0	0
Mvmt Flow	0	9	0	12	4	52	0	0	13	5	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.4	7.3	6.5	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	73%	0%	100%
Vol Thru, %	0%	100%	27%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	8	15	48	5
LT Vol	0	0	11	0	5
Through Vol	0	8	4	0	0
RT Vol	12	0	0	48	0
Lane Flow Rate	13	9	16	52	5
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.012	0.01	0.026	0.056	0.006
Departure Headway (Hd)	3.434	4.304	5.84	3.872	4.241
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	1035	833	616	930	840
Service Time	1.479	2.323	3.543	1.575	2.285
HCM Lane V/C Ratio	0.013	0.011	0.026	0.056	0.006
HCM Control Delay	6.5	7.4	8.7	6.8	7.3
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0.2	0

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	40	535	101	40	532	203	28	91
v/c Ratio	0.27	0.75	0.15	0.25	0.63	0.67	0.15	0.41
Control Delay	49.1	33.8	1.6	48.4	27.5	48.0	41.7	38.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	33.8	1.6	48.4	27.5	48.0	41.7	38.7
Queue Length 50th (ft)	23	283	0	23	281	110	16	40
Queue Length 95th (ft)	62	452	12	61	449	204	44	92
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	148	828	778	158	862	374	352	386
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	0.27	0.65	0.13	0.25	0.62	0.54	0.08	0.24

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	492	93	37	477	13	78	77	31	26	54	29
Future Volume (vph)	37	492	93	37	477	13	78	77	31	26	54	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1642	1828	1539	1745	1816			1713		1638	1719	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1642	1828	1539	1745	1816			1713		1638	1719	
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)	40	535	101	40	518	14	85	84	34	28	59	32
RTOR Reduction (vph)	0	0	60	0	1	0	0	7	0	0	19	0
Lane Group Flow (vph)	40	535	41	40	531	0	0	196	0	28	72	0
Heavy Vehicles (%)	11%	5%	6%	6%	7%	0%	8%	4%	7%	8%	4%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	4.3	38.4	38.4	8.2	42.3			15.7		8.5	8.5	
Effective Green, g (s)	4.3	38.4	38.4	8.2	42.3			15.7		8.5	8.5	
Actuated g/C Ratio	0.05	0.41	0.41	0.09	0.45			0.17		0.09	0.09	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	74	740	623	150	810			283		146	154	
v/s Ratio Prot	c0.02	c0.29		0.02	c0.29			c0.11		0.02	c0.04	
v/s Ratio Perm			0.03									
v/c Ratio	0.54	0.72	0.07	0.27	0.66			0.69		0.19	0.47	
Uniform Delay, d1	44.3	23.7	17.2	40.5	20.6			37.3		40.0	41.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	9.7	3.7	0.1	1.3	2.1			7.7		0.9	3.0	
Delay (s)	54.0	27.5	17.3	41.8	22.7			45.0		40.8	44.0	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		27.5			24.0			45.0			43.3	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	94.8	Sum of lost time (s)	24.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	483	20	9	467	0	0
Future Volume (Veh/h)	483	20	9	467	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.93	0.50	0.50	0.93	0.93	0.93
Hourly flow rate (vph)	519	40	18	502	0	0
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			559		1057	519
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			559		1057	519
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	100
cM capacity (veh/h)			1022		247	561

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	519	40	18	502
Volume Left	0	0	18	0
Volume Right	0	40	0	0
cSH	1700	1700	1022	1700
Volume to Capacity	0.31	0.02	0.02	0.30
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.0	0.0	8.6	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.3	
Approach LOS				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	487	0	0	440	38	53
Future Volume (Veh/h)	487	0	0	440	38	53
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	529	0	0	478	76	106
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			529		1007	529
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			529		1007	529
tC, single (s)			4.1		6.5	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.5
p0 queue free %			100		70	80
cM capacity (veh/h)			1048		255	521

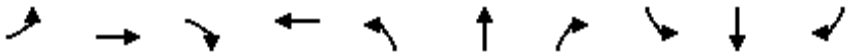
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	529	478	76	106
Volume Left	0	0	76	0
Volume Right	0	0	0	106
cSH	1700	1700	255	521
Volume to Capacity	0.31	0.28	0.30	0.20
Queue Length 95th (ft)	0	0	30	19
Control Delay (s)	0.0	0.0	25.0	13.7
Lane LOS			D	B
Approach Delay (s)	0.0	0.0	18.4	
Approach LOS			C	

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	522	16	15	443	0	0
Future Volume (Veh/h)	522	16	15	443	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	567	32	30	482	0	0
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			599		1109	567
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			599		1109	567
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	100
cM capacity (veh/h)			988		227	527

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	567	32	30	482
Volume Left	0	0	30	0
Volume Right	0	32	0	0
cSH	1700	1700	988	1700
Volume to Capacity	0.33	0.02	0.03	0.28
Queue Length 95th (ft)	0	0	2	0
Control Delay (s)	0.0	0.0	8.8	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.5	
Approach LOS				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	138	140	186	20	170	239	11	18	347	139
v/c Ratio	0.53	0.54	0.13	0.15	0.41	0.17	0.02	0.04	0.57	0.21
Control Delay	38.5	38.7	0.2	27.3	18.1	17.5	0.1	13.8	33.0	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	38.7	0.2	27.3	18.1	17.5	0.1	13.8	33.0	1.4
Queue Length 50th (ft)	62	63	0	4	48	34	0	5	78	0
Queue Length 95th (ft)	132	133	0	27	99	87	0	18	135	9
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	388	390	1485	154	469	1380	633	500	838	780
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.36	0.13	0.13	0.36	0.17	0.02	0.04	0.41	0.18

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	268	2	180	6	3	11	165	232	11	11	7	337
Future Volume (vph)	268	2	180	6	3	11	165	232	11	11	7	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.93		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.99		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1655	1661	1485		1329		1737	3474	1211		1678	3276
Flt Permitted	0.95	0.95	1.00		0.99		0.54	1.00	1.00		0.60	1.00
Satd. Flow (perm)	1655	1661	1485		1329		994	3474	1211		1065	3276
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	276	2	186	6	3	11	170	239	11	11	7	347
RTOR Reduction (vph)	0	0	0	0	10	0	0	0	7	0	0	0
Lane Group Flow (vph)	138	140	186	0	10	0	170	239	4	0	18	347
Heavy Vehicles (%)	1%	0%	6%	33%	33%	27%	6%	6%	36%	0%	14%	8%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	11.9	11.9	83.2		7.3		31.5	30.3	30.3		31.5	21.6
Effective Green, g (s)	11.9	11.9	83.2		7.3		31.5	30.3	30.3		31.5	21.6
Actuated g/C Ratio	0.14	0.14	1.00		0.09		0.38	0.36	0.36		0.38	0.26
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	236	237	1485		116		464	1265	441		412	850
v/s Ratio Prot	0.08	c0.08			0.01		c0.04	c0.07			0.00	c0.11
v/s Ratio Perm			c0.13				0.09		0.00		0.02	
v/c Ratio	0.58	0.59	0.13		0.09		0.37	0.19	0.01		0.04	0.41
Uniform Delay, d1	33.3	33.4	0.0		34.9		17.8	18.1	16.9		16.2	25.5
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.7	3.9	0.2		0.3		0.5	0.1	0.0		0.0	0.3
Delay (s)	37.0	37.3	0.2		35.2		18.3	18.1	16.9		16.3	25.8
Level of Service	D	D	A		D		B	B	B		B	C
Approach Delay (s)		22.3			35.2			18.2				22.6
Approach LOS		C			D			B				C

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	32.5
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	135
Future Volume (vph)	135
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1507
Flt Permitted	1.00
Satd. Flow (perm)	1507
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	139
RTOR Reduction (vph)	83
Lane Group Flow (vph)	56
Heavy Vehicles (%)	5%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	33.5
Effective Green, g (s)	33.5
Actuated g/C Ratio	0.40
Clearance Time (s)	6.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	606
v/s Ratio Prot	0.01
v/s Ratio Perm	0.02
v/c Ratio	0.09
Uniform Delay, d1	15.4
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	15.5
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	186	410	69	183	401	227	84	130
Average Queue (ft)	40	213	28	39	182	107	21	53
95th Queue (ft)	118	349	58	113	342	191	58	101
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	8		0	8		0	1
Queuing Penalty (veh)	0	3		0	3		0	0

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement	WB
Directions Served	L
Maximum Queue (ft)	33
Average Queue (ft)	4
95th Queue (ft)	20
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	255
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement	EB	NB	NB
Directions Served	T	L	R
Maximum Queue (ft)	10	83	88
Average Queue (ft)	0	25	35
95th Queue (ft)	2	63	75
Link Distance (ft)	505	382	382
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	WB
Directions Served	L
Maximum Queue (ft)	33
Average Queue (ft)	6
95th Queue (ft)	26
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	160
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	B17	SB
Directions Served	ULT	UTR	T	L>
Maximum Queue (ft)	256	132	7	92
Average Queue (ft)	82	20	0	31
95th Queue (ft)	200	80	5	71
Link Distance (ft)	393	351	787	742
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	146	116	61	68	135	134	84	39	40	157	162	84
Average Queue (ft)	81	42	5	16	70	67	14	5	11	84	88	37
95th Queue (ft)	133	96	29	51	120	119	47	24	32	136	145	69
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)										0		
Queuing Penalty (veh)										0		

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	22	66	64	59	29
Average Queue (ft)	2	16	26	14	4
95th Queue (ft)	13	51	53	46	21
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 6

MOVEMENT SUMMARY

Site: 101 [2026 Background - AM Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.564	10.6	LOS B	4.8	128.4	0.29	0.13	0.29	24.2
6	T1	440	10.0	484	10.0	0.564	10.9	LOS B	4.8	128.4	0.29	0.13	0.29	23.1
16	R2	75	11.0	82	11.0	0.564	11.0	LOS B	4.8	128.4	0.29	0.13	0.29	22.5
Approach		516	10.1	567	10.1	0.564	10.9	LOS B	4.8	128.4	0.29	0.13	0.29	23.0
North: Falmouth Street														
7	L2	77	21.0	85	21.0	0.211	9.2	LOS A	1.3	36.1	0.69	0.59	0.69	23.2
14	R2	35	9.0	38	9.0	0.211	8.3	LOS A	1.3	36.1	0.69	0.59	0.69	22.2
Approach		112	17.3	123	17.3	0.211	8.9	LOS A	1.3	36.1	0.69	0.59	0.69	22.9
West: E Shirley Avenue														
5u	U	1	0.0	1	0.0	0.135	4.7	LOS A	0.8	21.3	0.34	0.18	0.34	25.4
5	L2	32	19.0	35	19.0	0.135	5.4	LOS A	0.8	21.3	0.34	0.18	0.34	24.7
2	T1	306	9.0	336	9.0	0.135	1.4	LOS A	0.8	21.3	0.09	0.05	0.09	25.5
Approach		339	9.9	373	9.9	0.135	1.8	LOS A	0.8	21.3	0.12	0.06	0.12	25.4
All Vehicles		967	10.9	1063	10.9	0.564	7.5	LOS A	4.8	128.4	0.27	0.16	0.27	23.8

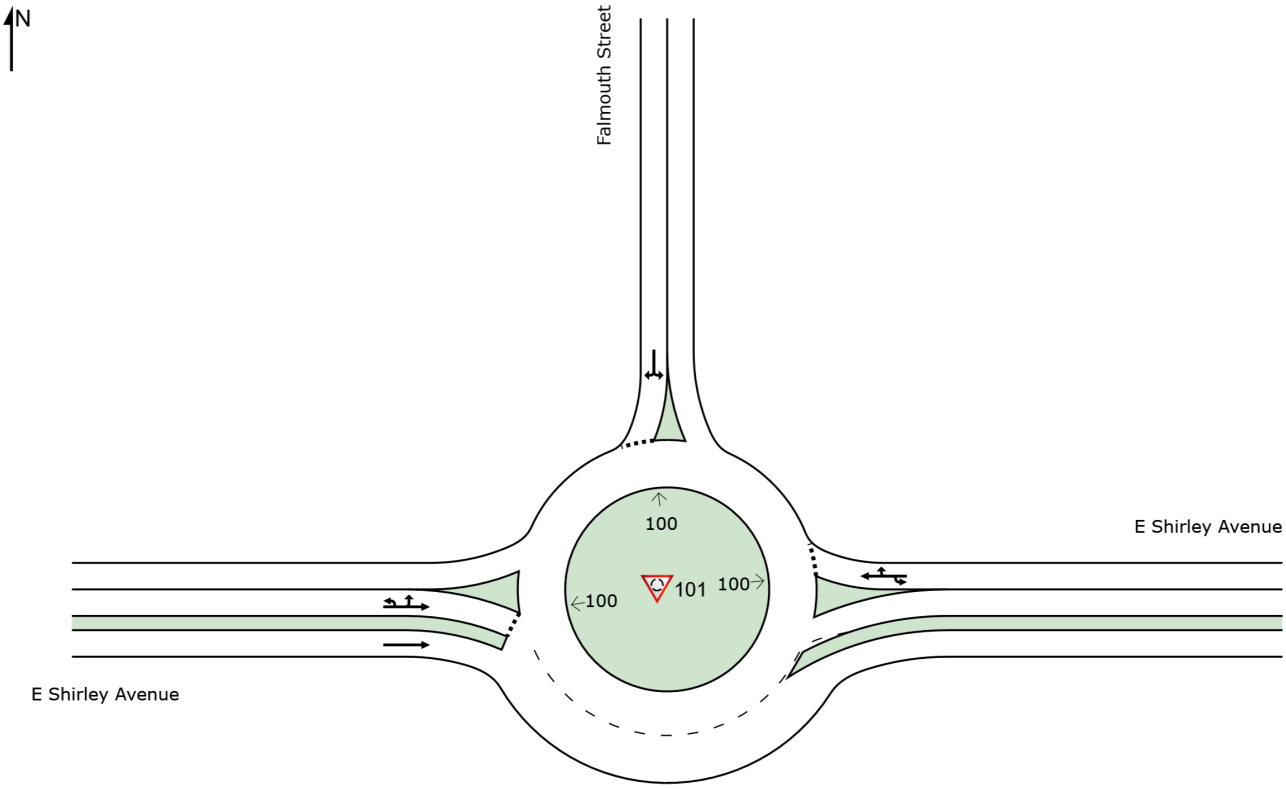
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2026 Background - AM Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:27:08 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Background\Taylor MS 2026 Background.sip9

MOVEMENT SUMMARY

Site: 101 [2026 Background - Commuter Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.643	12.8	LOS B	6.7	190.3	0.27	0.10	0.27	23.5
6	T1	426	21.0	468	21.0	0.643	13.5	LOS B	6.7	190.3	0.27	0.10	0.27	22.5
16	R2	139	4.0	153	4.0	0.643	13.0	LOS B	6.7	190.3	0.27	0.10	0.27	22.0
Approach		566	16.8	622	16.8	0.643	13.4	LOS B	6.7	190.3	0.27	0.10	0.27	22.4
North: Falmouth Street														
7	L2	111	1.0	122	1.0	0.233	8.0	LOS A	1.5	38.9	0.71	0.59	0.71	23.3
14	R2	33	9.0	36	9.0	0.233	8.5	LOS A	1.5	38.9	0.71	0.59	0.71	22.3
Approach		144	2.8	158	2.8	0.233	8.1	LOS A	1.5	38.9	0.71	0.59	0.71	23.0
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.191	5.3	LOS A	1.2	30.5	0.38	0.22	0.38	25.5
5	L2	19	11.0	21	11.0	0.191	5.8	LOS A	1.2	30.5	0.38	0.22	0.38	24.8
2	T1	476	5.0	523	5.0	0.191	1.7	LOS A	1.2	30.5	0.12	0.07	0.12	25.4
Approach		497	5.2	546	5.2	0.191	1.9	LOS A	1.2	30.5	0.13	0.07	0.13	25.4
All Vehicles		1207	10.4	1326	10.4	0.643	8.0	LOS A	6.7	190.3	0.27	0.15	0.27	23.6

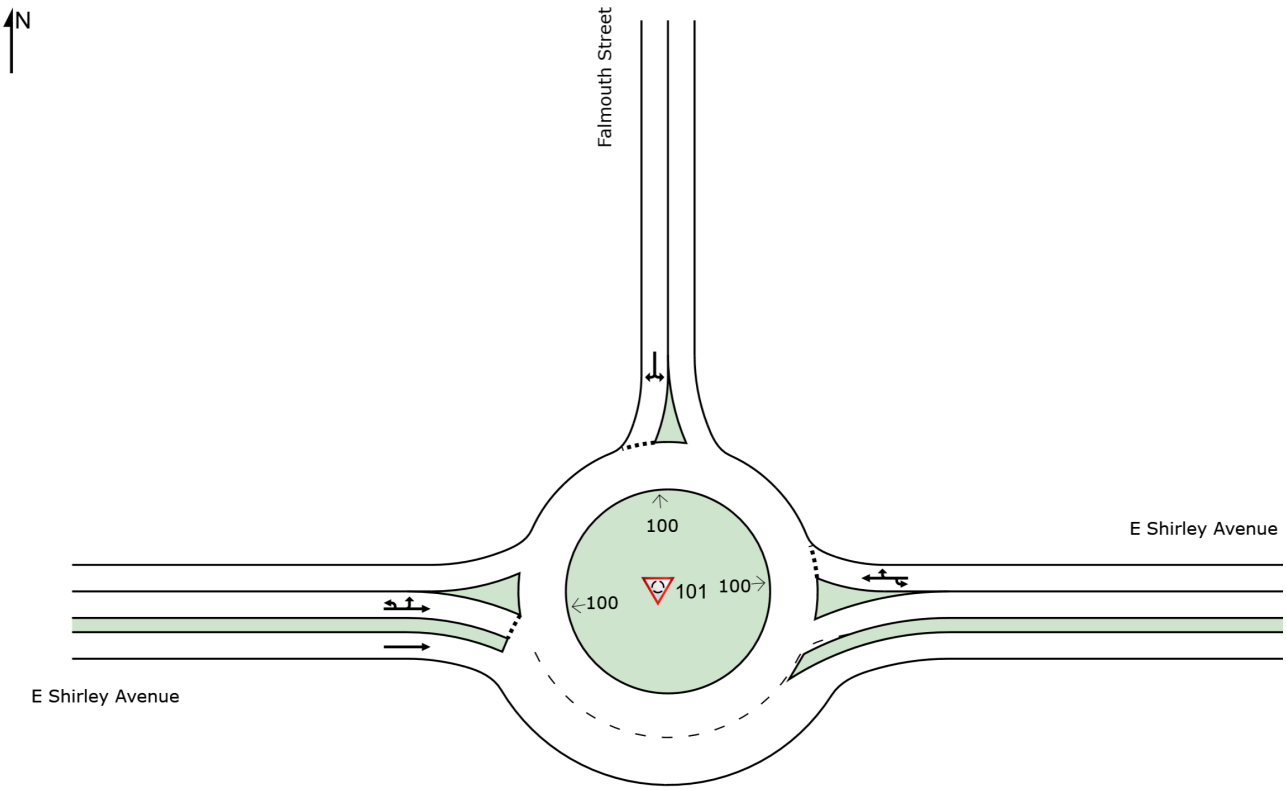
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2026 Background - Commuter Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:28:51 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Background\Taylor MS 2026 Background.sip9

MOVEMENT SUMMARY

Site: 101 [2026 Background - School PM (Site Folder: General)]

School PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	2	0.0	2	0.0	0.517	9.3	LOS A	4.1	106.5	0.24	0.09	0.24	24.5
6	T1	417	4.0	421	4.0	0.517	9.5	LOS A	4.1	106.5	0.24	0.09	0.24	23.4
16	R2	130	6.0	131	6.0	0.517	9.5	LOS A	4.1	106.5	0.24	0.09	0.24	22.8
Approach		549	4.5	555	4.5	0.517	9.5	LOS A	4.1	106.5	0.24	0.09	0.24	23.3
North: Falmouth Street														
7	L2	123	7.0	124	7.0	0.203	7.3	LOS A	1.2	32.4	0.62	0.49	0.62	23.4
14	R2	24	0.0	24	0.0	0.203	6.9	LOS A	1.2	32.4	0.62	0.49	0.62	22.5
Approach		147	5.9	148	5.9	0.203	7.2	LOS A	1.2	32.4	0.62	0.49	0.62	23.3
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.195	5.5	LOS A	1.2	31.0	0.40	0.23	0.40	25.4
5	L2	27	23.0	27	23.0	0.195	6.5	LOS A	1.2	31.0	0.40	0.23	0.40	24.7
2	T1	515	5.0	520	5.0	0.195	1.7	LOS A	1.2	31.0	0.12	0.07	0.12	25.4
Approach		544	5.9	549	5.9	0.195	2.0	LOS A	1.2	31.0	0.13	0.08	0.13	25.4
All Vehicles		1240	5.2	1253	5.2	0.517	5.9	LOS A	4.1	106.5	0.24	0.13	0.24	24.2

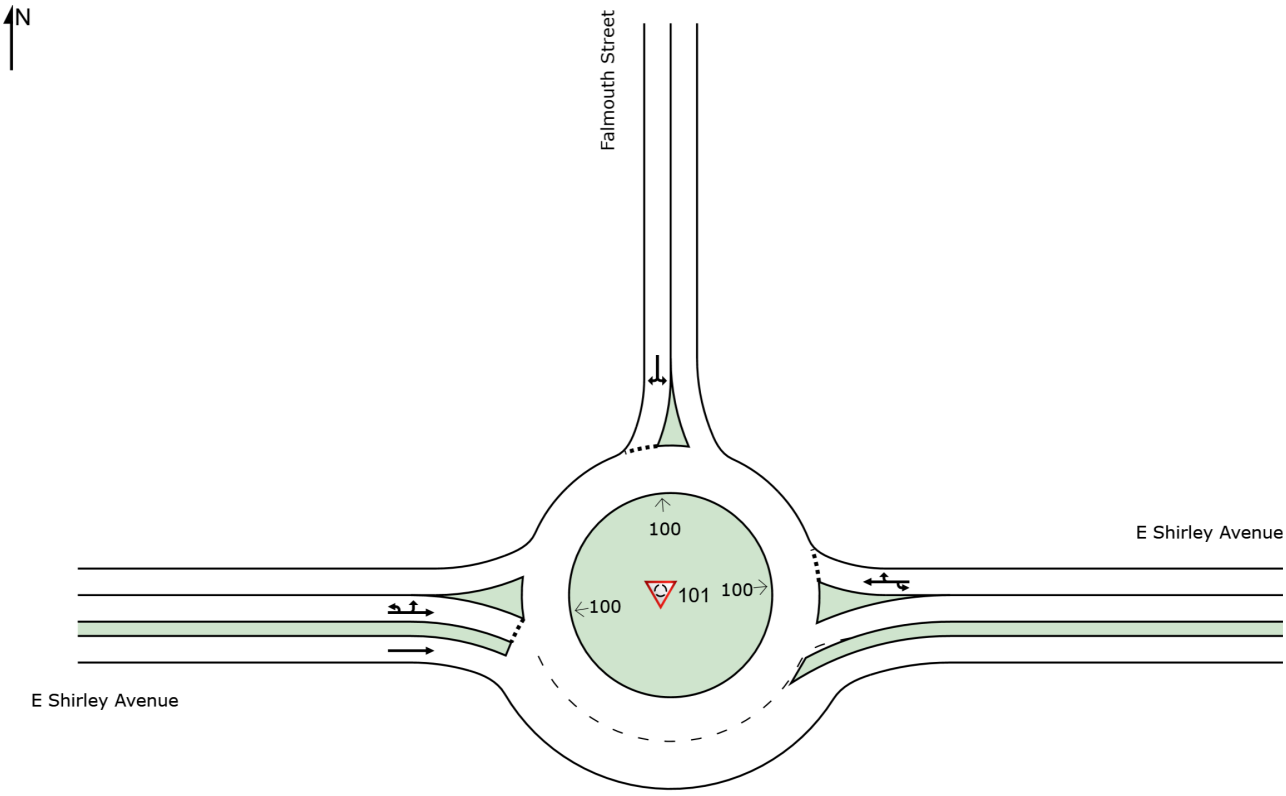
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2026 Background - School PM (Site Folder: General)]

School PM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:30:17 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Background\Taylor MS 2026 Background.sip9

MOVEMENT SUMMARY

Site: 101 [2032 Background - AM Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.689	14.3	LOS B	7.7	209.4	0.39	0.18	0.39	23.2
6	T1	527	10.0	579	10.0	0.689	14.6	LOS B	7.7	209.4	0.39	0.18	0.39	22.2
16	R2	100	11.0	110	11.0	0.689	14.6	LOS B	7.7	209.4	0.39	0.18	0.39	21.7
Approach		628	10.1	690	10.1	0.689	14.6	LOS B	7.7	209.4	0.39	0.18	0.39	22.2
North: Falmouth Street														
7	L2	90	21.0	99	21.0	0.271	11.3	LOS B	1.7	49.2	0.77	0.70	0.77	22.7
14	R2	37	9.0	41	9.0	0.271	10.3	LOS B	1.7	49.2	0.77	0.70	0.77	21.8
Approach		127	17.5	140	17.5	0.271	11.0	LOS B	1.7	49.2	0.77	0.70	0.77	22.4
West: E Shirley Avenue														
5u	U	1	0.0	1	0.0	0.155	5.0	LOS A	0.9	25.1	0.38	0.21	0.38	25.3
5	L2	34	19.0	37	19.0	0.155	5.8	LOS A	0.9	25.1	0.38	0.21	0.38	24.6
2	T1	350	9.0	385	9.0	0.155	1.4	LOS A	0.9	25.1	0.10	0.06	0.10	25.5
Approach		385	9.9	423	9.9	0.155	1.9	LOS A	0.9	25.1	0.13	0.07	0.13	25.4
All Vehicles		1140	10.9	1253	10.9	0.689	9.9	LOS A	7.7	209.4	0.34	0.20	0.34	23.2

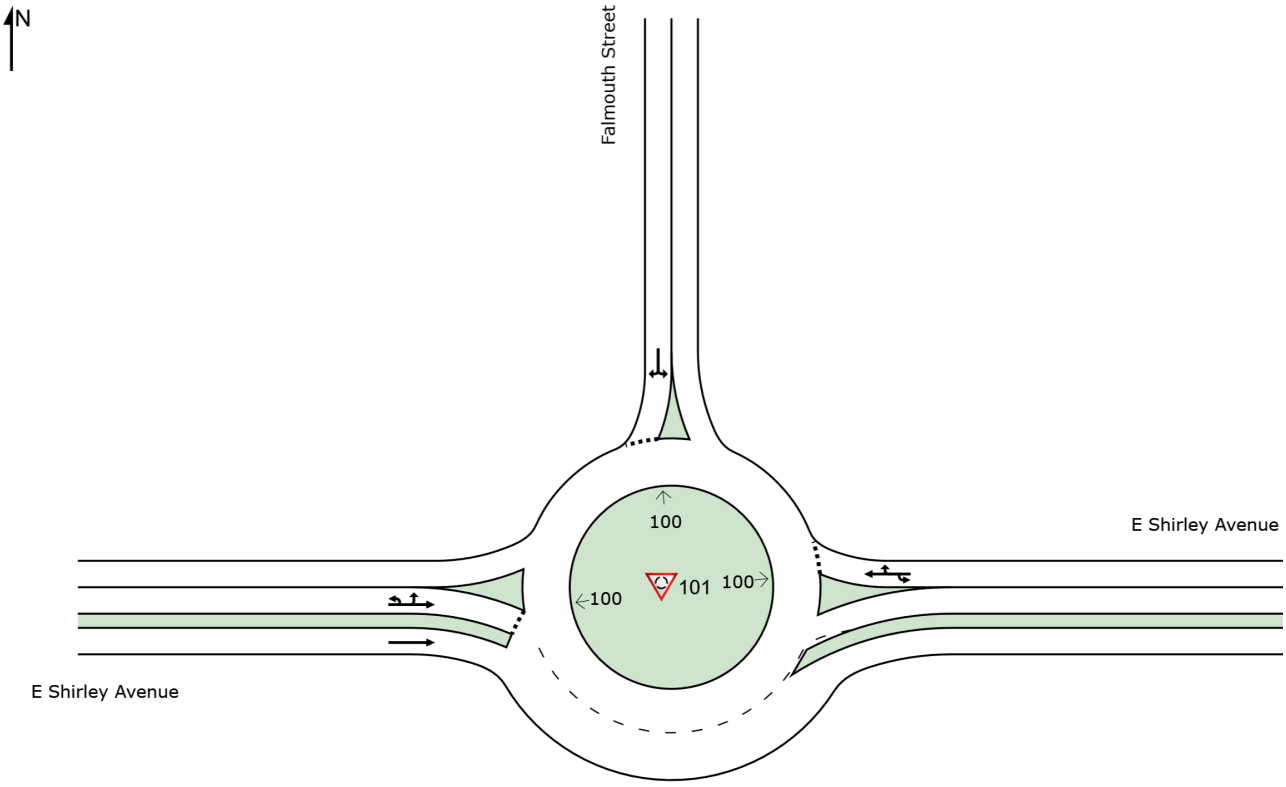
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2032 Background - AM Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:36:51 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Background\Taylor MS 2032 Background.sip9

MOVEMENT SUMMARY

Site: 101 [2032 Background - Commuter Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.765	18.0	LOS B	11.6	329.9	0.39	0.15	0.39	22.3
6	T1	505	21.0	555	21.0	0.765	18.7	LOS B	11.6	329.9	0.39	0.15	0.39	21.4
16	R2	166	4.0	182	4.0	0.765	18.1	LOS B	11.6	329.9	0.39	0.15	0.39	20.9
Approach		672	16.8	738	16.8	0.765	18.6	LOS B	11.6	329.9	0.39	0.15	0.39	21.3
North: Falmouth Street														
7	L2	145	1.0	159	1.0	0.329	10.4	LOS B	2.3	59.6	0.81	0.73	0.81	22.7
14	R2	35	9.0	38	9.0	0.329	11.1	LOS B	2.3	59.6	0.81	0.73	0.81	21.8
Approach		180	2.6	198	2.6	0.329	10.6	LOS B	2.3	59.6	0.81	0.73	0.81	22.5
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.239	6.2	LOS A	1.5	39.9	0.46	0.30	0.46	25.3
5	L2	20	11.0	22	11.0	0.239	6.7	LOS A	1.5	39.9	0.46	0.30	0.46	24.6
2	T1	586	5.0	644	5.0	0.239	1.9	LOS A	1.5	39.9	0.14	0.09	0.14	25.4
Approach		608	5.2	668	5.2	0.239	2.2	LOS A	1.5	39.9	0.15	0.10	0.15	25.3
All Vehicles		1460	10.2	1604	10.2	0.765	10.7	LOS B	11.6	329.9	0.34	0.20	0.34	23.0

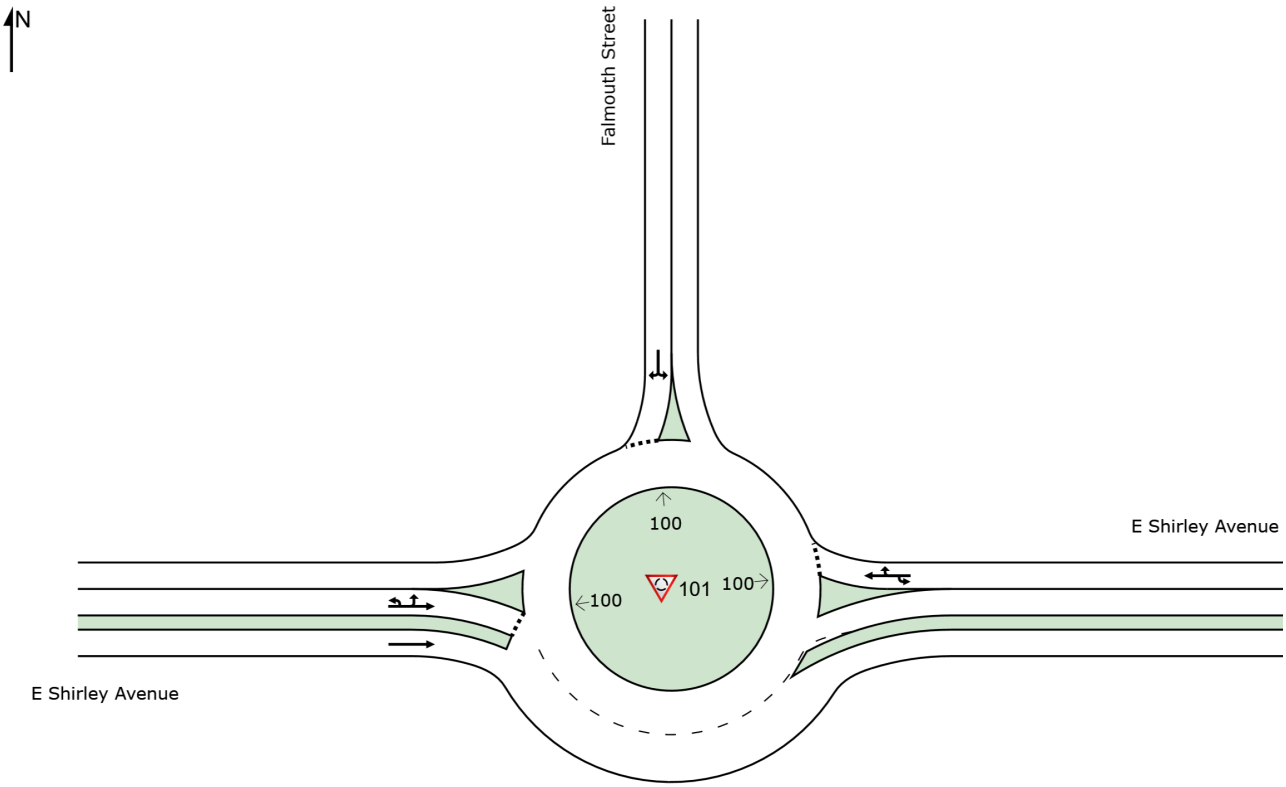
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2032 Background - Commuter Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:38:27 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Background\Taylor MS 2032 Background.sip9

MOVEMENT SUMMARY

Site: 101 [2032 Background - School PM (Site Folder: General)]

School PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	2	0.0	2	0.0	0.602	11.2	LOS B	5.7	148.8	0.29	0.12	0.29	24.0
6	T1	484	4.0	489	4.0	0.602	11.3	LOS B	5.7	148.8	0.29	0.12	0.29	23.0
16	R2	152	6.0	154	6.0	0.602	11.4	LOS B	5.7	148.8	0.29	0.12	0.29	22.4
Approach		638	4.5	644	4.5	0.602	11.3	LOS B	5.7	148.8	0.29	0.12	0.29	22.8
North: Falmouth Street														
7	L2	144	7.0	145	7.0	0.250	8.4	LOS A	1.6	41.8	0.68	0.57	0.68	23.1
14	R2	25	0.0	25	0.0	0.250	7.9	LOS A	1.6	41.8	0.68	0.57	0.68	22.2
Approach		169	6.0	171	6.0	0.250	8.3	LOS A	1.6	41.8	0.68	0.57	0.68	23.0
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.225	6.0	LOS A	1.4	36.8	0.44	0.28	0.44	25.3
5	L2	28	23.0	28	23.0	0.225	7.0	LOS A	1.4	36.8	0.44	0.28	0.44	24.6
2	T1	590	5.0	596	5.0	0.225	1.8	LOS A	1.4	36.8	0.13	0.08	0.13	25.4
Approach		620	5.8	626	5.8	0.225	2.1	LOS A	1.4	36.8	0.14	0.09	0.14	25.4
All Vehicles		1427	5.2	1441	5.2	0.602	6.9	LOS A	5.7	148.8	0.27	0.16	0.27	23.9

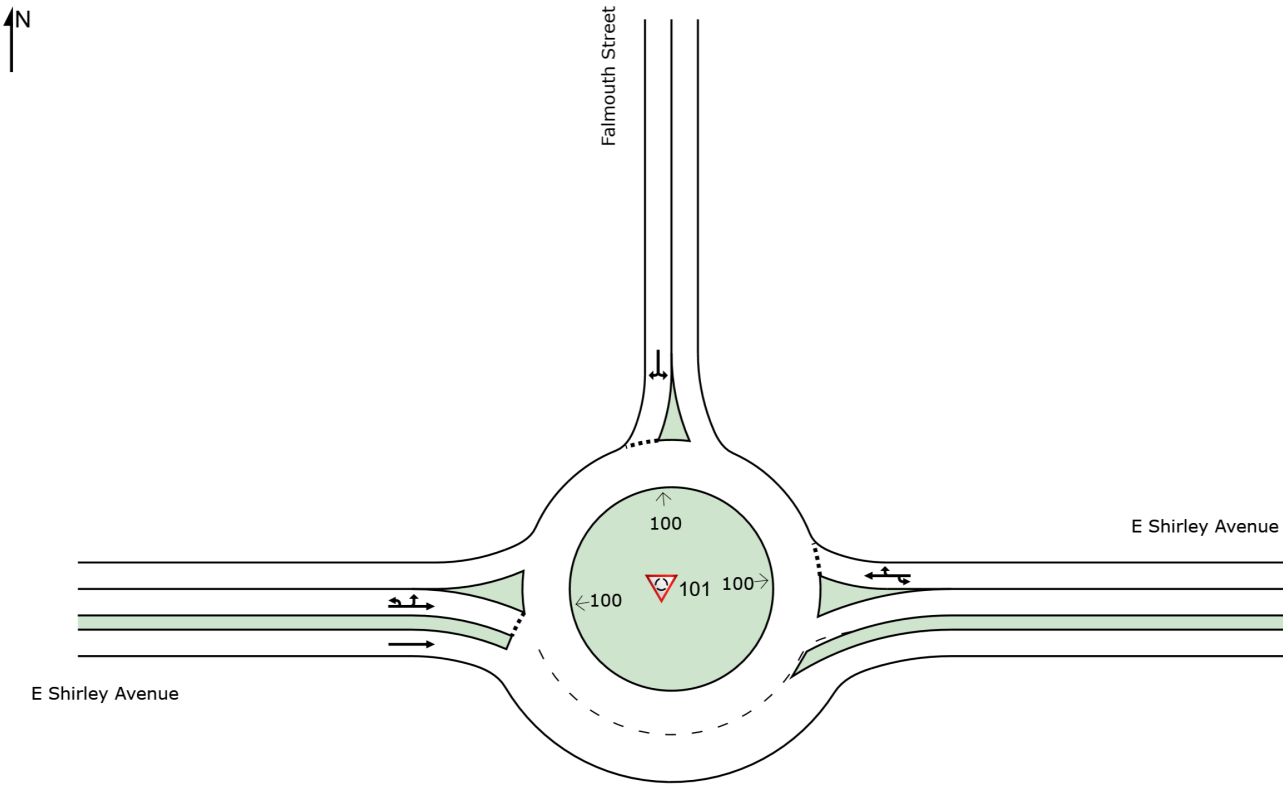
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2032 Background - School PM (Site Folder: General)]

School PM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:40:06 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Background\Taylor MS 2032 Background.sip9

Appendix F
2026 Future Analysis Worksheets

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	5	0	46	21	175	0	0	35	79	0	0
Future Vol, veh/h	0	5	0	46	21	175	0	0	35	79	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
Heavy Vehicles, %	0	0	0	24	0	7	0	0	65	8	0	0
Mvmt Flow	0	5	0	50	23	190	0	0	38	86	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

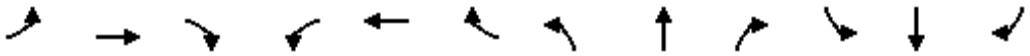
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.6	8.2	7.2	8.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	69%	0%	100%
Vol Thru, %	0%	100%	31%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	5	67	175	79
LT Vol	0	0	46	0	79
Through Vol	0	5	21	0	0
RT Vol	35	0	0	175	0
Lane Flow Rate	38	5	73	190	86
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.042	0.007	0.111	0.212	0.116
Departure Headway (Hd)	3.998	4.564	5.471	4.017	4.868
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	900	787	648	879	740
Service Time	2.002	2.577	3.266	1.811	2.87
HCM Lane V/C Ratio	0.042	0.006	0.113	0.216	0.116
HCM Control Delay	7.2	7.6	9	7.9	8.5
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0	0.4	0.8	0.4

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	32	393	74	32	500	234	16	57
v/c Ratio	0.19	0.57	0.11	0.21	0.63	0.71	0.09	0.29
Control Delay	45.6	27.2	0.3	46.3	26.8	47.0	41.7	32.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	27.2	0.3	46.3	26.8	47.0	41.7	32.5
Queue Length 50th (ft)	18	188	0	18	260	120	9	20
Queue Length 95th (ft)	50	297	0	50	406	#239	30	59
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	166	804	784	152	824	386	383	384
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	0.19	0.49	0.09	0.21	0.61	0.61	0.04	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	362	68	29	437	23	80	83	52	15	32	20
Future Volume (vph)	29	362	68	29	437	23	80	83	52	15	32	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99			0.97		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1823	1761	1539	1667	1720			1735		1769	1690	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1823	1761	1539	1667	1720			1735		1769	1690	
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)	32	393	74	32	475	25	87	90	57	16	35	22
RTOR Reduction (vph)	0	0	44	0	2	0	0	11	0	0	20	0
Lane Group Flow (vph)	32	393	30	32	498	0	0	223	0	16	37	0
Heavy Vehicles (%)	0%	9%	6%	11%	13%	0%	6%	2%	4%	0%	3%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	4.4	37.7	37.7	8.2	41.5			16.5		7.1	7.1	
Effective Green, g (s)	4.4	37.7	37.7	8.2	41.5			16.5		7.1	7.1	
Actuated g/C Ratio	0.05	0.40	0.40	0.09	0.44			0.18		0.08	0.08	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	85	710	620	146	763			306		134	128	
v/s Ratio Prot	0.02	0.22		c0.02	c0.29			c0.13		0.01	c0.02	
v/s Ratio Perm			0.02									
v/c Ratio	0.38	0.55	0.05	0.22	0.65			0.73		0.12	0.29	
Uniform Delay, d1	43.2	21.4	17.0	39.7	20.4			36.4		40.3	40.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	3.8	1.2	0.0	1.0	2.2			9.0		0.5	1.7	
Delay (s)	47.0	22.6	17.0	40.7	22.6			45.4		40.8	42.5	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		23.3			23.7			45.4			42.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	93.5	Sum of lost time (s)	24.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	367	12	19	472	0	0
Future Volume (Veh/h)	367	12	19	472	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	399	24	38	513	0	0
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			423		988	399
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			423		988	399
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			96		100	100
cM capacity (veh/h)			1080		267	655

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	399	24	38	513
Volume Left	0	0	38	0
Volume Right	0	24	0	0
cSH	1700	1700	1080	1700
Volume to Capacity	0.23	0.01	0.04	0.30
Queue Length 95th (ft)	0	0	3	0
Control Delay (s)	0.0	0.0	8.5	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.6	
Approach LOS				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	358	0	0	482	12	19
Future Volume (Veh/h)	358	0	0	482	12	19
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	389	0	0	524	24	38
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			389		913	389
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			389		913	389
tC, single (s)			4.1		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.4
p0 queue free %			100		92	94
cM capacity (veh/h)			1181		286	630

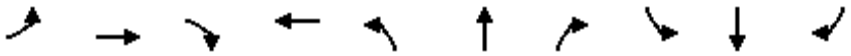
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	389	524	24	38
Volume Left	0	0	24	0
Volume Right	0	0	0	38
cSH	1700	1700	286	630
Volume to Capacity	0.23	0.31	0.08	0.06
Queue Length 95th (ft)	0	0	7	5
Control Delay (s)	0.0	0.0	18.7	11.1
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	14.0	
Approach LOS			B	

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	338	80	25	423	57	44
Future Volume (Veh/h)	338	80	25	423	57	44
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.95	0.50	0.50	0.95	0.95	0.95
Hourly flow rate (vph)	356	160	50	445	60	46
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			516		901	356
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			516		901	356
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		80	93
cM capacity (veh/h)			1060		297	693

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	356	160	50	445	106
Volume Left	0	0	50	0	60
Volume Right	0	160	0	0	46
cSH	1700	1700	1060	1700	395
Volume to Capacity	0.21	0.09	0.05	0.26	0.27
Queue Length 95th (ft)	0	0	4	0	27
Control Delay (s)	0.0	0.0	8.6	0.0	17.4
Lane LOS			A		C
Approach Delay (s)	0.0		0.9		17.4
Approach LOS					C

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	60	60	145	6	283	403	10	10	142	155
v/c Ratio	0.38	0.38	0.11	0.01	0.57	0.28	0.01	0.02	0.28	0.24
Control Delay	38.2	38.2	0.2	0.0	18.8	16.2	0.0	11.7	30.8	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	38.2	0.2	0.0	18.8	16.2	0.0	11.7	30.8	0.9
Queue Length 50th (ft)	27	27	0	0	79	55	0	2	30	0
Queue Length 95th (ft)	68	68	0	0	146	129	0	11	63	0
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	225	225	1291	429	618	1482	858	420	723	699
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.27	0.11	0.01	0.46	0.27	0.01	0.02	0.20	0.22

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	110	0	133	2	0	4	260	371	9	2	7	131
Future Volume (vph)	110	0	133	2	0	4	260	371	9	2	7	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.91		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1316	1316	1291		1015		1674	3409	1647		1436	3103
Flt Permitted	0.95	0.95	1.00		0.98		0.66	1.00	1.00		0.51	1.00
Satd. Flow (perm)	1316	1316	1291		1015		1166	3409	1647		778	3103
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)	120	0	145	2	0	4	283	403	10	2	8	142
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	6	0	0	0
Lane Group Flow (vph)	60	60	145	0	1	0	283	403	4	0	10	142
Heavy Vehicles (%)	27%	0%	22%	50%	0%	75%	10%	8%	0%	0%	29%	14%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	9.1	9.1	81.6		7.0		33.0	31.7	31.7		33.0	19.3
Effective Green, g (s)	9.1	9.1	81.6		7.0		33.0	31.7	31.7		33.0	19.3
Actuated g/C Ratio	0.11	0.11	1.00		0.09		0.40	0.39	0.39		0.40	0.24
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	146	146	1291		87		556	1324	639		325	733
v/s Ratio Prot	c0.05	0.05			0.00		c0.09	0.12			0.00	0.05
v/s Ratio Perm			c0.11				c0.12		0.00		0.01	
v/c Ratio	0.41	0.41	0.11		0.01		0.51	0.30	0.01		0.03	0.19
Uniform Delay, d1	33.8	33.8	0.0		34.1		17.4	17.3	15.3		14.6	24.9
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	1.9	0.2		0.0		0.7	0.1	0.0		0.0	0.1
Delay (s)	35.6	35.6	0.2		34.1		18.2	17.4	15.3		14.6	25.1
Level of Service	D	D	A		C		B	B	B		B	C
Approach Delay (s)		16.2			34.1			17.7				21.2
Approach LOS		B			C			B				C

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	81.6	Sum of lost time (s)	32.5
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	143
Future Volume (vph)	143
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1426
Flt Permitted	1.00
Satd. Flow (perm)	1426
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	155
RTOR Reduction (vph)	101
Lane Group Flow (vph)	54
Heavy Vehicles (%)	11%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	28.4
Effective Green, g (s)	28.4
Actuated g/C Ratio	0.35
Clearance Time (s)	6.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	496
v/s Ratio Prot	0.01
v/s Ratio Perm	0.03
v/c Ratio	0.11
Uniform Delay, d1	18.0
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	18.1
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	98	280	64	172	378	212	52	99
Average Queue (ft)	27	138	24	30	172	112	14	36
95th Queue (ft)	75	237	52	97	309	193	40	78
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	1		0	6			0
Queuing Penalty (veh)	0	0		0	2			0

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement	WB
Directions Served	L
Maximum Queue (ft)	46
Average Queue (ft)	5
95th Queue (ft)	26
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	255
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	66	72
Average Queue (ft)	13	19
95th Queue (ft)	44	56
Link Distance (ft)	382	382
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	EB	WB	NB
Directions Served	R	L	LR
Maximum Queue (ft)	27	40	79
Average Queue (ft)	1	7	31
95th Queue (ft)	16	30	61
Link Distance (ft)			380
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	140	160	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	B17	SB
Directions Served	ULT	TR	T	L>
Maximum Queue (ft)	111	135	6	82
Average Queue (ft)	22	25	0	26
95th Queue (ft)	74	87	6	67
Link Distance (ft)	393	351	787	742
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	144	78	22	61	210	198	131	23	45	102	93	114
Average Queue (ft)	52	16	1	6	97	89	26	3	6	45	35	49
95th Queue (ft)	110	55	11	33	165	158	81	14	27	84	75	89
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)					0	0	0					
Queuing Penalty (veh)					0	0	0					

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	8	76	86	88	70
Average Queue (ft)	1	37	45	35	33
95th Queue (ft)	5	67	72	79	59
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 3

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

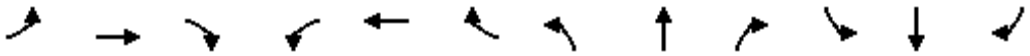
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	16	0	14	4	36	0	0	28	30	0	0
Future Vol, veh/h	0	16	0	14	4	36	0	0	28	30	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	57	0	18	0	0	7	0	0	0
Mvmt Flow	0	17	0	15	4	39	0	0	30	33	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.3	7.5	6.6	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	78%	0%	100%
Vol Thru, %	0%	100%	22%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	28	16	18	36	30
LT Vol	0	0	14	0	30
Through Vol	0	16	4	0	0
RT Vol	28	0	0	36	0
Lane Flow Rate	30	17	20	39	33
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.029	0.02	0.032	0.043	0.039
Departure Headway (Hd)	3.452	4.154	5.978	3.918	4.252
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	1025	858	600	913	836
Service Time	1.513	2.196	3.705	1.644	2.306
HCM Lane V/C Ratio	0.029	0.02	0.033	0.043	0.039
HCM Control Delay	6.6	7.3	8.9	6.8	7.5
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1	0.1	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	40	504	155	34	497	189	37	147
v/c Ratio	0.26	0.75	0.23	0.22	0.62	0.66	0.15	0.57
Control Delay	50.1	36.1	4.8	49.4	28.8	49.1	39.4	46.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	36.1	4.8	49.4	28.8	49.1	39.4	46.2
Queue Length 50th (ft)	23	268	0	19	262	102	20	78
Queue Length 95th (ft)	63	438	43	56	426	195	53	153
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	154	788	760	152	836	363	355	364
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	0.26	0.64	0.20	0.22	0.59	0.52	0.10	0.40

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	474	146	32	463	4	84	65	29	35	112	26
Future Volume (vph)	38	474	146	32	463	4	84	65	29	35	112	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1823	1863	1584	1796	1889			1774		1769	1780	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1823	1863	1584	1796	1889			1774		1769	1780	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	40	504	155	34	493	4	89	69	31	37	119	28
RTOR Reduction (vph)	0	0	96	0	0	0	0	7	0	0	8	0
Lane Group Flow (vph)	40	504	59	34	497	0	0	182	0	37	139	0
Heavy Vehicles (%)	0%	3%	3%	3%	3%	0%	2%	2%	4%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	4.4	37.3	37.3	8.1	41.0			15.2		13.6	13.6	
Effective Green, g (s)	4.4	37.3	37.3	8.1	41.0			15.2		13.6	13.6	
Actuated g/C Ratio	0.04	0.38	0.38	0.08	0.42			0.15		0.14	0.14	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	81	707	601	148	788			274		244	246	
v/s Ratio Prot	c0.02	c0.27		0.02	c0.26			c0.10		0.02	c0.08	
v/s Ratio Perm			0.04									
v/c Ratio	0.49	0.71	0.10	0.23	0.63			0.67		0.15	0.57	
Uniform Delay, d1	45.8	25.9	19.6	42.1	22.6			39.1		37.2	39.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	6.3	3.7	0.1	1.1	1.9			6.6		0.4	3.6	
Delay (s)	52.1	29.5	19.7	43.2	24.5			45.7		37.6	43.1	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		28.7			25.7			45.7			42.0	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	98.2	Sum of lost time (s)	24.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	508	0	0	468	0	0
Future Volume (Veh/h)	508	0	0	468	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	552	0	0	509	0	0
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			552		1061	552
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			552		1061	552
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1028		250	537

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	552	0	0	509
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.32	0.00	0.00	0.30
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	511	0	0	464	0	0
Future Volume (Veh/h)	511	0	0	464	0	0
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	555	0	0	504	0	0
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			555		1059	555
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			555		1059	555
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1026		251	535

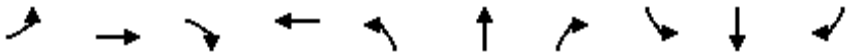
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	555	504	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.33	0.30	0.00	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	
Approach LOS			A	

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	483	29	28	447	20	4
Future Volume (Veh/h)	483	29	28	447	20	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	525	58	56	486	22	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						
vC, conflicting volume			583		1123	525
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			583		1123	525
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			94		90	99
cM capacity (veh/h)			958		217	557

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	525	58	56	486	26
Volume Left	0	0	56	0	22
Volume Right	0	58	0	0	4
cSH	1700	1700	958	1700	239
Volume to Capacity	0.31	0.03	0.06	0.29	0.11
Queue Length 95th (ft)	0	0	5	0	9
Control Delay (s)	0.0	0.0	9.0	0.0	21.9
Lane LOS			A		C
Approach Delay (s)	0.0		0.9		21.9
Approach LOS					C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	136	136	221	17	214	268	1	15	378	88
v/c Ratio	0.53	0.53	0.14	0.05	0.53	0.19	0.00	0.04	0.59	0.14
Control Delay	37.9	37.9	0.2	0.2	20.5	17.4	0.0	13.7	32.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	37.9	0.2	0.2	20.5	17.4	0.0	13.7	32.5	0.5
Queue Length 50th (ft)	62	62	0	0	62	38	0	4	86	0
Queue Length 95th (ft)	125	125	0	0	122	95	0	15	140	1
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	417	417	1529	547	418	1415	465	388	858	767
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.33	0.14	0.03	0.51	0.19	0.00	0.04	0.44	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	258	0	210	5	0	11	203	255	1	9	6	359
Future Volume (vph)	258	0	210	5	0	11	203	255	1	9	6	359
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.90		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.99		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1655	1655	1529		1502		1721	3541	824		1328	3369
Flt Permitted	0.95	0.95	1.00		0.99		0.53	1.00	1.00		0.59	1.00
Satd. Flow (perm)	1655	1655	1529		1502		955	3541	824		820	3369
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)	272	0	221	5	0	12	214	268	1	9	6	378
RTOR Reduction (vph)	0	0	0	0	16	0	0	0	1	0	0	0
Lane Group Flow (vph)	136	136	221	0	1	0	214	268	0	0	15	378
Heavy Vehicles (%)	1%	0%	3%	20%	0%	9%	7%	4%	100%	0%	83%	5%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	11.8	11.8	83.0		7.1		31.6	30.4	30.4		31.6	21.8
Effective Green, g (s)	11.8	11.8	83.0		7.1		31.6	30.4	30.4		31.6	21.8
Actuated g/C Ratio	0.14	0.14	1.00		0.09		0.38	0.37	0.37		0.38	0.26
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	235	235	1529		128		454	1296	301		319	884
v/s Ratio Prot	c0.08	0.08			0.00		c0.06	c0.08			0.00	0.11
v/s Ratio Perm			c0.14				c0.12		0.00		0.02	
v/c Ratio	0.58	0.58	0.14		0.01		0.47	0.21	0.00		0.05	0.43
Uniform Delay, d1	33.3	33.3	0.0		34.7		18.2	18.0	16.7		16.1	25.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	3.4	0.2		0.0		0.8	0.1	0.0		0.1	0.3
Delay (s)	36.7	36.7	0.2		34.8		19.0	18.1	16.7		16.2	25.8
Level of Service	D	D	A		C		B	B	B		B	C
Approach Delay (s)		20.3			34.8			18.5				23.5
Approach LOS		C			C			B				C

Intersection Summary			
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	83.0	Sum of lost time (s)	32.5
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	84
Future Volume (vph)	84
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1439
Flt Permitted	1.00
Satd. Flow (perm)	1439
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	88
RTOR Reduction (vph)	52
Lane Group Flow (vph)	36
Heavy Vehicles (%)	10%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	33.6
Effective Green, g (s)	33.6
Actuated g/C Ratio	0.40
Clearance Time (s)	6.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	582
v/s Ratio Prot	0.01
v/s Ratio Perm	0.02
v/c Ratio	0.06
Uniform Delay, d1	15.1
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	15.1
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	214	363	89	164	344	215	106	184
Average Queue (ft)	41	207	38	34	182	99	27	84
95th Queue (ft)	117	329	68	110	310	179	72	153
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	8		0	9		0	3
Queuing Penalty (veh)	0	3		0	3		0	1

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	EB	EB	WB	NB
Directions Served	T	R	L	LR
Maximum Queue (ft)	3	4	60	46
Average Queue (ft)	0	0	9	14
95th Queue (ft)	3	5	37	36
Link Distance (ft)	204			380
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		140	160	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	SB
Directions Served	ULT	TR	L>
Maximum Queue (ft)	208	139	79
Average Queue (ft)	57	18	28
95th Queue (ft)	151	78	62
Link Distance (ft)	393	351	742
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	157	111	46	53	190	139	98	32	80	156	166	72
Average Queue (ft)	80	37	5	11	90	71	16	1	12	83	87	30
95th Queue (ft)	132	89	26	36	155	125	53	13	47	137	144	64
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)							0		0	0		
Queuing Penalty (veh)							0		0	0		

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	11	64	67	57	43
Average Queue (ft)	3	19	25	21	20
95th Queue (ft)	10	55	57	49	42
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 7

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	8	0	11	4	76	0	0	12	72	0	0
Future Vol, veh/h	0	8	0	11	4	76	0	0	12	72	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
Heavy Vehicles, %	0	13	0	55	2	7	0	0	35	0	0	0
Mvmt Flow	0	9	0	12	4	83	0	0	13	78	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.6	7.5	6.7	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	73%	0%	100%
Vol Thru, %	0%	100%	27%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	8	15	76	72
LT Vol	0	0	11	0	72
Through Vol	0	8	4	0	0
RT Vol	12	0	0	76	0
Lane Flow Rate	13	9	16	83	78
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.013	0.011	0.027	0.092	0.093
Departure Headway (Hd)	3.542	4.457	5.969	3.999	4.292
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	993	795	598	891	827
Service Time	1.627	2.531	3.719	1.747	2.358
HCM Lane V/C Ratio	0.013	0.011	0.027	0.093	0.094
HCM Control Delay	6.7	7.6	8.9	7.2	7.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0.3	0.3

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	40	557	101	40	563	203	28	91
v/c Ratio	0.27	0.78	0.15	0.25	0.66	0.68	0.15	0.41
Control Delay	49.4	35.2	1.6	48.7	28.5	48.3	41.8	38.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.4	35.2	1.6	48.7	28.5	48.3	41.8	38.9
Queue Length 50th (ft)	24	300	0	24	306	114	16	41
Queue Length 95th (ft)	62	#509	12	61	#522	204	44	92
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	148	823	775	157	858	372	350	384
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	0.27	0.68	0.13	0.25	0.66	0.55	0.08	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	512	93	37	505	13	78	77	31	26	54	29
Future Volume (vph)	37	512	93	37	505	13	78	77	31	26	54	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1642	1828	1539	1745	1816			1713		1638	1719	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1642	1828	1539	1745	1816			1713		1638	1719	
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)	40	557	101	40	549	14	85	84	34	28	59	32
RTOR Reduction (vph)	0	0	60	0	1	0	0	7	0	0	19	0
Lane Group Flow (vph)	40	557	41	40	562	0	0	196	0	28	72	0
Heavy Vehicles (%)	11%	5%	6%	6%	7%	0%	8%	4%	7%	8%	4%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	4.3	38.9	38.9	8.2	42.8			15.7		8.6	8.6	
Effective Green, g (s)	4.3	38.9	38.9	8.2	42.8			15.7		8.6	8.6	
Actuated g/C Ratio	0.05	0.41	0.41	0.09	0.45			0.16		0.09	0.09	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	74	745	627	149	814			281		147	154	
v/s Ratio Prot	c0.02	c0.30		0.02	c0.31			c0.11		0.02	c0.04	
v/s Ratio Perm			0.03									
v/c Ratio	0.54	0.75	0.07	0.27	0.69			0.70		0.19	0.47	
Uniform Delay, d1	44.6	24.1	17.2	40.8	21.0			37.6		40.2	41.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	9.7	4.4	0.1	1.3	2.7			7.9		0.9	3.0	
Delay (s)	54.3	28.5	17.3	42.1	23.8			45.6		41.0	44.3	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		28.3			25.0			45.6			43.5	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	95.4	Sum of lost time (s)	24.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	511	12	19	495	0	0
Future Volume (Veh/h)	511	12	19	495	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.93	0.50	0.50	0.93	0.93	0.93
Hourly flow rate (vph)	549	24	38	532	0	0
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			573		1157	549
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			573		1157	549
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	100
cM capacity (veh/h)			1010		211	539

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	549	24	38	532
Volume Left	0	0	38	0
Volume Right	0	24	0	0
cSH	1700	1700	1010	1700
Volume to Capacity	0.32	0.01	0.04	0.31
Queue Length 95th (ft)	0	0	3	0
Control Delay (s)	0.0	0.0	8.7	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.6	
Approach LOS				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	515	0	0	504	12	19
Future Volume (Veh/h)	515	0	0	504	12	19
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	560	0	0	548	24	38
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			560		1108	560
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			560		1108	560
tC, single (s)			4.1		6.5	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.5
p0 queue free %			100		89	92
cM capacity (veh/h)			1021		221	500

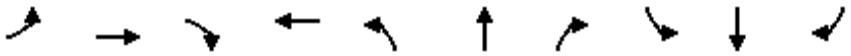
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	560	548	24	38
Volume Left	0	0	24	0
Volume Right	0	0	0	38
cSH	1700	1700	221	500
Volume to Capacity	0.33	0.32	0.11	0.08
Queue Length 95th (ft)	0	0	9	6
Control Delay (s)	0.0	0.0	23.2	12.8
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	16.8	
Approach LOS			C	

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	528	44	7	453	54	46
Future Volume (Veh/h)	528	44	7	453	54	46
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	574	88	14	492	59	50
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			662		1094	574
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			662		1094	574
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		75	90
cM capacity (veh/h)			936		236	522

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	574	88	14	492	109
Volume Left	0	0	14	0	59
Volume Right	0	88	0	0	50
cSH	1700	1700	936	1700	315
Volume to Capacity	0.34	0.05	0.01	0.29	0.35
Queue Length 95th (ft)	0	0	1	0	37
Control Delay (s)	0.0	0.0	8.9	0.0	22.4
Lane LOS			A		C
Approach Delay (s)	0.0		0.2		22.4
Approach LOS					C

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	138	140	255	20	199	236	11	18	315	139
v/c Ratio	0.53	0.54	0.17	0.15	0.47	0.17	0.02	0.04	0.53	0.21
Control Delay	38.3	38.5	0.3	27.1	19.1	17.5	0.1	13.9	32.9	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	38.5	0.3	27.1	19.1	17.5	0.1	13.9	32.9	1.4
Queue Length 50th (ft)	63	64	0	4	57	33	0	5	71	0
Queue Length 95th (ft)	130	132	0	26	115	86	0	18	123	9
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	388	389	1485	154	468	1385	634	501	838	771
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.36	0.17	0.13	0.43	0.17	0.02	0.04	0.38	0.18

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	268	2	247	6	3	11	193	229	11	11	7	306
Future Volume (vph)	268	2	247	6	3	11	193	229	11	11	7	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.93		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.99		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1655	1661	1485		1329		1737	3474	1211		1678	3276
Flt Permitted	0.95	0.95	1.00		0.99		0.56	1.00	1.00		0.60	1.00
Satd. Flow (perm)	1655	1661	1485		1329		1025	3474	1211		1068	3276
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	276	2	255	6	3	11	199	236	11	11	7	315
RTOR Reduction (vph)	0	0	0	0	10	0	0	0	7	0	0	0
Lane Group Flow (vph)	138	140	255	0	10	0	199	236	4	0	18	315
Heavy Vehicles (%)	1%	0%	6%	33%	33%	27%	6%	6%	36%	0%	14%	8%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	11.9	11.9	83.2		7.3		31.5	30.3	30.3		31.5	21.1
Effective Green, g (s)	11.9	11.9	83.2		7.3		31.5	30.3	30.3		31.5	21.1
Actuated g/C Ratio	0.14	0.14	1.00		0.09		0.38	0.36	0.36		0.38	0.25
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	236	237	1485		116		477	1265	441		413	830
v/s Ratio Prot	0.08	c0.08			0.01		c0.05	0.07			0.00	0.10
v/s Ratio Perm			c0.17				c0.11		0.00		0.02	
v/c Ratio	0.58	0.59	0.17		0.09		0.42	0.19	0.01		0.04	0.38
Uniform Delay, d1	33.3	33.4	0.0		34.9		18.1	18.0	16.9		16.2	25.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.7	3.9	0.3		0.3		0.6	0.1	0.0		0.0	0.3
Delay (s)	37.0	37.3	0.3		35.2		18.7	18.1	16.9		16.3	25.9
Level of Service	D	D	A		D		B	B	B		B	C
Approach Delay (s)		19.5			35.2			18.4				22.6
Approach LOS		B			D			B				C

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	32.5
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	135
Future Volume (vph)	135
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1507
Flt Permitted	1.00
Satd. Flow (perm)	1507
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	139
RTOR Reduction (vph)	84
Lane Group Flow (vph)	55
Heavy Vehicles (%)	5%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	33.0
Effective Green, g (s)	33.0
Actuated g/C Ratio	0.40
Clearance Time (s)	6.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	597
v/s Ratio Prot	0.01
v/s Ratio Perm	0.02
v/c Ratio	0.09
Uniform Delay, d1	15.7
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	15.8
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	186	401	74	161	397	225	86	147
Average Queue (ft)	45	210	30	39	199	107	23	54
95th Queue (ft)	131	350	59	113	353	192	61	107
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	7		0	10		0	0
Queuing Penalty (veh)	0	3		0	4		0	0

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement	WB
Directions Served	L
Maximum Queue (ft)	40
Average Queue (ft)	5
95th Queue (ft)	26
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	255
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	54	69
Average Queue (ft)	10	17
95th Queue (ft)	38	50
Link Distance (ft)	382	382
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	EB	WB	NB
Directions Served	R	L	LR
Maximum Queue (ft)	4	31	91
Average Queue (ft)	0	4	33
95th Queue (ft)	3	20	64
Link Distance (ft)			380
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	140	160	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	B17	SB
Directions Served	ULT	UTR	T	L>
Maximum Queue (ft)	199	132	6	76
Average Queue (ft)	65	21	0	32
95th Queue (ft)	157	79	5	69
Link Distance (ft)	393	351	787	742
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	165	114	52	70	167	128	74	43	39	142	160	81
Average Queue (ft)	81	43	6	17	79	61	11	6	9	76	79	40
95th Queue (ft)	136	97	30	52	139	114	43	25	29	126	132	72
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)										0		
Queuing Penalty (veh)										0		

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	23	64	62	60	53
Average Queue (ft)	3	14	33	12	28
95th Queue (ft)	13	48	54	44	46
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 7

MOVEMENT SUMMARY

Site: 101 [2026 Future - AM Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.530	9.9	LOS A	4.1	111.2	0.30	0.14	0.30	24.3
6	T1	403	10.0	443	10.0	0.530	10.3	LOS B	4.1	111.2	0.30	0.14	0.30	23.2
16	R2	75	11.0	82	11.0	0.530	10.3	LOS B	4.1	111.2	0.30	0.14	0.30	22.7
Approach		479	10.1	526	10.1	0.530	10.3	LOS B	4.1	111.2	0.30	0.14	0.30	23.1
North: Falmouth Street														
7	L2	77	21.0	85	21.0	0.219	9.0	LOS A	1.3	37.0	0.67	0.56	0.67	23.3
14	R2	44	9.0	48	9.0	0.219	8.2	LOS A	1.3	37.0	0.67	0.56	0.67	22.3
Approach		121	16.6	133	16.6	0.219	8.7	LOS A	1.3	37.0	0.67	0.56	0.67	22.9
West: E Shirley Avenue														
5u	U	1	0.0	1	0.0	0.127	4.6	LOS A	0.7	19.8	0.34	0.18	0.34	25.3
5	L2	39	19.0	43	19.0	0.127	5.4	LOS A	0.7	19.8	0.34	0.18	0.34	24.6
2	T1	276	9.0	303	9.0	0.127	1.2	LOS A	0.7	19.8	0.08	0.04	0.08	25.5
Approach		316	10.2	347	10.2	0.127	1.8	LOS A	0.7	19.8	0.11	0.06	0.11	25.4
All Vehicles		916	11.0	1007	11.0	0.530	7.1	LOS A	4.1	111.2	0.28	0.17	0.28	23.8

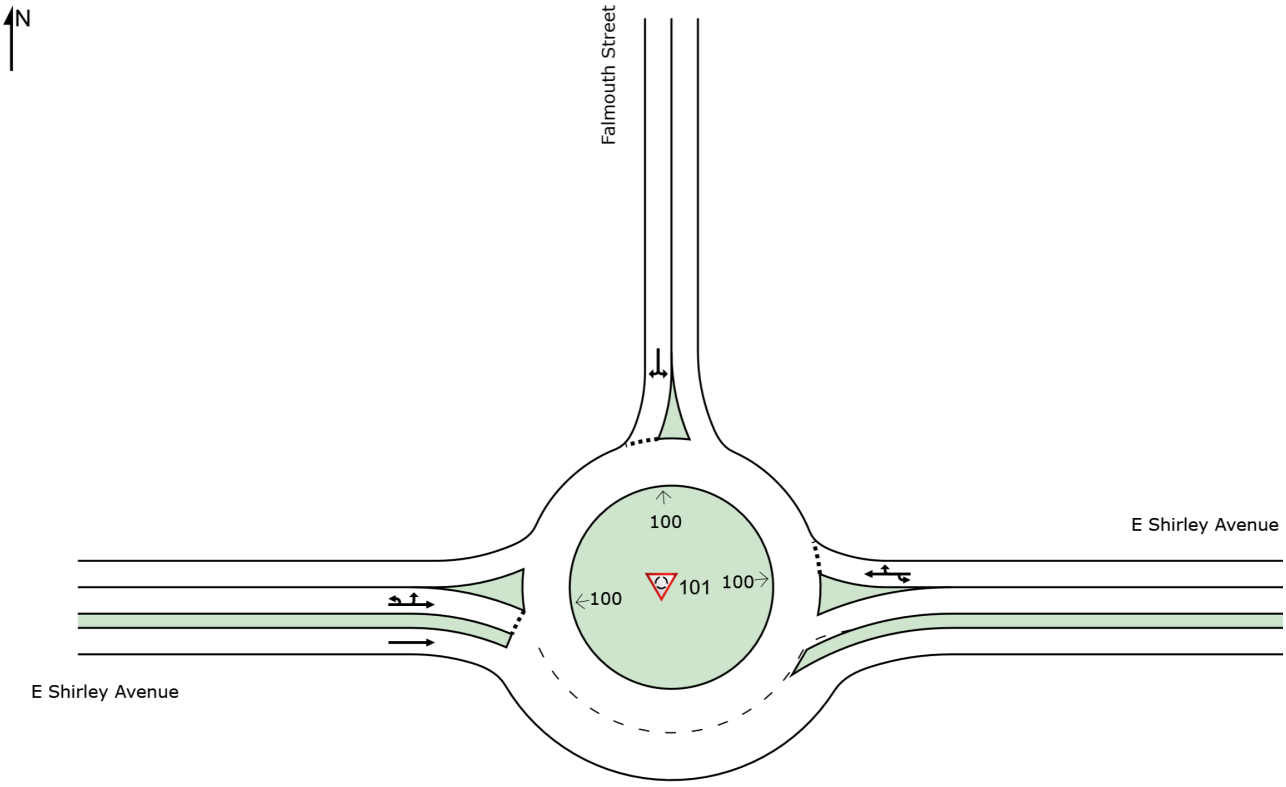
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2026 Future - AM Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:41:56 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Total\Taylor MS 2026 Future.sip9

MOVEMENT SUMMARY

Site: 101 [2026 Future - Commuter Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.640	12.8	LOS B	6.6	187.8	0.28	0.10	0.28	23.5
6	T1	423	21.0	465	21.0	0.640	13.5	LOS B	6.6	187.8	0.28	0.10	0.28	22.5
16	R2	139	4.0	153	4.0	0.640	12.9	LOS B	6.6	187.8	0.28	0.10	0.28	22.0
Approach		563	16.8	619	16.8	0.640	13.3	LOS B	6.6	187.8	0.28	0.10	0.28	22.4
North: Falmouth Street														
7	L2	111	1.0	122	1.0	0.238	8.0	LOS A	1.6	39.8	0.71	0.59	0.71	23.3
14	R2	36	9.0	40	9.0	0.238	8.6	LOS A	1.6	39.8	0.71	0.59	0.71	22.3
Approach		147	3.0	162	3.0	0.238	8.2	LOS A	1.6	39.8	0.71	0.59	0.71	23.0
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.190	5.3	LOS A	1.2	30.3	0.38	0.22	0.38	25.5
5	L2	20	11.0	22	11.0	0.190	5.8	LOS A	1.2	30.3	0.38	0.22	0.38	24.8
2	T1	473	5.0	520	5.0	0.190	1.7	LOS A	1.2	30.3	0.12	0.07	0.12	25.4
Approach		495	5.2	544	5.2	0.190	1.9	LOS A	1.2	30.3	0.13	0.07	0.13	25.4
All Vehicles		1205	10.3	1324	10.3	0.640	8.0	LOS A	6.6	187.8	0.27	0.15	0.27	23.6

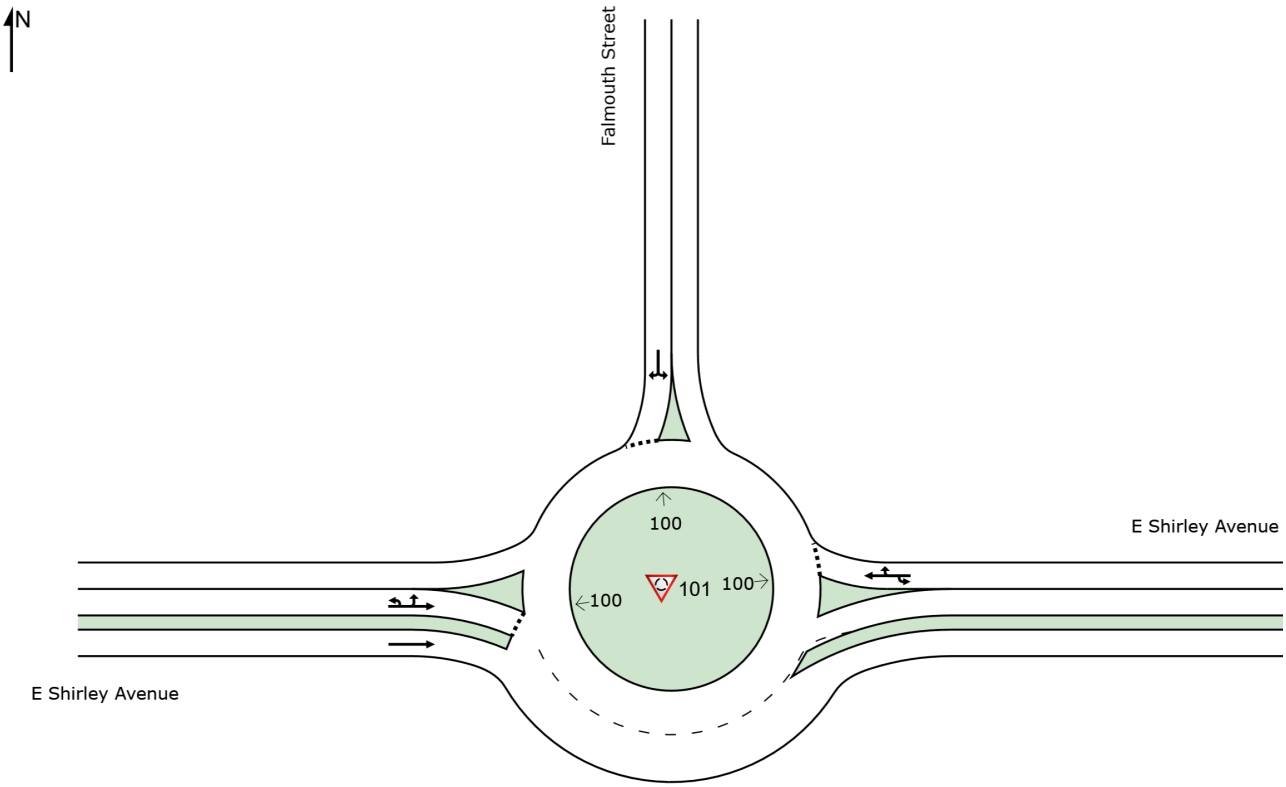
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2026 Future - Commuter Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:43:08 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Total\Taylor MS 2026 Future.sip9

MOVEMENT SUMMARY

Site: 101 [2026 Future - School PM (Site Folder: General)]

School PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	2	0.0	2	0.0	0.520	9.5	LOS A	4.1	106.2	0.27	0.12	0.27	24.5
6	T1	414	4.0	418	4.0	0.520	9.6	LOS A	4.1	106.2	0.27	0.12	0.27	23.4
16	R2	130	6.0	131	6.0	0.520	9.7	LOS A	4.1	106.2	0.27	0.12	0.27	22.8
Approach		546	4.5	552	4.5	0.520	9.6	LOS A	4.1	106.2	0.27	0.12	0.27	23.2
North: Falmouth Street														
7	L2	123	7.0	124	7.0	0.210	7.4	LOS A	1.3	33.5	0.62	0.49	0.62	23.4
14	R2	29	0.0	29	0.0	0.210	7.0	LOS A	1.3	33.5	0.62	0.49	0.62	22.5
Approach		152	5.7	154	5.7	0.210	7.3	LOS A	1.3	33.5	0.62	0.49	0.62	23.2
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.187	5.4	LOS A	1.1	29.7	0.39	0.23	0.39	25.3
5	L2	34	23.0	34	23.0	0.187	6.4	LOS A	1.1	29.7	0.39	0.23	0.39	24.6
2	T1	484	5.0	489	5.0	0.187	1.6	LOS A	1.1	29.7	0.11	0.07	0.11	25.4
Approach		520	6.2	525	6.2	0.187	1.9	LOS A	1.1	29.7	0.13	0.08	0.13	25.4
All Vehicles		1218	5.3	1230	5.3	0.520	6.0	LOS A	4.1	106.2	0.25	0.15	0.25	24.1

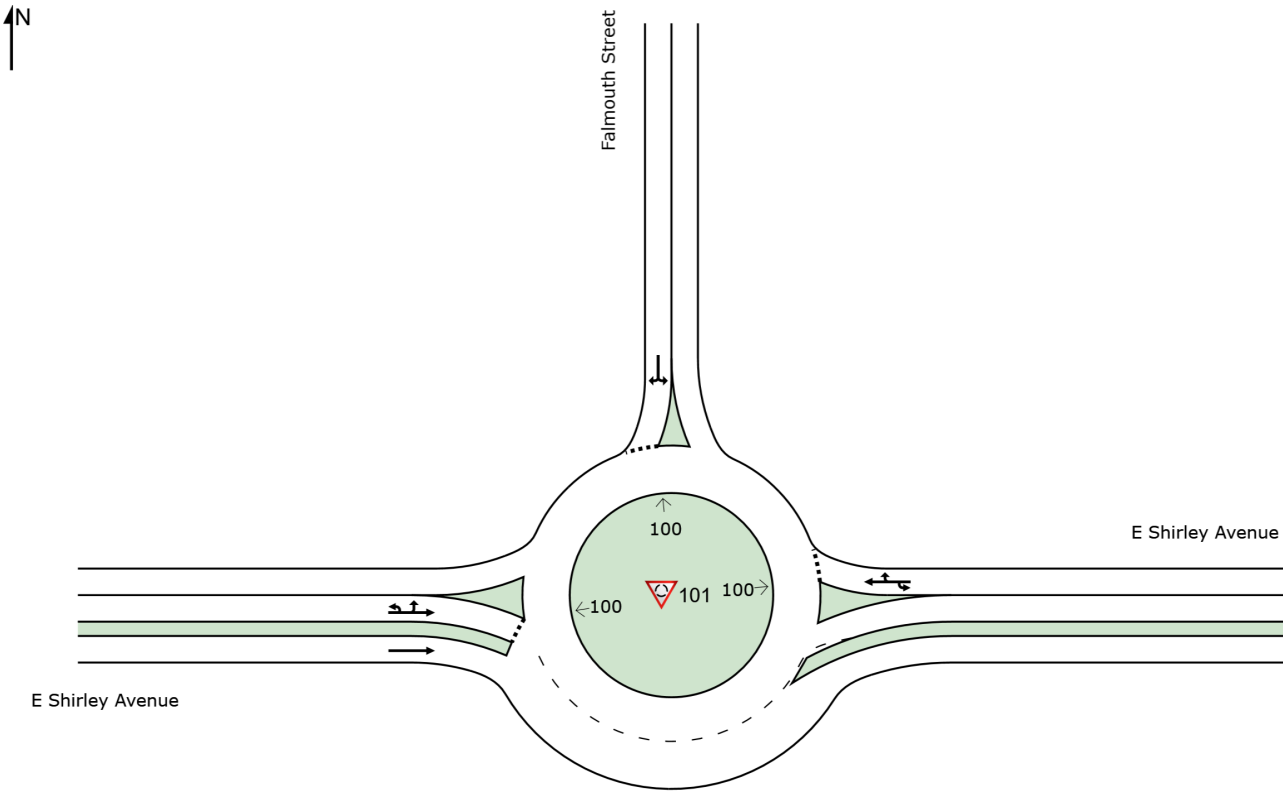
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2026 Future - School PM (Site Folder: General)]

School PM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:43:56 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Total\Taylor MS 2026 Future.sip9

Appendix G
2032 Background Analysis Worksheets

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	51	0	49	41	96	0	0	37	14	0	0
Future Vol, veh/h	0	51	0	49	41	96	0	0	37	14	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
Heavy Vehicles, %	0	0	0	24	0	7	0	0	65	8	0	0
Mvmt Flow	0	55	0	53	45	104	0	0	40	15	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

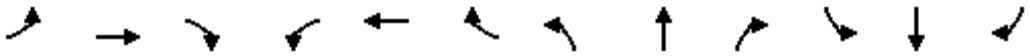
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.6	8	7.1	8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	54%	0%	100%
Vol Thru, %	0%	100%	46%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	37	51	90	96	14
LT Vol	0	0	49	0	14
Through Vol	0	51	41	0	0
RT Vol	37	0	0	96	0
Lane Flow Rate	40	55	98	104	15
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.044	0.065	0.144	0.114	0.021
Departure Headway (Hd)	3.9	4.243	5.307	3.925	4.862
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	923	832	675	910	740
Service Time	1.901	2.333	3.047	1.664	2.864
HCM Lane V/C Ratio	0.043	0.066	0.145	0.114	0.02
HCM Control Delay	7.1	7.6	8.9	7.2	8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.5	0.4	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	34	391	78	34	553	249	17	60
v/c Ratio	0.21	0.56	0.11	0.23	0.69	0.75	0.09	0.31
Control Delay	46.8	26.8	0.3	47.5	28.8	50.5	42.4	33.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	26.8	0.3	47.5	28.8	50.5	42.4	33.3
Queue Length 50th (ft)	21	187	0	21	302	142	10	22
Queue Length 95th (ft)	53	296	0	53	#507	#264	31	62
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	163	789	771	149	809	379	376	377
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	0.21	0.50	0.10	0.23	0.68	0.66	0.05	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	360	72	31	485	24	85	89	55	16	34	21
Future Volume (vph)	31	360	72	31	485	24	85	89	55	16	34	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99			0.97		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1823	1761	1539	1667	1721			1736		1769	1691	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1823	1761	1539	1667	1721			1736		1769	1691	
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)	34	391	78	34	527	26	92	97	60	17	37	23
RTOR Reduction (vph)	0	0	46	0	2	0	0	11	0	0	21	0
Lane Group Flow (vph)	34	391	32	34	551	0	0	238	0	17	39	0
Heavy Vehicles (%)	0%	9%	6%	11%	13%	0%	6%	2%	4%	0%	3%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	4.3	39.0	39.0	8.2	42.9			17.0		7.2	7.2	
Effective Green, g (s)	4.3	39.0	39.0	8.2	42.9			17.0		7.2	7.2	
Actuated g/C Ratio	0.05	0.41	0.41	0.09	0.45			0.18		0.08	0.08	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	82	719	629	143	773			309		133	127	
v/s Ratio Prot	0.02	0.22		c0.02	c0.32			c0.14		0.01	c0.02	
v/s Ratio Perm			0.02									
v/c Ratio	0.41	0.54	0.05	0.24	0.71			0.77		0.13	0.31	
Uniform Delay, d1	44.3	21.4	17.0	40.7	21.3			37.3		41.2	41.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	4.6	1.1	0.0	1.2	3.4			11.9		0.6	1.9	
Delay (s)	48.9	22.5	17.1	41.9	24.6			49.3		41.8	43.6	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		23.4			25.6			49.3			43.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	95.4	Sum of lost time (s)	24.0
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	348	37	48	531	0	0
Future Volume (Veh/h)	348	37	48	531	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	378	74	96	577	0	0
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			452		1147	378
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			452		1147	378
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			91		100	100
cM capacity (veh/h)			1053		202	673

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	378	74	96	577
Volume Left	0	0	96	0
Volume Right	0	74	0	0
cSH	1700	1700	1053	1700
Volume to Capacity	0.22	0.04	0.09	0.34
Queue Length 95th (ft)	0	0	8	0
Control Delay (s)	0.0	0.0	8.8	0.0
Lane LOS			A	
Approach Delay (s)	0.0		1.2	
Approach LOS				

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	338	0	0	542	41	51
Future Volume (Veh/h)	338	0	0	542	41	51
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	367	0	0	589	82	102
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			367		956	367
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			367		956	367
tC, single (s)			4.1		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.4
p0 queue free %			100		70	84
cM capacity (veh/h)			1203		269	648

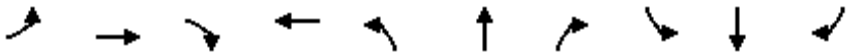
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	367	589	82	102
Volume Left	0	0	82	0
Volume Right	0	0	0	102
cSH	1700	1700	269	648
Volume to Capacity	0.22	0.35	0.30	0.16
Queue Length 95th (ft)	0	0	31	14
Control Delay (s)	0.0	0.0	24.1	11.6
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	17.2	
Approach LOS			C	

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	377	17	24	540	0	0
Future Volume (Veh/h)	377	17	24	540	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.95	0.50	0.50	0.95	0.95	0.95
Hourly flow rate (vph)	397	34	48	568	0	0
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		1061	397
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			431		1061	397
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	100
cM capacity (veh/h)			1139		240	657

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	397	34	48	568
Volume Left	0	0	48	0
Volume Right	0	34	0	0
cSH	1700	1700	1139	1700
Volume to Capacity	0.23	0.02	0.04	0.33
Queue Length 95th (ft)	0	0	3	0
Control Delay (s)	0.0	0.0	8.3	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.6	
Approach LOS				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	31.8%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	85	86	84	6	205	514	11	11	204	184
v/c Ratio	0.46	0.47	0.07	0.02	0.47	0.37	0.01	0.03	0.38	0.30
Control Delay	38.8	39.0	0.1	0.2	17.9	18.2	0.0	12.7	30.5	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	39.0	0.1	0.2	17.9	18.2	0.0	12.7	30.5	2.8
Queue Length 50th (ft)	37	37	0	0	57	77	0	3	43	0
Queue Length 95th (ft)	88	88	0	0	110	172	0	12	82	20
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	263	263	1291	336	515	1402	825	374	859	687
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.33	0.07	0.02	0.40	0.37	0.01	0.03	0.24	0.27

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	157	0	77	2	0	4	189	473	10	2	8	188
Future Volume (vph)	157	0	77	2	0	4	189	473	10	2	8	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.91		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1316	1316	1291		1015		1674	3409	1647		1430	3103
Flt Permitted	0.95	0.95	1.00		0.98		0.62	1.00	1.00		0.46	1.00
Satd. Flow (perm)	1316	1316	1291		1015		1099	3409	1647		688	3103
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)	171	0	84	2	0	4	205	514	11	2	9	204
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	7	0	0	0
Lane Group Flow (vph)	85	86	84	0	1	0	205	514	4	0	11	204
Heavy Vehicles (%)	27%	0%	22%	50%	0%	75%	10%	8%	0%	0%	29%	14%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	10.3	10.3	80.8		7.0		31.0	29.8	29.8		31.0	19.9
Effective Green, g (s)	10.3	10.3	80.8		7.0		31.0	29.8	29.8		31.0	19.9
Actuated g/C Ratio	0.13	0.13	1.00		0.09		0.38	0.37	0.37		0.38	0.25
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	167	167	1291		87		500	1257	607		274	764
v/s Ratio Prot	0.06	c0.07			0.00		c0.06	c0.15			0.00	0.07
v/s Ratio Perm			c0.07				0.10		0.00		0.01	
v/c Ratio	0.51	0.51	0.07		0.01		0.41	0.41	0.01		0.04	0.27
Uniform Delay, d1	32.9	32.9	0.0		33.7		17.5	19.0	16.1		15.5	24.6
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.4	2.7	0.1		0.0		0.5	0.2	0.0		0.1	0.2
Delay (s)	35.3	35.6	0.1		33.7		18.0	19.2	16.1		15.5	24.8
Level of Service	D	D	A		C		B	B	B		B	C
Approach Delay (s)		23.8			33.7			18.8				20.8
Approach LOS		C			C			B				C

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	80.8	Sum of lost time (s)	32.5
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	169
Future Volume (vph)	169
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1426
Flt Permitted	1.00
Satd. Flow (perm)	1426
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	184
RTOR Reduction (vph)	115
Lane Group Flow (vph)	69
Heavy Vehicles (%)	11%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	30.2
Effective Green, g (s)	30.2
Actuated g/C Ratio	0.37
Clearance Time (s)	6.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	532
v/s Ratio Prot	0.02
v/s Ratio Perm	0.03
v/c Ratio	0.13
Uniform Delay, d1	16.6
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	16.8
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	172	326	58	178	434	230	56	109
Average Queue (ft)	29	155	21	35	196	114	14	39
95th Queue (ft)	86	271	48	112	359	199	42	81
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	3		0	10			0
Queuing Penalty (veh)	0	1		0	3			0

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement	EB	EB	WB
Directions Served	T	R	L
Maximum Queue (ft)	8	13	65
Average Queue (ft)	0	0	16
95th Queue (ft)	5	7	50
Link Distance (ft)	3093		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		125	255
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	96	73
Average Queue (ft)	30	31
95th Queue (ft)	73	65
Link Distance (ft)	382	382
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	EB	WB
Directions Served	R	L
Maximum Queue (ft)	6	35
Average Queue (ft)	0	7
95th Queue (ft)	6	30
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	140	160
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	B17	SB
Directions Served	ULT	TR	T	L>
Maximum Queue (ft)	197	199	9	94
Average Queue (ft)	41	45	0	35
95th Queue (ft)	122	137	9	77
Link Distance (ft)	393	351	787	742
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	156	110	11	53	176	219	164	20	45	115	115	116
Average Queue (ft)	71	28	0	6	81	120	50	3	6	57	51	50
95th Queue (ft)	131	79	7	31	145	196	135	13	27	97	99	90
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)							0			0		
Queuing Penalty (veh)							0			0		

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	23	69	68	85	54
Average Queue (ft)	7	40	36	35	12
95th Queue (ft)	16	63	58	77	39
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 4

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	58	0	15	66	19	0	0	30	22	0	0
Future Vol, veh/h	0	58	0	15	66	19	0	0	30	22	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
Heavy Vehicles, %	0	0	0	57	0	18	0	0	7	0	0	0
Mvmt Flow	0	63	0	16	72	21	0	0	33	24	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.6	8.9	6.9	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	19%	0%	100%
Vol Thru, %	0%	100%	81%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	58	81	19	22
LT Vol	0	0	15	0	22
Through Vol	0	58	66	0	0
RT Vol	30	0	0	19	0
Lane Flow Rate	33	63	88	21	24
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.034	0.073	0.139	0.023	0.03
Departure Headway (Hd)	3.767	4.178	5.693	3.929	4.573
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	956	846	630	908	787
Service Time	1.768	2.261	3.432	1.667	2.574
HCM Lane V/C Ratio	0.035	0.074	0.14	0.023	0.03
HCM Control Delay	6.9	7.6	9.4	6.8	7.7
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.5	0.1	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	43	607	165	36	578	202	39	156
v/c Ratio	0.29	0.87	0.24	0.25	0.70	0.70	0.15	0.60
Control Delay	52.5	45.1	5.6	51.4	31.9	52.9	40.5	48.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	45.1	5.6	51.4	31.9	52.9	40.5	48.9
Queue Length 50th (ft)	28	364	5	23	337	122	23	93
Queue Length 95th (ft)	67	#613	49	58	#561	209	55	163
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	147	755	733	145	826	348	340	350
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	0.29	0.80	0.23	0.25	0.70	0.58	0.11	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	571	155	34	540	4	90	69	31	37	119	27
Future Volume (vph)	40	571	155	34	540	4	90	69	31	37	119	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1823	1863	1584	1796	1889			1774		1769	1781	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1823	1863	1584	1796	1889			1774		1769	1781	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	43	607	165	36	574	4	96	73	33	39	127	29
RTOR Reduction (vph)	0	0	94	0	0	0	0	7	0	0	8	0
Lane Group Flow (vph)	43	607	71	36	578	0	0	195	0	39	148	0
Heavy Vehicles (%)	0%	3%	3%	3%	3%	0%	2%	2%	4%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	4.5	40.1	40.1	8.1	43.7			15.9		14.2	14.2	
Effective Green, g (s)	4.5	40.1	40.1	8.1	43.7			15.9		14.2	14.2	
Actuated g/C Ratio	0.04	0.39	0.39	0.08	0.43			0.16		0.14	0.14	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	80	730	620	142	806			275		245	247	
v/s Ratio Prot	c0.02	c0.33		0.02	c0.31			c0.11		0.02	c0.08	
v/s Ratio Perm			0.05									
v/c Ratio	0.54	0.83	0.12	0.25	0.72			0.71		0.16	0.60	
Uniform Delay, d1	47.9	28.1	19.8	44.3	24.2			41.0		38.8	41.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	8.6	8.4	0.1	1.3	3.3			8.7		0.4	4.7	
Delay (s)	56.5	36.4	19.9	45.5	27.5			49.7		39.2	46.1	
Level of Service	E	D	B	D	C			D		D	D	
Approach Delay (s)		34.1			28.5			49.7			44.7	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	102.3	Sum of lost time (s)	24.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	604	4	6	544	0	0
Future Volume (Veh/h)	604	4	6	544	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	657	8	12	591	0	0
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			665		1272	657
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			665		1272	657
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			934		184	468

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	657	8	12	591
Volume Left	0	0	12	0
Volume Right	0	8	0	0
cSH	1700	1700	934	1700
Volume to Capacity	0.39	0.00	0.01	0.35
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.0	0.0	8.9	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.2	
Approach LOS				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	606	0	0	531	15	3
Future Volume (Veh/h)	606	0	0	531	15	3
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	659	0	0	577	30	6
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			659		1236	659
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			659		1236	659
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		85	99
cM capacity (veh/h)			939		197	467

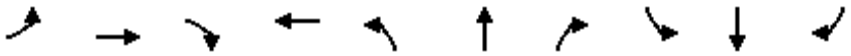
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	659	577	30	6
Volume Left	0	0	30	0
Volume Right	0	0	0	6
cSH	1700	1700	197	467
Volume to Capacity	0.39	0.34	0.15	0.01
Queue Length 95th (ft)	0	0	13	1
Control Delay (s)	0.0	0.0	26.6	12.8
Lane LOS			D	B
Approach Delay (s)	0.0	0.0	24.3	
Approach LOS			C	

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	594	13	22	534	0	0
Future Volume (Veh/h)	594	13	22	534	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	646	26	44	580	0	0
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			672		1314	646
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			672		1314	646
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			95		100	100
cM capacity (veh/h)			887		168	475

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	646	26	44	580
Volume Left	0	0	44	0
Volume Right	0	26	0	0
cSH	1700	1700	887	1700
Volume to Capacity	0.38	0.02	0.05	0.34
Queue Length 95th (ft)	0	0	4	0
Control Delay (s)	0.0	0.0	9.3	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.7	
Approach LOS				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	162	163	229	18	216	325	1	18	461	152
v/c Ratio	0.61	0.62	0.15	0.05	0.53	0.24	0.00	0.05	0.67	0.23
Control Delay	43.0	43.2	0.2	0.2	19.8	19.9	0.0	13.5	35.2	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	43.2	0.2	0.2	19.8	19.9	0.0	13.5	35.2	1.7
Queue Length 50th (ft)	82	83	0	0	66	50	0	5	114	0
Queue Length 95th (ft)	154	155	0	0	119	111	0	17	174	12
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	349	349	1529	360	454	1359	471	372	873	740
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.47	0.15	0.05	0.48	0.24	0.00	0.05	0.53	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	309	0	218	5	0	12	205	309	1	10	7	438
Future Volume (vph)	309	0	218	5	0	12	205	309	1	10	7	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.90		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.99		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1655	1655	1529		1502		1721	3541	824		1337	3369
Flt Permitted	0.95	0.95	1.00		0.99		0.46	1.00	1.00		0.56	1.00
Satd. Flow (perm)	1655	1655	1529		1502		834	3541	824		782	3369
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)	325	0	229	5	0	13	216	325	1	11	7	461
RTOR Reduction (vph)	0	0	0	0	17	0	0	0	1	0	0	0
Lane Group Flow (vph)	162	163	229	0	1	0	216	325	0	0	18	461
Heavy Vehicles (%)	1%	0%	3%	20%	0%	9%	7%	4%	100%	0%	83%	5%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	12.9	12.9	85.8		7.1		33.3	30.8	30.8		33.3	22.2
Effective Green, g (s)	12.9	12.9	85.8		7.1		33.3	30.8	30.8		33.3	22.2
Actuated g/C Ratio	0.15	0.15	1.00		0.08		0.39	0.36	0.36		0.39	0.26
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	248	248	1529		124		438	1271	295		319	871
v/s Ratio Prot	0.10	c0.10			0.00		c0.06	c0.09			0.00	c0.14
v/s Ratio Perm			c0.15				0.13		0.00		0.02	
v/c Ratio	0.65	0.66	0.15		0.01		0.49	0.26	0.00		0.06	0.53
Uniform Delay, d1	34.3	34.4	0.0		36.1		18.4	19.4	17.6		16.3	27.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	6.1	6.2	0.2		0.0		0.9	0.1	0.0		0.1	0.6
Delay (s)	40.4	40.5	0.2		36.2		19.3	19.5	17.6		16.4	27.9
Level of Service	D	D	A		D		B	B	B		B	C
Approach Delay (s)		23.8			36.2			19.4				24.6
Approach LOS		C			D			B				C

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	85.8	Sum of lost time (s)	32.5
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	144
Future Volume (vph)	144
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1439
Flt Permitted	1.00
Satd. Flow (perm)	1439
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	152
RTOR Reduction (vph)	90
Lane Group Flow (vph)	62
Heavy Vehicles (%)	10%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	35.1
Effective Green, g (s)	35.1
Actuated g/C Ratio	0.41
Clearance Time (s)	6.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	588
v/s Ratio Prot	0.02
v/s Ratio Perm	0.03
v/c Ratio	0.11
Uniform Delay, d1	15.7
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	15.7
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	214	504	80	184	417	210	116	186
Average Queue (ft)	56	269	38	43	231	103	32	87
95th Queue (ft)	159	438	66	128	374	184	86	156
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	17		0	15		0	3
Queuing Penalty (veh)	0	7		0	5		0	1

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement	EB	WB
Directions Served	R	L
Maximum Queue (ft)	2	21
Average Queue (ft)	0	2
95th Queue (ft)	2	15
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	255
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	46	32
Average Queue (ft)	11	3
95th Queue (ft)	37	19
Link Distance (ft)	382	382
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	WB
Directions Served	L
Maximum Queue (ft)	54
Average Queue (ft)	8
95th Queue (ft)	33
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	160
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	B17	SB
Directions Served	ULT	TR	T	L>
Maximum Queue (ft)	249	172	8	89
Average Queue (ft)	101	29	0	38
95th Queue (ft)	214	111	6	75
Link Distance (ft)	393	351	787	742
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	188	144	60	56	193	160	131	17	107	197	205	112
Average Queue (ft)	97	52	8	12	92	85	23	1	15	111	114	44
95th Queue (ft)	155	114	35	38	162	144	78	11	65	175	181	85
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)							0		0	1	0	0
Queuing Penalty (veh)							0		0	0	0	0

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	24	79	59	58	33
Average Queue (ft)	7	37	16	20	14
95th Queue (ft)	15	66	46	47	38
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 14

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	40	0	12	37	51	0	0	13	5	0	0
Future Vol, veh/h	0	40	0	12	37	51	0	0	13	5	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
Heavy Vehicles, %	0	13	0	55	2	7	0	0	35	0	0	0
Mvmt Flow	0	43	0	13	40	55	0	0	14	5	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

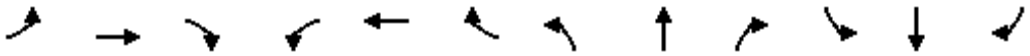
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.6	7.8	6.7	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	24%	0%	100%
Vol Thru, %	0%	100%	76%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	13	40	49	51	5
LT Vol	0	0	12	0	5
Through Vol	0	40	37	0	0
RT Vol	13	0	0	51	0
Lane Flow Rate	14	43	53	55	5
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.014	0.052	0.083	0.06	0.007
Departure Headway (Hd)	3.668	4.334	5.615	3.89	4.477
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	982	823	640	923	804
Service Time	1.668	2.377	3.328	1.604	2.477
HCM Lane V/C Ratio	0.014	0.052	0.083	0.06	0.006
HCM Control Delay	6.7	7.6	8.8	6.9	7.5
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0	0.2	0.3	0.2	0

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	42	615	107	42	610	215	29	96
v/c Ratio	0.30	0.84	0.15	0.28	0.71	0.71	0.15	0.44
Control Delay	51.1	39.4	1.9	50.3	30.5	50.9	42.5	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.1	39.4	1.9	50.3	30.5	50.9	42.5	40.0
Queue Length 50th (ft)	26	356	0	26	352	126	17	45
Queue Length 95th (ft)	64	#601	15	64	#597	#228	45	97
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	142	796	754	151	860	360	338	373
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	0.77	0.14	0.28	0.71	0.60	0.09	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	566	98	39	547	14	83	82	33	27	57	31
Future Volume (vph)	39	566	98	39	547	14	83	82	33	27	57	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1642	1828	1539	1745	1816			1713		1638	1719	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1642	1828	1539	1745	1816			1713		1638	1719	
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)	42	615	107	42	595	15	90	89	36	29	62	34
RTOR Reduction (vph)	0	0	62	0	1	0	0	7	0	0	20	0
Lane Group Flow (vph)	42	615	45	42	609	0	0	208	0	29	76	0
Heavy Vehicles (%)	11%	5%	6%	6%	7%	0%	8%	4%	7%	8%	4%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	4.4	41.0	41.0	8.2	44.8			16.5		8.8	8.8	
Effective Green, g (s)	4.4	41.0	41.0	8.2	44.8			16.5		8.8	8.8	
Actuated g/C Ratio	0.04	0.42	0.42	0.08	0.45			0.17		0.09	0.09	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	73	760	640	145	825			286		146	153	
v/s Ratio Prot	c0.03	c0.34		0.02	c0.34			c0.12		0.02	c0.04	
v/s Ratio Perm			0.03									
v/c Ratio	0.58	0.81	0.07	0.29	0.74			0.73		0.20	0.50	
Uniform Delay, d1	46.1	25.3	17.3	42.4	22.0			38.9		41.6	42.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	12.5	6.7	0.1	1.5	3.7			9.5		0.9	3.4	
Delay (s)	58.6	32.0	17.3	43.9	25.8			48.4		42.5	46.2	
Level of Service	E	C	B	D	C			D		D	D	
Approach Delay (s)		31.4			26.9			48.4			45.3	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	98.5	Sum of lost time (s)	24.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	556	20	9	536	0	0
Future Volume (Veh/h)	556	20	9	536	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.93	0.50	0.50	0.93	0.93	0.93
Hourly flow rate (vph)	598	40	18	576	0	0
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			638		1210	598
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			638		1210	598
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	100
cM capacity (veh/h)			956		200	506

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	598	40	18	576
Volume Left	0	0	18	0
Volume Right	0	40	0	0
cSH	1700	1700	956	1700
Volume to Capacity	0.35	0.02	0.02	0.34
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.0	0.0	8.8	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.3	
Approach LOS				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	560	0	0	508	38	53
Future Volume (Veh/h)	560	0	0	508	38	53
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	609	0	0	552	76	106
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			609		1161	609
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			609		1161	609
tC, single (s)			4.1		6.5	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.5
p0 queue free %			100		63	77
cM capacity (veh/h)			979		206	469

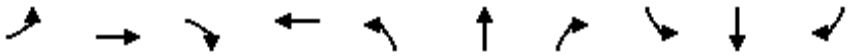
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	609	552	76	106
Volume Left	0	0	76	0
Volume Right	0	0	0	106
cSH	1700	1700	206	469
Volume to Capacity	0.36	0.32	0.37	0.23
Queue Length 95th (ft)	0	0	40	22
Control Delay (s)	0.0	0.0	32.4	14.9
Lane LOS			D	B
Approach Delay (s)	0.0	0.0	22.2	
Approach LOS			C	

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	597	16	15	511	0	0
Future Volume (Veh/h)	597	16	15	511	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	649	32	30	555	0	0
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			681		1264	649
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			681		1264	649
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	100
cM capacity (veh/h)			921		183	474

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	649	32	30	555
Volume Left	0	0	30	0
Volume Right	0	32	0	0
cSH	1700	1700	921	1700
Volume to Capacity	0.38	0.02	0.03	0.33
Queue Length 95th (ft)	0	0	3	0
Control Delay (s)	0.0	0.0	9.0	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.5	
Approach LOS				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	160	163	201	22	185	281	12	20	399	177
v/c Ratio	0.59	0.60	0.14	0.17	0.46	0.22	0.02	0.04	0.61	0.25
Control Delay	40.6	40.9	0.2	28.1	18.8	20.5	0.1	13.8	33.7	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.6	40.9	0.2	28.1	18.8	20.5	0.1	13.8	33.7	2.1
Queue Length 50th (ft)	76	77	0	5	54	42	0	5	94	0
Queue Length 95th (ft)	151	153	0	29	105	99	0	19	150	16
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	378	380	1485	134	441	1292	608	468	902	786
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.43	0.14	0.16	0.42	0.22	0.02	0.04	0.44	0.23

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	311	2	195	7	3	12	179	273	12	12	8	387
Future Volume (vph)	311	2	195	7	3	12	179	273	12	12	8	387
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.93		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1655	1661	1485		1329		1737	3474	1211		1675	3276
Flt Permitted	0.95	0.95	1.00		0.98		0.52	1.00	1.00		0.58	1.00
Satd. Flow (perm)	1655	1661	1485		1329		945	3474	1211		1021	3276
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	321	2	201	7	3	12	185	281	12	12	8	399
RTOR Reduction (vph)	0	0	0	0	11	0	0	0	8	0	0	0
Lane Group Flow (vph)	160	163	201	0	11	0	185	281	4	0	20	399
Heavy Vehicles (%)	1%	0%	6%	33%	33%	27%	6%	6%	36%	0%	14%	8%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	12.8	12.8	83.5		7.1		31.1	28.6	28.6		31.1	21.2
Effective Green, g (s)	12.8	12.8	83.5		7.1		31.1	28.6	28.6		31.1	21.2
Actuated g/C Ratio	0.15	0.15	1.00		0.09		0.37	0.34	0.34		0.37	0.25
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	253	254	1485		113		445	1189	414		399	831
v/s Ratio Prot	0.10	c0.10			0.01		c0.05	c0.08			0.00	c0.12
v/s Ratio Perm			c0.14				0.11		0.00		0.02	
v/c Ratio	0.63	0.64	0.14		0.10		0.42	0.24	0.01		0.05	0.48
Uniform Delay, d1	33.1	33.2	0.0		35.2		18.4	19.6	18.1		16.6	26.5
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	5.1	5.5	0.2		0.4		0.6	0.1	0.0		0.1	0.4
Delay (s)	38.2	38.6	0.2		35.6		19.0	19.7	18.1		16.7	26.9
Level of Service	D	D	A		D		B	B	B		B	C
Approach Delay (s)		23.8			35.6			19.4				23.2
Approach LOS		C			D			B				C

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	83.5	Sum of lost time (s)	32.5
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	172
Future Volume (vph)	172
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1507
Flt Permitted	1.00
Satd. Flow (perm)	1507
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	177
RTOR Reduction (vph)	105
Lane Group Flow (vph)	72
Heavy Vehicles (%)	5%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	34.0
Effective Green, g (s)	34.0
Actuated g/C Ratio	0.41
Clearance Time (s)	6.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	613
v/s Ratio Prot	0.02
v/s Ratio Perm	0.03
v/c Ratio	0.12
Uniform Delay, d1	15.4
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	15.5
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	204	486	76	184	479	235	87	144
Average Queue (ft)	51	260	31	45	228	113	24	53
95th Queue (ft)	146	431	60	132	402	199	61	103
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	14		0	14		0	1
Queuing Penalty (veh)	0	6		0	6		0	0

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement	WB
Directions Served	L
Maximum Queue (ft)	34
Average Queue (ft)	3
95th Queue (ft)	18
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	255
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement	EB	NB	NB
Directions Served	T	L	R
Maximum Queue (ft)	5	77	102
Average Queue (ft)	0	25	34
95th Queue (ft)	4	62	78
Link Distance (ft)	505	382	382
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	WB
Directions Served	L
Maximum Queue (ft)	40
Average Queue (ft)	8
95th Queue (ft)	30
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	160
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	B17	B17	SB
Directions Served	ULT	UTR	T		L>
Maximum Queue (ft)	288	189	7	5	102
Average Queue (ft)	105	33	0	0	35
95th Queue (ft)	234	120	5	5	78
Link Distance (ft)	393	351	787	787	742
Upstream Blk Time (%)	0				
Queuing Penalty (veh)	0				
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	178	130	77	70	176	159	128	43	68	182	186	96
Average Queue (ft)	95	53	7	17	83	76	21	6	12	96	99	44
95th Queue (ft)	150	111	40	50	149	137	73	25	44	153	156	80
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)							0		0	0		
Queuing Penalty (veh)							0		0	0		

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	47	72	58	60	31
Average Queue (ft)	10	32	26	13	5
95th Queue (ft)	31	62	51	45	22
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 12

MOVEMENT SUMMARY

Site: 101 [2032 Background - AM Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.689	14.3	LOS B	7.7	209.4	0.39	0.18	0.39	23.2
6	T1	527	10.0	579	10.0	0.689	14.6	LOS B	7.7	209.4	0.39	0.18	0.39	22.2
16	R2	100	11.0	110	11.0	0.689	14.6	LOS B	7.7	209.4	0.39	0.18	0.39	21.7
Approach		628	10.1	690	10.1	0.689	14.6	LOS B	7.7	209.4	0.39	0.18	0.39	22.2
North: Falmouth Street														
7	L2	90	21.0	99	21.0	0.271	11.3	LOS B	1.7	49.2	0.77	0.70	0.77	22.7
14	R2	37	9.0	41	9.0	0.271	10.3	LOS B	1.7	49.2	0.77	0.70	0.77	21.8
Approach		127	17.5	140	17.5	0.271	11.0	LOS B	1.7	49.2	0.77	0.70	0.77	22.4
West: E Shirley Avenue														
5u	U	1	0.0	1	0.0	0.155	5.0	LOS A	0.9	25.1	0.38	0.21	0.38	25.3
5	L2	34	19.0	37	19.0	0.155	5.8	LOS A	0.9	25.1	0.38	0.21	0.38	24.6
2	T1	350	9.0	385	9.0	0.155	1.4	LOS A	0.9	25.1	0.10	0.06	0.10	25.5
Approach		385	9.9	423	9.9	0.155	1.9	LOS A	0.9	25.1	0.13	0.07	0.13	25.4
All Vehicles		1140	10.9	1253	10.9	0.689	9.9	LOS A	7.7	209.4	0.34	0.20	0.34	23.2

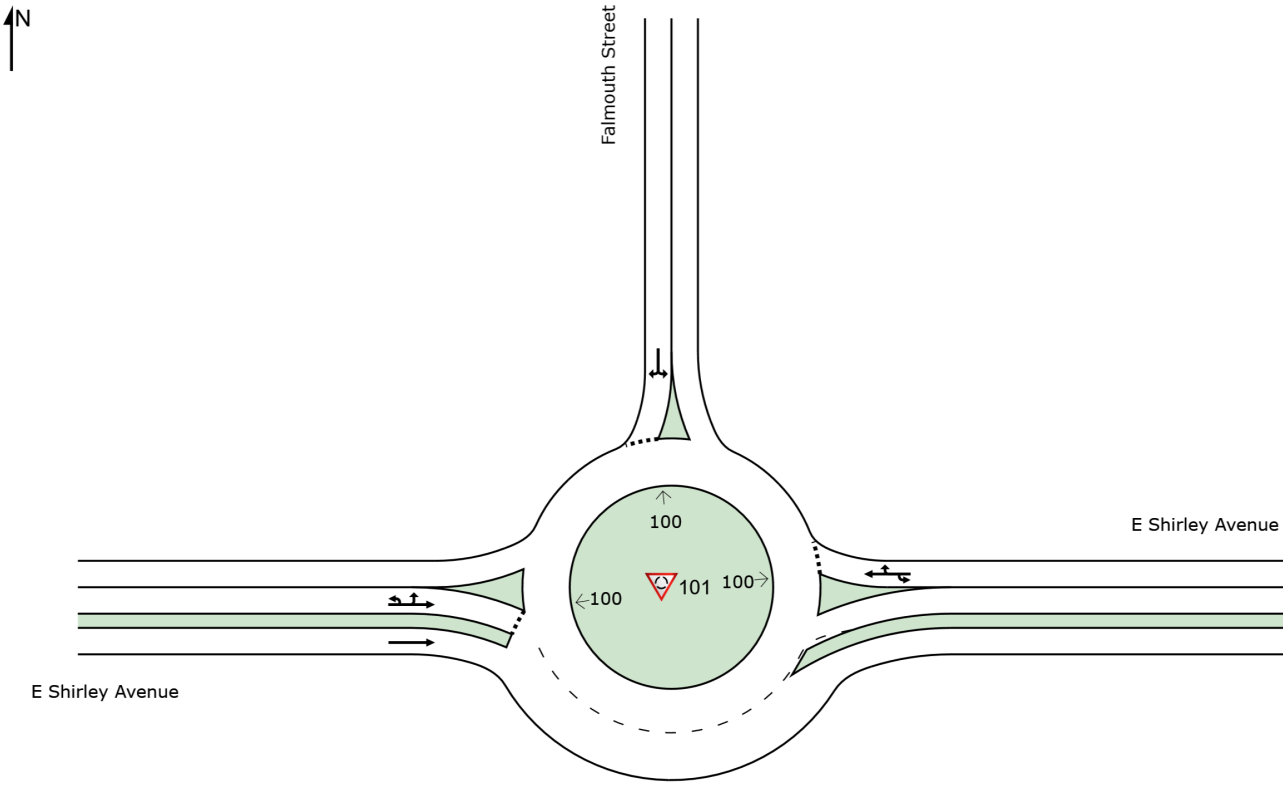
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2032 Background - AM Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:36:51 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Background\Taylor MS 2032 Background.sip9

MOVEMENT SUMMARY

Site: 101 [2032 Background - Commuter Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.765	18.0	LOS B	11.6	329.9	0.39	0.15	0.39	22.3
6	T1	505	21.0	555	21.0	0.765	18.7	LOS B	11.6	329.9	0.39	0.15	0.39	21.4
16	R2	166	4.0	182	4.0	0.765	18.1	LOS B	11.6	329.9	0.39	0.15	0.39	20.9
Approach		672	16.8	738	16.8	0.765	18.6	LOS B	11.6	329.9	0.39	0.15	0.39	21.3
North: Falmouth Street														
7	L2	145	1.0	159	1.0	0.329	10.4	LOS B	2.3	59.6	0.81	0.73	0.81	22.7
14	R2	35	9.0	38	9.0	0.329	11.1	LOS B	2.3	59.6	0.81	0.73	0.81	21.8
Approach		180	2.6	198	2.6	0.329	10.6	LOS B	2.3	59.6	0.81	0.73	0.81	22.5
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.239	6.2	LOS A	1.5	39.9	0.46	0.30	0.46	25.3
5	L2	20	11.0	22	11.0	0.239	6.7	LOS A	1.5	39.9	0.46	0.30	0.46	24.6
2	T1	586	5.0	644	5.0	0.239	1.9	LOS A	1.5	39.9	0.14	0.09	0.14	25.4
Approach		608	5.2	668	5.2	0.239	2.2	LOS A	1.5	39.9	0.15	0.10	0.15	25.3
All Vehicles		1460	10.2	1604	10.2	0.765	10.7	LOS B	11.6	329.9	0.34	0.20	0.34	23.0

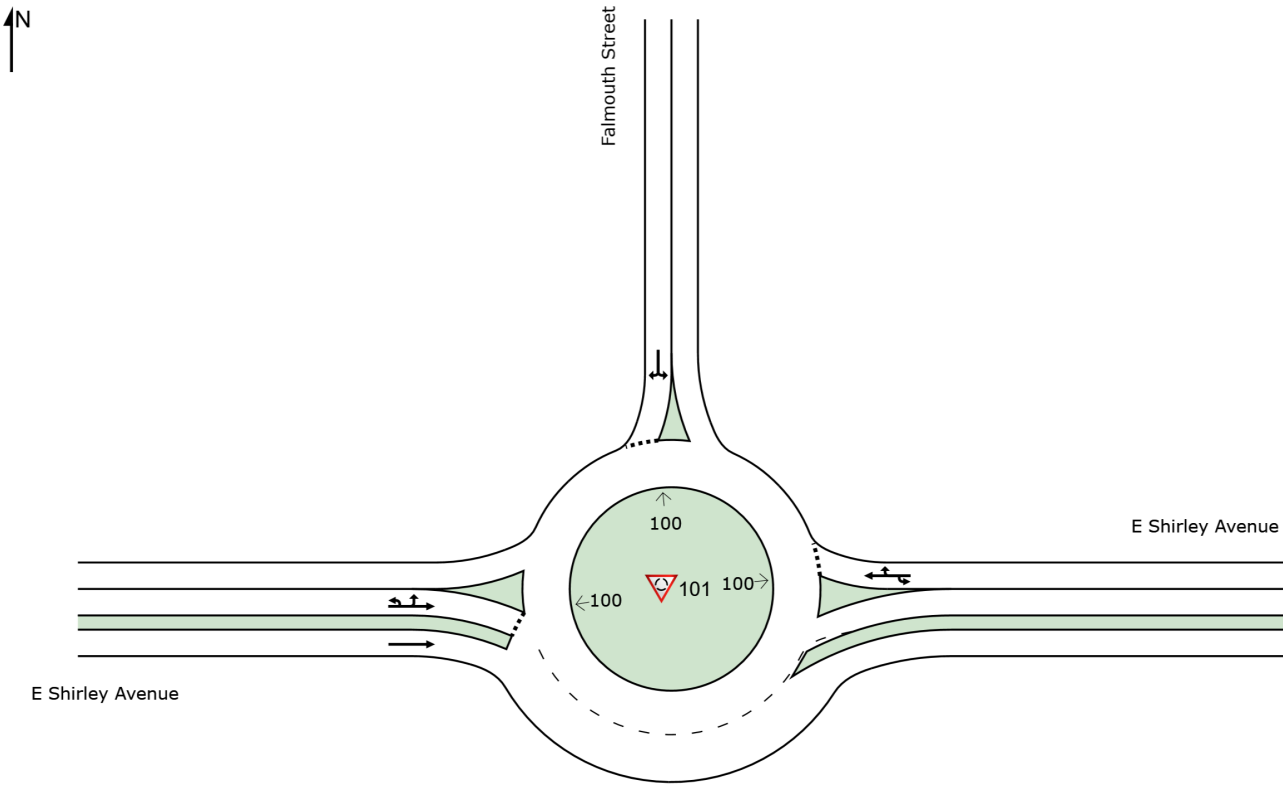
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2032 Background - Commuter Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:38:27 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Background\Taylor MS 2032 Background.sip9

MOVEMENT SUMMARY

Site: 101 [2032 Background - School PM (Site Folder: General)]

School PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	2	0.0	2	0.0	0.602	11.2	LOS B	5.7	148.8	0.29	0.12	0.29	24.0
6	T1	484	4.0	489	4.0	0.602	11.3	LOS B	5.7	148.8	0.29	0.12	0.29	23.0
16	R2	152	6.0	154	6.0	0.602	11.4	LOS B	5.7	148.8	0.29	0.12	0.29	22.4
Approach		638	4.5	644	4.5	0.602	11.3	LOS B	5.7	148.8	0.29	0.12	0.29	22.8
North: Falmouth Street														
7	L2	144	7.0	145	7.0	0.250	8.4	LOS A	1.6	41.8	0.68	0.57	0.68	23.1
14	R2	25	0.0	25	0.0	0.250	7.9	LOS A	1.6	41.8	0.68	0.57	0.68	22.2
Approach		169	6.0	171	6.0	0.250	8.3	LOS A	1.6	41.8	0.68	0.57	0.68	23.0
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.225	6.0	LOS A	1.4	36.8	0.44	0.28	0.44	25.3
5	L2	28	23.0	28	23.0	0.225	7.0	LOS A	1.4	36.8	0.44	0.28	0.44	24.6
2	T1	590	5.0	596	5.0	0.225	1.8	LOS A	1.4	36.8	0.13	0.08	0.13	25.4
Approach		620	5.8	626	5.8	0.225	2.1	LOS A	1.4	36.8	0.14	0.09	0.14	25.4
All Vehicles		1427	5.2	1441	5.2	0.602	6.9	LOS A	5.7	148.8	0.27	0.16	0.27	23.9

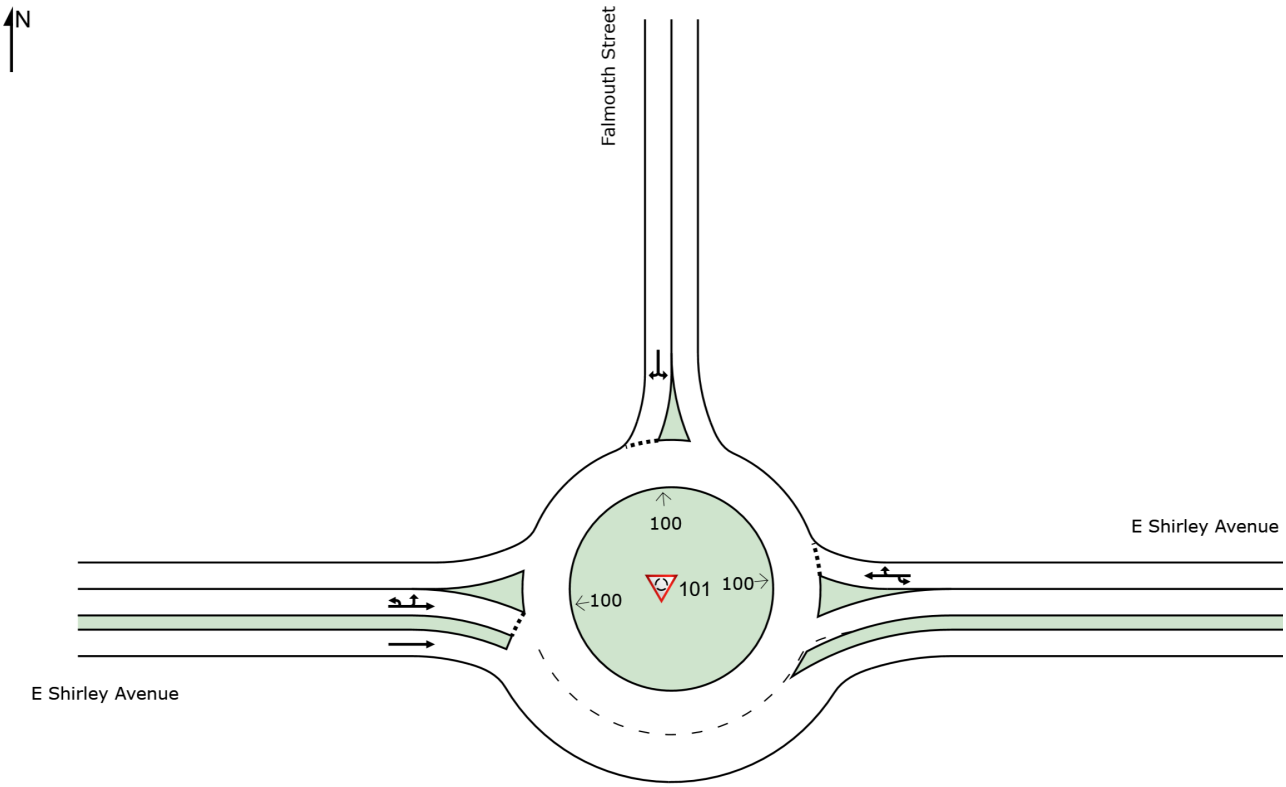
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2032 Background - School PM (Site Folder: General)]

School PM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:40:06 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Background\Taylor MS 2032 Background.sip9

Appendix H
2032 Future Analysis Worksheets

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	51	0	49	41	180	0	0	37	80	0	0
Future Vol, veh/h	0	51	0	49	41	180	0	0	37	80	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
Heavy Vehicles, %	0	0	0	24	0	7	0	0	65	8	0	0
Mvmt Flow	0	55	0	53	45	196	0	0	40	87	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

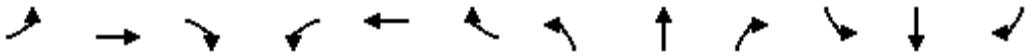
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	8	8.5	7.4	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	54%	0%	100%
Vol Thru, %	0%	100%	46%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	37	51	90	180	80
LT Vol	0	0	49	0	80
Through Vol	0	51	41	0	0
RT Vol	37	0	0	180	0
Lane Flow Rate	40	55	98	196	87
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.047	0.071	0.151	0.226	0.122
Departure Headway (Hd)	4.183	4.615	5.541	4.156	5.05
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	856	777	649	865	711
Service Time	2.208	2.639	3.259	1.874	3.072
HCM Lane V/C Ratio	0.047	0.071	0.151	0.227	0.122
HCM Control Delay	7.4	8	9.2	8.1	8.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.5	0.9	0.4

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	34	433	78	34	584	249	17	60
v/c Ratio	0.21	0.62	0.11	0.23	0.72	0.75	0.09	0.31
Control Delay	46.8	28.4	0.3	47.6	30.4	50.6	42.4	33.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	28.4	0.3	47.6	30.4	50.6	42.4	33.3
Queue Length 50th (ft)	21	214	0	21	328	142	10	22
Queue Length 95th (ft)	53	335	0	53	#555	#264	31	62
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	163	788	771	149	807	379	376	377
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	0.21	0.55	0.10	0.23	0.72	0.66	0.05	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	398	72	31	513	24	85	89	55	16	34	21
Future Volume (vph)	31	398	72	31	513	24	85	89	55	16	34	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99			0.97		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1823	1761	1539	1667	1721			1736		1769	1691	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1823	1761	1539	1667	1721			1736		1769	1691	
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)	34	433	78	34	558	26	92	97	60	17	37	23
RTOR Reduction (vph)	0	0	46	0	1	0	0	11	0	0	21	0
Lane Group Flow (vph)	34	433	32	34	583	0	0	238	0	17	39	0
Heavy Vehicles (%)	0%	9%	6%	11%	13%	0%	6%	2%	4%	0%	3%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	4.3	39.0	39.0	8.2	42.9			17.0		7.2	7.2	
Effective Green, g (s)	4.3	39.0	39.0	8.2	42.9			17.0		7.2	7.2	
Actuated g/C Ratio	0.05	0.41	0.41	0.09	0.45			0.18		0.08	0.08	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	82	719	629	143	773			309		133	127	
v/s Ratio Prot	0.02	0.25		c0.02	c0.34			c0.14		0.01	c0.02	
v/s Ratio Perm			0.02									
v/c Ratio	0.41	0.60	0.05	0.24	0.75			0.77		0.13	0.31	
Uniform Delay, d1	44.3	22.1	17.0	40.7	21.9			37.3		41.2	41.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	4.6	1.7	0.0	1.2	4.5			11.9		0.6	1.9	
Delay (s)	48.9	23.8	17.1	41.9	26.3			49.3		41.8	43.6	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		24.4			27.2			49.3			43.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	95.4	Sum of lost time (s)	24.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	411	12	19	559	0	0
Future Volume (Veh/h)	411	12	19	559	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	447	24	38	608	0	0
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			471		1131	447
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			471		1131	447
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			96		100	100
cM capacity (veh/h)			1036		219	616

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	447	24	38	608
Volume Left	0	0	38	0
Volume Right	0	24	0	0
cSH	1700	1700	1036	1700
Volume to Capacity	0.26	0.01	0.04	0.36
Queue Length 95th (ft)	0	0	3	0
Control Delay (s)	0.0	0.0	8.6	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.5	
Approach LOS				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	401	0	0	570	12	19
Future Volume (Veh/h)	401	0	0	570	12	19
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	436	0	0	620	24	38
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			436		1056	436
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			436		1056	436
tC, single (s)			4.1		6.6	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.4
p0 queue free %			100		90	94
cM capacity (veh/h)			1134		234	592

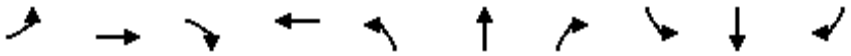
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	436	620	24	38
Volume Left	0	0	24	0
Volume Right	0	0	0	38
cSH	1700	1700	234	592
Volume to Capacity	0.26	0.36	0.10	0.06
Queue Length 95th (ft)	0	0	8	5
Control Delay (s)	0.0	0.0	22.1	11.5
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	15.6	
Approach LOS			C	

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	383	80	25	511	57	44
Future Volume (Veh/h)	383	80	25	511	57	44
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.95	0.50	0.50	0.95	0.95	0.95
Hourly flow rate (vph)	403	160	50	538	60	46
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			563		1041	403
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			563		1041	403
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		75	93
cM capacity (veh/h)			1019		245	652

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	403	160	50	538	106
Volume Left	0	0	50	0	60
Volume Right	0	160	0	0	46
cSH	1700	1700	1019	1700	336
Volume to Capacity	0.24	0.09	0.05	0.32	0.32
Queue Length 95th (ft)	0	0	4	0	33
Control Delay (s)	0.0	0.0	8.7	0.0	20.6
Lane LOS			A		C
Approach Delay (s)	0.0		0.7		20.6
Approach LOS					C

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	39.4%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	85	86	155	6	297	474	11	11	172	184
v/c Ratio	0.48	0.48	0.12	0.01	0.60	0.33	0.01	0.03	0.35	0.28
Control Delay	41.0	41.2	0.2	0.0	20.3	17.3	0.0	12.3	32.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	41.2	0.2	0.0	20.3	17.3	0.0	12.3	32.5	1.2
Queue Length 50th (ft)	40	40	0	0	88	71	0	3	38	0
Queue Length 95th (ft)	90	91	0	0	160	157	0	12	75	3
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	253	253	1291	418	601	1468	852	386	663	720
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.34	0.12	0.01	0.49	0.32	0.01	0.03	0.26	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	157	0	143	2	0	4	273	436	10	2	8	158
Future Volume (vph)	157	0	143	2	0	4	273	436	10	2	8	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.91		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1316	1316	1291		1015		1674	3409	1647		1430	3103
Flt Permitted	0.95	0.95	1.00		0.98		0.64	1.00	1.00		0.48	1.00
Satd. Flow (perm)	1316	1316	1291		1015		1133	3409	1647		723	3103
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)	171	0	155	2	0	4	297	474	11	2	9	172
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	7	0	0	0
Lane Group Flow (vph)	85	86	155	0	1	0	297	474	4	0	11	172
Heavy Vehicles (%)	27%	0%	22%	50%	0%	75%	10%	8%	0%	0%	29%	14%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	10.4	10.4	83.7		7.1		33.7	32.5	32.5		33.7	19.4
Effective Green, g (s)	10.4	10.4	83.7		7.1		33.7	32.5	32.5		33.7	19.4
Actuated g/C Ratio	0.12	0.12	1.00		0.08		0.40	0.39	0.39		0.40	0.23
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	163	163	1291		86		548	1323	639		301	719
v/s Ratio Prot	0.06	c0.07			0.00		c0.09	c0.14			0.00	0.06
v/s Ratio Perm			c0.12				c0.13		0.00		0.01	
v/c Ratio	0.52	0.53	0.12		0.01		0.54	0.36	0.01		0.04	0.24
Uniform Delay, d1	34.3	34.3	0.0		35.1		18.2	18.2	15.7		15.1	26.1
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.0	3.1	0.2		0.0		1.1	0.2	0.0		0.0	0.2
Delay (s)	37.3	37.4	0.2		35.1		19.3	18.4	15.7		15.1	26.3
Level of Service	D	D	A		D		B	B	B		B	C
Approach Delay (s)		19.7			35.1			18.7				22.0
Approach LOS		B			D			B				C

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	83.7	Sum of lost time (s)	32.5
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	169
Future Volume (vph)	169
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1426
Flt Permitted	1.00
Satd. Flow (perm)	1426
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	184
RTOR Reduction (vph)	118
Lane Group Flow (vph)	66
Heavy Vehicles (%)	11%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	29.8
Effective Green, g (s)	29.8
Actuated g/C Ratio	0.36
Clearance Time (s)	6.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	507
v/s Ratio Prot	0.02
v/s Ratio Perm	0.03
v/c Ratio	0.13
Uniform Delay, d1	18.2
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	18.3
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	164	325	61	170	444	251	47	86
Average Queue (ft)	31	155	23	34	212	119	15	34
95th Queue (ft)	91	266	51	106	384	210	42	69
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	3		0	12			0
Queuing Penalty (veh)	0	1		0	4			0

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement	EB	WB
Directions Served	R	L
Maximum Queue (ft)	6	44
Average Queue (ft)	0	6
95th Queue (ft)	5	29
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	255
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement	EB	NB	NB
Directions Served	T	L	R
Maximum Queue (ft)	2	64	68
Average Queue (ft)	0	11	21
95th Queue (ft)	2	42	57
Link Distance (ft)	505	382	382
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	EB	EB	WB	NB
Directions Served	T	R	L	LR
Maximum Queue (ft)	7	12	45	82
Average Queue (ft)	0	0	9	33
95th Queue (ft)	5	7	34	63
Link Distance (ft)	204			380
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		140	160	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	SB
Directions Served	ULT	TR	L>
Maximum Queue (ft)	128	215	97
Average Queue (ft)	27	50	32
95th Queue (ft)	86	150	76
Link Distance (ft)	393	351	742
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	175	129	36	60	219	203	168	23	65	119	118	122
Average Queue (ft)	69	31	1	8	107	106	40	3	7	53	47	52
95th Queue (ft)	137	84	14	36	183	177	114	14	36	97	95	93
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)					0		0		0	0		
Queuing Penalty (veh)					0		0		0	0		

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	20	80	79	74	65
Average Queue (ft)	7	41	45	34	33
95th Queue (ft)	16	70	69	74	59
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 5

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	58	0	15	66	37	0	0	30	31	0	0
Future Vol, veh/h	0	58	0	15	66	37	0	0	30	31	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
Heavy Vehicles, %	0	0	0	57	0	18	0	0	7	0	0	0
Mvmt Flow	0	63	0	16	72	40	0	0	33	34	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

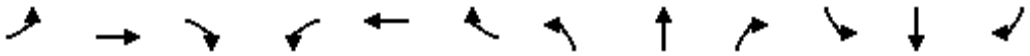
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.6	8.6	7	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	19%	0%	100%
Vol Thru, %	0%	100%	81%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	58	81	37	31
LT Vol	0	0	15	0	31
Through Vol	0	58	66	0	0
RT Vol	30	0	0	37	0
Lane Flow Rate	33	63	88	40	34
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.035	0.074	0.14	0.044	0.043
Departure Headway (Hd)	3.817	4.21	5.711	3.947	4.611
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	943	837	626	902	781
Service Time	1.818	2.305	3.46	1.695	2.613
HCM Lane V/C Ratio	0.035	0.075	0.141	0.044	0.044
HCM Control Delay	7	7.6	9.4	6.9	7.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.5	0.1	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	43	620	165	36	584	202	39	156
v/c Ratio	0.29	0.89	0.24	0.25	0.71	0.70	0.16	0.60
Control Delay	52.6	46.7	5.9	51.6	32.1	53.1	40.6	49.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.6	46.7	5.9	51.6	32.1	53.1	40.6	49.0
Queue Length 50th (ft)	28	377	6	23	343	122	23	93
Queue Length 95th (ft)	67	#634	51	58	#569	209	55	163
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	147	752	729	144	828	346	339	348
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	0.29	0.82	0.23	0.25	0.71	0.58	0.12	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	583	155	34	545	4	90	69	31	37	119	27
Future Volume (vph)	40	583	155	34	545	4	90	69	31	37	119	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1823	1863	1584	1796	1889			1774		1769	1781	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1823	1863	1584	1796	1889			1774		1769	1781	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	43	620	165	36	580	4	96	73	33	39	127	29
RTOR Reduction (vph)	0	0	92	0	0	0	0	7	0	0	8	0
Lane Group Flow (vph)	43	620	73	36	584	0	0	195	0	39	148	0
Heavy Vehicles (%)	0%	3%	3%	3%	3%	0%	2%	2%	4%	0%	2%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	4.5	40.4	40.4	8.1	44.0			16.0		14.3	14.3	
Effective Green, g (s)	4.5	40.4	40.4	8.1	44.0			16.0		14.3	14.3	
Actuated g/C Ratio	0.04	0.39	0.39	0.08	0.43			0.16		0.14	0.14	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	79	732	622	141	808			276		246	247	
v/s Ratio Prot	c0.02	c0.33		0.02	c0.31			c0.11		0.02	c0.08	
v/s Ratio Perm			0.05									
v/c Ratio	0.54	0.85	0.12	0.26	0.72			0.71		0.16	0.60	
Uniform Delay, d1	48.1	28.4	19.9	44.5	24.3			41.2		39.0	41.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	9.3	9.3	0.1	1.3	3.4			8.6		0.4	4.7	
Delay (s)	57.4	37.7	20.0	45.8	27.8			49.8		39.4	46.3	
Level of Service	E	D	B	D	C			D		D	D	
Approach Delay (s)		35.2			28.8			49.8			44.9	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	102.8	Sum of lost time (s)	24.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	620	0	0	549	0	0
Future Volume (Veh/h)	620	0	0	549	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	674	0	0	597	0	0
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			674		1271	674
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			674		1271	674
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			927		187	458

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	674	0	0	597
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.40	0.01	0.00	0.35
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	622	0	0	545	0	0
Future Volume (Veh/h)	622	0	0	545	0	0
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	676	0	0	592	0	0
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		1268	676
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			676		1268	676
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			925		188	457

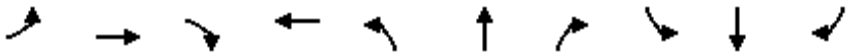
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	676	592	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.40	0.35	0.12	0.08
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	
Approach LOS			A	

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	594	29	28	528	20	4
Future Volume (Veh/h)	594	29	28	528	20	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	646	58	56	574	22	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						
vC, conflicting volume			704		1332	646
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			704		1332	646
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			94		86	99
cM capacity (veh/h)			862		161	475

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	646	58	56	574	26
Volume Left	0	0	56	0	22
Volume Right	0	58	0	0	4
cSH	1700	1700	862	1700	179
Volume to Capacity	0.38	0.03	0.06	0.34	0.15
Queue Length 95th (ft)	0	0	5	0	12
Control Delay (s)	0.0	0.0	9.5	0.0	28.5
Lane LOS			A		D
Approach Delay (s)	0.0		0.8		28.5
Approach LOS					D

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	162	163	239	18	235	322	1	18	458	152
v/c Ratio	0.62	0.63	0.16	0.05	0.56	0.24	0.00	0.05	0.66	0.23
Control Delay	44.0	44.2	0.2	0.2	20.4	19.6	0.0	13.2	35.3	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	44.2	0.2	0.2	20.4	19.6	0.0	13.2	35.3	1.7
Queue Length 50th (ft)	83	84	0	0	72	49	0	5	115	0
Queue Length 95th (ft)	155	156	0	0	128	109	0	17	173	13
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	338	338	1529	360	463	1375	474	375	873	730
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.48	0.16	0.05	0.51	0.23	0.00	0.05	0.52	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	309	0	227	5	0	12	223	306	1	10	7	435
Future Volume (vph)	309	0	227	5	0	12	223	306	1	10	7	435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.90		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.99		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1655	1655	1529		1502		1721	3541	824		1337	3369
Flt Permitted	0.95	0.95	1.00		0.99		0.46	1.00	1.00		0.56	1.00
Satd. Flow (perm)	1655	1655	1529		1502		838	3541	824		784	3369
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)	325	0	239	5	0	13	235	322	1	11	7	458
RTOR Reduction (vph)	0	0	0	0	17	0	0	0	1	0	0	0
Lane Group Flow (vph)	162	163	239	0	1	0	235	322	0	0	18	458
Heavy Vehicles (%)	1%	0%	3%	20%	0%	9%	7%	4%	100%	0%	83%	5%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	12.7	12.7	86.0		7.1		33.7	31.2	31.2		33.7	22.2
Effective Green, g (s)	12.7	12.7	86.0		7.1		33.7	31.2	31.2		33.7	22.2
Actuated g/C Ratio	0.15	0.15	1.00		0.08		0.39	0.36	0.36		0.39	0.26
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	244	244	1529		124		446	1284	298		323	869
v/s Ratio Prot	0.10	c0.10			0.00		c0.07	c0.09			0.00	c0.14
v/s Ratio Perm			c0.16				0.14		0.00		0.02	
v/c Ratio	0.66	0.67	0.16		0.01		0.53	0.25	0.00		0.06	0.53
Uniform Delay, d1	34.6	34.7	0.0		36.2		18.4	19.2	17.5		16.1	27.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	6.6	6.8	0.2		0.0		1.1	0.1	0.0		0.1	0.6
Delay (s)	41.3	41.4	0.2		36.3		19.6	19.3	17.5		16.2	28.0
Level of Service	D	D	A		D		B	B	B		B	C
Approach Delay (s)		23.9			36.3			19.4				24.7
Approach LOS		C			D			B				C

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	32.5
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	144
Future Volume (vph)	144
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1439
Flt Permitted	1.00
Satd. Flow (perm)	1439
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	152
RTOR Reduction (vph)	90
Lane Group Flow (vph)	62
Heavy Vehicles (%)	10%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	34.9
Effective Green, g (s)	34.9
Actuated g/C Ratio	0.41
Clearance Time (s)	6.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	583
v/s Ratio Prot	0.02
v/s Ratio Perm	0.03
v/c Ratio	0.11
Uniform Delay, d1	15.9
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	15.9
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	214	548	111	184	467	246	114	199
Average Queue (ft)	61	295	42	38	220	111	31	87
95th Queue (ft)	170	513	79	113	391	198	81	161
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	19		0	13		0	3
Queuing Penalty (veh)	0	8		0	5		0	1

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	52	50
Average Queue (ft)	10	13
95th Queue (ft)	36	35
Link Distance (ft)		380
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	160	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	B17	SB
Directions Served	ULT	TR	T	L>
Maximum Queue (ft)	252	189	13	86
Average Queue (ft)	96	27	0	34
95th Queue (ft)	208	111	8	69
Link Distance (ft)	393	351	787	742
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	161	124	63	52	185	178	124	31	68	176	189	99
Average Queue (ft)	95	54	8	12	94	79	23	2	13	103	107	42
95th Queue (ft)	149	110	40	38	158	144	74	17	45	160	167	80
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)							0			1		
Queuing Penalty (veh)							0			0		

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	23	77	66	61	41
Average Queue (ft)	7	37	26	20	18
95th Queue (ft)	15	65	57	48	42
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 14

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	40	0	12	37	79	0	0	13	72	0	0
Future Vol, veh/h	0	40	0	12	37	79	0	0	13	72	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
Heavy Vehicles, %	0	13	0	55	2	7	0	0	35	0	0	0
Mvmt Flow	0	43	0	13	40	86	0	0	14	78	0	0
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.9	7.9	6.9	8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	24%	0%	100%
Vol Thru, %	0%	100%	76%	0%	0%
Vol Right, %	100%	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	13	40	49	79	72
LT Vol	0	0	12	0	72
Through Vol	0	40	37	0	0
RT Vol	13	0	0	79	0
Lane Flow Rate	14	43	53	86	78
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.015	0.055	0.085	0.096	0.099
Departure Headway (Hd)	3.821	4.589	5.746	4.019	4.547
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	941	784	619	882	792
Service Time	1.826	2.597	3.518	1.79	2.55
HCM Lane V/C Ratio	0.015	0.055	0.086	0.098	0.098
HCM Control Delay	6.9	7.9	9.1	7.2	8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0	0.2	0.3	0.3	0.3

Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	42	637	107	42	640	215	29	96
v/c Ratio	0.30	0.86	0.15	0.28	0.74	0.71	0.15	0.44
Control Delay	51.2	41.7	1.9	50.4	31.9	51.1	42.6	40.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	41.7	1.9	50.4	31.9	51.1	42.6	40.1
Queue Length 50th (ft)	26	375	0	26	379	126	17	45
Queue Length 95th (ft)	64	#636	15	64	#645	#228	45	97
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	142	792	752	151	862	359	337	371
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	0.80	0.14	0.28	0.74	0.60	0.09	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	586	98	39	575	14	83	82	33	27	57	31
Future Volume (vph)	39	586	98	39	575	14	83	82	33	27	57	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-5%			0%			4%	
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00			0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (prot)	1642	1828	1539	1745	1816			1713		1638	1719	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1642	1828	1539	1745	1816			1713		1638	1719	
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)	42	637	107	42	625	15	90	89	36	29	62	34
RTOR Reduction (vph)	0	0	62	0	1	0	0	7	0	0	20	0
Lane Group Flow (vph)	42	637	45	42	639	0	0	208	0	29	76	0
Heavy Vehicles (%)	11%	5%	6%	6%	7%	0%	8%	4%	7%	8%	4%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	4.4	41.3	41.3	8.2	45.1			16.5		8.8	8.8	
Effective Green, g (s)	4.4	41.3	41.3	8.2	45.1			16.5		8.8	8.8	
Actuated g/C Ratio	0.04	0.42	0.42	0.08	0.46			0.17		0.09	0.09	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	73	764	643	144	828			286		145	153	
v/s Ratio Prot	c0.03	c0.35		0.02	c0.35			c0.12		0.02	c0.04	
v/s Ratio Perm			0.03									
v/c Ratio	0.58	0.83	0.07	0.29	0.77			0.73		0.20	0.50	
Uniform Delay, d1	46.3	25.7	17.2	42.6	22.5			39.0		41.7	42.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	12.5	8.1	0.1	1.5	4.8			9.5		0.9	3.4	
Delay (s)	58.8	33.8	17.3	44.1	27.3			48.5		42.7	46.3	
Level of Service	E	C	B	D	C			D		D	D	
Approach Delay (s)		32.9			28.3			48.5			45.5	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	24.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	584	12	19	564	0	0
Future Volume (Veh/h)	584	12	19	564	0	0
Sign Control	Free			Free	Stop	
Grade	-4%			2%	0%	
Peak Hour Factor	0.93	0.50	0.50	0.93	0.93	0.93
Hourly flow rate (vph)	628	24	38	606	0	0
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			652		1310	628
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			652		1310	628
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	100
cM capacity (veh/h)			944		170	487

Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	628	24	38	606
Volume Left	0	0	38	0
Volume Right	0	24	0	0
cSH	1700	1700	944	1700
Volume to Capacity	0.37	0.01	0.04	0.36
Queue Length 95th (ft)	0	0	3	0
Control Delay (s)	0.0	0.0	9.0	0.0
Lane LOS			A	
Approach Delay (s)	0.0		0.5	
Approach LOS				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	588	0	0	472	12	19
Future Volume (Veh/h)	588	0	0	472	12	19
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	639	0	0	513	24	38
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			639		1152	639
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			639		1152	639
tC, single (s)			4.1		6.5	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.5
p0 queue free %			100		88	92
cM capacity (veh/h)			955		208	450

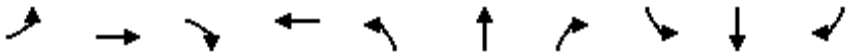
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	639	513	24	38
Volume Left	0	0	24	0
Volume Right	0	0	0	38
cSH	1700	1700	208	450
Volume to Capacity	0.38	0.30	0.12	0.08
Queue Length 95th (ft)	0	0	10	7
Control Delay (s)	0.0	0.0	24.5	13.7
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	17.9	
Approach LOS			C	

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	603	44	7	521	54	46
Future Volume (Veh/h)	603	44	7	521	54	46
Sign Control	Free			Free	Stop	
Grade	0%			0%	-3%	
Peak Hour Factor	0.92	0.50	0.50	0.92	0.92	0.92
Hourly flow rate (vph)	655	88	14	566	59	50
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			743		1249	655
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			743		1249	655
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		69	89
cM capacity (veh/h)			873		190	470

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	655	88	14	566	109
Volume Left	0	0	14	0	59
Volume Right	0	88	0	0	50
cSH	1700	1700	873	1700	262
Volume to Capacity	0.39	0.05	0.02	0.33	0.42
Queue Length 95th (ft)	0	0	1	0	49
Control Delay (s)	0.0	0.0	9.2	0.0	28.2
Lane LOS			A		D
Approach Delay (s)	0.0		0.2		28.2
Approach LOS					D

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	160	163	270	22	213	278	12	20	367	177
v/c Ratio	0.59	0.60	0.18	0.17	0.50	0.22	0.02	0.04	0.60	0.26
Control Delay	40.7	41.1	0.3	28.2	19.5	20.4	0.1	13.8	34.7	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	41.1	0.3	28.2	19.5	20.4	0.1	13.8	34.7	2.3
Queue Length 50th (ft)	76	77	0	5	64	41	0	5	87	0
Queue Length 95th (ft)	151	153	0	29	120	98	0	19	142	18
Internal Link Dist (ft)		1992		455		682			791	
Turn Bay Length (ft)	560				315		160	165		250
Base Capacity (vph)	377	378	1485	134	478	1297	610	471	814	768
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.43	0.18	0.16	0.45	0.21	0.02	0.04	0.45	0.23

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	311	2	262	7	3	12	207	270	12	12	8	356
Future Volume (vph)	311	2	262	7	3	12	207	270	12	12	8	356
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			1%			-4%				4%
Total Lost time (s)	6.3	6.3	4.0		8.8		8.7	8.7	8.7		8.7	8.7
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95	1.00		1.00	0.95
Frt	1.00	1.00	0.85		0.93		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00		0.98		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1655	1661	1485		1329		1737	3474	1211		1675	3276
Flt Permitted	0.95	0.95	1.00		0.98		0.53	1.00	1.00		0.58	1.00
Satd. Flow (perm)	1655	1661	1485		1329		975	3474	1211		1024	3276
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	321	2	270	7	3	12	213	278	12	12	8	367
RTOR Reduction (vph)	0	0	0	0	11	0	0	0	8	0	0	0
Lane Group Flow (vph)	160	163	270	0	11	0	213	278	4	0	20	367
Heavy Vehicles (%)	1%	0%	6%	33%	33%	27%	6%	6%	36%	0%	14%	8%
Turn Type	Split	NA	Free	Split	NA		D.P+P	NA	Perm	D.P+P	D.P+P	NA
Protected Phases	4	4		3	3		5	2		1	1	6
Permitted Phases			Free				6		2	2	2	
Actuated Green, G (s)	12.9	12.9	83.9		7.1		31.4	28.9	28.9		31.4	20.3
Effective Green, g (s)	12.9	12.9	83.9		7.1		31.4	28.9	28.9		31.4	20.3
Actuated g/C Ratio	0.15	0.15	1.00		0.08		0.37	0.34	0.34		0.37	0.24
Clearance Time (s)	6.3	6.3			8.8		8.7	8.7	8.7		8.7	8.7
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	254	255	1485		112		465	1196	417		402	792
v/s Ratio Prot	0.10	c0.10			0.01		c0.06	0.08			0.00	c0.11
v/s Ratio Perm			c0.18				0.11		0.00		0.02	
v/c Ratio	0.63	0.64	0.18		0.10		0.46	0.23	0.01		0.05	0.46
Uniform Delay, d1	33.3	33.3	0.0		35.4		18.7	19.6	18.1		16.6	27.1
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.8	5.2	0.3		0.4		0.7	0.1	0.0		0.1	0.4
Delay (s)	38.1	38.5	0.3		35.8		19.4	19.7	18.1		16.7	27.6
Level of Service	D	D	A		D		B	B	B		B	C
Approach Delay (s)		21.0			35.8			19.5				23.6
Approach LOS		C			D			B				C

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	83.9	Sum of lost time (s)	32.5
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	172
Future Volume (vph)	172
Ideal Flow (vphpl)	1900
Grade (%)	
Total Lost time (s)	6.3
Lane Util. Factor	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1507
Flt Permitted	1.00
Satd. Flow (perm)	1507
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	177
RTOR Reduction (vph)	107
Lane Group Flow (vph)	70
Heavy Vehicles (%)	5%
Turn Type	pm+ov
Protected Phases	4
Permitted Phases	6
Actuated Green, G (s)	33.2
Effective Green, g (s)	33.2
Actuated g/C Ratio	0.40
Clearance Time (s)	6.3
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	596
v/s Ratio Prot	0.02
v/s Ratio Perm	0.03
v/c Ratio	0.12
Uniform Delay, d1	16.1
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	16.2
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	214	551	77	177	578	248	82	147
Average Queue (ft)	53	282	30	42	269	115	21	59
95th Queue (ft)	157	480	63	122	480	205	58	115
Link Distance (ft)		1077	1077		3093	989		776
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	17		0	18		0	1
Queuing Penalty (veh)	0	7		0	7		0	0

Intersection: 2: Site Entrance #1 & E Shirley Avenue

Movement	WB
Directions Served	L
Maximum Queue (ft)	44
Average Queue (ft)	8
95th Queue (ft)	32
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	255
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Site Entrance #2 & E Shirley Avenue

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	50	65
Average Queue (ft)	10	19
95th Queue (ft)	38	53
Link Distance (ft)	382	382
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Site Entrance #3 & E Shirley Avenue

Movement	EB	WB	NB
Directions Served	R	L	LR
Maximum Queue (ft)	6	33	100
Average Queue (ft)	0	3	37
95th Queue (ft)	4	18	77
Link Distance (ft)			380
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	140	160	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: E Shirley Avenue & Falmouth Street

Movement	EB	WB	B17	SB
Directions Served	ULT	UTR	T	L>
Maximum Queue (ft)	272	201	7	91
Average Queue (ft)	103	42	0	39
95th Queue (ft)	233	135	5	76
Link Distance (ft)	393	351	787	742
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Movement	EB	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	R	LTR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	173	141	84	78	196	165	128	50	56	166	175	100
Average Queue (ft)	100	59	11	19	92	77	25	6	11	93	95	47
95th Queue (ft)	157	119	45	55	160	142	83	28	38	149	156	82
Link Distance (ft)		1974	1974	480		730	730			787	787	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	560				315			160	165			250
Storage Blk Time (%)							0			0		
Queuing Penalty (veh)							0			0		

Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	42	73	72	64	59
Average Queue (ft)	10	31	35	13	29
95th Queue (ft)	27	61	61	47	48
Link Distance (ft)	954	1974		170	605
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			270		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 14

MOVEMENT SUMMARY

Site: 101 [2032 Future - AM Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.656	13.2	LOS B	6.6	179.4	0.39	0.19	0.39	23.5
6	T1	490	10.0	538	10.0	0.656	13.6	LOS B	6.6	179.4	0.39	0.19	0.39	22.5
16	R2	100	11.0	110	11.0	0.656	13.6	LOS B	6.6	179.4	0.39	0.19	0.39	22.0
Approach		591	10.2	649	10.2	0.656	13.6	LOS B	6.6	179.4	0.39	0.19	0.39	22.4
North: Falmouth Street														
7	L2	90	21.0	99	21.0	0.277	11.0	LOS B	1.7	49.5	0.75	0.68	0.75	22.8
14	R2	46	9.0	51	9.0	0.277	10.0	LOS A	1.7	49.5	0.75	0.68	0.75	21.9
Approach		136	16.9	149	16.9	0.277	10.6	LOS B	1.7	49.5	0.75	0.68	0.75	22.5
West: E Shirley Avenue														
5u	U	1	0.0	1	0.0	0.146	4.9	LOS A	0.9	23.5	0.37	0.21	0.37	25.2
5	L2	41	19.0	45	19.0	0.146	5.7	LOS A	0.9	23.5	0.37	0.21	0.37	24.5
2	T1	320	9.0	352	9.0	0.146	1.3	LOS A	0.9	23.5	0.09	0.05	0.09	25.5
Approach		362	10.1	398	10.1	0.146	1.8	LOS A	0.9	23.5	0.12	0.07	0.12	25.4
All Vehicles		1089	11.0	1197	11.0	0.656	9.3	LOS A	6.6	179.4	0.35	0.21	0.35	23.3

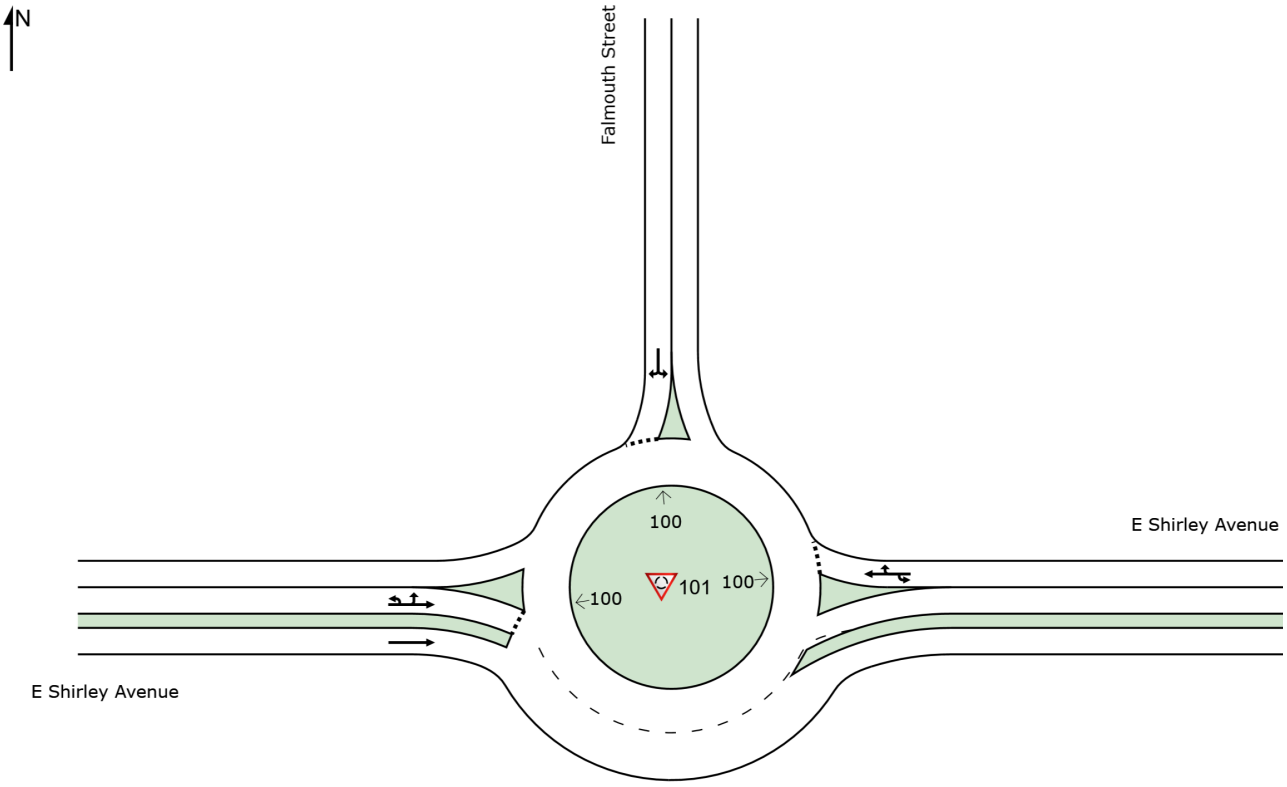
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2032 Future - AM Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:45:43 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Total\Taylor MS 2032 Future.sip9

MOVEMENT SUMMARY

Site: 101 [2032 Future - Commuter Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.763	17.9	LOS B	11.4	324.5	0.40	0.16	0.40	22.3
6	T1	502	21.0	552	21.0	0.763	18.6	LOS B	11.4	324.5	0.40	0.16	0.40	21.4
16	R2	166	4.0	182	4.0	0.763	18.0	LOS B	11.4	324.5	0.40	0.16	0.40	20.9
Approach		669	16.8	735	16.8	0.763	18.4	LOS B	11.4	324.5	0.40	0.16	0.40	21.3
North: Falmouth Street														
7	L2	145	1.0	159	1.0	0.334	10.5	LOS B	2.4	60.6	0.81	0.73	0.81	22.7
14	R2	38	9.0	42	9.0	0.334	11.2	LOS B	2.4	60.6	0.81	0.73	0.81	21.7
Approach		183	2.7	201	2.7	0.334	10.7	LOS B	2.4	60.6	0.81	0.73	0.81	22.5
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.238	6.2	LOS A	1.5	39.8	0.46	0.30	0.46	25.3
5	L2	21	11.0	23	11.0	0.238	6.6	LOS A	1.5	39.8	0.46	0.30	0.46	24.6
2	T1	583	5.0	641	5.0	0.238	1.9	LOS A	1.5	39.8	0.14	0.09	0.14	25.4
Approach		606	5.2	666	5.2	0.238	2.2	LOS A	1.5	39.8	0.15	0.10	0.15	25.3
All Vehicles		1458	10.2	1602	10.2	0.763	10.7	LOS B	11.4	324.5	0.35	0.20	0.35	23.0

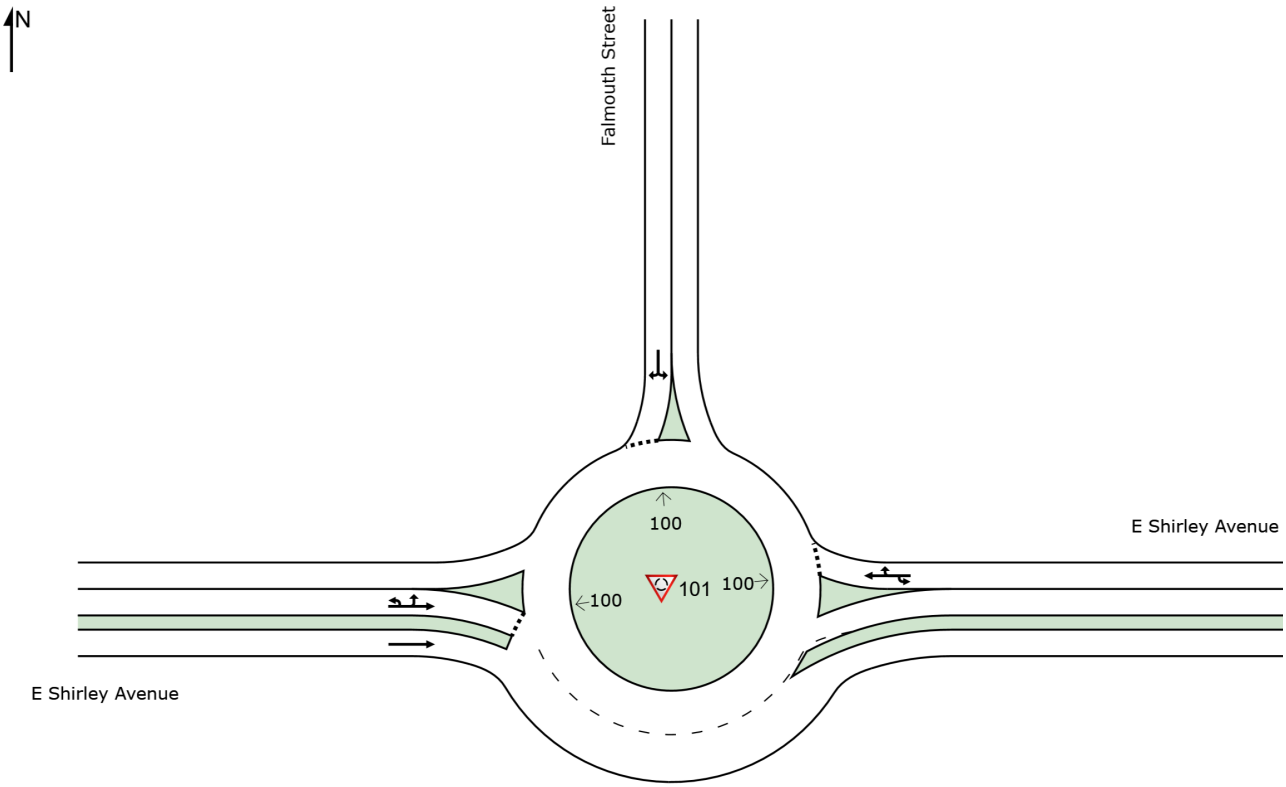
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2032 Future - Commuter Peak (Site Folder: General)]

AM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:47:04 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Total\Taylor MS 2032 Future.sip9

MOVEMENT SUMMARY

Site: 101 [2032 Future - School PM (Site Folder: General)]

School PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: E Shirley Avenue														
1u	U	2	0.0	2	0.0	0.606	11.4	LOS B	5.7	148.2	0.32	0.14	0.32	24.0
6	T1	481	4.0	486	4.0	0.606	11.5	LOS B	5.7	148.2	0.32	0.14	0.32	22.9
16	R2	152	6.0	154	6.0	0.606	11.6	LOS B	5.7	148.2	0.32	0.14	0.32	22.4
Approach		635	4.5	641	4.5	0.606	11.5	LOS B	5.7	148.2	0.32	0.14	0.32	22.8
North: Falmouth Street														
7	L2	144	7.0	145	7.0	0.258	8.5	LOS A	1.7	43.2	0.69	0.58	0.69	23.1
14	R2	30	0.0	30	0.0	0.258	8.0	LOS A	1.7	43.2	0.69	0.58	0.69	22.2
Approach		174	5.8	176	5.8	0.258	8.4	LOS A	1.7	43.2	0.69	0.58	0.69	23.0
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.217	5.9	LOS A	1.3	35.4	0.44	0.28	0.44	25.2
5	L2	35	23.0	35	23.0	0.217	7.0	LOS A	1.3	35.4	0.44	0.28	0.44	24.5
2	T1	559	5.0	565	5.0	0.217	1.7	LOS A	1.3	35.4	0.12	0.08	0.12	25.4
Approach		596	6.0	602	6.0	0.217	2.1	LOS A	1.3	35.4	0.14	0.09	0.14	25.3
All Vehicles		1405	5.3	1419	5.3	0.606	7.1	LOS A	5.7	148.2	0.29	0.17	0.29	23.8

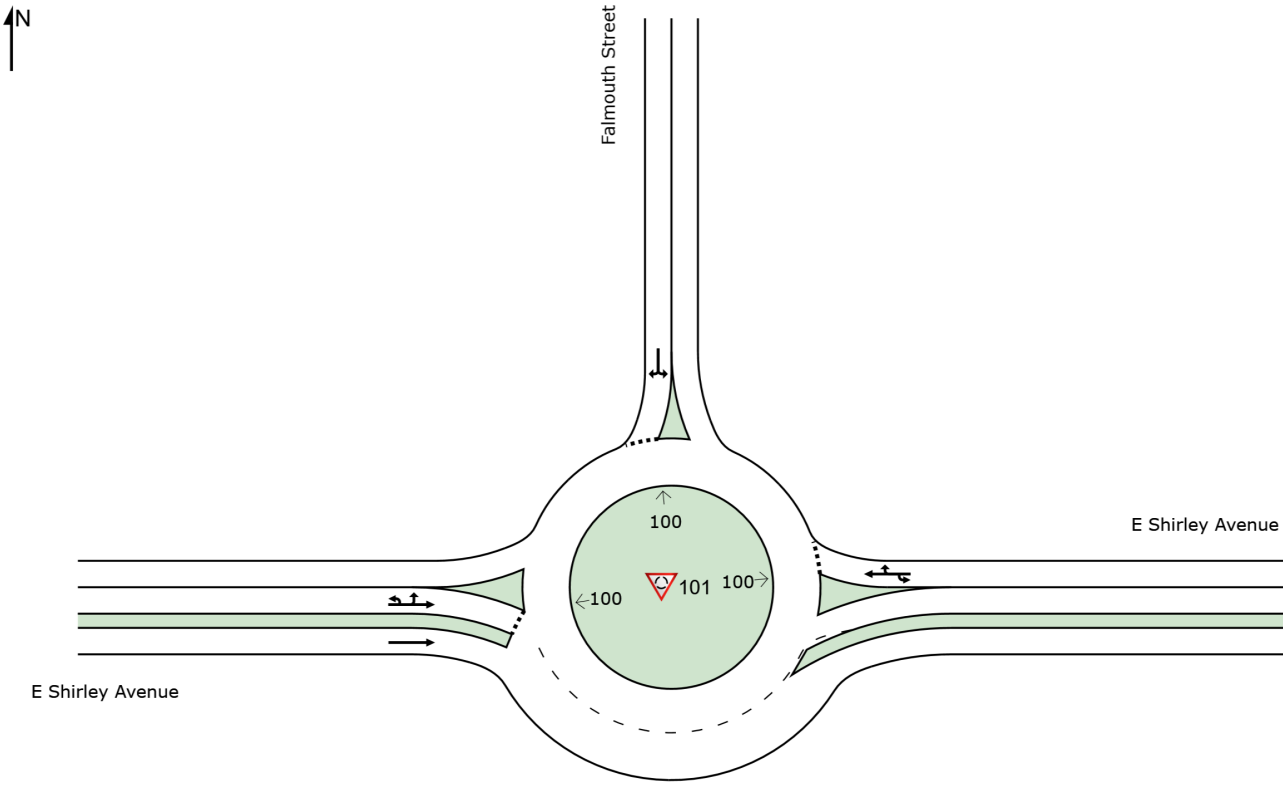
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2032 Future - School PM (Site Folder: General)]

School PM Peak
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



Organisation: TIMMONS GROUP | Licence: PLUS / 1PC | Created: Wednesday, January 10, 2024 12:50:44 PM
Project: L:\207\58360-T_Taylor_MS Expansion TIA\TRAFFIC\4. Analysis\SIDRA\Total\Taylor MS 2032 Future.sip9

TIMMONS GROUP

20110 Ashbrook Place
Suite 100
Ashburn, VA 20147

P 703.554.6700
F 703.726.1345
www.timmons.com

January 12, 2024

Denise Harris, AICP
Department of Community Development
Town of Warrenton
PO Box 341
Warrenton, VA 20188

RE: **Taylor Middle School Addition & Renovation – SUP 23-4**
1st Review

Dear Ms. Harris,

Below are the responses as shown in italic to your comments dated November 14, 2023 for the above referenced project.

Planning Staff Comments

General:

1. The applicant should be aware that as presented the SUP, and if approved, subsequent Conditions of Approval, will apply to the entire parcel. If there are proposed modifications to Either Taylor Middle School or Brumfield Elementary the approved SUP Plan may need to be amended.

Response: Comment Acknowledged.

2. Please update the SUP plans to add a combined sheets C3.01 and C3.02 with all existing and proposed conditions that include Brumfield Elementary and the land adjacent to Walmart.

Response: The above sheet has been added. See sheet C3.00.

3. Please rename the sheets from "Site Development Plan to "Special Use Permit Plan."

Response: Sheets C3.00-C3.02 have been updated to include "Special Use Permit Plan."

4. Please indicate if the fields are proposed to be lighted and, if so, provide details of proposed site lighting.

Response: The fields are existing and are not currently lit and are not proposed to be lighted with this application. A note has been added to sheet C3.01 to clarify the intent for the fields.

5. Fauquier County Approved the Arrington rezoning modifications to lift the age restriction proffer. If developed, the residential units located to the southwest will utilize both the elementary and middle schools.

Response: Comment Acknowledged.

Community Facilities:

6. The Applicant should explore options to interconnect Taylor Middle School with the surrounding neighborhoods through multi-modal bicycle/ pedestrian facilities. Careful attention should be given to the potential environmental impacts as the proposal includes retaining walls, a new road, and relocated fields. In addition, Brumfield Elementary, located on the same parcel, contains a wetland that was constructed as part of a grant from the Virginia Department of Game and Inland Fisheries as part of the County and Town MS4 programs. How will the proposal impact the wetlands?

Response: As discussed during the post submission meeting, provisions for multimodal access are being provided by the proposed dedication of a Public Access Easement to facilitate the future extension of a Shared Use Path that would allow connection to the Greenway trail and extend south along the School property frontage and then continues west along the southern boundary of the School property. Note that it is not desired by the Client to extend a sidewalk connection from Taylor MS down along the new access road to Brumfield ES an Alwington Blvd due to the inherent risks of allowing public free access to the site during school hours (as mentioned in the Town Police Department review comments). We feel that by providing the access easements for the Construction of a shared use path, the request for providing multimodal/pedestrian connections to the surrounding neighborhoods is being met.

During the detailed site plan process, the site design will take into account the existing constructed wetland to ensure there are no adverse impacts to the facility. Ultimately, the proposed improvements are intended to be treated by and "onsite" SWM/BMP facility, so there will be no more impervious area or rate of runoff draining to the constructed wetland facility than what it was designed to treat.

Historical Resources:

7. The Applicant's Statement of Justification acknowledges the historical importance of the school. Town staff is available to help facilitate discussions between the applicant and the Virginia Department of Historic Resources as there is a strong desire to help preserve and celebrate African American Heritage sites.

Response: Comment Acknowledged and appreciated. Design team will keep in mind as we develop the historical graphics.

Transportation and Circulation:

8. Taylor Middle School and Brumfield Elementary are located on a key public parcel to link neighborhoods and trails to the schools through bicycle and pedestrian connections. Both the Town of Warrenton and Fauquier County comprehensive plans indicate these important linkages on the adopted maps. This is an opportunity for the FCPS, the Town, and VDOT to work together to ensure these linkages are achieved.

Response: Comment Acknowledged. As discussed during the post submission meeting, provisions for multimodal access are being provided by the proposed dedication of a Public Access Easement to facilitate the future extension of a Shared Use Path that would allow connection to the Greenway trail and extend south along the School property frontage and then continues west along the southern boundary of the School property.

Land Use and Character District:

9. Schools serve as vital community centers for residents. The town is dedicated to enhancing its walkability and looks forward to working with the schools and VDOT to bring this to fruition.

Response: Comment Acknowledged.

Transportation:

10. It would be beneficial for the applicant to meet with the Town, VDOT, and the County to discuss the larger transportation picture in this area. There may be opportunities to ensure the safety and operational efficiencies of both the elementary and middle schools and ensure multimodal linkages to adjacent neighborhoods and the greenway.

Response: Comment Acknowledged. The above parties met on November 16th to discuss the transportation items. As discussed during the post submission meeting, provisions for multimodal access are being provided by the proposed dedication of a Public Access Easement to facilitate the future extension of a Shared Use Path that would allow connection to the Greenway trail and extend south along the School property frontage and then continues west along the southern boundary of the School property. In addition, the proposed access road from Brumfield to Taylor has been realigned to allow for easier access and additional queuing into the parent drop-off/pick up loop.

Fauquier County Service District:

11. The property that encompasses the Brumfield Elementary School and Taylor Middle School will be in easy walking distance from adjacent neighbors.

Response: Comment Acknowledged. As discussed during the post submission meeting, provisions for multimodal access are being provided by the proposed dedication of a Public Access Easement to facilitate the future extension of a Shared Use Path that would allow connection to the Greenway trail

and extend south along the School property frontage and then continues west along the southern boundary of the School property.

Town Transportation Consultant – Liz Byrom, PhD, PE and Chris Tiesler, PE, PTOE

1. The TIA states that site entrance #1 is for buses to enter and site entrance #2 is for buses to exit. However, the site plan shows that visitor parking is also allowed in this parking lot. Please clarify the intent of passenger vehicle parking in the bus area and what, if any, restrictions would be applied.

Response: A note has been added to the plans stating that visitor parking to be closed during school pickup and drop off. Please see Sheet C3.01. School Staff will manage/control access to the noted visitor parking spaces during the time of bus pickup and drop-off.

2. Inbound and outbound volumes are unbalanced between site entrance #1 and site entrance #2. For example, on Figure 6-1, 26 vehicle enter site entrance #1 in the AM peak hour but 105 vehicles exit this loop from site entrance #2. What assumptions are being made?

Response: The TIA has been updated to correct the imbalance.

3. The TIA narrative describes a new traffic pattern, particularly for the buses, but does not provide specifics on how this new condition is assumed to operate or describe any necessary changes/improvement (such a signage, pavement markings, etc.) to facilitate the new pattern. It also appears that the traffic control for site entrance #3 is changing.

Response: The specifics on the signage, pavement markings, etc will be designed at the time of site plan approval. The TIA focuses on the external intersections and the impact to the surrounding roadway network.

4. The TIA and site plan do not discuss ped/bike travel between the elementary and middle schools or show ped/bike facilities. We would expect that some students and visitors will connect between the schools and the community center, especially once the Arrington development is complete.

Response: While some students and visitors may walk/bike to the facility, to be conservative and analyze a "worst case" scenario from a vehicular standpoint, no reductions were applied to the traffic in the TIA.

5. The existing parking lot design connected to site entrance #3 on Shirley Avenue does not appear to support the function of the increased demand for student drop-off. There appear to be physical constraints, such as a short driveway throat and circuitous travel patterns that could complicate student drop off and the efficient circulation of traffic on site.

Response: The staff parking/parent drop off access entrance has been revised to accommodate a longer driveway through for an effective site circulation. Please see Sheet C3.01

6. Given the expected growth north of the existing schools, we would expect that some pick up and drop off vehicles will use the internal connection between the elementary and middle schools. This is expected to result in a high volume of turning vehicles at the uncontrolled, internal intersection.

    - No trip assignment or operational analysis is conducted at this internal intersection.

    Response: The TIA focuses on the external intersections and the impact to the surrounding roadway network.

    - No proposed traffic control is shown on the site plan for this intersection.

    Response: The specifics on the signage, pavement markings, etc will be designed at the time of site plan approval.

7. Page 6-1: Per comments above, the expansion of the middle school will impact local connectivity, especially with the elementary school. Kittelson recommends replacing "no impact on the surrounding network" text with additional narrative that better reflects the anticipated circulation and travel patterns between the two schools and community center as well as to/from the overall complex.

Response: The TIA narrative has been updated accordingly.

8. Page 1-1: From conversations with Town, the existing parcel also include Brumfield Elementary School. We recommend that the description of the existing parcel be updated/enhanced.

Response: The TIA has been updated accordingly.

9. Page 2-1: Shirley Avenue carries 9,700 vehicles per day (vpd) east of Falmouth Street. This data is available on Virginia Roads. We recommend that this additional information be provided.

Response: The TIA has been updated accordingly.

10. Page 2-2: Traffic volumes along Alwington Boulevard are available on Virginia Roads-7,000 vpd in 2016.

Response: The TIA has been updated accordingly.

11. Page 2-2: Should there be "no improvements at the study intersections?" We recommend that "intersections" be made plural.

Response: The TIA has been updated accordingly.

12. Figure 2-1/Synchro: The southbound SB Culpeper Street approach has a separate left-turn lane. We recommend that the figures and Synchro models be updated to reflect this condition.

Response: The TIA has been updated accordingly.

13. Figure 4-1: Trips do not balance throughout the system. For example, 3 trips are added between site entrance #1 and #2 in the commuter PM peak hour and 9 trips are lost in the AM peak hour. 52 vehicles are lost from site entrance #2 to site entrance #1 in the AM peak hour. This comment continues for future scenarios. Given there are no driveways between these study intersections, the volumes should balance between them.

Response: The TIA has been updated to correct the imbalance.

14. Figure 5-4: Recommend capitalizing Hour for AM Peak Hour Bus Trips. It is unclear why there is "School PM" but not "School AM" - just "AM"

Response: "Hour" has been capitalized in the revised TIA. The "School AM" and "AM" peak hours generally coincide with each other. The "School PM" occurs much earlier in the afternoon than the commuter PM (or "PM").

15. Page 7-1: Please confirm/update that Aspen Heights a relevant background study to cite or if this was merely a typo and should be referencing the Arrington Development TIA.

Response: This was a typo and the TIA has been updated accordingly.

16. Synchro: A 0% grade has been coded for all study intersection approaches within the Synchro files. We recommend updating the grades to reflect the general terrain of the signalized and stop-controlled study intersections. Google Earth is a planning-level resource to estimate intersection approach grades.

Response: The TIA has been updated to include the intersection grades.

17. Synchro: Pedestrian walk and flash don't walk times are not coded at the Shirley Avenue/Culpeper Street signalized intersection. These should be included.

Response: The pedestrian timings have been added but it is noted the pedestrian signals are actuated only and only come up when a pedestrian is present and initiates a call.

18. Synchro: Maximum splits in the existing conditions at Alwington Boulevard and James Madison Highway do not match the signal timing plans provided in the appendix.

Response: According to the provided signal timings, the traffic signal is running "free" under all time periods. Therefore, the minimum green, yellow, and red intervals were input based on the signal timings and the cycle length selected to insure none of the phases exceeded the max green times in the provided signal timings. The cycle lengths were held across all scenarios to ensure a comparative analysis between the scenarios.

19. Synchro: We recommend all analysis files and level of service tables be updated to reflect any changes related to the comments above.

Response: The TIA has been updated to correct the imbalance.

Zoning – Amber Heflin, CZO

Article 2- Fences & Walls:

1. Several retaining walls are shown on site that exceed the maximum permitted height of 6' along the proposed additional drive isle to exit onto Alwington Boulevard, along portions of the running track, and around the proposed outdoor learning area adjacent to the parking lot. The applicant has requested a waiver of 2-19.1 of the Zoning Ordinance to allow retaining walls larger than 6' for safety concerns. All retaining walls accessible to residential or pedestrian areas must have a safety railing along the top of the wall per Article 2-19.4 of the Zoning Ordinance.

Response: Comment noted. As required by the applicable building codes, a min. 42" tall guard is proposed with every retaining wall that has a vertical height exceeding 30".

2. There is a screen wall labeled on sheet C3.01, but there are no height details. Fencing and walls in excess of 6' in height may be approved in conjunction with a special use permit for permissible uses listed within Article 3.

Response: Screen wall at dumpster enclosure is proposed to be 10' max above grade. Screen wall (fence) around mechanical yard is proposed to be 10' max above grade. Details will be provided at time of stie plan. Please see Sheet C3.01 for updated callouts. However, construction type and materials will be compatible with the existing and proposed buildings.

Article 3- Lot and Yard Regulations:

3. The statement of justification should be revised to indicate that the building is a Public Building by right, not an institutional use.

Response: The SOJ has been updated accordingly and is included with this submission.

4. Revise note under Building Regulations section on sheet C1.01 to state the proposed building height of 40'.

Response: The note has been updated as requested on sheet C1.01.

Article 6- Signs:

5. Replacement of an existing monument sign is mentioned on sheet C3.01 of the plan and in the statement of justification. No details are provided on the signage, and staff is unable to verify signage will meet all requirements of Article 6. Include a prominent note on the plan and revise the statement of justification to note signage will be addressed at the time of site development plan.

Response: Note #3 has been added, stating that the proposed signage will be provided in accordance with requirements set forth by the Town of Warrenton Zoning Ordinance. Specific details will be provided at the time of site plan. Please see Sheet C3.01.

Article 7- Parking:

6. Overall, the plan appears to meet parking space requirements and provides one additional space. Staff will verify the proposed spaces will meet the required minimum dimensions at the time of site development plan.

Response: Comment Acknowledged.

7. Provide justification that two loading spaces will be adequate to handle the needs of the use.

Response: Per the Fauquier County Zoning Ordinance section 7-203, schools falls under Standard F for required loading spaces. Standard F requires, "One (1) space for the first 10,000 square feet of gross floor area, plus one (1) space for each additional 100,000 square feet or major fraction thereof." Given the total proposed gross area of the middle school of 148,943, the required loading space to the major fraction thereof is 2 spaces. See zoning tabulations on sheet 1.02 for calculations.

8. Loading space dimensions not provided. Staff is unable to determine if loading spaces meet the minimum size of 300 square feet.

Response: Dimensions and area have been added as requested. Please see Sheet C3.01.

Article 8- Landscaping:

9. Staff is unable to verify landscaping requirements as no landscaping details have been provided. The statement of justification provided by the applicant notes landscaping will be addressed at the time of site plan submittal.

Response: Note #4 has been added, stating that proposed landscaping will be provided in accordance with requirements set forth by the Town of Warrenton Zoning Ordinance. Specific details will be provided at time of site plan. Please see Sheet C3.01.

Article 9-8- Lighting:

10. The statement of justification acknowledges all lighting must meet the requirements of the Zoning Ordinance. All fixtures on site will require conformance to current lighting standards, and photometric plan will be reviewed at the time of site plan submittal.

Response: Note #2 has been added stating that proposed lighting will be provided in accordance with requirements set forth by the Town of Warrenton Zoning Ordinance. Specific details will be provided at time of site plan. Please see Sheet C3.01. A revised photometric plan has been included in this resubmission.

11. The applicant provided a preliminary photometric plan for review with the SUP submittal, and staff is concerned that the site lighting proposed along Waterloo Street will exceed 1.0 footcandle at the property line.

Response: A revised photometric plan has been included in this resubmission.

12. Fixture cutsheets have not been provided for the proposed wall mounted lighting. Staff is unable to verify if proposed lights will meet Zoning Ordinance requirements.

Response: Fixtures will meet Zoning Ordinance requirements and will be submitted at time of site plan.

13. Complete lighting plan was not provided with this submittal. The photometric plan only shows site lighting within the travel ways. Revise.

Response: A revised photometric plan has been included in this resubmission.

PW/PU – Paul Bernard

1. Ensure that the modification to the access points to public streets, and the revisions to the water and sanitary sewer system will need to be well coordinated with the current operations of the Taylor Pump Station and the connections to the existing water main to ensure adequate fire protection. The final project design will need to demonstrate adequate provisions for stormwater management and erosion and sediment controls meeting all current town and State ordinances and requirements including details and calculations as part of the final site plan submittal and review process.

Response: Comment acknowledged.

Emergency Service – James K. Swain

1. Please provide information on the sprinkler system.

Response: The entire building will be sprinklered throughout per VCC 903.1, The International Fire Code and NFPA 13 (Per VCC 903.3.1).

2. Fire Department Connection (FDC) should be 4" stortz connection instead of 2.5" Siamese.

Response: Comment noted. FDC details will be provided during the time of site plan and will meet the Town Fire and Rescue requirements.

3. Water supply for FDC? It is on the same side of the building and not across the roadway blocking pathway of responding apparatus.

Response: A hydrant has been added on the same side of the building as the FDC. See sheet C3.01.

4. Please show locations of all fire hydrants on the property so we can ensure coverage and locations are appropriate.

Response: The locations for all fire hydrants have been added to the plan. See sheet C3.01.

5. Concrete pathway around building - width? Aerial apparatus needs at least 18' to set up for above grade operations i.e., access to the roof via aerial ladder.

Response: There is a minimum 24' drive aisle around the building with a proposed 20' wide emergency access drive aisle around existing portion of the building for the aerial apparatus.

6. Pathways around building - to utilize ground ladders to access windows or rooflines for firefighters the ground needs to be level for 1/4 of the height.

Response: Comment acknowledged. Grading will be shown at time of final site plan.

7. Access gates around building, how are they secured? Will there be access for FD after hours and/or lock boxes? Due to locations lock boxes should be available on all gates.

Response: Specific details to locking mechanisms and lock boxes will be addressed during time of site plan/building permit.

8. Lock boxes in front of the building are recommended as well as on the rear of the building. Due to the size of the building and the time it takes to walk around it we may need additional. We can coordinate later with FCPS Staff.

Response: Comment noted. This will be addressed during time of site plan/building permit.

9. Will there be non-ambulatory students or staff on upper floors? Do we have a plan to shelter in place in a particular classroom? Will that classroom be marked by the outside?

Response: Life safety plans will be submitted at time of building permit plan.

10. Will the water supply be upgraded into the complex? Will this be a loop system?

Response: As reflected on the Special Use Permit Plan, the site water loop is intended to be upgraded and looped around the building to provide for two separate connections into the existing water main within E. Shirley Avenue.

11. All curbs be rounded for better access?

Response: Comment noted. Curbs will be proposed in accordance with VDOT, Fauquier County and/or Town of Warrenton requirements with details being provided at the time of site plan.

12. What will be the separation from the old building to the new construction?

Response: The noted specific details will be submitted at time of building permit plan.

Police Department – Lieutenant A. Arnold

Traffic:

1. There would be a minor effect to vehicular traffic during construction.

Response: Comment Acknowledged.

2. Once construction is complete, the entrances on E. Shirley Ave. and Alwington Blvd. will direct traffic into and out of the school.

Response: Comment Acknowledged. It should be noted that the parent pick up/drop-off traffic will be directed to the proposed MS through the new access that is served by the Brumfield ES entrance off of Alwington Blvd.

3. As designed, cut-through traffic will be able to use the access road and parking lot to cut through from E. Shirley Ave. to the area of Brumfield Elementary School. This will cause safety concerns for pedestrians accessing the school from the parking lot and students going to the athletic field.

Response: FCPS will close the access road with a gates during school hours and will open it for pick up and drop off only. Signage will be included at time of site plan. Reference sheets C3.01 & C3.02 for the proposed gates.

4. By separating staff and visitor parking and providing controlled entrance(s) for staff, this would prevent people from short-cutting through the campus.

Response: As noted above, the new access road will be gated off to prevent cut through traffic. Also, as proposed the visitors parking is separated from staff parking with the designated visitors spaces being within the bus loop.

5. The bus loop should only be for picking up and dropping off students. The visitors' parking area should be moved to a different location and clearly marked by signs.

Response: Visitor parking will only be open during school hours, after bus drop off and before bus pick up. School Staff will manage the spaces to ensure they are cleared prior to these times. Signage with this information will be provided at time of site plan.

6. Traffic flow on E. Shirley Ave. will be affected during the beginning and end of school, as it is with other school locations.

Response: Traffic on Shirley Ave. is anticipated to be reduced with new dedicated parent drop off/ pickup access from Alwington Blvd. No access to the pickup/dropoff loop will be provided from Shirley Avenue. In addition, the proposed layout provides longer stacking lanes to provide sufficient queuing length so that traffic does not back up to the public ROW.

7. Flashing lights, signs, and lowered speed limits are posted in the school zone.

Response: Comment Acknowledged. The above mentioned signs/lights are existing within the school zone frontage.

Pedestrian:

8. Pedestrian safety will not be affected by this construction.

Response: Comment Acknowledged.

9. The pedestrian crosswalk from the Warrenton Greenway to the school must be clearly marked and should have a traffic control device to allow children to cross the road safely.

Response: There is an existing traffic control device to allow children to cross the road safely. At the time of site plan any proposed pavement markings and or additional signage will be provided.

10. The addition of the sidewalk fronting the school will assist with pedestrian traffic.

Response: Comment Acknowledged.

11. As mentioned above, cut-through traffic will be a consideration for pedestrians around the campus.

Response: Comment Acknowledged. Cut-through traffic shall be closed during school hours by the proposed gates as reflected on sheets C3.01 & C3.02.

Lighting:

12. CPTED best practices show lighting should be LED or OLED with a correlated color temperature of between 2700 and 3000 Kelvin.

Response: Light fixtures will be submitted at time of site plan and will meet zoning requirements.

13. After installation a night-time lighting study should be done to check illumination, uniformity, and brightness and to ensure the lights are properly shielded so glare doesn't affect traffic on West Lee Hwy and Blackwell Rd.

Response: Light fixtures will be submitted at time of site plan and will meet zoning requirements.

14. Lighting should be of an unbreakable material and be tamperproof to prevent vandalism and pockets of shadows.

Response: Light fixtures will be submitted at time of site plan and will meet zoning requirements.

Landscaping:

15. The construction will result in new landscaping being installed.

Response: Comment Acknowledged. Detailed landscaping plans will be submitted at time of site plan.

16. Tree type and placement should be planned so the canopy doesn't interfere with the lights in the parking lot as they grow.

Response: Comment Acknowledged. Detailed landscaping plans will be submitted at time of site plan.

17. Tree type and shrubbery should not prevent line of sight access to the property or provide concealment.

Response: Comment Acknowledged. Detailed landscaping plans will be submitted at time of site plan.

18. Tree placement should be considered so as not allow access onto the roof.

Response: Comment Acknowledged. Detailed landscaping plans will be submitted at time of site plan.

School Safety:

19. Fewer entrances. Once school is in session, only the main front entrance can be opened from the outside. All visitors must use the front entrance.

Response: The proposed design will comply with the above and will be included at the time of building permit review.

20. Provide a separate, controlled entrance for staff.

Response: Staff will have key fobs that allow access to certain exterior doors as coordinated with the Owner.

21. Can the school office staff clearly see the entrance area and can they observe approaching visitors before they reach the entrance?

Response: Yes. Additional details will be provided at the time of building permit review.

22. Main entrance should be secured with a man trap.

Response: Design complies additional details will be provided at the time of building permit review

23. Do office staff have the ability to physically deny entry to visitors by remotely locking/unlocking the man trap?

Response: Yes. Additional details will be provided at the time of building permit review

24. Do staff members have immediate lockdown capability in classrooms and other locations?

Response: Yes. Additional details will be provided at the time of building permit review

25. Clearly establish and define school property lines.

Response: Property lines are existing and are already defined by the site survey.

26. Enclose the campus; this is more a measure to keep outsiders out than insiders in. Besides defining property boundaries, a robust fence forces a perpetrator to consciously trespass, rather than allowing casual entry.

Response: This is not feasible due to the cost it would add to the project. It would also diminish the ability for the public to use the play fields and outside amenities outside of school hours.

27. Ensure that classrooms and administrative areas can be closed off and locked from the gym and other facilities that might be used after hours.

Response: This recommendation will be considered at the time of building permit.

28. Restrict external access to parking areas. Have clearly defined areas for staff and visitor parking. Staff parking can be secured by controlled entrances.

Response: External access is restricted. Defined staff and visitor parking has been provided. Controlled entrances and gate are not feasible due to the nature of the use of the site and due to the additional costs.

29. Prohibit through-traffic on campus.

Response: Access road will be closed with gates between pick-up and drop-off times. Reference sheets C3.01 and C3.02 for additional details.

30. Minimize secluded hiding spaces for unauthorized persons.

Response: Design complies. Additional details will be provided at the time of Site Plan and Building Permit.

31. Avoid blocking lines of sight with landscaping.

Response: Design will comply with requirements set forth by Town Standards and Zoning Ordinance.

32. Provide clear signage and posted rules as to who is allowed to use parking facilities and when they are allowed to do so.

Response: Design will comply. Signage will be provided at time of site plan.

VDOT

1. US 17 Business (Shirley Ave) is currently being studied as part of the Project Pipeline. The Pipeline study identified the need for additional Bike and Ped connectivity along Shirley Ave. (Land Use).

Response: Comment acknowledged.

2. The Town should consider upgrading the existing pedestrian crossing of US 17 Bus to a shared use path and consider the extension to the south of the school site along Shirley Ave. If the shared use path cannot be incorporated into this project, the town should ensure that site can accommodate the typical section in figure A(1)-6 below for the future shared use path. (Land Use)

Response: The above parties met on November 16th to discuss the transportation items. To further improve the future walkability of the area, this application proposes to construct a portion of Shared Use Path (SUP) that will provide a connection to the Greenway Trail. The existing crosswalk to the Greenway Trail accommodates a shared use path, as there are existing signal head. The SUP will extend south along Shirley Avenue and will terminate at a sidewalk connection to the site. From there a public access easement will be dedicated that will extend to the southern property boundary with the County Owned community center. A second public access easement will be dedicated for the future extension of a SUP at the pipe stem area between the Community center property and the Walmart property, that will extend to the ROW of Alwington BLVD.

3. For curb and/or curb and gutter streets, the separation from the face of the curb to the edge of the shared use path shall be a minimum of 8 feet in order to provide the minimum lateral offset distance for signs to both the roadway and the shared use path users in accordance with MUTCD. The minimum paved width for a two-directional shared use path is 10 feet. A minimum 2-foot-wide graded area with a maximum 6:1 slope, shall be maintained adjacent to both sides of the path. A minimum 3-foot clearance shall be maintained from the edge of the path to signs, trees, poles, walls, fences, railing, guardrail, or other lateral obstructions. (Land Use)

Response: The parking lot and shared use path has been revised and updated. Further detailed design will be coordinated based on the requirements at the time of site plan.

4. The horizontal alignment of the parent dropoff private access road to Alwington Bld. should have a minimum design speed noted. If the access road will be utilized for emergency access, autoturn movements for a firetruck should be provided. (Land Use)

Response: The private access road has been revised and updated. Further detailed design will be a part of the site plan.

5. The retaining wall appears to be within the clearzone of the private access road and should be located either outside of the clearzone or protected with guardrail. (Land Use)

Response: Comment acknowledged. Detailed design of the retaining wall and clear zone will be provided at the time of site plan and will meet the town's requirements.

6. Please ensure that clear zone is free of fixed objects and that the slopes within the clear zone meet the town's design requirements based on the proposed design speed. (Land Use)

Response: Comment acknowledged. Detailed design of the retaining wall and clear zone will be provided at the time of site plan and will meet the town's requirements.

7. VDOT recommends that the Town ensure that the internal parking lot and internal access roads will handle the school operations. (Land Use)

Response: The parking lot and internal access roads have been revised and updated to accommodate the school operations. Furthermore specific items such as the parking lot entrance has been updated to provide adequate stacking distance.

Town Attorney

1. Review with Second Submission.

Should you have any questions regarding the above responses, please feel free to contact me (703) 554-6712.

Thank you,

Luke Fetcho
Senior Project Manager

TIMMONS GROUP

20110 Ashbrook Place
Suite 100
Ashburn, VA 20147

P 703.554.6700
F 703.726.1345
www.timmons.com

Draft Conditions of Approval
Taylor Middle School Addition & Renovation
Special Use Permit SUP# 23-4

GPIN 6983-48-7973-500

Owner/Applicant: County School Board of Fauquier County

02/07/2024

In approving a Special Use Permit, the Town Council may impose such conditions, safeguards, and restrictions as may be necessary to avoid, minimize, or mitigate any potentially adverse or injurious effect of such special uses upon other properties in the neighborhood, and to carry out the general purpose and intent of this Ordinance. The Council may require a guarantee or bond to ensure that compliance with the imposed conditions. All required conditions shall be set out in the documentation approving the Special Use Permit (SUP).

1. General: This Special Use Permit is issued covering the entire Property pursuant to the provisions of § 11-3.10 of the Town of Warrenton Zoning Ordinance.

2. 2. Site Development: The Property shall be developed in substantial conformance with the Special Use Permit Plan entitled, “Special Use Permit Plat,” prepared by Timmons Group, dated January 12, 2024. Minor changes and adjustments may be made to the road and street alignments, entrances, parking, dimensions and location of SWM/BMP facilities, the exact configuration and location of building footprints, and other similar features as shown on the SUP Plan, provided they meet the intent of these Conditions and are approved by the Director of Community Development or the Zoning Administrator.

3. Use Parameters:
    a. Special Use Permit Area – The Special Use Permit shall apply to the entire +/-39.18 acre site.
    b. Use Limitations – The use shall be limited to an institution and related facilities including the school and those accessory uses customarily incidental to the primary uses.

4. Signage: All signage shall comply with the applicable provisions of Article 6 of the Town of Warrenton Zoning Ordinance.

5. Environment: All landscaping shall be native and drought-resistant or other species as may be approved on the final site plan(s).
    a. Landscaping – The Applicant shall make all efforts to maintain and preserve the existing mature vegetation and hardwood trees when feasible.

b. Minimize Clearing and Grading – The Applicant shall show the limits of clearing and grading for the site on the approved final site plan(s). For portions of buffers located outside the limits of clearing and grading, the existing vegetation shall be preserved and supplemented to meet the intent the buffer as noted above. In addition, existing trees and shrubs shall be incorporated into the landscaping plan. This does not preclude the removal of diseased, noxious and/or invasive vegetation.

6. Lighting:
    a. Proposed lighting shall be reviewed during the review of the Certificate of Appropriateness and at the time of site plan in accordance with the Zoning Ordinance.
    b. Building-mounted security lighting, which is full cut-off and directed toward the building and in compliance with the Zoning Ordinance, shall be permitted.
    c. All other proposed lighting shall be addressed at site plan in accordance with the Zoning Ordinance.

7. Transportation:
    a. Vehicular Access – The primary site shall be accessed from E. Shirley Avenue with a secondary access from the bus loop entrance to Brumfield ES off of Alwington, which will also be the primary parent drop-off and pick up route. Egress shall be controlled via a stop sign traffic control with stop bar at the exits. The existing traffic signal will control the bus exit from the middle school site.
    b. Handicapped Parking and Signage – Handicapped parking and signage for shall be provided in accordance with the PFM and the Americans with Disabilities Act.
    c. At the time of Final Site Plan, dedication of a public access easement shall be dedicated along E. Shirley Avenue from the southern parking lot entrance to the Southern Property line with the adjacent Community Center as well as on the portion of the school property south of the existing Community Center extending west to Alwington Blvd. The public access easement shall be of sufficient width to facilitate the extension of a future 10’ wide Shared Use Path.

8. Water and Sewer: The site shall continue to be served by public water, with the property owner bearing all costs associated with providing the additional onsite services necessary to serve the school use. The site sanitary will be served by public sewer, with the property Owner responsible for the conveyance of the sewer to the Town pump station. No improvements to the pump station or related infrastructure will be required as part of this project.

9. Retaining Walls: To minimize grading and impact to existing features, the site retaining walls reflected on the SUP Plat may exceed the minimum height requirements as specified in Section 2-19.4 of the Town of Warrenton 2006 Zoning Ordinance.

TOWN OF WARRENTON
Department of Community Development
PO BOX 341
WARRENTON, VIRGINIA 20188
http://www.warrentonva.gov
TELEPHONE (540) 347-1101
FAX (540) 349-2414

February 9, 2024

Timmons Group
Attn: Luke Fetcho
20110 Ashbrook Place, Suite 100
Ashburn, VA 20147

RE: Special Use Permit Application (SUP 23-4) Taylor Middle School– Second Round Agency Comments

Dear Mr. Fetcho:

The attached comments are for the above refenced application that was officially accepted as of this date, September 29, 2023, with second submission received January 18, 2024.

REFERRAL AGENCY COMMENT SUMMARY			
Referral Agency	**Date**	**Outstanding Issues**	**Attached**
Planning	2/5/24	SUP Plan, multi-modal connections, transportation	X
Town Transportation Consultant	2/6/24	TIA comments, circulation, multi-modal connections	X
Zoning	2/7/24	Multiple SUP Plan and Zoning requirements	X
PW/PU	2/9/24	Water and sewer coordination	X
Emergency Service	1/22/24	Access gates	X
Police Department	2/7/24	No updates	X
VDOT	2/6/24	Pipeline Study, shared use path, design	X
Town Attorney		Review with Second Submission Conditions of Approval when submitted	

General overall comments continue to relate to the parcels relationship to the greater transportation network both internally and multi-modal interconnections. The Applicant should be aware that decision makers usually look at conditioning items like elevations, mitigating transportation impacts, refuse locations, and the other factors contained Article 11-3.10.3 of the Zoning Ordinance. All comments received to date are attached.

The application is scheduled for a Planning Commission work session on Tuesday, February 20, 2024 at 7:00 PM in Town Council Chambers.

Please do not hesitate to contact me at (540) 347-1101 X313 if you have any questions.

Sincerely,

Denise Harris

Denise Harris, AICP
Planning Manager

TOWN OF WARRENTON
Department of Community Development
PO BOX 341
WARRENTON, VIRGINIA 20188
http://www.warrentonva.gov
TELEPHONE (540) 347-1101
FAX (540) 349-2414

PLANNING STAFF COMMENTS

DATE: February 5, 2024

SUBJECT: Special Use Permit Application (SUP 23-4) Taylor Middle School
Planning 2nd Review Comments

The Applicant is requesting a SUP for an expansion to an existing middle school. The property is zoned Public/Semi Public (PSP) and is approximately 39.18 acres. Article 3-4.9.3 of the Town of Warrenton's Zoning Ordinance (ZO) allows school expansion to existing facilities equal to or over 10,000 square feet with the approval of a Special Use Permit by Town Council.

General Comments

The applicant has stated they are aware that as presented the SUP, and if approved, the subsequent Conditions of Approval, will apply to the entire parcel. If there are proposed modifications to either Taylor Middle School or Brumfield Elementary the approved SUP Plan may need to be amended.

The applicant has indicated the fields are not to be lit.

Fauquier County approved the Arrington rezoning modifications to lift the age restriction proffer. If developed, the residential units located to the southwest will utilize both the elementary and middle schools. The applicant should be aware of the Concept Development Plan and Proffers related to this rezoning as it contains three development options. At this time, the property is located in the County with associated proffers. However, if it boundary line adjusts into the Town there are several additional proffers will be triggered that may impact the schools.

Plan Warrenton 2040

Plan Warrenton 2040 designates Taylor Middle School in the Greenway and Makers Character District. The summary of this district *states "Future planning shall ensure that the Town, county, and School District properties are walkable and accessible from adjoining neighborhoods...The Greenway and Makers District will maintain the current zoning of 35 feet, or one to three stories, as a transition zone in areas adjacent to the Warrenton Branch Greenway, industrial zoned areas and where James Brumfield Elementary, Taylor Middle School, and the Warrenton Community Center are located."* Shirley Avenue is

considered a "Boulevard" road on the Warrenton Street Typology Map. The following are statements from chapters of the comprehensive plan as they relate to schools.

Community Facilities

Vision includes key aspirations of fostering high quality, equitable, and accessible community facilities; reinforcing the role of County community facilities into the Town fabric; and promoting livability through properly located schools.

CF-1.12 Encourage schools to retain their presence in Town in walkable, safe, environmentally appropriate locations.

CF-3.7 All public facilities and utilities should be designed and developed so as to limit environmental degradation and protect the public environment. Safeguard floodplain and environmentally critical areas through the prohibitions against public facility development.

Previous Staff Comment: The applicant should explore options to interconnect Taylor Middle School with the surrounding neighborhoods through multi-modal bicycle/pedestrian facilities. Careful attention should be given to the potential environmental impacts as the proposal includes retaining walls, a new road, and relocated fields. In addition, Brumfield Elementary, located on the same parcel, contains a wetland that was constructed as part of a grant from the Virginia Department of Game and Inland Fisheries as part of the County and Town MS4 programs. How will the proposal impact the wetlands?

Comment Remains: The applicant provided for a right-of-way easement for a multi-use trail on the southern portion of the property adjacent to Walmart. However, there is no connection being built between the elementary and middle school or to the Community Center along the frontage of Shirley Avenue. Nor is there a sidewalk provided on the access road. This will lead to students and residents walking on the access road and through parking lots to create a potentially dangerous situation when mixed with vehicles.

Historic Resources

Taylor Middle School opened in 1952 as a segregated high school. Named after William C. Taylor who served as the principal for the Warrenton Rosenwald School, the school has stood as an important landmark to the Town's history. It became an integrated junior high in 1969.

While the school is not located within the Town's historic district and it not designated on the National Register, it is an important historical resource. Plan Warrenton 2040 includes the following Historic Resources goals:

- Conserve, reuse, and promote historic resources to enhance the Town's sense of place...
- Preserve the authenticity and tell the stories of historic resources for generations to come through documentation.
- Educate the community on the value of the historic resource.
- Enhance the environment through preservation and sustainability best practices.

Previous Staff Comment:

The Applicant's Statement of Justification acknowledges the historical importance of the school. Town staff is available to help facilitate discussions between the applicant and the Virginia Department of Historic Resources as there is a strong desire to help preserve and celebrate African American Heritage sites.

Comment Remains: The applicant provided more detail on how the middle school will work to preserve the historical significance of the school. Town staff offers to help in any fashion on facilitating conversations regarding Historic Resources.

Transportation and Circulation

"Make Shirley Avenue walkable, with continuous sidewalks that are lined with street trees."

Plan Warrenton 2040 includes a Transportation Plan map that includes improvements to Shirley Avenue as well as bicycle and pedestrian connections. Both comprehensive plans for Fauquier County and the Town illustrate this property as a key linkage for bicycle and pedestrian facilities from neighborhoods to the north, west, and south.

Previous Staff Comment: Taylor Middle School and Brumfield Elementary are located on a key public parcel to link neighborhoods and trails to the schools through bicycle and pedestrian connections. Both the Town of Warrenton and Fauquier County comprehensive plans indicate these important linkages on the adopted maps. This is an opportunity for the FCPS, the Town, and VDOT to work together to ensure these linkages are achieved.

Comment Remains: The applicant provided right of way dedication for a multi-use trail on the southern portion of the property but stated it does not intend to build walkable access points from the south or west to access the school. The existing sidewalk on a portion of Shirley will remain with the connection to the Greenway. The VDOT Pipeline Study is currently recommending this is upgraded to an upgraded Pedestrian Hybrid Beacon and a shared use path along the frontage of Shirley Avenue from the crossing to the southern portion of the property.

Land Use and Character District

Greenway and Makers Character District will be promoted as the southern gateway into Town and maintain the critical linkages between education, civic uses and the surrounding neighborhoods. L-5.1 states "The Town, County, and School District properties should be walkable and accessible from the adjoining neighborhoods."

Previous Staff Comment: Schools serve as vital community centers for residents. The Town is dedicated to enhancing its walkability and looks forward to working with the schools and VDOT to bring this to fruition.

Comment Remains: There is no multi-modal infrastructure provided to the west or between the existing schools.

Transportation

A TIA was provided and is being reviewed with the SUP plans by VDOT and the Town's transportation consultant (see attached Kittleson comments). In 2017, the Town conducted Walkability Audits and published a Complete Streets Guide. Both these documents were incorporated and adopted into the 2040 Plan Warrenton comprehensive plan (see above). In addition, VDOT is currently undertaking a "Pipeline Study" of Shirley Avenue to assess multi-modal safety, accessibility, and capacity.

Previous Staff Comment: It would be beneficial for the applicant to meet with the Town, VDOT, and the County to discuss the larger transportation picture in this area. There may be opportunities to ensure the safety and operational efficiencies of both the elementary and middle schools, and ensure multi-modal linkages to adjacent neighborhoods and the Greenway.

Comment: The applicant met with VDOT, the County, and the Town to discuss the larger transportation initiatives and the key role the school parcel plays. As a result of this meeting, the applicant modified the access road alignment and has indicated right-of-way dedication provisions for a multi-use trail on the southern portion of the property adjacent to Walmart and the frontage along Shirley Avenue. However, as the Pipeline Study has progressed, taking the ideas from this meeting into account, there are recommendations for a shared use path along Shirley Avenue from the Greenway crossing south and an upgraded Pedestrian Hybrid Beacon.

Fauquier County Service District

This property is adjacent to the Town/County boundary and serves the surrounding student population of both Warrenton and Fauquier County. An active Rezoning and Special Exception application for Arrington was just passed by the Fauquier County Board of Supervisors that lifts the age restricted housing.

Previous Staff Comment: The property that encompasses Brumfield Elementary and Taylor Middle School will be in easy walking distance from adjacent neighborhoods.

Comment: Fauquier County Board of Supervisors and the Warrenton Town Council have passed resolutions regarding the property owner of the Arrington parcels desire to boundary line adjust into the Town. The applicant is encouraged to review the rezoning and proffers approved by Fauquier County as they contain three development scenarios with proffers that may impact the schools. The applicant did take into account potential transportation improvements at the Brumfield entrance; however, there may be additional proffers related to sewer and other miscellaneous items that interest the applicant.

Legal Comments Provided by Town Attorney

Major Safety Issue

The proposed 12' retaining wall shown on the plan page C3.01 is an ongoing safety issue for a middle school campus. The presence of a 42" fence at the top, as addressed in the Timmons Group Jan. 12 letter, does not necessarily mitigate the impact of this safety issue under the circumstances presented. The justification advanced for the retaining wall in excess of 6' consists solely of (1) minimizing impact to wetlands, (2) minimize clearing on that side of the building adjacent to the proposed emergency access road, and (3) maintaining the existing gravel track and

diamond field. Those are design choices that do not dictate the creation of a retaining wall twice the height of a by-right retaining wall.

Additional Issues

The following are all comments about Page C1.01 of the plans:

1. The project narrative references a site plan; this is incorrect.
2. Site Information Note 2 references a "Jeffrey A. Smeraldo" without indicating his affiliation or qualifications.
3. Note 7 (on floodplain coverage) is unclear because the portions after the first semicolon lack a verb. This needs to be rewritten for clarity.

KITTELSON & ASSOCIATES

TECHNICAL MEMORANDUM

Taylor Middle School Traffic Impact Study (2nd Submittal) Review

Date:	February 6, 2024	Project #: 284490.007
To:	Denise Harris, AICP	
From:	Liz Byrom, PhD, PE; and Chris Tiesler, PE, PTOE	

At the request of the Town of Warrenton, Virginia, Kittelson & Associates, Inc. (Kittelson) reviewed the following documents related to the proposed expansion of Taylor Middle School:

- Taylor Middle School Traffic Impact Analysis (TIA), second submittal dated January 12, 2024, prepared by Timmons Group (Reference 1)
- Taylor Middle School Special Use Permit application and supporting documentation (Reference 2).

All analysis inputs and assumptions were reviewed according to Virginia Department of Transportation (VDOT) *Traffic Operations and Safety Analysis Manual* (TOSAM) and requirements (Reference 3).

FINDINGS AND RECOMMENDATIONS

The following comments are related to function of the proposed development and its impact on the adjacent transportation system:

- Volumes between Site Entrances on Shirley Avenue are still not balanced even though there are no driveways between the intersections that could result in the addition/subtraction of trips. For example, on Figure 8-1, 42 trips are added southbound on Shirley Avenue between Site Entrance #2 and #3 during the AM peak hour. Other smaller imbalances between Site Entrances #1, #2, and #3 exist in all three study time periods and analysis scenarios. Because Site Entrances #2 and #3 operate with minor-street stop control, mainline volumes on Shirley Avenue and the availability of gaps in those traffic streams directly influence the calculated levels of service (LOS), capacity, and forecast 95th percentile queue lengths of critical movements. While the reported traffic operational results indicate that the minor-street stop-controlled movements generally operate within acceptable operational thresholds, these imbalances (and other revisions noted below that may impact traffic operations) should be corrected.

- The TIA does not discuss anticipated pedestrian or bicycle activity between the elementary and middle schools, and the site plan does not identify a route or designated facility to provide for such activity/movements. Given the nature of the middle school and surrounding land uses, pedestrian and bicycle activity between and amongst the residential development (Arrington

Development), two school campuses, and the adjacent community center are likely and should be addressed/accommodated.

- The revised site plan provides approximately 70 feet of throat depth for exiting traffic at Site Entrance #3. However, the analysis shows that during the 2032 School PM peak hour, the forecast 95th percentile queue will be 100 feet. Under this condition, one to two vehicles in the queue will still be stored along the internal perpendicular drive aisle (could be from either direction or both), which may adversely impact on-site circulation and parking maneuvers for several parking spaces in the vicinity of this internal intersection. The current location of Site Entrance #3 in the middle of the parking field also creates unusual "dead end" parking drive aisles closest to Shirley Avenue. Parking maneuvers in these drive aisles may be difficult and could also lead to this portion of the parking lot being underutilized. See **Attachment A** for a rough sketch of an alternative alignment/location for Site Entrance #3 that may provide better separation of parent pick-up/drop off activity and parking circulation. Our cursory review indicates that the northbound left-turn lane on Shirley Avenue could be shifted south to this new entrance and still be developed within the available physical distance between this entrance and the adjacent community center driveway to the south.

- It is unclear what on-site route parents doing pick-up/drop-off should take after entering Site Entrance #3. Does the school intend to have staff direct parents to the appropriate path in order not to complicate student pick-up/drop off? Is wayfinding signage proposed on-site? The current layout of the parking lot will tend to mix vehicles parking and those performing pick-up/drop-off activities, which could create added friction and on-site circulation challenges.

- Page 1-5: Per comments above, the expansion of the middle school will impact local connectivity, especially with the elementary school. Kittelson recommends replacing "no impact on the surrounding network" text with additional narrative that better reflects the anticipated circulation and travel patterns of all modes between the adjacent land uses (two schools, nearby residential development, and community center) as well as planned parent pick-up/drop-off routing of kiss-n-ride vehicular traffic.

- The Synchro files are not utilizing appropriate peak hour factors (PHF) in the future conditions. For example, the intersection of Shirley/Culpepper in the existing conditions has a PHF of 0.88. In the 2026 background conditions, it increases to 0.94. Another example is that the James Madison Highway/Alwington Boulevard intersection has a PHF of 0.86 in the existing conditions and 0.95 in 2026 conditions. Per TOSAM, the future conditions analyses should assume a default PHF of 0.92 when PHF is lower in existing conditions.

- The special use permit plan (C3.01) shows storage lengths that are not consistent with the storage listed on page 6-4. The western entrance (Site Entrance #1) right turn has storage of 85 feet and taper of 50 feet. The northbound left turn for this entrance has 50 feet of taper length that is not

included in the model. Per TOSAM, Synchro and SimTraffic models should reflect "effective storage length", which is equal to the existing striped storage length plus half of the taper length.

- Design plans and traffic analyses should be updated to address these comments so that the operational performance and anticipated queue lengths at the Site Entrances are still adequate and forecast queues can be stored within available turn lane lengths and will not adversely impact on-site circulation or parking maneuvers. After these changes, please confirm that queues are still maintained within the provided storage.

The following comments list minor technical or typographical errors noted in the TIA and analysis files through our review. While we don't anticipate these to fundamentally affect the conclusions or recommendations of the TIA, they should be addressed/corrected to support the technical accuracy of the TIA:

- **Page 2-1**: There appears to be a typo "Route 17 carries approximately 9,700~~0~~ vehicle per day." In addition, we recommend using consistent naming conventions throughout the document when referring to roadways (e.g., Route 15 versus US 15).
- **Page 2-2**: The sentence "No VDOT traffic data available for Alwington Boulevard" is not needed as volumes are provided in the following sentence.
- **Page 3-3**: We recommend that actual lane widths be approximated rather than a standard 12' for all approaches. The existing lane widths along Shirley Avenue appear to be closer to 11'.
- **Page 6-2**: We recommend that sub bullet 'a' be separated from bullet '6' like you have done in other sections.
- Typos are present in the operational summary tables. For example, the WBT at Culpepper St/Shirley Ave in the 2026 Background – School PM peak show a delay of 2.7 seconds and a LOS A. However, the Synchro results show that the calculated delay is 22.7 seconds and has a LOS of C. All tables should be reviewed and corrected. Related text should also be updated.
- Synchro: We recommend all analysis files and level of service tables be updated to reflect any changes related to the comments above.
- Page numbers appear to be off. For example, Section 6 starts on page 6-2.

Thank you for the opportunity to review. If you have any questions, please contact us at 919.473.9529.

ATTACHMENTS

Attachment A – Alternative Site Entrance #3 Location Sketch

REFERENCES

1. Timmons Group. Taylor Middle School – Addition Traffic Impact Analysis. September 2023.
2. Timmons Group. Taylor Middle School Special Use Permit application and supporting documentation. January 2024.

3. Virginia Department of Transportation. *Traffic Operations and Safety Analysis Manual* – Version 2.0. February 2020.

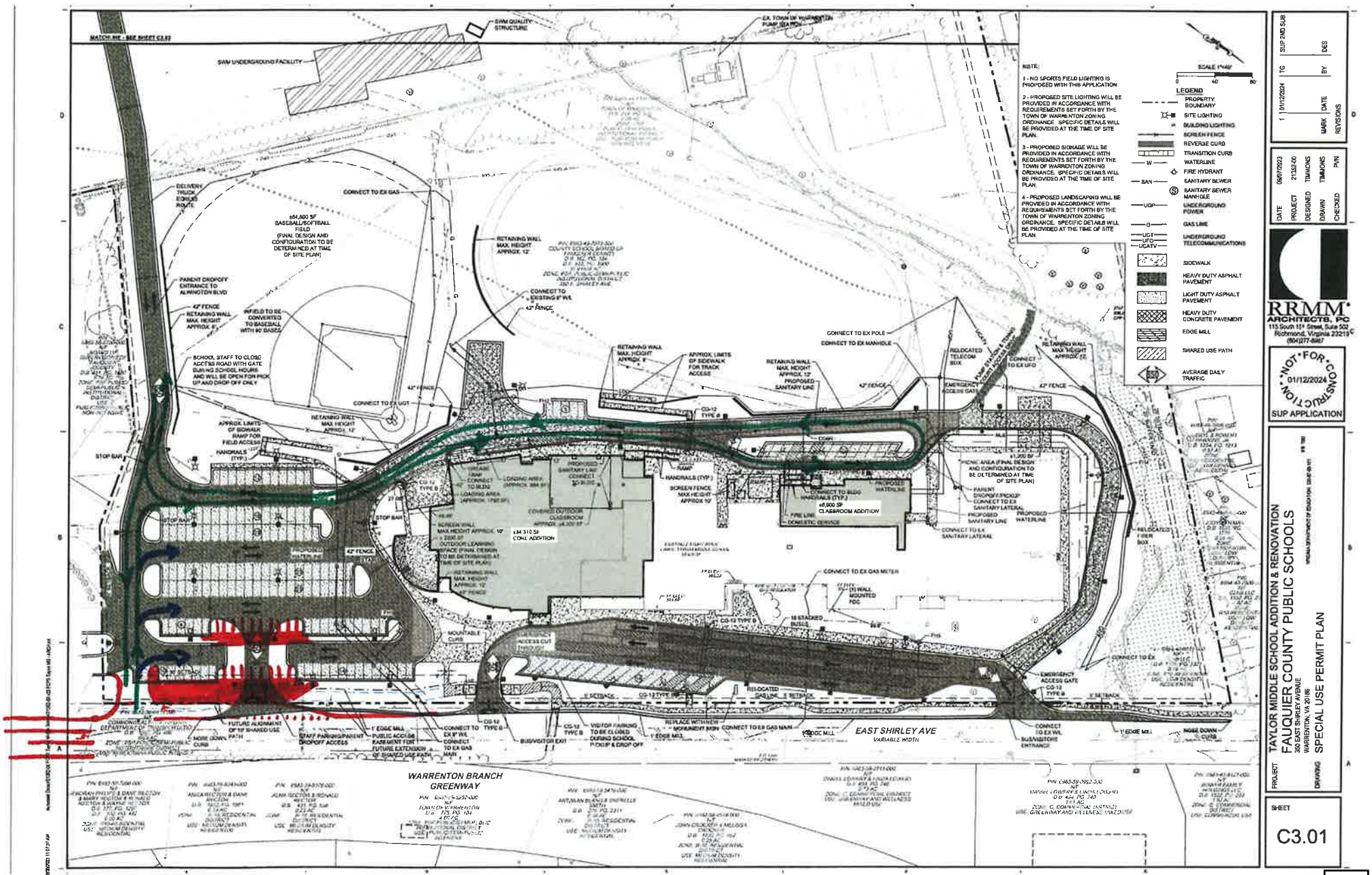
DISCLAIMER

This memorandum prepared by KITTELSON & ASSOCIATES INC. merely represents our professional, unbiased opinion with regard to the deliverable. This opinion is based solely on KITTELSON & ASSOCIATES, INC.'S evaluation of the information provided by the Town of Warrenton, and should not be considered an exhaustive review, insurance against errors or omissions in the deliverable, or advocacy of the intended project. The Town of Warrenton agrees that the purpose and intent of KITTELSON & ASSOCIATES, INC.'S evaluation of the deliverable is to reduce the risk of errors or omissions only and not to eliminate such risk. KITTELSON & ASSOCIATES, INC. offers no warranty or guarantee with regard to this plan review.

Attachment A

Alternative Site Entrance #3

Concept Sketch


NOTE:
1 - NO SPORTS FIELD LIGHTING IS PROPOSED WITH THIS APPLICATION
2 - PROPOSED SITE LIGHTING WILL BE PROVIDED IN ACCORDANCE WITH REQUIREMENTS SET FORTH BY THE TOWN OF WARRENTON ZONING ORDINANCE. SPECIFIC DETAILS WILL BE PROVIDED AT THE TIME OF SITE PLAN.
3 - PROPOSED SIGNAGE WILL BE PROVIDED IN ACCORDANCE WITH REQUIREMENTS SET FORTH BY THE TOWN OF WARRENTON ZONING ORDINANCE. SPECIFIC DETAILS WILL BE PROVIDED AT THE TIME OF SITE PLAN.
4 - PROPOSED LANDSCAPING WILL BE PROVIDED IN ACCORDANCE WITH REQUIREMENTS SET FORTH BY THE TOWN OF WARRENTON ZONING ORDINANCE. SPECIFIC DETAILS WILL BE PROVIDED AT THE TIME OF SITE PLAN.
SCALE 1"=40'
LEGEND
PROPERTY BOUNDARY
SITE LIGHTING
BUILDING LIGHTING
SCREEN FENCE
REVERSE CURB
TRANSITION CURB
WATERLINE
FIRE HYDRANT
SANITARY SEWER
SANITARY SEWER MANHOLE
UNDERGROUND POWER
GAS LINE
UNDERGROUND TELECOMMUNICATIONS
SIDEWALK
HEAVY DUTY ASPHALT PAVEMENT
LIGHT DUTY ASPHALT PAVEMENT
HEAVY DUTY CONCRETE PAVEMENT
EDGE MILL
SHARED USE PATH
AVERAGE DAILY TRAFFIC
MATCH LINE - SEE SHEET C3.02
SWM QUALITY STRUCTURE
SWM UNDERGROUND FACILITY
EX. TOWN OF WARRENTON PUMP STATION
DELIVERY TRUCK EXHAUST ROUTE
±54,400 SF BASEBALL/SOFTBALL FIELD (FINAL DESIGN AND CONFIGURATION TO BE DETERMINED AT TIME OF SITE PLAN)
CONNECT TO EX GAS
RETAINING WALL MAX. HEIGHT APPROX. 12'
CONNECT TO EXISTING 8" WL
42" FENCE
PARENT DROPOFF ENTRANCE TO ALWINGTON BLVD
INFIELD TO BE CONVERTED TO BASEBALL WITH 90' BASES
SCHOOL STAFF TO CLOSE ACCESS ROAD WITH GATE DURING SCHOOL HOURS AND WILL BE OPEN FOR PICK UP AND DROP OFF ONLY
CONNECT TO EX UGT
APPROX. LIMITS OF SIDEWALK RAMP FOR FIELD ACCESS
HANDRAILS (TYP.)
STOP BAR
CONNECT TO EX POLE
CONNECT TO EX MANHOLE
APPROX. LIMITS OF SIDEWALK FOR TRACK ACCESS
RETAINING WALL MAX. HEIGHT APPROX. 12' PROPOSED SANITARY LINE
RELOCATED TELECOM BOX
CONNECT TO EX UFO
EMERGENCY ACCESS GATE
RETAINING WALL MAX. HEIGHT APPROX. 12'
CG-12 TYPE B
RAMP
SCREEN FENCE MAX HEIGHT APPROX 10'
PROPOSED WATERLINE
CONNECT TO BLDG HANDRAILS (TYP.)
±6,900 SF CLASSROOM ADDITION
FIRE LINE
DOMESTIC SERVICE
CONNECT TO EX SANITARY LATERAL
PROPOSED SANITARY LINE
RELOCATED FIBER BOX
±34,310 SF CONC ADDITION
COVERED OUTDOOR CLASSROOM APPROX. ±4,300 SF
OUTDOOR LEARNING SPACE (FINAL DESIGN TO BE DETERMINED AT TIME OF SITE PLAN)
CONCRETE AREA (FINAL DESIGN AND CONFIGURATION TO BE DETERMINED AT TIME OF SITE PLAN)
PARENT DROPOFF/PICKUP
CONNECT TO EX SANITARY LATERAL
CONNECT TO EX GAS METER
(1) WALL MOUNTED FDC
16 STACKED BUSES
MOUNTABLE CURB
ACCESS CUT THROUGH
EMERGENCY ACCESS GATE
CG-12 TYPE B
CONNECT TO EX
CONNECT TO EX WL
BUS/VISITOR ENTRANCE
1' EDGE MILL
NOSE DOWN CURB
FUTURE ALIGNMENT OF 10' SHARED USE PATH
STAFF PARKING/PARENT DROPOFF ACCESS
PUBLIC ACCESS EASEMENT FOR FUTURE EXTENSION OF SHARED USE PATH
CONNECT TO EX 8" WL
CONNECT TO EX GAS MAIN
BUS/VISITOR EXIT
VISITOR PARKING TO BE CLOSED DURING SCHOOL PICKUP & DROP OFF
REPLACE WITH NEW MONUMENT SIGN
CONNECT TO EX GAS MAIN
EAST SHIRLEY AVE
VARIABLE WIDTH
WARRENTON BRANCH GREENWAY
PIN: 6983-54-5252-000
N/F
TOWN OF WARRENTON
D.B. 175 PG. 134
4.67 AC
ZONE: R-B RESIDENTIAL
USE: PUBLIC PARK
PIN: 6983-54-3913-000
N/F
ANTJUAN BLANCE SHERELLE SMITH
D.B. 2015 PG. 2311
0.34 AC
ZONE: R-B RESIDENTIAL DISTRICT
USE: MEDIUM DENSITY RESIDENTIAL
PIN: 6983-54-4168-000
N/F
JOHN CROCKER & MELISSA CROCKER
D.B. 1922 PG. 152
0.34 AC
ZONE: R-B RESIDENTIAL DISTRICT
USE: MEDIUM DENSITY RESIDENTIAL
PIN: 6983-54-2111-000
N/F
DAVID LOWERY & LINDA LOWERY
D.B. 424 PG. 240
0.73 AC
ZONE: C COMMERCIAL DISTRICT
USE: GREENWAY AND VILLAGE MIXED USE
PIN: 6983-59-3952-000
N/F
DANIEL LOWERY & LINDA LOWERY
D.B. 424 PG. 243
1.11 AC
ZONE: C COMMERCIAL DISTRICT
USE: GREENWAY AND VILLAGE MIXED USE
PIN: 6983-54-6127-000
N/F
RUBY H BAILEY
D.B. 1922 PG. 203
0.34 AC
ZONE: C COMMERCIAL DISTRICT
USE: COMMERCIAL USE
SETBACK
DATE 08/07/2023
PROJECT 21352-00
DESIGNED TIMMONS
DRAWN TIMMONS
CHECKED PVN
1 01/12/2024 TG SUP 2ND SUB
MARK DATE BY DES
REVISIONS
RRMM ARCHITECTS, PC
115 South 15th Street, Suite 502
Richmond, Virginia 23219
(804)277-8487
NOT FOR CONSTRUCTION
01/12/2024
SUP APPLICATION
PROJECT TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION
FAUQUIER COUNTY PUBLIC SCHOOLS
350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186
DRAWING SPECIAL USE PERMIT PLAN
SHEET C3.01

TOWN OF WARRENTON
Department of Community Development
PO BOX 341
WARRENTON, VIRGINIA 20188
http://www.warrentonva.gov
LandDevelopment@warrentonva.gov
(540) 347-2405

STAFF COMMENTS

TO: Denise Harris, AICP, Planning Manager

FROM: Amber Heflin, CZA, Zoning Official

DATE: February 7, 2024

SUBJECT: Taylor Middle School, 244 Waterloo Street (6983-48-7973-500)
SUP 2023- 4
Submission 01/18/2024; 2nd Review

I. Zoning Ordinance Review

The following analysis is based on the relevant Articles of the Zoning Ordinance.

Article 7 – Parking

Staff comment: ***Advisory comment remains:*** Staff will verify the proposed spaces will meet the required minimum dimensions at the time of site development plan.

The applicant will be required to demonstrate that parking stalls and drive aisle widths will meet minimum requirements at the time of site plan submission. Staff is unable to determine that these requirements have been met at this time.

Staff comment: *Comment remains*: Provide justification that two loading spaces will be adequate to handle the needs of the use.

Clarification: Justification with this submission is utilizing calculations within the Fauquier County Zoning Ordinance. The Town has separate requirements located under Article 7-18 of the Town of Warrenton Zoning Ordinance. Revise justification.

Article 8 – Landscaping

Staff comment: ***Advisory comment remains***: Staff is unable to verify landscaping requirements as no landscaping details have been provided. The statement of justification provided by the applicant notes landscaping will be addressed at the time of site plan submittal.

The applicant will be required to address landscaping at the time of site plan submittal. Zoning staff is unable to complete a full review to verify that landscaping requirements have been met at this time.

Article 9-8 – Lighting

Staff comment: ***Advisory comment remains***: The statement of justification acknowledges all lighting must meet the requirements of the Zoning Ordinance. All fixtures on site will require conformance to current lighting standards, and the photometric plan will be reviewed at the time of site plan submittal.

The applicant will be required to address site lighting at the time of site plan submittal. Zoning staff is unable to complete a full review to verify that lighting requirements have been met at this time.

Staff comment: *Comment remains*: The applicant provided a preliminary photometric plan for review with the SUP submittal, and staff is concerned that the site lighting proposed along Shirley Avenue will exceed 1.0 footcandle at the property line.

Clarification: Overall, the preliminary lighting plan looks acceptable. However, Zoning staff still has concerns about the site lighting at the entrances along Shirley Avenue. A more in-depth review of lighting requirements will be conducted at the time of site development plan, as fixture details may change.

Staff comment: ***Advisory comment remains***: Fixture cutsheets have not been provided for the proposed wall mounted lighting. Staff is unable to verify if proposed lights will meet Zoning Ordinance requirements.

The applicant will be required to address site lighting at the time of site plan submittal. Zoning Staff is unable to complete a full review to verify that lighting requirements have been met at this time.

Staff comment: ***Advisory comment remains***: Complete lighting plan was not provided with this submittal. The photometric plan only shows site lighting within the travel ways. Revise.

The applicant will be required to address site lighting at the time of site plan submittal. Zoning Staff is unable to complete a full review to verify that lighting requirements have been met at this time. See previous comment regarding the photometric plan.

TOWN OF WARRENTON
Department of Public Works & Utilities
PO BOX 341
WARRENTON, VIRGINIA 20188
http://www.warrentonva.gov
TELEPHONE (540) 347-1858
FAX (540) 349-2414

Memorandum

Date: February 5, 2024

To: Denise Harris, Planning Manager

From: Paul Bernard, Town Engineer
Steven Friend, Assistant Director, Public Utilities
John Ward, Assistant Director, Public Works

Re: SUP-23-04 Taylor Middle School Addition – 2nd Submission

The 2nd submittal provides no additional information than the 1st submission. This process for the Taylor Middle School major building addition SUP, the only comments at this time (which will be answered with more detailed plans) is to ensure that the modification to the access points to public streets, and revisions to the water and sanitary sewer system will need to be well coordinated with the current operations of the Taylor Pump Station and the connections to the existing water main ensuring adequate fire protection for the school. The Town is committed to provide adequate water and sewer facilities to support this program. The final project design will need to demonstrate adequate provisions for stormwater management and erosion and sediment controls meeting all the current Town and State ordinances and requirements including details and calculations as part of the final site plan submittal and review process.

This submittal has included a Statement of Justification (SoJ) that indicates the anticipated water demand and wastewater generation. The current monthly water use averages around 69,000 gallons. That would equate to around 3,450 gallons a day, assuming a 5-day week. The SoJ implies the projected wastewater generation from the new school will be around 15,600 gallons per day. While this is a significant increase over what is currently generated, the existing pumps at the pump station should be able to handle this, however, the Town will need to implement improvements to the current pump station's wet-well and structure.

The Traffic Impact Analysis implies no major impacts to the road network this proposal plans to connect to. This assessment is being reviewed by VDOT for their thoughts on the future planning for improvements to Shirley Highway.

More detailed infrastructure designs and details will be required with the construction site plan submittal and review process. Therefore, I have no additional comments at this time.

Warrenton Volunteer Fire Company, Inc.

167 West Shirley Ave. Warrenton, Virginia 20186
Fire Station 1 (540) 347-0522 EMS Station 1 (540) 347-4873
Business Services (540) 347-3232 Fax (540) 347-6513

MEMORANDUM

Date: October 15, 2023

From: James K. Swain, Fire Chief

To: Denise Harris, Planning Manager
Planning and Community Development – Town of Warrenton

Subject: Comments on Taylor Middle School – 350 East Shirley Ave.

Thank you for taking the time to seek our feedback and recommendations on the proposed project. Please see the bullet points below on some of our thoughts/ideas regarding Fire Department access and our ability to operate at the site during an emergency.

- Please provide information on the sprinkler system.
- Fire Department Connection (FDC) should be 4" stortz connection instead of 2.5" siamese.
- Water supply for FDC? It is on the same side of the building and not across the roadway blocking pathway of responding apparatus.
- Please show locations of all fire hydrants on the property so we can ensure coverage and locations are appropriate.
- Concrete pathway around building – width? Aerial apparatus needs at least 18' to set up for above grade operations i.e., access to the roof via aerial ladder.
- Pathways around building – to utilize ground ladders to access windows or rooflines for firefighters the ground needs to be level for ¼ of the height.
- Access gates around building, how are they secured? Will there be access for FD after hours and/or lock boxes? Due to locations lock boxes should be available on all gates.
- Lock boxes in front of the building are recommended as well as on the rear of the building. Due to the size of the building and the time it takes to walk around it we may need additional. We can coordinate later with FCPS Staff.
- Will there be non-ambulatory students or staff on upper floors? Do we have a plan to shelter in place in a particular classroom? Will that classroom be marked by the outside?
- Will the water supply be upgraded into the complex? Will this be a loop system?
- All curbs be rounded for better access?
- What will be the separation from the old building to the new construction?

Date: January 22, 2024

Subject: 2nd Submission Comments

- Access gates – the plans show they are locked during school hours. We need to design a plan where emergency services can gain access during emergencies.
- No further comments

We are looking forward to commenting on and working with the Town Officials as well as County Public Schools Staff relating to this building during construction and once completion has been achieved.

TOWN OF WARRENTON
POLICE DEPARTMENT
333 Carriage House Lane • Warrenton, Virginia 20186
Telephone (540) 347-1107 • Fax (540) 341-4190

To: Chief T. Carter

From: Major A. Arnold

Date: 02/07/24

Re: CPTED Assessment for Taylor Middle School 2nd Submission

I have reviewed the Special Use Permit paperwork and I have read the responses from the applicant on my suggestions submitted previously.

I have no further recommendations / updates at this time.

COMMONWEALTH of VIRGINIA
DEPARTMENT OF TRANSPORTATION
457 East Shirley Avenue
Warrenton, Virginia 20186

Stephen C. Brich, P.E.
Commissioner

Date: February 06, 2024

To: Denise Harris – Planning Manager Town of Warrenton.

cc: Ben Davison, P.E. VDOT

Re: **Taylor Middle School TIA & SUP** – 2nd Submission

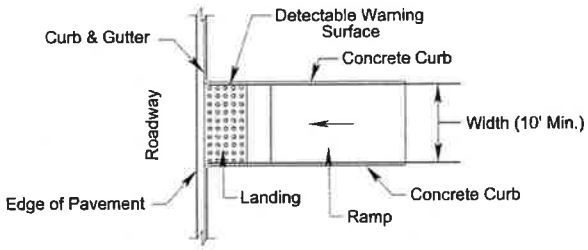
Dear Ms. Harris:

The above referenced Traffic Impact Analysis prepared by Gorove Slade with an engineer seal date of January 12, 2024, and a received by VDOT date of January 24, 2024, has been reviewed.

The following comments are advisory for the Town's consideration.

Special Use Permit Plans:

1. US 17 Business (Shirley Ave) is currently being studied as part of the Project Pipeline. The Pipeline study identified the need for additional Bike and Ped connectivity along Shirley Ave. (Land Use)
2. The shared use path width (10' min) should be extended across East Shirley Ave. The current plan shows narrow CG-12 for the connection with Shirley Ave.



Note: Ramp and Landing to be constructed of Hydraulic Cement Concrete Sidewalk (4" Depth)

Curb & Gutter Typical
(St'd. CG-12, Type B with Buffer Strip)
Not To Scale

FIGURE A(1)-11* ST'D. CG-12 TYPE B FOR SHARED USE PATH WITH CURB & GUTTER

3. While the public access easement for the future trail extension of the shared use path appears to be conceptual feasible, the proposed grading needs to be confirmed in order to ensure that the shared path can be constructed in the future. VDOT recommends that the shared use path is rough

graded with the future site plan. A typical cross section showing existing grades of Shirley Ave, future shared use path and proposed parking lot is recommended.

4. The current/proposed entrance geometry does not appear to meet VDOT standards. The minimum entrance width is 30'. Since this road is within the Town jurisdiction, VDOT will defer to the Town. VDOT recommends that all proposed entrance radius are confirmed with Autoturn movements.

Commercial Entrance Designs along Highways with Curb and Gutter

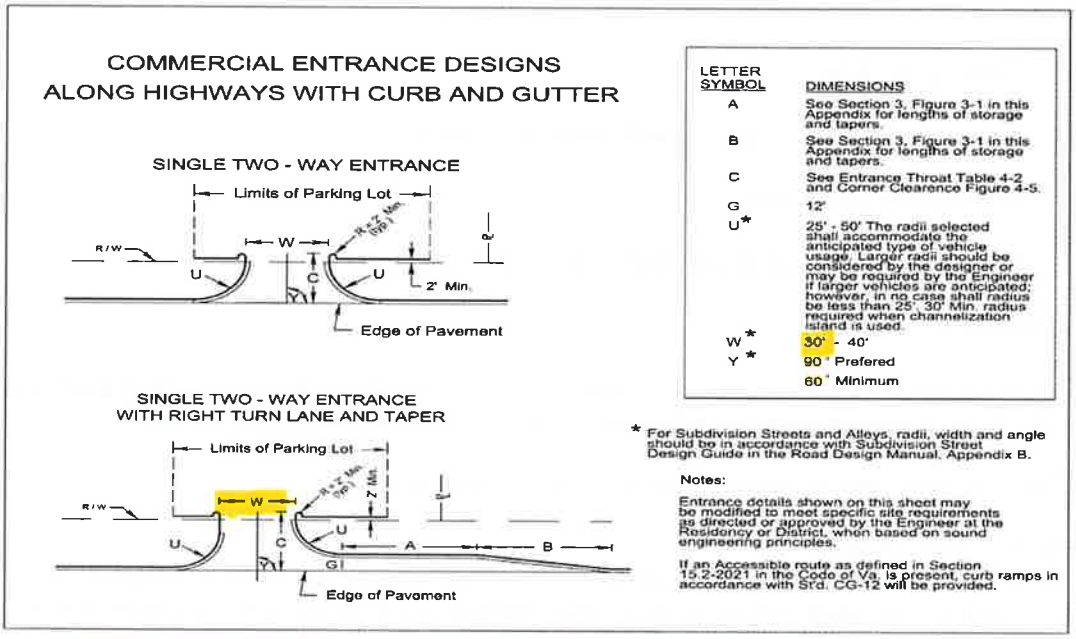


FIGURE 4-10 COMMERCIAL ENTRANCE DESIGNS ALONG HIGHWAYS WITH CURB AND GUTTER*

5. The existing turn lane widths, length of storage, and taper lengths do not appear to meet VDOT min standards. VDOT understands that there are site constraints but standard turn lane geometry is recommended to ensure safety. The SUP plans do not provide enough detail to provide a complete review.

required.

LENGTH OF STORAGE	TAPER - Urban	
Urban - Length determined by capacity analysis for Left and Right Turn Storage (100' Minimum)	- For Design Speeds 50 MPH or Higher	**T - 200' Min.
	- For Design Speeds 45 MPH or Less	**T - 100' Min. (single) **T - 150' Min. (dual)

FIGURE 3-1 RIGHT AND LEFT TURN LANE CRITERIA FOR SINGLE AND DUAL LANES

(*) For instructions on selection of design speed, see *Appendix A1.*

6. Advisory – The parent dropoff access road does not meet corner clearance min. of 225' from Alwington Bvd. Please note that since Alwington Blvd is not currently classified as a major roadway so this comment is advisory.

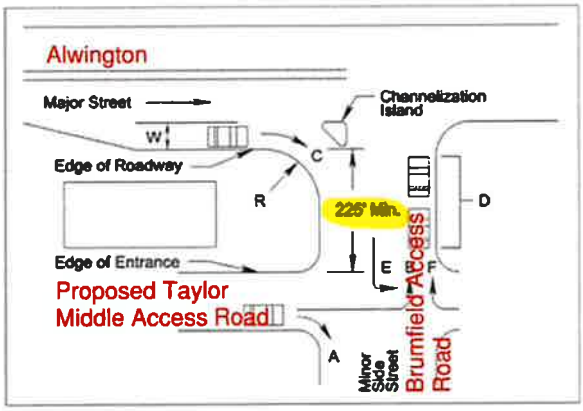


FIGURE 4-5 CORNER CLEARANCE

7. The design speed for the parent dropoff access road to Alwington Blvd should be defined. The retaining wall appears to be within the clearzone of the private access road and should be located either outside of the clearzone or protected with guardrail.
8. Please ensure that clear zone is free of fixed objects and that the slopes within the clear zone meet the town's design requirements based on the proposed design speed.
9. VDOT recommends that the Town ensure that the internal parking lot and internal access roads will handle the school operations.

The Taylor Middle School TIA and SUP was sent to Culpeper District Traffic Engineering and Planning for review. No comments were generated from their review.

Please contact me at 540-229-1164 or craig.simpson@vdot.virginia.gov if there are any questions or concerns.

Sincerely,

Simpson Craig abz63842

Craig M. Simpson, P.E.
Assistant Resident Engineer – Land Use
Warrenton Residency

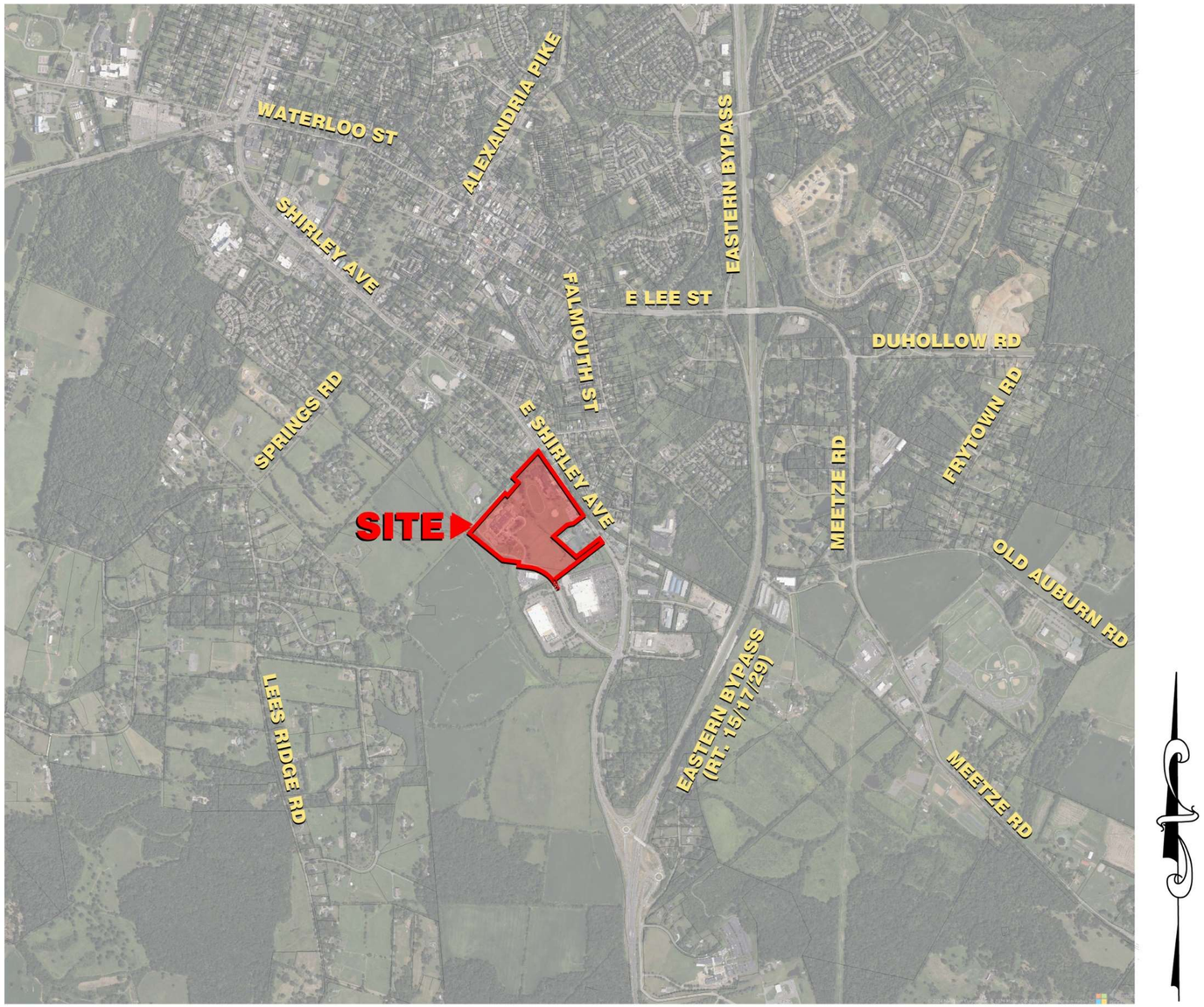
TAYLOR MIDDLE SCHOOL

ADDITION & RENOVATION

FAUQUIER COUNTY PUBLIC SCHOOLS

350 EAST SHIRLEY AVENUE
WARRENTON, VA 20186

TIMMONS GROUP
ENGINEERING | DESIGN | TECHNOLOGY



VICINITY MAP

FAUQUIER COUNTY PUBLIC SCHOOLS

TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION

350 EAST SHIRLEY AVENUE

WARRENTON, VA 20186

TIMMONS GROUP

ENGINEERING | DESIGN | TECHNOLOGY

PROUD LEGACY

- **IN 1952, WILLIAM C. TAYLOR HIGH SCHOOL OPENED AS THE FIRST HIGH SCHOOL TO SERVE AFRICAN AMERICAN STUDENTS IN THE WARRENTON AREA. MANY W.C. TAYLOR ALUMNI REMAIN ACTIVE MEMBERS OF THE WARRENTON COMMUNITY. THE SCHOOL'S HISTORY AND STRONG ROOTS MAKE THIS BUILDING A LANDMARK FOR MANY IN THE LOCAL COMMUNITY.**

- **MANY DESCENDANTS OF W.C. TAYLOR HIGH SCHOOL ALUMNI HAVE ATTENDED, OR CURRENTLY ATTEND, WHAT IS NOW CALLED W.C. TAYLOR MIDDLE SCHOOL. THE SHARED USE OF THE W.C. TAYLOR BUILDING OVER MULTIPLE GENERATIONS HAS ENHANCED THE COMMUNITIES SENSE OF PRIDE AND HERITAGE.**

- **THE W.C. TAYLOR AUDITORIUM CARRIES A RICH LEGACY OF IT'S OWN. THE AUDITORIUM HAS SERVED AS A POPULAR ENTERTAINMENT VENUE, HOSTING MANY WELL-KNOWN REGIONAL AND NATIONAL ARTISTS. THE AUDITORIUM IS A PARTICULARLY IMPORTANT SPACE FOR MEMBERS OF THE W.C. TAYLOR HIGH SCHOOL ALUMNI COMMITTEE.**

- **THE PROPOSED ADDITION / RENOVATION OF W.C. TAYLOR MIDDLE SCHOOL STRIVES TO PRESERVE THE HISTORIC NATURE OF THE EXISTING BUILDING, WHILE IMPROVING THE LEARNING ENVIRONMENT FOR IT'S STUDENTS AND STAFF. THE PROPOSED ADDITIONS COMPLIMENT THE ARCHITECTURE OF THE EXISTING BUILDING, INCREASE STUDENT CAPACITY, AND ALLOW FOR A MORE FUNCTIONAL AND ENERGY EFFICIENT SCHOOL.**

PROJECT HISTORY

FAUQUIER COUNTY PUBLIC SCHOOLS

TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION

350 EAST SHIRLEY AVENUE

WARRENTON, VA 20186

TIMMONS GROUP

ENGINEERING | DESIGN | TECHNOLOGY

MATCHLINE - SEE SHEET C3.02

EXISTING ATHLETIC TRACK

APPROXIMATE EASEMENT AREA

PROPOSED BASEBALL FIELDS

APPROXIMATE LOCATION OF PROPOSED 6' RETAINING WALL

PROPOSED SIDEWALK AND RAMP FOR FIELD ACCESS

PROPOSED BASEBALL DIAMOND

PROPOSED 42" FENCE

APPROXIMATE LOCATION OF PROPOSED RETAINING WALL

EXISTING ATHLETIC FIELD (TO REMAIN)

APPROXIMATE LOCATION OF PROPOSED RETAINING WALL

PROPOSED 42" FENCE

APPROXIMATE LOCATION OF PROPOSED RETAINING WALL

EMERGENCY ACCESS GATE

APPROXIMATE LOCATION OF PROPOSED RETAINING WALL

PROPOSED 42" FENCE

APPROXIMATE LOCATION RETAINING WALL

42" FENCE

LOADING AREA

PROPOSED PARKING

LOADING AREA

±47,435 SF (GROSS) PROPOSED ADDITION

COVERED OUTDOOR CLASSROOM

±20,796 SF (GROSS) PROPOSED ADDITION

PICNIC AREAS

PARENT DROPOFF

PROPOSED PARKING

42" FENCE STAIRS

OUTDOOR LEARNING SPACE

PROPOSED STATUE

RET. WALL 42" FENCE

EXISTING ±80,794 SF SCHOOL BUILDING (±80,794 SF TO REMAIN AFTER ±6,898 SF OF DEMOLITION)

EMERGENCY ACCESS GATE

PROPOSED BUS LANES

STAFF PARKING/ PARENT DROPOFF ACCESS

PUBLIC ACCESS EASEMENT FOR FUTURE EXTENSION OF SHARED USE PATH

EMERGENCY ACCESS CUT THROUGH

PROPOSED SITE ACCESS (EXIT ONLY)

PROPOSED SIDEWALK

PROPOSED CROSSWALK CONNECTION TO GREENWAY

PROPOSED VISITOR PARKING

PROPOSED VISITOR PARKING LANE

EXISTING BUS/VISITORS ENTRANCE TO REMAIN

PROPOSED SITE LAYOUT

FAUQUIER COUNTY PUBLIC SCHOOLS

TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION

350 EAST SHIRLEY AVENUE

WARRENTON, VA 20186

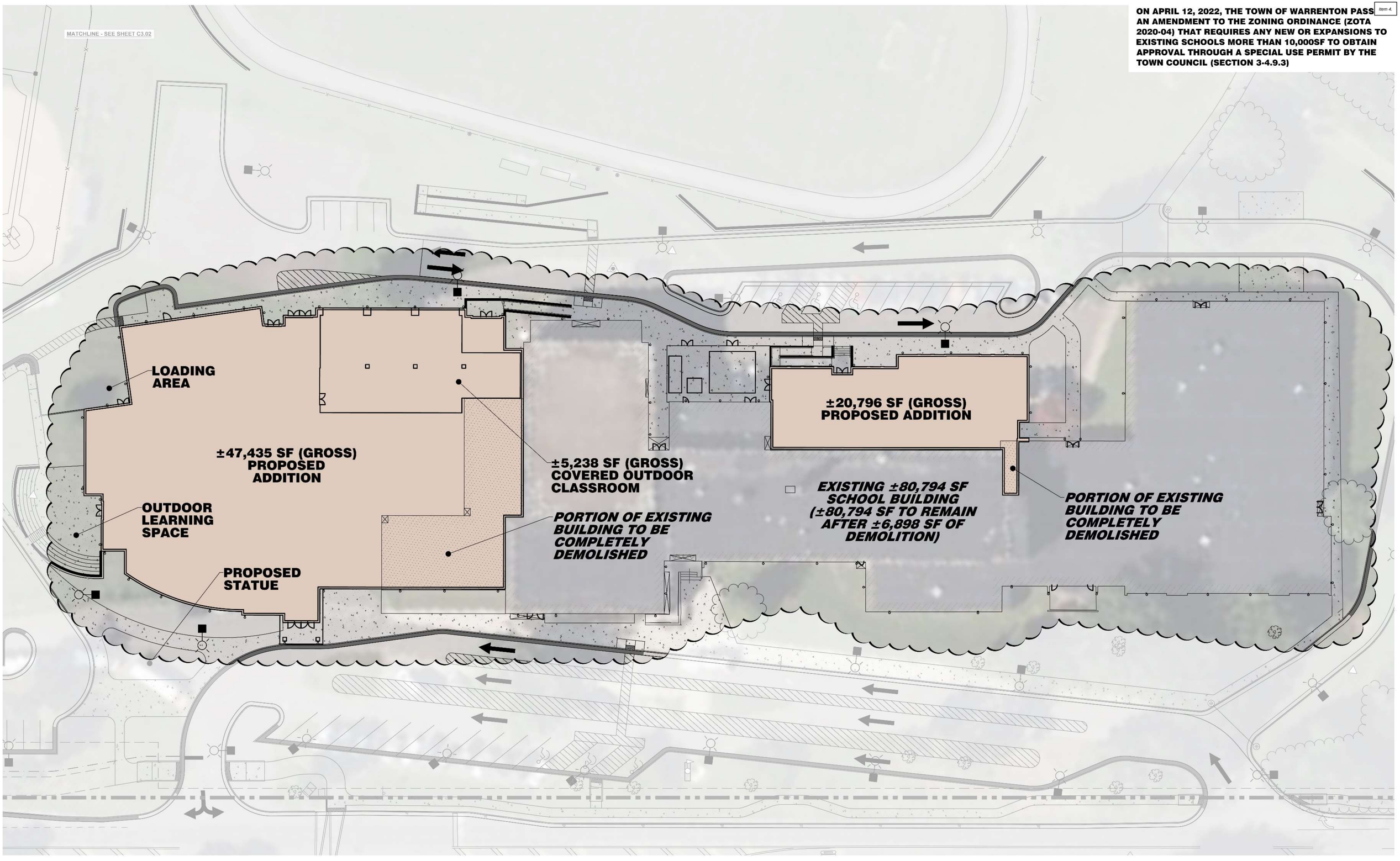
TIMMONS GROUP

ENGINEERING | DESIGN | TECHNOLO

ON APRIL 12, 2022, THE TOWN OF WARRENTON PASSED AN AMENDMENT TO THE ZONING ORDINANCE (ZOTA 2020-04) THAT REQUIRES ANY NEW SCHOOL, OR EXPANSION TO AN EXISTING SCHOOL, GREATER THAN 10,000 SQUARE FEET TO OBTAIN APPROVAL THROUGH A SPECIAL USE PERMIT BY THE TOWN COUNCIL (SECTION 3-4.9.3)

TIMMONS GROUP
ENGINEERING | DESIGN | TECHNOLOGY

ON APRIL 12, 2022, THE TOWN OF WARRENTON PASS AN AMENDMENT TO THE ZONING ORDINANCE (ZOTA 2020-04) THAT REQUIRES ANY NEW OR EXPANSIONS TO EXISTING SCHOOLS MORE THAN 10,000SF TO OBTAIN APPROVAL THROUGH A SPECIAL USE PERMIT BY THE TOWN COUNCIL (SECTION 3-4.9.3)



SPECIAL USE SITE FEATURES

FAUQUIER COUNTY PUBLIC SCHOOLS

TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION

350 EAST SHIRLEY AVENUE

WARRENTON, VA 20186

TIMMONS GROUP

ENGINEERING | DESIGN | TECHNOL

THIS APPLICATION ALSO REQUESTS A ZONING MODIFICATION TO Z.O. 2-19.4, TO PERMIT SITE RETAINING WALLS TO EXCEED 6' IN HEIGHT, IN ORDER TO:

- **AVOID/MINIMIZE IMPACT TO EXISTING WETLANDS**
- **MINIMIZE CLEARING AT THE NORTH/NORTHWEST SIDE OF THE BUILDING ADJACENT TO THE PROPOSED EMERGENCY ACCESS ROAD.**
- **PRESERVE AND MAINTAIN THE EXISTING GRAVEL TRACK AND BASEBALL FIELD.**

TIMMONS GROUP
ENGINEERING | DESIGN | TECHNOLOGY

THIS APPLICATION ALSO REQUESTS A ZONING MODIFICATION TO Z.O. 2-19.4, TO PERMIT SITE RETAINING WALLS TO EXCEED 6' IN HEIGHT, IN ORDER TO:

- **AVOID/MINIMIZE IMPACT TO EXISTING WETLANDS**
- **MINIMIZE CLEARING AT THE NORTH/NORTHWEST SIDE OF THE BUILDING ADJACENT TO THE PROPOSED EMERGENCY ACCESS ROAD.**
- **PRESERVE AND MAINTAIN THE EXISTING GRAVEL TRACK AND BASEBALL FIELD.**

MATCHLINE - SEE SHEET C3.02

APPROXIMATE 6' RETAINING WALL

APPROXIMATE 12' RETAINING WALL

APPROXIMATE 12' RETAINING WALL

APPROXIMATE 8' RETAINING WALL

APPROXIMATE 12' RETAINING WALL

APPROXIMATE 10' SCREEN WALL

APPROXIMATE 12' RETAINING WALL

APPROXIMATE 12' RETAINING WALL

3747
538.08
CPP NAIL

WAIVER REQUESTS

FAUQUIER COUNTY PUBLIC SCHOOLS

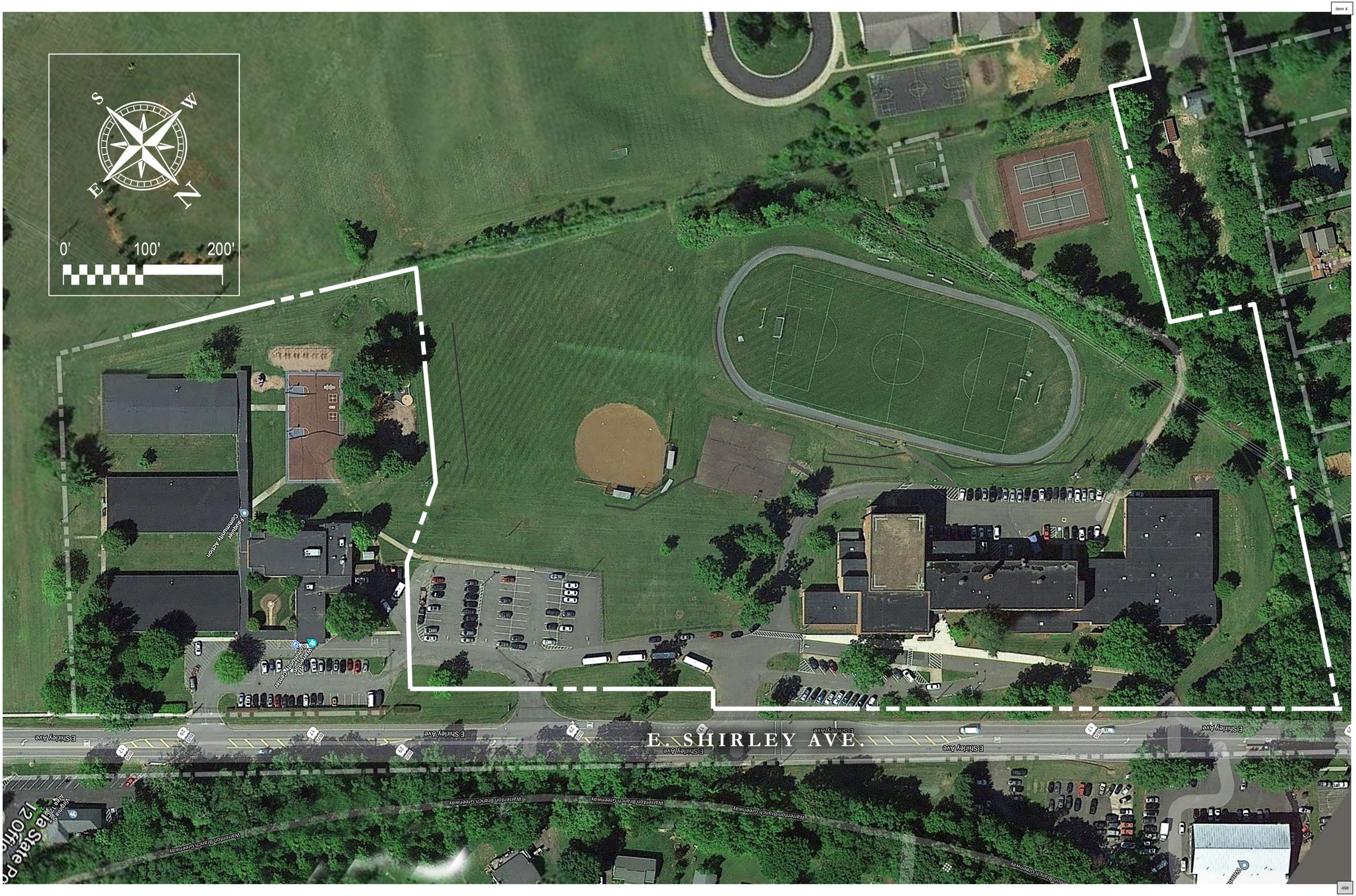
TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION

350 EAST SHIRLEY AVENUE

WARRENTON, VA 20186

TIMMONS GROUP

ENGINEERING | DESIGN | TECHNOL


S
W
E
N
0’
100'
200'
E. SHIRLEY AVE.
E Shirley Ave
Waterton Branch Greenway
Vaughn Community Center
Equidae Community Action


HOME OF THE TIGERS
TAYLOR MIDDLE SCHOOL
RENDERINGS FOR ILLUSTRATIVE PURPOSES ONLY


TAYLOR
MIDDLE SCHOOL
RENDERINGS FOR ILLUSTRATIVE PURPOSES ONLY


TAYLOR
MIDDLE SCHOOL
RENDERINGS FOR ILLUSTRATIVE PURPOSES ONLY


RENDERINGS FOR ILLUSTRATIVE PURPOSES ONLY


RENDERINGS FOR ILLUSTRATIVE PURPOSES ONLY


RENDERINGS FOR ILLUSTRATIVE PURPOSES ONLY

JAMES G. BRUMFIELD
ELEMENTARY SCHOOL

EXISTING
TENNIS

EXISTING
TRACK/PLAY FIELD

EXISTING
PLAY FIELD

PARENT DROP-OFF

COVERED
OUTDOOR
CLASSROOM
±47,435

PROPOSED
ADDITION
±20,796 SF

PROPOSED
ADDITION
±47,435

EXISTING SCHOOL

SERVICE

STAFF/VISITOR
PARKING

SECURE ENTRY

VISITOR PARKING

BUS DROP-OFF

WARRENTON
COMMUNITY
CENTER

E. SHIRLEY AVE.

0’ 100' 200'

EXPERIENCE WARRENTON VIRGINIA EST. 1810

Planning Commission Work Session
SUP 2023-04 Taylor Middle School
February 20, 2024

PC Decision Deadline May 30,2024 Unless Applicant Defers

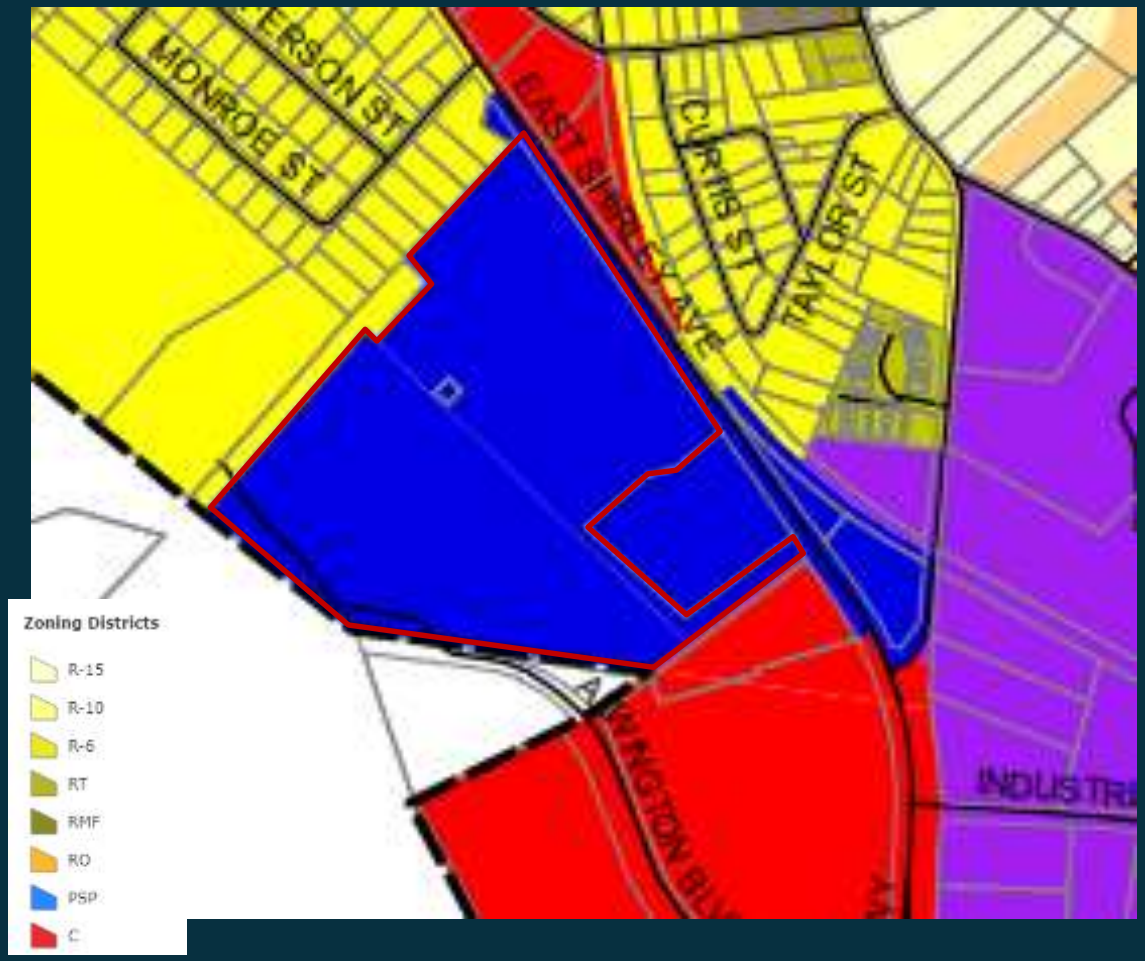
Request

- GPIN **Applicant:** 6984-48-7973-500
- **Property Owner:** Fauquier County School Board
- Representative: Luke Fetcho, Timmons Group
- **Zoning:** PSP (Public/Semi Public)
- **Comprehensive Plan:** Public/Semi Public Non-Intensive
- SUP to allow for an addition in excess of 10,000 square feet (proposing additional approximate 68, 231 square feet)

Location

Adjacent Uses

Zoning Map

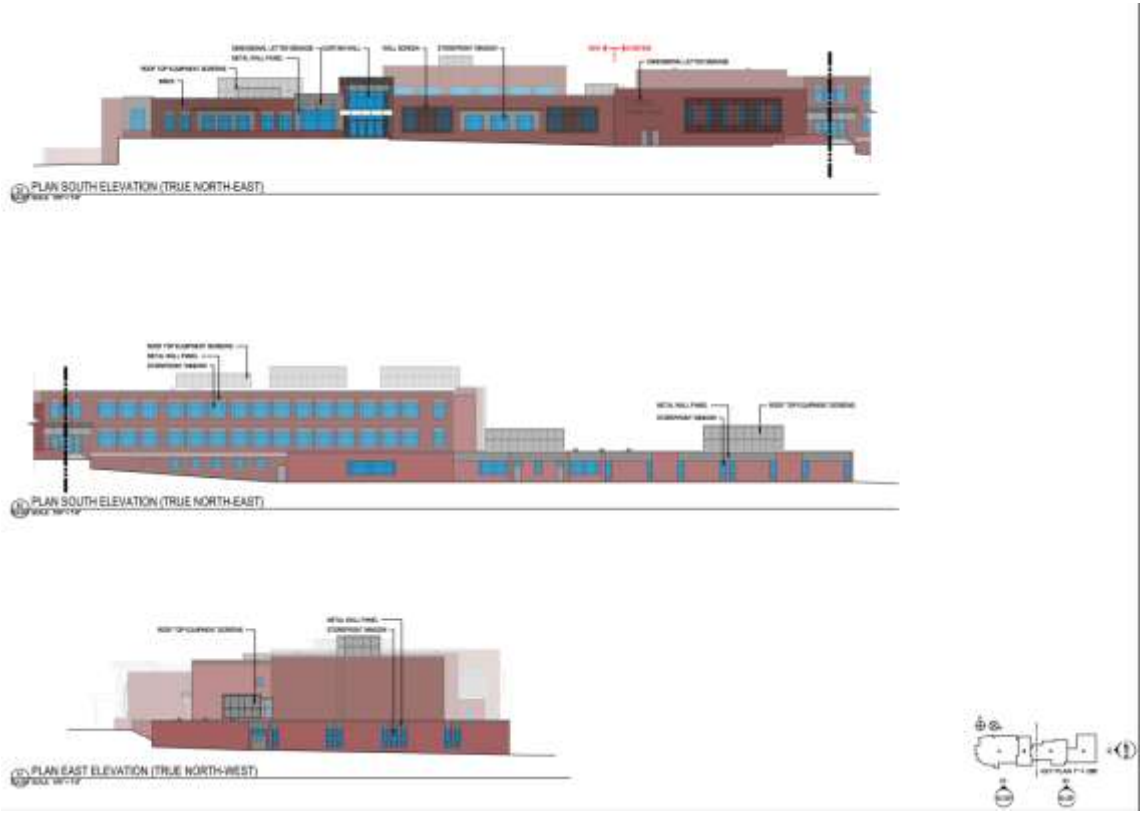


- R-10 Single Family Residential
- Commercial
- Public/Semi Public
- County Approved Future Housing

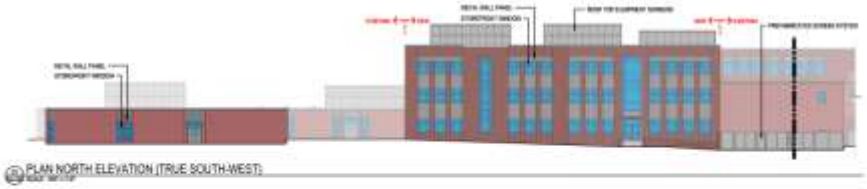
SUP Plan

Proposed SUP Plan

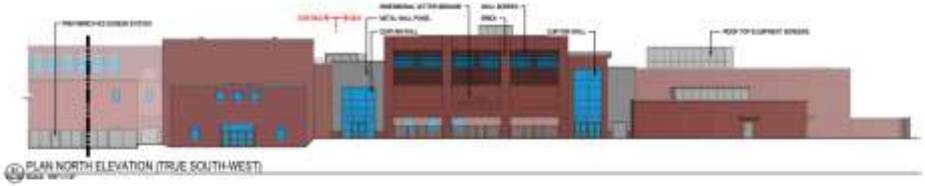
Elevations


PLAN SOUTH ELEVATION (TRUE NORTH-EAST)
PLAN SOUTH ELEVATION (TRUE NORTH-EAST)
PLAN EAST ELEVATION (TRUE NORTH-WEST)

Elevations

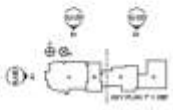


PLAN NORTH ELEVATION (TRUE SOUTH-WEST)



PLAN NORTH ELEVATION (TRUE SOUTH-WEST)

PLAN WEST ELEVATION (TRUE SOUTH-EAST)



Agency Reviews

- Full site
- Transportation and Internal Circulation
- Parking Orientation
- Walkability/Bicycle Connections
- Landscaping
- Lighting
- VDOT Pipeline Study
- Fauquier County Arrington Proffers

Town Policies – Plan Warrenton 2040

- Walkability Audit & Complete Streets
- Transportation Map – Bike/Ped New Facility links to County Plan
- Shirley Ave = Signature Road
- T-1.4 *Maintain the capacity of Signature Streets by providing multimodal accommodations and incorporating innovative approaches.*

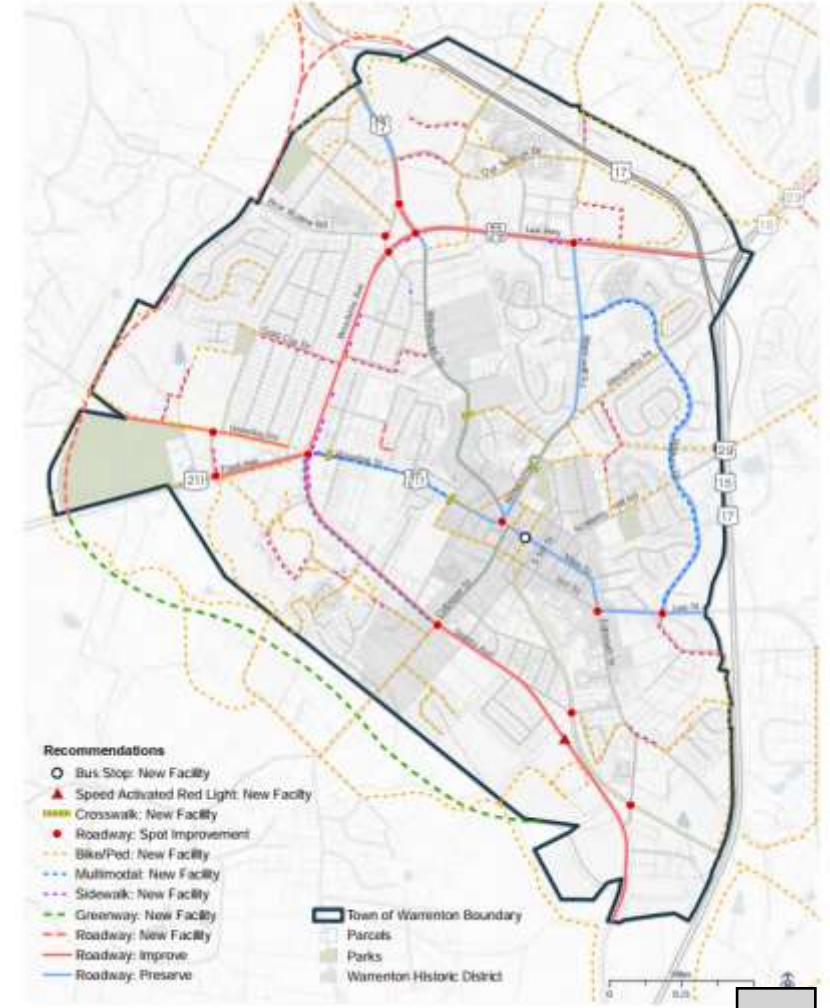
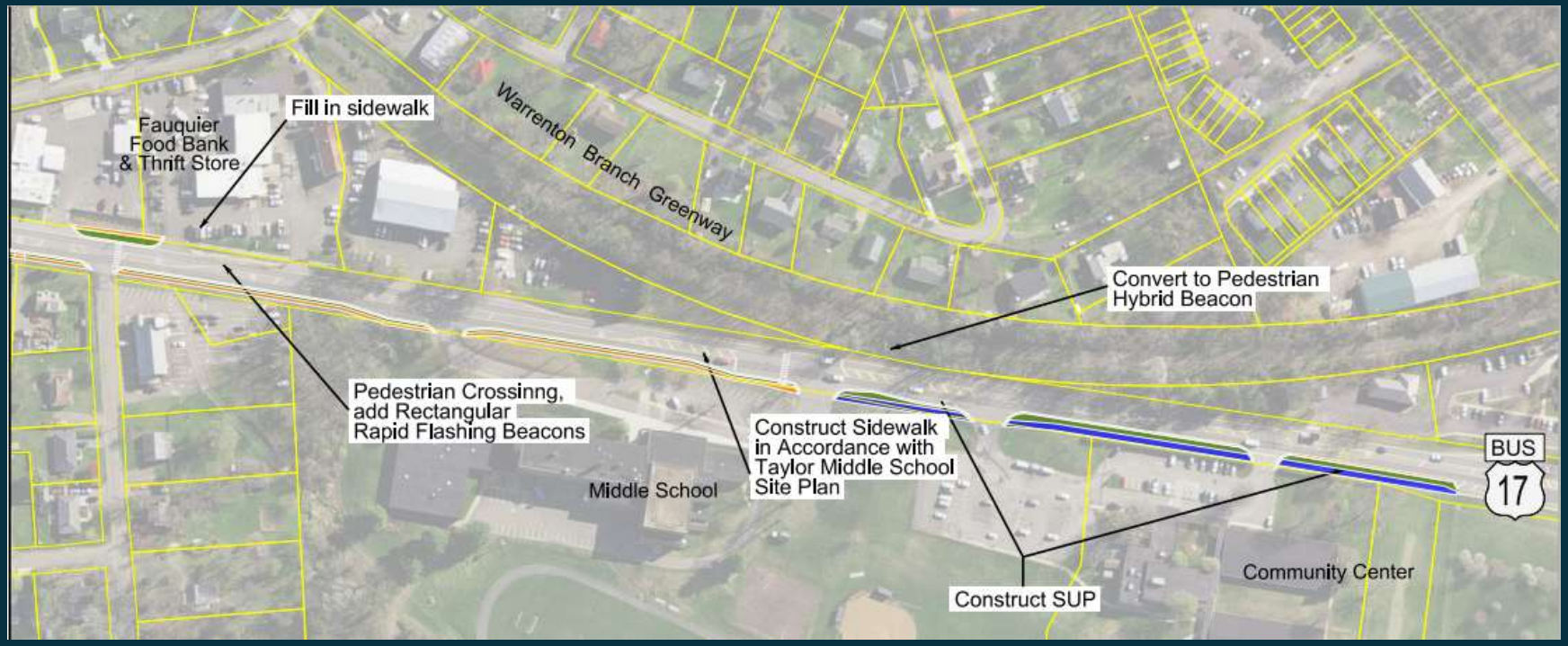


Figure 5-1: Town of Warrenton Transportation Plan map.

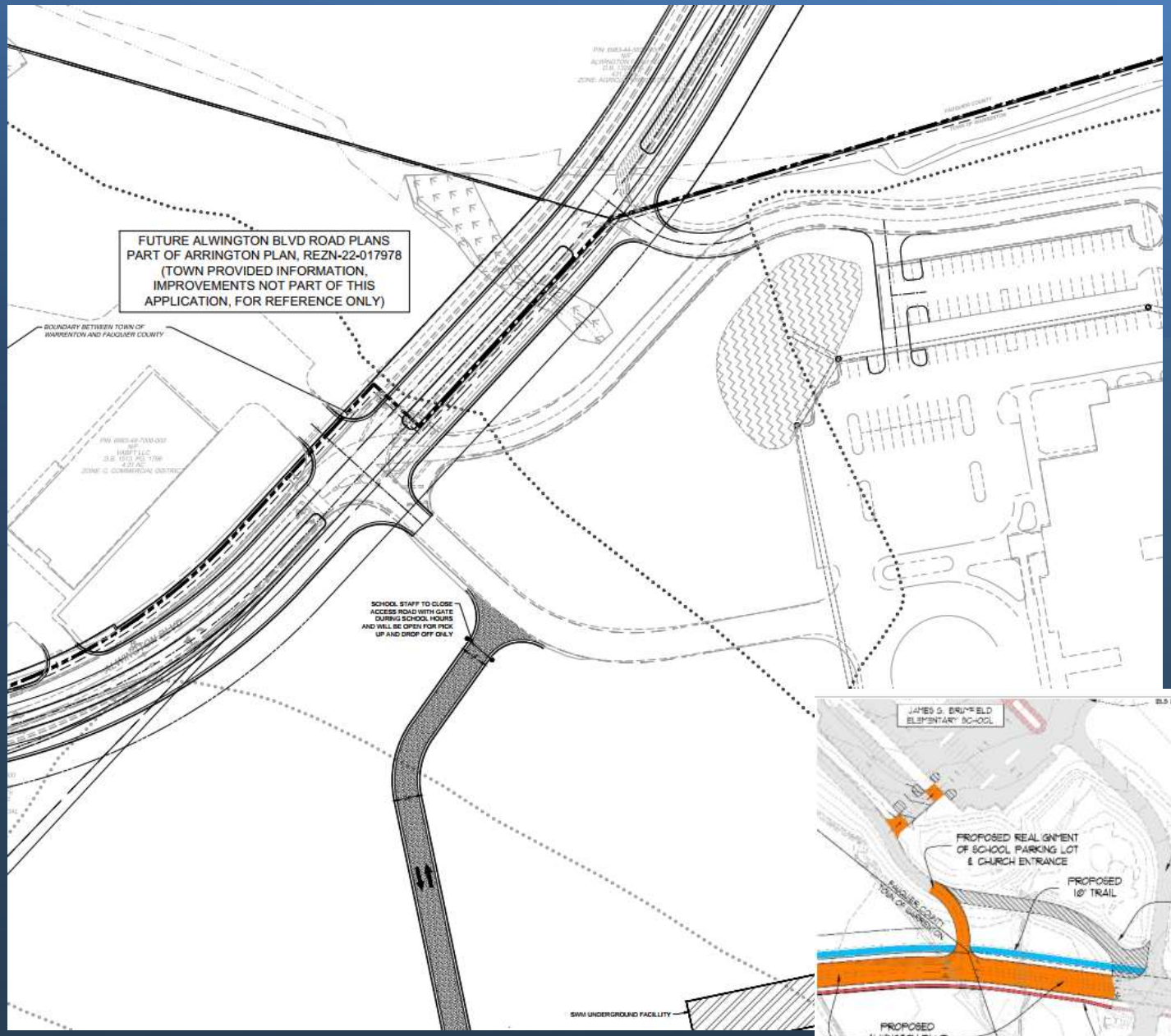
Preliminary VDOT Pipeline

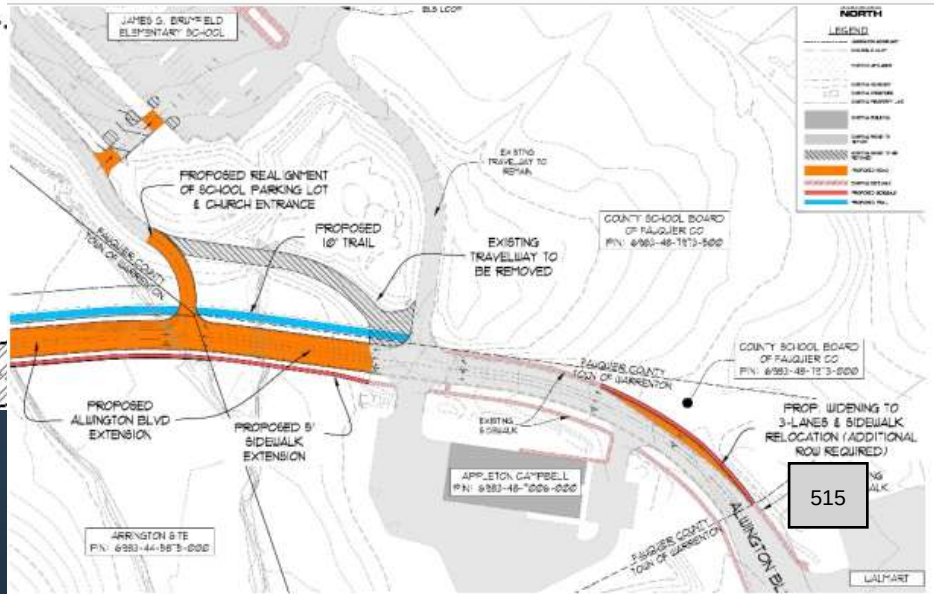
Add Sidewalk from Culpeper to Taylor MS

Construct Shared Use Path Taylor MS to Walmart

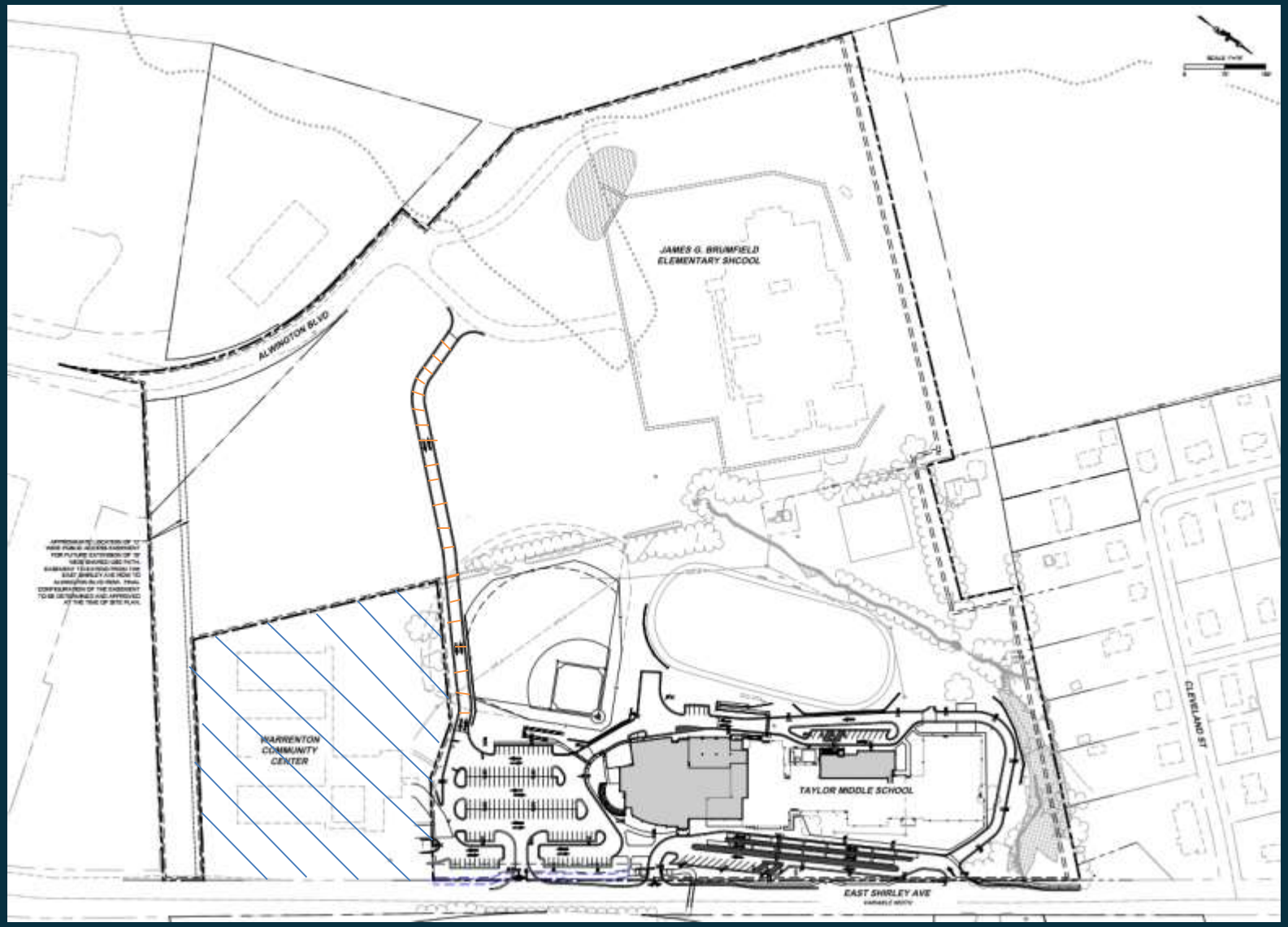


Prior to issuance of 21st occupancy permit for a residential dwelling unit.





SUP Plan



Proposed SUP Plan

Draft 2024 Planning Commission Goals

- Provide the Town Council with recommendations on land use applications, policies, and plans that with result in balanced, equitable, orderly growth.
- Ensure recommendations are well informed and legally defensible.
- Be transparent and open to the public on all matters related to land use.
- Base recommendations on the adopted policy and plans that set forth the vision for the Town.
- Develop a best practice process for the adoption of the Capital Improvement Program.
- Be engaged and informed on the Comprehensive Plan goals in reviewing current land use applications.
- Continue to examine and attend training seminars~~, as permitted under current Health Advisory~~.
- Collaborate with adjacent Planning Commissions~~, as permitted under current Health Advisory~~.
- Perform site visits, as appropriate, for land use applications.
- Be engaged and informed on the activities of the ~~Architectural Review Board~~ Town and community.
- Learn from the success stories of other jurisdictions that are applicable to Warrenton.