



**TIMMONS GROUP**

# **Taylor Middle School – Addition**

## ***Traffic Impact Analysis***

**September 8, 2023**

*Revised January 12, 2024*

*Revised March 1, 2024*

**Submitted to:  
Town of Warrenton,  
Virginia**

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# Taylor Middle School – Addition Traffic Impact Analysis

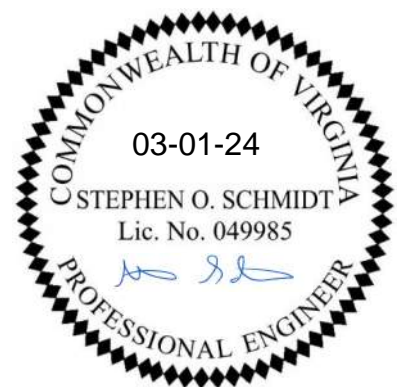
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September 2023  
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**1 EXECUTIVE SUMMARY**

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. A second round of comments was received in February of 2024. 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 and 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/Falmouth Street (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 11<sup>th</sup> 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 95<sup>th</sup> 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/Falmouth Street operates at LOS A in each of the peak hours with no queueing 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 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 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/Falmouth Street operates at LOS A in each of the peak hours with no queueing 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 or D in each of the peak hours. Each of the approaches operates at LOS D or better with no queuing 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 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/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 beyond those identified above.
7. 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 to vehicular traffic.
8. The site will provide a public access easement across the frontage for the future extension of the shared use path along Shirley Avenue. A five foot sidewalk will be provided along the roadway connection to the elementary school.

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 queuing 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/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 queuing 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/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 beyond those identified above.
7. 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 to vehicular traffic.
8. The site will provide a public access easement across the frontage for the future extension of the shared use path along Shirley Avenue. A five foot sidewalk will be provided along the roadway connection to the elementary school.

#### 1.4 RECOMMENDATIONS

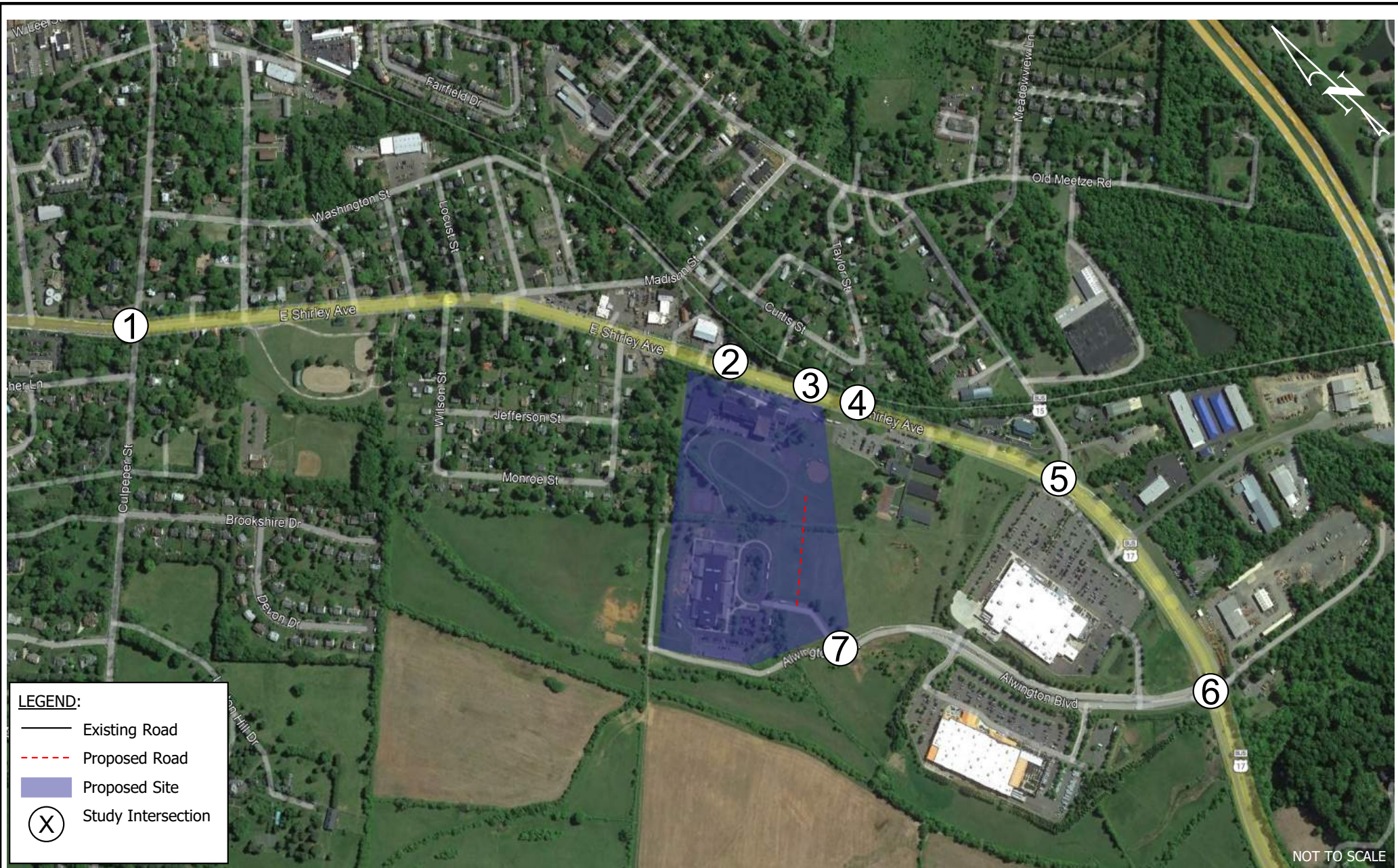
The expansion of the middle school will have minimal to no impact on the surrounding roadway network and no improvements are required at the study intersections beyond the turn lanes provided at the eastern site entrance on Shirley Avenue.

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 to vehicular traffic.

The site will provide a public access easement across the frontage for the future extension of the shared use path along Shirley Avenue. A five foot sidewalk will be provided along the roadway connection to the elementary school.

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.

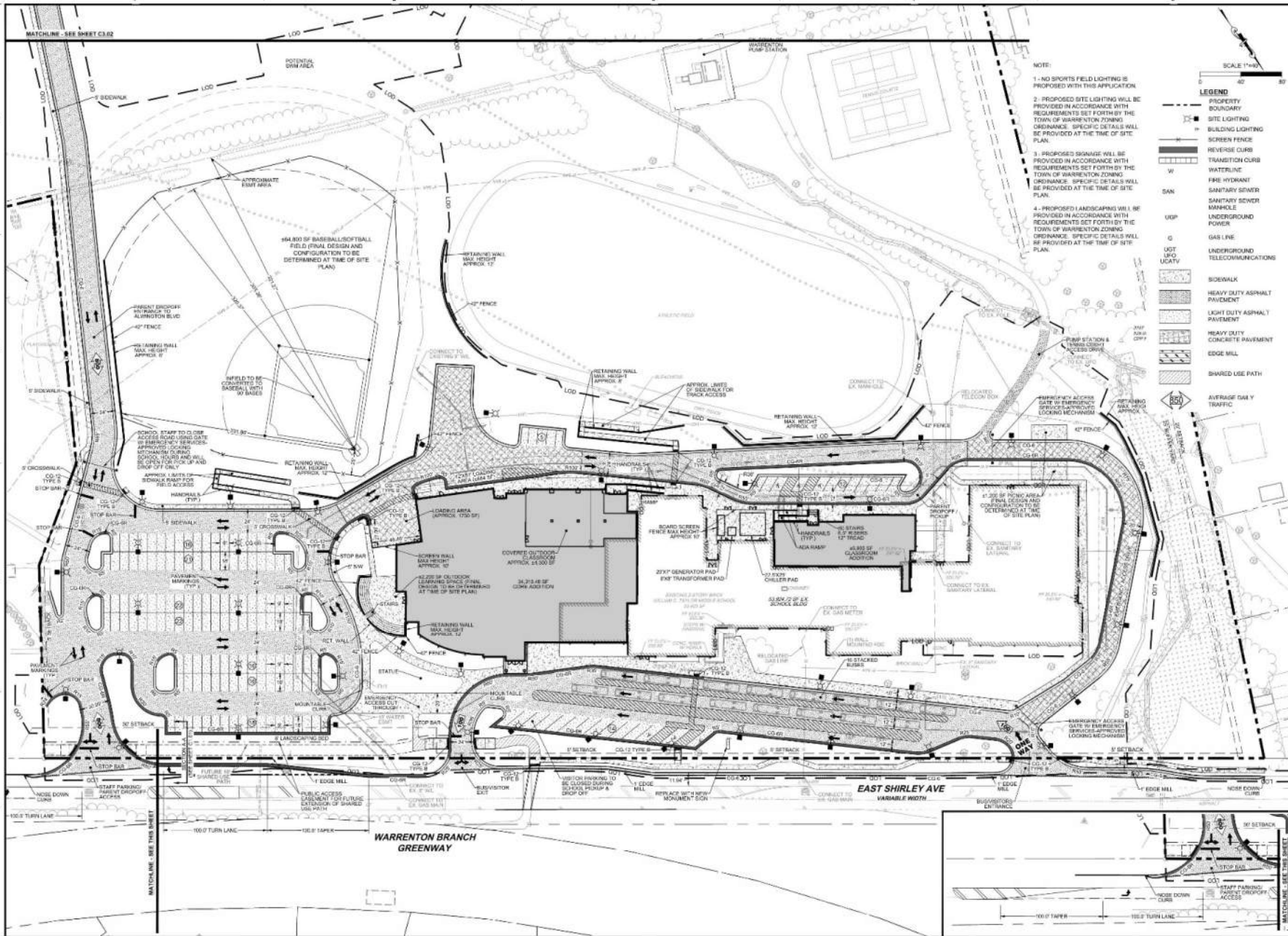




Site Location and Study Intersections  
 Taylor Middle School – Addition  
 Town of Warrenton, Virginia

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.

- LEGEND**
- PROPERTY BOUNDARY
  - SITE LIGHTING
  - BUILDING LIGHTING
  - SCREEN FENCE
  - RETAINING 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

DATE	PROJECT	DESIGNED	DRAWN	CHECKED	REVISIONS
08/07/2023	2150.00	TIMMONS	TIMMONS		

DATE: 08/07/2023  
 PROJECT: 2150.00  
 DESIGNED: TIMMONS  
 DRAWN: TIMMONS  
 CHECKED: [ ]  
 REVISIONS: [ ]

**RRMM ARCHITECTS, PC**  
 115 South 1st Street, Suite 502  
 Richmond, Virginia 23219  
 (804)277-8987

**NOT FOR CONSTRUCTION**  
 02/29/2024  
 SUP APPLICATION

**TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION**  
 FAUQUIER COUNTY PUBLIC SCHOOLS  
 10000 STATEWAY OF EDUCATION, CHARLOTTE, NC 28226  
 PROJECT: TAYLOR MIDDLE SCHOOL ADDITION & RENOVATION  
 DRAWING: SPECIAL USE PERMIT PLAN

SHEET  
**C3.01**



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 and 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/Falmouth Street (roundabout);
6. E Shirley Avenue/Alwington Boulevard (signalized); and
7. Alwington Boulevard/Elementary School Entrance (unsignalized).

### 2.3 EXISTING ROADWAY NETWORK

E Shirley Avenue (US Route 17) is a two-lane, undivided, minor arterial with a posted speed limit of 40 mph from Culpeper Street to Falmouth Street and 25 mph from Falmouth Street to Alwington Boulevard. The 2021 VDOT traffic data shows that E Shirley Avenue carries approximately 15,000 vehicles per day between Culpeper Street and Falmouth Street. The 2021 Virginia Roads traffic data shows that E Shirley Avenue carries approximately 9,700 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 (US 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 Falmouth Street carries approximately 4,300 vehicles per day between E Shirley Avenue 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. 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

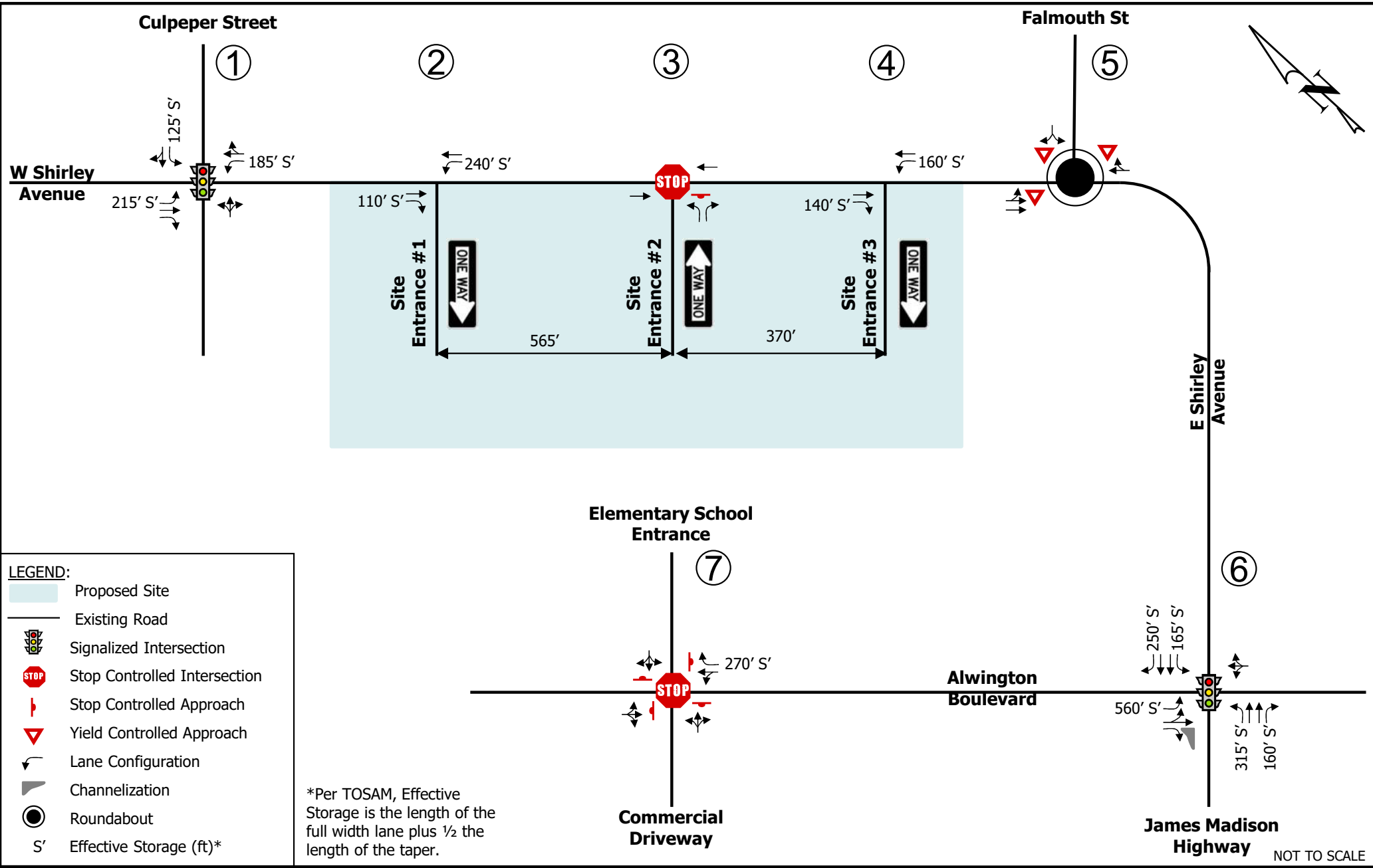
There are no improvements at the study intersections that will occur within the timeframe analyzed in the study except the realignment of the Alwington Boulevard/Elementary School Entrance/Commercial Driveway intersection. This improvement is a realignment only and will not impact the capacity of the intersection.

With the expansion, the access to the site will be reworked as shown in Figure 1-2. The two western entrances on East Shirley Avenue will be a bus loop only and the eastern entrance will be combined with the community center entrance and serve all other vehicles. The new entrance off of Alwington Boulevard will service passenger vehicles.

At the eastern entrance, the lanes along Shirley Avenue will be reworked to provide a right and left turn lane with 100 feet of storage and 100 feet of taper (effective storage of 150 feet).

The site will provide a public access easement across the frontage for the future extension of the shared use path along Shirley Avenue. A five foot sidewalk will be provided along the roadway connection to the elementary school.





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.

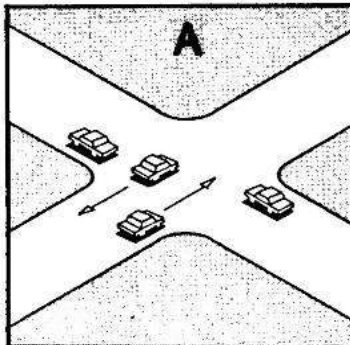
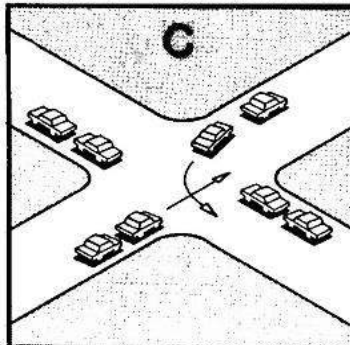
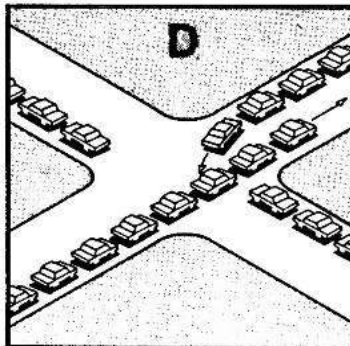
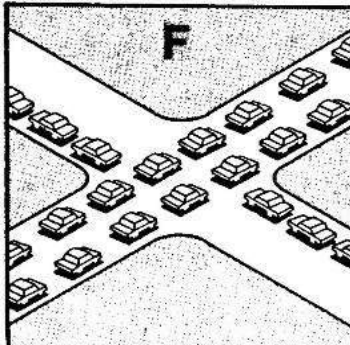

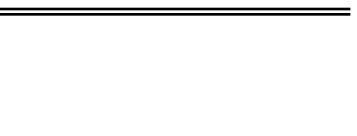
Existing signal timings for the Shirley Avenue/Culpeper Street intersection was provided by the Town of Warrenton and the E Shirley Avenue/Alwington Boulevard intersection was provided by VDOT. A copy of the signal timings included in Appendix C.

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 involves delay to all motorists due to congestion.	Very long queues may create lengthy delays, especially for left-turning vehicles.	
F	Forced flow with demand volumes greater than capacity resulting in complete congestion. Volumes drop to zero in extreme cases.	Backups from locations downstream restrict or prevent movement of vehicles out of approach creating a storage area during part or all of an hour.	

SOURCE: "A Policy on Design of Design of Urban Highways and Arterial Streets" - AASHTO, 1973 based upon material published in "Highway Capacity Manual", National Academy of Sciences, 1965.

For signalized and unsignalized intersections, level of service is defined in terms of **delay**, a measure of driver discomfort, frustration, fuel consumption and lost travel time. Table 3-2 summarizes the delay associated with each LOS category:

**Table 3-2: Signalized and Unsignalized Intersection Level of Service Criteria**

Signalized Intersections		Unsignalized Intersections	
Level of Service	Control Delay per Vehicle (sec/veh)	Level of Service	Average Control Delay (sec/veh)
A	≤ 10	A	0 to 10
B	> 10 to ≤ 20	B	> 10 to ≤ 15
C	> 20 to ≤ 35	C	> 15 to ≤ 25
D	> 35 to ≤ 55	D	> 25 to ≤ 35
E	> 55 to ≤ 80	E	> 35 to ≤ 50
F	> 80	F	> 50

*Source: Exhibit 16-2 and Exhibit 17-2 from TRB's "Highway Capacity Manual 2000"*

Capacity analyses were performed to assess existing (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 6<sup>th</sup> edition. All analysis uses the with the following assumptions:

- Existing 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 95<sup>th</sup> percentile queue is the maximum back of queue for a particular lane within a lane group considering 95<sup>th</sup> 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 95<sup>th</sup> percentile queue to be higher than the SimTraffic maximum queue due to the method in which each software calculates its respective value. The 95<sup>th</sup> 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, 95<sup>th</sup> 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.

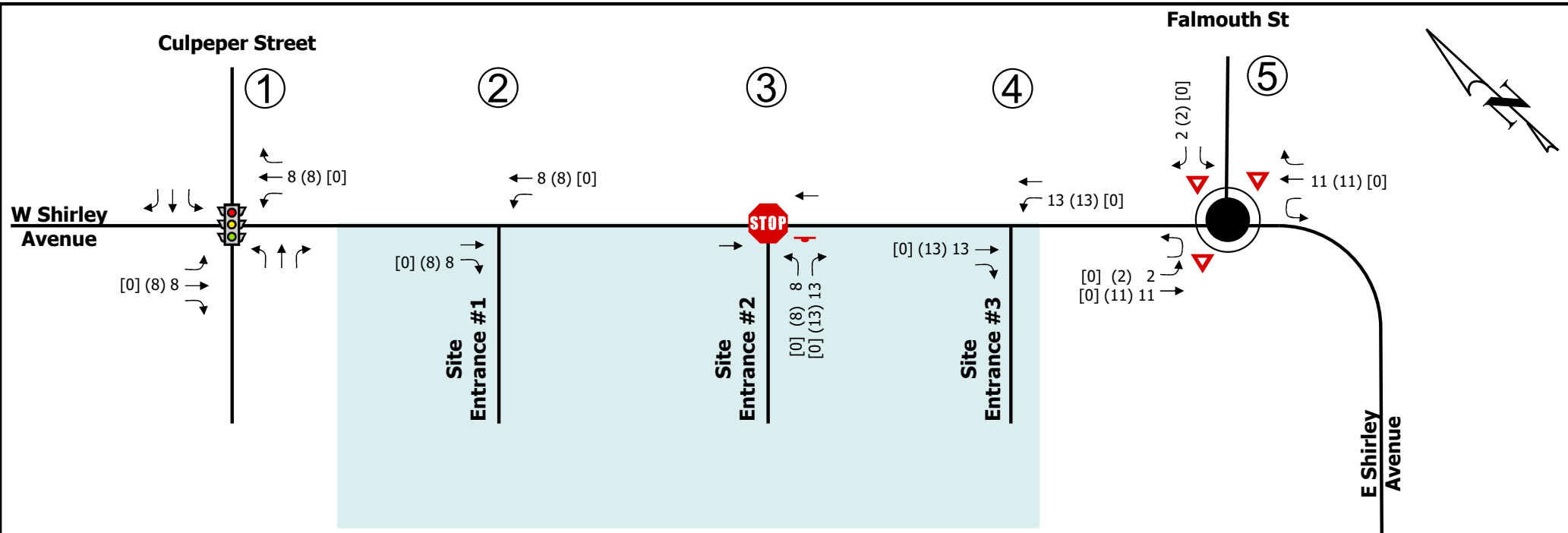
As shown in Table 3-3, under 2023 existing conditions:

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/Falmouth Street operates at LOS A in each of the peak hours with no queueing 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**

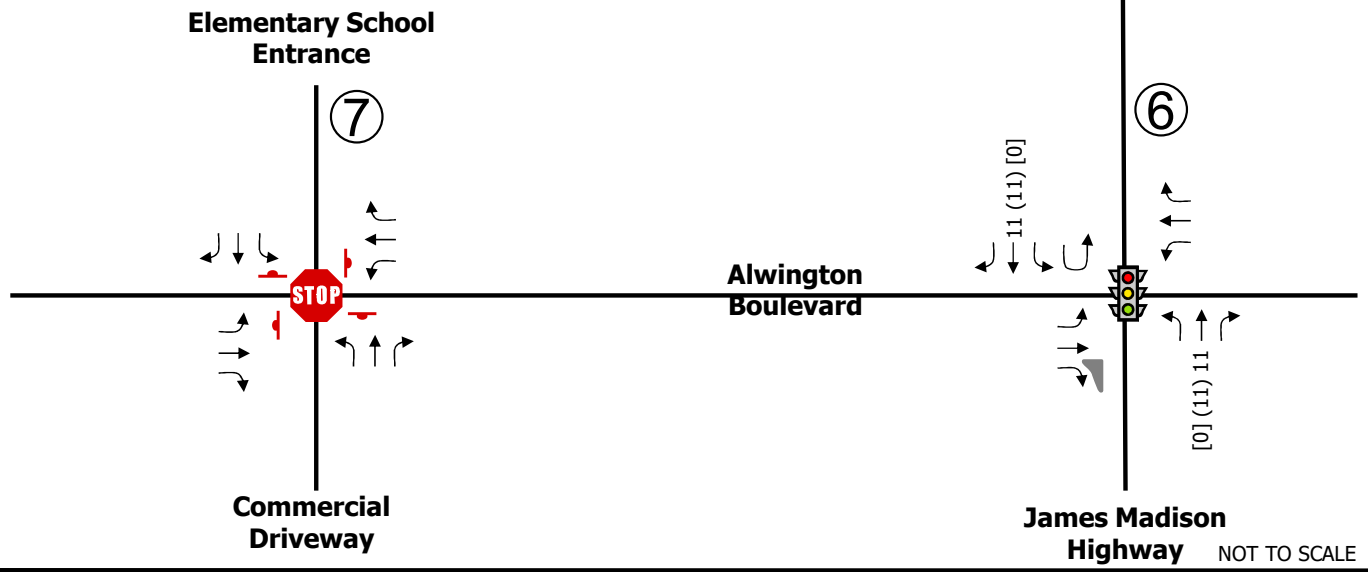
Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR			SCHOOL PM PEAK HOUR			COMMUTER PM PEAK HOUR					
			Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>(2)</sup> (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>(2)</sup> (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>(2)</sup> (ft)
1. Shirley Avenue (E-W) at Culpeper Street (N-S) Signalized	EB Left	215	43.6	D	46	119	56.3	E	62	169	46.0	D	57	214
	EB Thru		23.3	C	264	270	28.0	C	#453	374	32.4	C	#488	379
	EB Right		17.8	B	0	65	17.3	B	11	74	20.7	C	45	71
	<i>EB Approach</i>		23.8	C	--	--	28.1	C	--	--	30.6	C	--	--
	WB Left	185	39.3	D	47	132	42.1	D	61	184	40.4	D	50	162
	WB Thru/Right		25.0	C	#435	354	23.1	C	#452	349	26.9	C	#489	382
	<i>WB Approach</i>		25.9	C	--	--	24.4	C	--	--	27.8	C	--	--
	NB Left/Thru/Right		43.4	D	#226	231	45.5	D	201	224	43.3	D	179	187
	<i>NB Approach</i>		43.4	D	--	--	45.5	D	--	--	43.3	D	--	--
	SB Left	125	39.4	D	29	66	41.0	D	43	72	35.8	D	49	97
	SB Thru/Right		41.0	D	56	109	44.2	D	89	123	41.0	D	140	165
	<i>SB Approach</i>		40.6	D	--	--	43.4	D	--	--	40.0	D	--	--
<b>Overall</b>			<b>29.3</b>	<b>C</b>	--	--	<b>30.2</b>	<b>C</b>	--	--	<b>32.3</b>	<b>C</b>	--	--
2. E Shirley Avenue (E-W) at Site Entrance #1 (N-S) Unsignalized	EB Thru		†	†	0	2	†	†	0	0	†	†	0	0
	EB Right	110	†	†	0	6	†	†	0	0	†	†	0	2
	<i>EB Approach</i>		†	†	--	--	†	†	--	--	†	†	--	--
	WB Left	240	8.3	A	4	58	8.5	A	1	31	8.5	A	1	26
WB Thru		†	†	0	--	†	†	0	--	†	†	0	--	
<i>WB Approach</i>		0.8	A	--	--	0.2	A	--	--	0.1	A	--	--	
3. E Shirley Avenue (E-W) at Site Entrance #2 (N-S) Unsignalized	EB Thru		†	†	0	4	†	†	0	2	†	†	0	--
	EB Right		†	†	--	--	†	†	--	--	†	†	--	--
	<i>EB Approach</i>		†	†	--	--	†	†	--	--	†	†	--	--
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
<i>WB Approach</i>		†	†	--	--	†	†	--	--	†	†	--	--	
NB Left		17.8	C	12	79	23.2	C	16	78	19.5	C	5	35	
NB Right		10.7	B	7	82	13.0	B	10	90	11.6	B	0	30	
<i>NB Approach</i>		13.9	B	--	--	17.3	C	--	--	18.4	C	--	--	
4. E Shirley Avenue (E-W) at Site Entrance #3 (N-S) Unsignalized	EB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	EB Right	140	†	†	0	2	†	†	0	0	†	†	0	0
	<i>EB Approach</i>		†	†	--	--	†	†	--	--	†	†	--	--
	WB Left	160	8.0	A	2	31	8.7	A	1	35	8.7	A	2	42
WB Thru		†	†	0	--	†	†	0	--	†	†	0	--	
<i>WB Approach</i>		0.4	A	--	--	0.3	A	--	--	0.4	A	--	--	
5. E Shirley Avenue (E-W) at Falmouth Street (N) Roundabout* Unsignalized**	<i>EB Approach</i>		1.8	A	21	--	1.9	A	30	--	1.9	A	30	--
	<i>WB Approach</i>		10.5	B	120	--	9.2	A	100	--	12.7	B	176	--
	<i>SB Approach</i>		8.7	A	34	--	7.0	A	31	--	7.8	A	37	--
	<b>Overall</b>		<b>7.2</b>	<b>A</b>	--	--	<b>5.7</b>	<b>A</b>	--	--	<b>7.7</b>	<b>A</b>	--	--
6. E Shirley Avenue/ (N-S) James Madison Highway at Alwington Boulevard (E-W) Signalized	EB Left	560	34.1	C	63	123	36.7	D	128	147	38.6	D	128	152
	EB Left/Thru		34.1	C	63	90	36.9	D	130	109	38.6	D	129	107
	EB Right <sup>(3)</sup>		0.1	A	0	6	0.2	A	0	57	0.2	A	0	52
	<i>EB Approach</i>		21.2	C	--	--	22.1	C	--	--	21.8	C	--	--
	WB Left/Thru/Right		33.0	C	0	53	34.9	C	26	64	37.1	D	0	57
	<i>WB Approach</i>		33.0	C	--	--	34.9	C	--	--	37.1	D	--	--
	NB Left	315	17.6	B	99	171	18.1	B	95	146	18.5	B	102	163
	NB Thru		18.4	B	143	210	18.0	B	83	133	18.2	B	92	150
	NB Right	160	15.8	B	0	22	16.8	B	0	39	16.7	B	0	18
	<i>NB Approach</i>		18.1	B	--	--	18.0	B	--	--	18.3	B	--	--
	SB Left	165	15.2	B	11	39	16.2	B	17	41	16.0	B	15	66
	SB Thru		24.1	C	71	113	25.6	C	129	154	26.9	C	138	164
SB Right	250	16.9	B	15	104	15.5	B	9	85	15.3	B	0	77	
<i>SB Approach</i>		20.6	C	--	--	22.5	C	--	--	24.4	C	--	--	
<b>Overall</b>			<b>19.4</b>	<b>B</b>	--	--	<b>21.2</b>	<b>C</b>	--	--	<b>21.7</b>	<b>C</b>	--	--
7. Alwington Boulevard (E-W) at Elementary School Entrance/ Commercial Entrance (N-S) Unsignalized**	EB Left/Thru/Right		7.3	A	0	8	7.4	A	0	24	7.3	A	3	10
	<i>EB Approach</i>		7.3	A	--	--	7.4	A	--	--	7.3	A	--	--
	WB Left/Thru		8.7	A	10	75	8.8	A	3	64	8.9	A	3	72
	WB Right	270	7.1	A	10	63	6.9	A	5	49	6.7	A	3	59
	<i>WB Approach</i>		7.8	A	--	--	7.4	A	--	--	7.8	A	--	--
	NB Left/Thru/Right		6.9	A	3	87	6.6	A	3	68	6.6	A	3	60
	<i>NB Approach</i>		6.9	A	--	--	6.6	A	--	--	6.6	A	--	--
	SB Left/Thru/Right		7.8	A	3	42	7.4	A	0	29	7.4	A	3	31
<i>SB Approach</i>		7.8	A	--	--	7.4	A	--	--	7.4	A	--	--	

<sup>1</sup> Overall intersection LOS and delay reported for signalized intersections and roundabouts only.  
<sup>2</sup> SimTraffic Queues are average maximum queues after 10 runs of 60 minutes each.  
<sup>3</sup> 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:**

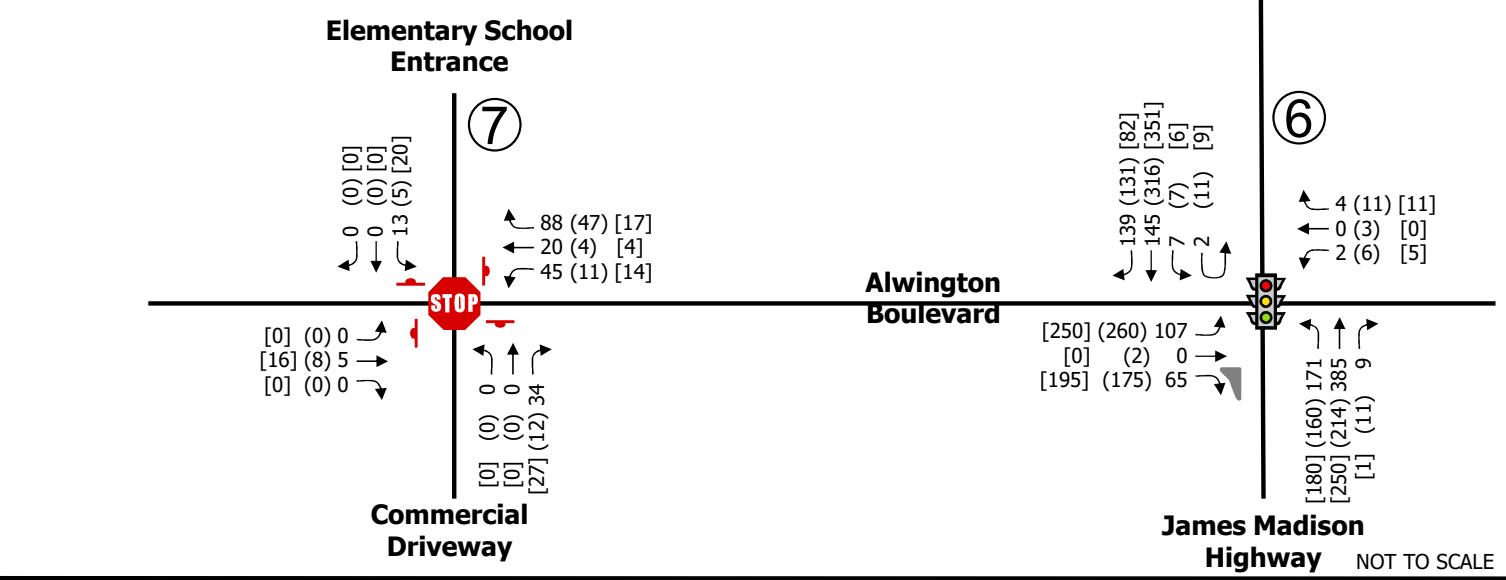
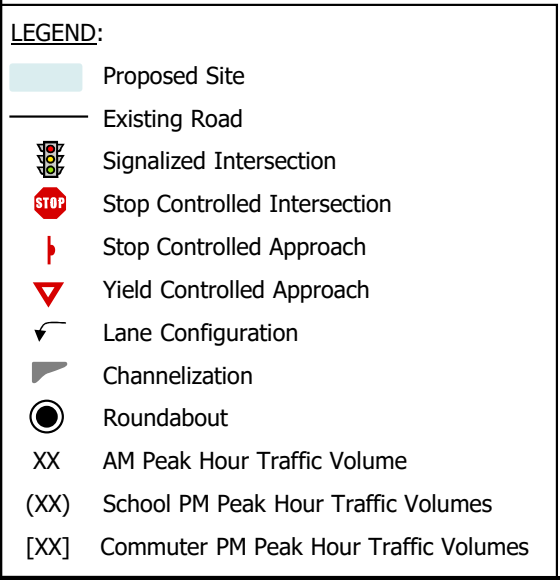
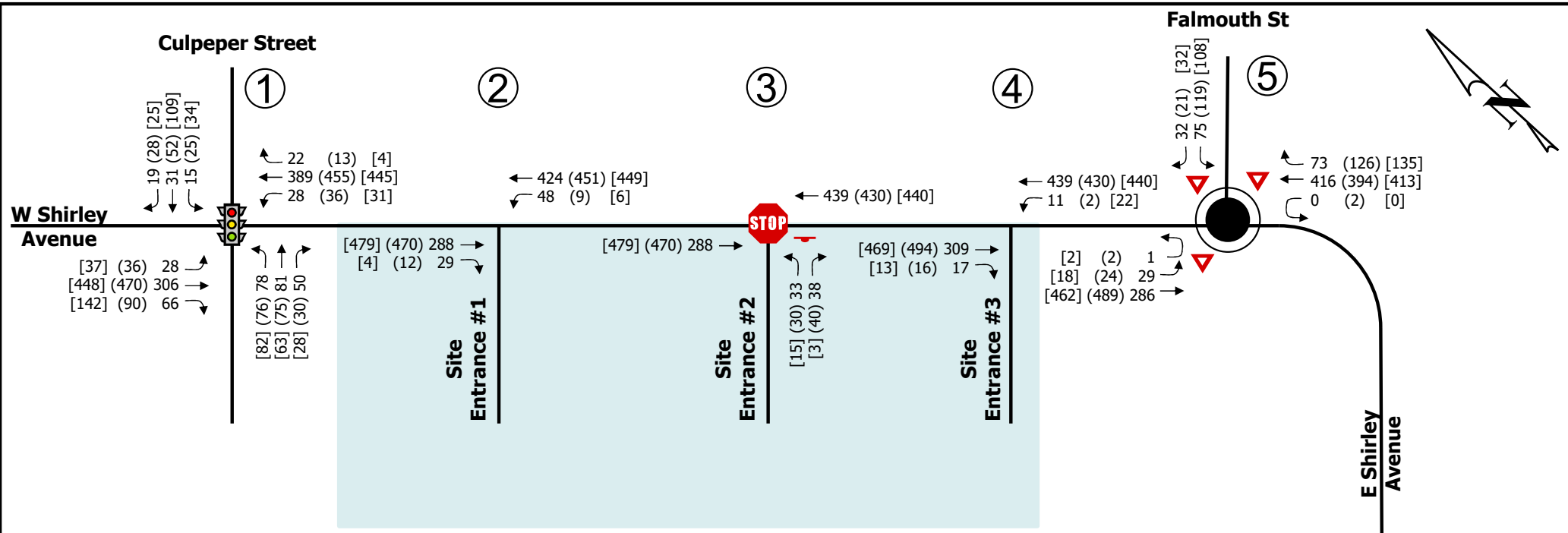
- Proposed Site
- Existing Road
- Signalized Intersection
- Stop Controlled Intersection
- Stop Controlled Approach
- Yield Controlled Approach
- Lane Configuration
- Channelization
- Roundabout
- XX AM Peak Hour Traffic Volume
- (XX) School PM Peak Hour Traffic Volumes
- [XX] Commuter PM Peak Hour Traffic Volumes



2023 Existing Bus Peak Hour Volumes  
 Taylor Middle School – Addition  
 Town of Warrenton, Virginia

Figure  
 3-1

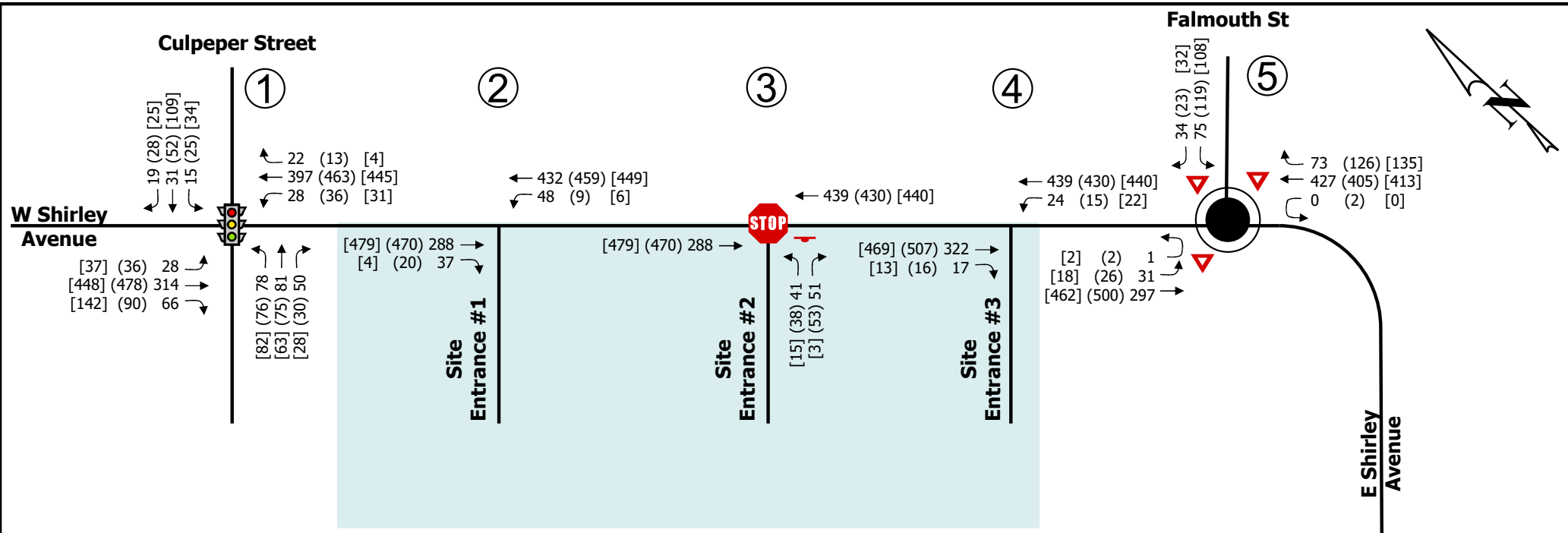
NOT TO SCALE



2023 Existing Vehicles (Non-Bus) Peak Hour Volumes  
 Taylor Middle School – Addition  
 Town of Warrenton, Virginia

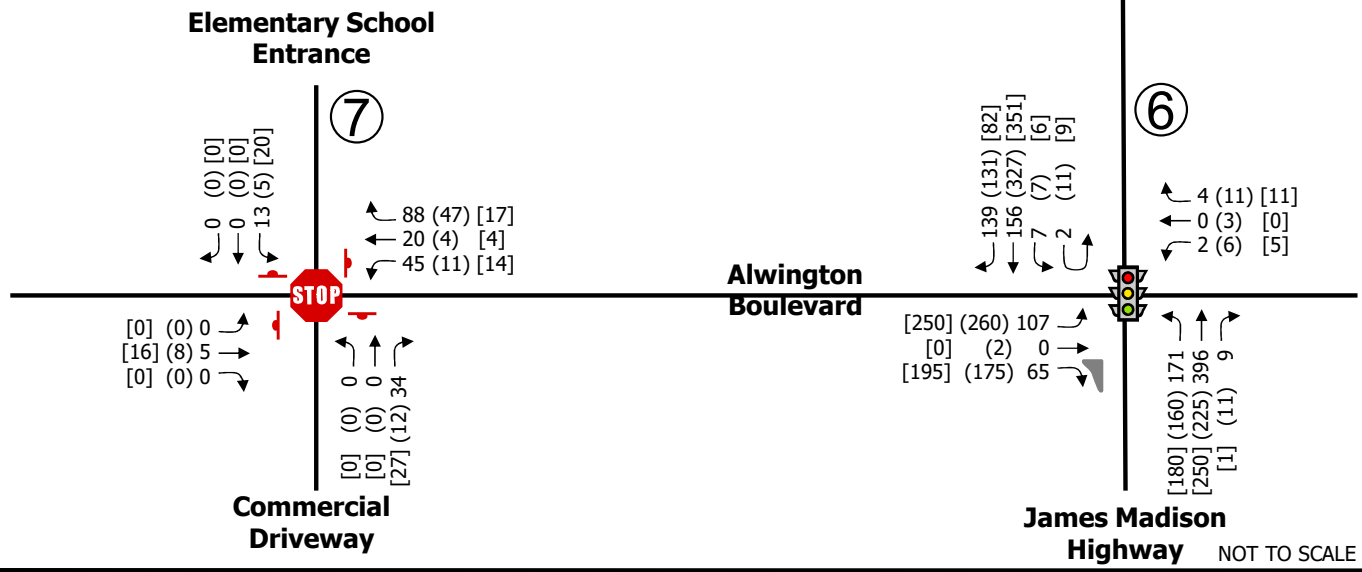
Figure  
 3-2





**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



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, 95<sup>th</sup> 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.

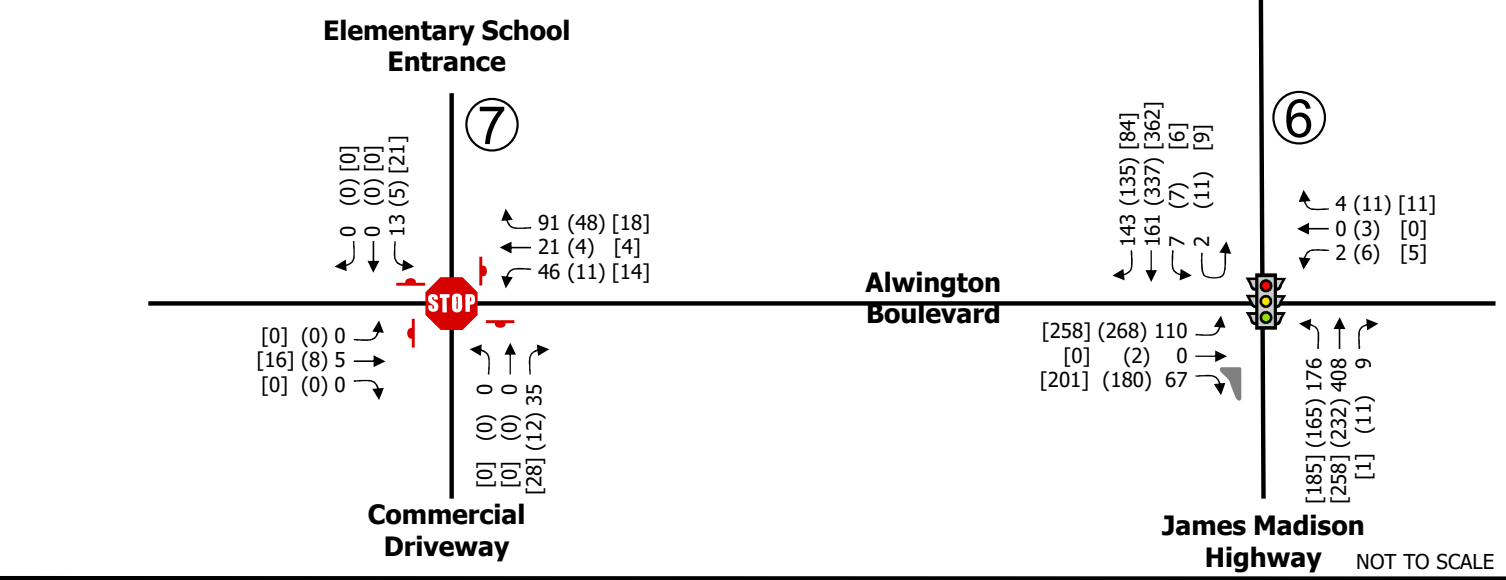
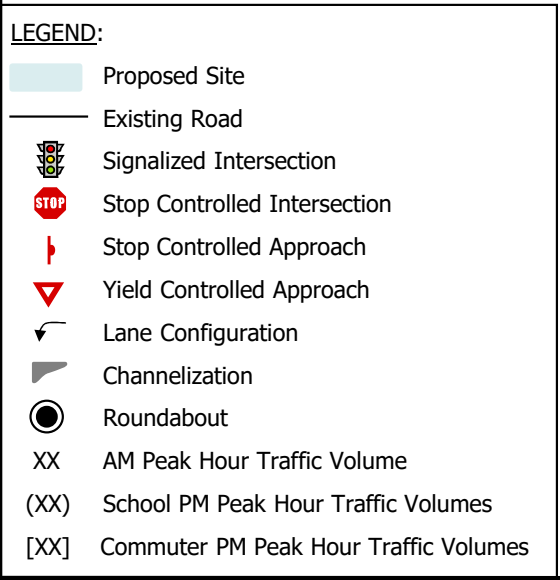
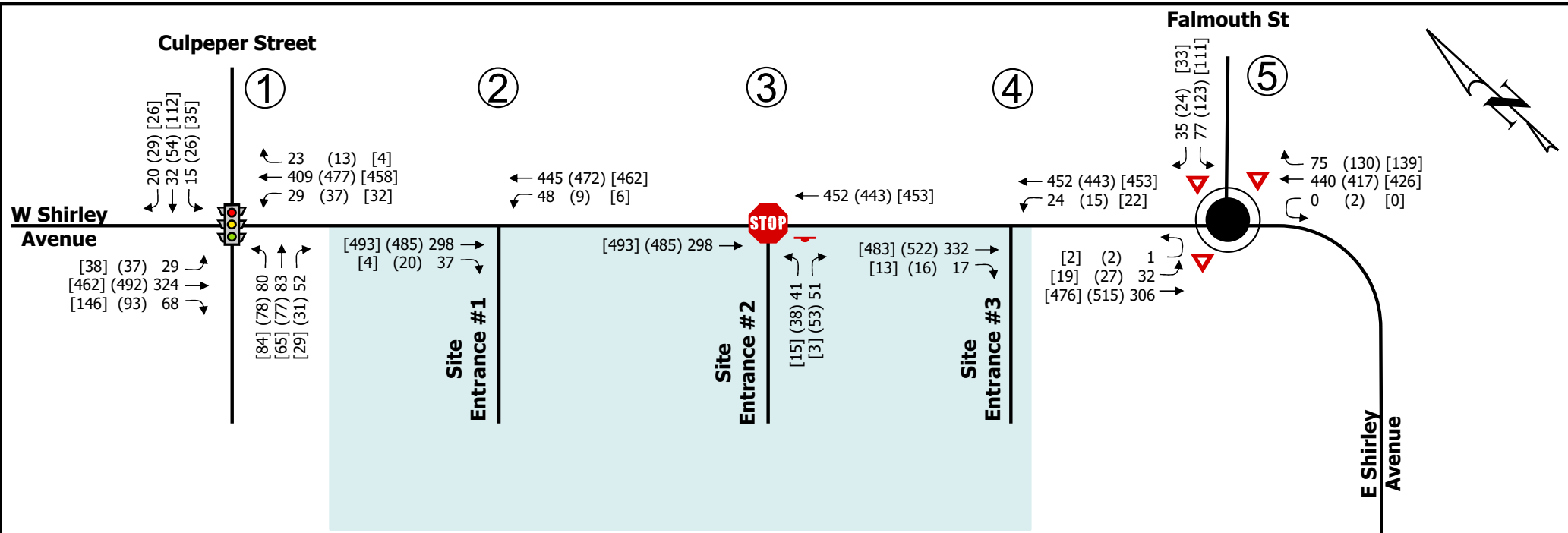
As shown in Table 4-1, under 2026 background conditions, all intersections experience similar levels of service, delay, and queueing as under existing conditions. Specifically:

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 E 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/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 <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>(2)</sup> (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>(2)</sup> (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>(2)</sup> (ft)
1. Shirley Avenue (E-W) at Culpeper Street (N-S) Signalized	EB Left	215	47.5	D	51	101	56.7	E	62	177	53.5	D	63	190
	EB Thru		22.3	C	270	279	28.8	C	#495	404	30.1	C	431	387
	EB Right		17.4	B	0	65	17.4	B	12	65	19.9	B	42	82
	EB Approach		23.3	C	--	--	28.7	C	--	--	29.1	C	--	--
	WB Left	185	40.9	D	51	136	42.5	D	62	177	43.6	D	56	139
	WB Thru/Right		22.7	C	389	343	23.6	C	#493	400	25.1	C	428	343
	WB Approach		23.9	C	--	--	24.9	C	--	--	26.3	C	--	--
	NB Left/Thru/Right		45.7	D	#236	232	46.7	D	#207	228	46.9	D	197	206
	NB Approach		45.7	D	--	--	46.7	D	--	--	46.9	D	--	--
	SB Left	125	40.9	D	30	50	41.2	D	44	84	37.7	D	53	106
	SB Thru/Right		42.6	D	60	92	44.7	D	93	131	43.9	D	154	191
	SB Approach		42.2	D	--	--	43.9	D	--	--	42.7	D	--	--
<b>Overall</b>			<b>28.7</b>	<b>C</b>	--	--	<b>30.8</b>	<b>C</b>	--	--	<b>31.9</b>	<b>C</b>	--	--
2. E Shirley Avenue (E-W) at Site Entrance #1 (N-S) Unsignalized	EB Thru		†	†	0	0	†	†	0	--	†	†	0	--
	EB Right	110	†	†	0	6	†	†	0	--	†	†	0	--
	EB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	WB Left	240	8.6	A	7	57	8.6	A	1	31	8.5	A	1	32
	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	0	†	†	0	4	†	†	0	--
	EB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	NB Left		19.6	C	24	84	25.1	D	30	83	20.5	C	10	45
NB Right		11.2	B	13	78	13.6	B	19	99	11.6	B	0	27	
NB Approach		14.9	B	--	--	18.4	C	--	--	19.7	C	--	--	
4. E Shirley Avenue (E-W) at Site Entrance #3 (N-S) Unsignalized	EB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	EB Right	140	†	†	0	2	†	†	0	4	†	†	0	4
	EB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	WB Left	160	8.2	A	3	40	8.8	A	2	35	8.8	A	4	48
	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	30	--
	WB Approach		10.1	B	125	--	9.5	A	107	--	13.1	B	185	--
	SB Approach		8.8	A	35	--	7.2	A	32	--	8.0	A	38	--
	<b>Overall</b>		<b>7.4</b>	<b>A</b>	--	--	<b>5.9</b>	<b>A</b>	--	--	<b>7.9</b>	<b>A</b>	--	--
6. E Shirley Avenue/ James Madison Highway at Alwington Boulevard (E-W) Signalized	EB Left	560	34.0	C	64	127	37.0	D	132	154	38.5	D	130	145
	EB Left/Thru		34.0	C	64	93	37.3	D	133	114	38.5	D	130	114
	EB Right <sup>(3)</sup>		0.1	A	0	6	0.2	A	0	59	0.2	A	0	63
	EB Approach		21.2	C	--	--	22.3	C	--	--	21.7	C	--	--
	WB Left/Thru/Right		32.6	C	0	52	35.2	D	27	65	34.9	C	0	48
	WB Approach		32.6	C	--	--	35.2	D	--	--	34.9	C	--	--
	NB Left	315	17.4	B	99	155	18.3	B	99	152	18.1	B	106	155
	NB Thru		18.3	B	143	200	18.1	B	87	161	17.7	B	93	157
	NB Right	160	15.8	B	0	19	16.9	B	0	48	16.3	B	0	8
	NB Approach		18.0	B	--	--	18.2	B	--	--	17.9	B	--	--
	SB Left	165	15.1	B	11	41	16.3	B	18	42	15.8	B	15	89
	SB Thru		23.7	C	70	110	25.9	C	135	163	25.8	C	141	170
	SB Right	250	16.7	B	15	107	15.5	B	9	91	15.4	B	0	76
SB Approach		20.3	C	--	--	22.6	C	--	--	23.6	C	--	--	
<b>Overall</b>			<b>19.3</b>	<b>B</b>	--	--	<b>21.4</b>	<b>C</b>	--	--	<b>21.3</b>	<b>C</b>	--	--
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	20	7.2	A	3	10
	EB Approach		7.3	A	--	--	7.4	A	--	--	7.2	A	--	--
	WB Left/Thru		8.7	A	10	76	8.7	A	3	64	8.9	A	3	69
	WB Right	270	7.1	A	10	61	6.8	A	5	60	6.7	A	3	59
	WB Approach		7.8	A	--	--	7.3	A	--	--	7.8	A	--	--
	NB Left/Thru/Right		6.9	A	3	83	6.5	A	0	61	6.6	A	3	56
	NB Approach		6.9	A	--	--	6.5	A	--	--	6.6	A	--	--
	SB Left/Thru/Right		7.8	A	3	45	7.3	A	0	29	7.4	A	3	34
SB Approach		7.8	A	--	--	7.3	A	--	--	7.4	A	--	--	

<sup>1</sup> Overall intersection LOS and delay reported for signalized intersections and roundabouts only.  
<sup>2</sup> SimTraffic Queues are average maximum queues after 10 runs of 60 minutes each.  
<sup>3</sup> 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.



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 be combined with the community center entrance and 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 565 feet from the middle entrance (bus out only). The middle entrance is spaced approximately 370 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 11<sup>th</sup> 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 <sup>(1)</sup>			School PM Peak <sup>(1)</sup>			Commuter PM Peak Hour <sup>(1)</sup>			Average Daily Trips <sup>(2)</sup>
				In	Out	Total	In	Out	Total	In	Out	Total	
<b>Existing Capacity</b>													
Middle School	510	Students	522	126	92	218	60	91	151	45	18	63	1071
<b>New Capacity</b>													
Middle School	850	Students	522	210	153	363	100	152	252	75	30	105	1785
<b>Increase</b>	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 and 12 out) and 714 average daily trips.

5.4 EXTERNAL TRIP DISTRIBUTIONS

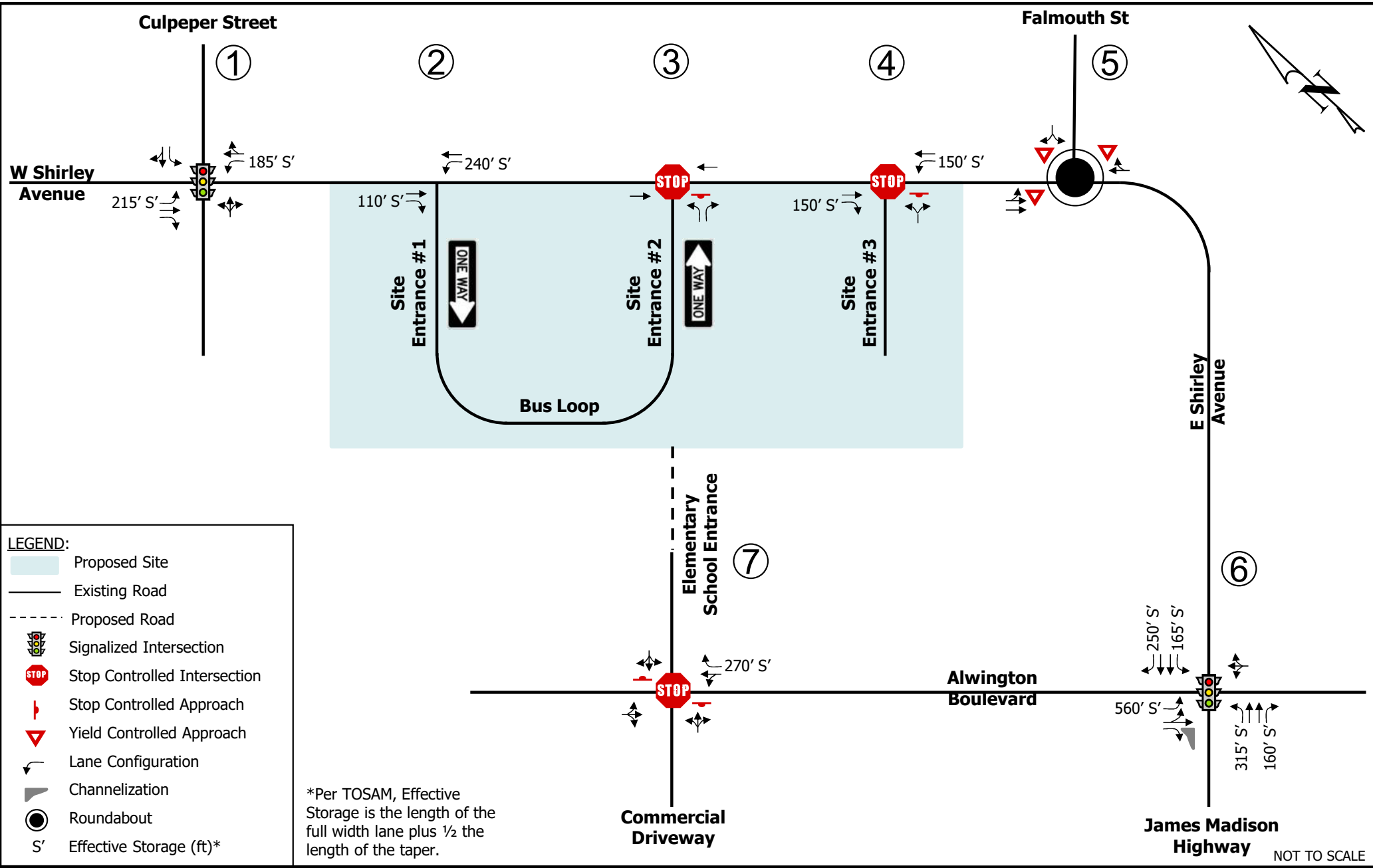
The distribution of trips generated by the proposed developed was based on other traffic studies in the area, the existing traffic volumes, the nature of the use, the school attendance map and local knowledge.

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.

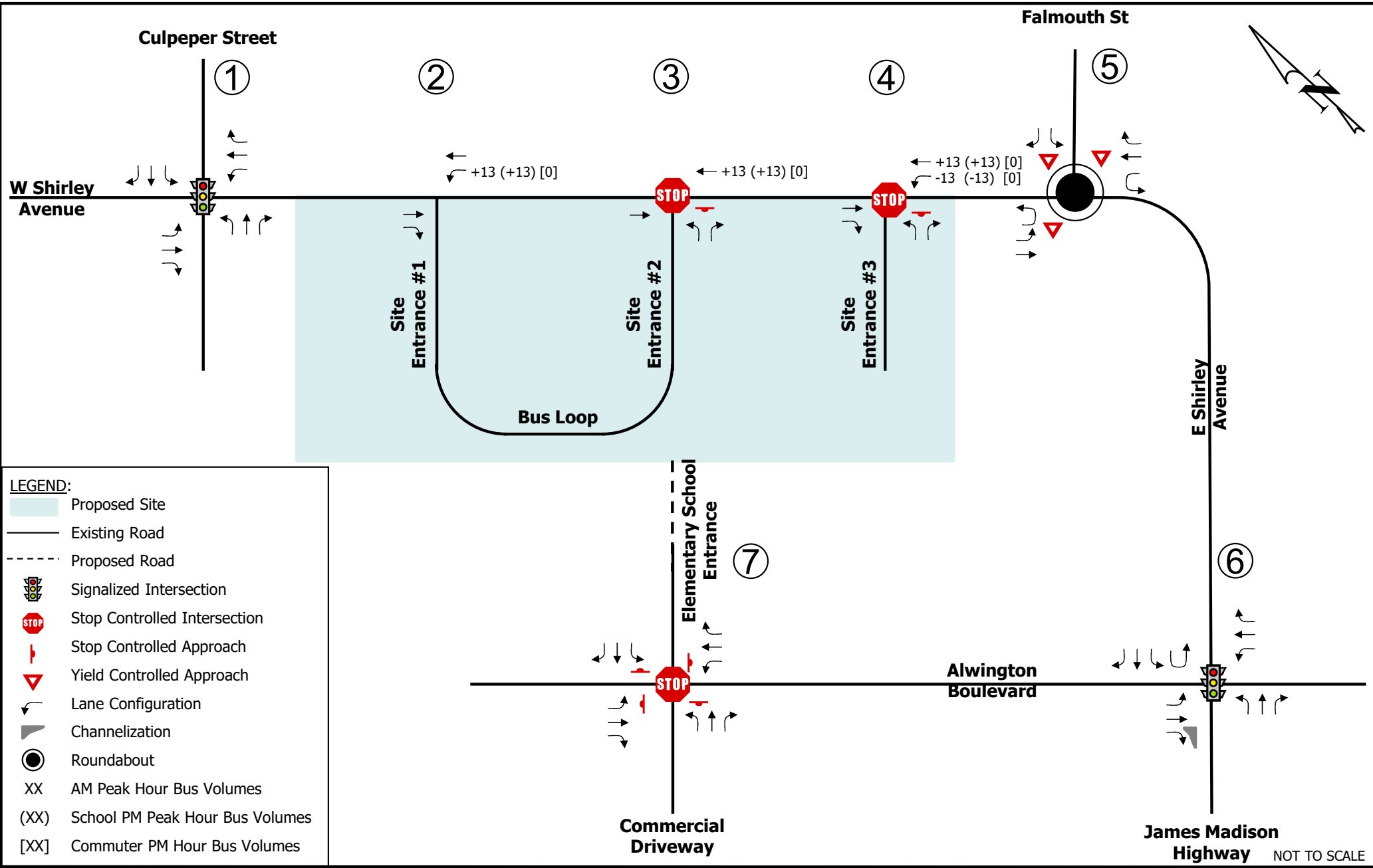
5.5 TRAFFIC ASSIGNMENT

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).



**Future Geometry and Stop Control**  
**Taylor Middle School – Addition**  
**Town of Warrenton, Virginia**

**Figure**  
**5-1**



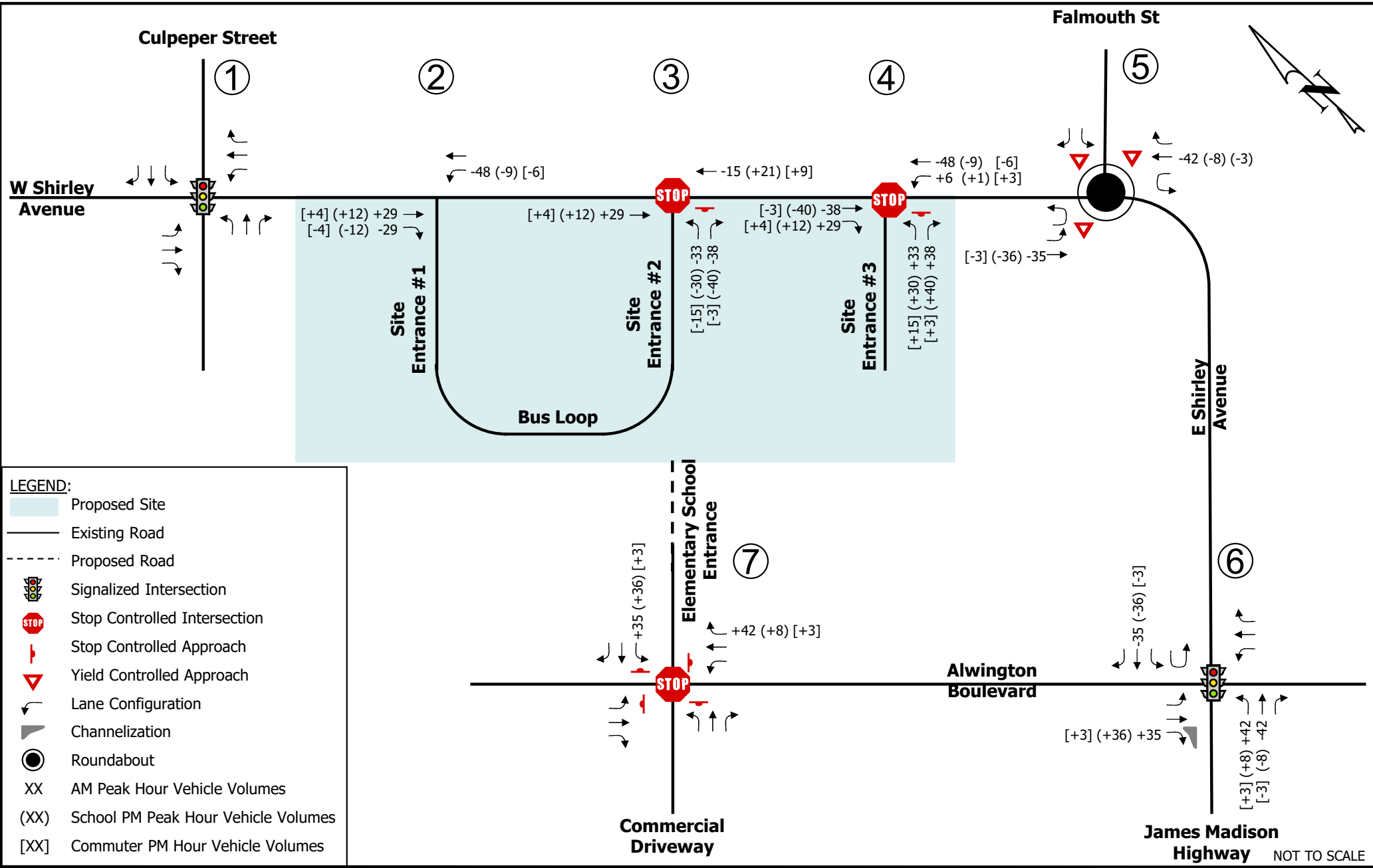
- LEGEND:**
- Proposed Site
  - Existing Road
  - Proposed Road
  - Signalized Intersection
  - Stop Controlled Intersection
  - Stop Controlled Approach
  - Yield Controlled Approach
  - Lane Configuration
  - Channelization
  - Roundabout
  - XX AM Peak Hour Bus Volumes
  - (XX) School PM Peak Hour Bus Volumes
  - [XX] Commuter PM Hour Bus Volumes



## Rerouted Existing Buses Taylor Middle School – Addition Town of Warrenton, Virginia

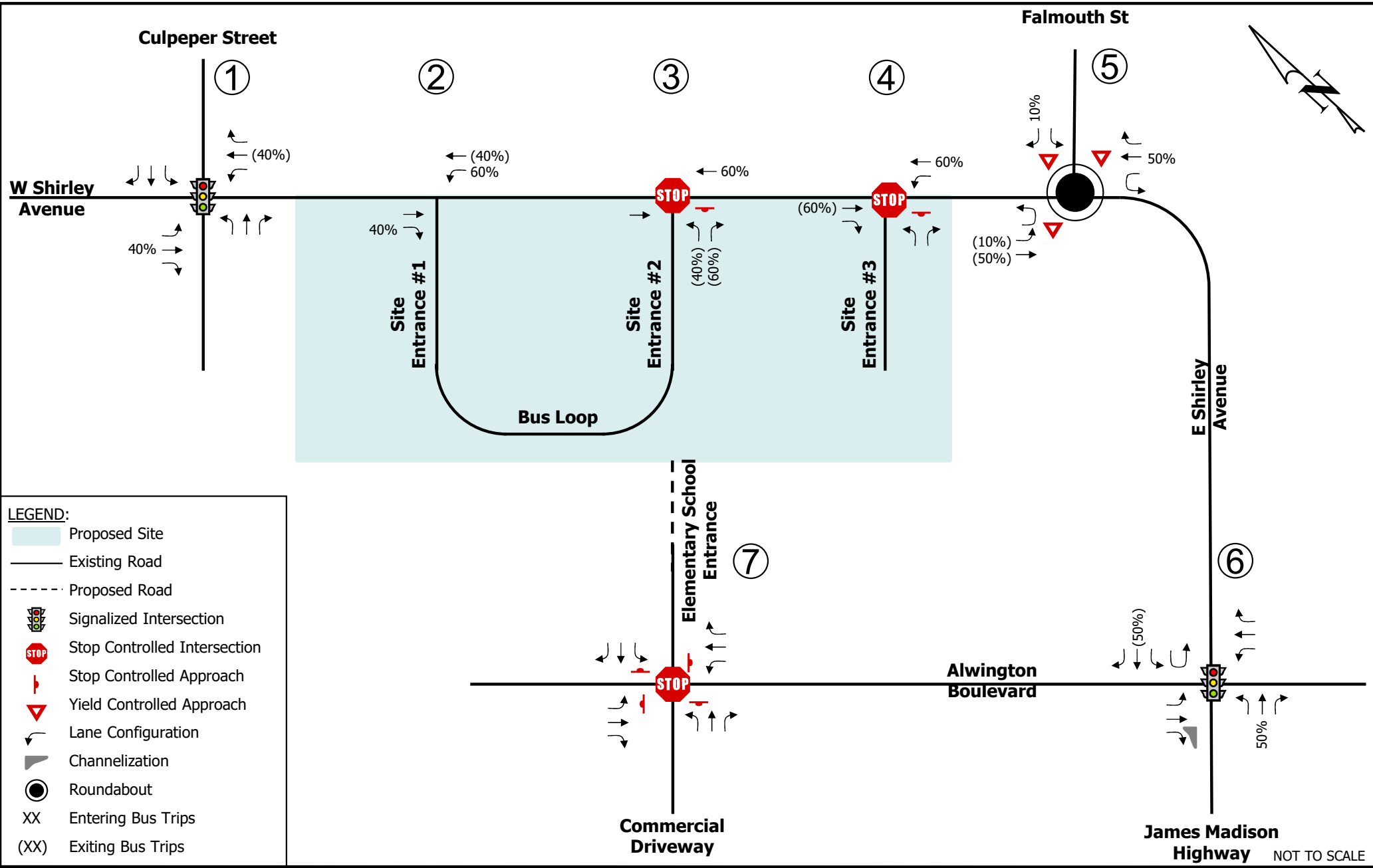
Figure  
5-2





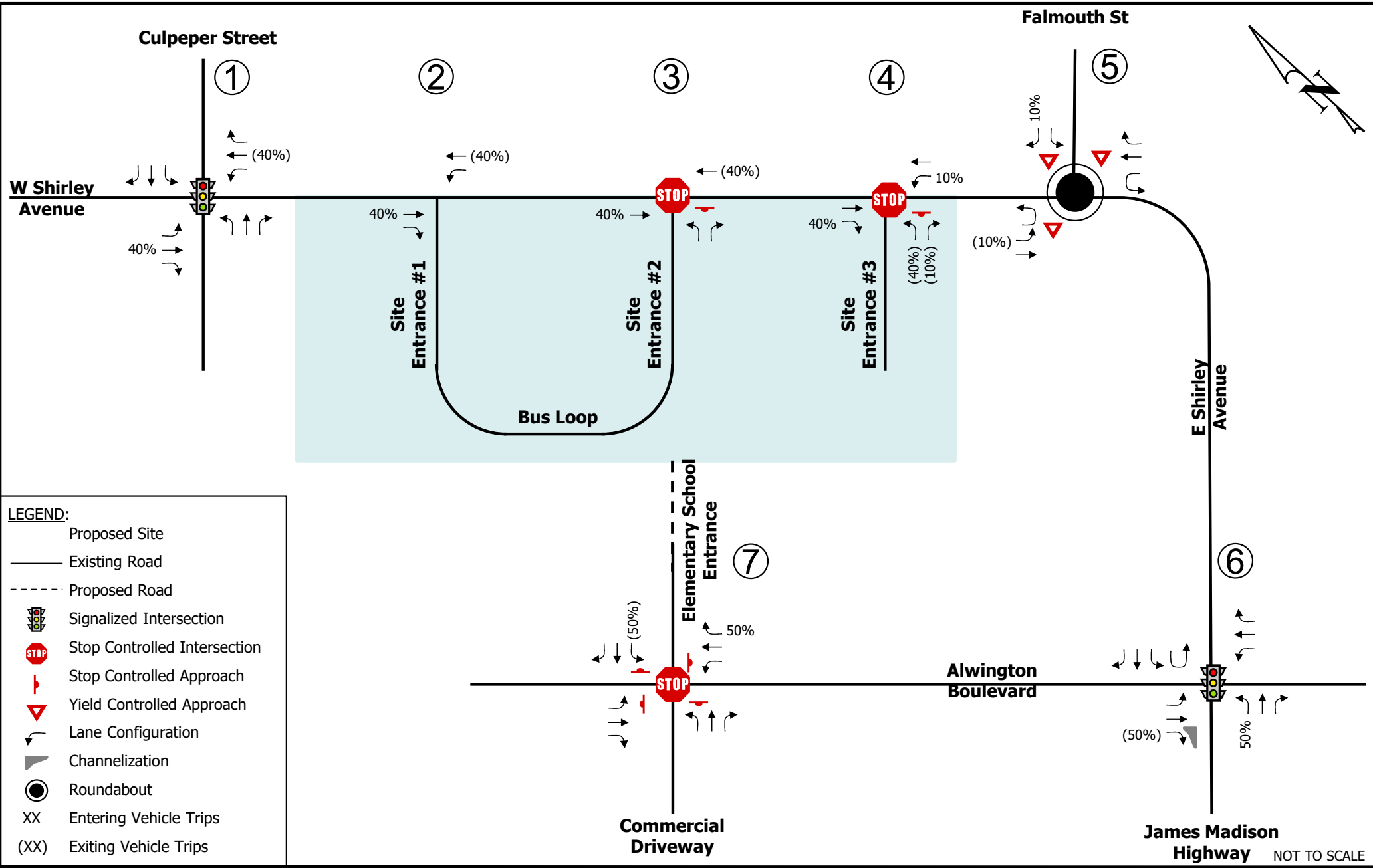
Rerouted Existing Vehicles (Non-Bus)  
 Taylor Middle School – Addition  
 Town of Warrenton, Virginia

Figure  
 5-3



Additional Bus Trip Distributions  
 Taylor Middle School – Addition  
 Town of Warrenton, Virginia

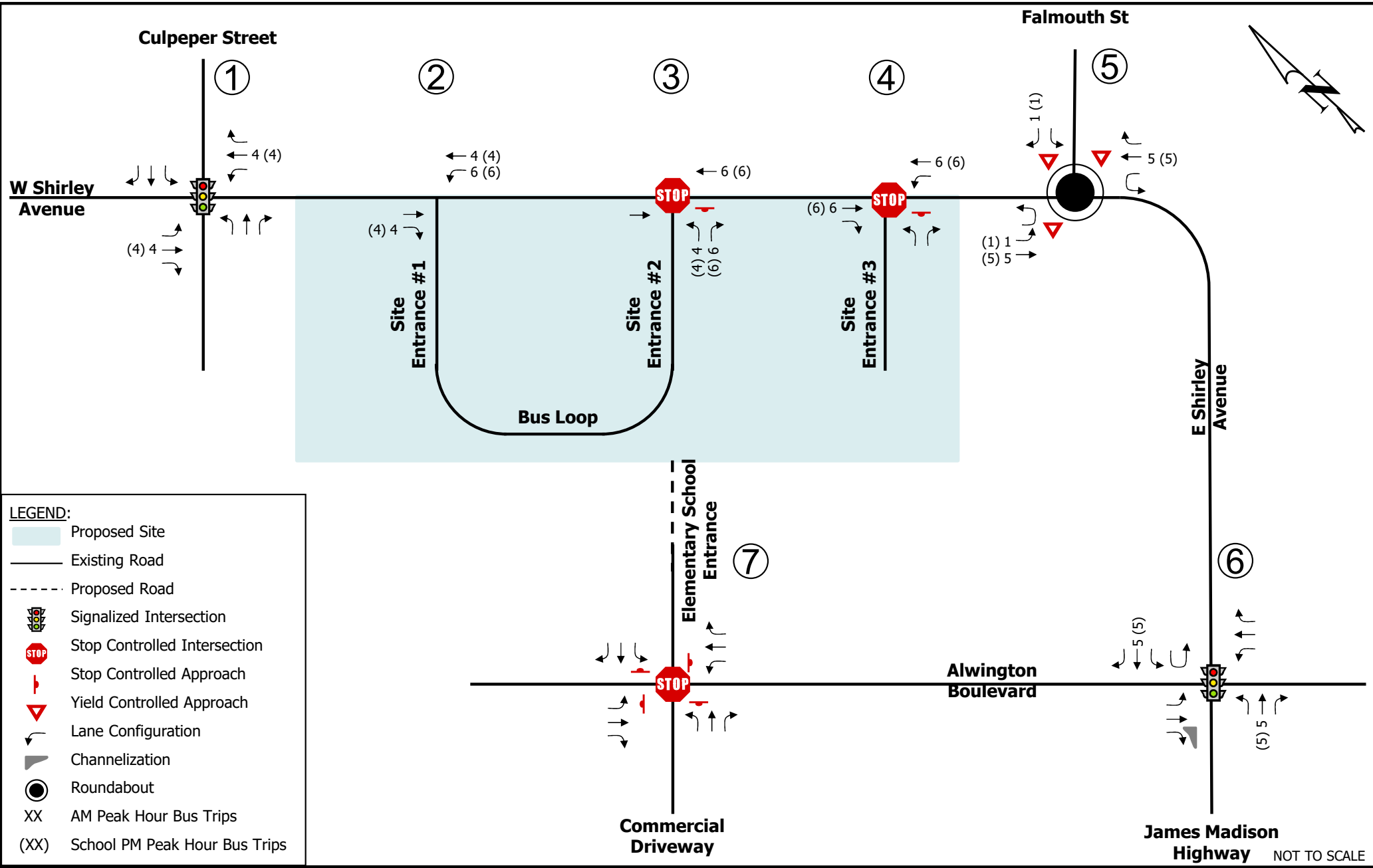
Figure  
 5-4



Additional Vehicle (Non-Bus) Trip Distributions  
 Taylor Middle School – Addition  
 Town of Warrenton, Virginia

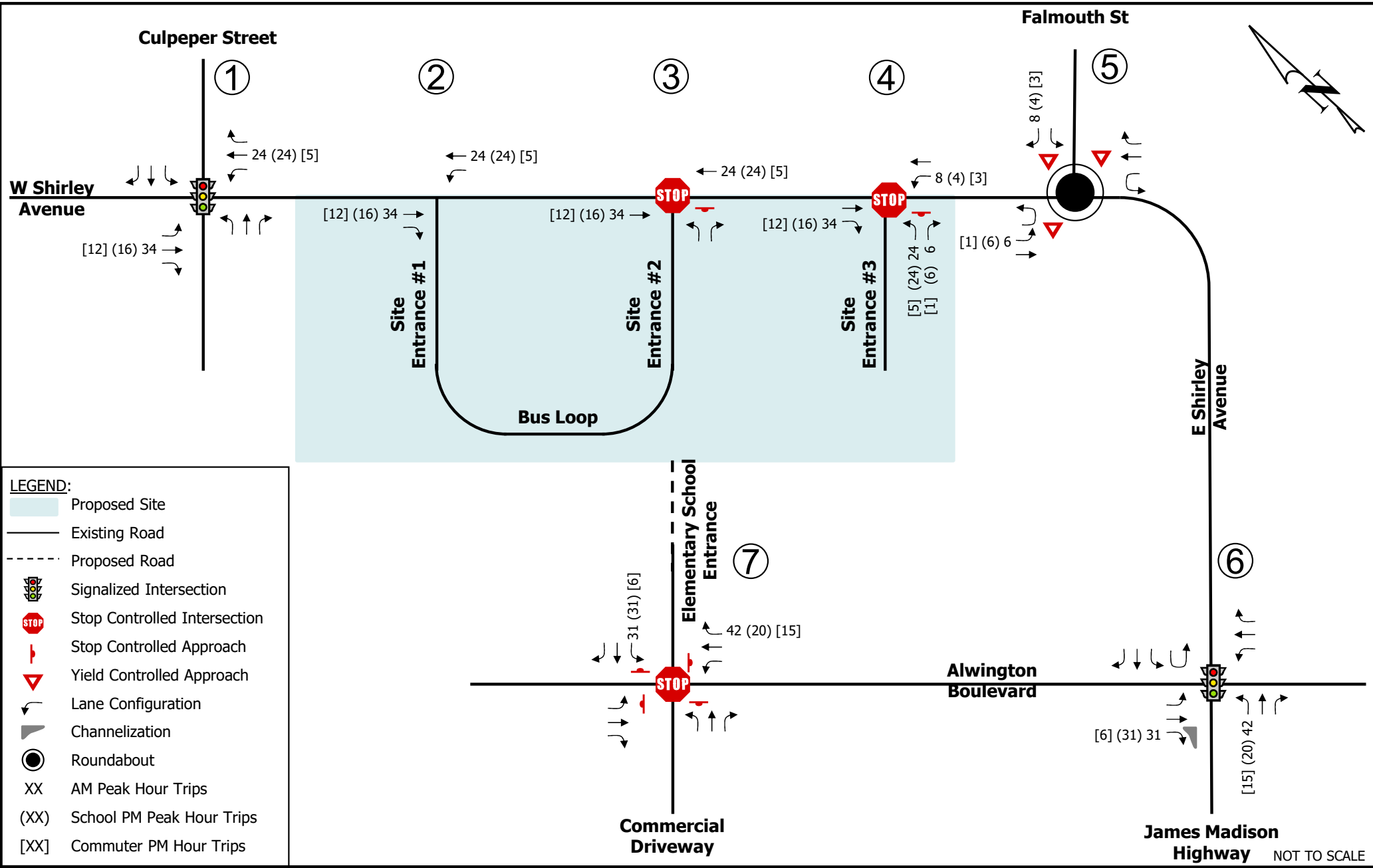
Figure  
 5-5





Site Generated Additional Bus Trips  
 Taylor Middle School – Addition  
 Town of Warrenton, Virginia

Figure  
 5-6



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, 95<sup>th</sup> 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 or D in each of the peak hours. Each of the approaches operates at LOS E 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/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 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 <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>(2)</sup> (ft)	Delay <sup>1</sup> (sec/veh)	LOS	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>(2)</sup> (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>(2)</sup> (ft)
1. Shirley Avenue (E-W) at Culpeper Street (N-S) Signalized	EB Left	215	47.8	D	51	169	58.1	E	62	202	53.6	D	63	202
	EB Thru		23.1	C	302	304	29.8	C	#529	394	30.8	C	446	411
	EB Right		17.1	B	0	74	17.4	B	12	66	19.8	B	42	116
	EB Approach		23.8	C	--	--	29.7	C	--	--	29.6	C	--	--
	WB Left	185	41.2	D	51	160	42.9	D	62	175	43.8	D	56	141
	WB Thru/Right		23.4	C	415	384	24.7	C	#541	423	25.2	C	434	373
	WB Approach		24.4	C	--	--	25.9	C	--	--	26.4	C	--	--
	NB Left/Thru/Right		47.9	D	#248	224	47.2	D	#207	242	47.2	D	197	192
	NB Approach		47.9	D	--	--	47.2	D	--	--	47.2	D	--	--
	SB Left	125	41.2	D	30	48	41.7	D	44	95	37.9	D	53	120
	SB Thru/Right		43.0	D	60	95	45.2	D	93	140	44.1	D	154	186
	SB Approach		42.6	D	--	--	44.4	D	--	--	42.9	D	--	--
<b>Overall</b>			<b>29.3</b>	<b>C</b>	<b>--</b>	<b>--</b>	<b>31.5</b>	<b>C</b>	<b>--</b>	<b>--</b>	<b>32.2</b>	<b>C</b>	<b>--</b>	<b>--</b>
2. E Shirley Avenue (E-W) at Site Entrance #1 (N-S) Unsignalized	EB Thru		†	†	0	2	†	†	0	--	†	†	0	--
	EB Right	110	†	†	0	--	†	†	0	0	†	†	0	--
	EB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	WB Left	240	8.4	A	3	42	8.7	A	3	34	†	†	0	--
WB Thru		†	†	0	--	†	†	0	--	†	†	0	--	
WB Approach		0.6	A	--	--	0.6	A	--	--	†	†	--	--	
3. E Shirley Avenue (E-W) at Site Entrance #2 (N-S) Unsignalized	EB Thru		†	†	0	--	†	†	0	4	†	†	0	--
	EB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	NB Left		18.8	C	7	52	23.3	C	9	60	†	†	0	--
NB Right		11.1	B	5	64	12.8	B	6	65	†	†	0	--	
NB Approach		14.1	B	--	--	16.8	C	--	--	†	†	--	--	
4. E Shirley Avenue (E-W) at Site Entrance #3 (N-S) Unsignalized	EB Thru		†	†	0	0	†	†	0	2	†	†	0	0
	EB Right	150	†	†	0	6	†	†	0	0	†	†	0	0
	EB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	WB Left	150	8.4	A	4	37	8.8	A	1	30	9.0	A	5	52
	WB Thru		†	†	0	--	†	†	--	--	†	†	--	--
	WB Approach		0.9	A	--	--	0.2	A	--	--	0.9	A	--	--
	NB Left-Right		21.4	C	64	108	30.5	D	91	134	23.5	C	18	42
NB Approach		21.4	C	--	--	30.5	D	--	--	23.5	C	--	--	
5. E Shirley Avenue (E-W) at Falmouth Street (N) Roundabout*	EB Approach		1.8	A	20	--	1.9	A	30	--	1.9	A	30	--
	WB Approach		10.1	B	109	--	9.6	A	106	--	13.1	B	182	--
	SB Approach		8.6	A	36	--	7.3	A	34	--	8.1	A	39	--
	<b>Overall</b>		<b>7.0</b>	<b>A</b>	<b>--</b>	<b>--</b>	<b>6.0</b>	<b>A</b>	<b>--</b>	<b>--</b>	<b>7.9</b>	<b>A</b>	<b>--</b>	<b>--</b>
6. E Shirley Avenue/ (N-S) James Madison Highway at Alwington Boulevard (E-W) Signalized	EB Left	560	35.6	D	68	133	37.0	D	130	164	36.7	D	125	151
	EB Left/Thru		35.6	D	68	96	37.3	D	132	125	36.7	D	125	113
	EB Right <sup>(3)</sup>		0.2	A	0	27	0.3	A	0	69	0.2	A	0	47
	EB Approach		16.2	B	--	--	19.5	B	--	--	20.3	C	--	--
	WB Left/Thru/Right		34.1	C	0	61	35.2	D	26	65	34.8	C	0	50
	WB Approach		34.1	C	--	--	35.2	D	--	--	34.8	C	--	--
	NB Left	315	18.2	B	146	213	18.7	B	115	164	19.0	B	122	181
	NB Thru		17.4	B	129	166	18.1	B	86	148	18.1	B	95	173
	NB Right	160	15.3	B	0	19	16.9	B	0	42	16.7	B	0	28
	NB Approach		17.7	B	--	--	18.4	B	--	--	18.5	B	--	--
	SB Left	165	14.6	B	11	43	16.3	B	18	51	16.2	B	15	74
	SB Thru		25.1	C	63	103	25.9	C	123	154	25.8	C	140	167
	SB Right	250	18.1	B	0	113	15.8	B	9	89	15.1	B	1	78
SB Approach		21.2	C	--	--	22.6	C	--	--	23.5	C	--	--	
<b>Overall</b>			<b>18.3</b>	<b>B</b>	<b>--</b>	<b>--</b>	<b>20.4</b>	<b>C</b>	<b>--</b>	<b>--</b>	<b>20.9</b>	<b>C</b>	<b>--</b>	<b>--</b>
7. Alwington Boulevard (E-W) at Elementary School Entrance/ Commercial Entrance (N-S) Unsignalized**	EB Left/Thru/Right		7.6	A	0	8	7.6	A	0	23	7.3	A	3	8
	EB Approach		7.6	A	--	--	7.6	A	--	--	7.3	A	--	--
	WB Left/Thru		9.0	A	10	74	8.9	A	3	65	8.9	A	3	75
	WB Right	270	7.9	A	20	86	7.2	A	8	68	6.8	A	3	68
	WB Approach		8.2	A	--	--	7.5	A	--	--	7.5	A	--	--
	NB Left/Thru/Right		7.2	A	3	83	6.7	A	0	63	6.6	A	3	56
	NB Approach		7.2	A	--	--	6.7	A	--	--	6.6	A	--	--
SB Left/Thru/Right		8.5	A	10	68	7.8	A	8	50	7.5	A	3	36	
SB Approach		8.5	A	--	--	7.8	A	--	--	7.5	A	--	--	

<sup>1</sup> Overall intersection LOS and delay reported for signalized intersections and roundabouts only.  
<sup>2</sup> SimTraffic Queues are average maximum queues after 10 runs of 60 minutes each.  
<sup>3</sup> 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. 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 beyond those identified above.
7. 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 to vehicular traffic.
8. The site will provide a public access easement across the frontage for the future extension of the shared use path along Shirley Avenue. A five foot sidewalk will be provided along the roadway connection to the elementary school.

### 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

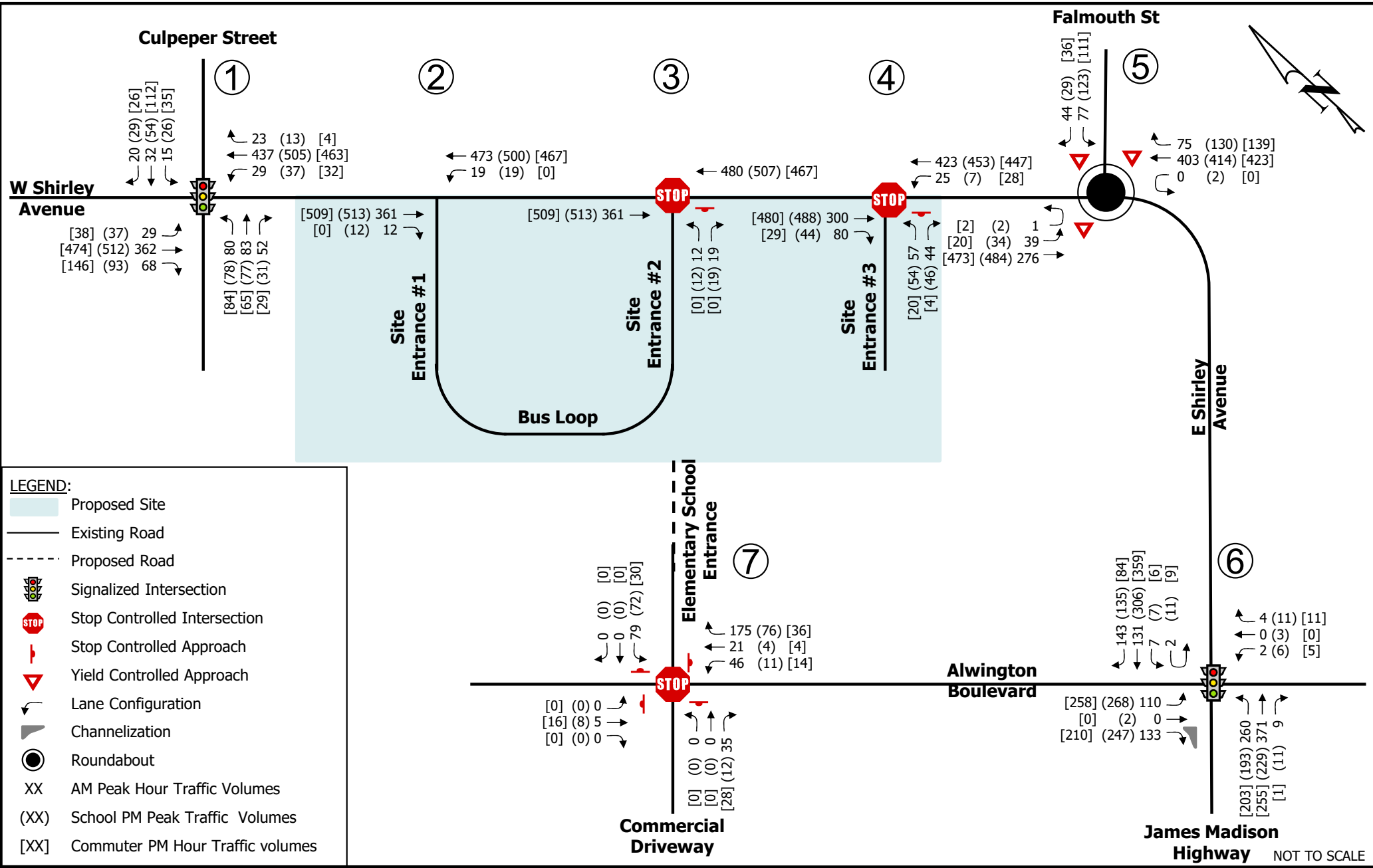
Westbound left turn lane with 160 feet of storage

As discussed above, with the expansion of the site, the access to the site will be reworked as shown in Figure 1-2. The two western entrances on East Shirley Avenue will be a bus loop only and the eastern entrance will be combined with the community center entrance and serve all other vehicles.

At the eastern entrance, the lanes along Shirley Avenue will be reworked to provide a right and left turn lane with 100 feet of storage and 100 feet of taper (effective storage of 150 feet).

As shown in Table 6-1, under 2026 future conditions, the 95<sup>th</sup> percentile and maximum queues at the site entrances will be contained within the existing available storage. No additional storage is required.





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, 95<sup>th</sup> 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.

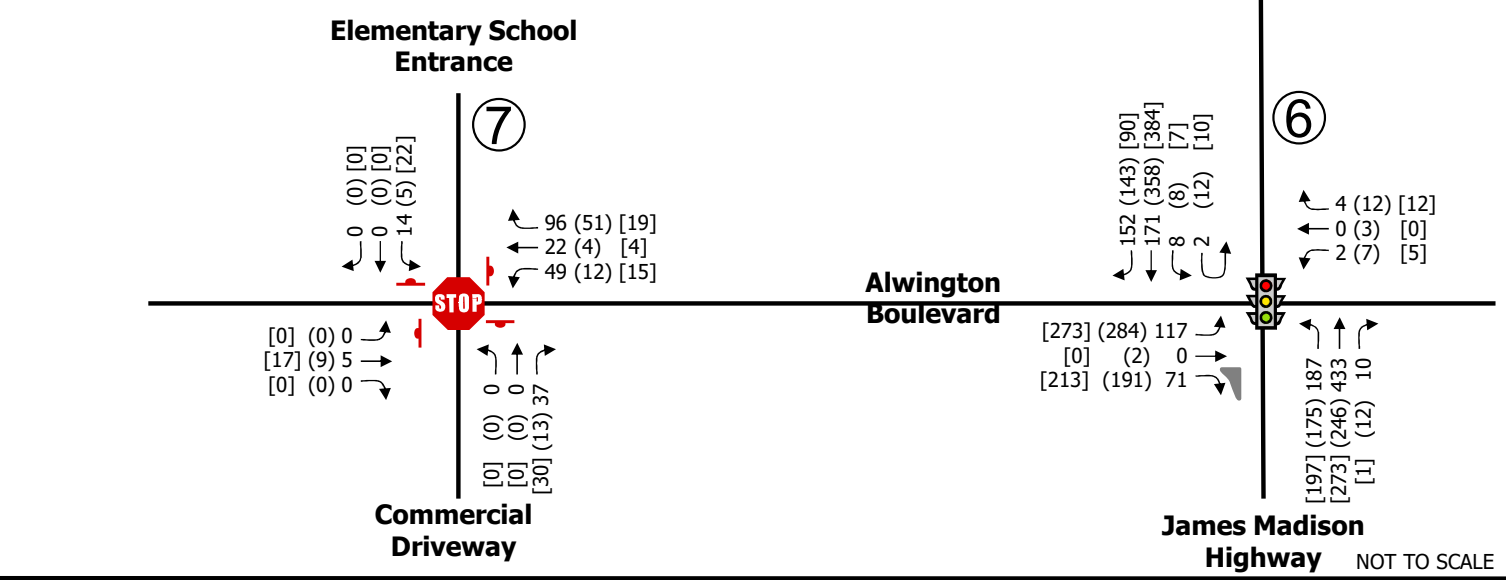
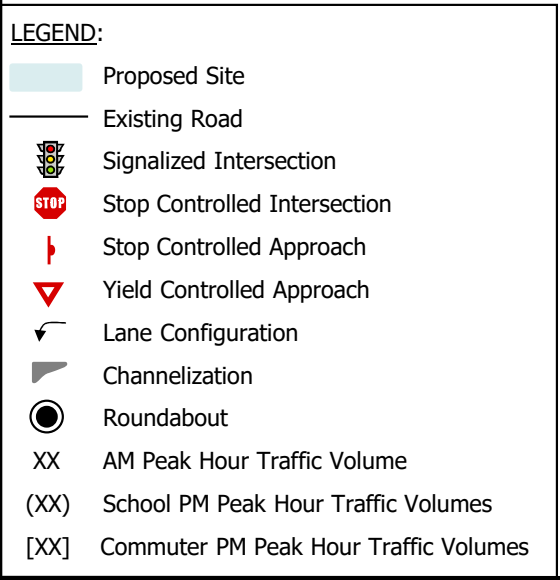
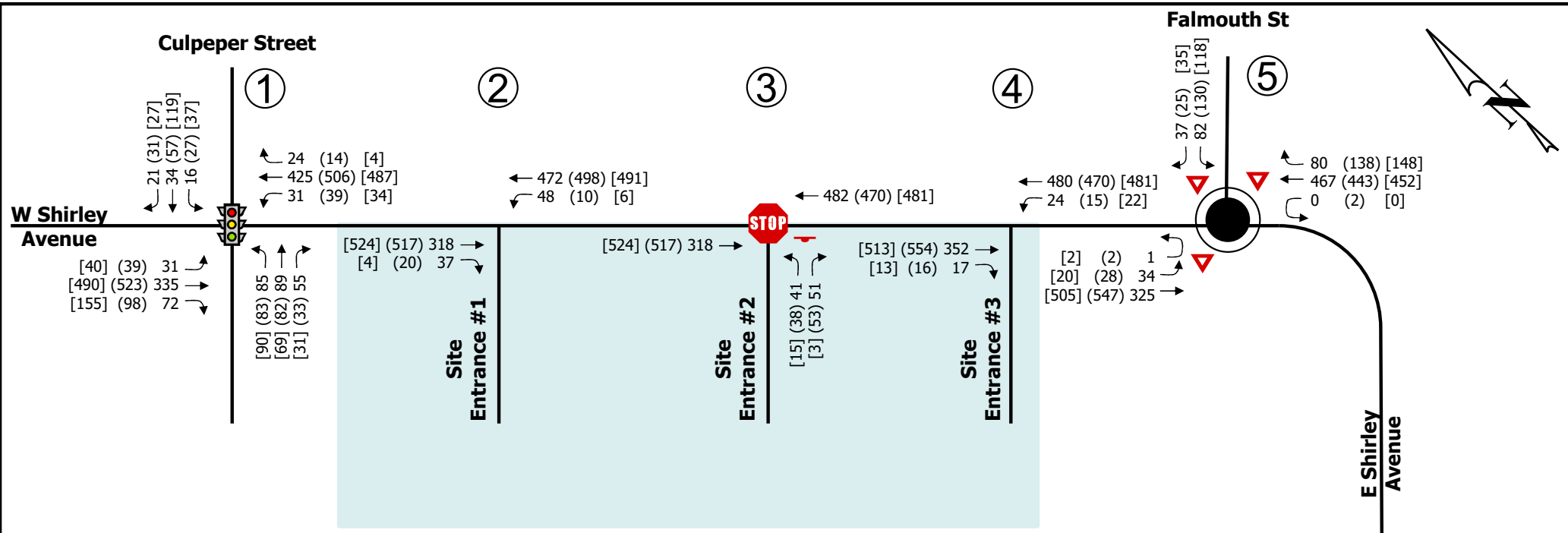
As shown in Table 7-1, under 2032 background conditions, all intersections experience similar levels of service, delay, and queueing as under 2026 background conditions. Specifically:

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 E 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/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**

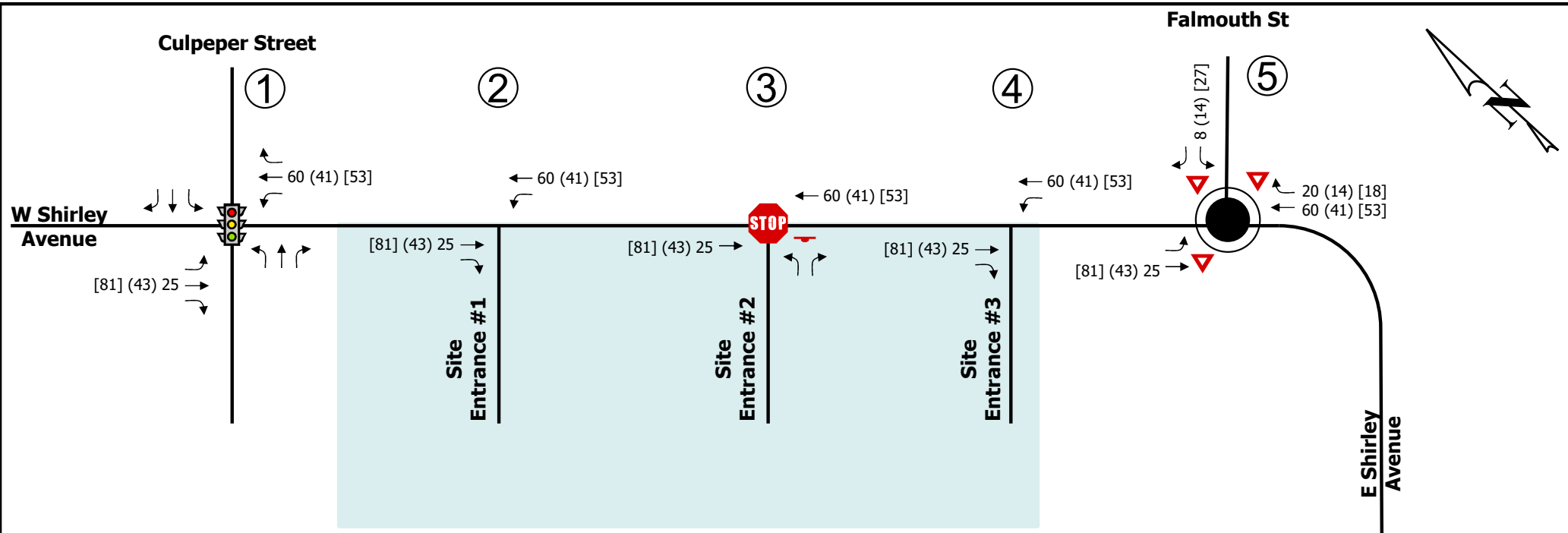
Intersection and Type of Control	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR			SCHOOL PM PEAK HOUR			COMMUTER PM PEAK HOUR					
			Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>2</sup> (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>2</sup> (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>2</sup> (ft)
1. Shirley Avenue (E-W) at Culpeper Street (N-S) Signalized	EB Left	215	49.4	D	53	135	61.7	E	64	214	59.7	E	67	214
	EB Thru		23.1	C	302	301	34.5	C	#621	477	39.1	D	#630	454
	EB Right		17.2	B	0	68	17.5	B	16	96	20.1	C	49	83
	EB Approach		24.0	C	--	--	33.6	C	--	--	36.4	D	--	--
	WB Left	185	42.3	D	54	162	44.5	D	64	184	46.4	D	58	161
	WB Thru/Right		26.2	C	#524	494	27.2	C	#617	452	28.8	C	#577	452
	WB Approach		27.1	C	--	--	28.3	C	--	--	29.8	C	--	--
	NB Left/Thru/Right		51.1	D	#272	239	50.0	D	#237	234	51.7	D	210	208
	NB Approach		51.1	D	--	--	50.0	D	--	--	51.7	D	--	--
	SB Left	125	42.0	D	31	50	42.8	D	45	91	39.6	D	55	117
	SB Thru/Right		43.9	D	62	95	46.8	D	97	140	47.1	D	164	197
	SB Approach		43.5	D	--	--	45.9	D	--	--	45.6	D	--	--
<b>Overall</b>			<b>31.1</b>	<b>C</b>	--	--	<b>34.5</b>	<b>C</b>	--	--	<b>36.9</b>	<b>D</b>	--	--
2. E Shirley Avenue (E-W) at Site Entrance #1 (N-S) Unsignalized	EB Thru		†	†	0	4	†	†	0	--	†	†	0	--
	EB Right	110	†	†	0	9	†	†	0	--	†	†	0	0
	EB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	WB Left	240	8.7	A	7	60	8.9	A	1	30	8.9	A	1	29
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
WB Approach		1.2	A	--	--	0.3	A	--	--	0.2	A	--	--	
3. E Shirley Avenue (E-W) at Site Entrance #2 (N-S) Unsignalized	EB Thru		†	†	0	4	†	†	0	2	†	†	0	--
	EB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	NB Left		24.3	C	31	93	32.6	D	40	79	26.6	D	13	47
NB Right		11.6	B	14	84	14.9	B	22	98	12.8	B	1	30	
NB Approach		17.3	C	--	--	22.3	C	--	--	24.3	C	--	--	
4. E Shirley Avenue (E-W) at Site Entrance #3 (N-S) Unsignalized	EB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	EB Right	140	†	†	0	0	†	†	0	2	†	†	0	2
	EB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	WB Left	160	8.3	A	3	40	9.0	A	3	35	9.3	A	4	51
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
WB Approach		0.6	A	--	--	0.5	A	--	--	0.7	A	--	--	
5. E Shirley Avenue (E-W) at Falmouth Street (N) Roundabout*	EB Approach		1.9	A	25	--	2.1	A	37	--	2.1	A	39	--
	WB Approach		14.3	B	203	--	11.3	B	149	--	18.1	B	317	--
	SB Approach		10.8	B	48	--	8.3	A	42	--	10.4	B	58	--
	<b>Overall</b>		<b>9.7</b>	<b>A</b>	--	--	<b>6.9</b>	<b>A</b>	--	--	<b>10.2</b>	<b>B</b>	--	--
6. E Shirley Avenue/ (N-S) James Madison Highway at Alwington Boulevard (E-W) Signalized	EB Left	560	35.3	D	88	149	38.2	D	151	180	40.4	D	154	176
	EB Left/Thru		35.6	D	88	109	38.6	D	153	143	40.5	D	155	132
	EB Right <sup>3</sup>		0.1	A	0	5	0.2	A	0	47	0.2	A	0	60
	EB Approach		23.8	C	--	--	23.8	C	--	--	23.8	C	--	--
	WB Left/Thru/Right		33.7	C	0	56	35.6	D	29	68	36.2	D	0	47
	WB Approach		33.7	C	--	--	35.6	D	--	--	36.2	D	--	--
	NB Left	315	18.0	B	110	157	19.0	B	105	168	19.3	B	119	176
	NB Thru		19.2	B	172	210	19.7	B	99	177	19.5	B	111	168
	NB Right	160	16.1	B	0	20	18.1	B	0	47	17.6	B	0	21
	NB Approach		18.8	B	--	--	19.4	B	--	--	19.4	B	--	--
	SB Left	165	15.5	B	12	46	16.7	B	19	49	16.4	B	17	80
	SB Thru		24.8	C	82	127	26.9	C	150	186	27.9	C	174	187
SB Right	250	16.8	B	20	109	15.5	B	16	105	15.7	B	12	92	
SB Approach		20.8	C	--	--	23.2	C	--	--	24.6	C	--	--	
<b>Overall</b>			<b>20.4</b>	<b>C</b>	--	--	<b>22.4</b>	<b>C</b>	--	--	<b>22.9</b>	<b>C</b>	--	--
7. Alwington Boulevard (E-W) at Elementary School Entrance/ Commercial Entrance (N-S) Unsignalized**	EB Left/Thru/Right		7.6	A	5	20	7.6	A	5	49	7.6	A	5	29
	EB Approach		7.6	A	--	--	7.6	A	--	--	7.6	A	--	--
	WB Left/Thru		8.9	A	13	81	8.8	A	8	71	9.4	A	13	82
	WB Right	270	7.2	A	10	73	6.9	A	5	63	6.8	A	3	57
	WB Approach		8.0	A	--	--	7.8	A	--	--	8.9	A	--	--
	NB Left/Thru/Right		7.1	A	3	81	6.7	A	0	69	6.9	A	3	57
	NB Approach		7.1	A	--	--	6.7	A	--	--	6.9	A	--	--
	SB Left/Thru/Right		8.0	A	3	54	7.5	A	0	26	7.7	A	3	31
SB Approach		8.0	A	--	--	7.5	A	--	--	7.7	A	--	--	

<sup>1</sup> Overall intersection LOS and delay reported for signalized intersections and roundabouts only.  
<sup>2</sup> SimTraffic Queues are average maximum queues after 10 runs of 60 minutes each.  
<sup>3</sup> 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.

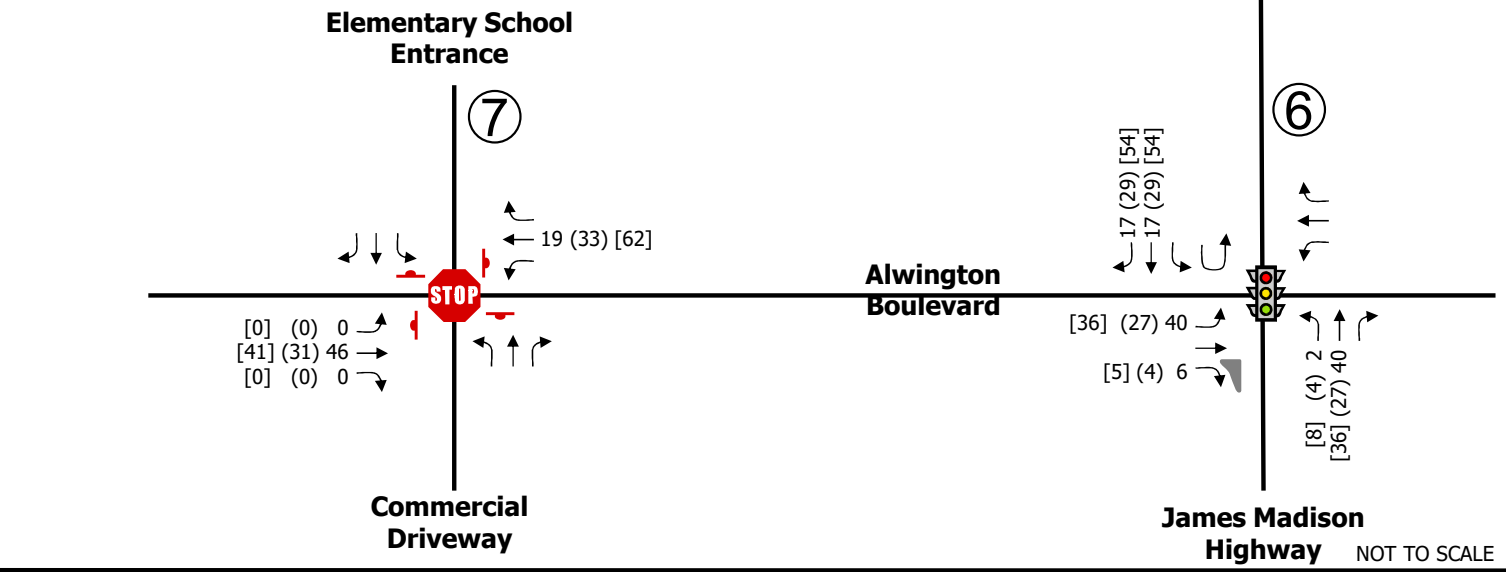


2032 Existing + Growth Peak Hour Volumes  
 Taylor Middle School – Addition  
 Town of Warrenton, Virginia

Figure  
 7-1



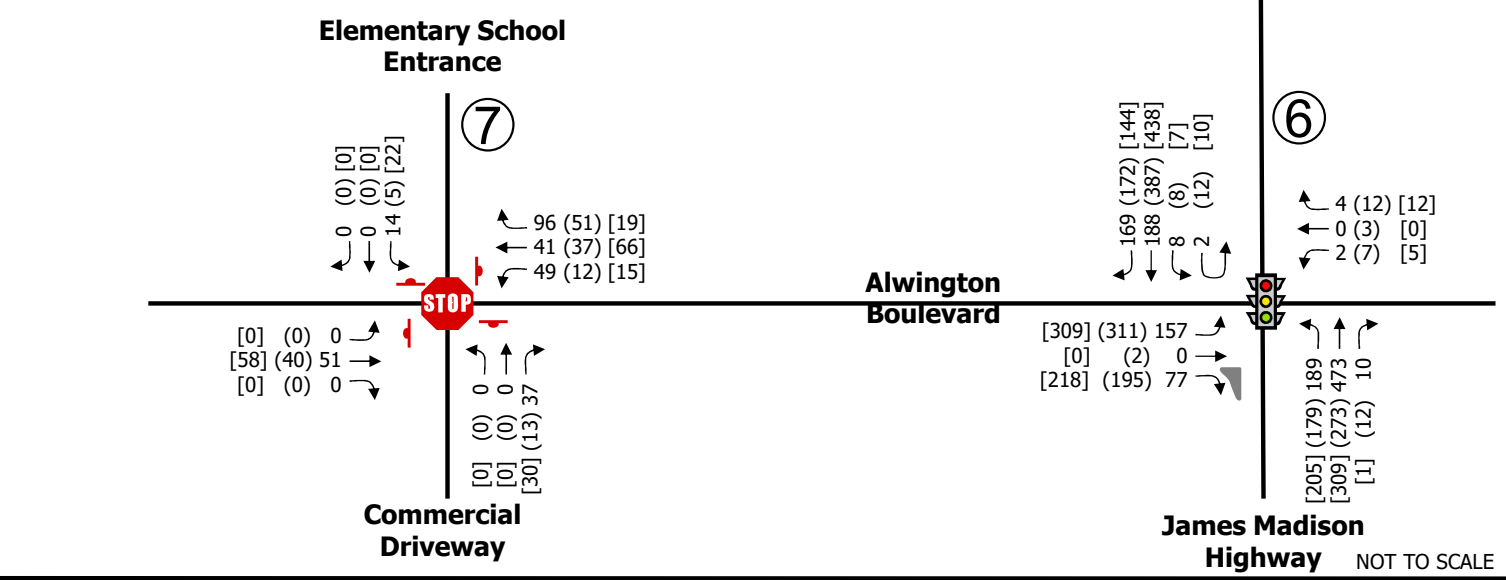
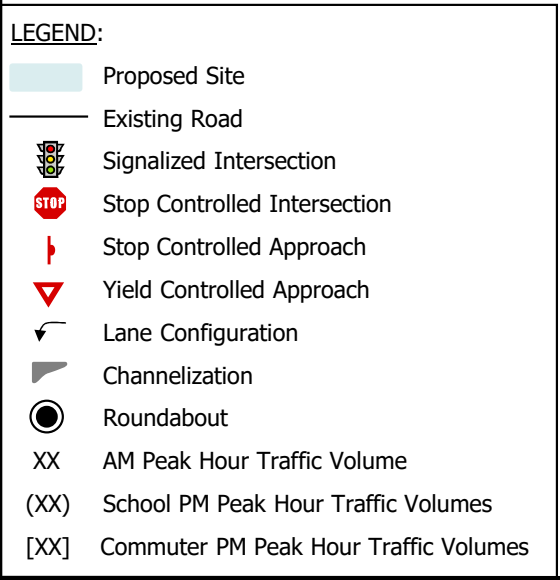
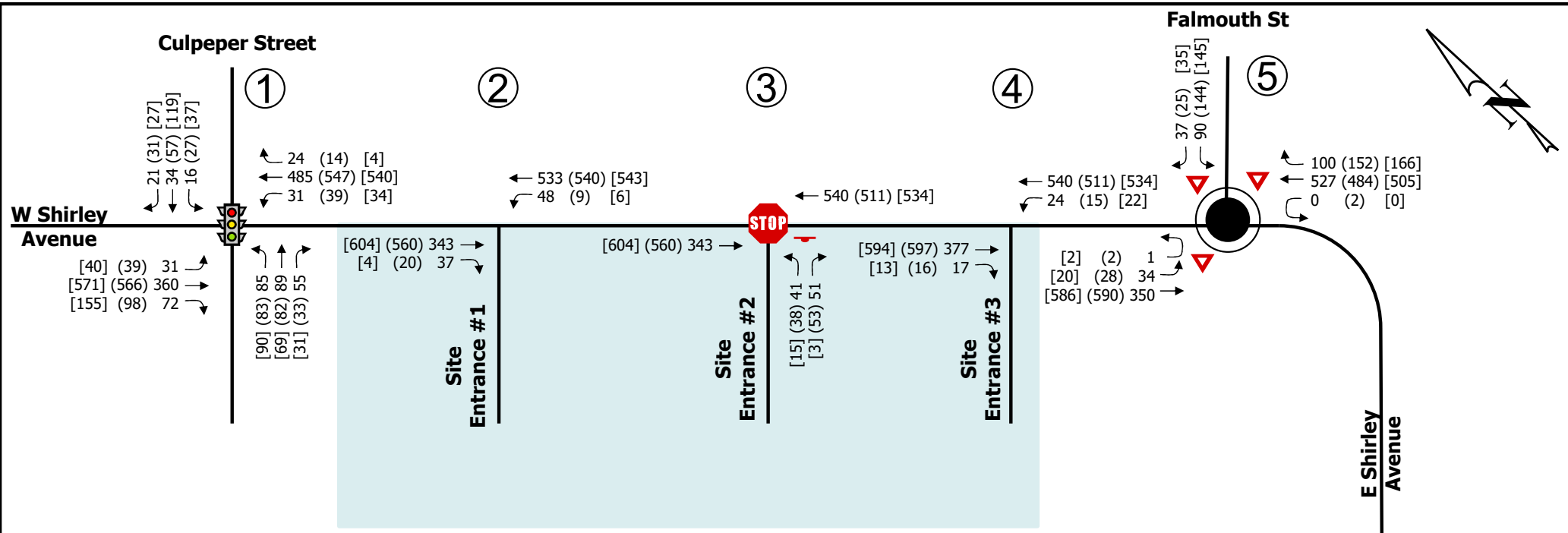
- LEGEND:**
- Proposed Site
  - Existing Road
  - Signalized Intersection
  - Stop Controlled Intersection
  - Stop Controlled Approach
  - Yield Controlled Approach
  - Lane Configuration
  - Channelization
  - Roundabout
  - XX AM Peak Hour Trips
  - (XX) School PM Peak Hour Trips
  - [XX] Commuter PM Peak Hour Trips



**Arrington Development Trips**  
**Taylor Middle School – Addition**  
**Town of Warrenton, Virginia**

**Figure**  
**7-2**

NOT TO SCALE



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, 95<sup>th</sup> 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:

- 9. 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.
- 10. 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.
- 11. The roundabout at East Shirley Avenue/Falmouth Street operates at LOS A or B in each of the peak hours with no queuing concerns.
- 12. 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.
- 13. Each of the movements at the Alwington Boulevard/School Entrance/Commercial Entrance intersection operates at LOS A in all peak hours.
- 14. 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 beyond those identified above.



15. 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 to vehicular traffic.
16. The site will provide a public access easement across the frontage for the future extension of the shared use path along Shirley Avenue. A five foot sidewalk will be provided along the roadway connection to the elementary school.

### 8.3 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 discussed above, with the expansion of the site, the access to the site will be reworked as shown in Figure 1-2. The two western entrances on East Shirley Avenue will be a bus loop only and the eastern entrance will be combined with the community center entrance and serve all other vehicles.

At the eastern entrance, the lanes along Shirley Avenue will be reworked to provide a right and left turn lane with 100 feet of storage and 100 feet of taper (effective storage of 150 feet).

As shown in Table 8-1, under 2032 future conditions, the 95<sup>th</sup> percentile and maximum queues at the site entrances will be contained within the existing available storage. No additional storage is required.

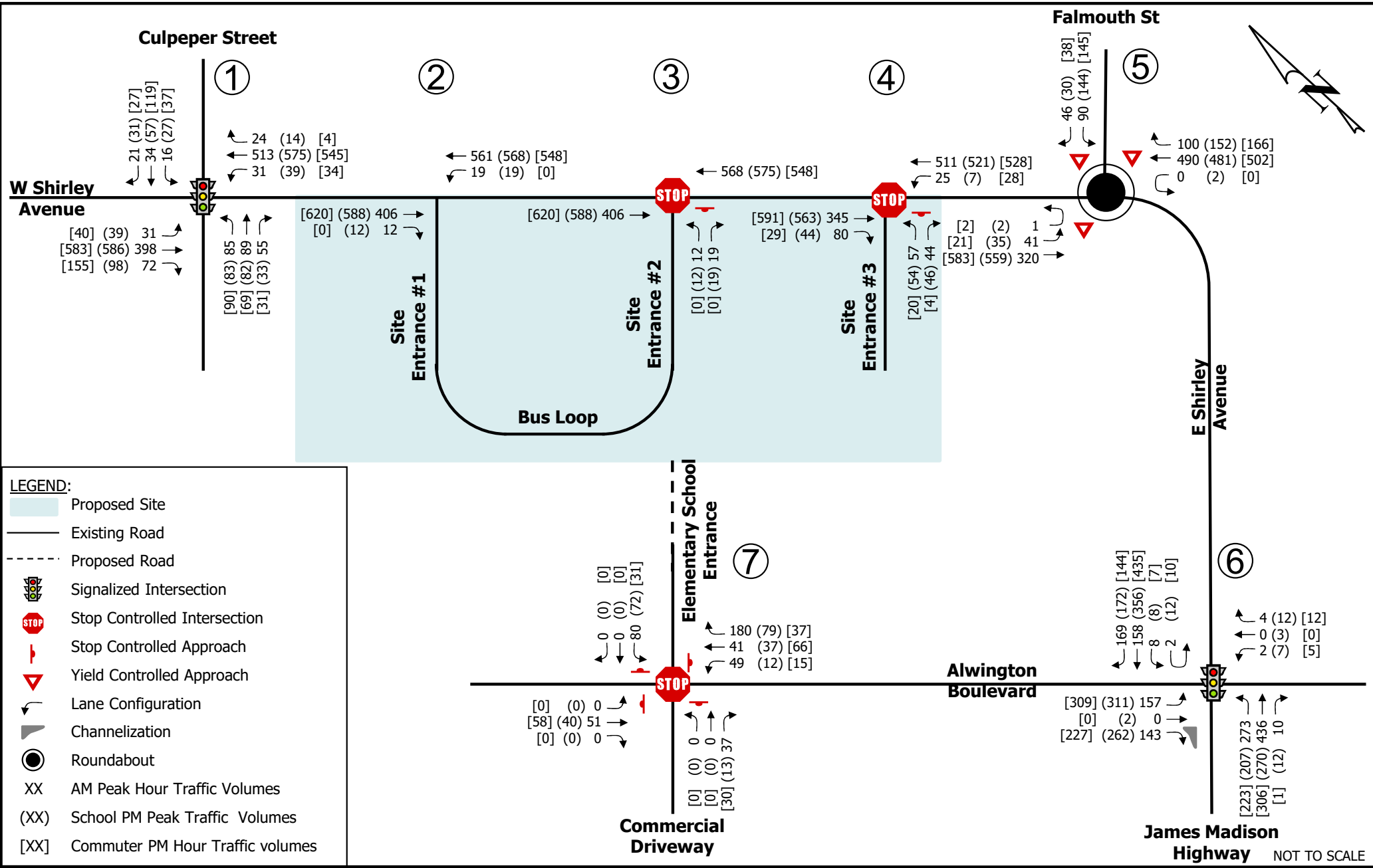
### 2032 TURN LANE WARRANT ANALYSIS

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:

**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 <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>(2)</sup> (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>(2)</sup> (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	HCS 95th Percentile Queue Length (ft)	Simulated Maximum Queue Length <sup>(2)</sup> (ft)
1. Shirley Avenue (E-W) at Culpeper Street (N-S) Signalized	EB Left	215	49.4	D	53	112	61.5	E	64	214	59.9	E	67	214
	EB Thru		24.6	C	342	308	35.9	D	#654	505	40.9	D	#650	590
	EB Right		17.2	B	0	66	17.3	B	16	137	20.1	C	51	119
	EB Approach		25.1	C	--	--	34.8	C	--	--	37.7	D	--	--
	WB Left	185	42.3	D	54	172	45.2	D	64	184	46.6	D	58	184
	WB Thru/Right		28.3	C	#572	451	28.8	C	#665	573	29.0	C	#586	459
	WB Approach		29.1	C	--	--	29.8	C	--	--	30.0	C	--	--
	NB Left/Thru/Right		51.1	D	#272	258	51.4	D	#237	255	52.3	D	210	237
	NB Approach		51.1	D	--	--	51.4	D	--	--	52.3	D	--	--
	SB Left	125	42.0	D	31	53	43.4	D	45	85	39.7	D	55	118
	SB Thru/Right		43.9	D	62	99	47.6	D	97	149	47.3	D	164	190
	SB Approach		43.5	D	--	--	46.6	D	--	--	45.8	D	--	--
	<b>Overall</b>			<b>32.0</b>	<b>C</b>	<b>--</b>	<b>--</b>	<b>35.7</b>	<b>D</b>	<b>--</b>	<b>--</b>	<b>37.6</b>	<b>D</b>	<b>--</b>
2. E Shirley Avenue (E-W) at Site Entrance #1 (N-S) Unsignalized	EB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	EB Right	110	†	†	0	5	†	†	0	6	†	†	0	--
	EB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	WB Left	240	8.6	A	3	55	9.0	A	3	48	†	†	0	--
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
WB Approach		0.5	A	--	--	0.5	A	--	--	†	†	--	--	
3. E Shirley Avenue (E-W) at Site Entrance #2 (N-S) Unsignalized	EB Thru		†	†	0	0	†	†	0	--	†	†	0	--
	EB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	WB Thru		†	†	0	--	†	†	0	--	†	†	0	--
	WB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	NB Left		22.2	C	8	53	28.4	D	11	58	†	†	0	--
NB Right		11.5	B	5	56	13.7	B	7	63	†	†	0	--	
NB Approach		15.7	C	--	--	19.4	C	--	--	†	†	--	--	
4. E Shirley Avenue (E-W) at Site Entrance #3 (N-S) Unsignalized	EB Thru		†	†	0	11	†	†	0	--	†	†	0	0
	EB Right	150	†	†	0	12	†	†	0	2	†	†	0	2
	EB Approach		†	†	--	--	†	†	--	--	†	†	--	--
	WB Left	150	8.6	A	4	43	9.0	A	1	30	9.4	A	5	57
	WB Thru		†	†	0	--	†	†	--	--	†	†	--	--
	WB Approach		0.7	A	--	--	0.2	A	--	--	0.8	A	--	--
NB Left-Right		19.4	C	31	81	26.1	D	45	92	28.3	D	12	43	
NB Approach		19.4	C	--	--	26.1	D	--	--	28.3	D	--	--	
5. E Shirley Avenue (E-W) at Falmouth Street (N) Roundabout*	EB Approach		1.8	A	23	--	2.1	A	35	--	2.1	A	39	--
	WB Approach		13.3	B	174	--	11.5	B	148	--	18.0	B	312	--
	SB Approach		10.5	B	48	--	8.4	A	43	--	10.4	B	59	--
	<b>Overall</b>		<b>9.1</b>	<b>A</b>	<b>--</b>	<b>--</b>	<b>7.1</b>	<b>A</b>	<b>--</b>	<b>--</b>	<b>10.4</b>	<b>B</b>	<b>--</b>	<b>--</b>
6. E Shirley Avenue/ (N-S) James Madison Highway at Alwington Boulevard (E-W) Signalized	EB Left	560	37.3	D	90	155	38.1	D	151	168	41.3	D	155	184
	EB Left/Thru		37.4	D	91	114	38.5	D	153	134	41.4	D	156	144
	EB Right <sup>(3)</sup>		0.2	A	0	36	0.3	A	0	84	0.2	A	0	60
	EB Approach		19.7	B	--	--	21.0	C	--	--	23.9	C	--	--
	WB Left/Thru/Right		35.1	D	0	55	35.8	D	29	74	36.3	D	0	65
	WB Approach		35.1	D	--	--	35.8	D	--	--	36.3	D	--	--
	NB Left	315	19.3	B	160	208	19.4	B	120	186	19.6	B	128	204
	NB Thru		18.4	B	157	209	19.7	B	98	172	19.3	B	109	168
	NB Right	160	15.7	B	0	20	18.1	B	0	46	17.5	B	0	28
	NB Approach		18.7	B	--	--	19.5	B	--	--	19.4	B	--	--
	SB Left	165	15.1	B	12	45	16.7	B	19	59	16.2	B	17	175
	SB Thru		26.3	C	75	123	27.6	C	142	180	28.0	C	173	192
	SB Right	250	18.3	B	3	111	16.2	B	18	103	15.9	B	13	99
SB Approach		22.0	C	--	--	23.6	C	--	--	24.7	C	--	--	
<b>Overall</b>			<b>19.8</b>	<b>B</b>	<b>--</b>	<b>--</b>	<b>21.6</b>	<b>C</b>	<b>--</b>	<b>--</b>	<b>22.9</b>	<b>C</b>	<b>--</b>	<b>--</b>
7. Alwington Boulevard (E-W) at Elementary School Entrance/ Commercial Entrance (N-S) Unsignalized**	EB Left/Thru/Right		8.0	A	5	23	7.9	A	5	35	7.6	A	5	29
	EB Approach		8.0	A	--	--	7.9	A	--	--	7.6	A	--	--
	WB Left/Thru		9.2	A	13	79	9.1	A	8	66	9.4	A	13	71
	WB Right	270	8.1	A	23	78	7.2	A	8	69	6.9	A	3	64
	WB Approach		8.5	A	--	--	7.9	A	--	--	8.6	A	--	--
	NB Left/Thru/Right		7.4	A	3	84	6.9	A	0	63	7.0	A	3	57
	NB Approach		7.4	A	--	--	6.9	A	--	--	7.0	A	--	--
	SB Left/Thru/Right		8.8	A	10	78	8.0	A	8	54	7.8	A	3	35
SB Approach		8.8	A	--	--	8.0	A	--	--	7.8	A	--	--	

<sup>1</sup> Overall intersection LOS and delay reported for signalized intersections and roundabouts only.  
<sup>2</sup> SimTraffic Queues are average maximum queues after 10 runs of 60 minutes each.  
<sup>3</sup> 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.



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 queuing 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/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 or D in each of the peak hours. Each of the approaches operates at LOS D or better with no queuing 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 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/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 or D in each of the peak hours. Each of the approaches operates at LOS D or better with no queuing 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 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/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 beyond those identified above.
7. 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 to vehicular traffic.
8. The site will provide a public access easement across the frontage for the future extension of the shared use path along Shirley Avenue. A five foot sidewalk will be provided along the roadway connection to the elementary school.

Under 2032 background conditions, all intersections experience similar levels of service, delay, and queuing 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 queuing 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/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 queuing 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/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 beyond those identified above.
7. 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 to vehicular traffic.

8. The site will provide a public access easement across the frontage for the future extension of the shared use path along Shirley Avenue. A five foot sidewalk will be provided along the roadway connection to the elementary school.

## 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 beyond the turn lanes provided at the eastern site entrance on Shirley Avenue.

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 to vehicular traffic.

The site will provide a public access easement across the frontage for the future extension of the shared use path along Shirley Avenue. A five foot sidewalk will be provided along the roadway connection to the elementary school.

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**

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## 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.

<b>Contact Information</b>				
Consultant Name: Tele: E-mail:	Steve Schmidt 804.200.6502 steve.schmidt@timmons.com			
Developer/Owner Name: Tele: E-mail:				
<b>Project Information</b>				
Project Name:	Taylor Middle School Expansion	Locality/County:	Town of Warrenton	
Project Location: <small>(Attach regional and site specific location map)</small>	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 <input type="checkbox"/>	Rezoning <input type="checkbox"/>	<del>Site Plan</del> <sup>SUP</sup> <input checked="" type="checkbox"/>	Subd Plat <input type="checkbox"/>
Project Description: <small>(Including details on the land use, acreage, phasing, access location, etc. Attach additional sheet if necessary)</small>	<p>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.</p> <p>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.</p> <p>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.</p>			
Proposed Use(s): <small>(Check all that apply; attach additional pages as necessary)</small>	Residential <input type="checkbox"/>	Commercial <input type="checkbox"/>	Mixed Use <input type="checkbox"/>	Other <input checked="" type="checkbox"/>

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.

	<b>Residential Uses(s)</b> Number of Units: _____ ITE LU Code(s): _____ _____ _____ <b>Commercial Use(s)</b> ITE LU Code(s): _____ _____ _____ Square Ft or Other Variable: _____		_____ _____ <b>Other Use(s)</b> ITE LU Code(s): 522 _____ _____ Independent Variable(s): Students _____ _____	
<b>Total Peak Hour Trip Projection:</b>	Less than 100 <input type="checkbox"/>	100 – 499 <input checked="" type="checkbox"/>	500 – 999 <input type="checkbox"/>	1,000 or more <input type="checkbox"/>
<b>Traffic Impact Analysis Assumptions</b>				
<b>Study Period</b>	Existing Year: 2023	Build-out Year: 2026	Design Year: 2032	
<b>Study Area Boundaries</b> (Attach map)	North: Route 17		South: Alwington Boulevard	
	East: Alwington Boulevard		West: Cleveland Street	
<b>External Factors That Could Affect Project</b> (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.			
<b>Consistency With Comprehensive Plan</b> (Land use, transportation plan)	The site is currently a middle school and there is no change in land use			
<b>Available Traffic Data</b> (Historical, forecasts)	VDOT AADT Data, AM (6-9AM) and PM (2-6PM) counts conducted in May '23 prior to school letting out.			
<b>Trip Distribution</b> (Attach sketch)	Road Name: see Figure 3 and notes		Road Name:	
	Road Name:		Road Name:	
<b>Annual Vehicle Trip Growth Rate:</b>	1%	<b>Peak Period for Study</b> (check all that apply)	<input checked="" type="checkbox"/> AM <input checked="" type="checkbox"/> PM <input type="checkbox"/> SAT	
		<b>Peak Hour of the Generator</b>	PM School Peak	
<b>Study Intersections and/or Road Segments</b> (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.
<b>Trip Adjustment Factors</b>	Internal allowance: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Reduction: _____% trips	Pass-by allowance: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Reduction: _____% trips
<b>Software Methodology</b>	<input checked="" type="checkbox"/> Synchro <input type="checkbox"/> HCS (v.2000/+) <input checked="" type="checkbox"/> aaSIDRA <input type="checkbox"/> CORSIM <input type="checkbox"/> Other _____	
<b>Traffic Signal Proposed or Affected</b> (Analysis software to be used, progression speed, cycle length)	Existing Signals: Culpeper St/Shirley Ave and Route 17/Alwington Boulevard	
<b>Improvement(s) Assumed or to be Considered</b>	<p>1. The traffic generated by the Arrington development will be included in all future analyses.</p> <p>2. With the Arrington development, the elementary school entrances will be reconfigured. This will be assumed in all future analyses.</p> <p>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.</p>	
<b>Background Traffic Studies Considered</b>	TIA for the Arrington Development will be used to compare traffic counts, growth rates, etc.	
<b>Plan Submission</b>	<input type="checkbox"/> Master Development Plan (MDP) <input checked="" type="checkbox"/> Generalized Development Plan (GDP) <input type="checkbox"/> Preliminary/Sketch Plan <input type="checkbox"/> Other Plan type (Final Site, Subd. Plan)	
<b>Additional Issues to be Addressed</b>	<input checked="" type="checkbox"/> Queuing analysis <input type="checkbox"/> Actuation/Coordination <input type="checkbox"/> Weaving analysis <input type="checkbox"/> Merge analysis <input checked="" type="checkbox"/> Bike/Ped Accommodations <input checked="" type="checkbox"/> Intersection(s) <input type="checkbox"/> TDM Measures <input checked="" type="checkbox"/> 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:

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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

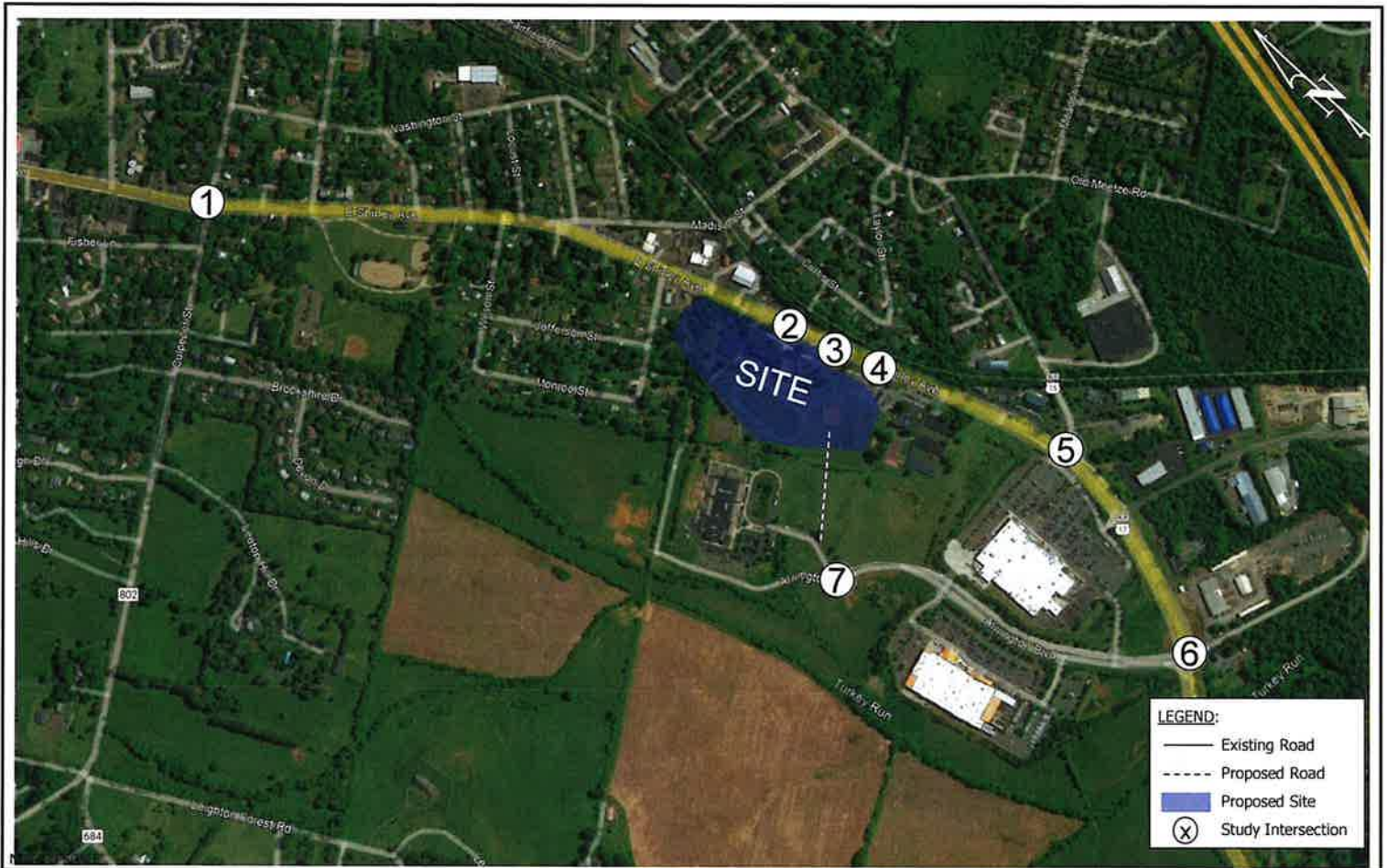
PRINT NAME: Steve Schmidt  
 Applicant or Consultant

SIGNED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 VDOT Representative

PRINT NAME: \_\_\_\_\_  
 VDOT Representative

SIGNED:  DATE: 8/29/23  
 Local Government Representative

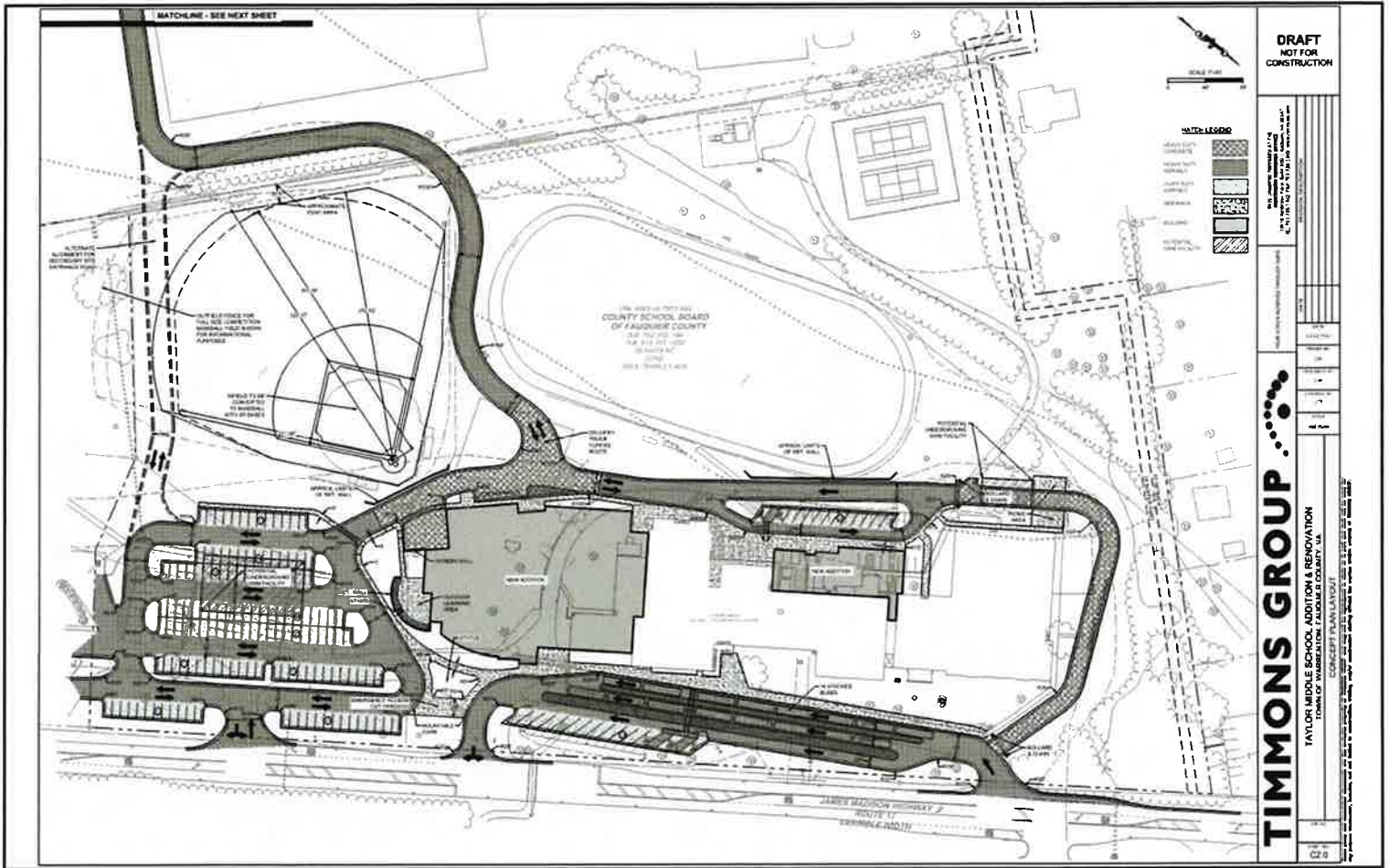
PRINT NAME: Denise Harris  
 Local Government Representative



Surrounding Roadway Network and Site Location  
Taylor Middle School Addition  
Town of Warrenton, Virginia

Figure  
1





Conceptual Plan  
 Taylor Middle School Addition  
 Town of Warrenton, Virginia

Figure  
 2



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 <sup>(1)</sup>			School PM Peak <sup>(1)</sup>			Commuter PM Peak Hour <sup>(1)</sup>			Average Daily Trips <sup>(2)</sup>
				In	Out	Total	In	Out	Total	In	Out	Total	
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			School PM Peak			Commuter PM Peak Hour			Average Daily Trips
				In	Out	Total	In	Out	Total	In	Out	Total	
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.

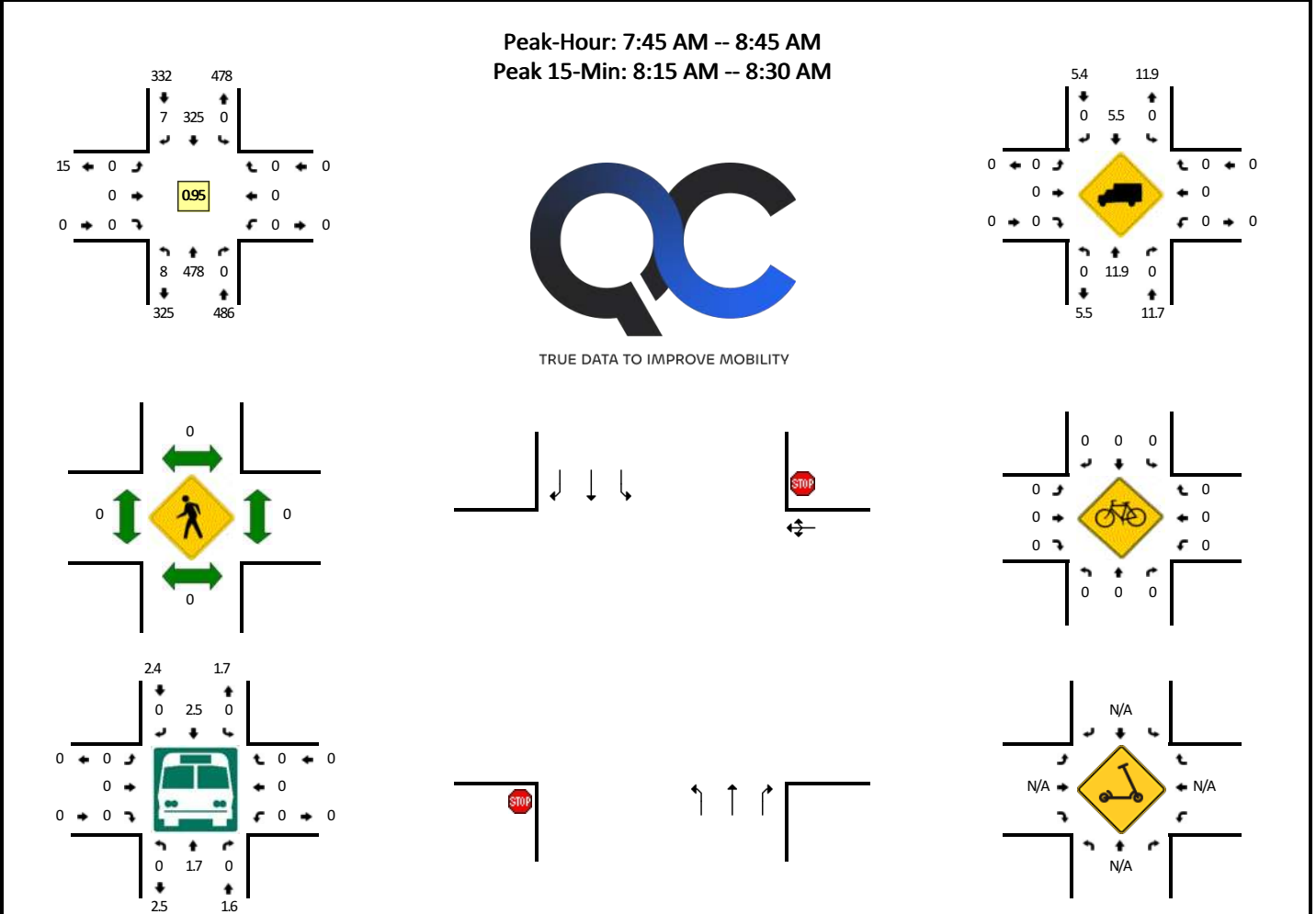


**Appendix B**  
**Traffic Count Data**

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**LOCATION:** Rte 17 Bus -- Western Dwy  
**CITY/STATE:** Warrenton, VA

**QC JOB #:** 16218101  
**DATE:** Tue, May 16 2023



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	0	16	0	0	0	0	0	0	0	0	0	0	64	
Buses	0	20	0	0	0	4	0	0	0	0	0	0	0	0	0	0	24	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Scooters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

*Comments:*

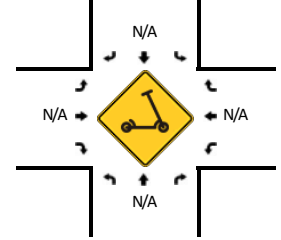
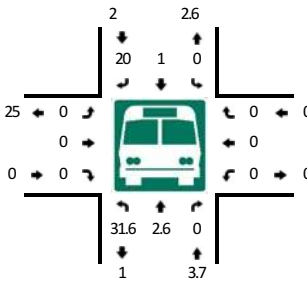
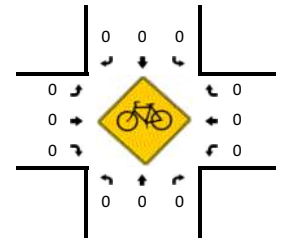
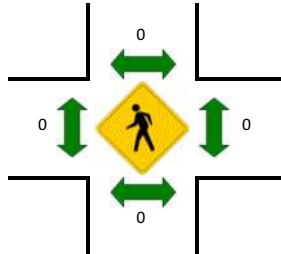
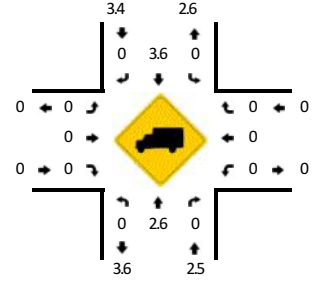
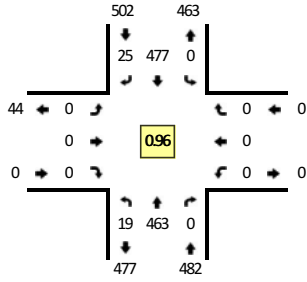
**LOCATION:** Rte 17 Bus -- Western Dwy  
**CITY/STATE:** Warrenton, VA

**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

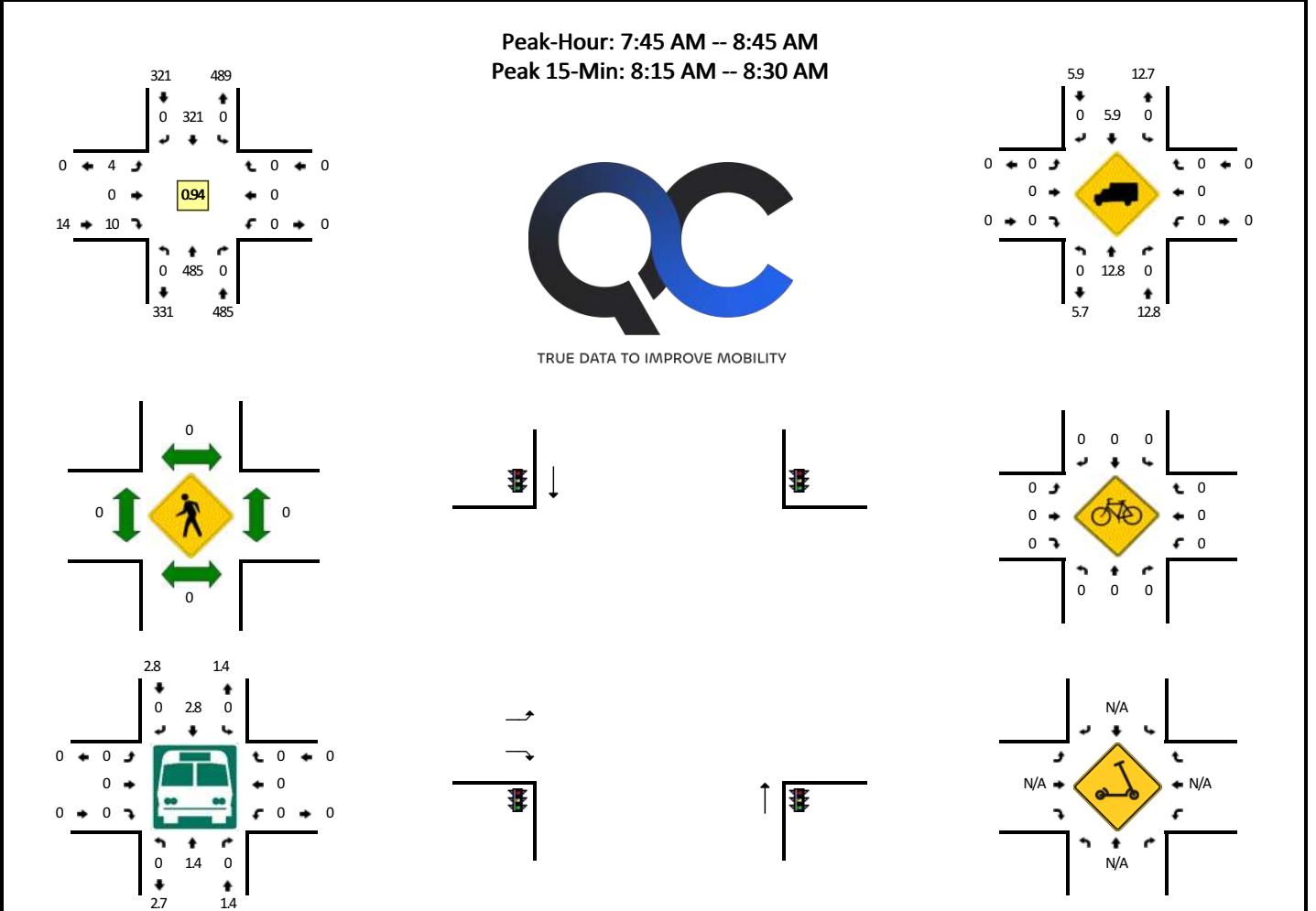
  

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	20	496	0	0	0	452	52	0	0	0	0	0	0	0	0	0	1020
Heavy Trucks	0	12	0	0	0	16	0	0	0	0	0	0	0	0	0	0	28
Buses	0	12	0	0	0	0	4	0	0	0	0	0	0	0	0	0	16
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scooters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments:

**LOCATION:** Rte 17 Bus -- Center Dwy  
**CITY/STATE:** Warrenton, VA

**QC JOB #:** 16218103  
**DATE:** Tue, May 16 2023



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	0	8	0	0	0	0	0	0	0	0	0	0	56	
Buses	0	20	0	0	0	8	0	0	0	0	0	0	0	0	0	0	28	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Scoters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

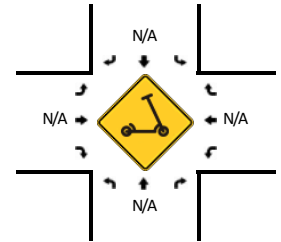
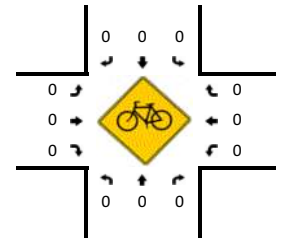
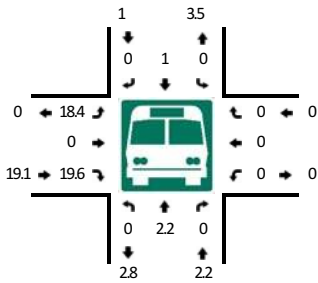
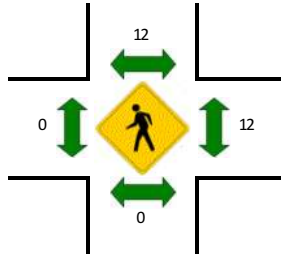
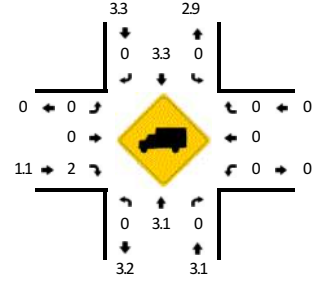
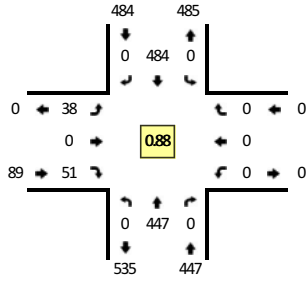
**LOCATION:** Rte 17 Bus -- Center Dwy  
**CITY/STATE:** Warrenton, VA

**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

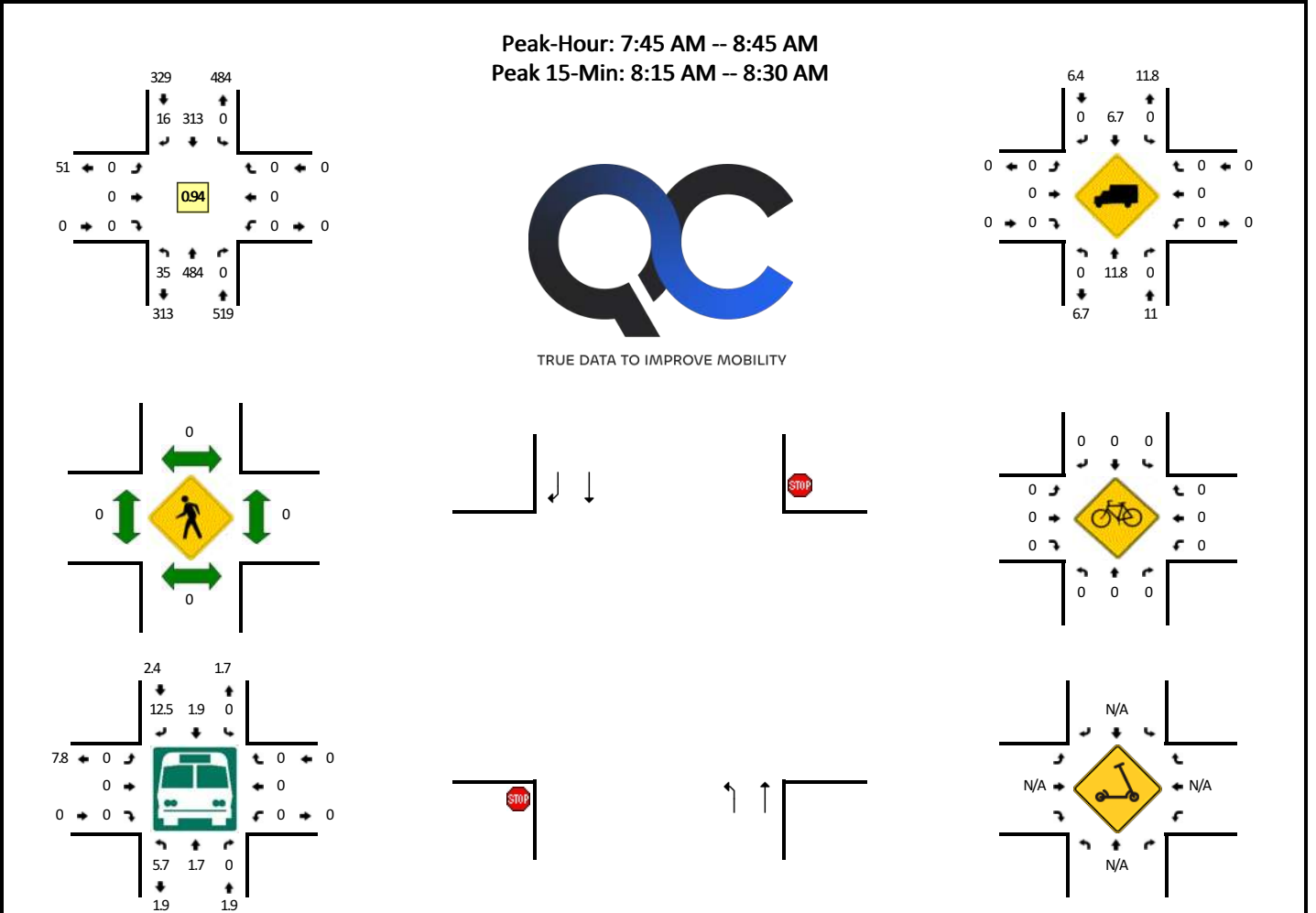
  

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	420	0	0	0	524	0	0	92	0	120	0	0	0	0	0	1156
Heavy Trucks	0	8	0	0	0	28	0	0	0	0	0	0	0	0	0	0	36
Buses	0	8	0	0	0	8	0	0	8	0	20	0	0	0	0	0	44
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scooters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments:

**LOCATION:** Rte 17 Bus -- Eastern Dwy  
**CITY/STATE:** Warrenton, VA

**QC JOB #:** 16218105  
**DATE:** Tue, May 16 2023



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	0	12	0	0	0	0	0	0	0	0	0	0	56	
Buses	0	20	0	0	0	4	0	0	0	0	0	0	0	0	0	0	24	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Scoters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

*Comments:*



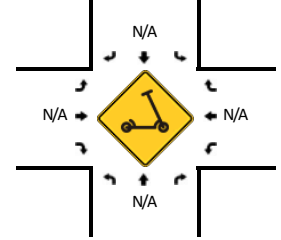
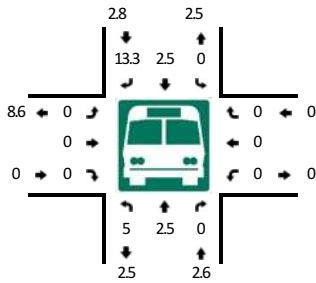
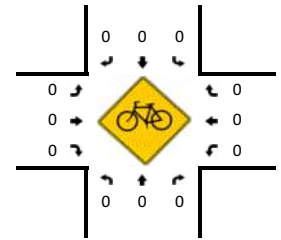
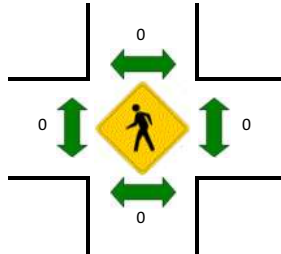
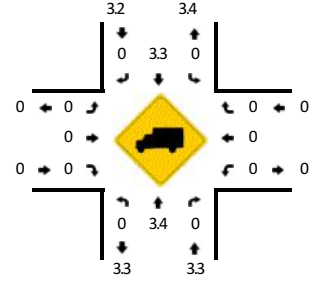
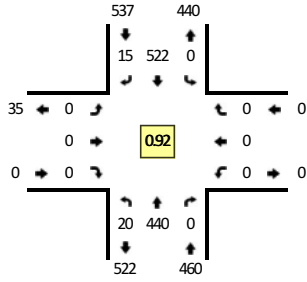
**LOCATION:** Rte 17 Bus -- Eastern Dwy  
**CITY/STATE:** Warrenton, VA

**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



TRUE DATA TO IMPROVE MOBILITY



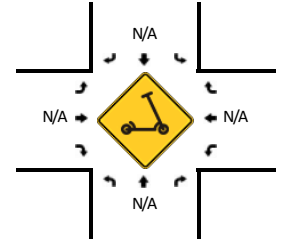
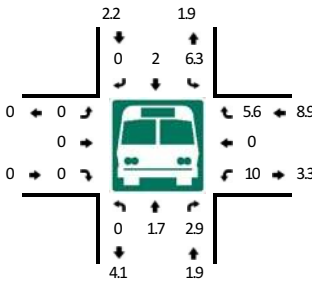
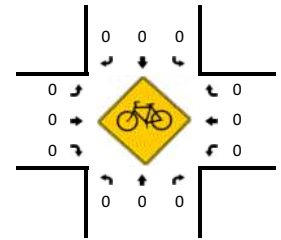
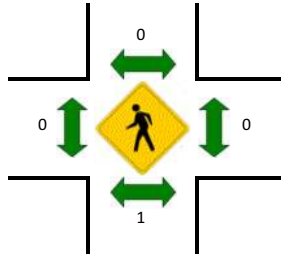
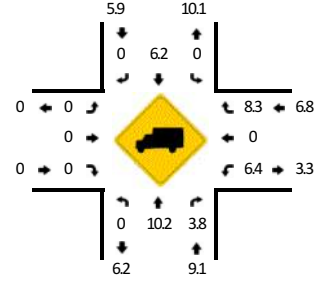
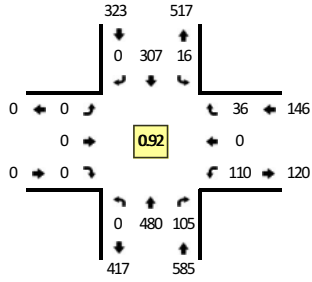
15-Min Count Period Beginning At	Rte 17 Bus (Northbound)				Rte 17 Bus (Southbound)				Eastern Dwy (Eastbound)				Eastern Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	5	110	0	0	0	139	2	0	0	0	0	0	0	0	0	0	256	
2:15 PM	6	131	0	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	0	24	0	0	0	0	0	0	0	0	0	0	36	
Buses	0	8	0	0	0	40	4	0	0	0	0	0	0	0	0	0	52	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Scooters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

**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	
Scoters																	0	

Comments:

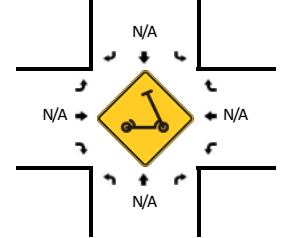
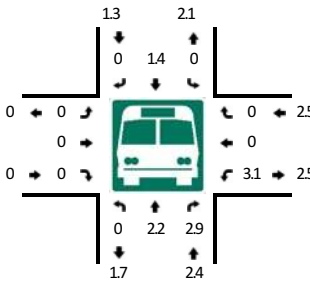
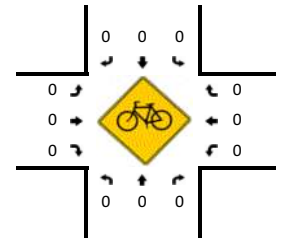
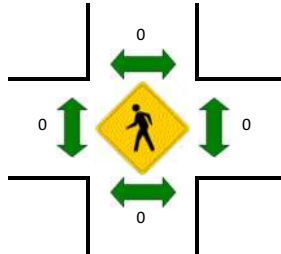
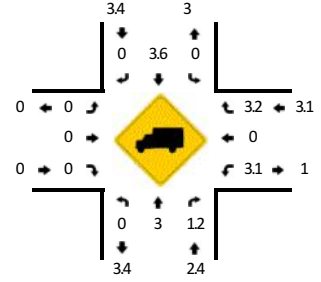
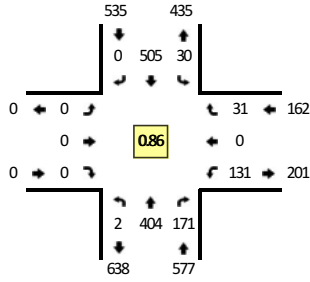
**LOCATION:** Rte 17 Bus -- Rte 15 Bus  
**CITY/STATE:** Warrenton, VA

**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



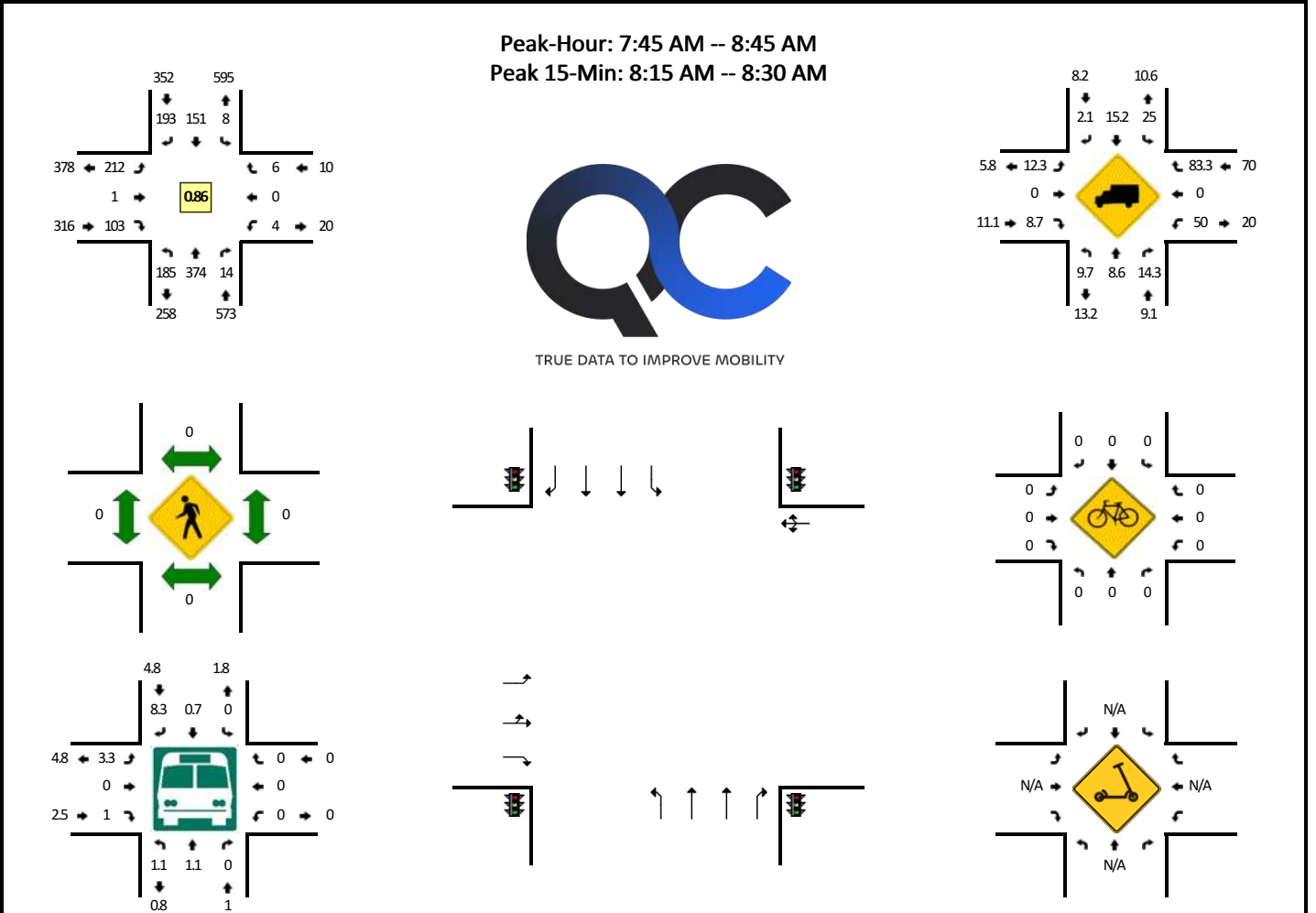
15-Min Count Period Beginning At	Rte 17 Bus (Northbound)				Rte 17 Bus (Southbound)				Rte 15 Bus (Eastbound)				Rte 15 Bus (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	0	101	23	0	6	133	0	0	0	0	0	0	31	0	5	0	299	
2:15 PM	0	131	30	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	0	16	0	0	0	0	0	0	0	0	4	0	32
Buses	0	20	8	0	0	8	0	0	0	0	0	0	4	0	0	0	40
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scoters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments:

**LOCATION:** Rte 17 Bus -- Alwington Boulevard  
**CITY/STATE:** Warrenton, VA

**QC JOB #:** 16218109  
**DATE:** Tue, May 16 2023



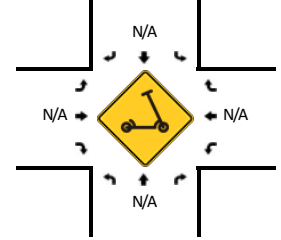
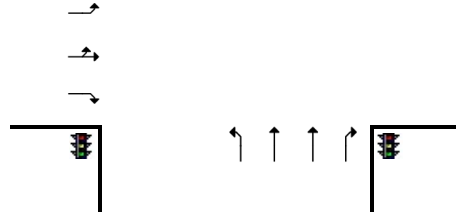
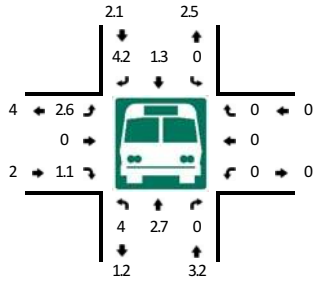
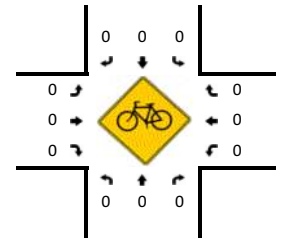
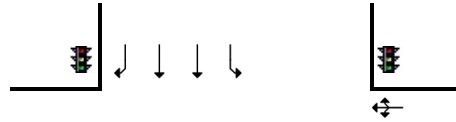
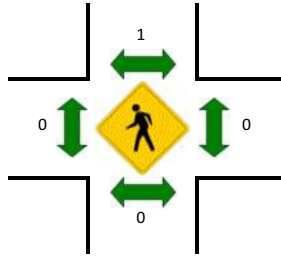
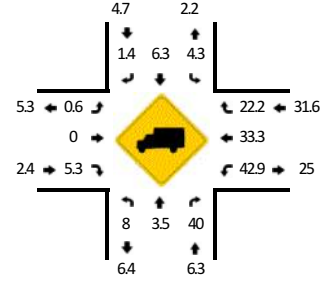
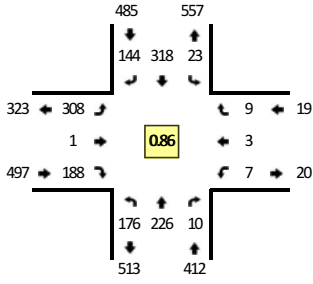
15-Min Count Period Beginning At	Rte 17 Bus (Northbound)				Rte 17 Bus (Southbound)				Alwington Boulevard (Eastbound)				Alwington Boulevard (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	12	23	3	0	1	17	6	0	3	0	9	0	3	0	2	0	79	
6:15 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 At	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	0	36	4	0	4	0	16	0	0	0	0	0	120	
Buses	4	0	0	0	0	0	24	0	20	0	4	0	0	0	0	0	52	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Scoters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

*Comments:*

**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**



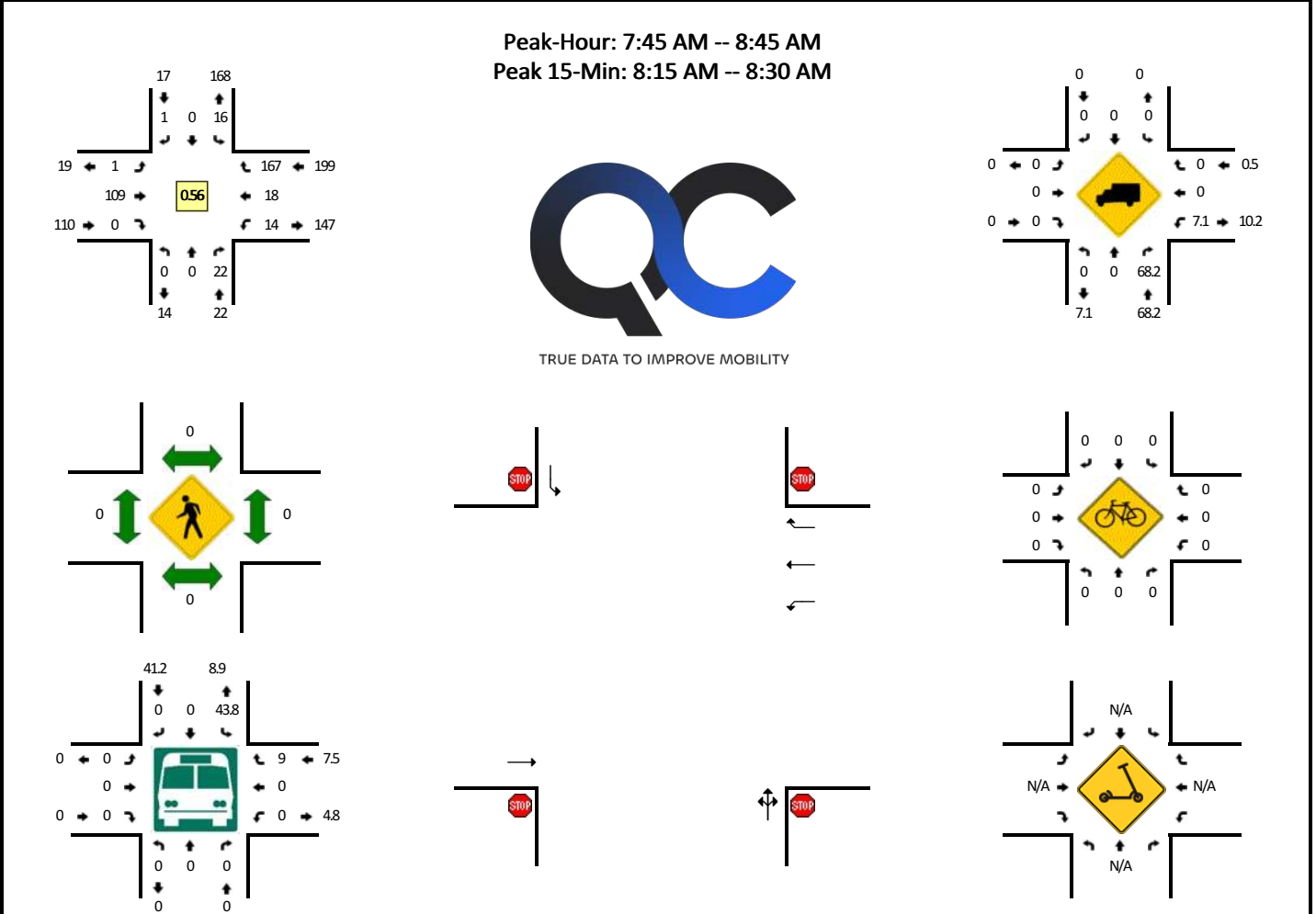
15-Min Count Period Beginning At	Rte 17 Bus (Northbound)				Rte 17 Bus (Southbound)				Alwington Boulevard (Eastbound)				Alwington Boulevard (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	48	55	3	0	2	76	34	2	71	0	46	0	2	1	2	0	342	
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	0		0	0	0		0	0	0		0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	0

Comments:

**LOCATION:** Elementary School Entrance -- Alwington Blvd  
**CITY/STATE:** Warrenton, VA

**QC JOB #:** 16218111  
**DATE:** Tue, May 16 2023



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	0	2	2	0	9	
6:15 AM	0	0	0	0	2	0	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	0	1	0	3	0	7	
6:45 AM	0	0	0	0	2	0	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	0	21	0	11	0	34	73
7:15 AM	0	0	6	0	6	0	0	0	0	1	0	0	0	21	1	11	0	46	111
7:30 AM	0	0	10	0	2	0	0	0	0	2	0	0	0	14	8	12	0	48	152
7:45 AM	0	0	12	0	3	0	0	0	0	1	0	0	0	3	7	31	0	57	185
8:00 AM	0	0	6	0	2	0	0	0	0	1	0	0	0	7	4	34	0	54	205
8:15 AM	0	0	2	0	8	0	1	0	0	65	0	0	0	2	6	72	0	156	315
8:30 AM	0	0	2	0	3	0	0	0	0	42	0	0	0	2	1	30	0	81	348
8:45 AM	0	0	4	0	3	0	0	0	0	7	0	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	0	0	0	0	8		
Buses	0	0	0	0	24	0	0	0	0	0	0	0	0	0	24	0	48		
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Scoters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Comments:

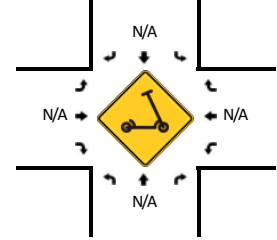
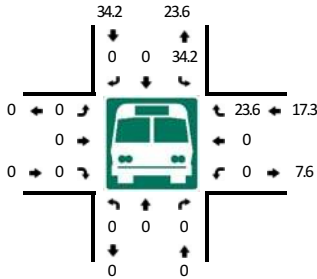
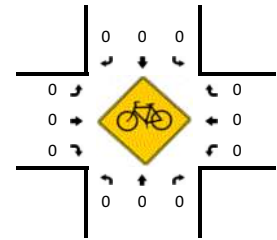
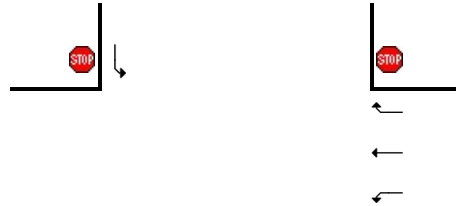
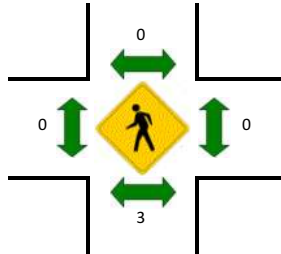
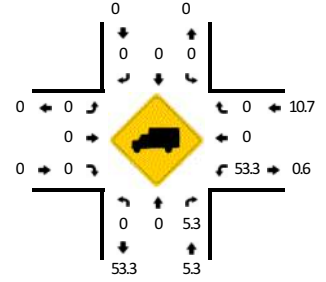
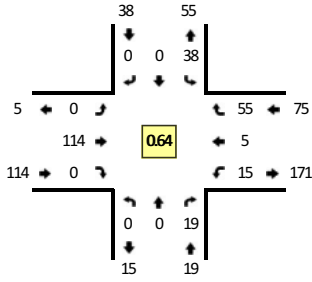
**LOCATION:** Elementary School Entrance -- Alwington Blvd  
**CITY/STATE:** Warrenton, VA

**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**



TRUE DATA TO IMPROVE MOBILITY



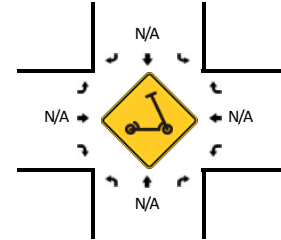
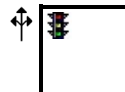
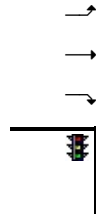
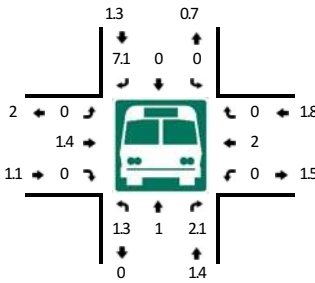
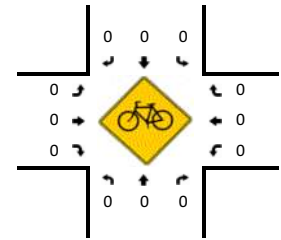
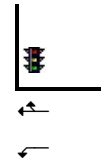
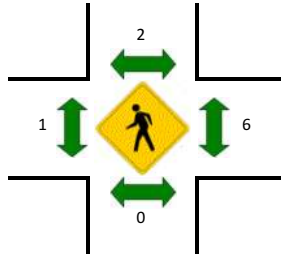
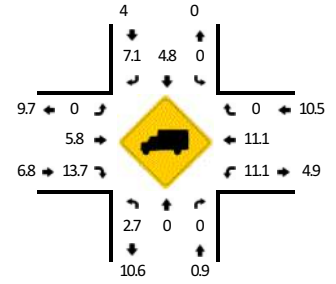
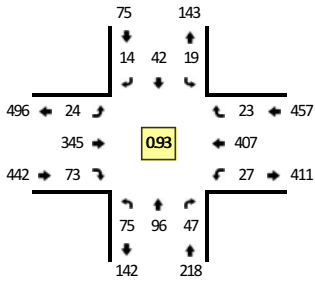
15-Min Count Period Beginning At	Elementary School Entrance (Northbound)				Elementary School Entrance (Southbound)				Alwington Blvd (Eastbound)				Alwington Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	0	0	2	0	5	0	0	0	0	7	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	0	0	0	20	0	0	0	20	
Buses	0	0	0	0	32	0	0	0	0	0	0	0	0	0	20	0	52	
Pedestrians	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Scooters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

**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**



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 At	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	
Scoters																	0	

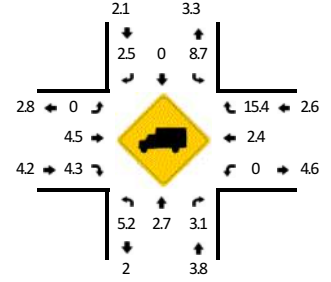
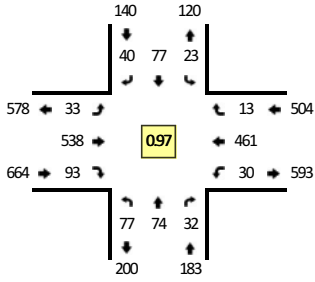
Comments:



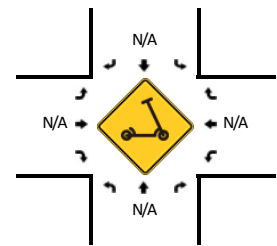
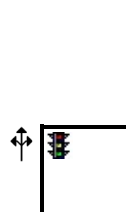
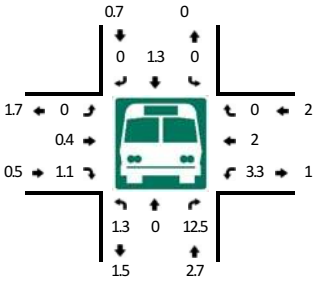
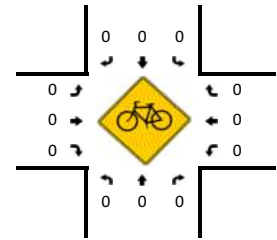
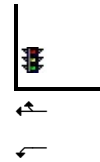
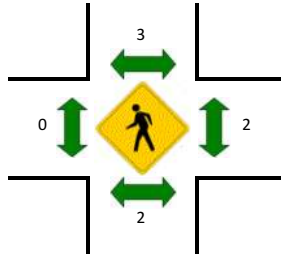
**LOCATION:** Culpeper St -- W Shirley Ave  
**CITY/STATE:** Warrenton, VA

**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	1359
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	
3:00 PM	16	19	12	0	4	21	12	0	8	137	23	0	6	125	3	0	386	
3:15 PM	24	20	8	0	9	17	9	0	9	152	19	0	5	98	3	0	373	
3:30 PM	22	17	4	0	5	15	8	0	10	130	16	0	13	116	2	0	358	
3:45 PM	15	18	8	0	5	24	11	0	6	119	35	0	6	122	5	0	374	
4:00 PM	19	18	8	0	6	19	8	0	8	130	25	0	4	115	5	0	365	
4:15 PM	21	15	9	0	8	29	3	0	8	105	29	0	7	92	3	0	329	
4:30 PM	18	16	8	0	17	19	12	0	14	129	37	0	8	106	1	0	385	
4:45 PM	22	17	4	0	5	34	3	0	9	115	40	0	10	107	0	0	366	
5:00 PM	21	14	10	0	5	24	5	0	7	112	30	0	9	130	2	0	369	
5:15 PM	21	16	6	0	7	32	5	0	7	92	35	0	4	102	1	0	328	
5:30 PM	16	16	7	0	5	23	3	0	4	110	31	0	8	91	1	0	315	
5:45 PM	14	13	10	0	4	13	7	0	3	100	22	0	6	111	3	0	306	

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	0	0	8	4	0	0	16	0	0	32
Buses	0	0	4	0	0	0	0	0	0	4	0	0	0	0	0	0	8
Pedestrians	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	8
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scooters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments:



**Appendix C**  
**Traffic Signal Timings**

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# 15-17-29BusJames Madison&1105 Alwington

## Phase Startup Options

9/1/2023 10:30:10 AM

Startup Flash  Mode   
 Startup All Red  Yellow

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  Ped Protect  AdvFls in Flash



# 15-17-29BusJames Madison&1105 Alwington

## MCE Options

9/1/2023 10:30:10 AM

Phases

1-8

9-16

MCE Ped Protect

	2	4	6				
	2	4	6				


MCE Veh Call

MCE Ped Call

MCE Veh Omit

MCE Ped Omit

MCE Veh Sync

MCE Ped Sync

MCE Halt Don't Walk

LRV Phases

1-8

MCE LRV Term Early

--	--	--	--	--	--	--	--



# 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

Ped Phase

Flash Yel  Dark Signal

Flash Delay  Flash Carryover

Green Mode

## Ped Hawk 2

Veh Phase

Ped Phase

Flash Yel  Dark Signal

Flash Delay  Flash Carryover

Green Mode

## Ped Hawk 3

Veh Phase

Ped Phase

Flash Yel  Dark Signal

Flash Delay  Flash Carryover

Green Mode

## Ped Hawk 4

Veh Phase

Ped Phase

Flash Yel  Dark Signal

Flash Delay  Flash Carryover

Green Mode

# 15-17-29BusJames Madison&1105 Alwington

Overlap 2

9/1/2023 10:30:10 AM

Min Green  Trail Green  Trail Green 2  Delay Green   
 Yellow  Red  Red Revert   
 Walk  Ped Clearance  Solid DW  Early Wlk  Delay Wlk

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  Walk  Ped Clr

PP Phase  PP Delay

Min FR  FR Hold  FR Delay

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

## 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

## Preempt 1 (Configuration)

9/1/2023 10:30:10 AM

Enabled	<input type="text" value="No"/>	Dwell Mode	<input type="text" value="Normal"/>	Output Mode	<input type="text" value="All"/>
Output2 Mode	<input type="text" value="All"/>	Fail Action	<input type="text" value="Preempt Off"/>	Exit Mode	<input type="text" value="Normal"/>
Override Flash	<input type="text" value="No"/>	Change Phasenext	<input type="text" value="Yes"/>		

	1-8	9-16		1-8	
Enable Phases	<input type="text"/>	<input type="text"/>	LRV Disable	<input type="text"/>	Max <input type="text" value="0"/>
Preempt Inputs	<input type="text"/>	<input type="text"/>	LRV Dwell Flash	<input type="text"/>	
			LRV Omit	<input type="text"/>	Delay <input type="text" value="0"/>
			LRV No Yel	<input type="text"/>	

## Preempt 1 (Timing/Phases/Overlaps)

	1-8	9-16		
Phases/Overlaps	<input type="text"/>	<input type="text"/>	Start Green	<input type="text" value="0"/>
Omit Olap Grn Clr	<input type="text"/>	<input type="text"/>	Start Walk	<input type="text" value="0"/>
Phs EWlk to Grn	<input type="text"/>	<input type="text"/>	Start Ped Clr	<input type="text" value="0"/>
TClr 1 Veh Phases	<input type="text"/>	<input type="text"/>	Track Clear 1	<input type="text" value="0"/>
TClr 1 Ped Phases	<input type="text"/>	<input type="text"/>	Track Clear 2	<input type="text" value="0"/>
TClr 1 Olap	<input type="text"/>	<input type="text"/>	TC1 Extend	<input type="text" value="0"/>
TClr 1 Olap Ped	<input type="text"/>	<input type="text"/>	TC1 Max	<input type="text" value="0"/>
TClr 2 Veh Phases	<input type="text"/>	<input type="text"/>	Exit Ped Clr	<input type="text" value="0"/>
TClr 2 Ped Phases	<input type="text"/>	<input type="text"/>	Exit Yellow	<input type="text" value="0.0"/>
TClr 2 Olap	<input type="text"/>	<input type="text"/>	Exit Red	<input type="text" value="0.0"/>
TClr 2 Olap Ped	<input type="text"/>	<input type="text"/>	Min Dwell	<input type="text" value="0"/>
Init Dwell Phases	<input type="text"/>	<input type="text"/>	Min Duration	<input type="text" value="0"/>
Dwell Veh Phases	<input type="text"/>	<input type="text"/>	Dwell Extend	<input type="text" value="0"/>
Dwell Ped Phases	<input type="text"/>	<input type="text"/>	Max Dwell	<input type="text" value="0"/>
Dwell Olap	<input type="text"/>	<input type="text"/>	Max Call	<input type="text" value="0"/>
Dwell Olap Ped	<input type="text"/>	<input type="text"/>	Reserve Inh Same	<input type="text" value="0"/>
Exit Veh Phases	<input type="text"/>	<input type="text"/>	Reserve Inh All	<input type="text" value="0"/>
Exit Ped Phases	<input type="text"/>	<input type="text"/>	Delay	<input type="text" value="0"/>
Exit Olap	<input type="text"/>	<input type="text"/>		
Exit Olap Ped	<input type="text"/>	<input type="text"/>		
Zero Phase Walk	<input type="text"/>	<input type="text"/>	Phases/Overlaps	1-8
Zero Phase Ped Clr	<input type="text"/>	<input type="text"/>	TClr 1 FR Olap	<input type="text"/>
Zero Phase Green	<input type="text"/>	<input type="text"/>	TClr 2 FR Olap	<input type="text"/>
Zero Olap Walk	<input type="text"/>	<input type="text"/>	Dwell FR Olap	<input type="text"/>
Zero Olap Ped Clr	<input type="text"/>	<input type="text"/>	TClr 1 FYA	<input type="text"/>
Zero Olap Green	<input type="text"/>	<input type="text"/>	TClr 2 FYA	<input type="text"/>
Dwell-Phase Red	<input type="text"/>	<input type="text"/>	Dwell FYA	<input type="text"/>
Dwell-Phase Red Flash	<input type="text"/>	<input type="text"/>		
Dwell-Phase Yel Flash	<input type="text"/>	<input type="text"/>		
Dwell-Olap Red Flash	<input type="text"/>	<input type="text"/>		
Dwell-Olap Yel Flash	<input type="text"/>	<input type="text"/>		
Dwell-Ped Dark	<input type="text"/>	<input type="text"/>		
Dwell-Olap Ped Dark	<input type="text"/>	<input type="text"/>		

# 15-17-29BusJames Madison&1105 Alwington

## Preempt 2 (Configuration)

9/1/2023 10:30:10 AM

Enabled	<input type="text" value="Yes"/>	Dwell Mode	<input type="text" value="Normal"/>	Output Mode	<input type="text" value="All"/>
Output2 Mode	<input type="text" value="All"/>	Fail Action	<input type="text" value="Preempt Off"/>	Exit Mode	<input type="text" value="Normal"/>
Override Flash	<input type="text" value="No"/>	Change Phasenext	<input type="text" value="Yes"/>		

	1-8	9-16
Enable Phases	<input type="text"/>	<input type="text"/>
Preempt Inputs	<input type="text" value="2"/>	<input type="text"/>

	1-8	
LRV Disable	<input type="text"/>	Max <input type="text" value="0"/>
LRV Dwell Flash	<input type="text"/>	
LRV Omit	<input type="text"/>	Delay <input type="text" value="0"/>
LRV No Yel	<input type="text"/>	

## Preempt 2 (Timing/Phases/Overlaps)

	1-8	9-16
Phases/Overlaps	<input type="text"/>	<input type="text"/>
Omit Olap Grn Clr	<input type="text"/>	<input type="text"/>
Phs EWlk to Grn	<input type="text"/>	<input type="text"/>
TClr 1 Veh Phases	<input type="text"/>	<input type="text"/>
TClr 1 Ped Phases	<input type="text"/>	<input type="text"/>
TClr 1 Olap	<input type="text"/>	<input type="text"/>
TClr 1 Olap Ped	<input type="text"/>	<input type="text"/>
TClr 2 Veh Phases	<input type="text"/>	<input type="text"/>
TClr 2 Ped Phases	<input type="text"/>	<input type="text"/>
TClr 2 Olap	<input type="text"/>	<input type="text"/>
TClr 2 Olap Ped	<input type="text"/>	<input type="text"/>
Init Dwell Phases	<input type="text"/>	<input type="text"/>
Dwell Veh Phases	<input type="text" value="2"/>	<input type="text" value="5"/>
Dwell Ped Phases	<input type="text"/>	<input type="text"/>
Dwell Olap	<input type="text"/>	<input type="text"/>
Dwell Olap Ped	<input type="text"/>	<input type="text"/>
Exit Veh Phases	<input type="text" value="2"/>	<input type="text" value="6"/>
Exit Ped Phases	<input type="text"/>	<input type="text"/>
Exit Olap	<input type="text"/>	<input type="text"/>
Exit Olap Ped	<input type="text"/>	<input type="text"/>
Zero Phase Walk	<input type="text"/>	<input type="text"/>
Zero Phase Ped Clr	<input type="text"/>	<input type="text"/>
Zero Phase Green	<input type="text"/>	<input type="text"/>
Zero Olap Walk	<input type="text"/>	<input type="text"/>
Zero Olap Ped Clr	<input type="text"/>	<input type="text"/>
Zero Olap Green	<input type="text"/>	<input type="text"/>
Dwell-Phase Red	<input type="text"/>	<input type="text"/>
Dwell-Phase Red Flash	<input type="text"/>	<input type="text"/>
Dwell-Phase Yel Flash	<input type="text"/>	<input type="text"/>
Dwell-Olap Red Flash	<input type="text"/>	<input type="text"/>
Dwell-Olap Yel Flash	<input type="text"/>	<input type="text"/>
Dwell-Ped Dark	<input type="text"/>	<input type="text"/>
Dwell-Olap Ped Dark	<input type="text"/>	<input type="text"/>

Start Green	<input type="text" value="5"/>	Start Walk	<input type="text" value="0"/>
		Start Ped Clr	<input type="text" value="0"/>
Track Clear 1	<input type="text" value="0"/>	Track Clear 2	<input type="text" value="0"/>
TC1 Extend	<input type="text" value="0"/>	TC1 Max	<input type="text" value="0"/>
Exit Ped Clr	<input type="text" value="0"/>	Exit Yellow	<input type="text" value="0.0"/>
Exit Red	<input type="text" value="0.0"/>		
Min Dwell	<input type="text" value="5"/>	Min Duration	<input type="text" value="0"/>
Dwell Extend	<input type="text" value="0"/>		
Max Dwell	<input type="text" value="180"/>	Max Call	<input type="text" value="0"/>
Reserve Inh Same	<input type="text" value="0"/>		
Reserve Inh All	<input type="text" value="0"/>		
Delay	<input type="text" value="0"/>		

	1-8	9-16
Phases/Overlaps	<input type="text"/>	<input type="text"/>
TClr 1 FR Olap	<input type="text"/>	<input type="text"/>
TClr 2 FR Olap	<input type="text"/>	<input type="text"/>
Dwell FR Olap	<input type="text"/>	<input type="text"/>
TClr 1 FYA	<input type="text"/>	<input type="text"/>
TClr 2 FYA	<input type="text"/>	<input type="text"/>
Dwell FYA	<input type="text" value="1"/>	<input type="text"/>



# 15-17-29BusJames Madison&1105 Alwington

## Preempt 3 (Configuration)

9/1/2023 10:30:10 AM

Enabled	<input type="text" value="Yes"/>	Dwell Mode	<input type="text" value="Normal"/>	Output Mode	<input type="text" value="All"/>
Output2 Mode	<input type="text" value="All"/>	Fail Action	<input type="text" value="Preempt Off"/>	Exit Mode	<input type="text" value="Normal"/>
Override Flash	<input type="text" value="No"/>	Change Phasenext	<input type="text" value="Yes"/>		

	1-8	9-16
Enable Phases	<input type="text"/>	<input type="text"/>
Preempt Inputs	<input type="text" value="3"/>	<input type="text"/>

	1-8	
LRV Disable	<input type="text"/>	Max <input type="text" value="0"/>
LRV Dwell Flash	<input type="text"/>	
LRV Omit	<input type="text"/>	Delay <input type="text" value="0"/>
LRV No Yel	<input type="text"/>	

## Preempt 3 (Timing/Phases/Overlaps)

	1-8	9-16
Phases/Overlaps	<input type="text"/>	<input type="text"/>
Omit Olap Grn Clr	<input type="text"/>	<input type="text"/>
Phs EWlk to Grn	<input type="text"/>	<input type="text"/>
TClr 1 Veh Phases	<input type="text"/>	<input type="text"/>
TClr 1 Ped Phases	<input type="text"/>	<input type="text"/>
TClr 1 Olap	<input type="text"/>	<input type="text"/>
TClr 1 Olap Ped	<input type="text"/>	<input type="text"/>
TClr 2 Veh Phases	<input type="text"/>	<input type="text"/>
TClr 2 Ped Phases	<input type="text"/>	<input type="text"/>
TClr 2 Olap	<input type="text"/>	<input type="text"/>
TClr 2 Olap Ped	<input type="text"/>	<input type="text"/>
Init Dwell Phases	<input type="text"/>	<input type="text"/>
Dwell Veh Phases	<input type="text" value="3"/>	<input type="text"/>
Dwell Ped Phases	<input type="text"/>	<input type="text"/>
Dwell Olap	<input type="text"/>	<input type="text"/>
Dwell Olap Ped	<input type="text"/>	<input type="text"/>
Exit Veh Phases	<input type="text" value="2"/> <input type="text" value="6"/>	<input type="text"/>
Exit Ped Phases	<input type="text"/>	<input type="text"/>
Exit Olap	<input type="text"/>	<input type="text"/>
Exit Olap Ped	<input type="text"/>	<input type="text"/>
Zero Phase Walk	<input type="text"/>	<input type="text"/>
Zero Phase Ped Clr	<input type="text"/>	<input type="text"/>
Zero Phase Green	<input type="text"/>	<input type="text"/>
Zero Olap Walk	<input type="text"/>	<input type="text"/>
Zero Olap Ped Clr	<input type="text"/>	<input type="text"/>
Zero Olap Green	<input type="text"/>	<input type="text"/>
Dwell-Phase Red	<input type="text"/>	<input type="text"/>
Dwell-Phase Red Flash	<input type="text"/>	<input type="text"/>
Dwell-Phase Yel Flash	<input type="text"/>	<input type="text"/>
Dwell-Olap Red Flash	<input type="text"/>	<input type="text"/>
Dwell-Olap Yel Flash	<input type="text"/>	<input type="text"/>
Dwell-Ped Dark	<input type="text"/>	<input type="text"/>
Dwell-Olap Ped Dark	<input type="text"/>	<input type="text"/>

Start Green	<input type="text" value="5"/>	Start Walk	<input type="text" value="0"/>
		Start Ped Clr	<input type="text" value="0"/>
Track Clear 1	<input type="text" value="0"/>	Track Clear 2	<input type="text" value="0"/>
TC1 Extend	<input type="text" value="0"/>	TC1 Max	<input type="text" value="0"/>
Exit Ped Clr	<input type="text" value="0"/>	Exit Yellow	<input type="text" value="0.0"/>
Exit Red	<input type="text" value="0.0"/>		
Min Dwell	<input type="text" value="5"/>	Min Duration	<input type="text" value="0"/>
Dwell Extend	<input type="text" value="0"/>		
Max Dwell	<input type="text" value="180"/>	Max Call	<input type="text" value="0"/>
Reserve Inh Same	<input type="text" value="0"/>		
Reserve Inh All	<input type="text" value="0"/>		
Delay	<input type="text" value="0"/>		

	1-8	9-16
Phases/Overlaps	<input type="text"/>	<input type="text"/>
TClr 1 FR Olap	<input type="text"/>	<input type="text"/>
TClr 2 FR Olap	<input type="text"/>	<input type="text"/>
Dwell FR Olap	<input type="text"/>	<input type="text"/>
TClr 1 FYA	<input type="text"/>	<input type="text"/>
TClr 2 FYA	<input type="text"/>	<input type="text"/>
Dwell FYA	<input type="text"/>	<input type="text"/>

# 15-17-29BusJames Madison&1105 Alwington

## Preempt 4 (Configuration)

9/1/2023 10:30:10 AM

Enabled	<input type="text" value="Yes"/>	Dwell Mode	<input type="text" value="Normal"/>	Output Mode	<input type="text" value="All"/>
Output2 Mode	<input type="text" value="All"/>	Fail Action	<input type="text" value="Preempt Off"/>	Exit Mode	<input type="text" value="Normal"/>
Override Flash	<input type="text" value="No"/>	Change Phasenext	<input type="text" value="Yes"/>		

	1-8	9-16
Enable Phases	<input type="text"/>	<input type="text"/>
Preempt Inputs	<input type="text" value="4"/>	<input type="text"/>

	1-8
LRV Disable	<input type="text"/> Max <input type="text" value="0"/>
LRV Dwell Flash	<input type="text"/>
LRV Omit	<input type="text"/> Delay <input type="text" value="0"/>
LRV No Yel	<input type="text"/>

## Preempt 4 (Timing/Phases/Overlaps)

	1-8	9-16
Phases/Overlaps	<input type="text"/>	<input type="text"/>
Omit Olap Grn Clr	<input type="text"/>	<input type="text"/>
Phs EWlk to Grn	<input type="text"/>	<input type="text"/>
TClr 1 Veh Phases	<input type="text"/>	<input type="text"/>
TClr 1 Ped Phases	<input type="text"/>	<input type="text"/>
TClr 1 Olap	<input type="text"/>	<input type="text"/>
TClr 1 Olap Ped	<input type="text"/>	<input type="text"/>
TClr 2 Veh Phases	<input type="text"/>	<input type="text"/>
TClr 2 Ped Phases	<input type="text"/>	<input type="text"/>
TClr 2 Olap	<input type="text"/>	<input type="text"/>
TClr 2 Olap Ped	<input type="text"/>	<input type="text"/>
Init Dwell Phases	<input type="text"/>	<input type="text"/>
Dwell Veh Phases	<input type="text" value="4"/>	<input type="text"/>
Dwell Ped Phases	<input type="text"/>	<input type="text"/>
Dwell Olap	<input type="text"/>	<input type="text"/>
Dwell Olap Ped	<input type="text"/>	<input type="text"/>
Exit Veh Phases	<input type="text" value="2"/> <input type="text" value="6"/>	<input type="text"/>
Exit Ped Phases	<input type="text"/>	<input type="text"/>
Exit Olap	<input type="text"/>	<input type="text"/>
Exit Olap Ped	<input type="text"/>	<input type="text"/>
Zero Phase Walk	<input type="text"/>	<input type="text"/>
Zero Phase Ped Clr	<input type="text"/>	<input type="text"/>
Zero Phase Green	<input type="text"/>	<input type="text"/>
Zero Olap Walk	<input type="text"/>	<input type="text"/>
Zero Olap Ped Clr	<input type="text"/>	<input type="text"/>
Zero Olap Green	<input type="text"/>	<input type="text"/>
Dwell-Phase Red	<input type="text"/>	<input type="text"/>
Dwell-Phase Red Flash	<input type="text"/>	<input type="text"/>
Dwell-Phase Yel Flash	<input type="text"/>	<input type="text"/>
Dwell-Olap Red Flash	<input type="text"/>	<input type="text"/>
Dwell-Olap Yel Flash	<input type="text"/>	<input type="text"/>
Dwell-Ped Dark	<input type="text"/>	<input type="text"/>
Dwell-Olap Ped Dark	<input type="text"/>	<input type="text"/>

Start Green	<input type="text" value="5"/>	Start Walk	<input type="text" value="0"/>
		Start Ped Clr	<input type="text" value="0"/>
Track Clear 1	<input type="text" value="0"/>	Track Clear 2	<input type="text" value="0"/>
TC1 Extend	<input type="text" value="0"/>	TC1 Max	<input type="text" value="0"/>
Exit Ped Clr	<input type="text" value="0"/>	Exit Yellow	<input type="text" value="0.0"/>
Exit Red	<input type="text" value="0.0"/>		
Min Dwell	<input type="text" value="5"/>	Min Duration	<input type="text" value="0"/>
Dwell Extend	<input type="text" value="0"/>		
Max Dwell	<input type="text" value="180"/>	Max Call	<input type="text" value="0"/>
Reserve Inh Same	<input type="text" value="0"/>		
Reserve Inh All	<input type="text" value="0"/>		
Delay	<input type="text" value="0"/>		

	1-8	9-16
Phases/Overlaps	<input type="text"/>	<input type="text"/>
TClr 1 FR Olap	<input type="text"/>	<input type="text"/>
TClr 2 FR Olap	<input type="text"/>	<input type="text"/>
Dwell FR Olap	<input type="text"/>	<input type="text"/>
TClr 1 FYA	<input type="text"/>	<input type="text"/>
TClr 2 FYA	<input type="text"/>	<input type="text"/>
Dwell FYA	<input type="text"/>	<input type="text"/>

# 15-17-29BusJames Madison&1105 Alwington

## Preempt 5 (Configuration)

9/1/2023 10:30:10 AM

Enabled	<input type="text" value="Yes"/>	Dwell Mode	<input type="text" value="Normal"/>	Output Mode	<input type="text" value="All"/>
Output2 Mode	<input type="text" value="All"/>	Fail Action	<input type="text" value="Preempt Off"/>	Exit Mode	<input type="text" value="Normal"/>
Override Flash	<input type="text" value="No"/>	Change Phasenext	<input type="text" value="Yes"/>		

	1-8	9-16
Enable Phases	<input type="text"/>	<input type="text"/>
Preempt Inputs	<input type="text" value="5"/>	<input type="text"/>

	1-8	
LRV Disable	<input type="text"/>	Max <input type="text" value="0"/>
LRV Dwell Flash	<input type="text"/>	
LRV Omit	<input type="text"/>	Delay <input type="text" value="0"/>
LRV No Yel	<input type="text"/>	

## Preempt 5 (Timing/Phases/Overlaps)

	1-8	9-16
Phases/Overlaps	<input type="text"/>	<input type="text"/>
Omit Olap Grn Clr	<input type="text"/>	<input type="text"/>
Phs EWlk to Grn	<input type="text"/>	<input type="text"/>
TClr 1 Veh Phases	<input type="text"/>	<input type="text"/>
TClr 1 Ped Phases	<input type="text"/>	<input type="text"/>
TClr 1 Olap	<input type="text"/>	<input type="text"/>
TClr 1 Olap Ped	<input type="text"/>	<input type="text"/>
TClr 2 Veh Phases	<input type="text"/>	<input type="text"/>
TClr 2 Ped Phases	<input type="text"/>	<input type="text"/>
TClr 2 Olap	<input type="text"/>	<input type="text"/>
TClr 2 Olap Ped	<input type="text"/>	<input type="text"/>
Init Dwell Phases	<input type="text"/>	<input type="text"/>
Dwell Veh Phases	<input type="text" value="1"/>	<input type="text" value="6"/>
Dwell Ped Phases	<input type="text"/>	<input type="text"/>
Dwell Olap	<input type="text"/>	<input type="text"/>
Dwell Olap Ped	<input type="text"/>	<input type="text"/>
Exit Veh Phases	<input type="text" value="2"/>	<input type="text" value="6"/>
Exit Ped Phases	<input type="text"/>	<input type="text"/>
Exit Olap	<input type="text"/>	<input type="text"/>
Exit Olap Ped	<input type="text"/>	<input type="text"/>
Zero Phase Walk	<input type="text"/>	<input type="text"/>
Zero Phase Ped Clr	<input type="text"/>	<input type="text"/>
Zero Phase Green	<input type="text"/>	<input type="text"/>
Zero Olap Walk	<input type="text"/>	<input type="text"/>
Zero Olap Ped Clr	<input type="text"/>	<input type="text"/>
Zero Olap Green	<input type="text"/>	<input type="text"/>
Dwell-Phase Red	<input type="text"/>	<input type="text"/>
Dwell-Phase Red Flash	<input type="text"/>	<input type="text"/>
Dwell-Phase Yel Flash	<input type="text"/>	<input type="text"/>
Dwell-Olap Red Flash	<input type="text"/>	<input type="text"/>
Dwell-Olap Yel Flash	<input type="text"/>	<input type="text"/>
Dwell-Ped Dark	<input type="text"/>	<input type="text"/>
Dwell-Olap Ped Dark	<input type="text"/>	<input type="text"/>

Start Green	<input type="text" value="5"/>	Start Walk	<input type="text" value="0"/>
		Start Ped Clr	<input type="text" value="0"/>
Track Clear 1	<input type="text" value="0"/>	Track Clear 2	<input type="text" value="0"/>
TC1 Extend	<input type="text" value="0"/>	TC1 Max	<input type="text" value="0"/>
Exit Ped Clr	<input type="text" value="0"/>	Exit Yellow	<input type="text" value="0.0"/>
Exit Red	<input type="text" value="0.0"/>		
Min Dwell	<input type="text" value="5"/>	Min Duration	<input type="text" value="0"/>
Dwell Extend	<input type="text" value="0"/>		
Max Dwell	<input type="text" value="180"/>	Max Call	<input type="text" value="0"/>
Reserve Inh Same	<input type="text" value="0"/>		
Reserve Inh All	<input type="text" value="0"/>		
Delay	<input type="text" value="0"/>		

	1-8	9-16
Phases/Overlaps	<input type="text"/>	<input type="text"/>
TClr 1 FR Olap	<input type="text"/>	<input type="text"/>
TClr 2 FR Olap	<input type="text"/>	<input type="text"/>
Dwell FR Olap	<input type="text"/>	<input type="text"/>
TClr 1 FYA	<input type="text"/>	<input type="text"/>
TClr 2 FYA	<input type="text"/>	<input type="text"/>
Dwell FYA	<input type="text" value="5"/>	<input type="text"/>

# 15-17-29BusJames Madison&1105 Alwington

## Preempt 6 (Configuration)

9/1/2023 10:30:10 AM

Enabled	<input type="text" value="No"/>	Dwell Mode	<input type="text" value="Normal"/>	Output Mode	<input type="text" value="All"/>
Output2 Mode	<input type="text" value="All"/>	Fail Action	<input type="text" value="Preempt Off"/>	Exit Mode	<input type="text" value="Normal"/>
Override Flash	<input type="text" value="No"/>	Change Phasenext	<input type="text" value="Yes"/>		

	1-8	9-16		1-8	
Enable Phases	<input type="text"/>	<input type="text"/>	LRV Disable	<input type="text"/>	Max <input type="text" value="0"/>
Preempt Inputs	<input type="text"/>	<input type="text"/>	LRV Dwell Flash	<input type="text"/>	
			LRV Omit	<input type="text"/>	Delay <input type="text" value="0"/>
			LRV No Yel	<input type="text"/>	

## Preempt 6 (Timing/Phases/Overlaps)

	1-8	9-16		
Phases/Overlaps	<input type="text"/>	<input type="text"/>	Start Green	<input type="text" value="0"/> Start Walk <input type="text" value="0"/>
Omit Olap Grn Clr	<input type="text"/>	<input type="text"/>		Start Ped Clr <input type="text" value="0"/>
Phs EWlk to Grn	<input type="text"/>	<input type="text"/>	Track Clear 1	<input type="text" value="0"/> Track Clear 2 <input type="text" value="0"/>
TClr 1 Veh Phases	<input type="text"/>	<input type="text"/>	TC1 Extend	<input type="text" value="0"/> TC1 Max <input type="text" value="0"/>
TClr 1 Ped Phases	<input type="text"/>	<input type="text"/>	Exit Ped Clr	<input type="text" value="0"/> Exit Yellow <input type="text" value="0.0"/>
TClr 1 Olap	<input type="text"/>	<input type="text"/>	Exit Red	<input type="text" value="0.0"/>
TClr 1 Olap Ped	<input type="text"/>	<input type="text"/>	Min Dwell	<input type="text" value="0"/> Min Duration <input type="text" value="0"/>
TClr 2 Veh Phases	<input type="text"/>	<input type="text"/>	Dwell Extend	<input type="text" value="0"/>
TClr 2 Ped Phases	<input type="text"/>	<input type="text"/>	Max Dwell	<input type="text" value="0"/> Max Call <input type="text" value="0"/>
TClr 2 Olap	<input type="text"/>	<input type="text"/>	Reserve Inh Same	<input type="text" value="0"/>
TClr 2 Olap Ped	<input type="text"/>	<input type="text"/>	Reserve Inh All	<input type="text" value="0"/>
Init Dwell Phases	<input type="text"/>	<input type="text"/>	Delay	<input type="text" value="0"/>
Dwell Veh Phases	<input type="text"/>	<input type="text"/>		
Dwell Ped Phases	<input type="text"/>	<input type="text"/>	Phases/Overlaps	1-8
Dwell Olap	<input type="text"/>	<input type="text"/>	TClr 1 FR Olap	<input type="text"/>
Dwell Olap Ped	<input type="text"/>	<input type="text"/>	TClr 2 FR Olap	<input type="text"/>
Exit Veh Phases	<input type="text"/>	<input type="text"/>	Dwell FR Olap	<input type="text"/>
Exit Ped Phases	<input type="text"/>	<input type="text"/>	TClr 1 FYA	<input type="text"/>
Exit Olap	<input type="text"/>	<input type="text"/>	TClr 2 FYA	<input type="text"/>
Exit Olap Ped	<input type="text"/>	<input type="text"/>	Dwell FYA	<input type="text"/>
Zero Phase Walk	<input type="text"/>	<input type="text"/>		
Zero Phase Ped Clr	<input type="text"/>	<input type="text"/>		
Zero Phase Green	<input type="text"/>	<input type="text"/>		
Zero Olap Walk	<input type="text"/>	<input type="text"/>		
Zero Olap Ped Clr	<input type="text"/>	<input type="text"/>		
Zero Olap Green	<input type="text"/>	<input type="text"/>		
Dwell-Phase Red	<input type="text"/>	<input type="text"/>		
Dwell-Phase Red Flash	<input type="text"/>	<input type="text"/>		
Dwell-Phase Yel Flash	<input type="text"/>	<input type="text"/>		
Dwell-Olap Red Flash	<input type="text"/>	<input type="text"/>		
Dwell-Olap Yel Flash	<input type="text"/>	<input type="text"/>		
Dwell-Ped Dark	<input type="text"/>	<input type="text"/>		
Dwell-Olap Ped Dark	<input type="text"/>	<input type="text"/>		

# 15-17-29BusJames Madison&1105 Alwington

## Preempt 7 (Configuration)

9/1/2023 10:30:10 AM

Enabled	<input type="text" value="No"/>	Dwell Mode	<input type="text" value="Normal"/>	Output Mode	<input type="text" value="All"/>
Output2 Mode	<input type="text" value="All"/>	Fail Action	<input type="text" value="Preempt Off"/>	Exit Mode	<input type="text" value="Normal"/>
Override Flash	<input type="text" value="No"/>	Change Phasenext	<input type="text" value="Yes"/>		

	1-8	9-16
Enable Phases	<input type="text"/>	<input type="text"/>
Preempt Inputs	<input type="text"/>	<input type="text"/>

	1-8	
LRV Disable	<input type="text"/>	Max <input type="text" value="0"/>
LRV Dwell Flash	<input type="text"/>	
LRV Omit	<input type="text"/>	Delay <input type="text" value="0"/>
LRV No Yel	<input type="text"/>	

## Preempt 7 (Timing/Phases/Overlaps)

	1-8	9-16
Phases/Overlaps	<input type="text"/>	<input type="text"/>
Omit Olap Grn Clr	<input type="text"/>	<input type="text"/>
Phs EWlk to Grn	<input type="text"/>	<input type="text"/>
TClr 1 Veh Phases	<input type="text"/>	<input type="text"/>
TClr 1 Ped Phases	<input type="text"/>	<input type="text"/>
TClr 1 Olap	<input type="text"/>	<input type="text"/>
TClr 1 Olap Ped	<input type="text"/>	<input type="text"/>
TClr 2 Veh Phases	<input type="text"/>	<input type="text"/>
TClr 2 Ped Phases	<input type="text"/>	<input type="text"/>
TClr 2 Olap	<input type="text"/>	<input type="text"/>
TClr 2 Olap Ped	<input type="text"/>	<input type="text"/>
Init Dwell Phases	<input type="text"/>	<input type="text"/>
Dwell Veh Phases	<input type="text"/>	<input type="text"/>
Dwell Ped Phases	<input type="text"/>	<input type="text"/>
Dwell Olap	<input type="text"/>	<input type="text"/>
Dwell Olap Ped	<input type="text"/>	<input type="text"/>
Exit Veh Phases	<input type="text"/>	<input type="text"/>
Exit Ped Phases	<input type="text"/>	<input type="text"/>
Exit Olap	<input type="text"/>	<input type="text"/>
Exit Olap Ped	<input type="text"/>	<input type="text"/>
Zero Phase Walk	<input type="text"/>	<input type="text"/>
Zero Phase Ped Clr	<input type="text"/>	<input type="text"/>
Zero Phase Green	<input type="text"/>	<input type="text"/>
Zero Olap Walk	<input type="text"/>	<input type="text"/>
Zero Olap Ped Clr	<input type="text"/>	<input type="text"/>
Zero Olap Green	<input type="text"/>	<input type="text"/>
Dwell-Phase Red	<input type="text"/>	<input type="text"/>
Dwell-Phase Red Flash	<input type="text"/>	<input type="text"/>
Dwell-Phase Yel Flash	<input type="text"/>	<input type="text"/>
Dwell-Olap Red Flash	<input type="text"/>	<input type="text"/>
Dwell-Olap Yel Flash	<input type="text"/>	<input type="text"/>
Dwell-Ped Dark	<input type="text"/>	<input type="text"/>
Dwell-Olap Ped Dark	<input type="text"/>	<input type="text"/>

Start Green	<input type="text" value="0"/>	Start Walk	<input type="text" value="0"/>
		Start Ped Clr	<input type="text" value="0"/>
Track Clear 1	<input type="text" value="0"/>	Track Clear 2	<input type="text" value="0"/>
TC1 Extend	<input type="text" value="0"/>	TC1 Max	<input type="text" value="0"/>
Exit Ped Clr	<input type="text" value="0"/>	Exit Yellow	<input type="text" value="0.0"/>
Exit Red	<input type="text" value="0.0"/>		
Min Dwell	<input type="text" value="0"/>	Min Duration	<input type="text" value="0"/>
Dwell Extend	<input type="text" value="0"/>		
Max Dwell	<input type="text" value="0"/>	Max Call	<input type="text" value="0"/>
Reserve Inh Same	<input type="text" value="0"/>		
Reserve Inh All	<input type="text" value="0"/>		
Delay	<input type="text" value="0"/>		

	1-8	9-16
Phases/Overlaps	<input type="text"/>	<input type="text"/>
TClr 1 FR Olap	<input type="text"/>	<input type="text"/>
TClr 2 FR Olap	<input type="text"/>	<input type="text"/>
Dwell FR Olap	<input type="text"/>	<input type="text"/>
TClr 1 FYA	<input type="text"/>	<input type="text"/>
TClr 2 FYA	<input type="text"/>	<input type="text"/>
Dwell FYA	<input type="text"/>	<input type="text"/>

# 15-17-29BusJames Madison&1105 Alwington

## Preempt 8 (Configuration)

9/1/2023 10:30:10 AM

Enabled	<input type="text" value="No"/>	Dwell Mode	<input type="text" value="Normal"/>	Output Mode	<input type="text" value="All"/>
Output2 Mode	<input type="text" value="All"/>	Fail Action	<input type="text" value="Preempt Off"/>	Exit Mode	<input type="text" value="Normal"/>
Override Flash	<input type="text" value="No"/>	Change Phasenext	<input type="text" value="Yes"/>		

	1-8	9-16
Enable Phases	<input type="text"/>	<input type="text"/>
Preempt Inputs	<input type="text"/>	<input type="text"/>

	1-8	
LRV Disable	<input type="text"/>	Max <input type="text" value="0"/>
LRV Dwell Flash	<input type="text"/>	
LRV Omit	<input type="text"/>	Delay <input type="text" value="0"/>
LRV No Yel	<input type="text"/>	

## Preempt 8 (Timing/Phases/Overlaps)

	1-8	9-16
Phases/Overlaps		
Omit Olap Grn Clr	<input type="text"/>	<input type="text"/>
Phs EWlk to Grn	<input type="text"/>	<input type="text"/>
TClr 1 Veh Phases	<input type="text"/>	<input type="text"/>
TClr 1 Ped Phases	<input type="text"/>	<input type="text"/>
TClr 1 Olap	<input type="text"/>	<input type="text"/>
TClr 1 Olap Ped	<input type="text"/>	<input type="text"/>
TClr 2 Veh Phases	<input type="text"/>	<input type="text"/>
TClr 2 Ped Phases	<input type="text"/>	<input type="text"/>
TClr 2 Olap	<input type="text"/>	<input type="text"/>
TClr 2 Olap Ped	<input type="text"/>	<input type="text"/>
Init Dwell Phases	<input type="text"/>	<input type="text"/>
Dwell Veh Phases	<input type="text"/>	<input type="text"/>
Dwell Ped Phases	<input type="text"/>	<input type="text"/>
Dwell Olap	<input type="text"/>	<input type="text"/>
Dwell Olap Ped	<input type="text"/>	<input type="text"/>
Exit Veh Phases	<input type="text"/>	<input type="text"/>
Exit Ped Phases	<input type="text"/>	<input type="text"/>
Exit Olap	<input type="text"/>	<input type="text"/>
Exit Olap Ped	<input type="text"/>	<input type="text"/>
Zero Phase Walk	<input type="text"/>	<input type="text"/>
Zero Phase Ped Clr	<input type="text"/>	<input type="text"/>
Zero Phase Green	<input type="text"/>	<input type="text"/>
Zero Olap Walk	<input type="text"/>	<input type="text"/>
Zero Olap Ped Clr	<input type="text"/>	<input type="text"/>
Zero Olap Green	<input type="text"/>	<input type="text"/>
Dwell-Phase Red	<input type="text"/>	<input type="text"/>
Dwell-Phase Red Flash	<input type="text"/>	<input type="text"/>
Dwell-Phase Yel Flash	<input type="text"/>	<input type="text"/>
Dwell-Olap Red Flash	<input type="text"/>	<input type="text"/>
Dwell-Olap Yel Flash	<input type="text"/>	<input type="text"/>
Dwell-Ped Dark	<input type="text"/>	<input type="text"/>
Dwell-Olap Ped Dark	<input type="text"/>	<input type="text"/>

Start Green	<input type="text" value="0"/>	Start Walk	<input type="text" value="0"/>
		Start Ped Clr	<input type="text" value="0"/>
Track Clear 1	<input type="text" value="0"/>	Track Clear 2	<input type="text" value="0"/>
TC1 Extend	<input type="text" value="0"/>	TC1 Max	<input type="text" value="0"/>
Exit Ped Clr	<input type="text" value="0"/>	Exit Yellow	<input type="text" value="0.0"/>
Exit Red	<input type="text" value="0.0"/>		
Min Dwell	<input type="text" value="0"/>	Min Duration	<input type="text" value="0"/>
Dwell Extend	<input type="text" value="0"/>		
Max Dwell	<input type="text" value="0"/>	Max Call	<input type="text" value="0"/>
Reserve Inh Same	<input type="text" value="0"/>		
Reserve Inh All	<input type="text" value="0"/>		
Delay	<input type="text" value="0"/>		

	1-8	9-16
Phases/Overlaps		
TClr 1 FR Olap	<input type="text"/>	<input type="text"/>
TClr 2 FR Olap	<input type="text"/>	<input type="text"/>
Dwell FR Olap	<input type="text"/>	<input type="text"/>
TClr 1 FYA	<input type="text"/>	<input type="text"/>
TClr 2 FYA	<input type="text"/>	<input type="text"/>
Dwell FYA	<input type="text"/>	<input type="text"/>

# 15-17-29BusJames Madison&1105 Alwington

## Preempt 9 (Configuration)

9/1/2023 10:30:10 AM

Enabled	<input type="text" value="No"/>	Dwell Mode	<input type="text" value="Normal"/>	Output Mode	<input type="text" value="All"/>
Output2 Mode	<input type="text" value="All"/>	Fail Action	<input type="text" value="Preempt Off"/>	Exit Mode	<input type="text" value="Normal"/>
Override Flash	<input type="text" value="No"/>	Change Phasenext	<input type="text" value="Yes"/>		

	1-8	9-16		1-8	
Enable Phases	<input type="text"/>	<input type="text"/>	LRV Disable	<input type="text"/>	Max <input type="text" value="0"/>
Preempt Inputs	<input type="text"/>	<input type="text"/>	LRV Dwell Flash	<input type="text"/>	
			LRV Omit	<input type="text"/>	Delay <input type="text" value="0"/>
			LRV No Yel	<input type="text"/>	

## Preempt 9 (Timing/Phases/Overlaps)

	1-8	9-16				
Phases/Overlaps	<input type="text"/>	<input type="text"/>	Start Green	<input type="text" value="0"/>	Start Walk	<input type="text" value="0"/>
Omit Olap Grn Clr	<input type="text"/>	<input type="text"/>			Start Ped Clr	<input type="text" value="0"/>
Phs EWlk to Grn	<input type="text"/>	<input type="text"/>			Track Clear 1	<input type="text" value="0"/>
TClr 1 Veh Phases	<input type="text"/>	<input type="text"/>	Track Clear 2	<input type="text" value="0"/>	TC1 Max	<input type="text" value="0"/>
TClr 1 Ped Phases	<input type="text"/>	<input type="text"/>	TC1 Extend	<input type="text" value="0"/>	TC1 Max	<input type="text" value="0"/>
TClr 1 Olap	<input type="text"/>	<input type="text"/>	Exit Ped Clr	<input type="text" value="0"/>	Exit Yellow	<input type="text" value="0.0"/>
TClr 1 Olap Ped	<input type="text"/>	<input type="text"/>	Exit Red	<input type="text" value="0.0"/>		
TClr 2 Veh Phases	<input type="text"/>	<input type="text"/>	Min Dwell	<input type="text" value="0"/>	Min Duration	<input type="text" value="0"/>
TClr 2 Ped Phases	<input type="text"/>	<input type="text"/>	Dwell Extend	<input type="text" value="0"/>		
TClr 2 Olap	<input type="text"/>	<input type="text"/>	Max Dwell	<input type="text" value="0"/>	Max Call	<input type="text" value="0"/>
TClr 2 Olap Ped	<input type="text"/>	<input type="text"/>	Reserve Inh Same	<input type="text" value="0"/>		
Init Dwell Phases	<input type="text"/>	<input type="text"/>	Reserve Inh All	<input type="text" value="0"/>		
Dwell Veh Phases	<input type="text"/>	<input type="text"/>	Delay	<input type="text" value="0"/>		
Dwell Ped Phases	<input type="text"/>	<input type="text"/>				
Dwell Olap	<input type="text"/>	<input type="text"/>	Phases/Overlaps	1-8	9-16	
Dwell Olap Ped	<input type="text"/>	<input type="text"/>	TClr 1 FR Olap	<input type="text"/>	<input type="text"/>	
Exit Veh Phases	<input type="text"/>	<input type="text"/>	TClr 2 FR Olap	<input type="text"/>	<input type="text"/>	
Exit Ped Phases	<input type="text"/>	<input type="text"/>	Dwell FR Olap	<input type="text"/>	<input type="text"/>	
Exit Olap	<input type="text"/>	<input type="text"/>	TClr 1 FYA	<input type="text"/>	<input type="text"/>	
Exit Olap Ped	<input type="text"/>	<input type="text"/>	TClr 2 FYA	<input type="text"/>	<input type="text"/>	
Zero Phase Walk	<input type="text"/>	<input type="text"/>	Dwell FYA	<input type="text"/>	<input type="text"/>	
Zero Phase Ped Clr	<input type="text"/>	<input type="text"/>				
Zero Phase Green	<input type="text"/>	<input type="text"/>				
Zero Olap Walk	<input type="text"/>	<input type="text"/>				
Zero Olap Ped Clr	<input type="text"/>	<input type="text"/>				
Zero Olap Green	<input type="text"/>	<input type="text"/>				
Dwell-Phase Red	<input type="text"/>	<input type="text"/>				
Dwell-Phase Red Flash	<input type="text"/>	<input type="text"/>				
Dwell-Phase Yel Flash	<input type="text"/>	<input type="text"/>				
Dwell-Olap Red Flash	<input type="text"/>	<input type="text"/>				
Dwell-Olap Yel Flash	<input type="text"/>	<input type="text"/>				
Dwell-Ped Dark	<input type="text"/>	<input type="text"/>				
Dwell-Olap Ped Dark	<input type="text"/>	<input type="text"/>				

# 15-17-29BusJames Madison&1105 Alwington

## Preempt 10 (Configuration)

9/1/2023 10:30:10 AM

Enabled	<input type="text" value="No"/>	Dwell Mode	<input type="text" value="Normal"/>	Output Mode	<input type="text" value="All"/>
Output2 Mode	<input type="text" value="All"/>	Fail Action	<input type="text" value="Preempt Off"/>	Exit Mode	<input type="text" value="Normal"/>
Override Flash	<input type="text" value="No"/>	Change Phasenext	<input type="text" value="Yes"/>		

	1-8	9-16
Enable Phases	<input type="text"/>	<input type="text"/>
Preempt Inputs	<input type="text"/>	<input type="text"/>

	1-8	
LRV Disable	<input type="text"/>	Max <input type="text" value="0"/>
LRV Dwell Flash	<input type="text"/>	
LRV Omit	<input type="text"/>	Delay <input type="text" value="0"/>
LRV No Yel	<input type="text"/>	

## Preempt 10 (Timing/Phases/Overlaps)

	1-8	9-16
Phases/Overlaps		
Omit Olap Grn Clr	<input type="text"/>	<input type="text"/>
Phs EWlk to Grn	<input type="text"/>	<input type="text"/>
TClr 1 Veh Phases	<input type="text"/>	<input type="text"/>
TClr 1 Ped Phases	<input type="text"/>	<input type="text"/>
TClr 1 Olap	<input type="text"/>	<input type="text"/>
TClr 1 Olap Ped	<input type="text"/>	<input type="text"/>
TClr 2 Veh Phases	<input type="text"/>	<input type="text"/>
TClr 2 Ped Phases	<input type="text"/>	<input type="text"/>
TClr 2 Olap	<input type="text"/>	<input type="text"/>
TClr 2 Olap Ped	<input type="text"/>	<input type="text"/>
Init Dwell Phases	<input type="text"/>	<input type="text"/>
Dwell Veh Phases	<input type="text"/>	<input type="text"/>
Dwell Ped Phases	<input type="text"/>	<input type="text"/>
Dwell Olap	<input type="text"/>	<input type="text"/>
Dwell Olap Ped	<input type="text"/>	<input type="text"/>
Exit Veh Phases	<input type="text"/>	<input type="text"/>
Exit Ped Phases	<input type="text"/>	<input type="text"/>
Exit Olap	<input type="text"/>	<input type="text"/>
Exit Olap Ped	<input type="text"/>	<input type="text"/>
Zero Phase Walk	<input type="text"/>	<input type="text"/>
Zero Phase Ped Clr	<input type="text"/>	<input type="text"/>
Zero Phase Green	<input type="text"/>	<input type="text"/>
Zero Olap Walk	<input type="text"/>	<input type="text"/>
Zero Olap Ped Clr	<input type="text"/>	<input type="text"/>
Zero Olap Green	<input type="text"/>	<input type="text"/>
Dwell-Phase Red	<input type="text"/>	<input type="text"/>
Dwell-Phase Red Flash	<input type="text"/>	<input type="text"/>
Dwell-Phase Yel Flash	<input type="text"/>	<input type="text"/>
Dwell-Olap Red Flash	<input type="text"/>	<input type="text"/>
Dwell-Olap Yel Flash	<input type="text"/>	<input type="text"/>
Dwell-Ped Dark	<input type="text"/>	<input type="text"/>
Dwell-Olap Ped Dark	<input type="text"/>	<input type="text"/>

Start Green	<input type="text" value="0"/>	Start Walk	<input type="text" value="0"/>
		Start Ped Clr	<input type="text" value="0"/>
Track Clear 1	<input type="text" value="0"/>	Track Clear 2	<input type="text" value="0"/>
TC1 Extend	<input type="text" value="0"/>	TC1 Max	<input type="text" value="0"/>
Exit Ped Clr	<input type="text" value="0"/>	Exit Yellow	<input type="text" value="0.0"/>
Exit Red	<input type="text" value="0.0"/>		
Min Dwell	<input type="text" value="0"/>	Min Duration	<input type="text" value="0"/>
Dwell Extend	<input type="text" value="0"/>		
Max Dwell	<input type="text" value="0"/>	Max Call	<input type="text" value="0"/>
Reserve Inh Same	<input type="text" value="0"/>		
Reserve Inh All	<input type="text" value="0"/>		
Delay	<input type="text" value="0"/>		

	1-8	9-16
Phases/Overlaps		
TClr 1 FR Olap	<input type="text"/>	<input type="text"/>
TClr 2 FR Olap	<input type="text"/>	<input type="text"/>
Dwell FR Olap	<input type="text"/>	<input type="text"/>
TClr 1 FYA	<input type="text"/>	<input type="text"/>
TClr 2 FYA	<input type="text"/>	<input type="text"/>
Dwell FYA	<input type="text"/>	<input type="text"/>











# 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	<input type="text" value="Free"/>				
Manual Pattern	<input type="text" value="0"/>	Manual Offset	<input type="text" value="0"/>		
Stop Time Input	<input type="text" value="Enabled"/>				
Aux Switch	<input type="text" value="None"/>	<input type="text" value="0"/>			
DLS Mode	<input type="text" value="D4"/>	Time Zone	<input type="text" value="Est (UTC-5)"/>	GPS Thresh	<input type="text" value="0"/>
Password Timeout	<input type="text" value="5"/>				
Maint Phs Recalls	<input type="text" value="1-8"/>	<input type="text" value="9-16"/>			
Maint Ped Recalls	<input type="text"/>	<input type="text"/>			

## Serial 1 Port Configuration

Broadcast Plan/Sync	<input type="text" value="Disabled"/>	Broadcast Time	<input type="text" value="00:00"/>
Serial Rebroadcast	<input type="text" value="Disabled"/>	Response	<input type="text" value="None"/>

## Serial 2 Port Configuration

Broadcast Plan/Sync	<input type="text" value="Disabled"/>	Broadcast Time	<input type="text" value="00:00"/>
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## Ethernet Port Configuration

Broadcast Plan/Sync	<input type="text" value="Disabled"/>	Broadcast Time	<input type="text" value="00:00"/>
Serial Rebroadcast	<input type="text" value="Disabled"/>		

## Peer Configuration

Peer 1	<input type="text" value="0"/>
Peer 2	<input type="text" value="0"/>
Peer 3	<input type="text" value="0"/>
Peer 4	<input type="text" value="0"/>
Peer 5	<input type="text" value="0"/>
Peer 6	<input type="text" value="0"/>
Peer 7	<input type="text" value="0"/>
Peer 8	<input type="text" value="0"/>

# Programmed EPAC Data

11/23/20  
2:09:23PM

**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**

<u>Vehical Basic Timings</u>							<u>Vehical Density Timings</u>			Time B4	Cars	Time To
Phase	Min_Grn	Passage	Max1	Max2	Yellow	All Red	Added Initial	Max_Initial	Reduction	Before	Reduce	Min_Gap
1	8	4.0	30	30	4.0	2.0	0.0	0	0	0	0	0.0
2	30	4.0	45	50	4.0	2.0	0.0	0	0	0	0	0.0
3	8	4.0	30	30	4.0	2.0	0.0	0	0	0	0	0.0
4	8	4.0	30	50	4.0	2.0	0.0	0	0	0	0	0.0
5	8	4.0	30	30	4.0	2.0	0.0	0	0	0	0	0.0
6	30	4.0	45	50	4.0	2.0	0.0	0	0	0	0	0.0

<u>Pedestrian Timing</u>			<u>Extended Actuated</u>			<u>General Control</u>					<u>Miscellaneous</u>				
Phase	Ped Walk	Flashing Clear	Ped Clear	Rest in Walk	Non-Act Initialize	Veh Response	Ped Recall	Recall Delay	Non Lock	Dual Entry	Last Car Passage	Conditional Service	Simultaneous Gap	No Simultaneous Out	
1	0	0	No	0	Inactive	None	Min	None	0	Yes	No	No	No	No	
2	0	0	No	0	Green	NonActI	Min	None	0	No	No	No	No	No	
3	7	12	No	0	Inactive	None	None	None	0	No	No	No	No	No	
4	7	12	No	0	Inactive	NonActII	None	None	0	No	No	No	No	No	
5	0	0	No	0	Inactive	None	None	None	0	Yes	No	No	No	No	
6	7	12	No	0	Green	NonActI	Min	None	0	No	No	No	No	No	

<u>Special Sequence</u> <b>Default Data</b>	<u>Vehical Detector Phase Assignment</u>				
	Assigned Phase	Mode	Switched Phase	Extend	Delay
	<b>Default Data</b>				

<u>Pedestrian Detector</u> <b>Default Data</b>	<u>Special Detector Phase Assignment</u>				
	Assign Phase	Switched Mode	Phase	Extend	Delay
	<b>Default Data</b>				

**Unit Data**

<u>General Control</u>	<u>Remote Flash</u>
Startup Time: 5sec Startup State: Flash Red Revert: 4sec	Test A = Flash Channel Color Flash Alternat
Auto Ped Clear: No Stop Time Reset: No Alternate Sequence: 0	Flash Flash
ABC connector Input Modes: 0 Input Output	Entry Exit <b>Default Data - No Flash</b>
ABC connector Output Modes: 0 Ring Respons Selection	Phase Phase Phase
D connector Input Modes: 0 1 Ring 1 Ring 1	<b>Default Data - No Flash</b>
D connector Output Modes: 0 2 Ring 2 Ring 2	
3 None None	
4 None None	

<u>Overlaps</u>	<u>Overlaps</u>															
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	Next	Phase(s)																
Phase	Ring	Phase																
1	1	2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2	1	3	5	5	7	7	2	2	4	4								
3	1	4	6	6	8	8	5	6	7	8								
4	1	1																
5	2	6																
6	2	7																

**Alternate Sequences**

Alternate Sequences

**Port 1 Data**

BIU Port Message  
 Addr Status 40

Phase  
 Pair(s)

**Default Data**

No  
 Alternate  
 Sequences

**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	Ph.2 Veh	2	2 - Ph.2 RYG	Ph.3 Veh	3	3 - Ph.3 RYG
Ph.4 Veh	4	4 - Ph.4 RYG	Ph.5 Veh	5	5 - Ph.5 RYG	Ph.6 Veh	6	6 - Ph.6 RYG
Ph.7 Veh	7	7 - Ph.7 RYG	Ph.8 Veh	8	8 - Ph.8 RYG	Ph.2 Ped	9	10 - Ph.2 DPW
Ph.4 Ped	10	12 - Ph.4 DPW	Ph.6 Ped	11	14 - Ph.6 DPW	Ph.8 Ped	12	16 - Ph.8 DPW
Ph.1 OLP	13	17 - Ph.1 RYG	Ph.2 OLP	14	18 - Ph.2 RYG	Ph.3 OLP	15	19 - Ph.3 RYG
Ph.4 OLP	16	20 - Ph.4 RYG	Ph.1 Ped	17	9 - Ph.1 DPW	Ph.3 Ped	18	11 - Ph.3 DPW
Ph.5 Ped	19	13 - Ph.5 DPW	Ph.7 Ped	20	15 - Ph.7 DPW			

**Coordination Data**

**Dial/Split Cycle**

General Coordination Data

Operation Mode: 0=Free      Offset Mode: 0=Beg Grn      Manual Dial: 1  
 Coordination Mode: 0=Permissive      Force Mode: 0=Plan      Manual Split: 1  
 Maximun Mode: 2=Max 2      Max Dwell Time: 0      Manual Offset: 1  
 Correction Mode: 0=Dwell      Yield Period: 0

**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 ReferenceHours: 0      Min: 0  
 End of Daylight Saving Month: 0      Week: 0

Source	Equate Days						
Day	1	2	3	4	5	6	7

**Traffic Data**

Event	Day	Time	D/S/O	flash	PHASE FUNCTION															
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		:	//		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

## AUX. Events

Event	Program Day	Hour	Min.	Aux Outputs			Det. Diag.	Det. Rpt.	Det. Mult100	Dimming	Special Function Outputs								
				1	2	3	D1	D2	D3		1	2	3	4	5	6	7	8	
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Default Data - No Special Day(s) or Week(s) Programmed

## Special Functions

Function	SF1	SF2	SF3	SF4	SF5	SF6	SF7	SF8
Special Function 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special Function 2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special Function 3	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special Function 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special Function 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special Function 6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special Function 7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Special Function 8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Phase Function

Phase Function Map	PF1	PF2	PF3	PF4	PF5	PF6	PF7	PF8	PF9	PF10	PF11	PF12	PF13	PF14	PF15	PF16
Phase 1 Max2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase 2 Max2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase 3 Max2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase 4 Max2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase 5 Max2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase 6 Max2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase 7 Max2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase 8 Max2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase 1 Phase Omit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase 2 Phase Omit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase 3 Phase Omit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase 4 Phase Omit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase 5 Phase Omit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase 6 Phase Omit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phase 7 Phase Omit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Phase 8 Phase Omit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## 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 > Preempt 1      Preempt 2 = Preempt 3      Preempt 4 = Preempt 5  
 Preempt 1 > Preempt 2      Preempt 3 = Preempt 4      Preempt 5 = Preempt 6

### Preempt Timers

Preempt	Non-Locking	Link to Preempt	Delay	Extend	Duration	MaxCall	Lock-Out	Select Ped			Track				Dwell Green	Return Ped		
								Clear	Yel	Red	Grn	Ped	Yel	Red		Clear	Yel	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			Preempt 2			Preempt 3			Preempt 4			Preempt 5			Preempt 6		
Exit Phase	Exit Phase	Exit Calls	Exit Phase	Exit Phase	Exit Calls	Exit Phase	Exit Phase	Exit Calls	Exit Phase	Exit Phase	Exit Calls	Exit Phase	Exit Phase	Exit Calls	Exit Phase	Exit Phase	Exit Calls
1	No	Yes	2	Yes	No	2	Yes	Yes	2	Yes	No	1	No	Yes	1	No	Yes
2	Yes	No	4	No	Yes	5	No	Yes	3	No	Yes	2	No	Yes	2	No	Yes
6	Yes	Yes	6	Yes	No	6	Yes	No	6	Yes	No	3	No	Yes	3	No	Yes
												4	No	Yes	4	No	Yes
												5	No	Yes	5	No	Yes
												6	No	Yes	6	No	Yes
												7	No	Yes	7	No	Yes
												8	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			Priority 2			Priority 3			Priority 4			Priority 5			Priority 6		
Exit Phase	Exit Phase	Exit Calls	Exit Phase	Exit Phase	Exit Calls	Exit Phase	Exit Phase	Exit Calls	Exit Phase	Exit Phase	Exit Calls	Exit Phase	Exit Phase	Exit Calls	Exit Phase	Exit Phase	Exit Calls

**Preempt 1**

Vehical Phases				Pedestrian Phases			Overlaps		
Ph. Track	Dwell	Cycle		Ph. Track	Dwell	Cycle	Ovlp. Track	Dwell	Cycle
1 Red	Green	No		<b>Default Data</b>			<b>Default Data</b>		
6 Red	Green	No							

**Preempt 2**

Vehical Phases				Pedestrian Phases			Overlaps		
Ph. Track	Dwell	Cycle		Ph. Track	Dwell	Cycle	Ovlp. Track	Dwell	Cycle
4 Red	Green	No		<b>Default Data</b>			<b>Default Data</b>		

**Preempt 3**

Vehical Phases				Pedestrian Phases			Overlaps		
Ph. Track	Dwell	Cycle		Ph. Track	Dwell	Cycle	Ovlp. Track	Dwell	Cycle
2 Red	Green	No		<b>Default Data</b>			<b>Default Data</b>		
5 Red	Green	No							

**Preempt 4**

Vehical Phases				Pedestrian Phases			Overlaps		
Ph. Track	Dwell	Cycle		Ph. Track	Dwell	Cycle	Ovlp. Track	Dwell	Cycle
3 Red	Green	No		<b>Default Data</b>			<b>Default Data</b>		

**Preempt 5**

Vehical Phases				Pedestrian Phases			Overlaps		
Ph. Track	Dwell	Cycle		Ph. Track	Dwell	Cycle	Ovlp. Track	Dwell	Cycle
				<b>Default Data</b>			<b>Default Data</b>		

**Preempt 6**

Vehical Phases				Pedestrian Phases			Overlaps		
Ph. Track	Dwell	Cycle		Ph. Track	Dwell	Cycle	Ovlp. Track	Dwell	Cycle
				<b>Default Data</b>			<b>Default Data</b>		

**System/Detectors Data**

**Local Critical Alarms**

Local Free: No    Cycle Failure: No    Coord Failure: No    Conflict Flash: No    Remote Flash: No    Revert to Backup: 15    1st Phone:    2nd Phone:  
 Local Fash: No    Cycle Fault: No    Coord Fault: No    Preemption: 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	Average Occupancy	Min Queue 1	System Weight	Queue 2	System Weight					
Detector Channel	Veh/Hr	Time(mins)	Correction/10	Volume %	Detectors	Detectors	Factor	Detectors	Detectors	Factor

**Default Data**

Sample Interval:

**Default Data**

**Queue: 1** Input Selection: 0=Average    **Queue:**    Level Enter Leave    Dial / Split / Offset  
 Detector Failed Level : 0  
**Queue: 2** Input Selection: 0=Average    / /  
 Detector Failed Level : 0    **Default Data**

**Vehical Detector**

Diagnostic Value 0  
 Max No Erratic  
 Detector Presence Activity Count

**Vehical Detector**

Diagnostic Value 1  
 Max No Erratic  
 Detector Presence Activity Count

**Special Detector**

Diagnostic Value 0  
 Max No Erratic  
 Detector Presence Activity Count

**Default Data - Diag 0 Values**

**Default Data - No Diag 1 Values**

**Default Data - No Diag 0 Vali**

**Pedestrian Detector**

Diagnostic Value 0

Max No Erratic  
Detector Presence Activity Count

**Default Data - No Diag 0 Values**

**Speed Trap Data**

Speed Trap:

Measurement:

Detector 1 Detector\_2 Distance :

**Default Data**

**Volume Detector Data**

Report Interval

Volume Controller

Detector Detector

Number Channel

**Default Data**

**Pedestrian Detector**

Diagnostic Value 1

Max No Erratic  
Detector Presence Activity Count

**Default Data - No Diag 1 Values**

Dial/Split/Offset  
//

**Default Data**

**Special Detector**

Diagnostic Value 1

Max No Erratic  
Detector Presence Activity Count

**Default Data - No Diag 1 Values**

Speed Trap Speed Trap  
Low Treshold High Treshold



**Appendix D**  
**Existing Analysis Worksheets**

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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	0.18	0.58	0.12	0.21	0.66	0.71	0.09	0.30
Control Delay	41.4	28.4	0.4	43.8	30.4	44.9	39.1	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	28.4	0.4	43.8	30.4	44.9	39.1	30.8
Queue Length 50th (ft)	17	167	0	17	246	117	9	19
Queue Length 95th (ft)	46	264	0	47	#435	#226	29	56
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	392	818	792	151	718	383	381	381
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	0.44	0.09	0.21	0.66	0.62	0.04	0.15

**Intersection Summary**

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.



2023 Existing - AM Peak  
1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

2023 Existing - AM Peak  
HCM Signalized Intersection Capacity Analysis

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
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
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)	1762	1702	1488	1611	1663			1678		1710	1634	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1762	1702	1488	1611	1663			1678		1710	1634	
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)	5.1	34.4	34.4	8.1	37.4			16.9		7.1	7.1	
Effective Green, g (s)	5.1	34.4	34.4	8.1	37.4			16.9		7.1	7.1	
Actuated g/C Ratio	0.06	0.38	0.38	0.09	0.41			0.19		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)	99	646	565	144	687			313		134	128	
v/s Ratio Prot	0.02	0.21		c0.02	c0.29			c0.14		0.01	c0.02	
v/s Ratio Perm			0.02									
v/c Ratio	0.32	0.55	0.05	0.22	0.69			0.73		0.13	0.29	
Uniform Delay, d1	41.0	22.0	17.7	38.3	21.8			34.6		38.8	39.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	2.6	1.3	0.1	1.1	3.2			8.8		0.6	1.7	
Delay (s)	43.6	23.3	17.8	39.3	25.0			43.4		39.4	41.0	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		23.8			25.9			43.4			40.6	
Approach LOS		C			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			29.3									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			90.5							24.0		
Intersection Capacity Utilization			53.3%									ICU Level of Service A
Analysis Period (min)			15									
c Critical Lane Group												

2023 Existing - AM Peak  
2: Site Entrance #1 & E Shirley Avenue

2023 Existing - AM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑		
Traffic Volume (veh/h)	288	37	48	432	0	0
Future Volume (Veh/h)	288	37	48	432	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)	316	41	53	475	0	0
<b>Pedestrians</b>						
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		897	316
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			357		897	316
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)			1143		298	729
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>		
Volume Total	316	41	53	475		
Volume Left	0	0	53	0		
Volume Right	0	41	0	0		
cSH	1700	1700	1143	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						
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization			33.1%	ICU Level of Service	A	
Analysis Period (min)			15			

2023 Existing - AM Peak  
3: Site Entrance #2 & E Shirley Avenue

2023 Existing - AM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (veh/h)	288	0	0	439	41	51
Future Volume (Veh/h)	288	0	0	439	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)	324	0	0	493	46	57
<b>Pedestrians</b>						
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			324			324
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			324			324
tC, single (s)			4.1			6.4
tC, 2 stage (s)						
tF (s)			2.2			3.4
p0 queue free %			100			92
cM capacity (veh/h)			1247			686
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	324	493	46	57		
Volume Left	0	0	46	0		
Volume Right	0	0	0	57		
cSH	1700	1700	327	686		
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			
<b>Intersection Summary</b>						
Average Delay			1.6			
Intersection Capacity Utilization			33.1%	ICU Level of Service		A
Analysis Period (min)			15			

2023 Existing - AM Peak  
4: Site Entrance #3 & E Shirley Avenue

2023 Existing - AM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
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
<b>Pedestrians</b>						
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
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>		
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						
<b>Intersection Summary</b>						
Average Delay			0.2			
Intersection Capacity Utilization			26.4%	ICU Level of Service	A	
Analysis Period (min)			15			

6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

Queues



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

6: James Madison Highway/E Shirley Avenue & Alwington Boulevard HCM Signalized Intersection Capacity Analysis



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	0.86	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	
<b>Intersection Summary</b>	

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



**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)	119	270	65	132	354	231	66	109
Average Queue (ft)	28	122	23	28	152	108	13	35
95th Queue (ft)	74	216	53	82	296	192	40	80
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	EB	EB	WB
Directions Served	T	R	L
Maximum Queue (ft)	2	6	58
Average Queue (ft)	0	0	11
95th Queue (ft)	2	4	40
Link Distance (ft)	3093		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		110	240
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)	4	79	82
Average Queue (ft)	0	30	33
95th Queue (ft)	3	66	66
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	31
Average Queue (ft)	0	7
95th Queue (ft)	2	28
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)	127	143	86
Average Queue (ft)	24	25	25
95th Queue (ft)	85	91	68
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)	123	90	6	53	171	210	176	22	39	113	103	104
Average Queue (ft)	47	17	0	6	72	96	30	3	6	51	40	45
95th Queue (ft)	99	62	5	31	133	170	103	13	26	93	85	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)	8	75	63	87	42
Average Queue (ft)	1	36	33	32	9
95th Queue (ft)	6	66	55	76	32
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
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


















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	0.28	0.76	0.15	0.26	0.64	0.68	0.15	0.41
Control Delay	49.7	34.7	1.5	48.9	28.0	48.5	41.9	38.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	34.7	1.5	48.9	28.0	48.5	41.9	38.5
Queue Length 50th (ft)	24	281	0	24	280	110	15	38
Queue Length 95th (ft)	62	#453	11	61	#452	201	43	89
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	143	798	753	152	831	361	339	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	0.28	0.66	0.13	0.26	0.63	0.55	0.08	0.24

**Intersection Summary**

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

2023 Existing - School PM Peak  
1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

2023 Existing - School PM Peak  
HCM Signalized Intersection Capacity Analysis

														
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		
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11		
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)	1588	1767	1488	1687	1755			1656		1583	1662			
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00			
Satd. Flow (perm)	1588	1767	1488	1687	1755			1656		1583	1662			
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	38.6	38.6	8.2	42.5			15.8		8.5	8.5			
Effective Green, g (s)	4.3	38.6	38.6	8.2	42.5			15.8		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)	71	717	603	145	784			275		141	148			
v/s Ratio Prot	c0.03	c0.30		0.02	c0.30			c0.12		0.02	c0.04			
v/s Ratio Perm			0.03											
v/c Ratio	0.56	0.73	0.07	0.28	0.67			0.70		0.19	0.46			
Uniform Delay, d1	44.5	23.9	17.3	40.7	20.7			37.4		40.1	41.1			
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00			
Incremental Delay, d2	11.8	4.1	0.1	1.4	2.4			8.1		0.9	3.1			
Delay (s)	56.3	28.0	17.3	42.1	23.1			45.5		41.0	44.2			
Level of Service	E	C	B	D	C			D		D	D			
Approach Delay (s)		28.1			24.4			45.5			43.4			
Approach LOS		C			C			D			D			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			30.2									HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio			0.65											
Actuated Cycle Length (s)			95.1								24.0		Sum of lost time (s)	
Intersection Capacity Utilization			56.6%										ICU Level of Service	B
Analysis Period (min)			15											
c	Critical Lane Group													

2023 Existing - School PM Peak  
2: Site Entrance #1 & E Shirley Avenue

2023 Existing - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑		
Traffic Volume (veh/h)	470	20	9	459	0	0
Future Volume (Veh/h)	470	20	9	459	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)	505	22	10	494	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			527	1019	505	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			527	1019	505	
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)			1050	262	571	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2		
Volume Total	505	22	10	494		
Volume Left	0	0	10	0		
Volume Right	0	22	0	0		
cSH	1700	1700	1050	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			34.7%	ICU Level of Service	A	
Analysis Period (min)			15			

2023 Existing - School PM Peak  
3: Site Entrance #2 & E Shirley Avenue

2023 Existing - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (veh/h)	470	0	0	430	38	53
Future Volume (Veh/h)	470	0	0	430	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)	547	0	0	500	44	62
<b>Pedestrians</b>						
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			547	1047	547	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			547	1047	547	
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)			1033	241	509	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	547	500	44	62		
Volume Left	0	0	44	0		
Volume Right	0	0	0	62		
cSH	1700	1700	241	509		
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	13.0		
Lane LOS			C	B		
Approach Delay (s)	0.0	0.0	17.3			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			1.6			
Intersection Capacity Utilization			34.7%	ICU Level of Service	A	
Analysis Period (min)			15			

2023 Existing - School PM Peak  
4: Site Entrance #3 & E Shirley Avenue

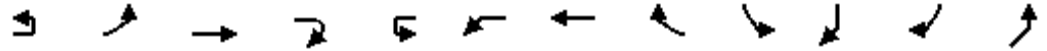
2023 Existing - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
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
<b>Pedestrians</b>						
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
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>		
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						
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			30.0%	ICU Level of Service	A	
Analysis Period (min)			15			



2023 Existing - School PM Peak  
5: E Shirley Avenue & Falmouth Street

2023 Existing - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	SBL	SBR	SBR2	NEL
Right Turn Channelized												
Traffic Volume (veh/h)	2	26	500	0	2	0	405	126	119	0	23	0
Future Volume (veh/h)	2	26	500	0	2	0	405	126	119	0	23	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.92
Hourly flow rate (vph)	2	26	505	0	2	0	409	127	120	0	23	0
Approach Volume (veh/h)			533				538		143			0
Crossing Volume (veh/h)			122				28		413			655
High Capacity (veh/h)			1259				1355		1000			824
High v/c (veh/h)			0.42				0.40		0.14			0.00
Low Capacity (veh/h)			1047				1134		814			658
Low v/c (veh/h)			0.51				0.47		0.18			0.00

Intersection Summary												
Maximum v/c High			0.42									
Maximum v/c Low			0.51									
Intersection Capacity Utilization			47.1%			ICU Level of Service			A			



Movement	NER
Right Turn Channelized	
Traffic Volume (veh/h)	0
Future Volume (veh/h)	0
Peak Hour Factor	0.92
Hourly flow rate (vph)	0
Approach Volume (veh/h)	
Crossing Volume (veh/h)	
High Capacity (veh/h)	
High v/c (veh/h)	
Low Capacity (veh/h)	
Low v/c (veh/h)	

Intersection Summary	



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

6: James Madison Highway/E Shirley Avenue & Alwington Boulevard HCM Signalized Intersection Capacity Analysis



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	
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	2	0	0	33	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

**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)	169	374	74	184	349	224	72	123
Average Queue (ft)	39	199	28	39	178	103	20	48
95th Queue (ft)	109	335	56	120	325	185	55	97
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	0
Queuing Penalty (veh)	0	2		0	3		0	0

**Intersection: 2: Site Entrance #1 & E Shirley Avenue**

Movement	WB
Directions Served	L
Maximum Queue (ft)	31
Average Queue (ft)	4
95th Queue (ft)	20
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	240
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	78	90
Average Queue (ft)	0	29	37
95th Queue (ft)	2	65	73
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)	35
Average Queue (ft)	5
95th Queue (ft)	23
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	SB
Directions Served	ULT	UTR	L>
Maximum Queue (ft)	226	125	76
Average Queue (ft)	78	18	29
95th Queue (ft)	190	74	65
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)	147	109	57	64	146	133	82	39	41	142	154	85
Average Queue (ft)	85	42	4	15	69	64	14	5	9	79	83	38
95th Queue (ft)	134	93	27	47	119	118	48	23	30	128	138	70
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)	24	64	49	68	29
Average Queue (ft)	2	14	24	13	4
95th Queue (ft)	10	47	45	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



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

**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	379	71	162	382	187	97	165
Average Queue (ft)	44	211	33	34	189	86	24	76
95th Queue (ft)	131	344	58	104	333	156	68	138
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	9		0	10		0	2
Queuing Penalty (veh)	0	3		0	3		0	1

**Intersection: 2: Site Entrance #1 & E Shirley Avenue**

Movement	EB	WB
Directions Served	R	L
Maximum Queue (ft)	2	26
Average Queue (ft)	0	3
95th Queue (ft)	2	16
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	110	240
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 3: Site Entrance #2 & E Shirley Avenue**

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	35	30
Average Queue (ft)	13	3
95th Queue (ft)	39	17
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)	42
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	SB
Directions Served	ULT	TR	L>
Maximum Queue (ft)	162	133	66
Average Queue (ft)	47	15	24
95th Queue (ft)	125	72	57
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)	152	107	52	57	163	150	96	18	66	164	159	77
Average Queue (ft)	81	40	4	12	77	66	15	1	10	87	90	30
95th Queue (ft)	135	93	28	38	135	123	53	12	41	138	141	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		
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	72	59	60	31
Average Queue (ft)	3	18	16	19	15
95th Queue (ft)	10	55	47	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: 8



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	0.23	0.80	0.25	0.20	0.66	0.64	0.15	0.55
Control Delay	44.0	41.4	5.7	43.9	32.6	45.9	36.5	43.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	41.4	5.7	43.9	32.6	45.9	36.5	43.4
Queue Length 50th (ft)	21	249	0	18	249	95	18	73
Queue Length 95th (ft)	57	#488	45	50	#489	179	49	140
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	348	597	608	342	724	364	356	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	0.11	0.80	0.25	0.10	0.66	0.51	0.10	0.39

**Intersection Summary**

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

2023 Existing - Commuter PM Peak  
1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

2023 Existing - Commuter PM Peak  
HCM Signalized Intersection Capacity Analysis



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
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
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)	1762	1801	1531	1736	1826			1715		1710	1721	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1762	1801	1531	1736	1826			1715		1710	1721	
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			15.0		13.4	13.4	
Effective Green, g (s)	5.5	33.1	33.1	8.8	36.4			15.0		13.4	13.4	
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)	102	632	537	162	704			272		242	244	
v/s Ratio Prot	c0.02	c0.26		0.02	c0.26			c0.10		0.02	c0.08	
v/s Ratio Perm			0.03									
v/c Ratio	0.38	0.75	0.10	0.20	0.68			0.65		0.15	0.55	
Uniform Delay, d1	42.8	27.0	20.6	39.5	24.1			37.2		35.5	37.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	3.2	5.4	0.1	0.9	2.8			6.1		0.4	3.3	
Delay (s)	46.0	32.4	20.7	40.4	26.9			43.3		35.8	41.0	
Level of Service	D	C	C	D	C			D		D	D	
Approach Delay (s)		30.6			27.8			43.3			40.0	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	94.3	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			

2023 Existing - Commuter PM Peak  
2: Site Entrance #1 & E Shirley Avenue

2023 Existing - Commuter PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑		
Traffic Volume (veh/h)	479	4	6	449	0	0
Future Volume (Veh/h)	479	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)	544	5	7	510	0	0
<b>Pedestrians</b>						
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			549	1068	544	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			549	1068	544	
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)			1031	246	543	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>		
Volume Total	544	5	7	510		
Volume Left	0	0	7	0		
Volume Right	0	5	0	0		
cSH	1700	1700	1031	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						
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			35.2%	ICU Level of Service	A	
Analysis Period (min)			15			

2023 Existing - Commuter PM Peak  
3: Site Entrance #2 & E Shirley Avenue

2023 Existing - Commuter PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (veh/h)	479	0	0	440	15	3
Future Volume (Veh/h)	479	0	0	440	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)	532	0	0	489	17	3
<b>Pedestrians</b>						
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			532	1021	532	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			532	1021	532	
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)			1046	264	552	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	532	489	17	3		
Volume Left	0	0	17	0		
Volume Right	0	0	0	3		
cSH	1700	1700	264	552		
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	18.4			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			0.4			
Intersection Capacity Utilization			35.2%	ICU Level of Service	A	
Analysis Period (min)			15			



2023 Existing - Commuter PM Peak  
4: Site Entrance #3 & E Shirley Avenue

2023 Existing - Commuter PM Peak  
HCM Unsignalized Intersection Capacity Analysis






















	→	↘	↙	←	↖	↗
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
<b>Pedestrians</b>						
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	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>		
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						
<b>Intersection Summary</b>						
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

6: James Madison Highway/E Shirley Avenue & Alwington Boulevard HCM Signalized Intersection Capacity Analysis

												
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
<b>Intersection Summary</b>												
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	
<b>Intersection Summary</b>	

# 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		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
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.

# 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		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
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

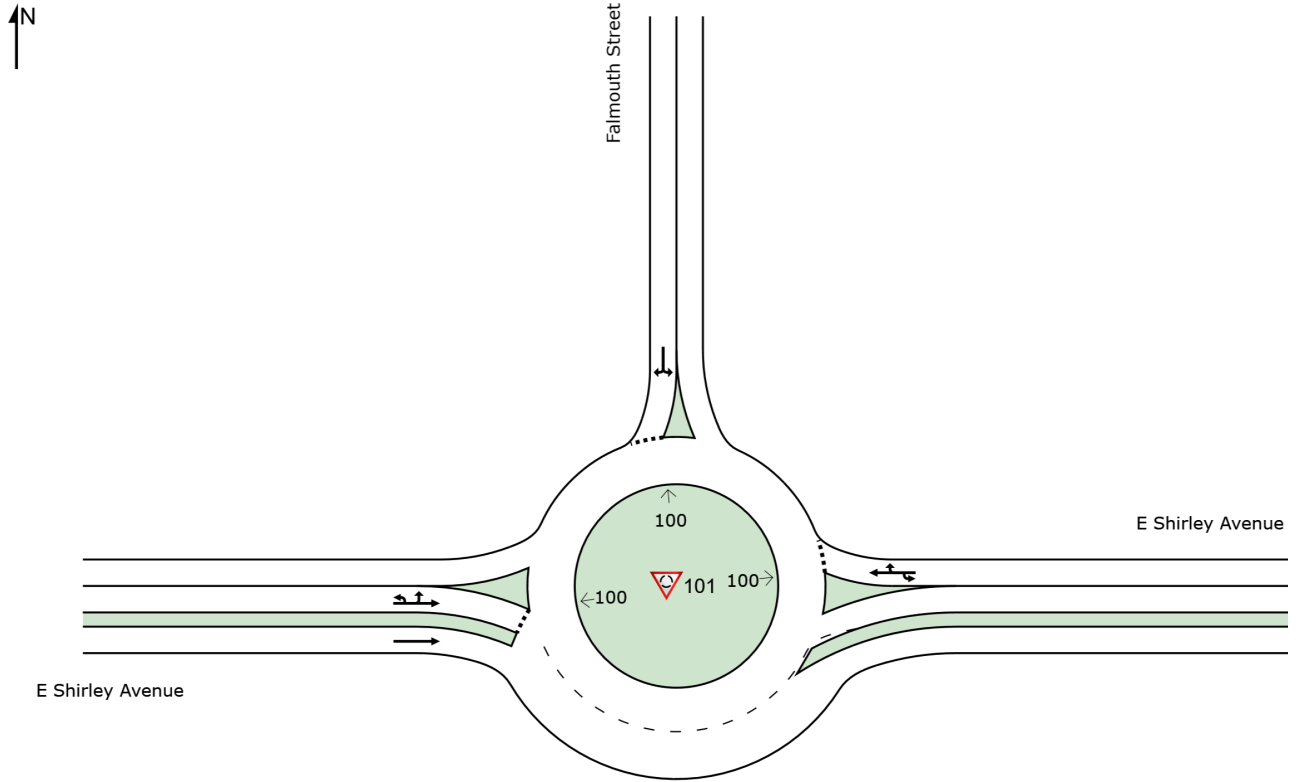
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.  
 LOS F will 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.

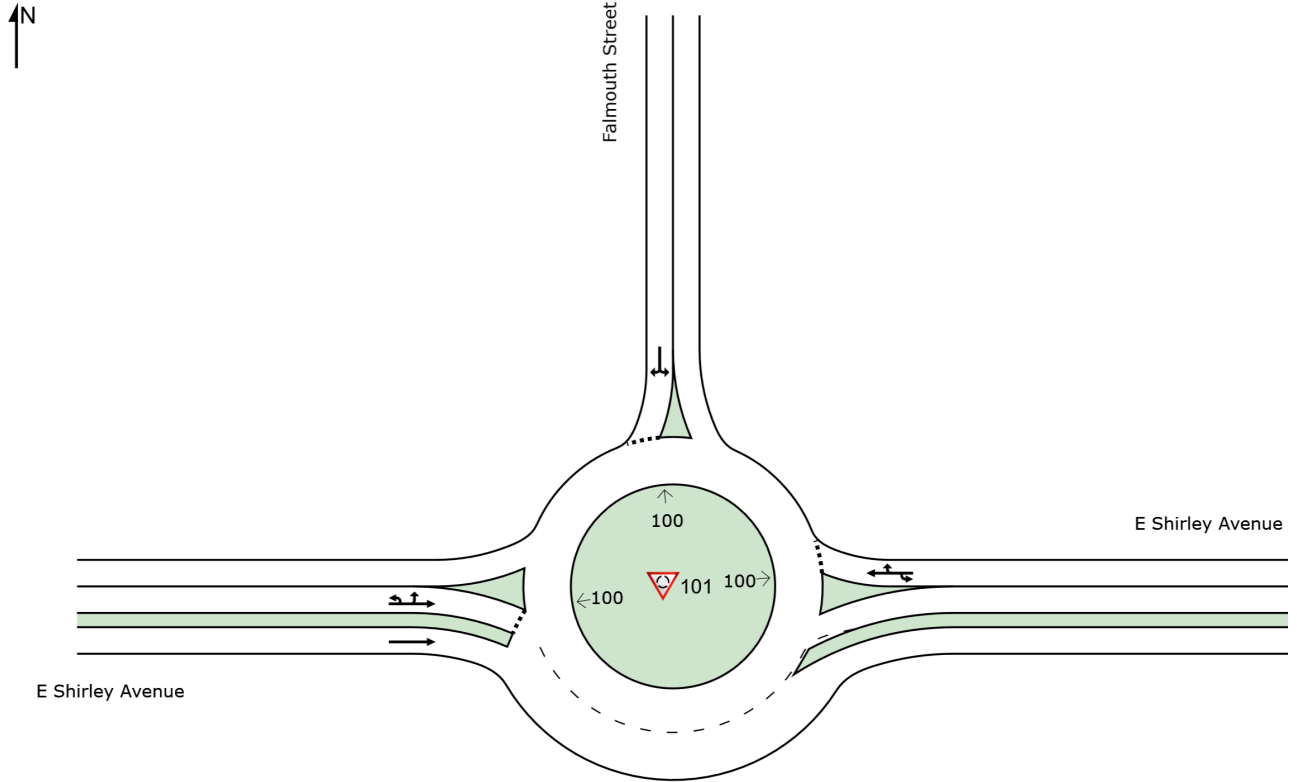


# SITE LAYOUT

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 - School PM Peak  
(Site Folder: General)]**

School PM Peak  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
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).

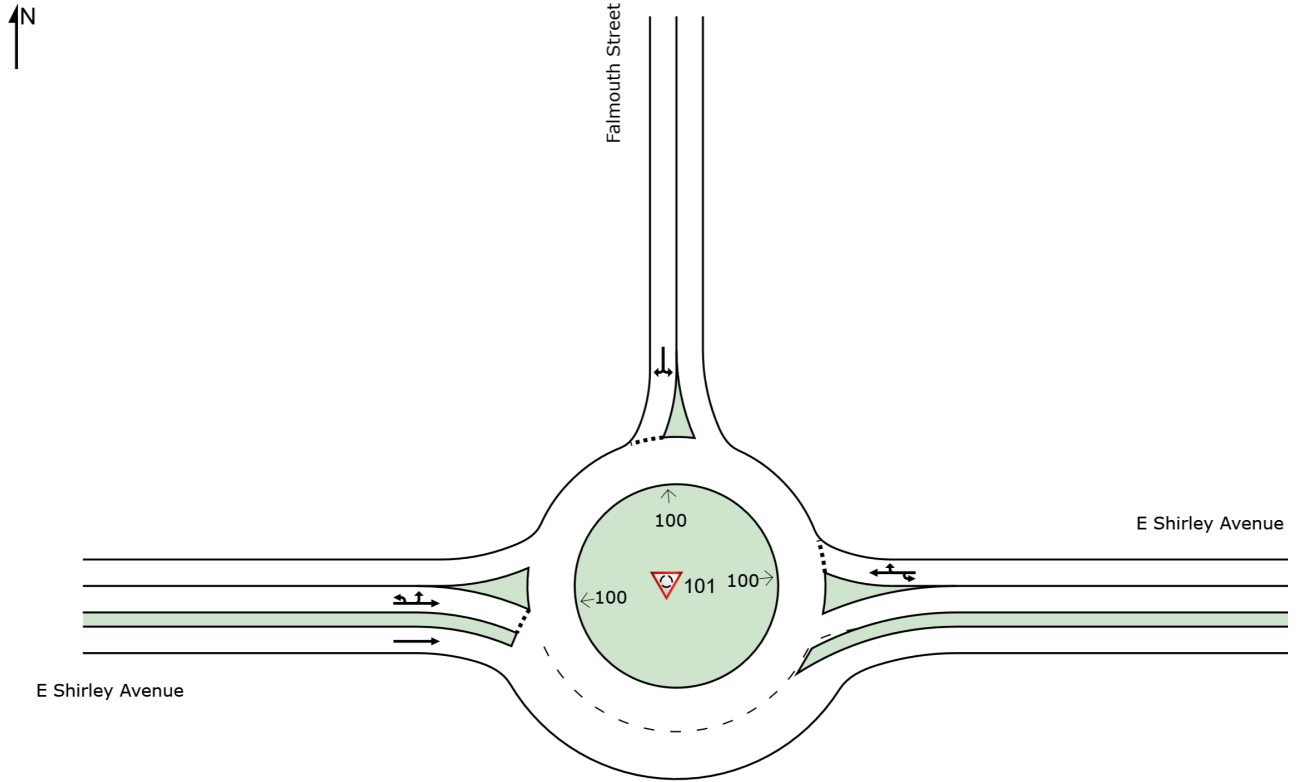
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# 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.





**Appendix E**  
**2026 Background Analysis Worksheets**

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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	0.20	0.54	0.11	0.22	0.62	0.71	0.09	0.30
Control Delay	46.0	27.0	0.3	46.7	27.2	47.0	41.8	32.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	27.0	0.3	46.7	27.2	47.0	41.8	32.7
Queue Length 50th (ft)	18	166	0	18	243	120	9	19
Queue Length 95th (ft)	51	270	0	51	389	#236	30	60
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	160	757	744	147	785	392	370	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	0.20	0.46	0.10	0.22	0.60	0.60	0.04	0.15

**Intersection Summary**

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

2026 Background - AM Peak  
 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

2026 Background - AM Peak  
 HCM Signalized Intersection Capacity Analysis

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
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
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)	1762	1702	1488	1611	1663			1677		1710	1634	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1762	1702	1488	1611	1663			1677		1710	1634	
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	37.3	37.3	8.2	41.1			17.0		7.2	7.2	
Effective Green, g (s)	4.4	37.3	37.3	8.2	41.1			17.0		7.2	7.2	
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)	82	677	592	140	729			304		131	125	
v/s Ratio Prot	0.02	0.21		c0.02	c0.28			c0.13		0.01	c0.02	
v/s Ratio Perm			0.02									
v/c Ratio	0.39	0.52	0.05	0.23	0.64			0.73		0.12	0.29	
Uniform Delay, d1	43.3	21.4	17.3	39.8	20.6			36.2		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	4.2	0.9	0.0	1.1	2.2			9.5		0.6	1.8	
Delay (s)	47.5	22.3	17.4	40.9	22.7			45.7		40.9	42.6	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		23.3			23.9			45.7			42.2	
Approach LOS		C			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			28.7									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			93.7							24.0		
Intersection Capacity Utilization			53.6%									ICU Level of Service A
Analysis Period (min)			15									
c Critical Lane Group												

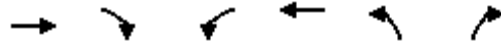
2026 Background - AM Peak  
2: Site Entrance #1 & E Shirley Avenue

2026 Background - AM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑		
Traffic Volume (veh/h)	298	37	48	445	0	0
Future Volume (Veh/h)	298	37	48	445	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)	324	74	96	484	0	0
<b>Pedestrians</b>						
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			398	1000	324	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			398	1000	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 %			91	100	100	
cM capacity (veh/h)			1103	248	722	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>		
Volume Total	324	74	96	484		
Volume Left	0	0	96	0		
Volume Right	0	74	0	0		
cSH	1700	1700	1103	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						
<b>Intersection Summary</b>						
Average Delay			0.8			
Intersection Capacity Utilization			33.8%	ICU Level of Service	A	
Analysis Period (min)			15			

2026 Background - AM Peak  
3: Site Entrance #2 & E Shirley Avenue

2026 Background - AM Peak  
HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↘
Traffic Volume (veh/h)	298	0	0	452	41	51
Future Volume (Veh/h)	298	0	0	452	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)	324	0	0	491	82	102
<b>Pedestrians</b>						
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			324		815	324
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			324		815	324
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)			1247		328	686
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	324	491	82	102		
Volume Left	0	0	82	0		
Volume Right	0	0	0	102		
cSH	1700	1700	328	686		
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	11.2		
Lane LOS			C	B		
Approach Delay (s)	0.0	0.0	14.9			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			2.8			
Intersection Capacity Utilization			33.8%	ICU Level of Service	A	
Analysis Period (min)			15			



2026 Background - AM Peak  
4: Site Entrance #3 & E Shirley Avenue

2026 Background - AM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
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	0.50	0.50
Hourly flow rate (vph)	349	34	48	476	0	0
<b>Pedestrians</b>						
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
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>		
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						
<b>Intersection Summary</b>						
Average Delay			0.4			
Intersection Capacity Utilization			27.1%	ICU Level of Service	A	
Analysis Period (min)			15			

6: James Madison Highway/E Shirley Avenue & Alwington Boulevard






















Queues



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

6: James Madison Highway/E Shirley Avenue & Alwington Boulevard HCM Signalized Intersection Capacity Analysis

												
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
<b>Intersection Summary</b>												
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	
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

**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)	101	279	65	136	343	232	50	92
Average Queue (ft)	25	133	22	29	154	109	13	32
95th Queue (ft)	67	239	51	91	288	192	39	68
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	2		0	5			0
Queuing Penalty (veh)	0	0		0	2			0

**Intersection: 2: Site Entrance #1 & E Shirley Avenue**

Movement	EB	WB
Directions Served	R	L
Maximum Queue (ft)	6	57
Average Queue (ft)	0	13
95th Queue (ft)	6	44
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	110	240
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 3: Site Entrance #2 & E Shirley Avenue**

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	84	78
Average Queue (ft)	28	30
95th Queue (ft)	68	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)	2	40
Average Queue (ft)	0	6
95th Queue (ft)	2	29
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		L>
Maximum Queue (ft)	128	144	7	81
Average Queue (ft)	29	28	0	27
95th Queue (ft)	92	98	7	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)	127	93	6	52	155	200	175	19	41	110	102	107
Average Queue (ft)	51	19	0	6	73	99	35	2	6	50	40	46
95th Queue (ft)	103	62	5	31	128	166	105	11	26	91	83	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				
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)	10	76	61	83	45
Average Queue (ft)	1	37	34	33	11
95th Queue (ft)	7	68	56	75	35
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





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	0.28	0.78	0.15	0.26	0.65	0.69	0.15	0.42
Control Delay	50.1	35.7	1.7	49.3	28.6	49.4	42.0	39.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	35.7	1.7	49.3	28.6	49.4	42.0	39.3
Queue Length 50th (ft)	24	292	0	24	290	114	16	42
Queue Length 95th (ft)	62	#495	12	62	#493	#207	44	93
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	142	792	749	151	825	358	337	370
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	0.28	0.68	0.13	0.26	0.64	0.57	0.08	0.25

**Intersection Summary**

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

2026 Background - School PM Peak  
1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

2026 Background - School PM Peak  
HCM Signalized Intersection Capacity Analysis

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	
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11	
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)	1588	1767	1488	1687	1756			1656		1583	1662		
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00		
Satd. Flow (perm)	1588	1767	1488	1687	1756			1656		1583	1662		
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	38.9	38.9	8.2	42.8			16.0		8.7	8.7		
Effective Green, g (s)	4.3	38.9	38.9	8.2	42.8			16.0		8.7	8.7		
Actuated g/C Ratio	0.04	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)	71	717	604	144	784			276		143	150		
v/s Ratio Prot	c0.03	c0.30		0.02	c0.30			c0.12		0.02	c0.04		
v/s Ratio Perm			0.03										
v/c Ratio	0.56	0.75	0.07	0.28	0.68			0.71		0.20	0.48		
Uniform Delay, d1	44.8	24.2	17.4	41.0	21.0			37.7		40.3	41.4		
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00		
Incremental Delay, d2	11.8	4.5	0.1	1.4	2.6			8.9		0.9	3.3		
Delay (s)	56.7	28.8	17.4	42.5	23.6			46.7		41.2	44.7		
Level of Service	E	C	B	D	C			D		D	D		
Approach Delay (s)		28.7			24.9			46.7			43.9		
Approach LOS		C			C			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			30.8									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.67										
Actuated Cycle Length (s)			95.8									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												

2026 Background - School PM Peak  
2: Site Entrance #1 & E Shirley Avenue

2026 Background - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑		
Traffic Volume (veh/h)	485	20	9	472	0	0
Future Volume (Veh/h)	485	20	9	472	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)	522	40	18	508	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			562	1066	522	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			562	1066	522	
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)			1019	244	559	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2		
Volume Total	522	40	18	508		
Volume Left	0	0	18	0		
Volume Right	0	40	0	0		
cSH	1700	1700	1019	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			35.5%	ICU Level of Service		A
Analysis Period (min)			15			

2026 Background - School PM Peak  
3: Site Entrance #2 & E Shirley Avenue

2026 Background - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (veh/h)	485	0	0	443	38	53
Future Volume (Veh/h)	485	0	0	443	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)	527	0	0	482	76	106
<b>Pedestrians</b>						
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			527	1009		527
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			527	1009		527
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)			1050	254		523
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	527	482	76	106		
Volume Left	0	0	76	0		
Volume Right	0	0	0	106		
cSH	1700	1700	254	523		
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	25.1	13.6		
Lane LOS			D	B		
Approach Delay (s)	0.0	0.0	18.4			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			2.8			
Intersection Capacity Utilization			35.5%	ICU Level of Service		A
Analysis Period (min)			15			

2026 Background - School PM Peak  
4: Site Entrance #3 & E Shirley Avenue

2026 Background - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
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
<b>Pedestrians</b>						
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
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>		
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						
<b>Intersection Summary</b>						
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

6: James Madison Highway/E Shirley Avenue & Alwington Boulevard HCM Signalized Intersection Capacity Analysis



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	
<b>Intersection Summary</b>	



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

**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)	177	404	65	177	400	228	84	131
Average Queue (ft)	45	202	27	41	190	102	22	52
95th Queue (ft)	124	330	53	120	336	186	61	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	6		0	8		0	1
Queuing Penalty (veh)	0	2		0	3		0	0

**Intersection: 2: Site Entrance #1 & E Shirley Avenue**

Movement	WB
Directions Served	L
Maximum Queue (ft)	31
Average Queue (ft)	4
95th Queue (ft)	21
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	240
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)	4	83	99
Average Queue (ft)	0	26	34
95th Queue (ft)	3	63	76
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	35
Average Queue (ft)	0	5
95th Queue (ft)	4	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	B17	SB
Directions Served	ULT	UTR	T	L>
Maximum Queue (ft)	227	166	5	81
Average Queue (ft)	77	21	0	31
95th Queue (ft)	184	93	5	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)	154	114	59	65	152	161	122	48	42	163	152	91
Average Queue (ft)	82	40	5	15	70	70	16	5	11	83	84	40
95th Queue (ft)	137	96	31	49	122	125	59	26	33	137	135	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			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)	20	64	60	61	29
Average Queue (ft)	3	14	27	13	4
95th Queue (ft)	13	48	51	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



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	0.27	0.76	0.24	0.23	0.63	0.68	0.15	0.58
Control Delay	50.7	36.9	4.8	50.0	29.6	50.6	39.5	47.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.7	36.9	4.8	50.0	29.6	50.6	39.5	47.0
Queue Length 50th (ft)	23	265	0	20	264	104	20	79
Queue Length 95th (ft)	63	431	42	56	428	197	53	154
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	148	758	734	146	804	349	342	351
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	0.21	0.23	0.61	0.54	0.11	0.42
<b>Intersection Summary</b>								

2026 Background - Commuter PM Peak  
 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

2026 Background - Commuter PM Peak  
 HCM Signalized Intersection Capacity Analysis









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
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
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)	1762	1801	1531	1736	1826			1715		1710	1721	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1762	1801	1531	1736	1826			1715		1710	1721	
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	37.4	37.4	8.1	41.1			15.4		13.8	13.8	
Effective Green, g (s)	4.4	37.4	37.4	8.1	41.1			15.4		13.8	13.8	
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)	78	682	580	142	760			267		239	240	
v/s Ratio Prot	c0.02	c0.27		0.02	c0.27			c0.11		0.02	c0.08	
v/s Ratio Perm			0.04									
v/c Ratio	0.51	0.72	0.10	0.24	0.65			0.68		0.15	0.58	
Uniform Delay, d1	46.1	26.2	19.8	42.4	23.0			39.3		37.3	39.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	7.4	3.9	0.1	1.2	2.1			7.6		0.4	4.2	
Delay (s)	53.5	30.1	19.9	43.6	25.1			46.9		37.7	43.9	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		29.1			26.3			46.9			42.7	
Approach LOS		C			C			D			D	

Intersection Summary		
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.65	
Actuated Cycle Length (s)	98.7	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		

2026 Background - Commuter PM Peak  
2: Site Entrance #1 & E Shirley Avenue

2026 Background - Commuter PM Peak  
HCM Unsignalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑		
Traffic Volume (veh/h)	493	4	6	462	0	0
Future Volume (Veh/h)	493	4	6	462	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)	536	8	12	502	0	0
<b>Pedestrians</b>						
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			544	1062	536	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			544	1062	536	
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)			1035	247	549	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>		
Volume Total	536	8	12	502		
Volume Left	0	0	12	0		
Volume Right	0	8	0	0		
cSH	1700	1700	1035	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		0.2			
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			35.9%	ICU Level of Service	A	
Analysis Period (min)			15			

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (veh/h)	493	0	0	453	15	3
Future Volume (Veh/h)	493	0	0	453	15	3
Sign Control	Free			Free	Stop	
Grade	1%			0%	-2%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.50	0.92
Hourly flow rate (vph)	536	0	0	492	30	3
<b>Pedestrians</b>						
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			536	1028		536
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			536	1028		536
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)			1042	262		549
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	536	492	30	3		
Volume Left	0	0	30	0		
Volume Right	0	0	0	3		
cSH	1700	1700	262	549		
Volume to Capacity	0.32	0.29	0.11	0.01		
Queue Length 95th (ft)	0	0	10	0		
Control Delay (s)	0.0	0.0	20.5	11.6		
Lane LOS			C	B		
Approach Delay (s)	0.0	0.0	19.7			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			0.6			
Intersection Capacity Utilization			35.9%	ICU Level of Service		A
Analysis Period (min)			15			



2026 Background - Commuter PM Peak  
4: Site Entrance #3 & E Shirley Avenue

2026 Background - Commuter PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
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	0.50	0.50
Hourly flow rate (vph)	525	26	44	492	0	0
<b>Pedestrians</b>						
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
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>		
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						
<b>Intersection Summary</b>						
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

6: James Madison Highway/E Shirley Avenue & Alwington Boulevard HCM Signalized Intersection Capacity Analysis

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
<b>Intersection Summary</b>												
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	
<b>Intersection Summary</b>	

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

---

**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)	190	387	82	139	343	206	106	191
Average Queue (ft)	42	195	36	29	175	94	31	85
95th Queue (ft)	122	329	65	88	296	171	77	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	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)	32
Average Queue (ft)	3
95th Queue (ft)	17
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	240
Storage Blk Time (%)	
Queuing Penalty (veh)	

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**Intersection: 3: Site Entrance #2 & E Shirley Avenue**


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Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	45	27
Average Queue (ft)	11	3
95th Queue (ft)	36	18
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)	4	48
Average Queue (ft)	0	7
95th Queue (ft)	3	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)	184	147	2	67
Average Queue (ft)	53	22	0	26
95th Queue (ft)	143	94	2	60
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)	145	114	63	48	155	157	100	8	89	162	170	76
Average Queue (ft)	83	42	7	10	81	71	16	1	13	89	93	32
95th Queue (ft)	135	97	33	36	138	131	55	8	54	143	154	68
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)	10	69	59	56	34
Average Queue (ft)	3	18	16	18	14
95th Queue (ft)	10	55	47	46	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: 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		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist ] ft				
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.558	10.4	LOS B	4.6	125.3	0.28	0.12	0.28	24.2
6	T1	440	10.0	478	10.0	0.558	10.8	LOS B	4.6	125.3	0.28	0.12	0.28	23.1
16	R2	75	11.0	82	11.0	0.558	10.8	LOS B	4.6	125.3	0.28	0.12	0.28	22.6
Approach		516	10.1	561	10.1	0.558	10.8	LOS B	4.6	125.3	0.28	0.12	0.28	23.0
North: Falmouth Street														
7	L2	77	21.0	84	21.0	0.208	9.1	LOS A	1.2	35.4	0.68	0.58	0.68	23.2
14	R2	35	9.0	38	9.0	0.208	8.2	LOS A	1.2	35.4	0.68	0.58	0.68	22.3
Approach		112	17.3	122	17.3	0.208	8.8	LOS A	1.2	35.4	0.68	0.58	0.68	22.9
West: E Shirley Avenue														
5u	U	1	0.0	1	0.0	0.134	4.7	LOS A	0.8	21.0	0.33	0.18	0.33	25.4
5	L2	32	19.0	35	19.0	0.134	5.4	LOS A	0.8	21.0	0.33	0.18	0.33	24.7
2	T1	306	9.0	333	9.0	0.134	1.4	LOS A	0.8	21.0	0.09	0.05	0.09	25.5
Approach		339	9.9	368	9.9	0.134	1.8	LOS A	0.8	21.0	0.11	0.06	0.11	25.4
All Vehicles		967	10.9	1051	10.9	0.558	7.4	LOS A	4.6	125.3	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.

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# 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		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
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.

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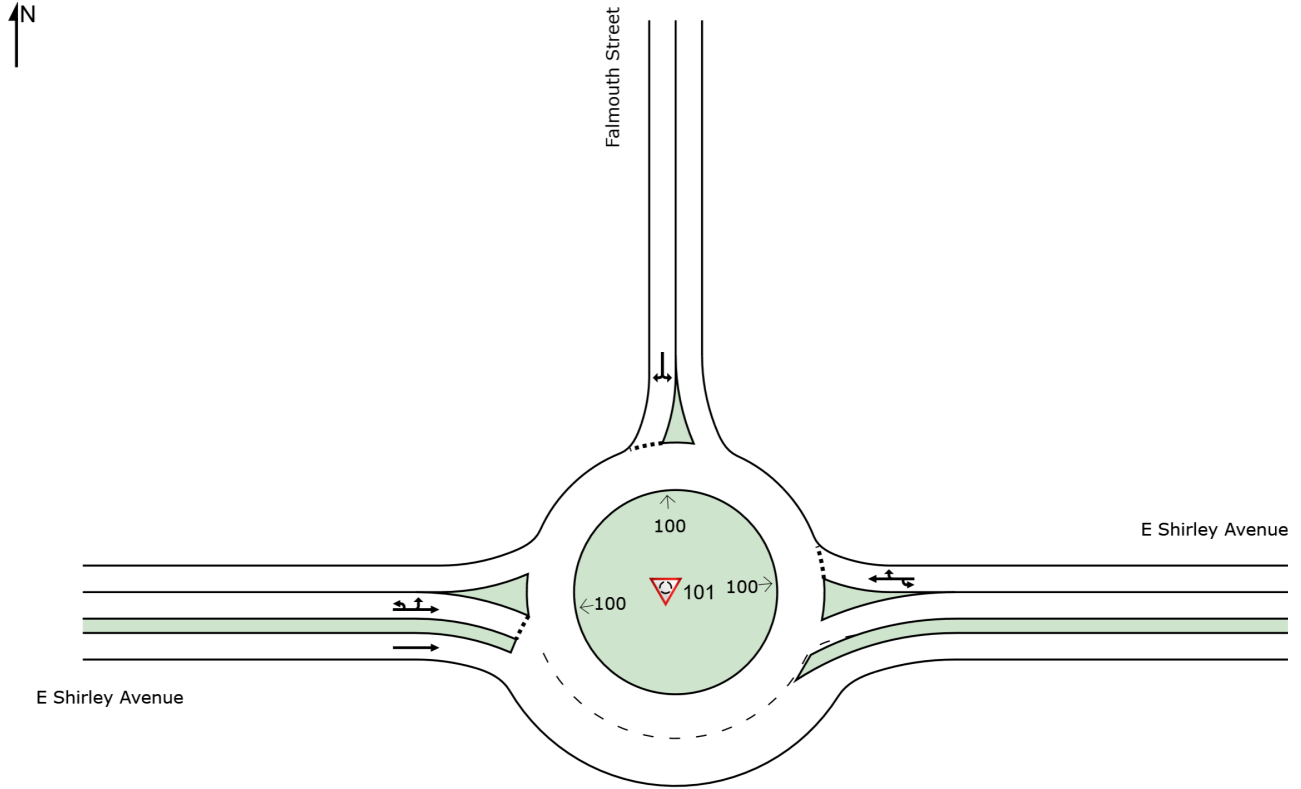
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# SITE LAYOUT

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.



# 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		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.636	12.6	LOS B	6.5	184.8	0.27	0.10	0.27	23.6
6	T1	426	21.0	463	21.0	0.636	13.3	LOS B	6.5	184.8	0.27	0.10	0.27	22.5
16	R2	139	4.0	151	4.0	0.636	12.7	LOS B	6.5	184.8	0.27	0.10	0.27	22.0
Approach		566	16.8	615	16.8	0.636	13.1	LOS B	6.5	184.8	0.27	0.10	0.27	22.4
North: Falmouth Street														
7	L2	111	1.0	121	1.0	0.229	7.9	LOS A	1.5	38.1	0.70	0.58	0.70	23.3
14	R2	33	9.0	36	9.0	0.229	8.4	LOS A	1.5	38.1	0.70	0.58	0.70	22.3
Approach		144	2.8	157	2.8	0.229	8.0	LOS A	1.5	38.1	0.70	0.58	0.70	23.1
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.189	5.3	LOS A	1.1	30.0	0.38	0.21	0.38	25.5
5	L2	19	11.0	21	11.0	0.189	5.7	LOS A	1.1	30.0	0.38	0.21	0.38	24.8
2	T1	476	5.0	517	5.0	0.189	1.7	LOS A	1.1	30.0	0.12	0.07	0.12	25.4
Approach		497	5.2	540	5.2	0.189	1.9	LOS A	1.1	30.0	0.13	0.07	0.13	25.4
All Vehicles		1207	10.4	1312	10.4	0.636	7.9	LOS A	6.5	184.8	0.26	0.15	0.26	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.



**Appendix F**  
**2026 Future Analysis Worksheets**

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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	0.20	0.59	0.11	0.22	0.65	0.73	0.09	0.30
Control Delay	46.3	27.8	0.3	47.0	27.7	49.0	42.1	32.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	27.8	0.3	47.0	27.7	49.0	42.1	32.9
Queue Length 50th (ft)	18	190	0	18	264	124	9	20
Queue Length 95th (ft)	51	302	0	51	415	#248	30	60
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	159	771	755	146	790	371	368	369
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	0.20	0.51	0.10	0.22	0.63	0.63	0.04	0.15

**Intersection Summary**

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

2026 Future - AM Peak  
1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

2026 Future - AM Peak  
HCM Signalized Intersection Capacity Analysis

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	
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11	
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)	1762	1702	1488	1611	1663			1677		1710	1634		
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00		
Satd. Flow (perm)	1762	1702	1488	1611	1663			1677		1710	1634		
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	38.2	38.2	8.2	42.0			16.7		7.2	7.2		
Effective Green, g (s)	4.4	38.2	38.2	8.2	42.0			16.7		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	689	602	140	740			296		130	124		
v/s Ratio Prot	0.02	0.23		c0.02	c0.30			c0.13		0.01	c0.02		
v/s Ratio Perm			0.02										
v/c Ratio	0.39	0.57	0.05	0.23	0.67			0.75		0.12	0.30		
Uniform Delay, d1	43.6	21.7	17.0	40.1	20.7			36.9		40.6	41.2		
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00		
Incremental Delay, d2	4.2	1.4	0.0	1.1	2.7			11.0		0.6	1.8		
Delay (s)	47.8	23.1	17.1	41.2	23.4			47.9		41.2	43.0		
Level of Service	D	C	B	D	C			D		D	D		
Approach Delay (s)		23.8			24.4			47.9			42.6		
Approach LOS		C			C			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			29.3									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.64										
Actuated Cycle Length (s)			94.3									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													



2026 Future - AM Peak  
2: Site Entrance #1 & E Shirley Avenue

2026 Future - AM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑		
Traffic Volume (veh/h)	361	12	19	473	0	0
Future Volume (Veh/h)	361	12	19	473	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)	392	24	38	514	0	0
<b>Pedestrians</b>						
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			416		982	392
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			416		982	392
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			97		100	100
cM capacity (veh/h)			1086		269	661
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>		
Volume Total	392	24	38	514		
Volume Left	0	0	38	0		
Volume Right	0	24	0	0		
cSH	1700	1700	1086	1700		
Volume to Capacity	0.23	0.01	0.03	0.30		
Queue Length 95th (ft)	0	0	3	0		
Control Delay (s)	0.0	0.0	8.4	0.0		
Lane LOS			A			
Approach Delay (s)	0.0	0.6				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			35.3%	ICU Level of Service	A	
Analysis Period (min)			15			

2026 Future - AM Peak  
3: Site Entrance #2 & E Shirley Avenue

2026 Future - AM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (veh/h)	361	0	0	480	12	19
Future Volume (Veh/h)	361	0	0	480	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)	392	0	0	522	24	38
<b>Pedestrians</b>						
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			392		914	392
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			392		914	392
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)			1178		286	627
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	392	522	24	38		
Volume Left	0	0	24	0		
Volume Right	0	0	0	38		
cSH	1700	1700	286	627		
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	18.8	11.1		
Lane LOS			C	B		
Approach Delay (s)	0.0	0.0	14.1			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			0.9			
Intersection Capacity Utilization			35.3%	ICU Level of Service	A	
Analysis Period (min)			15			

2026 Future - AM Peak  
4: Site Entrance #3 & E Shirley Avenue

2026 Future - AM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↖	↗
Traffic Volume (veh/h)	300	80	25	423	57	44
Future Volume (Veh/h)	300	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	0.50	0.50
Hourly flow rate (vph)	316	160	50	445	114	88
<b>Pedestrians</b>						
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			476			861 316
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			476			861 316
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			64 88
cM capacity (veh/h)			1097			314 729
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	316	160	50	445	202	
Volume Left	0	0	50	0	114	
Volume Right	0	160	0	0	88	
cSH	1700	1700	1097	1700	418	
Volume to Capacity	0.19	0.09	0.05	0.26	0.48	
Queue Length 95th (ft)	0	0	4	0	64	
Control Delay (s)	0.0	0.0	8.4	0.0	21.4	
Lane LOS	A			C		
Approach Delay (s)	0.0	0.9		21.4		
Approach LOS				C		
<b>Intersection Summary</b>						
Average Delay			4.1			
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

6: James Madison Highway/E Shirley Avenue & Alwington Boulevard Signalized Intersection Capacity Analysis



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
HCM 2000 Volume to Capacity ratio	0.45	B
Actuated Cycle Length (s)	81.6	Sum of lost time (s)
Intersection Capacity Utilization	52.1%	32.5
Analysis Period (min)	15	ICU Level of Service
		A

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	
<b>Intersection Summary</b>	

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

**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)	169	304	74	160	384	224	48	95
Average Queue (ft)	30	143	23	28	172	114	13	38
95th Queue (ft)	94	258	53	89	321	201	40	77
Link Distance (ft)		1078	1078		3094	992		778
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	2		0	7			0
Queuing Penalty (veh)	0	1		0	2			0

**Intersection: 2: Site Entrance #1 & E Shirley Avenue**

Movement	EB	WB
Directions Served	T	L
Maximum Queue (ft)	2	42
Average Queue (ft)	0	5
95th Queue (ft)	2	25
Link Distance (ft)	3094	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		240
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 3: Site Entrance #2 & E Shirley Avenue**

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	52	64
Average Queue (ft)	12	17
95th Queue (ft)	41	51
Link Distance (ft)	383	383
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	37	108
Average Queue (ft)	0	8	32
95th Queue (ft)	5	31	72
Link Distance (ft)			868
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	150	150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 5: E Shirley Avenue & Falmouth Street**

Movement	EB	WB	B17	B17	SB
Directions Served	ULT	TR	T		L>
Maximum Queue (ft)	116	170	29	9	84
Average Queue (ft)	23	30	2	0	25
95th Queue (ft)	77	105	27	9	65
Link Distance (ft)	392	351	787	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)	133	96	27	61	213	166	135	19	43	103	94	113
Average Queue (ft)	54	20	1	8	103	89	28	2	5	43	34	50
95th Queue (ft)	107	65	13	36	181	154	89	11	25	82	75	91
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	74	86	83	68
Average Queue (ft)	1	37	45	34	34
95th Queue (ft)	5	66	70	78	60
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



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	0.28	0.80	0.15	0.27	0.68	0.69	0.15	0.43
Control Delay	50.5	36.9	1.6	49.7	29.6	50.1	42.3	39.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	36.9	1.6	49.7	29.6	50.1	42.3	39.8
Queue Length 50th (ft)	25	310	0	25	315	118	17	43
Queue Length 95th (ft)	62	#529	12	62	#541	#207	44	93
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	141	784	743	149	825	355	334	367
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	0.28	0.71	0.14	0.27	0.68	0.57	0.08	0.25

**Intersection Summary**

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

2026 Future - School PM Peak  
1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

2026 Future - School PM Peak  
HCM Signalized Intersection Capacity Analysis

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
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
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)	1588	1767	1488	1687	1756			1656		1583	1662	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1588	1767	1488	1687	1756			1656		1583	1662	
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	39.7	39.7	8.3	43.7			16.1		8.7	8.7	
Effective Green, g (s)	4.3	39.7	39.7	8.3	43.7			16.1		8.7	8.7	
Actuated g/C Ratio	0.04	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)	70	724	610	144	792			275		142	149	
v/s Ratio Prot	c0.03	c0.32		0.02	c0.32			c0.12		0.02	c0.04	
v/s Ratio Perm			0.03									
v/c Ratio	0.57	0.77	0.07	0.28	0.71			0.71		0.20	0.48	
Uniform Delay, d1	45.3	24.6	17.3	41.4	21.4			38.2		40.8	41.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	12.8	5.2	0.1	1.4	3.2			9.1		0.9	3.3	
Delay (s)	58.1	29.8	17.4	42.9	24.7			47.2		41.7	45.2	
Level of Service	E	C	B	D	C			D		D	D	
Approach Delay (s)		29.7			25.9			47.2			44.4	
Approach LOS		C			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.5									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			96.8							24.0		
Intersection Capacity Utilization			57.7%									ICU Level of Service B
Analysis Period (min)			15									
c Critical Lane Group												

2026 Future - School PM Peak  
2: Site Entrance #1 & E Shirley Avenue

2026 Future - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑		
Traffic Volume (veh/h)	513	12	19	500	0	0
Future Volume (Veh/h)	513	12	19	500	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)	552	24	38	538	0	0
<b>Pedestrians</b>						
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			576	1166	552	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			576	1166	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 %			96	100	100	
cM capacity (veh/h)			1007	208	537	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>		
Volume Total	552	24	38	538		
Volume Left	0	0	38	0		
Volume Right	0	24	0	0		
cSH	1700	1700	1007	1700		
Volume to Capacity	0.32	0.01	0.04	0.32		
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						
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			37.0%	ICU Level of Service	A	
Analysis Period (min)			15			







2026 Future - School PM Peak  
3: Site Entrance #2 & E Shirley Avenue

2026 Future - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (veh/h)	513	0	0	507	12	19
Future Volume (Veh/h)	513	0	0	507	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)	558	0	0	551	24	38
<b>Pedestrians</b>						
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			558	1109	558	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			558	1109	558	
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)			1023	221	502	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	558	551	24	38		
Volume Left	0	0	24	0		
Volume Right	0	0	0	38		
cSH	1700	1700	221	502		
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	23.3	12.8		
Lane LOS			C	B		
Approach Delay (s)	0.0	0.0	16.8			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			0.9			
Intersection Capacity Utilization			37.0%	ICU Level of Service	A	
Analysis Period (min)			15			

2026 Future - School PM Peak  
4: Site Entrance #3 & E Shirley Avenue

2026 Future - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	488	44	7	453	54	46
Future Volume (Veh/h)	488	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	0.50	0.50
Hourly flow rate (vph)	530	88	14	492	108	92
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			618			530
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			618			530
tC, single (s)			4.1			6.2
tC, 2 stage (s)						
tF (s)			2.2			3.3
p0 queue free %			99			83
cM capacity (veh/h)			972			553
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	530	88	14	492	200	
Volume Left	0	0	14	0	108	
Volume Right	0	88	0	0	92	
cSH	1700	1700	972	1700	335	
Volume to Capacity	0.31	0.05	0.01	0.29	0.60	
Queue Length 95th (ft)	0	0	1	0	91	
Control Delay (s)	0.0	0.0	8.8	0.0	30.5	
Lane LOS	A			D		
Approach Delay (s)	0.0	0.2		30.5		
Approach LOS				D		
Intersection Summary						
Average Delay			4.7			
Intersection Capacity Utilization			38.2%	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)	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



6: James Madison Highway/E Shirley Avenue & Alwington Boulevard HCM Signalized Intersection Capacity Analysis



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
HCM 2000 Volume to Capacity ratio	0.46	C
Actuated Cycle Length (s)	83.2	Sum of lost time (s)
Intersection Capacity Utilization	54.6%	32.5
Analysis Period (min)	15	ICU Level of Service
		A

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	
<b>Intersection Summary</b>	

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

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**Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue**


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Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	202	394	66	175	423	242	95	140
Average Queue (ft)	47	217	28	44	215	109	22	56
95th Queue (ft)	138	362	56	127	372	193	60	111
Link Distance (ft)		1078	1078		3094	992		778
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	10		0	12		0	1
Queuing Penalty (veh)	0	4		0	4		0	0

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**Intersection: 2: Site Entrance #1 & E Shirley Avenue**


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Movement	WB
Directions Served	L
Maximum Queue (ft)	34
Average Queue (ft)	7
95th Queue (ft)	28
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	240
Storage Blk Time (%)	
Queuing Penalty (veh)	

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**Intersection: 3: Site Entrance #2 & E Shirley Avenue**


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Movement	EB	NB	NB
Directions Served	T	L	R
Maximum Queue (ft)	4	60	65
Average Queue (ft)	0	13	17
95th Queue (ft)	3	43	49
Link Distance (ft)	505	383	383
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)	2	30	134
Average Queue (ft)	0	3	38
95th Queue (ft)	2	17	89
Link Distance (ft)			868
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	150	150	
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)	216	176	29	9	88
Average Queue (ft)	69	32	2	0	32
95th Queue (ft)	170	112	28	9	71
Link Distance (ft)	392	351	787	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)	164	125	69	65	164	148	92	42	51	147	154	89
Average Queue (ft)	83	46	6	14	79	67	14	5	11	79	82	39
95th Queue (ft)	140	103	35	46	137	128	51	24	34	126	135	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)	23	65	68	63	50
Average Queue (ft)	3	13	31	13	28
95th Queue (ft)	12	47	56	45	45
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: 9



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	0.27	0.78	0.24	0.23	0.64	0.68	0.15	0.58
Control Delay	50.9	37.9	4.8	50.2	29.8	50.6	39.7	47.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.9	37.9	4.8	50.2	29.8	50.6	39.7	47.3
Queue Length 50th (ft)	24	277	0	20	270	105	20	81
Queue Length 95th (ft)	63	446	42	56	434	197	53	154
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	148	756	732	145	801	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	0.27	0.67	0.21	0.23	0.62	0.54	0.11	0.42
<b>Intersection Summary</b>								

2026 Future - Commuter PM Peak  
1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

2026 Future - Commuter PM Peak  
HCM Signalized Intersection Capacity Analysis

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
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
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)	1762	1801	1531	1736	1826			1715		1710	1721	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1762	1801	1531	1736	1826			1715		1710	1721	
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	37.7	37.7	8.1	41.4			15.4		13.8	13.8	
Effective Green, g (s)	4.4	37.7	37.7	8.1	41.4			15.4		13.8	13.8	
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)	78	685	583	142	763			266		238	239	
v/s Ratio Prot	c0.02	c0.28		0.02	c0.27			c0.11		0.02	c0.08	
v/s Ratio Perm			0.04									
v/c Ratio	0.51	0.74	0.10	0.24	0.65			0.69		0.16	0.58	
Uniform Delay, d1	46.3	26.4	19.7	42.6	23.0			39.5		37.5	39.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	7.4	4.4	0.1	1.2	2.2			7.7		0.4	4.2	
Delay (s)	53.6	30.8	19.8	43.8	25.2			47.2		37.9	44.1	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		29.6			26.4			47.2			42.9	
Approach LOS		C			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			32.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			99.0			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											



2026 Future - Commuter PM Peak  
2: Site Entrance #1 & E Shirley Avenue

2026 Future - Commuter PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑		
Traffic Volume (veh/h)	509	0	0	467	0	0
Future Volume (Veh/h)	509	0	0	467	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)	553	0	0	508	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			553	1061	553	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			553	1061	553	
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)			1027	250	537	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2		
Volume Total	553	0	0	508		
Volume Left	0	0	0	0		
Volume Right	0	0	0	0		
cSH	1700	1700	1700	1700		
Volume to Capacity	0.33	0.01	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			36.8%	ICU Level of Service	A	
Analysis Period (min)			15			

2026 Future - Commuter PM Peak  
3: Site Entrance #2 & E Shirley Avenue

2026 Future - Commuter PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (veh/h)	509	0	0	467	0	0
Future Volume (Veh/h)	509	0	0	467	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)	553	0	0	508	0	0
<b>Pedestrians</b>						
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			553	1061	553	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			553	1061	553	
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)			1027	250	537	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	553	508	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	0.08	0.06		
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			
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			36.8%	ICU Level of Service	A	
Analysis Period (min)			15			

2026 Future - Commuter PM Peak  
4: Site Entrance #3 & E Shirley Avenue

2026 Future - Commuter PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑	↖	↗
Traffic Volume (veh/h)	480	29	28	447	20	4
Future Volume (Veh/h)	480	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	0.50	0.50
Hourly flow rate (vph)	522	58	56	486	40	8
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			580			522
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			580			522
tC, single (s)			4.2			6.2
tC, 2 stage (s)						
tF (s)			2.3			3.3
p0 queue free %			94			99
cM capacity (veh/h)			960			559
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	522	58	56	486	48	
Volume Left	0	0	56	0	40	
Volume Right	0	58	0	0	8	
cSH	1700	1700	960	1700	242	
Volume to Capacity	0.31	0.03	0.06	0.29	0.20	
Queue Length 95th (ft)	0	0	5	0	18	
Control Delay (s)	0.0	0.0	9.0	0.0	23.5	
Lane LOS			A	C		
Approach Delay (s)	0.0	0.9		23.5		
Approach LOS			C			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			35.3%	ICU Level of Service		A
Analysis Period (min)			15			

2026 Future - Commuter PM Peak  
 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

2026 Future - Commuter PM Peak  
 Queues



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

6: James Madison Highway/E Shirley Avenue & Alwington Boulevard Signalized Intersection Capacity Analysis



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
HCM 2000 Volume to Capacity ratio	0.48	C
Actuated Cycle Length (s)	83.0	Sum of lost time (s)
Intersection Capacity Utilization	54.8%	32.5
Analysis Period (min)	15	ICU Level of Service
		A

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	
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

**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)	202	411	116	141	373	192	120	186
Average Queue (ft)	44	202	39	31	181	100	29	84
95th Queue (ft)	135	340	86	94	313	172	79	156
Link Distance (ft)		1078	1078		3094	992		778
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	7		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	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	52	42
Average Queue (ft)	10	13
95th Queue (ft)	37	34
Link Distance (ft)		868
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
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)	198	124	37	65
Average Queue (ft)	57	16	1	26
95th Queue (ft)	149	73	23	56
Link Distance (ft)	392	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)	151	113	47	50	181	173	91	28	74	165	167	78
Average Queue (ft)	80	36	4	9	86	71	15	2	11	89	93	32
95th Queue (ft)	133	89	22	33	148	131	54	16	44	145	150	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	75	68	56	36
Average Queue (ft)	3	22	25	19	19
95th Queue (ft)	9	62	56	45	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

# 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		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.524	9.8	LOS A	4.0	108.7	0.30	0.14	0.30	24.4
6	T1	403	10.0	438	10.0	0.524	10.1	LOS B	4.0	108.7	0.30	0.14	0.30	23.3
16	R2	75	11.0	82	11.0	0.524	10.2	LOS B	4.0	108.7	0.30	0.14	0.30	22.7
Approach		479	10.1	521	10.1	0.524	10.1	LOS B	4.0	108.7	0.30	0.14	0.30	23.2
North: Falmouth Street														
7	L2	77	21.0	84	21.0	0.215	8.9	LOS A	1.3	36.2	0.66	0.55	0.66	23.3
14	R2	44	9.0	48	9.0	0.215	8.1	LOS A	1.3	36.2	0.66	0.55	0.66	22.3
Approach		121	16.6	132	16.6	0.215	8.6	LOS A	1.3	36.2	0.66	0.55	0.66	22.9
West: E Shirley Avenue														
5u	U	1	0.0	1	0.0	0.125	4.6	LOS A	0.7	19.6	0.33	0.17	0.33	25.3
5	L2	39	19.0	42	19.0	0.125	5.3	LOS A	0.7	19.6	0.33	0.17	0.33	24.6
2	T1	276	9.0	300	9.0	0.125	1.2	LOS A	0.7	19.6	0.08	0.04	0.08	25.5
Approach		316	10.2	343	10.2	0.125	1.8	LOS A	0.7	19.6	0.11	0.06	0.11	25.4
All Vehicles		916	11.0	996	11.0	0.524	7.0	LOS A	4.0	108.7	0.28	0.17	0.28	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.

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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		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist ft ]				
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).

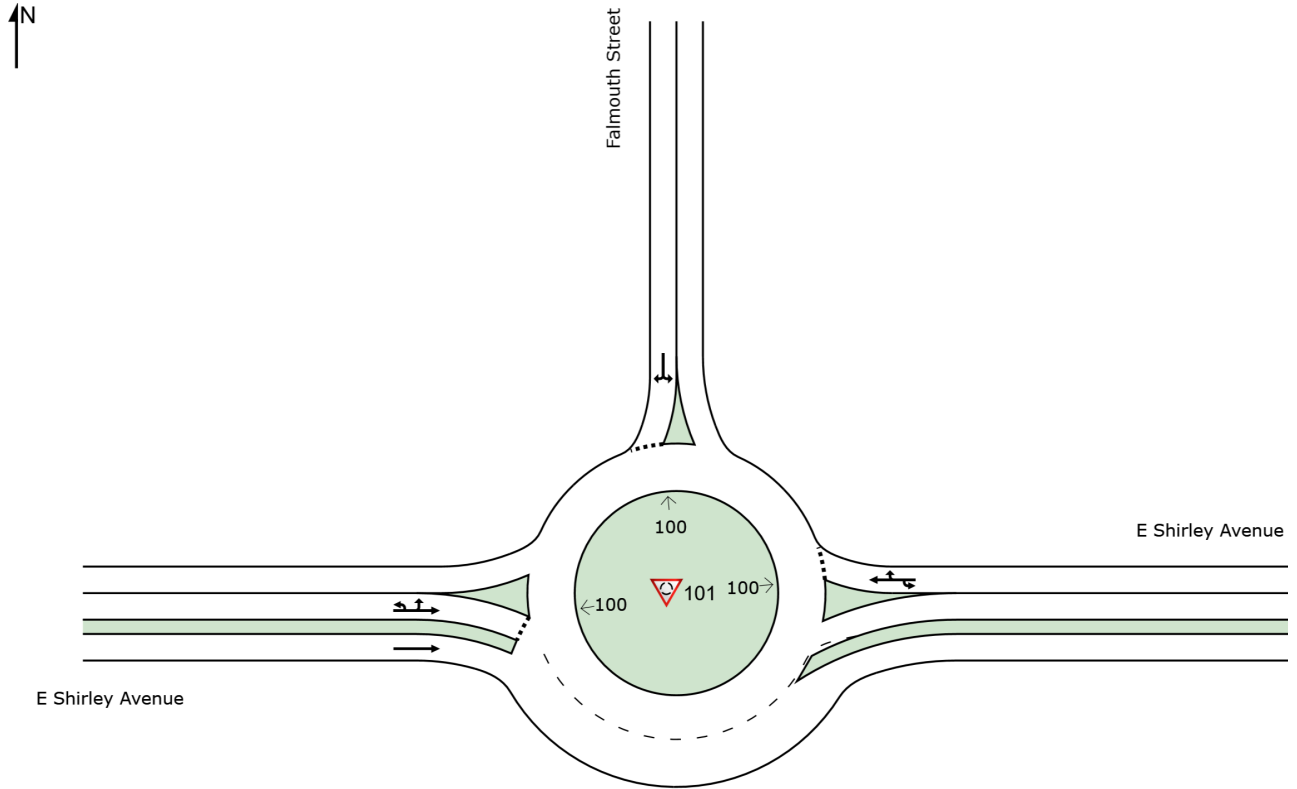
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# 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.



# 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		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.633	12.5	LOS B	6.4	182.4	0.27	0.10	0.27	23.6
6	T1	423	21.0	460	21.0	0.633	13.2	LOS B	6.4	182.4	0.27	0.10	0.27	22.6
16	R2	139	4.0	151	4.0	0.633	12.7	LOS B	6.4	182.4	0.27	0.10	0.27	22.0
Approach		563	16.8	612	16.8	0.633	13.1	LOS B	6.4	182.4	0.27	0.10	0.27	22.4
North: Falmouth Street														
7	L2	111	1.0	121	1.0	0.234	7.9	LOS A	1.5	38.9	0.70	0.58	0.70	23.3
14	R2	36	9.0	39	9.0	0.234	8.5	LOS A	1.5	38.9	0.70	0.58	0.70	22.3
Approach		147	3.0	160	3.0	0.234	8.1	LOS A	1.5	38.9	0.70	0.58	0.70	23.0
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.188	5.3	LOS A	1.1	29.9	0.38	0.21	0.38	25.5
5	L2	20	11.0	22	11.0	0.188	5.7	LOS A	1.1	29.9	0.38	0.21	0.38	24.8
2	T1	473	5.0	514	5.0	0.188	1.7	LOS A	1.1	29.9	0.12	0.07	0.12	25.4
Approach		495	5.2	538	5.2	0.188	1.9	LOS A	1.1	29.9	0.13	0.07	0.13	25.4
All Vehicles		1205	10.3	1310	10.3	0.633	7.9	LOS A	6.4	182.4	0.26	0.15	0.26	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.



**Appendix G**  
**2032 Background Analysis Worksheets**

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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	0.22	0.58	0.12	0.24	0.71	0.76	0.10	0.32
Control Delay	47.2	27.6	0.3	48.1	30.3	52.0	42.4	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	27.6	0.3	48.1	30.3	52.0	42.4	33.6
Queue Length 50th (ft)	21	189	0	21	307	143	10	22
Queue Length 95th (ft)	53	302	0	54	#524	#272	31	62
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	157	758	745	143	777	365	362	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	0.22	0.52	0.10	0.24	0.71	0.68	0.05	0.16

**Intersection Summary**

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

2032 Background - AM Peak  
1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

2032 Background - AM Peak  
HCM Signalized Intersection Capacity Analysis













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
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
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)	1762	1702	1488	1611	1663			1678		1710	1635	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1762	1702	1488	1611	1663			1678		1710	1635	
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)	4.4	39.1	39.1	8.2	42.9			17.3		7.3	7.3	
Effective Green, g (s)	4.4	39.1	39.1	8.2	42.9			17.3		7.3	7.3	
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)	80	693	606	137	743			302		130	124	
v/s Ratio Prot	0.02	0.23		c0.02	c0.33			c0.14		0.01	c0.02	
v/s Ratio Perm			0.02									
v/c Ratio	0.42	0.56	0.05	0.25	0.74			0.79		0.13	0.31	
Uniform Delay, d1	44.5	21.8	17.2	41.0	21.9			37.6		41.3	41.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	4.9	1.3	0.0	1.3	4.3			13.5		0.6	2.0	
Delay (s)	49.4	23.1	17.2	42.3	26.2			51.1		42.0	43.9	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		24.0			27.1			51.1			43.5	
Approach LOS		C			C			D			D	

Intersection Summary		
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.69	
Actuated Cycle Length (s)	95.9	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		

2032 Background - AM Peak  
2: Site Entrance #1 & E Shirley Avenue

2032 Background - AM Peak  
HCM Unsignalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	343	37	48	533	0	0
Future Volume (Veh/h)	343	37	48	533	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)	373	74	96	579	0	0
<b>Pedestrians</b>						
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			447		1144	373
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			447		1144	373
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)			1057		203	678
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>		
Volume Total	373	74	96	579		
Volume Left	0	0	96	0		
Volume Right	0	74	0	0		
cSH	1700	1700	1057	1700		
Volume to Capacity	0.22	0.04	0.09	0.34		
Queue Length 95th (ft)	0	0	7	0		
Control Delay (s)	0.0	0.0	8.7	0.0		
Lane LOS			A			
Approach Delay (s)	0.0		1.2			
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.7			
Intersection Capacity Utilization			38.4%	ICU Level of Service		A
Analysis Period (min)			15			

2032 Background - AM Peak  
3: Site Entrance #2 & E Shirley Avenue

2032 Background - AM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (veh/h)	343	0	0	540	41	51
Future Volume (Veh/h)	343	0	0	540	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)	373	0	0	587	82	102
<b>Pedestrians</b>						
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			373			373
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			373			373
tC, single (s)			4.1			6.4
tC, 2 stage (s)						
tF (s)			2.2			3.4
p0 queue free %			100			84
cM capacity (veh/h)			1197			643
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	373	587	82	102		
Volume Left	0	0	82	0		
Volume Right	0	0	0	102		
cSH	1700	1700	268	643		
Volume to Capacity	0.22	0.35	0.31	0.16		
Queue Length 95th (ft)	0	0	31	14		
Control Delay (s)	0.0	0.0	24.3	11.6		
Lane LOS			C	B		
Approach Delay (s)	0.0	0.0	17.3			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			2.8			
Intersection Capacity Utilization			38.4%	ICU Level of Service		A
Analysis Period (min)			15			

2032 Background - AM Peak  
4: Site Entrance #3 & E Shirley Avenue

2032 Background - AM Peak  
HCM Unsignalized Intersection Capacity Analysis






















	→	↘	↙	←	↖	↗
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
<b>Pedestrians</b>						
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
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>		
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						
<b>Intersection Summary</b>						
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

6: James Madison Highway/E Shirley Avenue & Alwington Boulevard HCM Signalized Intersection Capacity Analysis

												
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
<b>Intersection Summary</b>												
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	
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

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**Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue**


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Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	135	301	68	162	494	239	50	95
Average Queue (ft)	28	145	26	36	198	113	13	35
95th Queue (ft)	78	248	55	109	377	203	39	74
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	2		0	9			0
Queuing Penalty (veh)	0	1		0	3			0

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**Intersection: 2: Site Entrance #1 & E Shirley Avenue**


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Movement	EB	EB	WB
Directions Served	T	R	L
Maximum Queue (ft)	4	9	60
Average Queue (ft)	0	0	14
95th Queue (ft)	2	5	47
Link Distance (ft)	3093		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		110	240
Storage Blk Time (%)			
Queuing Penalty (veh)			

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**Intersection: 3: Site Entrance #2 & E Shirley Avenue**


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Movement	EB	NB	NB
Directions Served	T	L	R
Maximum Queue (ft)	4	93	84
Average Queue (ft)	0	29	29
95th Queue (ft)	3	72	65
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)	7
95th Queue (ft)	29
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)	160	206	14	87
Average Queue (ft)	32	50	0	34
95th Queue (ft)	107	152	7	73
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)	149	109	5	56	157	210	170	20	46	127	121	109
Average Queue (ft)	69	27	0	7	80	118	49	3	6	57	51	50
95th Queue (ft)	128	79	3	34	138	195	134	14	27	100	102	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		
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)	20	81	73	81	54
Average Queue (ft)	6	38	36	34	13
95th Queue (ft)	15	66	59	76	40
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



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	0.31	0.87	0.16	0.29	0.74	0.72	0.16	0.45
Control Delay	51.9	42.6	1.9	51.1	32.0	52.5	42.7	40.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	42.6	1.9	51.1	32.0	52.5	42.7	40.6
Queue Length 50th (ft)	26	366	0	26	362	127	17	46
Queue Length 95th (ft)	64	#621	16	64	#617	#237	45	97
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	137	763	727	145	829	345	324	358
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	0.31	0.81	0.15	0.29	0.74	0.62	0.09	0.27

**Intersection Summary**

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

2032 Background - School PM Peak  
1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

2032 Background - School PM Peak  
HCM Signalized Intersection Capacity Analysis

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
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
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)	1588	1767	1488	1687	1756			1656		1583	1661	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1588	1767	1488	1687	1756			1656		1583	1661	
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	41.3	41.3	8.2	45.1			16.8		8.9	8.9	
Effective Green, g (s)	4.4	41.3	41.3	8.2	45.1			16.8		8.9	8.9	
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)	70	735	619	139	798			280		142	149	
v/s Ratio Prot	c0.03	c0.35		0.02	c0.35			c0.13		0.02	c0.05	
v/s Ratio Perm			0.03									
v/c Ratio	0.60	0.84	0.07	0.30	0.76			0.74		0.20	0.51	
Uniform Delay, d1	46.5	25.9	17.4	42.8	22.6			39.2		41.9	43.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	15.2	8.6	0.1	1.7	4.6			10.9		1.0	3.7	
Delay (s)	61.7	34.5	17.5	44.5	27.2			50.0		42.8	46.8	
Level of Service	E	C	B	D	C			D		D	D	
Approach Delay (s)		33.6			28.3			50.0			45.9	
Approach LOS		C			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			34.5									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			99.2								24.0	
Intersection Capacity Utilization			60.0%									ICU Level of Service B
Analysis Period (min)			15									
c Critical Lane Group												

2032 Background - School PM Peak  
2: Site Entrance #1 & E Shirley Avenue

2032 Background - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑		
Traffic Volume (veh/h)	560	20	9	540	0	0
Future Volume (Veh/h)	560	20	9	540	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)	602	40	18	581	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			642		1219	602
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			642		1219	602
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)			952		197	503
Direction, Lane #	EB 1	EB 2	WB 1	WB 2		
Volume Total	602	40	18	581		
Volume Left	0	0	18	0		
Volume Right	0	40	0	0		
cSH	1700	1700	952	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	8.9	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			

2032 Background - School PM Peak  
3: Site Entrance #2 & E Shirley Avenue











2032 Background - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (veh/h)	560	0	0	511	38	53
Future Volume (Veh/h)	560	0	0	511	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	555	76	106
<b>Pedestrians</b>						
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		1164	609
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			609		1164	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		205	469
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	609	555	76	106		
Volume Left	0	0	76	0		
Volume Right	0	0	0	106		
cSH	1700	1700	205	469		
Volume to Capacity	0.36	0.33	0.37	0.23		
Queue Length 95th (ft)	0	0	40	22		
Control Delay (s)	0.0	0.0	32.6	14.9		
Lane LOS			D	B		
Approach Delay (s)	0.0	0.0	22.3			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			3.0			
Intersection Capacity Utilization			39.5%	ICU Level of Service	A	
Analysis Period (min)			15			



2032 Background - School PM Peak  
4: Site Entrance #3 & E Shirley Avenue

2032 Background - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis

						
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

6: James Madison Highway/E Shirley Avenue & Alwington Boulevard HCM Signalized Intersection Capacity Analysis



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	
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

**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	477	96	184	452	234	91	140
Average Queue (ft)	50	251	31	46	228	117	23	55
95th Queue (ft)	139	427	74	134	399	197	62	110
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	13		0	15		0	1
Queuing Penalty (veh)	0	5		0	6		0	0

**Intersection: 2: Site Entrance #1 & E Shirley Avenue**

Movement	WB
Directions Served	L
Maximum Queue (ft)	30
Average Queue (ft)	3
95th Queue (ft)	18
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	240
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	79	98
Average Queue (ft)	0	25	36
95th Queue (ft)	2	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	EB	WB
Directions Served	R	L
Maximum Queue (ft)	2	35
Average Queue (ft)	0	6
95th Queue (ft)	3	27
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	B17	SB
Directions Served	ULT	UTR	T		L>
Maximum Queue (ft)	295	199	6	6	92
Average Queue (ft)	107	32	0	0	38
95th Queue (ft)	242	121	6	6	80
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)	180	143	47	68	168	177	136	47	49	166	186	105
Average Queue (ft)	96	55	5	16	81	80	22	6	10	95	102	45
95th Queue (ft)	159	120	27	50	143	144	77	27	34	147	162	83
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)	49	71	63	69	26
Average Queue (ft)	11	32	27	15	4
95th Queue (ft)	33	65	55	50	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: 12





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	0.31	0.90	0.25	0.26	0.72	0.72	0.16	0.61
Control Delay	53.5	48.8	5.7	52.3	33.3	54.9	40.7	50.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	48.8	5.7	52.3	33.3	54.9	40.7	50.1
Queue Length 50th (ft)	28	377	5	23	348	124	23	94
Queue Length 95th (ft)	67	#630	49	58	#577	210	55	164
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	140	720	705	139	799	332	325	334
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	0.31	0.84	0.23	0.26	0.72	0.61	0.12	0.47

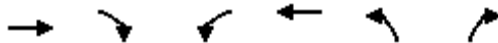
**Intersection Summary**

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

2032 Background - Commuter PM Peak  
 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

2032 Background - Commuter PM Peak  
 HCM Signalized Intersection Capacity Analysis

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		
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11		
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)	1762	1801	1531	1736	1826			1715		1710	1722			
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00			
Satd. Flow (perm)	1762	1801	1531	1736	1826			1715		1710	1722			
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	93	0	0	0	0	7	0	0	8	0		
Lane Group Flow (vph)	43	607	72	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	40.7	40.7	8.1	44.3			16.2		14.5	14.5			
Effective Green, g (s)	4.5	40.7	40.7	8.1	44.3			16.2		14.5	14.5			
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)	76	708	602	135	781			268		239	241			
v/s Ratio Prot	c0.02	c0.34		0.02	c0.32			c0.11		0.02	c0.09			
v/s Ratio Perm			0.05											
v/c Ratio	0.57	0.86	0.12	0.27	0.74			0.73		0.16	0.62			
Uniform Delay, d1	48.5	28.7	20.0	44.9	24.8			41.6		39.2	41.9			
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00			
Incremental Delay, d2	11.2	10.4	0.1	1.4	4.0			10.1		0.4	5.3			
Delay (s)	59.7	39.1	20.1	46.4	28.8			51.7		39.6	47.1			
Level of Service	E	D	C	D	C			D		D	D			
Approach Delay (s)		36.4			29.8			51.7			45.6			
Approach LOS		D			C			D			D			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			36.9									HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio			0.74											
Actuated Cycle Length (s)			103.5							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	543	0	0
Future Volume (Veh/h)	604	4	6	543	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	590	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		1271	657
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			665		1271	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		185	468
Direction, Lane #	EB 1	EB 2	WB 1	WB 2		
Volume Total	657	8	12	590		
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			41.8%	ICU Level of Service	A	
Analysis Period (min)			15			

2032 Background - Commuter PM Peak  
3: Site Entrance #2 & E Shirley Avenue

2032 Background - Commuter PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (veh/h)	604	0	0	534	15	3
Future Volume (Veh/h)	604	0	0	534	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)	657	0	0	580	30	6
<b>Pedestrians</b>						
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			657	1237	657	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			657	1237	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 %			100	85	99	
cM capacity (veh/h)			940	196	469	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	657	580	30	6		
Volume Left	0	0	30	0		
Volume Right	0	0	0	6		
cSH	1700	1700	196	469		
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			
<b>Intersection Summary</b>						
Average Delay			0.7			
Intersection Capacity Utilization			41.8%	ICU Level of Service	A	
Analysis Period (min)			15			

2032 Background - Commuter PM Peak  
4: Site Entrance #3 & E Shirley Avenue

2032 Background - Commuter PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
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

6: James Madison Highway/E Shirley Avenue & Alwington Boulevard HCM Signalized Intersection Capacity Analysis

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
<b>Intersection Summary</b>												
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	
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

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**Intersection: 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue**


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Movement	EB	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	T	R	L	TR	LTR	L	TR
Maximum Queue (ft)	214	454	83	161	452	208	117	197
Average Queue (ft)	52	262	39	31	227	105	33	86
95th Queue (ft)	152	412	69	95	392	183	87	155
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	15		0	15		0	3
Queuing Penalty (veh)	0	6		0	5		0	1

---

**Intersection: 2: Site Entrance #1 & E Shirley Avenue**


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Movement	WB
Directions Served	L
Maximum Queue (ft)	29
Average Queue (ft)	3
95th Queue (ft)	17
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	240
Storage Blk Time (%)	
Queuing Penalty (veh)	

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**Intersection: 3: Site Entrance #2 & E Shirley Avenue**


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Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	47	30
Average Queue (ft)	11	4
95th Queue (ft)	37	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)	2	51
Average Queue (ft)	0	8
95th Queue (ft)	2	32
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)	248	177	1	83
Average Queue (ft)	98	25	0	33
95th Queue (ft)	213	102	1	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)	176	132	60	47	176	168	123	21	80	177	187	92
Average Queue (ft)	96	54	7	12	86	77	21	1	15	104	112	44
95th Queue (ft)	153	114	33	36	146	137	69	13	56	159	174	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	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)	29	82	57	57	31
Average Queue (ft)	8	38	15	21	15
95th Queue (ft)	18	67	46	48	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: 13

# 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		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.681	14.0	LOS B	7.5	202.8	0.38	0.17	0.38	23.3
6	T1	527	10.0	573	10.0	0.681	14.3	LOS B	7.5	202.8	0.38	0.17	0.38	22.3
16	R2	100	11.0	109	11.0	0.681	14.3	LOS B	7.5	202.8	0.38	0.17	0.38	21.8
Approach		628	10.1	683	10.1	0.681	14.3	LOS B	7.5	202.8	0.38	0.17	0.38	22.2
North: Falmouth Street														
7	L2	90	21.0	98	21.0	0.266	11.1	LOS B	1.7	48.0	0.77	0.69	0.77	22.7
14	R2	37	9.0	40	9.0	0.266	10.1	LOS B	1.7	48.0	0.77	0.69	0.77	21.8
Approach		127	17.5	138	17.5	0.266	10.8	LOS B	1.7	48.0	0.77	0.69	0.77	22.4
West: E Shirley Avenue														
5u	U	1	0.0	1	0.0	0.153	5.0	LOS A	0.9	24.8	0.37	0.21	0.37	25.3
5	L2	34	19.0	37	19.0	0.153	5.8	LOS A	0.9	24.8	0.37	0.21	0.37	24.6
2	T1	350	9.0	380	9.0	0.153	1.4	LOS A	0.9	24.8	0.10	0.06	0.10	25.5
Approach		385	9.9	418	9.9	0.153	1.9	LOS A	0.9	24.8	0.13	0.07	0.13	25.4
All Vehicles		1140	10.9	1239	10.9	0.681	9.7	LOS A	7.5	202.8	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.

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# 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		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
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.

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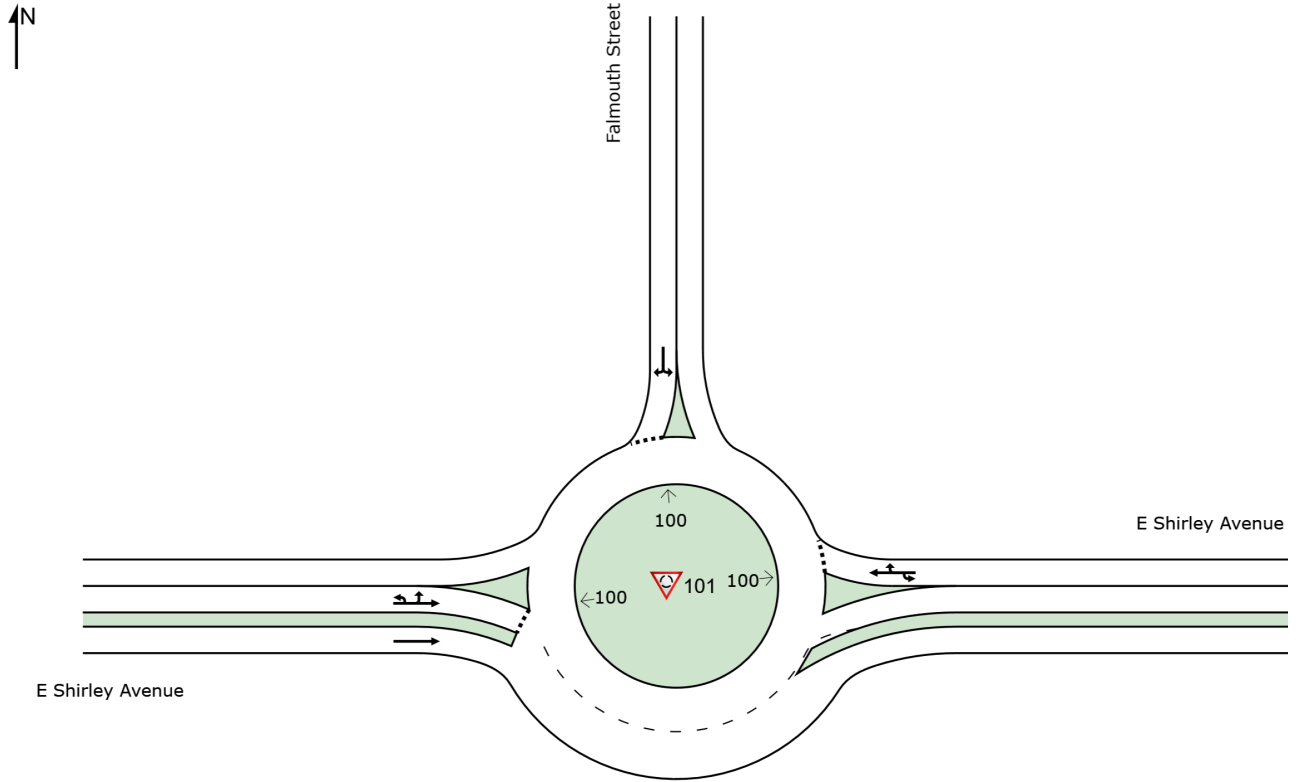
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# SITE LAYOUT

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.



# 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		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.756	17.5	LOS B	11.2	316.5	0.38	0.15	0.38	22.4
6	T1	505	21.0	549	21.0	0.756	18.2	LOS B	11.2	316.5	0.38	0.15	0.38	21.5
16	R2	166	4.0	180	4.0	0.756	17.6	LOS B	11.2	316.5	0.38	0.15	0.38	21.0
Approach		672	16.8	730	16.8	0.756	18.1	LOS B	11.2	316.5	0.38	0.15	0.38	21.4
North: Falmouth Street														
7	L2	145	1.0	158	1.0	0.322	10.2	LOS B	2.3	58.1	0.81	0.72	0.81	22.7
14	R2	35	9.0	38	9.0	0.322	10.9	LOS B	2.3	58.1	0.81	0.72	0.81	21.8
Approach		180	2.6	196	2.6	0.322	10.4	LOS B	2.3	58.1	0.81	0.72	0.81	22.5
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.236	6.1	LOS A	1.5	39.3	0.45	0.29	0.45	25.3
5	L2	20	11.0	22	11.0	0.236	6.6	LOS A	1.5	39.3	0.45	0.29	0.45	24.6
2	T1	586	5.0	637	5.0	0.236	1.9	LOS A	1.5	39.3	0.14	0.09	0.14	25.4
Approach		608	5.2	661	5.2	0.236	2.1	LOS A	1.5	39.3	0.15	0.10	0.15	25.3
All Vehicles		1460	10.2	1587	10.2	0.756	10.5	LOS B	11.2	316.5	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.





**Appendix H**  
**2032 Future Analysis Worksheets**

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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	0.22	0.65	0.12	0.24	0.75	0.76	0.10	0.32
Control Delay	47.2	29.5	0.3	48.1	32.2	52.0	42.4	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	29.5	0.3	48.1	32.2	52.0	42.4	33.6
Queue Length 50th (ft)	21	216	0	21	334	143	10	22
Queue Length 95th (ft)	53	342	0	54	#572	#272	31	62
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	157	758	745	143	777	365	362	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	0.22	0.57	0.10	0.24	0.75	0.68	0.05	0.16

**Intersection Summary**

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.







Taylor Middle School Addition  
 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

2032 Future - AM Peak  
 HCM Signalized Intersection Capacity Analysis

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
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
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)	1762	1702	1488	1611	1663			1678		1710	1635	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1762	1702	1488	1611	1663			1678		1710	1635	
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)	4.4	39.1	39.1	8.2	42.9			17.3		7.3	7.3	
Effective Green, g (s)	4.4	39.1	39.1	8.2	42.9			17.3		7.3	7.3	
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)	80	693	606	137	743			302		130	124	
v/s Ratio Prot	0.02	0.25		c0.02	c0.35			c0.14		0.01	c0.02	
v/s Ratio Perm			0.02									
v/c Ratio	0.42	0.62	0.05	0.25	0.78			0.79		0.13	0.31	
Uniform Delay, d1	44.5	22.6	17.2	41.0	22.6			37.6		41.3	41.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	4.9	2.0	0.0	1.3	5.8			13.5		0.6	2.0	
Delay (s)	49.4	24.6	17.2	42.3	28.3			51.1		42.0	43.9	
Level of Service	D	C	B	D	C			D		D	D	
Approach Delay (s)		25.1			29.1			51.1			43.5	
Approach LOS		C			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			32.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			95.9			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												

Taylor Middle School Addition  
2: Site Entrance #1 & E Shirley Avenue

2032 Future - AM Peak  
HCM Unsignalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑		
Traffic Volume (veh/h)	406	12	19	561	0	0
Future Volume (Veh/h)	406	12	19	561	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)	441	24	38	610	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			465		1127	441
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			465		1127	441
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)			1041		220	621
Direction, Lane #	EB 1	EB 2	WB 1	WB 2		
Volume Total	441	24	38	610		
Volume Left	0	0	38	0		
Volume Right	0	24	0	0		
cSH	1700	1700	1041	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			39.9%	ICU Level of Service		A
Analysis Period (min)			15			

Taylor Middle School Addition  
3: Site Entrance #2 & E Shirley Avenue

2032 Future - AM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (veh/h)	406	0	0	568	12	19
Future Volume (Veh/h)	406	0	0	568	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)	441	0	0	617	24	38
<b>Pedestrians</b>						
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			441	1058		441
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			441	1058		441
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)			1130	233		588
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	441	617	24	38		
Volume Left	0	0	24	0		
Volume Right	0	0	0	38		
cSH	1700	1700	233	588		
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	22.2	11.5		
Lane LOS			C	B		
Approach Delay (s)	0.0	0.0	15.7			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			0.9			
Intersection Capacity Utilization			39.9%	ICU Level of Service		A
Analysis Period (min)			15			

Taylor Middle School Addition  
4: Site Entrance #3 & E Shirley Avenue

2032 Future - AM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑	↖	↗
Traffic Volume (veh/h)	345	80	25	511	57	44
Future Volume (Veh/h)	345	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)	363	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			523		1001	363
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			523		1001	363
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		77	93
cM capacity (veh/h)			1054		259	687
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	363	160	50	538	106	
Volume Left	0	0	50	0	60	
Volume Right	0	160	0	0	46	
cSH	1700	1700	1054	1700	355	
Volume to Capacity	0.21	0.09	0.05	0.32	0.30	
Queue Length 95th (ft)	0	0	4	0	31	
Control Delay (s)	0.0	0.0	8.6	0.0	19.4	
Lane LOS			A	C		
Approach Delay (s)	0.0		0.7		19.4	
Approach LOS					C	
Intersection Summary						
Average Delay			2.0			
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



6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

HCM Signalized Intersection Capacity Analysis



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
HCM 2000 Volume to Capacity ratio	0.50	B
Actuated Cycle Length (s)	83.7	Sum of lost time (s)
Intersection Capacity Utilization	55.7%	32.5
Analysis Period (min)	15	ICU Level of Service
		B

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	
<b>Intersection Summary</b>	

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

**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)	112	308	66	172	451	258	53	99
Average Queue (ft)	26	159	22	36	224	123	13	38
95th Queue (ft)	71	269	50	114	397	219	40	79
Link Distance (ft)		1078	1078		3094	992		778
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	3		0	14			0
Queuing Penalty (veh)	0	1		0	4			0

**Intersection: 2: Site Entrance #1 & E Shirley Avenue**

Movement	EB	WB
Directions Served	T	L
Maximum Queue (ft)	5	55
Average Queue (ft)	0	5
95th Queue (ft)	5	30
Link Distance (ft)	3094	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		240
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 3: Site Entrance #2 & E Shirley Avenue**

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	53	56
Average Queue (ft)	10	16
95th Queue (ft)	37	48
Link Distance (ft)	383	383
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)	11	12	43	81
Average Queue (ft)	0	0	9	34
95th Queue (ft)	8	8	33	65
Link Distance (ft)	204		384	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150		150	
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 5: E Shirley Avenue & Falmouth Street**

Movement	EB	WB	B17	B17	SB
Directions Served	ULT	TR	T		L>
Maximum Queue (ft)	132	216	95	9	96
Average Queue (ft)	31	50	3	0	35
95th Queue (ft)	93	150	34	7	80
Link Distance (ft)	392	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)	155	114	36	55	208	209	147	20	45	123	115	111
Average Queue (ft)	69	32	1	6	112	102	37	3	7	52	47	55
95th Queue (ft)	128	86	15	32	188	174	103	13	29	96	96	97
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	79	78	84	78
Average Queue (ft)	7	38	44	34	36
95th Queue (ft)	16	66	69	77	63
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
---------------------------------



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	0.31	0.88	0.15	0.30	0.76	0.73	0.16	0.45
Control Delay	52.2	43.9	1.9	51.3	33.4	53.3	42.7	40.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	43.9	1.9	51.3	33.4	53.3	42.7	40.6
Queue Length 50th (ft)	26	387	0	26	390	127	17	46
Queue Length 95th (ft)	64	#654	16	64	#665	#237	45	97
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	134	747	715	142	838	338	318	351
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	0.31	0.85	0.15	0.30	0.76	0.64	0.09	0.27

**Intersection Summary**

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Taylor Middle School Addition  
 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

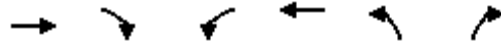
2032 Future - School PM Peak  
 HCM Signalized Intersection Capacity Analysis

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
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
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)	1588	1767	1488	1687	1756			1656		1583	1661	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1588	1767	1488	1687	1756			1656		1583	1661	
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)	4.5	42.4	42.4	8.2	46.1			16.8		9.0	9.0	
Effective Green, g (s)	4.5	42.4	42.4	8.2	46.1			16.8		9.0	9.0	
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)	71	746	628	137	806			277		141	148	
v/s Ratio Prot	c0.03	c0.36		0.02	c0.36			c0.13		0.02	c0.05	
v/s Ratio Perm			0.03									
v/c Ratio	0.59	0.85	0.07	0.31	0.79			0.75		0.21	0.51	
Uniform Delay, d1	47.0	26.2	17.3	43.4	23.1			39.8		42.4	43.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	14.5	9.7	0.1	1.7	5.7			11.6		1.0	4.0	
Delay (s)	61.5	35.9	17.3	45.2	28.8			51.4		43.4	47.6	
Level of Service	E	D	B	D	C			D		D	D	
Approach Delay (s)		34.8			29.8			51.4			46.6	
Approach LOS		C			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			35.7			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			100.4			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											



Taylor Middle School Addition  
2: Site Entrance #1 & E Shirley Avenue

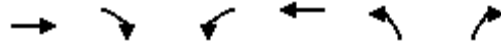
2032 Future - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑		
Traffic Volume (veh/h)	588	12	19	568	0	0
Future Volume (Veh/h)	588	12	19	568	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)	632	24	38	611	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			656		1319	632
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			656		1319	632
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)			941		168	484
Direction, Lane #	EB 1	EB 2	WB 1	WB 2		
Volume Total	632	24	38	611		
Volume Left	0	0	38	0		
Volume Right	0	24	0	0		
cSH	1700	1700	941	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			

Taylor Middle School Addition  
3: Site Entrance #2 & E Shirley Avenue







2032 Future - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (veh/h)	588	0	0	575	12	19
Future Volume (Veh/h)	588	0	0	575	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	625	24	38
<b>Pedestrians</b>						
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		1264	639
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			639		1264	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		86	92
cM capacity (veh/h)			955		178	450
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	639	625	24	38		
Volume Left	0	0	24	0		
Volume Right	0	0	0	38		
cSH	1700	1700	178	450		
Volume to Capacity	0.38	0.37	0.14	0.08		
Queue Length 95th (ft)	0	0	11	7		
Control Delay (s)	0.0	0.0	28.4	13.7		
Lane LOS			D	B		
Approach Delay (s)	0.0	0.0	19.4			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			0.9			
Intersection Capacity Utilization			40.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Taylor Middle School Addition  
4: Site Entrance #3 & E Shirley Avenue

2032 Future - School PM Peak  
HCM Unsignalized Intersection Capacity Analysis

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	563	44	7	521	54	46
Future Volume (Veh/h)	563	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)	612	88	14	566	59	50
<b>Pedestrians</b>						
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			700		1206	612
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			700		1206	612
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		71	90
cM capacity (veh/h)			906		202	497
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	
Volume Total	612	88	14	566	109	
Volume Left	0	0	14	0	59	
Volume Right	0	88	0	0	50	
cSH	1700	1700	906	1700	278	
Volume to Capacity	0.36	0.05	0.02	0.33	0.39	
Queue Length 95th (ft)	0	0	1	0	45	
Control Delay (s)	0.0	0.0	9.0	0.0	26.1	
Lane LOS	A			D		
Approach Delay (s)	0.0		0.2		26.1	
Approach LOS	D					
<b>Intersection Summary</b>						
Average Delay			2.1			
Intersection Capacity Utilization			42.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Taylor Middle School Addition  
 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

2032 Future - School PM Peak

Queues



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

6: James Madison Highway/E Shirley Avenue & Alwington Boulevard HCM Signalized Intersection Capacity Analysis



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**

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

**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	505	137	184	573	255	85	149
Average Queue (ft)	51	281	32	53	281	122	23	58
95th Queue (ft)	150	459	86	147	505	213	63	117
Link Distance (ft)		1078	1078		3094	992		778
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	18		0	20		0	1
Queuing Penalty (veh)	0	7		0	8		0	0

**Intersection: 2: Site Entrance #1 & E Shirley Avenue**

Movement	EB	WB
Directions Served	R	L
Maximum Queue (ft)	6	48
Average Queue (ft)	0	7
95th Queue (ft)	5	31
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	110	240
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 3: Site Entrance #2 & E Shirley Avenue**

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	58	63
Average Queue (ft)	12	18
95th Queue (ft)	43	51
Link Distance (ft)	383	383
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)	2	30	92
Average Queue (ft)	0	3	37
95th Queue (ft)	2	17	71
Link Distance (ft)			384
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	150	150	
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)	258	218	71	9	97
Average Queue (ft)	102	37	4	0	40
95th Queue (ft)	219	131	40	10	82
Link Distance (ft)	392	351	787	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)	168	134	84	74	186	172	145	46	59	174	180	103
Average Queue (ft)	92	53	13	19	92	78	22	6	10	94	96	45
95th Queue (ft)	147	109	51	55	156	140	77	27	37	150	159	83
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)	35	66	69	63	54
Average Queue (ft)	10	30	33	13	31
95th Queue (ft)	28	61	58	47	49
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: 16



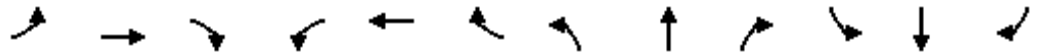
Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	43	620	165	36	584	202	39	156
v/c Ratio	0.31	0.91	0.25	0.26	0.73	0.72	0.16	0.61
Control Delay	53.6	50.5	5.9	52.4	33.5	55.0	40.8	50.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.6	50.5	5.9	52.4	33.5	55.0	40.8	50.2
Queue Length 50th (ft)	28	389	6	23	353	124	23	94
Queue Length 95th (ft)	67	#650	51	58	#586	210	55	164
Internal Link Dist (ft)		1033			3084	958		736
Turn Bay Length (ft)	215			185			125	
Base Capacity (vph)	140	716	700	138	802	330	323	332
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	0.31	0.87	0.24	0.26	0.73	0.61	0.12	0.47

**Intersection Summary**

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Taylor Middle School Addition  
 1: Culpeper Street & W Shirley Avenue/E Shirley Avenue

2032 Future - Commuter PM Peak  
 HCM Signalized Intersection Capacity Analysis



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
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
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)	1762	1801	1531	1736	1826			1715		1710	1722	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98		0.95	1.00	
Satd. Flow (perm)	1762	1801	1531	1736	1826			1715		1710	1722	
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	91	0	0	0	0	7	0	0	8	0
Lane Group Flow (vph)	43	620	74	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	41.0	41.0	8.1	44.6			16.2		14.6	14.6	
Effective Green, g (s)	4.5	41.0	41.0	8.1	44.6			16.2		14.6	14.6	
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)	76	710	604	135	783			267		240	241	
v/s Ratio Prot	c0.02	c0.34		0.02	c0.32			c0.11		0.02	c0.09	
v/s Ratio Perm			0.05									
v/c Ratio	0.57	0.87	0.12	0.27	0.75			0.73		0.16	0.62	
Uniform Delay, d1	48.7	29.0	20.0	45.1	24.9			41.8		39.3	42.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	11.2	11.8	0.1	1.4	4.1			10.5		0.4	5.3	
Delay (s)	59.9	40.9	20.1	46.6	29.0			52.3		39.7	47.3	
Level of Service	E	D	C	D	C			D		D	D	
Approach Delay (s)		37.7			30.0			52.3			45.8	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	37.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	103.9	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		

Taylor Middle School Addition  
2: Site Entrance #1 & E Shirley Avenue

2032 Future - Commuter PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑		
Traffic Volume (veh/h)	620	0	0	548	0	0
Future Volume (Veh/h)	620	0	0	548	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	596	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	1270	674	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			674	1270	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	596		
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			42.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Taylor Middle School Addition  
3: Site Entrance #2 & E Shirley Avenue

2032 Future - Commuter PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Traffic Volume (veh/h)	620	0	0	548	0	0
Future Volume (Veh/h)	620	0	0	548	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)	674	0	0	596	0	0
<b>Pedestrians</b>						
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		1270	674
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			674		1270	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		188	458
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>		
Volume Total	674	596	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	0.10	0.06		
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			
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			42.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Taylor Middle School Addition  
4: Site Entrance #3 & E Shirley Avenue

2032 Future - Commuter PM Peak  
HCM Unsignalized Intersection Capacity Analysis

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↖	↗
Traffic Volume (veh/h)	591	29	28	528	20	4
Future Volume (Veh/h)	591	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)	642	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			700			642
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			700			642
tC, single (s)			4.2			6.2
tC, 2 stage (s)						
tF (s)			2.3			3.3
p0 queue free %			94			99
cM capacity (veh/h)			865			478
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	642	58	56	574	26	
Volume Left	0	0	56	0	22	
Volume Right	0	58	0	0	4	
cSH	1700	1700	865	1700	180	
Volume to Capacity	0.38	0.03	0.06	0.34	0.14	
Queue Length 95th (ft)	0	0	5	0	12	
Control Delay (s)	0.0	0.0	9.4	0.0	28.3	
Lane LOS			A			D
Approach Delay (s)	0.0	0.8				28.3
Approach LOS					D	
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			41.1%	ICU Level of Service		A
Analysis Period (min)			15			

Taylor Middle School Addition  
 6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

2032 Future - Commuter PM Peak

Queues



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



6: James Madison Highway/E Shirley Avenue & Alwington Boulevard

HCM Signalized Intersection Capacity Analysis



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	T
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**

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

**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	590	119	184	459	237	118	190
Average Queue (ft)	55	312	41	40	243	116	34	91
95th Queue (ft)	156	519	95	128	412	201	87	163
Link Distance (ft)		1078	1078		3094	992		778
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	215			185			125	
Storage Blk Time (%)	0	24		0	19		0	4
Queuing Penalty (veh)	0	10		0	6		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	WB	NB
Directions Served	R	L	LR
Maximum Queue (ft)	2	57	43
Average Queue (ft)	0	11	16
95th Queue (ft)	2	39	38
Link Distance (ft)			384
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	150	150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 5: E Shirley Avenue & Falmouth Street**

Movement	EB	WB	B17	B17	SB
Directions Served	ULT	TR	T		L>
Maximum Queue (ft)	241	187	51	10	98
Average Queue (ft)	96	24	3	0	36
95th Queue (ft)	216	98	23	11	76
Link Distance (ft)	392	351	787	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)	184	144	60	65	204	168	137	28	114	175	192	99
Average Queue (ft)	94	54	9	13	98	80	27	1	15	106	112	44
95th Queue (ft)	151	117	38	43	168	148	89	14	58	159	174	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	0		
Queuing Penalty (veh)							0		0	0		

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**Intersection: 7: Commercial Entrance /Elementary School Entrance & Alwington Boulevard**

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Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	LTR	LTR
Maximum Queue (ft)	29	71	64	57	35
Average Queue (ft)	8	37	25	20	19
95th Queue (ft)	17	63	57	47	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)					

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**Network Summary**

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Network wide Queuing Penalty: 18

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# 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		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.649	13.0	LOS B	6.4	174.3	0.38	0.19	0.38	23.6
6	T1	490	10.0	533	10.0	0.649	13.3	LOS B	6.4	174.3	0.38	0.19	0.38	22.5
16	R2	100	11.0	109	11.0	0.649	13.4	LOS B	6.4	174.3	0.38	0.19	0.38	22.0
Approach		591	10.2	642	10.2	0.649	13.3	LOS B	6.4	174.3	0.38	0.19	0.38	22.4
North: Falmouth Street														
7	L2	90	21.0	98	21.0	0.272	10.8	LOS B	1.7	48.4	0.75	0.67	0.75	22.8
14	R2	46	9.0	50	9.0	0.272	9.8	LOS A	1.7	48.4	0.75	0.67	0.75	21.9
Approach		136	16.9	148	16.9	0.272	10.5	LOS B	1.7	48.4	0.75	0.67	0.75	22.5
West: E Shirley Avenue														
5u	U	1	0.0	1	0.0	0.145	4.9	LOS A	0.8	23.2	0.37	0.21	0.37	25.2
5	L2	41	19.0	45	19.0	0.145	5.7	LOS A	0.8	23.2	0.37	0.21	0.37	24.5
2	T1	320	9.0	348	9.0	0.145	1.3	LOS A	0.8	23.2	0.09	0.05	0.09	25.5
Approach		362	10.1	393	10.1	0.145	1.8	LOS A	0.8	23.2	0.12	0.07	0.12	25.4
All Vehicles		1089	11.0	1184	11.0	0.649	9.1	LOS A	6.4	174.3	0.34	0.21	0.34	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.

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# 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		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist ft ]				
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.

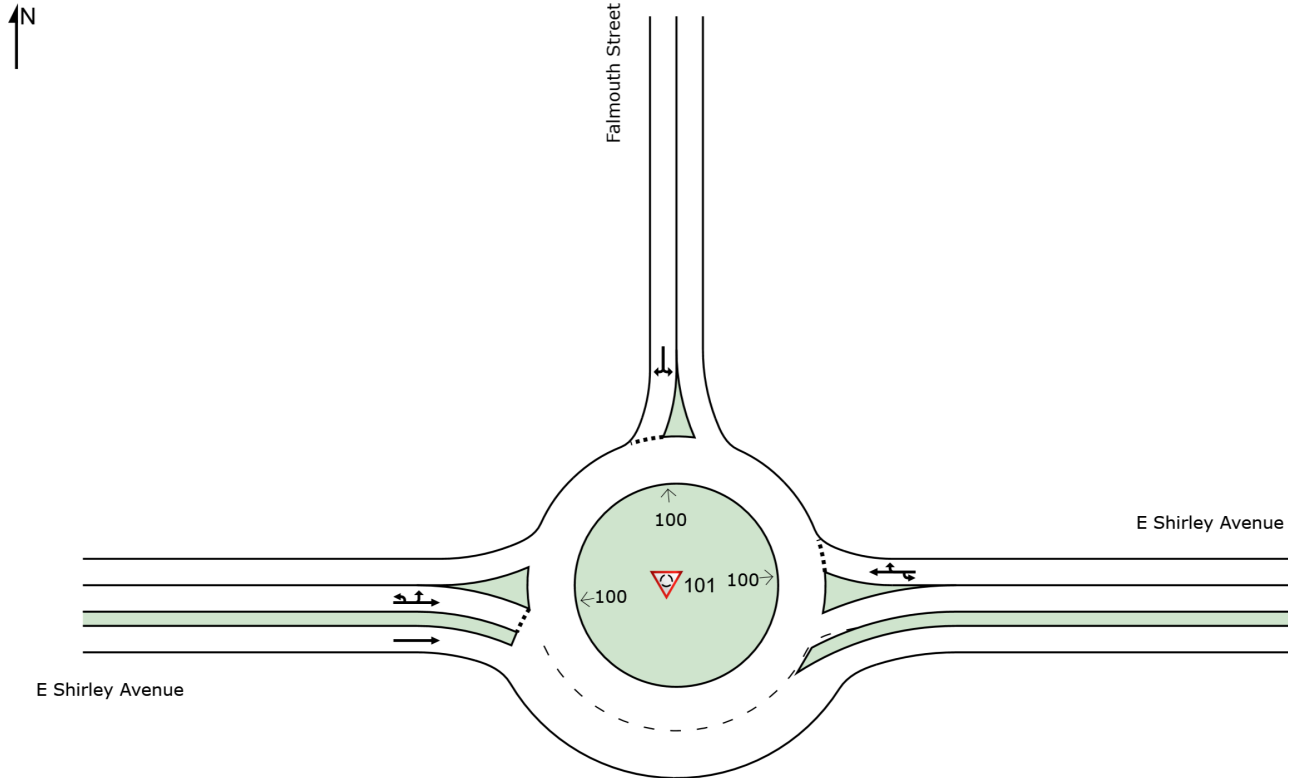


# SITE LAYOUT

 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.



# 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		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
East: E Shirley Avenue														
1u	U	1	0.0	1	0.0	0.754	17.4	LOS B	11.0	311.5	0.39	0.15	0.39	22.4
6	T1	502	21.0	546	21.0	0.754	18.1	LOS B	11.0	311.5	0.39	0.15	0.39	21.5
16	R2	166	4.0	180	4.0	0.754	17.5	LOS B	11.0	311.5	0.39	0.15	0.39	21.0
Approach		669	16.8	727	16.8	0.754	18.0	LOS B	11.0	311.5	0.39	0.15	0.39	21.4
North: Falmouth Street														
7	L2	145	1.0	158	1.0	0.327	10.3	LOS B	2.3	59.1	0.81	0.72	0.81	22.7
14	R2	38	9.0	41	9.0	0.327	11.0	LOS B	2.3	59.1	0.81	0.72	0.81	21.8
Approach		183	2.7	199	2.7	0.327	10.4	LOS B	2.3	59.1	0.81	0.72	0.81	22.5
West: E Shirley Avenue														
5u	U	2	0.0	2	0.0	0.235	6.1	LOS A	1.5	39.2	0.45	0.29	0.45	25.3
5	L2	21	11.0	23	11.0	0.235	6.6	LOS A	1.5	39.2	0.45	0.29	0.45	24.6
2	T1	583	5.0	634	5.0	0.235	1.9	LOS A	1.5	39.2	0.14	0.09	0.14	25.4
Approach		606	5.2	659	5.2	0.235	2.1	LOS A	1.5	39.2	0.15	0.10	0.15	25.3
All Vehicles		1458	10.2	1585	10.2	0.754	10.4	LOS B	11.0	311.5	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.

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