TRAFFIC IMPACT STUDY

Clark Tract Development

Spout Springs Road at Union Circle
Flowery Branch, GA

Keck & Wood Project No.
260328.00

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1. INTRODUCTION

A residential development, identified as the Clark Charles Curtis Tract project, is proposed on the northeast corner of the intersection at Spout Springs Road and Union Circle in Flowery Branch, GA. A Traffic Impact Study was performed to determine the amount of new traffic that would be generated by the proposed development and how the new traffic would impact the existing roadway network.

1.1. STUDY AREA

The study area is located to the north of Union Circle, just east of Spout Springs Road in Flowery Branch, GA. Figure 1.1 presents the location of the project site and identifies the study intersections. All three (3) study intersections are existing, with one (1) adding a driveway for the proposed development. The study intersections are listed below, with existing intersections indicated in bold.

1. **Spout Springs Road at Cherokee Bluff High School/Spout Springs Elementary School**
2. **Spout Springs Road at Union Circle**
3. **Union Circle at Elderberry Lane**/Site Driveway

1.2. PROPOSED DEVELOPMENT

The residential development will consist of a mix of 54 single-family detached housing units and 66 townhomes. The proposed development will be positioned on 39.1 acres, in close proximity to the Cherokee Bluff High School. Access to the site would be provided by a single full access driveway on Union Circle. The proposed development is expected to be built out in the year 2028. Currently, the proposed project site is largely undeveloped and contains a single residential unit. The proposed site layout is provided in **Appendix A**.

1.3. PLANNED TRANSPORTATION IMPROVEMENTS

A search for planned Georgia Department of Transportation (GDOT) projects in or near the study area was performed using the GDOT GeoPI web application (http://www.dot.ga.gov/DS/Maps/geopi#). Based on the results of that search, one (1) project was found in the vicinity of the study area.

PI 0015280 – This project proposes to widen CR 1287 / Spout Springs Road from a 2-lane roadway to a 4-lane divided roadway with a 20-foot raised median and sidewalks. Median openings and intersections will be modified/removed accordingly. The project limits along Spout Springs Road are Union Circle to S. of SR 347 for a total distance of 2.51 miles. The planned construction year is in 2029. Because the project scope and construct year are not within the study area and periods, this project is not included in this analysis.

1.4. ROADWAYS

Spout Springs Road is a four-lane, divided roadway that traverses north-south through the study area. It is classified as a minor arterial roadway with a 45-mph speed limit in the vicinity of the project site. Land uses in the immediate vicinity of the study area consist primarily of residential developments and multiple schools. Near the study area there are sidewalks and crosswalks on all approaches, however, there are no bicycle facilities present.

Union Circle is a two-lane, undivided roadway that traverses east-west through the study area. It is classified as a minor collector roadway with a 35-mph speed limit speed limit in the vicinity of the project site. Union Circle begins at its intersection with Spout Springs Road and continues east. Land uses along the route consist of residential developments and an access to Cherokee Bluff Middle School. Near the study area, there are no pedestrian or bicycle facilities present.

1.5. INTERSECTIONS

The following three (3) intersections were identified to be studied (existing intersections are in bold):

1. **Spout Springs Road at Cherokee Bluff High School/Spout Springs Elementary**
2. **Spout Springs Road at Union Circle**
3. **Union Circle at Elderberry Lane**/Site Driveway

The existing lane geometries and intersection control types are presented in Figure 1.2.



Figure 1.1 – Aerial View of Study Area

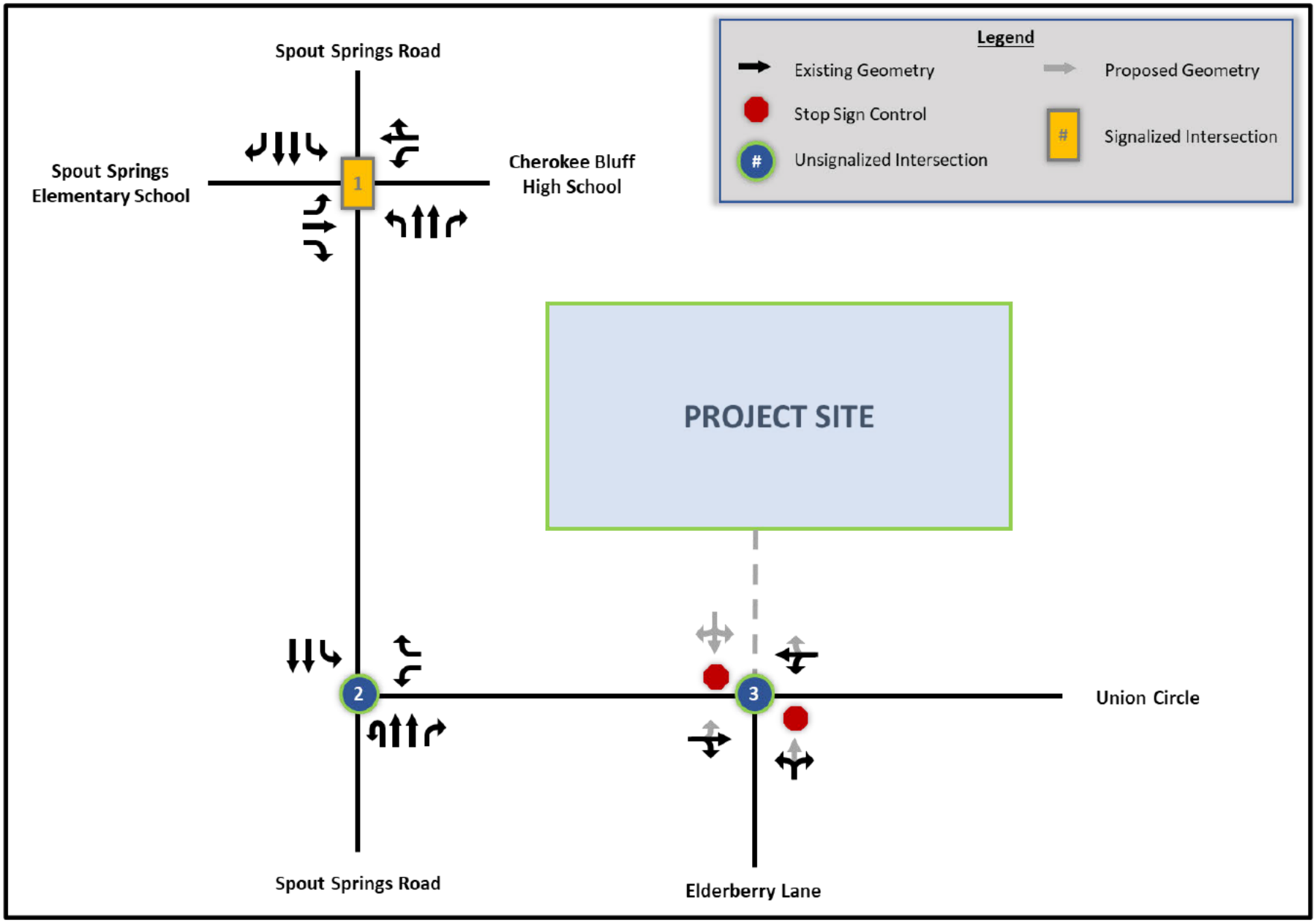


Figure 1.2 – Existing and Proposed Intersection Geometries

2. TRAFFIC ANALYSIS AND METHODOLOGY

2.1. TRAFFIC DATA COLLECTION

The traffic data for this project was collected on Thursday, August 27, 2026. The following traffic counts were collected:

- 1 – 4-Hour TMC (7:00 am to 9:00 am & 4:00 pm to 6:00 pm)
  - Spout Springs Road at Cherokee Bluff High School/Spout Springs Elementary
- 1 – 12-Hour TMC (6:00 am to 6:00pm)
  - Spout Springs Road at Union Circle
- 2 – 24-Hour Bi-Directional Classification Tube Counts
  - Spout Springs Road south of Union Circle
  - Union Circle east of Spout Springs Road

The traffic counts obtained for this study are included in **Appendix B**. The existing year 2026 peak hour volume is presented in Figure 3.1.

2.2. BACKGROUND GROWTH

A build-out year of 2028 established for the project. An average annual growth rate was determined based on historic Average Annual Daily Traffic (AADT) counts recorded for nearby GDOT Count Stations. AADTs for the following count stations were obtained from GDOT's Traffic Analysis and Data Application (TADA) website (https://gdottrafficdata.drakewell.com/publicmultinodemap.asp):

- 139-0437: Spout Springs Road south of Williams Road
- 139-0441: Spout Springs Road south of Ivy Springs Drive
- 139-8206: Union Circle east of Spout Springs Road
- 139-8207: Union Church Road north of Deaton Creek Parkway
- 139-0779: Cash Road north of Glen Forrest Drive

Both the 5-year and 15-year growth rates were calculated at each of the historical traffic count locations. The 5-year growth rate of the three (3) locations averaged 3.3% while the 15-year growth rate averaged 3.7%. Overall, a 3.5% annual growth rate was used for the purpose of this study. The growth rate calculations can be found in **Appendix B**. The 3.5% growth rate was applied to the Existing Year 2026 peak hour traffic for a period of two (2) years to establish the 2028 future year background scenario volumes.

2.3. STUDY SCENARIOS

For the purposes of this study, two (2) scenarios will be analyzed beyond the Existing Year 2026 scenario. Details for each scenario analyzed can be found below:

- Opening Year 2028 – Background Scenario
  - This scenario will include the background growth rate applied for two (2) years. This scenario will not include any project trips from the proposed development.
- Opening Year 2028 – With Project Scenario
  - In addition to the background growth rate applied for two (2) years, this scenario will include new trips from the proposed residential development.

2.4. LEVEL OF SERVICE CRITERIA

In order to quantify the impacts of additional traffic and to determine any needed roadway and/or operational improvements, a capacity analysis was performed for each scenario's peak hour conditions based on the methodology outlined in the *Highway Capacity Manual (HCM).* Various computer programs are available which implement the *HCM* methodology. For this project, Synchro 12 was used to analyze each of the study intersections.

HCM defines level of service (LOS) in terms of the amount of control delay, including initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The LOS categories range from A to F, with different thresholds specified according to the type of stop control at the intersection. The LOS criteria for unsignalized and signalized intersections are listed in Table 2.1.

Table 2.1 – Level of Service Criteria

Level of Service (LOS)	Unsignalized or Roundabout Control Delay per Vehicle (sec)	Signalized Control Delay per Vehicle (sec)
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

Rural, sparsely developed areas have a minimum LOS requirement of C based on rural residents' expectation for relatively uncongested conditions in combination with design flexibility associated with lower right of way costs. The minimum LOS for urban areas is D, reflecting the greater acceptance of delay and congestion by urban residents. Additionally, the increased density of developments makes right of way costs much higher in urban areas. The study intersections are located in a suburban/transition area; therefore, a minimum LOS D is assumed for the study intersections.

2.5. BACK OF QUEUE ANALYSIS

A Back of Queue (BOQ) analysis was used to determine the storage needs for each of the scenarios listed in Section 2.3. The 95th percentile BOQ length was calculated for specific movements at each intersection. The queue is expected to be the reported length or shorter 95 percent of the time. The BOQ results were taken from the capacity analysis reports output by Synchro 12 for each study intersection.

3. EXISTING YEAR 2026 CONDITIONS

3.1. EXISTING INTERSECTION CAPACITY ANALYSIS

A capacity analysis was performed for the Existing Year 2026 conditions using the current intersection geometries. The results of the analysis are listed in Table 3.1 and the reports from the capacity analysis are included in **Appendix C**.

Table 3.1 – Existing Year 2026 Capacity Analysis Results

No.	Intersection	Intersection Control	Approach	Existing Year 2026			
				AM Peak		PM Peak	
				LOS	sec/veh	LOS	sec/veh
1	Spout Springs Road @ Cherokee Bluff High School/Spout Springs Elementary	Signalized	Overall	B	17.8	B	10.4
			EB	C	28.9	C	28.8
			WB	C	25.9	C	29.7
			NB	B	15.8	B	10.2
			SB	B	14.2	A	8.2
2	Spout Springs Road @ Union Circle	Side Street Stop Controlled	WB	F	53.7	F	53.2
			NB	A	0.0	A	0.0
			SBL	B	12.3	B	10.7
3	Union Circle @ Elderberry Lane	Side Street Stop Controlled	EB	A	0.0	A	0.0
			WBL	A	8.1	A	8.0
			NB	C	15.0	B	13.2

As shown in Table 3.1, each of the study intersections is currently operating with acceptable LOS during both the AM and PM peak periods, with the exception of Spout Springs Road at Union Circle. The westbound approach at this intersection is currently operating with inadequate LOS F in both peak periods in the existing condition.

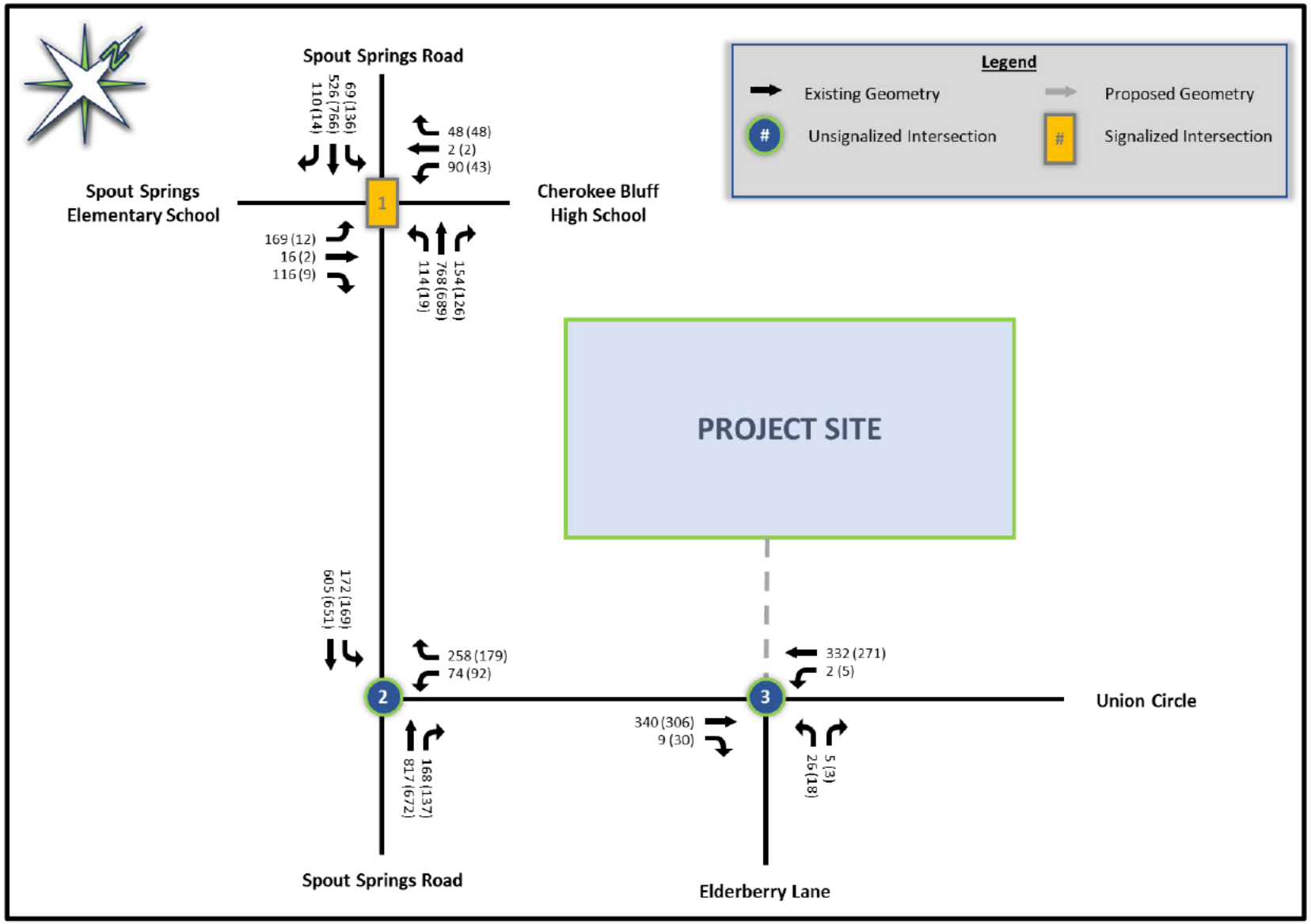


Figure 3.1 – Existing Year 2026 Peak Hour Traffic

4. TRIP GENERATION

The traffic that would be generated by the proposed development was estimated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual (TGM) 12th Edition*. The number of trips expected to be generated by this development were determined using the following ITE Land Use Codes:

- ITE Land Use Code 210 – Single Family Detached Housing
- ITE Land Use Code 215 – Single Family Attached Housing (Townhomes)

The total number of project-generated trips was estimated for the typical weekday and the morning and evening peak hours. Since the development is considered a residential development, pass-by trips will not be anticipated for the site.

Table 4.1 – Trip Generation

ITE	ITE	Size	Unit	Daily			AM Peak Hour			PM Peak Hour		
Category	Code			Total	In	Out	Total	In	Out	Total	In	Out
Single Family - Total Trips	210	54	Units	491	245	246	38	10	28	50	31	19
Pass-by Trips	0% AM / 0% PM			0	0	0	0	0	0	0	0	0
New Trips				491	245	246	38	10	28	50	31	19
Townhouse - Total Trips	215	66	Units	434	217	217	31	8	23	34	19	15
Pass-by Trips	0% AM / 0% PM			0	0	0	0	0	0	0	0	0
New Trips				434	217	217	31	8	23	34	19	15
Overall Total Trips	(Total Trips)			925	462	463	69	18	51	84	50	34
Overall Pass-By Trips				0	0	0	0	0	0	0	0	0
Overall New Trips				925	462	463	69	18	51	84	50	34

4.1. DISTRIBUTION OF PROJECT-GENERATED TRIPS

The new trips generated by the project were distributed to the surrounding roadway network based on existing traffic patterns observed in the peak hours. The inbound trips were allocated based on the existing traffic patterns entering the study area. The outbound trips were then assigned to the site driveways and distributed based on the route vehicles would have taken if the site were not built.

The project-generated traffic (Figure 4.2) was superimposed with the Opening Year 2028 – Background traffic shown in Figure 5.1 to provide an estimate of the traffic expected to be present when the proposed development is complete. Figure 5.2 presents the Opening Year 2028 – With Project peak hour traffic.

4.2. ASSIGNMENT OF PROJECT-GENERATED TRIPS

The number of new trips were assigned to the roadway network based on the trip distribution outlined previously. The new trip distribution of project-generated traffic is shown in Figure 4.1. Figure 4.2 shows the new peak hour trip adjustments for the proposed development.

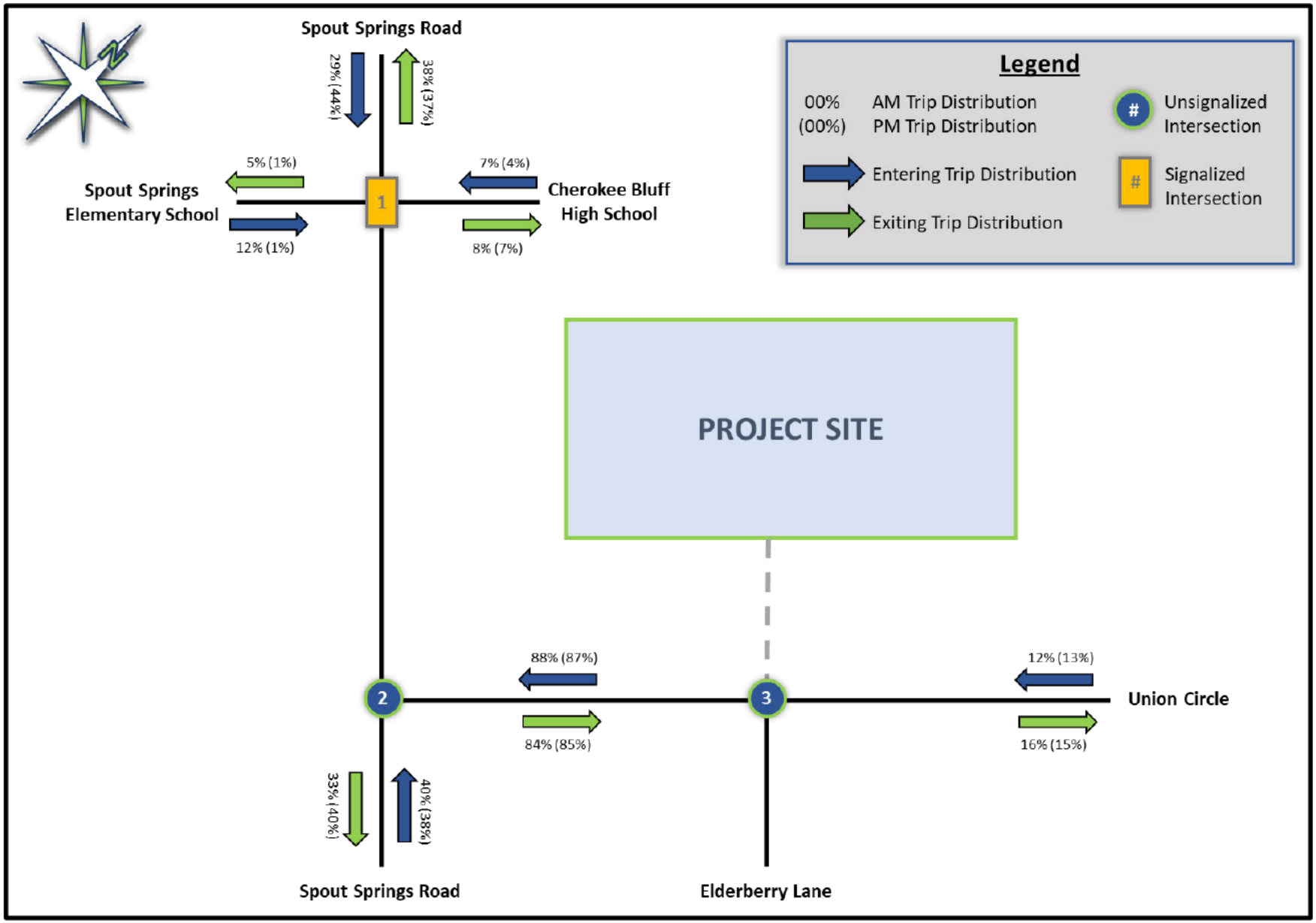


Figure 4.1 – New Trip Distribution

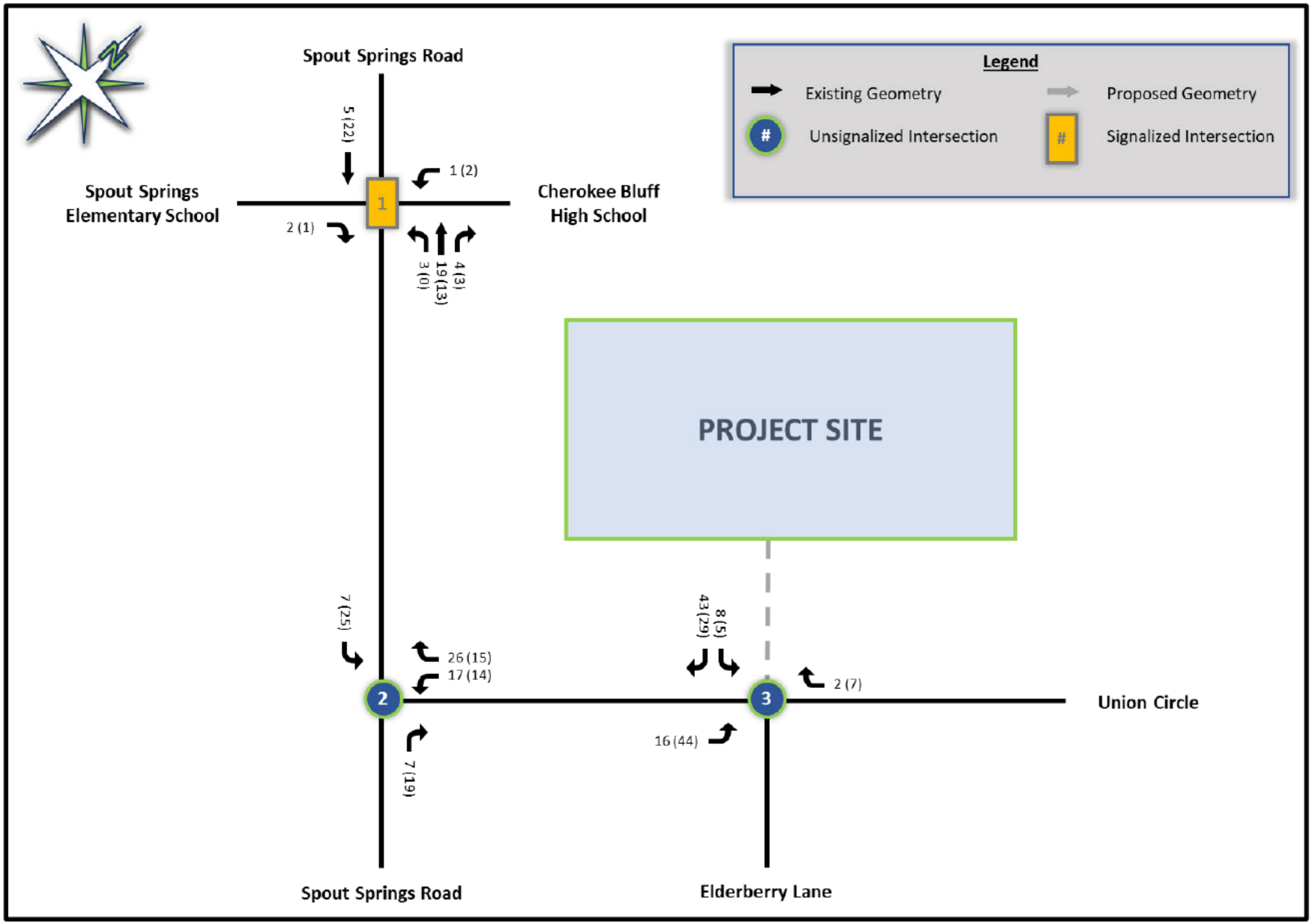


Figure 4.2 – Peak Hour Project Trip Adjustments

5. OPENING YEAR 2028 CONDITIONS

5.1. OPENING YEAR 2028 INTERSECTION CAPACITY ANALYSIS

A capacity analysis was performed to evaluate the AM and PM peak hour periods for both the Opening Year 2028 scenarios. The results of the analysis are listed in Table 5.1. Reports detailing the capacity analysis are included in **Appendix D**. The Opening Year peak hour traffic volumes are shown in Figures 5.1 and 5.2. For the purposes of this study, the following assumptions were made:

- Opening Year 2028 – Background
  - This scenario assumes the same roadway network and lane assignments as in the Existing Year 2026 conditions.
- Opening Year 2028 – With Project
  - This scenario assumes the same roadway network and lane assignments as in the Opening Year 2028 – Background scenario with the addition of the site driveway. The proposed driveways are detailed below:
    - A full access driveway at Union Circle and Elderberry Lane/Site Driveway will be constructed with a single lane in and a single lane out of the site. The eastbound and westbound lane configurations on Union Circle will not be altered. There are no improvements proposed for the Elderberry Lane approach.

Table 5.1 – Opening Year 2028 Capacity Analysis Results

No.	Intersection	Intersection Control	Approach	Opening Year 2028							
				Background		With Project		Background		With Project	
				AM Peak				PM Peak			
				LOS	sec/veh	LOS	sec/veh	LOS	sec/veh	LOS	sec/veh
1	Spout Springs Road @ Cherokee Bluff High School/Spout Springs Elementary	Signalized	Overall	B	18.7	B	18.8	B	10.7	B	10.8
			EB	C	29.1	C	29.1	C	28.9	C	28.9
			WB	C	25.8	C	25.9	C	29.8	C	29.8
			NB	B	17.0	B	17.2	B	10.5	B	10.6
			SB	B	15.3	B	15.4	A	8.6	A	8.7
2	Spout Springs Road @ Union Circle	Side Street Stop Controlled	WB	F	84.6	F	124.8	F	86.2	F	138.5
			NB	A	0.0	A	0.0	A	0.0	A	0.0
			SBL	B	13.2	B	13.4	B	11.3	B	11.7
3	Union Circle @ Elderberry Lane/Site Driveway	Side Street Stop Controlled	EBL	A	0.0	A	8.2	A	0.0	A	8.0
			WBL	A	8.2	A	8.2	A	8	A	8.1
			NB	C	16.0	C	20.2	B	13.2	C	17.7
			SB	--	--	B	12.7	--	--	B	11.4

As shown in Table 5.1, the study intersections are expected to remain operating with acceptable LOS for both the AM and PM peak periods with the exception of the Spout Springs Road at Union Circle Intersection.

The westbound approach on Union Circle at Spout Springs Road with the proposed development is expected to remain operating at LOS F in both peak periods, with increase in the approach delays compared to the Background scenario.

5.2. BACK OF QUEUE ANALYSIS

A Back of Queue (BOQ) analysis was used to determine the storage needs for the Opening Year 2028 scenarios. The 95th percentile BOQ length was calculated for specific movements at each intersection. The queue is expected to be the reported length or shorter 95 percent of the time. The BOQ results were taken from the capacity analysis reports for each study intersection (refer to **Appendix D** for the capacity analysis reports). Table 5.2 lists the BOQ lengths for each peak hour for the Opening Year 2028 – Background and With Project scenarios.

Table 5.2 – Opening Year 2028 Back of Queue Results

No.	Intersection	Intersection Control	Movement	Existing/Proposed Full Length Storage (feet)	95th Percentile Back of Queue (feet)			
					Background 2028		With Project 2028	
					AM Peak	PM Peak	AM Peak	PM Peak
1	Spout Springs Road @ Cherokee Bluff High School/Spout Springs Elementary	Signalized	EBL	N/A	170	25	170	25
			EBT	N/A	25	25	25	25
			EBR	N/A	39	0	39	0
			WBL	290'	93	52	94	55
			WBT	N/A	27	32	27	32
			NBL	350'	65	25	66	25
			NBT	N/A	310	187	319	193
			NBR	200'	41	30	42	30
			SBL	350'	44	45	44	45
			SBT	N/A	204	188	205	196
			SBR	275'	34	0	34	0
2	Spout Springs Road @ Union Circle	Side Street Stop Controlled	WBL	N/A	175	200	225	178
			WBR	350'	75	50	100	50
			NBU	320'	0	0	0	0
			NBR	200'	0	0	0	0
			SBL	390'	50	25	50	50
3	Union Circle @ Elderberry Lane/Site Driveway	Side Street Stop Controlled	EBL	N/A	0	0	0	25
			EBT+R	N/A	0	0	0	0
			WBL	N/A	0	0	0	0
			WBT+R	150'	0	0	0	0
			NB	N/A	25	25	25	25
			SB	N/A	--	--	25	25

As shown in Table 5.2, the results of the BOQ analysis indicate that each of the study intersections is expected to have sufficient storage to accommodate the project-generated traffic for each of the Opening Year 2028 scenarios.

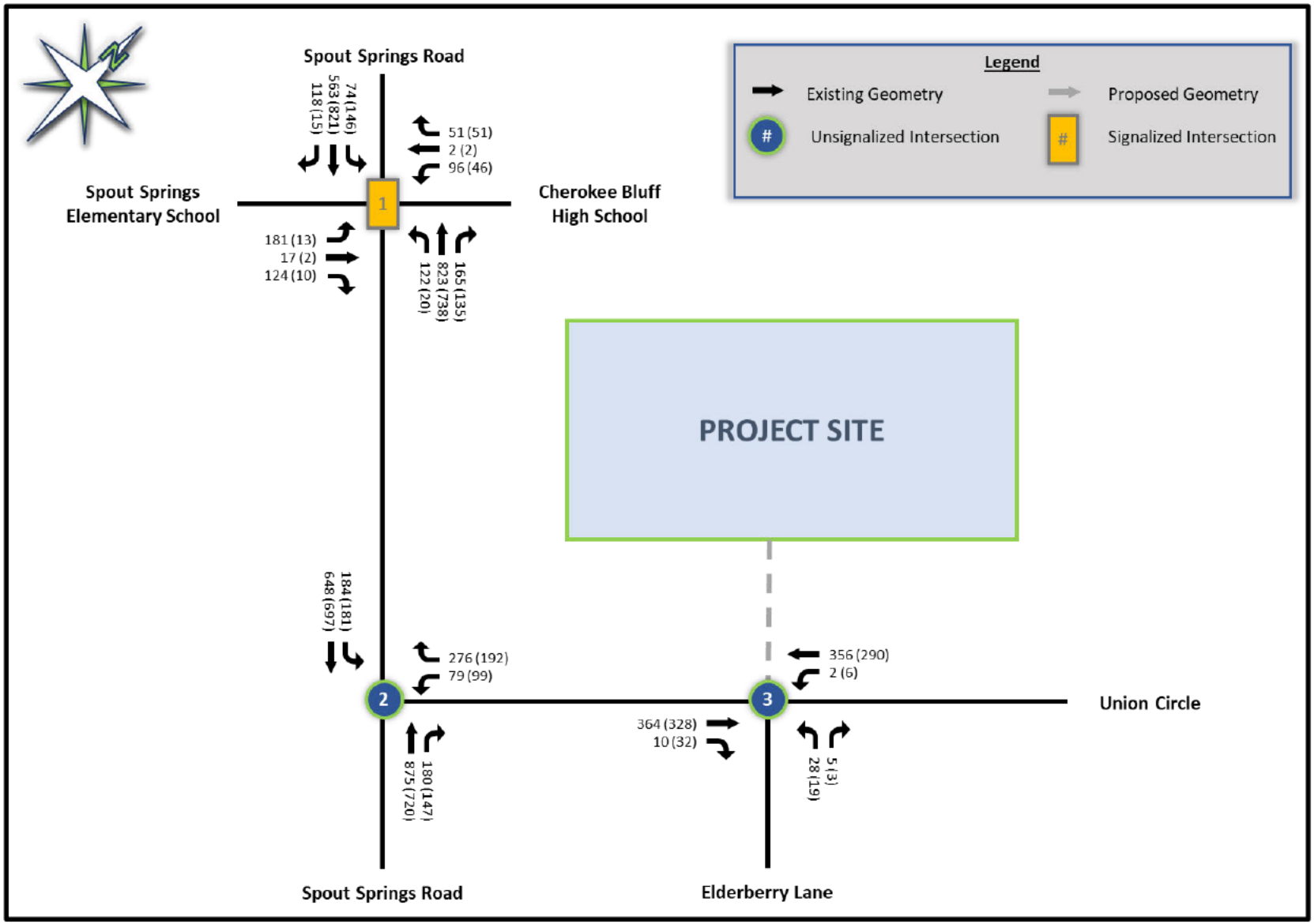


Figure 5.1 – Opening Year 2028 – Background Peak Hour Traffic

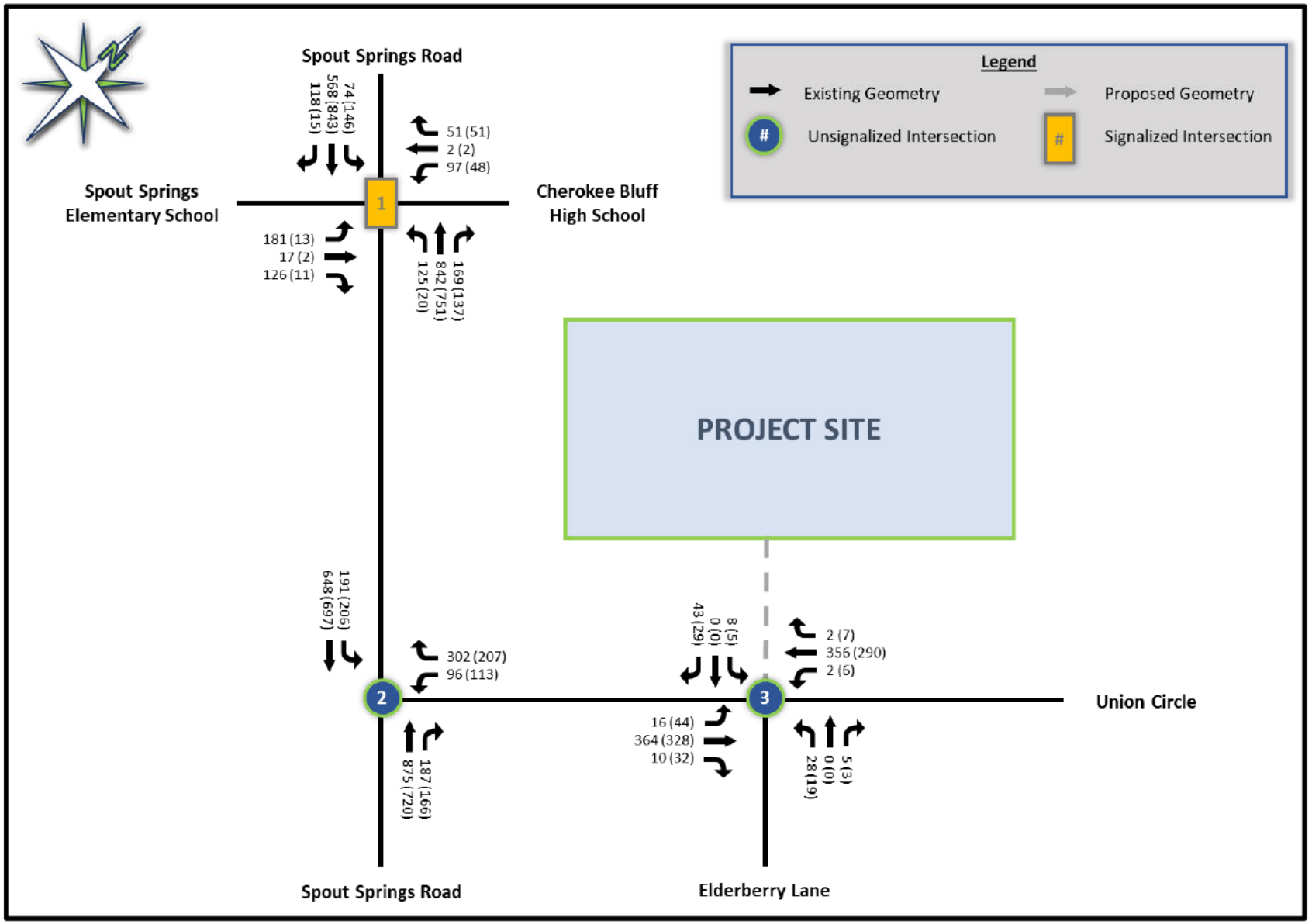


Figure 5.2 – Opening Year 2028 – With Project Peak Hour Traffic

6. SIGNAL WARRANT ANALYSIS

A signal warrant analysis was conducted for the intersection Spout Springs Road and Union Circle using the criteria in the Manual on Uniform Traffic Control Devices (MUTCD) 11th Edition published by Federal Highway Administration (FHWA). The MUTCD states that an investigation of the need for a traffic signal shall include an analysis of the applicable factors contained in the nine traffic signal warrants and other factors related to the existing operation and safety at the study location. Each of the following signal warrants was considered and were evaluated where appropriate.

- Warrant 1, Eight-Hour Vehicular Volume
  - Evaluated for Existing Year 2026 and Opening Year 2028 – Background & With Project
- Warrant 2, Four-Hour Vehicular Volume
  - Evaluated for Existing Year 2026 and Opening Year 2028 – Background & With Project
- Warrant 7, Crash Experience
  - Evaluated using crash data between 2021 and 2025

Warrants 1 and 2 were evaluated using PC Warrants software for the Existing 2026, Background 2028, and With Project 2028 volumes. 100% right turn reduction was applied to the side street on Union Circle to reflect the dedicated right-turn lane present at this approach. Warrant 7 was evaluated based on the one-year and three-year criteria presented in Section 4C.08 of MUTCD and the historical crash data obtained from GDOT's Numetric platform. The remaining warrants do not apply to the study intersection, and thus, were not evaluated. The PC Warrants reports are included in **Appendix E**.

Figure 6.1 – Signal Warrant Analysis Results

Signal Warrants	Warrant Met?		
	Existing 2026	Background 2028	With Project 2028
Warrant 1A - Minimum Vehicular Volume	No (0 / 8 Hours)	No (0 / 8 Hours)	No (0 / 8 Hours)
Warrant 1B - Interruption of Continuous Volumes	No (0 / 8 Hours)	No (4 / 8 Hour)	No (7 / 8 Hour)
Warrant 1C - Combination of Warrants	No (0 / 8 Hours)	No (0 / 8 Hours)	No (1 / 8 Hours)
Warrant 2 - Four Hour Volumes	No (0 / 4 Hours)	**Yes (4 / 4 Hours)**	**Yes (6 / 4 Hours)**
Warrant 7 - Crash Experience (One-Year Period)	No (3 / 4 Crashes)		
Warrant 7 - Crash Experience (Three-Year Period)	**Yes (11 / 5 Crashes)**		

The Opening Year 2028 – Background and With Project volumes at the intersection Spout Springs Road and Union Circle are expected to meet the minimum requirements for Warrant 2 – Four Hour Volumes.

Warrant 7 – Crash Experience requires a minimum of 4 crashes susceptible to correction by a traffic signal over a 12-month period, or 5 crashes over a 36-month period. Over the 12-month period from January 2025 to December 2025, three (3) crashes of a type that are considered susceptible to correction by a traffic signal. Over the 36-month period from January 2022 to December 2024, there were eleven (11) crashes that are considered susceptible to correction by a traffic signal. However, no scenarios satisfy the 8-hour volume thresholds stated in Criteria C of Warrant 7, and thus, Warrant 7 is not satisfied for the study intersection.

Based on the results of the traffic signal warrant analysis, the Opening Year 2028 – Background and Opening Year 2028 - With Project volumes at the intersection of Spout Springs Road and Union Circle are expected to warrant a traffic signal.

7. AUXILIARY LANES

The GDOT manual of *Regulations for Driveway and Encroachment Control* requires that the need for auxiliary turn lanes be determined in conjunction with commercial driveway permits on state-maintained roadways. The proposed project has one (1) driveway that provides access a minor collector roadway. The proposed driveway was evaluated based on the traffic expected for the Opening Year 2028 – With Project scenarios. No other scenarios were evaluated for auxiliary turn lanes. The intersection evaluated is as follows:

- Union Circle at Elderberry Drive/Site Driveway

7.1. RIGHT-TURN LANES

The minimum requirements for right-turn deceleration lanes can be found in Section 4.9.1.1 of the *Regulations for Driveway and Encroachment Control* manual by GDOT. Below is a recreation of "Table 4-6 – Minimum Volume Requiring Right Turn Lanes" taken from that manual:

Table 7.1 – Minimum Volumes Requiring Right-Turn Lanes

Posted Speed	2 Lane Routes		More than 2 Lanes on Main Road	
	AADT		AADT	
	< 6,000	>= 6,000	< 10,000	>= 10,000
35 MPH or Less	200 RTV a day	100 RTV a day	200 RTV a day	100 RTV a day
40 to 50 MPH	150 RTV a day	75 RTV a day	150 RTV a day	75 RTV a day
55 to 60 MPH	100 RTV a day	50 RTV a day	100 RTV a day	50 RTV a day
>= 65 MPH	Always	Always	Always	Always

- Union Circle at Elderberry Drive/Site Driveway
    - Union Circle is a 35-mph roadway with two lanes and a 2025 AADT of 5,410 vehicles along this roadway segment. Therefore, a threshold for warranting a right-turn lane is 200 right-turning vehicles a day. The westbound right-turn movement from Union Circle is NOT expected to meet that volume threshold. While a westbound right-turn lane on Union Circle is not required per GDOT standard, the existing right-turn lane at the intersection could be utilized for the proposed site driveway.

7.2. LEFT-TURN LANES

The minimum requirements for a left-turn lane can be found in Section 4.9.1.2 of the *Regulations for Driveway and Encroachment Control* manual by GDOT. Below is a recreation of "Table 4-7a – Minimum Volumes Requiring Left Turn Lanes" taken from that manual:

Table 7.2 – Minimum Volumes Requiring Left-Turn Lanes

Posted Speed	2 Lane Routes		More than 2 Lanes on Main Road	
	ADT		ADT	
	< 6,000	>= 6,000	< 10,000	>= 10,000
35 MPH or Less	300 LTV a day	200 LTV a day	400 LTV a day	300 LTV a day
40 to 50 MPH	250 LTV a day	175 LTV a day	325 LTV a day	250 LTV a day
>= 55 MPH	200 LTV a day	150 LTV a day	250 LTV a day	200 LTV a day

Based on the above table, a left-turn lane would be required as follows:

- Union Circle at Elderberry Drive/Site Driveway
    - Union Circle is a 35-mph roadway with two lanes and approximately 5,410 vehicles (ADT) along this roadway segment. Therefore, a threshold for warranting a left-turn lane is 300 left-turning vehicles a day. The eastbound left-turn movement from Union Circle is NOT expected to meet that volume threshold. Therefore, a southbound left-turn lane is not required for the Opening Year 2028 – With Project scenarios.

8. MITIGATION

Based on the results of the data analysis for the study area, there are locations where vehicle delays are inadequate for the Background and With Project scenarios. Based on the results of the signal warrant analysis, the following recommendations are expected to mitigate any negative impacts from proposed project.

8.1. SUMMARY OF RECOMMENDATIONS

- Spout Springs Road at Union Circle:
    - Install a traffic signal at the intersection

The results of the With Project 2028 – Mitigated analysis is shown in Tables 8.1 and 8.2. Detailed reports for both the capacity and BOQ analysis are included in **Appendix F.**

Table 8.1 – Spout Springs Road and Union Circle Mitigation Analysis Results

Approach	Opening Year 2028											
	AM Peak						PM Peak					
	Background		With Project		Mitigated		Background		With Project		Mitigated	
	LOS	sec/veh	LOS	sec/veh	LOS	sec/veh	LOS	sec/veh	LOS	sec/veh	LOS	sec/veh
Overall Intersection	--	--	--	--	C	20.5	--	--	--	--	B	15.4
WB	F	84.6	F	124.8	D	47.8	F	86.2	F	138.5	D	47.0
NB	A	0.0	A	0.0	B	18.6	A	0.0	A	0.0	B	12.9
SBL	B	13.2	B	13.4	B	10.0	B	11.3	B	11.7	A	6.8

As shown in Table 8.1, the With Project 2028 – Mitigated scenario with traffic signal at Spout Springs Road and Union Circle is expected to have LOS D or better on all approaches, with significant improvement on the westbound approach compared to the Background and With Project scenarios.

Table 8.2 – Spout Springs Road and Union Circle Mitigation Back of Queue Results

Movement	Existing/Proposed Full Length Storage (feet)	95th Percentile Back of Queue (feet)					
		Background 2028		With Project 2028		Mitigated 2028	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
WBL	N/A	175	200	225	250	109	122
WBR	350'	75	50	100	50	78	63
NBT	N/A	--	--	--	--	275	201
NBR	200'	0	0	0	0	38	33
SBT	N/A	--	--	--	--	103	127
SBL	390'	50	25	50	50	194	101

As shown in Table 8.2, the With Project 2028 – Mitigated scenarios are expected to reduce westbound left-turn queues on Union Circle by half compared to those in the Background and With Project scenario thresholds. The northbound and southbound approaches on Spout Spring Road also expected to maintain reasonable operations with a traffic signal.

9. CONCLUSIONS

The residential development will consist of a mix of single-family detached housing and townhomes, with 54 single-family detached homes and 66 townhomes. The proposed development is expected to be built out in the year 2028. Currently, the proposed project site is largely undeveloped and contains only a single residential development.

Access to the site would be provided by a single full access driveway on Union Circle. The proposed project is expected to generate a total of 925 total daily trips on a typical weekday, with 69 new trips in the AM peak and 84 new trips in the PM peak.

For the Existing Year 2026 capacity analysis, each of the study intersections is currently operating with acceptable LOS during both the AM and PM peak periods, with the exception of the westbound movement at the intersection of Spout Springs Road and Union Circle, which operates at an inadequate LOS F.

For the Opening Year 2028 scenarios, each of the study intersections is expected to operate with acceptable LOS for both the AM and PM peak periods with the exception of the Spout Springs Road and Union Circle. For both Background and With Project scenarios in 2028, the westbound approach at the intersection of Spout Springs Road and Union Circle is expected to operate inadequately with LOS F.

For the Opening Year 2028 scenarios, the results of the BOQ analysis indicate that all of the three (3) study intersections are expected to have sufficient storage to accommodate the project generated traffic.

A traffic signal warrant analysis indicates that a traffic signal is warranted at the intersection of Spout Springs Road and Union Circle for the Background and With Project scenarios for the Warrant 2 – Four Hour in 2028.

The need for auxiliary lanes was also evaluated at the intersection of Union Circle and Elderberry Road/Site Driveway. Based on the requirements provided in the GDOT manual *Regulations for Driveway and Encroachment Control*, it was determined that auxiliary lanes should not be considered for the Opening Year 2028– with Project scenarios.

A mitigation scenario was evaluated for the With Project scenario with the installation of a traffic signal at Spout Springs Road and Union Circle. The results indicated that this mitigation will improve the westbound operation on Union Circle from LOS F to LOS D, without significant impact on the mainline of Spout Springs Road. The 95th percentile queue lengths are also expected to reduce by half compared to those in the Background and With Project scenarios.

Based on the information presented in this report, Keck & Wood recommends the following:

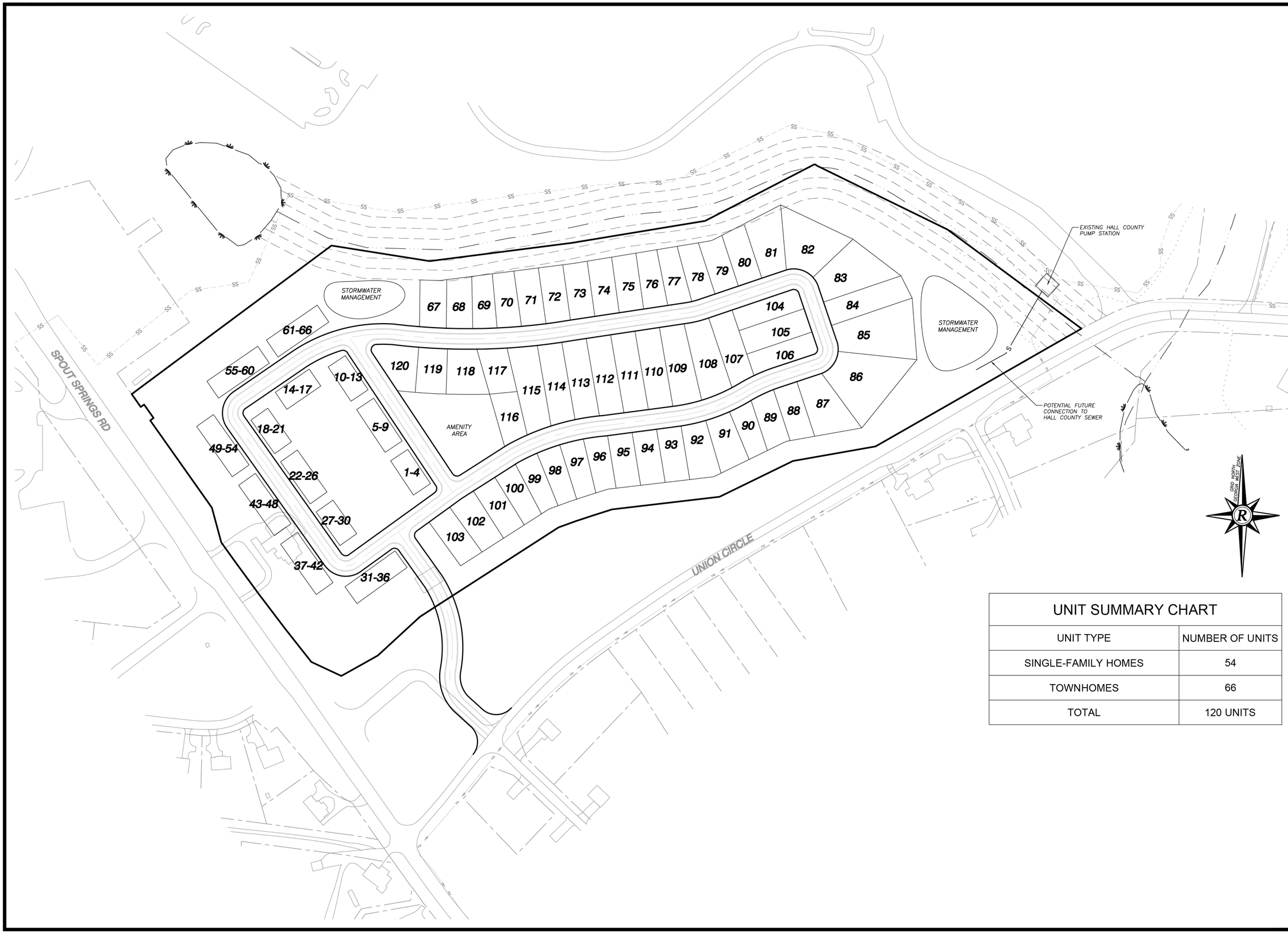
- **Installation of a traffic signal at the intersection of Spout Springs Road and Union Circle**

While the proposed development is expected to increase delay on the westbound approach of Union Circle at Spout Springs Road, the installation of a traffic signal at this intersection is expected to mitigate westbound delays and queues in both the Background and With Project scenarios.

10. REFERENCES

1. Trip Generation, 12th Edition + Supplement, Institute of Transportation Engineers, Washington, DC, 2021.
2. Synchro, Version 12, Trafficware Ltd., Sugar Land, TX, 2019.
3. Highway Capacity Manual, 6th Edition, Transportation Research Board, Washington, DC, 2016.

APPENDIX A – SITE LAYOUT



UNIT SUMMARY CHART	
UNIT TYPE	NUMBER OF UNITS
SINGLE-FAMILY HOMES	54
TOWNHOMES	66
TOTAL	120 UNITS

DCCM Infrastructure, Inc.
425 Oak Street NW, Gainesville, GA 30501
770.718.0600 | DCCM.com

LOT LAYOUT VERSION 4
FOR:

CLARK CHARLES CURTIS TRACT
SPOUT SPRINGS ROAD

LOCATED IN:
HALL COUNTY GEORGIA

NO.	DATE	REVISIONS DESCRIPTION

ANY CHANGES OR ALTERATIONS MADE TO THESE CONSTRUCTION DRAWINGS WITHOUT THE KNOWLEDGE AND CONSENT OF THE SEAL AUTHOR SHOWN HEREON AND ANY LIABILITY ASSOCIATED WITH THIS PROJECT. ORIGINAL DRAWINGS ARE KEPT ON FILE FOR VERIFICATION OF ANY CHANGES.

GRAPHIC SCALE
50' 0' 100' 200'

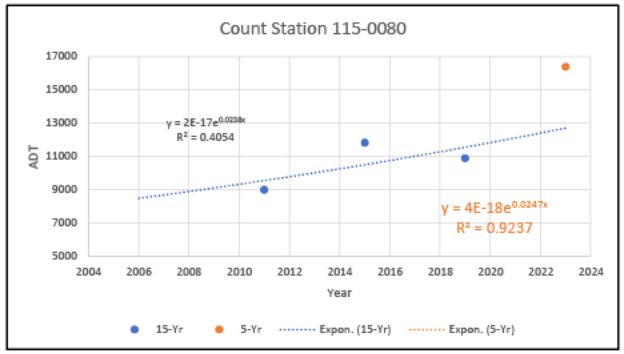
SHEET 1 OF 1

DATE: 09/01/2026
SCALE: 1"=100'
JOB NO. G226006.PUL
DWG NO. PRELIM.dwg
DRAWN BY: BGA/SHU

APPENDIX B – TRAFFIC COUNTS & GROWTH RATE CALCULATIONS

Growth Rate Calculations

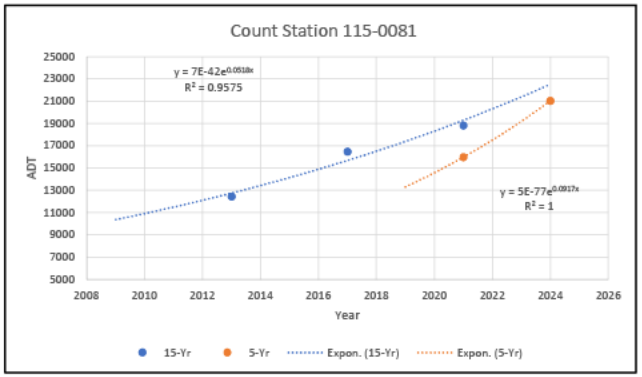
Count Station #	139-0437		
Count Station Description	Spout Springs Rd south of Williams Rd		
Functional Classification	Minor Arterial (Urban)		
Years	ADT	AADT	Notes
2006			
2007			
2008			
2009			
2010			
2011	9009		
2012			
2013			
2014			
2015	11823		
2016			
2017			
2018			
2019	10895	11200	
2020			
2021			
2022			
2023			
2024			
2025	16401	14300	



5-Year Growth Rate:
15-Year Growth Rate: 2.38%

Average 5-Year Growth Rate:	3.3%
Average 15-Year Growth Rate:	3.7%
Proposed:	3.5%

Count Station #	139-0441		
Count Station Description	Spout Springs Rd south of Ivy Springs Dr		
Functional Classification	Minor Arterial (Urban)		
Years	ADT	AADT	Notes
2006			
2007			
2008			
2009			
2010	12434		
2011			
2012			
2013			
2014	16450		
2015			
2016			
2017			
2018	18816	16400	
2019			
2020			
2021			
2022	15970	13400	
2023			
2024			

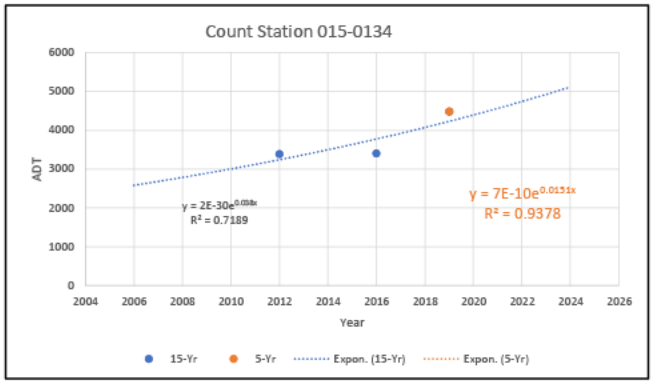


5-Year Growth Rate: 9.17%
15-Year Growth Rate: 5.18%

Growth Rate Calculations

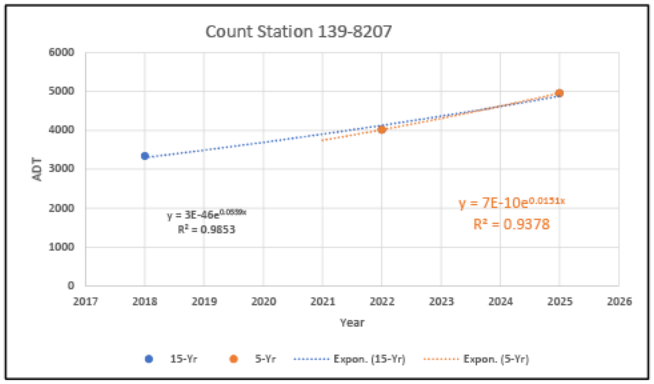
2025	21026	19200	

Count Station #	139-8206		
Count Station Description	Union Circle east of Spout Springs Rd		
Functional Classification	Minor Collector (Urban)		
Years	ADT	AADT	Notes
2006			
2007			
2008			
2009			
2010			
2011			
2012	3390		
2013			
2014			
2015			
2016	3402		
2017			
2018			
2019	4488		
2020			
2021			
2022			
2023			
2024			
2025	6246		



5-Year Growth Rate:
15-Year Growth Rate: 3.80%

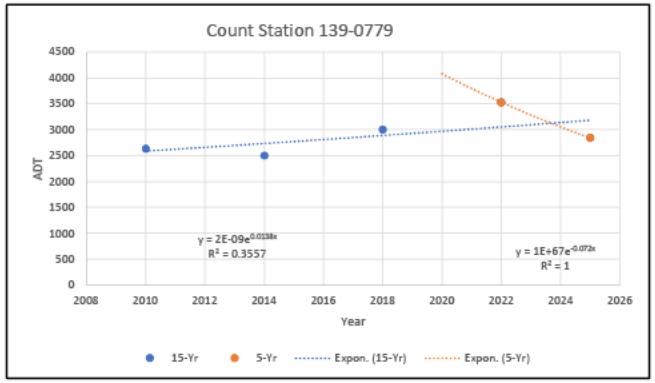
Count Station #	139-8207		
Count Station Description	Union Church Rd north of Deaton Creek Pkwy		
Functional Classification	Minor Collector (Urban)		
Years	ADT	AADT	Notes
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
2015			
2016			
2017			
2018	3341		
2019			
2020			
2021			
2022	4018		
2023			
2024			
2025	4962		



5-Year Growth Rate: 1.51%
15-Year Growth Rate: 5.59%

Growth Rate Calculations

Count Station #	139-0779		
Count Station Description	Cash Rd north of Glen Forrest Dr		
Functional Classification	Minor Collector (Urban)		
Years	ADT	AADT	Notes
2006			
2007			
2008			
2009			
2010	2636		
2011			
2012			
2013			
2014	2500		
2015			
2016			
2017			
2018	3006		
2019			
2020			
2021			
2022	3531		
2023			
2024			
2025	2842		

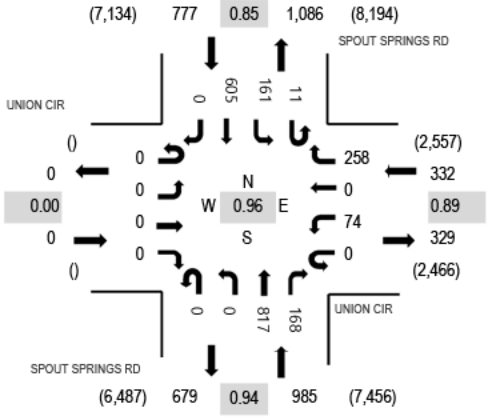


5-Year Growth Rate: -0.72%
15-Year Growth Rate: 1.38%

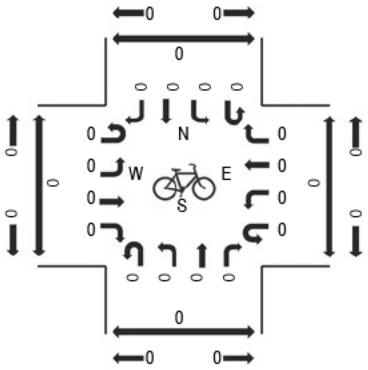
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 2 SPOUT SPRINGS RD & UNION CIR AM
Date: Thursday, August 27, 2026
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

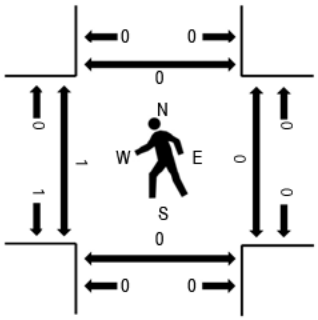
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	UNION CIR Eastbound				UNION CIR Westbound				SPOUT SPRINGS RD Northbound				SPOUT SPRINGS RD Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
6:00 AM	0	0	0	0	0	6	0	24	0	0	96	8	0	6	43	0	183	907	0	0	0	0
6:15 AM	0	0	0	0	0	7	0	29	0	0	109	10	0	7	48	0	210	1,033	0	0	0	0
6:30 AM	0	0	0	0	0	8	0	35	0	0	123	11	0	9	53	0	239	1,306	0	0	0	0
6:45 AM	0	0	0	0	0	10	0	43	0	0	139	14	0	11	58	0	275	1,608	0	0	0	0
7:00 AM	0	0	0	0	0	12	0	50	0	0	155	16	1	13	62	0	309	1,880	0	0	0	0
7:15 AM	0	0	0	0	0	7	0	42	0	0	216	32	4	35	147	0	483	2,094	0	0	0	0
7:30 AM	0	0	0	0	0	15	0	71	0	0	221	22	3	42	167	0	541	2,037	0	0	0	0
7:45 AM	0	0	0	0	0	23	0	74	0	0	202	59	4	47	138	0	547	1,828	0	0	0	0
8:00 AM	0	0	0	0	0	29	0	71	0	0	178	55	0	37	153	0	523	1,628	1	0	0	0
8:15 AM	0	0	0	0	0	16	0	55	0	0	151	23	0	31	150	0	426	1,410	2	0	0	0
8:30 AM	0	0	0	0	0	15	0	37	0	0	139	20	0	24	97	0	332	1,284	0	0	0	0
8:45 AM	0	0	0	0	0	19	0	31	0	0	164	24	0	18	91	0	347	1,255	0	0	0	0
9:00 AM	0	0	0	0	0	14	0	30	0	0	141	18	0	15	87	0	305	1,202	0	0	0	0
9:15 AM	0	0	0	0	0	18	0	31	0	0	118	18	0	28	87	0	300	1,214	0	0	0	0
9:30 AM	0	0	0	0	0	12	0	31	0	0	112	19	0	25	104	0	303	1,182	0	0	0	0
9:45 AM	0	0	0	0	0	13	0	37	0	0	129	10	0	22	83	0	294	1,147	0	0	0	0
10:00 AM	0	0	0	0	0	14	0	36	0	0	122	14	1	21	109	0	317	1,090	0	0	0	0
10:15 AM	0	0	0	0	0	11	0	22	0	0	106	11	0	24	94	0	268	1,048	0	0	0	0
10:30 AM	0	0	0	0	0	16	0	19	0	0	97	15	0	21	100	0	268	1,069	0	0	0	0
10:45 AM	0	0	0	0	0	6	0	23	0	0	99	11	0	18	80	0	237	1,099	0	0	0	0
11:00 AM	0	0	0	0	0	15	0	28	0	0	97	13	0	15	107	0	275	1,141	0	0	0	0
11:15 AM	0	0	0	0	0	24	0	18	0	0	113	11	0	18	105	0	289	1,183	0	0	0	0
11:30 AM	0	0	0	0	0	11	0	32	0	0	113	22	0	17	103	0	298	1,219	0	0	0	0
11:45 AM	0	0	0	0	0	19	0	16	0	0	113	10	0	13	108	0	279	1,235	0	0	0	0
12:00 PM	0	0	0	0	0	10	0	26	0	0	133	12	0	22	114	0	317	1,257	0	0	0	0
12:15 PM	0	0	0	0	0	15	0	27	0	0	122	29	0	23	109	0	325	1,240	0	0	0	0
12:30 PM	0	0	0	0	0	13	0	28	0	0	113	11	0	24	125	0	314	1,218	0	0	0	0
12:45 PM	0	0	0	0	0	14	0	19	0	0	111	20	0	26	111	0	301	1,215	0	0	0	0
1:00 PM	0	0	0	0	0	9	0	25	0	0	109	14	2	20	121	0	300	1,233	0	0	0	0
1:15 PM	0	0	0	0	0	16	0	32	0	0	107	13	3	32	100	0	303	1,285	0	0	0	0
1:30 PM	0	0	0	0	0	20	0	29	0	0	110	13	0	20	119	0	311	1,329	0	0	0	0
1:45 PM	0	0	0	0	0	11	0	22	0	0	112	18	1	27	128	0	319	1,401	0	0	0	0
2:00 PM	0	0	0	0	0	12	0	46	0	0	114	20	0	32	128	0	352	1,440	0	0	0	0
2:15 PM	0	0	0	0	0	20	0	33	0	0	117	24	0	41	112	0	347	1,459	0	0	0	0

2:30 PM	0	0	0	0	0	13	0	44	0	0	109	33	0	48	136	0	383	1,513	0	0	0	0
2:45 PM	0	0	0	0	0	17	0	33	0	0	111	33	0	40	124	0	358	1,632	0	0	0	0
3:00 PM	0	0	0	0	0	18	0	32	1	0	107	43	2	48	120	0	371	1,727	0	0	0	0
3:15 PM	0	0	0	0	0	26	0	33	0	0	121	30	1	44	146	0	401	1,738	0	0	0	0
3:30 PM	0	0	0	0	0	37	0	82	0	0	118	12	0	61	192	0	502	1,793	0	0	0	0
3:45 PM	0	0	0	0	0	25	0	39	0	0	128	17	0	45	199	0	453	1,758	0	0	0	0
4:00 PM	0	0	0	0	0	11	0	41	0	0	142	23	1	48	116	0	382	1,741	0	0	0	0
4:15 PM	0	0	0	0	0	28	0	44	0	0	157	31	1	47	148	0	456	1,845	0	0	0	0
4:30 PM	0	0	0	0	0	21	0	26	0	0	171	26	0	44	179	0	467	1,878	0	0	0	0
4:45 PM	0	0	0	0	0	22	0	42	0	0	165	27	1	36	143	0	436	1,894	0	0	0	0
5:00 PM	0	0	0	0	0	20	0	51	1	0	175	21	0	36	182	0	486	1,901	0	0	0	0
5:15 PM	0	0	0	0	0	17	0	43	0	0	184	33	0	36	176	0	489		0	0	0	0
5:30 PM	0	0	0	0	0	23	0	46	0	0	171	41	0	54	148	0	483		0	0	0	0
5:45 PM	0	0	0	0	0	32	0	39	0	0	142	42	0	43	145	0	443		0	0	0	0

Peak Rolling Hour Flow Rates

	Eastbound				Westbound				Northbound				Southbound				
Vehicle Type	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	0	0	0	0	74	0	256	0	0	808	165	11	148	589	0	2,051
Mediums	0	0	0	0	0	0	0	2	0	0	9	3	0	13	16	0	43
Total	0	0	0	0	0	74	0	258	0	0	817	168	11	161	605	0	2,094

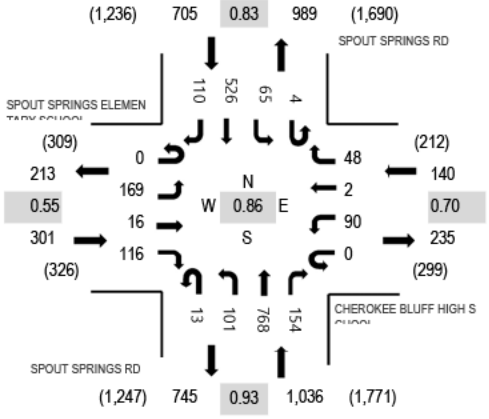
Heavy Vehicle Percentage and Peak Hour Factor

	Eastbound				Westbound				Northbound				Southbound				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total
Heavy Vehicle %		0.0%				0.6%				1.2%				3.7%			2.1%
Heavy Vehicle %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	1.1%	1.8%	0.0%	8.1%	2.6%	0.0%	2.1%
Peak Hour Factor		0.00				0.89				0.94				0.85			0.96
Peak Hour Factor	0.00	0.00	0.00	0.00	0.00	0.72	0.00	0.92	0.25	0.00	0.92	0.71	0.75	0.82	0.93	0.00	0.96

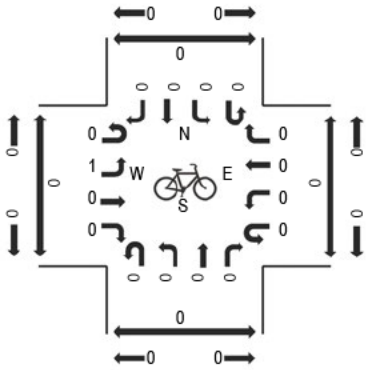
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 1 SPOUT SPRINGS RD & CHEROKEE BLUFF HIGH SCHOOL AM
Date: Thursday, August 27, 2026
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

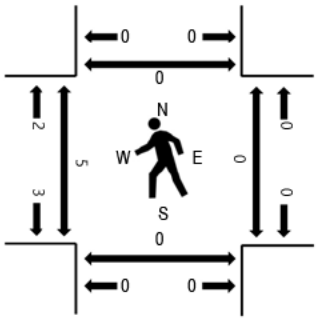
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	SPOUT SPRINGS ELEMENTARY SCHOOL Eastbound				CHEROKEE BLUFF HIGH SCHOOL Westbound				SPOUT SPRINGS RD Northbound				SPOUT SPRINGS RD Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	4	1	2	0	0	0	0	1	28	152	2	3	6	91	43	333	2,039	0	1	0	0
7:15 AM	0	71	7	59	0	17	1	2	1	57	179	3	1	8	100	57	563	2,182	0	0	0	0
7:30 AM	0	75	8	46	0	7	1	6	2	34	219	23	2	19	145	46	633	2,025	0	0	0	0
7:45 AM	0	18	1	9	0	26	0	17	3	9	209	53	1	22	138	4	510	1,712	2	0	0	0
8:00 AM	0	5	0	2	0	40	0	23	7	1	161	75	0	16	143	3	476	1,506	3	0	0	0
8:15 AM	0	4	0	1	0	31	0	25	3	1	167	28	0	5	140	1	406		1	0	0	0
8:30 AM	0	5	0	2	0	5	0	6	0	1	169	8	0	2	116	6	320		0	0	0	0
8:45 AM	0	4	1	1	0	2	0	3	1	7	159	8	0	3	106	9	304		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	163	15	115	0	80	2	44	12	101	762	150	4	65	512	110	2,135
Mediums	0	6	1	1	0	10	0	4	1	0	6	4	0	0	14	0	47
Total	0	169	16	116	0	90	2	48	13	101	768	154	4	65	526	110	2,182

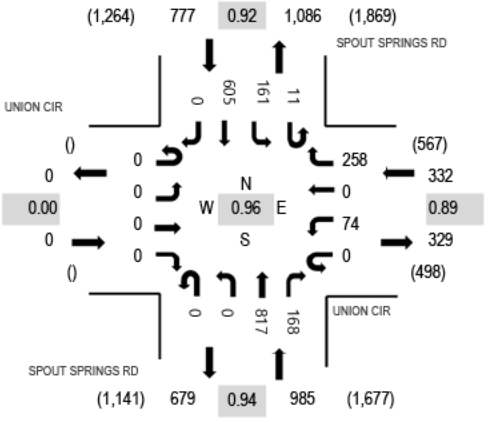
Heavy Vehicle Percentage and Peak Hour Factor

	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Heavy Vehicle %		2.7%				10.0%				1.1%				2.0%			2.2%
Heavy Vehicle %	0.0%	3.6%	6.3%	0.9%	0.0%	11.1%	0.0%	8.3%	7.7%	0.0%	0.8%	2.6%	0.0%	0.0%	2.7%	0.0%	2.2%
Peak Hour Factor		0.55				0.70				0.93				0.83			0.86
Peak Hour Factor	0.00	0.56	0.53	0.49	0.00	0.65	0.50	0.71	0.54	0.56	0.88	0.60	0.58	0.74	0.98	0.66	0.86

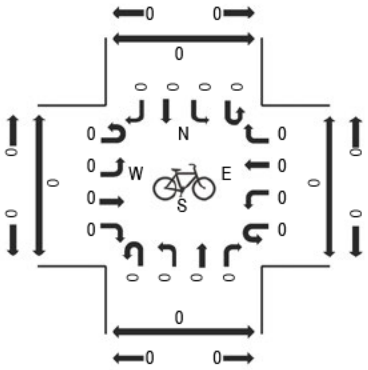
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Location: 2 SPOUT SPRINGS RD & UNION CIR AM
Date: Thursday, August 27, 2026
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

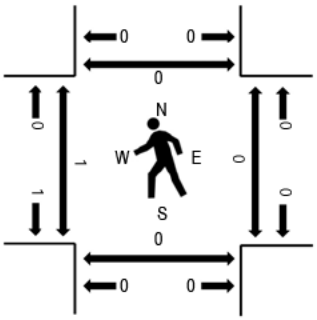
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	UNION CIR Eastbound				UNION CIR Westbound				SPOUT SPRINGS RD Northbound				SPOUT SPRINGS RD Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	0	0	0	0	12	0	50	0	0	155	16	1	13	62	0	309	1,880	0	0	0	0
7:15 AM	0	0	0	0	0	7	0	42	0	0	216	32	4	35	147	0	483	2,094	0	0	0	0
7:30 AM	0	0	0	0	0	15	0	71	0	0	221	22	3	42	167	0	541	2,037	0	0	0	0
7:45 AM	0	0	0	0	0	23	0	74	0	0	202	59	4	47	138	0	547	1,828	0	0	0	0
8:00 AM	0	0	0	0	0	29	0	71	0	0	178	55	0	37	153	0	523	1,628	1	0	0	0
8:15 AM	0	0	0	0	0	16	0	55	0	0	151	23	0	31	150	0	426		2	0	0	0
8:30 AM	0	0	0	0	0	15	0	37	0	0	139	20	0	24	97	0	332		0	0	0	0
8:45 AM	0	0	0	0	0	19	0	31	0	0	164	24	0	18	91	0	347		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	0	0	0	0	74	0	256	0	0	808	165	11	148	589	0	2,051
Mediums	0	0	0	0	0	0	0	2	0	0	9	3	0	13	16	0	43
Total	0	0	0	0	0	74	0	258	0	0	817	168	11	161	605	0	2,094

Heavy Vehicle Percentage and Peak Hour Factor

	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Heavy Vehicle %		0.0%				0.6%				1.2%				3.7%			2.1%
Heavy Vehicle %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	1.1%	1.8%	0.0%	8.1%	2.6%	0.0%	2.1%
Peak Hour Factor		0.00				0.89				0.94				0.92			0.96
Peak Hour Factor	0.00	0.00	0.00	0.00	0.00	0.72	0.00	0.92	0.00	0.00	0.92	0.71	0.75	0.86	0.91	0.00	0.96

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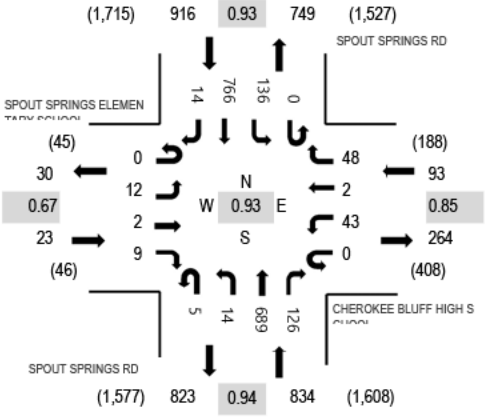
Location: 1 SPOUT SPRINGS RD & CHEROKEE BLUFF HIGH SCHOOL PM

Date: Thursday, August 27, 2026

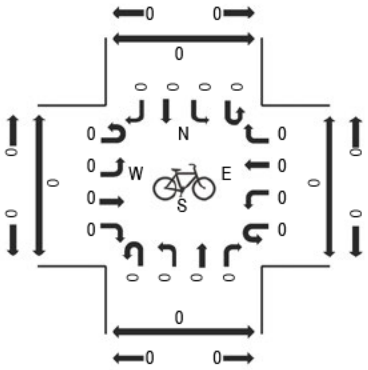
Peak Hour: 05:00 PM - 06:00 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

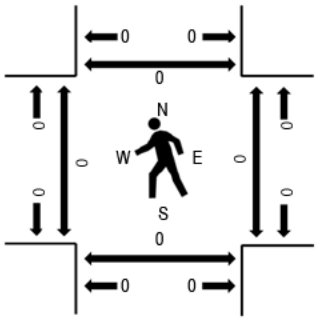
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	SPOUT SPRINGS ELEMENTARY SCHOOL Eastbound				CHEROKEE BLUFF HIGH SCHOOL Westbound				SPOUT SPRINGS RD Northbound				SPOUT SPRINGS RD Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	3	0	1	0	11	0	15	0	0	179	8	0	11	156	1	385	1,691	0	0	0	0
4:15 PM	0	4	0	5	0	10	0	11	0	0	183	12	0	14	175	4	418	1,806	0	0	0	0
4:30 PM	0	6	0	1	0	18	0	10	0	0	183	14	0	25	200	7	464	1,856	1	0	0	0
4:45 PM	0	3	0	0	0	7	0	13	0	0	168	27	0	33	170	3	424	1,864	0	0	0	0
5:00 PM	0	3	0	1	0	11	0	12	1	1	193	31	0	29	212	6	500	1,866	0	0	0	0
5:15 PM	0	4	2	3	0	5	0	7	0	7	176	37	0	30	193	4	468		0	0	0	0
5:30 PM	0	4	0	4	0	16	2	15	4	3	173	31	0	40	178	2	472		0	0	0	0
5:45 PM	0	1	0	1	0	11	0	14	0	3	147	27	0	37	183	2	426		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	12	2	9	0	43	2	48	5	14	684	125	0	136	764	14	1,858
Mediums	0	0	0	0	0	0	0	0	0	0	5	1	0	0	2	0	8
Total	0	12	2	9	0	43	2	48	5	14	689	126	0	136	766	14	1,866

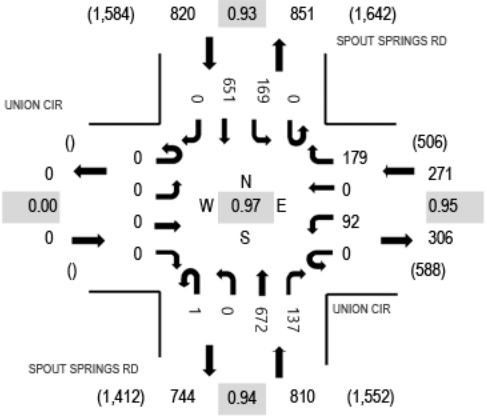
Heavy Vehicle Percentage and Peak Hour Factor

	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Heavy Vehicle %		0.0%				0.0%				0.7%				0.2%			0.4%
Heavy Vehicle %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.8%	0.0%	0.0%	0.3%	0.0%	0.4%
Peak Hour Factor		0.67				0.85				0.94				0.93			0.93
Peak Hour Factor	0.00	0.67	0.25	0.56	0.00	0.64	0.25	0.82	0.31	0.50	0.94	0.85	0.00	0.85	0.91	0.71	0.93

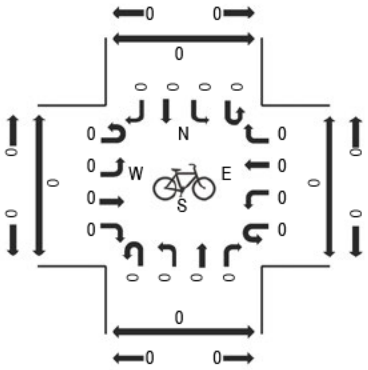
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 2 SPOUT SPRINGS RD & UNION CIR PM
Date: Thursday, August 27, 2026
Peak Hour: 05:00 PM - 06:00 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

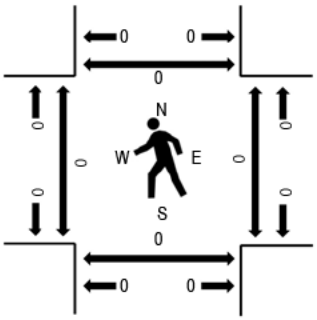
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	UNION CIR Eastbound				UNION CIR Westbound				SPOUT SPRINGS RD Northbound				SPOUT SPRINGS RD Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	0	0	0	0	11	0	41	0	0	142	23	1	48	116	0	382	1,741	0	0	0	0
4:15 PM	0	0	0	0	0	28	0	44	0	0	157	31	1	47	148	0	456	1,845	0	0	0	0
4:30 PM	0	0	0	0	0	21	0	26	0	0	171	26	0	44	179	0	467	1,878	0	0	0	0
4:45 PM	0	0	0	0	0	22	0	42	0	0	165	27	1	36	143	0	436	1,894	0	0	0	0
5:00 PM	0	0	0	0	0	20	0	51	1	0	175	21	0	36	182	0	486	1,901	0	0	0	0
5:15 PM	0	0	0	0	0	17	0	43	0	0	184	33	0	36	176	0	489		0	0	0	0
5:30 PM	0	0	0	0	0	23	0	46	0	0	171	41	0	54	148	0	483		0	0	0	0
5:45 PM	0	0	0	0	0	32	0	39	0	0	142	42	0	43	145	0	443		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Lights	0	0	0	0	0	92	0	176	1	0	670	134	0	168	649	0	1,890
Mediums	0	0	0	0	0	0	0	3	0	0	1	3	0	1	2	0	10
Total	0	0	0	0	0	92	0	179	1	0	672	137	0	169	651	0	1,901

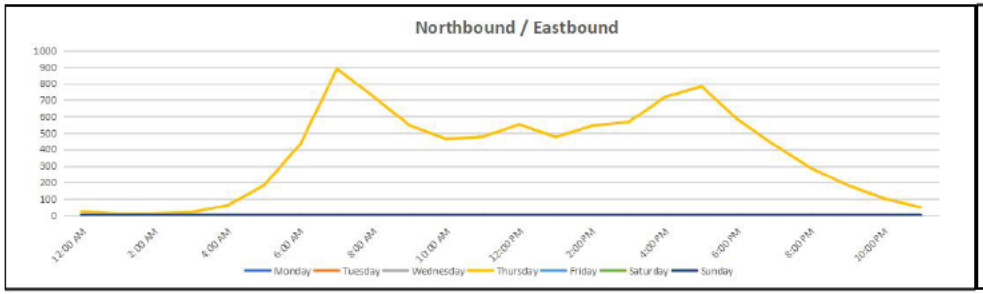
Heavy Vehicle Percentage and Peak Hour Factor

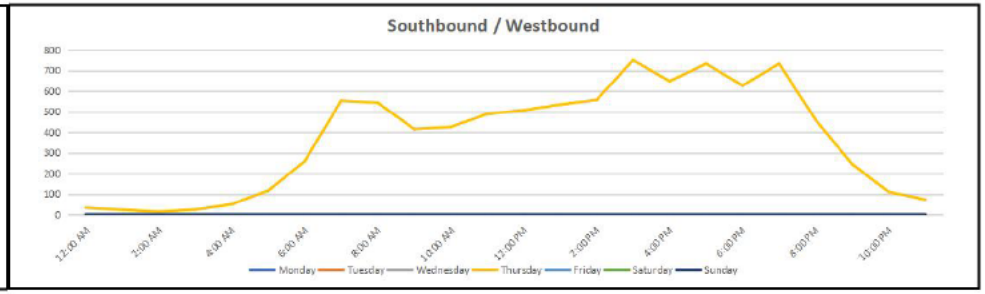
	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Heavy Vehicle %		0.0%				1.1%				0.6%				0.4%			0.6%
Heavy Vehicle %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	0.0%	0.0%	0.3%	2.2%	0.0%	0.6%	0.3%	0.0%	0.6%
Peak Hour Factor		0.00				0.95				0.94				0.93			0.97
Peak Hour Factor	0.00	0.00	0.00	0.00	0.00	0.72	0.00	0.89	0.25	0.00	0.94	0.82	0.75	0.91	0.93	0.00	0.97

Vehicle Volume Report - Hourly

Site Description: Spout Springs Road south of Union Circle
Site Number: 1
Start Date: 08/27/2026
End Date: 08/27/2026

Time	Monday 8/31/26			Tuesday 9/1/26			Wednesday 9/2/26			Thursday 8/27/26			Friday 8/28/26			Saturday 8/29/26			Sunday 8/30/26			3 Day Avg Tue-Thu		5 Day Avg Mon-Fri		7 Day Avg Mon-Sun	
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	NB	SB	NB	SB
12:00 AM	-	-	-	-	-	-	-	-	-	22	33	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1:00 AM	-	-	-	-	-	-	-	-	-	10	23	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:00 AM	-	-	-	-	-	-	-	-	-	11	14	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 AM	-	-	-	-	-	-	-	-	-	18	24	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 AM	-	-	-	-	-	-	-	-	-	61	50	111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5:00 AM	-	-	-	-	-	-	-	-	-	182	116	298	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:00 AM	-	-	-	-	-	-	-	-	-	434	259	693	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	-	-	-	-	-	-	-	-	-	890	553	1443	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8:00 AM	-	-	-	-	-	-	-	-	-	721	543	1264	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9:00 AM	-	-	-	-	-	-	-	-	-	545	415	960	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 AM	-	-	-	-	-	-	-	-	-	464	425	889	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	-	-	-	-	-	-	-	-	-	478	489	967	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12:00 PM	-	-	-	-	-	-	-	-	-	551	506	1057	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1:00 PM	-	-	-	-	-	-	-	-	-	476	534	1010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:00 PM	-	-	-	-	-	-	-	-	-	544	557	1101	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	-	-	-	-	-	-	-	-	-	566	750	1316	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	-	-	-	-	-	-	-	-	-	719	647	1366	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5:00 PM	-	-	-	-	-	-	-	-	-	782	733	1515	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:00 PM	-	-	-	-	-	-	-	-	-	579	626	1205	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 PM	-	-	-	-	-	-	-	-	-	426	733	1159	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8:00 PM	-	-	-	-	-	-	-	-	-	286	460	746	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9:00 PM	-	-	-	-	-	-	-	-	-	183	245	428	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 PM	-	-	-	-	-	-	-	-	-	103	110	213	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 PM	-	-	-	-	-	-	-	-	-	49	72	121	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:00 AM - 9:00 AM	-	-	-	-	-	-	-	-	-	2045	1355	3400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM - 6:00 PM	-	-	-	-	-	-	-	-	-	2067	2130	4197	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:00 AM - 7:00 PM	-	-	-	-	-	-	-	-	-	7749	7037	14786	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12:00 AM - 12:00 AM	-	-	-	-	-	-	-	-	-	9100	8917	18017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Percent	-	-	-	-	-	-	-	-	-	*50.5%*	*49.5%*	*100.0%*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AM Peak	-	-		-	-		-	-		7:00 AM	8:00 AM		-	-		-	-		-	-							
PM Peak	-	-		-	-		-	-		5:00 PM	6:00 PM		-	-		-	-		-	-							





Vehicle Classification Report - Hourly

Site Description: Spout Springs Road south of Union Circle
Site Number: 1
Start Date: 08/27/2026
End Date: 08/27/2026

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

		FHWA Vehicle Classification - Total Study												
	Total	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Northbound	9100	16	7464	1380	64	60	33	48	19	10	3	0	0	3
Percent	*100.0%*	*0.2%*	*82.0%*	*15.2%*	*0.7%*	*0.7%*	*0.4%*	*0.5%*	*0.2%*	*0.1%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Southbound	8917	15	7642	1078	50	44	30	36	9	5	2	1	0	5
Percent	*100.0%*	*0.2%*	*85.7%*	*12.1%*	*0.6%*	*0.5%*	*0.3%*	*0.4%*	*0.1%*	*0.1%*	*0.0%*	*0.0%*	*0.0%*	*0.1%*
Total	18017	31	15106	2458	114	104	63	84	28	15	5	1	0	8
Percent	*100.0%*	*0.2%*	*83.8%*	*13.6%*	*0.6%*	*0.6%*	*0.3%*	*0.5%*	*0.2%*	*0.1%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*

Site Description: Spout Springs Road south of Union Circle
Site Number: 1
Start Date: 08/27/2026
End Date: 08/27/2026

Vehicle Classification Report (Northbound - 08/27/2026)

Thursday		Northbound												
		Classes												
	Total	1	2	3	4	5	6	7	8	9	10	11	12	13
8/27/26														
12:00 AM	22	0	20	2	0	0	0	0	0	0	0	0	0	0
1:00 AM	10	0	10	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	11	0	10	1	0	0	0	0	0	0	0	0	0	0
3:00 AM	18	0	17	1	0	0	0	0	0	0	0	0	0	0
4:00 AM	61	0	53	6	1	0	0	0	0	1	0	0	0	0
5:00 AM	182	2	143	33	1	1	0	0	0	1	0	0	0	1
6:00 AM	434	0	366	61	4	2	0	0	1	0	0	0	0	0
7:00 AM	890	0	722	140	12	5	2	6	1	1	1	0	0	0
8:00 AM	721	1	596	102	4	5	7	3	2	0	0	0	0	1
9:00 AM	545	2	443	83	3	3	5	2	2	2	0	0	0	0
10:00 AM	464	0	369	82	1	3	3	5	0	1	0	0	0	0
11:00 AM	478	0	373	90	6	3	3	1	1	0	1	0	0	0
12:00 PM	551	0	430	104	1	5	1	7	2	0	1	0	0	0
1:00 PM	476	1	389	72	0	5	5	4	0	0	0	0	0	0
2:00 PM	544	1	437	87	13	3	0	2	1	0	0	0	0	0
3:00 PM	566	2	468	77	7	5	2	3	1	1	0	0	0	0
4:00 PM	719	1	592	101	10	7	2	4	1	1	0	0	0	0
5:00 PM	782	1	644	123	1	8	0	2	1	1	0	0	0	1
6:00 PM	579	1	487	79	0	3	2	5	2	0	0	0	0	0
7:00 PM	426	0	357	62	0	2	1	1	3	0	0	0	0	0
8:00 PM	286	2	248	33	0	0	0	2	1	0	0	0	0	0
9:00 PM	183	1	155	25	0	0	0	1	0	1	0	0	0	0
10:00 PM	103	1	91	11	0	0	0	0	0	0	0	0	0	0
11:00 PM	49	0	44	5	0	0	0	0	0	0	0	0	0	0
6:00 AM - 9:00 AM	2045	1	1684	303	20	12	9	9	4	1	1	0	0	1
3:00 PM - 6:00 PM	2067	4	1704	301	18	20	4	9	3	3	0	0	0	1
6:00 AM - 7:00 PM	7749	10	6316	1201	62	57	32	44	15	7	3	0	0	2
12:00 AM - 12:00 AM	9100	16	7464	1380	64	60	33	48	19	10	3	0	0	3
Percent	*100%*	*0.2%*	*82.0%*	*15.2%*	*0.7%*	*0.7%*	*0.4%*	*0.5%*	*0.2%*	*0.1%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*

Site Description: Spout Springs Road south of Union Circle
Site Number: 1
Start Date: 08/27/2026
End Date: 08/27/2026

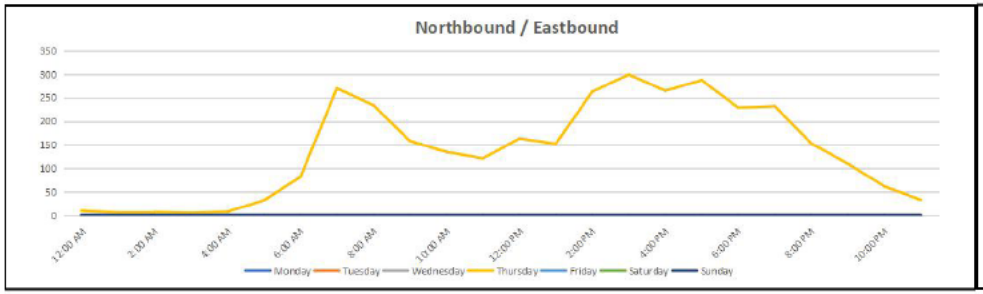
Vehicle Classification Report (Southbound - 08/27/2026)

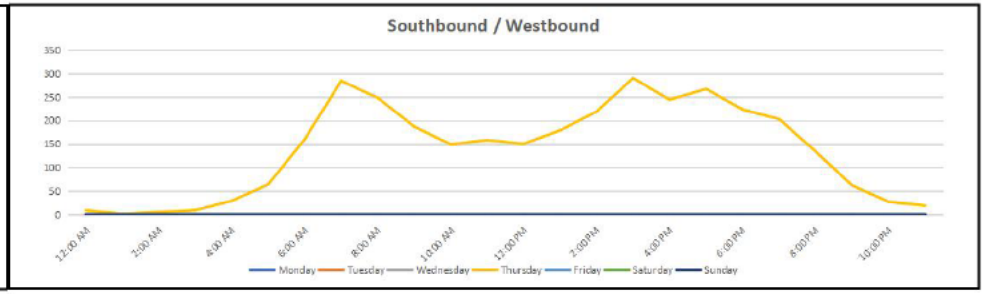
Thursday		Southbound												
		Classes												
	Total	1	2	3	4	5	6	7	8	9	10	11	12	13
8/27/26														
12:00 AM	33	1	29	2	0	0	1	0	0	0	0	0	0	0
1:00 AM	23	0	23	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	14	0	11	2	0	1	0	0	0	0	0	0	0	0
3:00 AM	24	0	23	1	0	0	0	0	0	0	0	0	0	0
4:00 AM	50	0	41	9	0	0	0	0	0	0	0	0	0	0
5:00 AM	116	1	96	17	0	1	0	0	0	1	0	0	0	0
6:00 AM	259	1	199	47	8	3	1	0	0	0	0	0	0	0
7:00 AM	553	0	482	52	5	2	3	6	1	0	1	0	0	1
8:00 AM	543	0	461	67	1	4	4	3	1	0	1	0	0	1
9:00 AM	415	1	343	54	5	4	8	0	0	0	0	0	0	0
10:00 AM	425	1	364	51	3	2	2	2	0	0	0	0	0	0
11:00 AM	489	2	410	68	2	1	1	2	0	2	0	0	0	1
12:00 PM	506	1	435	62	1	2	2	0	1	1	0	1	0	0
1:00 PM	534	1	442	79	4	7	0	1	0	0	0	0	0	0
2:00 PM	557	0	471	65	7	4	3	6	0	1	0	0	0	0
3:00 PM	750	1	666	64	8	3	1	5	2	0	0	0	0	0
4:00 PM	647	0	572	64	3	2	0	5	1	0	0	0	0	0
5:00 PM	733	1	642	83	0	4	2	0	1	0	0	0	0	0
6:00 PM	626	0	534	85	1	1	1	3	0	0	0	0	0	1
7:00 PM	733	1	621	103	0	3	1	2	1	0	0	0	0	1
8:00 PM	460	2	394	60	2	0	0	1	1	0	0	0	0	0
9:00 PM	245	1	222	22	0	0	0	0	0	0	0	0	0	0
10:00 PM	110	0	95	15	0	0	0	0	0	0	0	0	0	0
11:00 PM	72	0	66	6	0	0	0	0	0	0	0	0	0	0
6:00 AM - 9:00 AM	1355	1	1142	166	14	9	8	9	2	0	2	0	0	2
3:00 PM - 6:00 PM	2130	2	1880	211	11	9	3	10	4	0	0	0	0	0
6:00 AM - 7:00 PM	7037	9	6021	841	48	39	28	33	7	4	2	1	0	4
12:00 AM - 12:00 AM	8917	15	7642	1078	50	44	30	36	9	5	2	1	0	5
Percent	*100%*	*0.2%*	*85.7%*	*12.1%*	*0.6%*	*0.5%*	*0.3%*	*0.4%*	*0.1%*	*0.1%*	*0.0%*	*0.0%*	*0.0%*	*0.1%*

Vehicle Volume Report - Hourly

Site Description: Union Circle east of Spout Springs Road
Site Number: 2
Start Date: 08/27/2026
End Date: 08/27/2026

Time	Monday 8/31/26			Tuesday 9/1/26			Wednesday 9/2/26			Thursday 8/27/26			Friday 8/28/26			Saturday 8/29/26			Sunday 8/30/26			3 Day Avg Tue-Thu		5 Day Avg Mon-Fri		7 Day Avg Mon-Sun	
	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	EB	WB	EB	WB
12:00 AM	-	-	-	-	-	-	-	-	-	10	9	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1:00 AM	-	-	-	-	-	-	-	-	-	6	1	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:00 AM	-	-	-	-	-	-	-	-	-	7	5	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 AM	-	-	-	-	-	-	-	-	-	5	9	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 AM	-	-	-	-	-	-	-	-	-	8	29	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5:00 AM	-	-	-	-	-	-	-	-	-	32	64	96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:00 AM	-	-	-	-	-	-	-	-	-	82	160	242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	-	-	-	-	-	-	-	-	-	270	284	554	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8:00 AM	-	-	-	-	-	-	-	-	-	234	248	482	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9:00 AM	-	-	-	-	-	-	-	-	-	158	187	345	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 AM	-	-	-	-	-	-	-	-	-	135	149	284	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	-	-	-	-	-	-	-	-	-	121	158	279	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12:00 PM	-	-	-	-	-	-	-	-	-	163	150	313	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1:00 PM	-	-	-	-	-	-	-	-	-	152	179	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:00 PM	-	-	-	-	-	-	-	-	-	263	219	482	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	-	-	-	-	-	-	-	-	-	299	290	589	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	-	-	-	-	-	-	-	-	-	265	244	509	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5:00 PM	-	-	-	-	-	-	-	-	-	287	267	554	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:00 PM	-	-	-	-	-	-	-	-	-	229	223	452	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 PM	-	-	-	-	-	-	-	-	-	232	203	435	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8:00 PM	-	-	-	-	-	-	-	-	-	153	134	287	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9:00 PM	-	-	-	-	-	-	-	-	-	110	62	172	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10:00 PM	-	-	-	-	-	-	-	-	-	62	27	89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 PM	-	-	-	-	-	-	-	-	-	33	19	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:00 AM - 9:00 AM	-	-	-	-	-	-	-	-	-	586	692	1278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM - 6:00 PM	-	-	-	-	-	-	-	-	-	851	801	1652	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:00 AM - 7:00 PM	-	-	-	-	-	-	-	-	-	2658	2758	5416	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12:00 AM - 12:00 AM	-	-	-	-	-	-	-	-	-	3316	3320	6636	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Percent	-	-	-	-	-	-	-	-	-	*50.0%*	*50.0%*	*100.0%*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AM Peak	-	-		-	-		-	-		7:00 AM	8:00 AM		-	-		-	-		-	-							
PM Peak	-	-		-	-		-	-		3:00 PM	4:00 PM		-	-		-	-		-	-							





Vehicle Classification Report - Hourly

Site Description: Union Circle east of Spout Springs Road
Site Number: 2
Start Date: 08/27/2026
End Date: 08/27/2026

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

		FHWA Vehicle Classification - Total Study												
	Total	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Eastbound	3316	8	2712	489	62	31	13	0	0	1	0	0	0	0
Percent	*100.0%*	*0.2%*	*81.8%*	*14.7%*	*1.9%*	*0.9%*	*0.4%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Westbound	3320	5	2734	514	36	28	2	0	0	1	0	0	0	0
Percent	*100.0%*	*0.2%*	*82.3%*	*15.5%*	*1.1%*	*0.8%*	*0.1%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Total	6636	13	5446	1003	98	59	15	0	0	2	0	0	0	0
Percent	*100.0%*	*0.2%*	*82.1%*	*15.1%*	*1.5%*	*0.9%*	*0.2%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*

Site Description: Union Circle east of Spout Springs Road
Site Number: 2
Start Date: 08/27/2026
End Date: 08/27/2026

Vehicle Classification Report (Eastbound - 08/27/2026)

Thursday		Eastbound												
		Classes												
	Total	1	2	3	4	5	6	7	8	9	10	11	12	13
8/27/26														
12:00 AM	10	0	7	3	0	0	0	0	0	0	0	0	0	0
1:00 AM	6	0	5	1	0	0	0	0	0	0	0	0	0	0
2:00 AM	7	0	5	2	0	0	0	0	0	0	0	0	0	0
3:00 AM	5	0	4	1	0	0	0	0	0	0	0	0	0	0
4:00 AM	8	0	7	1	0	0	0	0	0	0	0	0	0	0
5:00 AM	32	1	23	7	1	0	0	0	0	0	0	0	0	0
6:00 AM	82	0	65	14	1	2	0	0	0	0	0	0	0	0
7:00 AM	270	0	225	28	12	3	2	0	0	0	0	0	0	0
8:00 AM	234	1	192	32	5	4	0	0	0	0	0	0	0	0
9:00 AM	158	0	119	34	4	1	0	0	0	0	0	0	0	0
10:00 AM	135	0	107	26	0	1	0	0	0	1	0	0	0	0
11:00 AM	121	0	99	22	0	0	0	0	0	0	0	0	0	0
12:00 PM	163	0	132	28	1	1	1	0	0	0	0	0	0	0
1:00 PM	152	0	127	22	2	0	1	0	0	0	0	0	0	0
2:00 PM	263	2	215	33	7	4	2	0	0	0	0	0	0	0
3:00 PM	299	1	237	36	19	4	2	0	0	0	0	0	0	0
4:00 PM	265	0	218	36	6	4	1	0	0	0	0	0	0	0
5:00 PM	287	1	248	32	1	4	1	0	0	0	0	0	0	0
6:00 PM	229	0	188	40	0	1	0	0	0	0	0	0	0	0
7:00 PM	232	0	184	41	3	2	2	0	0	0	0	0	0	0
8:00 PM	153	1	123	28	0	0	1	0	0	0	0	0	0	0
9:00 PM	110	0	94	16	0	0	0	0	0	0	0	0	0	0
10:00 PM	62	1	58	3	0	0	0	0	0	0	0	0	0	0
11:00 PM	33	0	30	3	0	0	0	0	0	0	0	0	0	0
6:00 AM - 9:00 AM	586	1	482	74	18	9	2	0	0	0	0	0	0	0
3:00 PM - 6:00 PM	851	2	703	104	26	12	4	0	0	0	0	0	0	0
6:00 AM - 7:00 PM	2658	5	2172	383	58	29	10	0	0	1	0	0	0	0
12:00 AM - 12:00 AM	3316	8	2712	489	62	31	13	0	0	1	0	0	0	0
Percent	*100%*	*0.2%*	*81.8%*	*14.7%*	*1.9%*	*0.9%*	*0.4%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*

Site Description: Union Circle east of Spout Springs Road
Site Number: 2
Start Date: 08/27/2026
End Date: 08/27/2026

Vehicle Classification Report (Westbound - 08/27/2026)

Thursday		Westbound												
		Classes												
	Total	1	2	3	4	5	6	7	8	9	10	11	12	13
8/27/26														
12:00 AM	9	1	8	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	5	0	3	2	0	0	0	0	0	0	0	0	0	0
3:00 AM	9	0	7	2	0	0	0	0	0	0	0	0	0	0
4:00 AM	29	0	21	8	0	0	0	0	0	0	0	0	0	0
5:00 AM	64	0	48	12	2	2	0	0	0	0	0	0	0	0
6:00 AM	160	0	119	31	8	2	0	0	0	0	0	0	0	0
7:00 AM	284	0	238	41	3	2	0	0	0	0	0	0	0	0
8:00 AM	248	0	202	40	3	3	0	0	0	0	0	0	0	0
9:00 AM	187	0	154	29	1	3	0	0	0	0	0	0	0	0
10:00 AM	149	0	127	21	0	0	1	0	0	0	0	0	0	0
11:00 AM	158	0	122	32	1	3	0	0	0	0	0	0	0	0
12:00 PM	150	0	132	17	1	0	0	0	0	0	0	0	0	0
1:00 PM	179	0	139	32	7	0	1	0	0	0	0	0	0	0
2:00 PM	219	0	182	31	2	4	0	0	0	0	0	0	0	0
3:00 PM	290	0	248	38	2	2	0	0	0	0	0	0	0	0
4:00 PM	244	1	211	29	2	1	0	0	0	0	0	0	0	0
5:00 PM	267	0	219	43	2	3	0	0	0	0	0	0	0	0
6:00 PM	223	0	190	30	0	2	0	0	0	1	0	0	0	0
7:00 PM	203	2	144	54	2	1	0	0	0	0	0	0	0	0
8:00 PM	134	0	116	18	0	0	0	0	0	0	0	0	0	0
9:00 PM	62	0	58	4	0	0	0	0	0	0	0	0	0	0
10:00 PM	27	0	27	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	19	1	18	0	0	0	0	0	0	0	0	0	0	0
6:00 AM - 9:00 AM	692	0	559	112	14	7	0	0	0	0	0	0	0	0
3:00 PM - 6:00 PM	801	1	678	110	6	6	0	0	0	0	0	0	0	0
6:00 AM - 7:00 PM	2758	1	2283	414	32	25	2	0	0	1	0	0	0	0
12:00 AM - 12:00 AM	3320	5	2734	514	36	28	2	0	0	1	0	0	0	0
Percent	*100%*	*0.2%*	*82.3%*	*15.5%*	*1.1%*	*0.8%*	*0.1%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*

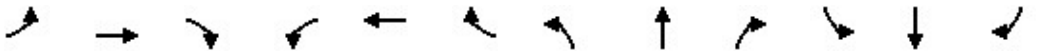
APPENDIX C – EXISTING YEAR 2026 OPERATIONAL ANALYSIS REPORTS



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	197	19	135	105	58	133	893	179	80	612	128
v/c Ratio	0.69	0.05	0.30	0.35	0.15	0.28	0.55	0.22	0.23	0.41	0.17
Control Delay (s/veh)	42.2	24.6	6.8	30.1	8.6	9.7	19.8	3.8	10.2	18.8	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	42.2	24.6	6.8	30.1	8.6	9.7	19.8	3.8	10.2	18.8	4.2
Queue Length 50th (ft)	92	8	0	45	1	26	176	0	15	110	0
Queue Length 95th (ft)	158	24	37	88	27	61	280	36	41	186	31
Internal Link Dist (ft)		278			386		1263			1000	
Turn Bay Length (ft)	100		100			350		200	350		275
Base Capacity (vph)	458	637	630	475	581	676	1622	822	561	1477	737
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.03	0.21	0.22	0.10	0.20	0.55	0.22	0.14	0.41	0.17

Intersection Summary

HCM 7th Signalized Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	16	116	90	2	48	114	768	154	69	526	110
Future Volume (veh/h)	169	16	116	90	2	48	114	768	154	69	526	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	197	19	135	105	2	56	133	893	179	80	612	128
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	338	392	332	345	12	323	448	1577	703	328	1575	702
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.07	0.44	0.44	0.05	0.44	0.44
Sat Flow, veh/h	1345	1870	1585	1233	55	1538	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	197	19	135	105	0	58	133	893	179	80	612	128
Grp Sat Flow(s),veh/h/ln	1345	1870	1585	1233	0	1593	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	10.5	0.6	5.5	5.6	0.0	2.2	3.0	14.0	5.3	1.8	8.7	3.7
Cycle Q Clear(g_c), s	12.8	0.6	5.5	6.2	0.0	2.2	3.0	14.0	5.3	1.8	8.7	3.7
Prop In Lane	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	338	392	332	345	0	334	448	1577	703	328	1575	702
V/C Ratio(X)	0.58	0.05	0.41	0.30	0.00	0.17	0.30	0.57	0.25	0.24	0.39	0.18
Avail Cap(c_a), veh/h	544	679	575	534	0	579	771	1577	703	652	1575	702
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.5	23.6	25.6	26.1	0.0	24.3	10.4	15.5	13.1	11.4	14.0	12.6
Incr Delay (d2), s/veh	1.6	0.1	0.8	0.5	0.0	0.2	0.4	1.5	0.9	0.4	0.7	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.3	2.1	1.6	0.0	0.8	1.1	5.5	1.9	0.7	3.4	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	31.1	23.7	26.4	26.6	0.0	24.5	10.8	17.0	13.9	11.8	14.8	13.2
LnGrp LOS	C	C	C	C		C	B	B	B	B	B	B
Approach Vol, veh/h		351			163			1205			820	
Approach Delay, s/veh		28.9			25.9			15.8			14.2	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.4	40.0		23.5	11.4	40.0		23.5				
Change Period (Y+Rc), s	7.3	6.8		7.8	6.5	6.8		7.8				
Max Green Setting (Gmax), s	17.7	33.2		27.2	18.5	33.2		27.2				
Max Q Clear Time (g_c+I1), s	3.8	16.0		14.8	5.0	10.7		8.2				
Green Ext Time (p_c), s	0.1	6.6		0.9	0.3	4.7		0.6				

Intersection Summary												
HCM 7th Control Delay, s/veh			17.8									
HCM 7th LOS			B									

Intersection	
Int Delay, s/veh	9.5

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	74	258	0	817	168	172	605
Future Vol, veh/h	74	258	0	817	168	172	605
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	300	320	-	200	390	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	77	269	0	851	175	179	630

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	1524	426	630	0	0	1026	0
Stage 1	851	-	-	-	-	-	-
Stage 2	673	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	6.44	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.52	-	-	2.22	-
Pot Cap-1 Maneuver	109	577	572	-	-	672	-
Stage 1	379	-	-	-	-	-	-
Stage 2	468	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	80	577	572	-	-	672	-
Mov Cap-2 Maneuver	80	-	-	-	-	-	-
Stage 1	278	-	-	-	-	-	-
Stage 2	468	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	53.69	0	2.72
HCM LOS	F		

Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	572	-	-	80	577	672	-
HCM Lane V/C Ratio	-	-	-	0.967	0.466	0.266	-
HCM Ctrl Dly (s/v)	0	-	-	183.2	16.6	12.3	-
HCM Lane LOS	A	-	-	F	C	B	-
HCM 95th %tile Q(veh)	0	-	-	5.2	2.5	1.1	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	340	9	2	332	26	5
Future Vol, veh/h	340	9	2	332	26	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	382	10	2	373	29	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	392	0	765	387
Stage 1	-	-	-	-	387	-
Stage 2	-	-	-	-	378	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1150	-	367	654
Stage 1	-	-	-	-	680	-
Stage 2	-	-	-	-	687	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1150	-	366	654
Mov Cap-2 Maneuver	-	-	-	-	366	-
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	687	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.05	15.01
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	394	-	-	11	-
HCM Lane V/C Ratio	0.088	-	-	0.002	-
HCM Ctrl Dly (s/v)	15	-	-	8.1	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

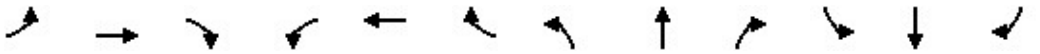
Queues



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	13	2	10	46	54	20	741	135	146	824	15
v/c Ratio	0.09	0.01	0.04	0.29	0.24	0.04	0.40	0.15	0.28	0.33	0.01
Control Delay (s/veh)	29.6	28.0	0.2	34.0	12.6	4.2	12.9	3.0	6.2	6.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	29.6	28.0	0.2	34.0	12.6	4.2	12.9	3.0	6.2	6.7	0.0
Queue Length 50th (ft)	5	1	0	19	1	2	107	0	19	64	0
Queue Length 95th (ft)	21	7	0	49	31	9	171	28	41	171	0
Internal Link Dist (ft)		278			383		1263			1000	
Turn Bay Length (ft)	100		100			350		200	350		275
Base Capacity (vph)	522	723	689	547	650	751	1834	886	746	2534	1172
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.00	0.01	0.08	0.08	0.03	0.40	0.15	0.20	0.33	0.01

Intersection Summary

HCM 7th Signalized Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	2	9	43	2	48	19	689	126	136	766	14
Future Volume (veh/h)	12	2	9	43	2	48	19	689	126	136	766	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	13	2	10	46	2	52	20	741	135	146	824	15
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	179	156	132	226	5	128	444	1826	815	482	2042	911
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	0.02	0.51	0.51	0.07	0.57	0.57
Sat Flow, veh/h	1361	1885	1598	1413	60	1547	1795	3582	1598	1795	3582	1598
Grp Volume(v), veh/h	13	2	10	46	0	54	20	741	135	146	824	15
Grp Sat Flow(s),veh/h/ln	1361	1885	1598	1413	0	1607	1795	1791	1598	1795	1791	1598
Q Serve(g_s), s	0.6	0.1	0.4	2.0	0.0	2.1	0.3	8.3	2.9	2.4	8.4	0.3
Cycle Q Clear(g_c), s	2.7	0.1	0.4	2.1	0.0	2.1	0.3	8.3	2.9	2.4	8.4	0.3
Prop In Lane	1.00		1.00	1.00		0.96	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	156	132	226	0	133	444	1826	815	482	2042	911
V/C Ratio(X)	0.07	0.01	0.08	0.20	0.00	0.41	0.05	0.41	0.17	0.30	0.40	0.02
Avail Cap(c_a), veh/h	636	787	667	700	0	671	912	1826	815	842	2042	911
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.6	27.4	27.6	28.4	0.0	28.4	6.0	9.9	8.5	6.9	7.8	6.1
Incr Delay (d2), s/veh	0.2	0.0	0.2	0.4	0.0	2.0	0.0	0.7	0.4	0.3	0.6	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.1	0.7	0.0	0.8	0.1	3.0	1.0	0.8	2.8	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.8	27.5	27.8	28.8	0.0	30.4	6.0	10.5	9.0	7.3	8.4	6.1
LnGrp LOS	C	C	C	C		C	A	B	A	A	A	A
Approach Vol, veh/h		25			100			896			985	
Approach Delay, s/veh		28.8			29.7			10.2			8.2	
Approach LOS		C			C			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.9	40.0		13.2	8.0	43.9		13.2				
Change Period (Y+Rc), s	7.3	6.8		7.8	6.5	6.8		7.8				
Max Green Setting (Gmax), s	17.7	33.2		27.2	18.5	33.2		27.2				
Max Q Clear Time (g_c+I1), s	4.4	10.3		4.7	2.3	10.4		4.1				
Green Ext Time (p_c), s	0.3	5.9		0.0	0.0	6.2		0.4				

Intersection Summary												
HCM 7th Control Delay, s/veh			10.4									
HCM 7th LOS			B									

Intersection	
Int Delay, s/veh	8.5

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	92	179	1	672	137	169	651
Future Vol, veh/h	92	179	1	672	137	169	651
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	300	320	-	200	390	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	1	1	1
Mvmt Flow	95	185	1	693	141	174	671

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	1379	346	671	0	0	834	0
Stage 1	695	-	-	-	-	-	-
Stage 2	684	-	-	-	-	-	-
Critical Hdwy	6.82	6.92	6.42	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	2.51	-	-	2.21	-
Pot Cap-1 Maneuver	137	653	543	-	-	801	-
Stage 1	459	-	-	-	-	-	-
Stage 2	465	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	107	653	543	-	-	801	-
Mov Cap-2 Maneuver	107	-	-	-	-	-	-
Stage 1	359	-	-	-	-	-	-
Stage 2	465	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	53.19	0.01	2.21
HCM LOS	F		

Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	543	-	-	107	653	801	-
HCM Lane V/C Ratio	0.002	-	-	0.887	0.283	0.217	-
HCM Ctrl Dly (s/v)	11.6	-	-	132	12.7	10.7	-
HCM Lane LOS	B	-	-	F	B	B	-
HCM 95th %tile Q(veh)	0	-	-	5.3	1.2	0.8	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	306	30	5	271	18	3
Future Vol, veh/h	306	30	5	271	18	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	322	32	5	285	19	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	354	0	634	338
Stage 1	-	-	-	-	338	-
Stage 2	-	-	-	-	296	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1189	-	439	697
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1189	-	436	697
Mov Cap-2 Maneuver	-	-	-	-	436	-
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	748	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.15	13.2
HCM LOS			B

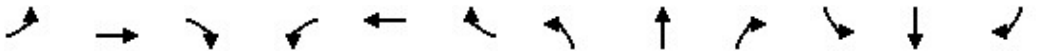
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	461	-	-	33	-
HCM Lane V/C Ratio	0.048	-	-	0.004	-
HCM Ctrl Dly (s/v)	13.2	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

APPENDIX D –OPENING YEAR 2028 OPERATIONAL ANALYSIS REPORTS



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	210	20	144	112	61	142	957	192	86	655	137
v/c Ratio	0.71	0.05	0.31	0.36	0.15	0.31	0.60	0.23	0.26	0.45	0.19
Control Delay (s/veh)	43.0	24.5	6.6	30.1	8.3	10.5	21.2	4.2	11.1	19.9	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	43.0	24.5	6.6	30.1	8.3	10.5	21.2	4.2	11.1	19.9	4.4
Queue Length 50th (ft)	100	8	0	49	1	28	198	2	17	123	0
Queue Length 95th (ft)	170	25	39	93	27	65	310	41	44	204	34
Internal Link Dist (ft)		278			243		1263			1000	
Turn Bay Length (ft)	100		100			350		200	350		275
Base Capacity (vph)	450	627	629	467	575	648	1602	818	532	1455	731
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.03	0.23	0.24	0.11	0.22	0.60	0.23	0.16	0.45	0.19

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	17	124	96	2	51	122	823	165	74	563	118
Future Volume (veh/h)	181	17	124	96	2	51	122	823	165	74	563	118
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	210	20	144	112	2	59	142	957	192	86	655	137
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	348	412	349	353	12	340	427	1557	695	305	1543	688
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.07	0.44	0.44	0.05	0.43	0.43
Sat Flow, veh/h	1341	1870	1585	1222	52	1541	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	210	20	144	112	0	61	142	957	192	86	655	137
Grp Sat Flow(s),veh/h/ln	1341	1870	1585	1222	0	1593	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	11.5	0.6	6.0	6.1	0.0	2.4	3.3	15.8	5.9	2.0	9.8	4.1
Cycle Q Clear(g_c), s	13.9	0.6	6.0	6.7	0.0	2.4	3.3	15.8	5.9	2.0	9.8	4.1
Prop In Lane	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	348	412	349	353	0	351	427	1557	695	305	1543	688
V/C Ratio(X)	0.60	0.05	0.41	0.32	0.00	0.17	0.33	0.61	0.28	0.28	0.42	0.20
Avail Cap(c_a), veh/h	530	666	564	519	0	567	735	1557	695	620	1543	688
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	23.5	25.6	26.1	0.0	24.2	11.0	16.5	13.7	12.3	15.0	13.4
Incr Delay (d2), s/veh	1.7	0.0	0.8	0.5	0.0	0.2	0.5	1.8	1.0	0.5	0.9	0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.3	2.2	1.8	0.0	0.9	1.2	6.3	2.2	0.7	3.8	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	31.5	23.5	26.3	26.6	0.0	24.4	11.5	18.3	14.7	12.8	15.9	14.0
LnGrp LOS	C	C	C	C		C	B	B	B	B	B	B
Approach Vol, veh/h		374			173			1291			878	
Approach Delay, s/veh		29.1			25.8			17.0			15.3	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.5	40.3		24.6	11.8	40.0		24.6				
Change Period (Y+Rc), s	7.3	6.8		7.8	6.5	6.8		7.8				
Max Green Setting (Gmax), s	17.7	33.2		27.2	18.5	33.2		27.2				
Max Q Clear Time (g_c+I1), s	4.0	17.8		15.9	5.3	11.8		8.7				
Green Ext Time (p_c), s	0.1	6.7		1.0	0.3	5.1		0.6				

Intersection Summary												
HCM 7th Control Delay, s/veh			18.7									
HCM 7th LOS			B									

Intersection	
Int Delay, s/veh	14.5

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	79	276	0	875	180	184	648
Future Vol, veh/h	79	276	0	875	180	184	648
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	300	320	-	200	390	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	82	288	0	911	188	192	675

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	1632	456	675	0	0	1099	0
Stage 1	911	-	-	-	-	-	-
Stage 2	721	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	6.44	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.52	-	-	2.22	-
Pot Cap-1 Maneuver	92	552	536	-	-	631	-
Stage 1	352	-	-	-	-	-	-
Stage 2	443	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	~ 64	552	536	-	-	631	-
Mov Cap-2 Maneuver	~ 64	-	-	-	-	-	-
Stage 1	245	-	-	-	-	-	-
Stage 2	443	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	84.61	0	2.91
HCM LOS	F		

Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	536	-	-	64	552	631	-
HCM Lane V/C Ratio	-	-	-	1.283	0.521	0.304	-
HCM Ctrl Dly (s/v)	0	-	-	$ 315.9	18.4	13.2	-
HCM Lane LOS	A	-	-	F	C	B	-
HCM 95th %tile Q(veh)	0	-	-	6.8	3	1.3	-

Notes	
~: Volume exceeds capacity	$: Delay exceeds 300s
+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	364	10	2	356	28	5
Future Vol, veh/h	364	10	2	356	28	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	409	11	2	400	31	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	420	0	819	415
Stage 1	-	-	-	-	415	-
Stage 2	-	-	-	-	404	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1123	-	341	631
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	667	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1123	-	340	631
Mov Cap-2 Maneuver	-	-	-	-	340	-
Stage 1	-	-	-	-	659	-
Stage 2	-	-	-	-	667	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.05	15.95
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	366	-	-	10	-
HCM Lane V/C Ratio	0.101	-	-	0.002	-
HCM Ctrl Dly (s/v)	16	-	-	8.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

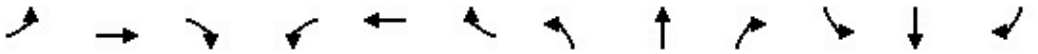
Queues



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	14	2	11	49	57	22	794	145	157	883	16
v/c Ratio	0.09	0.01	0.04	0.31	0.25	0.05	0.43	0.16	0.32	0.37	0.01
Control Delay (s/veh)	29.8	28.0	0.2	34.4	12.5	4.5	13.4	3.0	6.6	8.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	29.8	28.0	0.2	34.4	12.5	4.5	13.4	3.0	6.6	8.6	0.0
Queue Length 50th (ft)	6	1	0	20	1	3	117	0	20	71	0
Queue Length 95th (ft)	21	7	0	52	32	10	187	30	45	188	0
Internal Link Dist (ft)		278			243		1263			1000	
Turn Bay Length (ft)	100		100			350		200	350		275
Base Capacity (vph)	518	719	686	544	649	724	1827	888	721	2409	1120
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.00	0.02	0.09	0.09	0.03	0.43	0.16	0.22	0.37	0.01

Intersection Summary

HCM 7th Signalized Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	2	10	46	2	51	20	738	135	146	821	15
Future Volume (veh/h)	13	2	10	46	2	51	20	738	135	146	821	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	14	2	11	49	2	55	22	794	145	157	883	16
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	178	158	134	227	5	130	422	1822	813	462	2034	907
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	0.03	0.51	0.51	0.07	0.57	0.57
Sat Flow, veh/h	1357	1885	1598	1412	56	1550	1795	3582	1598	1795	3582	1598
Grp Volume(v), veh/h	14	2	11	49	0	57	22	794	145	157	883	16
Grp Sat Flow(s),veh/h/ln	1357	1885	1598	1412	0	1606	1795	1791	1598	1795	1791	1598
Q Serve(g_s), s	0.6	0.1	0.4	2.2	0.0	2.2	0.3	9.1	3.2	2.6	9.2	0.3
Cycle Q Clear(g_c), s	2.8	0.1	0.4	2.2	0.0	2.2	0.3	9.1	3.2	2.6	9.2	0.3
Prop In Lane	1.00		1.00	1.00		0.96	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	178	158	134	227	0	134	422	1822	813	462	2034	907
V/C Ratio(X)	0.08	0.01	0.08	0.22	0.00	0.42	0.05	0.44	0.18	0.34	0.43	0.02
Avail Cap(c_a), veh/h	630	786	666	697	0	669	885	1822	813	819	2034	907
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	27.4	27.6	28.4	0.0	28.4	6.1	10.1	8.7	7.1	8.1	6.2
Incr Delay (d2), s/veh	0.2	0.0	0.3	0.5	0.0	2.1	0.1	0.8	0.5	0.4	0.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.2	0.7	0.0	0.9	0.1	3.3	1.1	0.9	3.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.9	27.5	27.9	28.9	0.0	30.5	6.2	10.9	9.1	7.6	8.8	6.2
LnGrp LOS	C	C	C	C		C	A	B	A	A	A	A
Approach Vol, veh/h		27			106			961			1056	
Approach Delay, s/veh		28.9			29.8			10.5			8.6	
Approach LOS		C			C			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	40.0		13.3	8.1	43.9		13.3				
Change Period (Y+Rc), s	7.3	6.8		7.8	6.5	6.8		7.8				
Max Green Setting (Gmax), s	17.7	33.2		27.2	18.5	33.2		27.2				
Max Q Clear Time (g_c+I1), s	4.6	11.1		4.8	2.3	11.2		4.2				
Green Ext Time (p_c), s	0.3	6.3		0.0	0.0	6.6		0.4				

Intersection Summary												
HCM 7th Control Delay, s/veh			10.7									
HCM 7th LOS			B									

Intersection	
Int Delay, s/veh	13.3

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	99	192	1	720	147	181	697
Future Vol, veh/h	99	192	1	720	147	181	697
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	300	320	-	200	390	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	1	1	1
Mvmt Flow	102	198	1	742	152	187	719

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	1477	371	719	0	0	894	0
Stage 1	744	-	-	-	-	-	-
Stage 2	732	-	-	-	-	-	-
Critical Hdwy	6.82	6.92	6.42	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	2.51	-	-	2.21	-
Pot Cap-1 Maneuver	118	629	506	-	-	761	-
Stage 1	433	-	-	-	-	-	-
Stage 2	439	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	~ 89	629	506	-	-	761	-
Mov Cap-2 Maneuver	~ 89	-	-	-	-	-	-
Stage 1	326	-	-	-	-	-	-
Stage 2	439	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	86.19	0.01	2.32
HCM LOS	F		

Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	506	-	-	89	629	761	-
HCM Lane V/C Ratio	0.002	-	-	1.149	0.315	0.245	-
HCM Ctrl Dly (s/v)	12.1	-	-	227.5	13.3	11.3	-
HCM Lane LOS	B	-	-	F	B	B	-
HCM 95th %tile Q(veh)	0	-	-	7.1	1.3	1	-

Notes	
~: Volume exceeds capacity	$: Delay exceeds 300s
+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	306	30	5	271	18	3
Future Vol, veh/h	306	30	5	271	18	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	322	32	5	285	19	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	354	0	634	338
Stage 1	-	-	-	-	338	-
Stage 2	-	-	-	-	296	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1189	-	439	697
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1189	-	436	697
Mov Cap-2 Maneuver	-	-	-	-	436	-
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	748	-

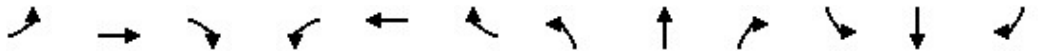
Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.15	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	461	-	-	33	-
HCM Lane V/C Ratio	0.048	-	-	0.004	-
HCM Ctrl Dly (s/v)	13.2	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	210	20	147	113	61	145	979	197	86	660	137
v/c Ratio	0.71	0.05	0.32	0.37	0.15	0.32	0.61	0.24	0.27	0.45	0.19
Control Delay (s/veh)	43.0	24.5	6.5	30.2	8.4	10.5	21.4	4.4	11.2	20.0	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	43.0	24.5	6.5	30.2	8.4	10.5	21.4	4.4	11.2	20.0	4.5
Queue Length 50th (ft)	100	8	0	49	1	29	205	3	17	124	0
Queue Length 95th (ft)	170	25	39	94	27	66	319	42	44	205	34
Internal Link Dist (ft)		278			371		1263			1000	
Turn Bay Length (ft)	100		100			350		200	350		275
Base Capacity (vph)	449	627	630	466	575	646	1604	819	526	1453	731
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.03	0.23	0.24	0.11	0.22	0.61	0.24	0.16	0.45	0.19

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	17	126	97	2	51	125	842	169	74	568	118
Future Volume (veh/h)	181	17	126	97	2	51	125	842	169	74	568	118
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	210	20	147	113	2	59	145	979	197	86	660	137
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	348	412	349	352	12	340	427	1559	695	299	1541	687
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.07	0.44	0.44	0.05	0.43	0.43
Sat Flow, veh/h	1341	1870	1585	1218	52	1541	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	210	20	147	113	0	61	145	979	197	86	660	137
Grp Sat Flow(s),veh/h/ln	1341	1870	1585	1218	0	1593	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	11.5	0.6	6.1	6.2	0.0	2.4	3.4	16.3	6.1	2.0	9.9	4.1
Cycle Q Clear(g_c), s	13.9	0.6	6.1	6.8	0.0	2.4	3.4	16.3	6.1	2.0	9.9	4.1
Prop In Lane	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	348	412	349	352	0	351	427	1559	695	299	1541	687
V/C Ratio(X)	0.60	0.05	0.42	0.32	0.00	0.17	0.34	0.63	0.28	0.29	0.43	0.20
Avail Cap(c_a), veh/h	529	664	563	517	0	566	732	1559	695	613	1541	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	23.5	25.6	26.2	0.0	24.2	11.1	16.6	13.8	12.4	15.1	13.4
Incr Delay (d2), s/veh	1.7	0.0	0.8	0.5	0.0	0.2	0.5	1.9	1.0	0.5	0.9	0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.3	2.3	1.8	0.0	0.9	1.3	6.5	2.2	0.8	3.9	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	31.5	23.6	26.5	26.7	0.0	24.4	11.5	18.6	14.8	13.0	16.0	14.1
LnGrp LOS	C	C	C	C		C	B	B	B	B	B	B
Approach Vol, veh/h		377			174			1321			883	
Approach Delay, s/veh		29.1			25.9			17.2			15.4	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.5	40.4		24.7	11.9	40.0		24.7				
Change Period (Y+Rc), s	7.3	6.8		7.8	6.5	6.8		7.8				
Max Green Setting (Gmax), s	17.7	33.2		27.2	18.5	33.2		27.2				
Max Q Clear Time (g_c+I1), s	4.0	18.3		15.9	5.4	11.9		8.8				
Green Ext Time (p_c), s	0.1	6.7		1.0	0.3	5.1		0.6				

Intersection Summary												
HCM 7th Control Delay, s/veh			18.8									
HCM 7th LOS			B									

Intersection	
Int Delay, s/veh	22.7

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	96	302	0	875	187	191	648
Future Vol, veh/h	96	302	0	875	187	191	648
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	0	320	-	200	390	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	100	315	0	911	195	199	675

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	1647	456	675	0	0	1106	0
Stage 1	911	-	-	-	-	-	-
Stage 2	735	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	6.44	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.52	-	-	2.22	-
Pot Cap-1 Maneuver	~ 90	552	536	-	-	627	-
Stage 1	352	-	-	-	-	-	-
Stage 2	435	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	~ 61	552	536	-	-	627	-
Mov Cap-2 Maneuver	~ 61	-	-	-	-	-	-
Stage 1	240	-	-	-	-	-	-
Stage 2	435	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	124.79	0	3.05
HCM LOS	F		

Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	536	-	-	61	552	627	-
HCM Lane V/C Ratio	-	-	-	1.627	0.57	0.317	-
HCM Ctrl Dly (s/v)	0	-	-	$ 455	19.8	13.4	-
HCM Lane LOS	A	-	-	F	C	B	-
HCM 95th %tile Q(veh)	0	-	-	9	3.6	1.4	-

Notes	
~: Volume exceeds capacity	$: Delay exceeds 300s
+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↰	↱		↕			↕	
Traffic Vol, veh/h	16	364	10	2	356	2	28	0	5	8	0	43
Future Vol, veh/h	16	364	10	2	356	2	28	0	5	8	0	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	18	409	11	2	400	2	31	0	6	9	0	48

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	402	0	0	420	0	0	855	857	415	849	861	400
Stage 1	-	-	-	-	-	-	451	451	-	404	404	-
Stage 2	-	-	-	-	-	-	404	407	-	445	456	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.15	6.55	6.25	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.545	4.045	3.345	3.545	4.045	3.345
Pot Cap-1 Maneuver	1140	-	-	1123	-	-	275	291	631	277	290	643
Stage 1	-	-	-	-	-	-	582	566	-	617	594	-
Stage 2	-	-	-	-	-	-	617	592	-	586	563	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1140	-	-	1123	-	-	248	285	631	269	283	643
Mov Cap-2 Maneuver	-	-	-	-	-	-	248	285	-	269	283	-
Stage 1	-	-	-	-	-	-	570	555	-	615	592	-
Stage 2	-	-	-	-	-	-	569	591	-	569	551	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.34	0.05	20.21	12.65
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	274	73	-	-	10	-	-	528
HCM Lane V/C Ratio	0.136	0.016	-	-	0.002	-	-	0.109
HCM Ctrl Dly (s/v)	20.2	8.2	0	-	8.2	0	-	12.6
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.4

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	14	2	12	52	57	22	808	147	157	906	16
v/c Ratio	0.09	0.01	0.04	0.32	0.25	0.05	0.44	0.17	0.32	0.38	0.01
Control Delay (s/veh)	29.7	28.0	0.3	34.7	12.4	4.5	13.6	3.0	6.7	8.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	29.7	28.0	0.3	34.7	12.4	4.5	13.6	3.0	6.7	8.8	0.0
Queue Length 50th (ft)	6	1	0	22	1	3	121	0	21	74	0
Queue Length 95th (ft)	21	7	0	55	32	10	193	30	45	196	0
Internal Link Dist (ft)		278			378		1263			1000	
Turn Bay Length (ft)	100		100			350		200	350		275
Base Capacity (vph)	517	718	685	544	648	715	1824	888	713	2405	1119
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.00	0.02	0.10	0.09	0.03	0.44	0.17	0.22	0.38	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	2	11	48	2	51	20	751	137	146	843	15
Future Volume (veh/h)	13	2	11	48	2	51	20	751	137	146	843	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	14	2	12	52	2	55	22	808	147	157	906	16
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	179	159	135	228	5	131	413	1821	812	456	2033	907
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	0.03	0.51	0.51	0.07	0.57	0.57
Sat Flow, veh/h	1357	1885	1598	1411	56	1550	1795	3582	1598	1795	3582	1598
Grp Volume(v), veh/h	14	2	12	52	0	57	22	808	147	157	906	16
Grp Sat Flow(s),veh/h/ln	1357	1885	1598	1411	0	1606	1795	1791	1598	1795	1791	1598
Q Serve(g_s), s	0.6	0.1	0.5	2.3	0.0	2.2	0.3	9.4	3.3	2.6	9.6	0.3
Cycle Q Clear(g_c), s	2.8	0.1	0.5	2.4	0.0	2.2	0.3	9.4	3.3	2.6	9.6	0.3
Prop In Lane	1.00		1.00	1.00		0.96	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	159	135	228	0	135	413	1821	812	456	2033	907
V/C Ratio(X)	0.08	0.01	0.09	0.23	0.00	0.42	0.05	0.44	0.18	0.34	0.45	0.02
Avail Cap(c_a), veh/h	630	785	665	696	0	669	876	1821	812	813	2033	907
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.7	27.4	27.6	28.5	0.0	28.4	6.2	10.2	8.7	7.2	8.2	6.2
Incr Delay (d2), s/veh	0.2	0.0	0.3	0.5	0.0	2.1	0.1	0.8	0.5	0.4	0.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.2	0.8	0.0	0.9	0.1	3.4	1.1	0.9	3.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.9	27.4	27.9	29.0	0.0	30.5	6.3	11.0	9.2	7.7	8.9	6.2
LnGrp LOS	C	C	C	C		C	A	B	A	A	A	A
Approach Vol, veh/h		28			109			977			1079	
Approach Delay, s/veh		28.9			29.8			10.6			8.7	
Approach LOS		C			C			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	40.0		13.3	8.1	43.9		13.3				
Change Period (Y+Rc), s	7.3	6.8		7.8	6.5	6.8		7.8				
Max Green Setting (Gmax), s	17.7	33.2		27.2	18.5	33.2		27.2				
Max Q Clear Time (g_c+I1), s	4.6	11.4		4.8	2.3	11.6		4.4				
Green Ext Time (p_c), s	0.3	6.4		0.0	0.0	6.8		0.4				

Intersection Summary												
HCM 7th Control Delay, s/veh			10.8									
HCM 7th LOS			B									

Intersection	
Int Delay, s/veh	22.2

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	113	207	0	720	166	206	697
Future Vol, veh/h	113	207	0	720	166	206	697
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	0	320	-	200	390	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	1	1	1
Mvmt Flow	116	213	0	742	171	212	719

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	1526	371	719	0	0	913	0
Stage 1	742	-	-	-	-	-	-
Stage 2	784	-	-	-	-	-	-
Critical Hdwy	6.82	6.92	6.42	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	2.51	-	-	2.21	-
Pot Cap-1 Maneuver	~ 109	629	506	-	-	748	-
Stage 1	434	-	-	-	-	-	-
Stage 2	413	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	~ 78	629	506	-	-	748	-
Mov Cap-2 Maneuver	~ 78	-	-	-	-	-	-
Stage 1	311	-	-	-	-	-	-
Stage 2	413	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	138.5	0	2.67
HCM LOS	F		

Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	506	-	-	78	629	748	-
HCM Lane V/C Ratio	-	-	-	1.487	0.339	0.284	-
HCM Ctrl Dly (s/v)	0	-	-	$ 367.2	13.6	11.7	-
HCM Lane LOS	A	-	-	F	B	B	-
HCM 95th %tile Q(veh)	0	-	-	9.4	1.5	1.2	-

Notes	
~: Volume exceeds capacity	$: Delay exceeds 300s
+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↰	↱		↕			↕	
Traffic Vol, veh/h	44	328	32	6	290	7	19	0	3	5	0	29
Future Vol, veh/h	44	328	32	6	290	7	19	0	3	5	0	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	46	345	34	6	305	7	20	0	3	5	0	31

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	313	0	0	379	0	0	773	780	362	756	789	305
Stage 1	-	-	-	-	-	-	455	455	-	318	318	-
Stage 2	-	-	-	-	-	-	318	325	-	438	472	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.15	6.55	6.25	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.545	4.045	3.345	3.545	4.045	3.345
Pot Cap-1 Maneuver	1231	-	-	1163	-	-	313	323	676	321	319	728
Stage 1	-	-	-	-	-	-	579	564	-	687	648	-
Stage 2	-	-	-	-	-	-	687	644	-	592	554	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1231	-	-	1163	-	-	283	306	676	302	302	728
Mov Cap-2 Maneuver	-	-	-	-	-	-	283	306	-	302	302	-
Stage 1	-	-	-	-	-	-	552	537	-	683	644	-
Stage 2	-	-	-	-	-	-	654	639	-	561	528	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.88	0.16	17.65	11.35
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	308	193	-	-	36	-	-	603
HCM Lane V/C Ratio	0.075	0.038	-	-	0.005	-	-	0.059
HCM Ctrl Dly (s/v)	17.7	8	0	-	8.1	0	-	11.3
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	0.2

APPENDIX E – TRAFFIC SIGNAL WARRANT ANALYSIS REPORT

Spout Springs Road at Union Circle

Signal Warrant Analysis

Existing 2026

Study Name: Spout @ Union Existing 2026 - (100% RT Reduction)

Study Date : 9/4/2026

Signal Warrants - Summary

Major Street Approaches

Northbound:
Number of Lanes : 1

Total Approach Volume: 0

Southbound: Union Circle
Number of Lanes :1

Total Approach Volume: 2,557

Minor Street Approaches

Westbound: Spout Springs Rd
Number of Lanes :2+

Total Approach Volume: 7,109

Warrant Summary (Urban Values Apply)

Warrant 1 - Eight Hour Vehicular Volumes.....Not Satisfied

Warrant 1A - Minimum Vehicular Volume.....Not Satisfied
Required volumes reached for 0 hours, 8 are needed

Warrant 1B - Interruption Of Continuous Traffic.....Not Satisfied
Required volumes reached for 0 hours, 8 are needed

Warrant 1C - Combination Of Warrants.....Not Satisfied
Required 1A volumes reached for 0 hours, 8 are needed
Required 1B volumes reached for 0 hours, 8 are needed

Warrant 2 - Four Hour Volumes.....Not Satisfied
Number of hours (0) volumes exceed minimum < minimum required (4).

Warrant 3 - Peak Hour.....Satisfied

Warrant 3A - Peak Hour Delay.....Satisfied
Number of one hour periods (47) volumes exceed minimum >= required (1). Delay data not evaluated.

Warrant 3B - Peak Hour Volumes.....Satisfied
Volumes exceed minimums for at least one hour period.

Warrant 4 - Pedestrian Volumes.....Not Evaluated

Warrant 5 - School Crossing.....Not Evaluated

Warrant 6 - Coordinated Signal System.....Not Evaluated

Warrant 7 - Crash Experience.....Not Evaluated

Warrant 8 - Roadway Network.....Not Evaluated

Warrant 9 - Intersection Near a Grade Crossing.....Not Evaluated

Spout Springs Road at Union Circle

Signal Warrant Analysis

Existing 2026

Study Name: Spout @ Union Existing 2026 - (100% RT Reduction)

Study Date : 9/4/2026

Warrant 1A - Minimum Volumes

Description

Intended For sites where the volume Of intersecting traffic Is the principal reason For consideration Of a signal installation.

Summary

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number Of Major Lanes = **1**
Number Of Minor Lanes = **2 or more**

Volume Requirements

Veh/Hr Major = **500**

Veh/Hr Minor = **200**

	Major Road					Minor Road		
						Spout Springs Rd		
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met?
07:30 - 08:30	0	+	354	=	354	752	765	No
07:15 - 08:15	0	+	332	=	332	817	766	No
07:45 - 08:45	0	+	320	=	320	670	677	No
15:30 - 16:30	0	+	307	=	307	545	856	No
07:00 - 08:00	0	+	294	=	294	794	651	No
15:15 - 16:15	0	+	294	=	294	509	851	No
15:00 - 16:00	0	+	292	=	292	474	855	No
14:45 - 15:45	0	+	278	=	278	457	775	No
08:00 - 09:00	0	+	273	=	273	632	601	No
17:00 - 18:00	0	+	271	=	271	672	820	No
16:45 - 17:45	0	+	264	=	264	695	811	No
16:15 - 17:15	0	+	254	=	254	668	815	No
06:45 - 07:45	0	+	250	=	250	731	535	No
16:30 - 17:30	0	+	242	=	242	695	832	No
15:45 - 16:45	0	+	235	=	235	598	826	No
16:00 - 17:00	0	+	235	=	235	635	761	No
14:00 - 15:00	0	+	218	=	218	451	661	No
08:15 - 09:15	0	+	217	=	217	595	513	No
14:30 - 15:30	0	+	216	=	216	448	706	No
14:15 - 15:15	0	+	210	=	210	444	669	No
06:30 - 07:30	0	+	207	=	207	633	388	No
13:45 - 14:45	0	+	201	=	201	452	652	No
17:15 - 18:15	0	+	200	=	200	497	602	No
08:30 - 09:30	0	+	195	=	195	562	447	No
06:15 - 07:15	0		194		194	526	261	No

Spout Springs Road at Union Circle

Signal Warrant Analysis

Existing 2026

Study Name: Spout @ Union Existing 2026 - (100% RT Reduction)

Study Date : 9/4/2026

Warrant 1B - Interruption Of Continuous Traffic

Description

Intended For sites where the volume Of the major street Is so heavy that traffic On the minor street suffers excessive delay Or hazard.

Summary

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number Of Major Lanes = **1**
Number Of Minor Lanes = **2 or more**

Volume Requirements

Veh/Hr Major = **750**

Veh/Hr Minor = **100**

	Major Road					Minor Road		
						Spout Springs Rd		
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met?
07:30 - 08:30	0	+	354	=	354	752	765	No
07:15 - 08:15	0	+	332	=	332	817	766	No
07:45 - 08:45	0	+	320	=	320	670	677	No
15:30 - 16:30	0	+	307	=	307	545	856	No
15:15 - 16:15	0	+	294	=	294	509	851	No
07:00 - 08:00	0	+	294	=	294	794	651	No
15:00 - 16:00	0	+	292	=	292	474	855	No
14:45 - 15:45	0	+	278	=	278	457	775	No
08:00 - 09:00	0	+	273	=	273	632	601	No
17:00 - 18:00	0	+	271	=	271	672	820	No
16:45 - 17:45	0	+	264	=	264	695	811	No
16:15 - 17:15	0	+	254	=	254	668	815	No
06:45 - 07:45	0	+	250	=	250	731	535	No
16:30 - 17:30	0	+	242	=	242	695	832	No
15:45 - 16:45	0	+	235	=	235	598	826	No
16:00 - 17:00	0	+	235	=	235	635	761	No
14:00 - 15:00	0	+	218	=	218	451	661	No
08:15 - 09:15	0	+	217	=	217	595	513	No
14:30 - 15:30	0	+	216	=	216	448	706	No
14:15 - 15:15	0	+	210	=	210	444	669	No
06:30 - 07:30	0	+	207	=	207	633	388	No
13:45 - 14:45	0	+	201	=	201	452	652	No
17:15 - 18:15	0	+	200	=	200	497	602	No
08:30 - 09:30	0	+	195	=	195	562	447	No
06:15 - 07:15	0		194		194	526	261	No

Spout Springs Road at Union Circle

Signal Warrant Analysis

Existing 2026

Study Name: Spout @ Union Existing 2026 - (100% RT Reduction)

Study Date : 9/4/2026

Warrant 1C Combination Of Warrants

Description

Intended For sites where the traffic volumes don't meet individual warrants but where Warrants 1A and 1B are both met to 80% of their stated values.

Summary

Only 0 hours meet 1A minimums.
Only 0 hours meet 1B minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply =	**False**
Number Of Major Lanes =	**1**
Number Of Minor Lanes =	**2 or more**

Volume Requirements

Warrant	1A	1B
Veh/Hr Major =	**400**	**600**
Veh/Hr Minor =	**160**	**80**

	Major Road					Minor Road		
						Spout Springs Rd		
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met1A?
07:30 - 08:30	0	+	354	=	354	752	765	No
07:15 - 08:15	0	+	332	=	332	817	766	No
07:45 - 08:45	0	+	320	=	320	670	677	No
15:30 - 16:30	0	+	307	=	307	545	856	No
07:00 - 08:00	0	+	294	=	294	794	651	No
15:15 - 16:15	0	+	294	=	294	509	851	No
15:00 - 16:00	0	+	292	=	292	474	855	No
14:45 - 15:45	0	+	278	=	278	457	775	No
08:00 - 09:00	0	+	273	=	273	632	601	No
17:00 - 18:00	0	+	271	=	271	672	820	No
16:45 - 17:45	0	+	264	=	264	695	811	No
16:15 - 17:15	0		254		254	668	815	No

Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met1B?
07:30 - 08:30	0	+	354	=	354	752	765	No
07:15 - 08:15	0	+	332	=	332	817	766	No
07:45 - 08:45	0	+	320	=	320	670	677	No
15:30 - 16:30	0	+	307	=	307	545	856	No
07:00 - 08:00	0	+	294	=	294	794	651	No
15:15 - 16:15	0	+	294	=	294	509	851	No
15:00 - 16:00	0	+	292	=	292	474	855	No
14:45 - 15:45	0	+	278	=	278	457	775	No
08:00 - 09:00	0	+	273	=	273	632	601	No
17:00 - 18:00	0	+	271	=	271	672	820	No
16:45 - 17:45	0	+	264	=	264	695	811	No
16:15 - 17:15	0		254		254	668	815	No

Spout Springs Road at Union Circle

Signal Warrant Analysis

Existing 2026

Study Name: Spout @ Union Existing 2026 - (100% RT Reduction)

Study Date : 9/4/2026

Warrant 2 - Four Hour Volumes

Description

Intended for sites where the volume of intersecting traffic during any four hours of the day is the principal reason for consideration of a signal installation.

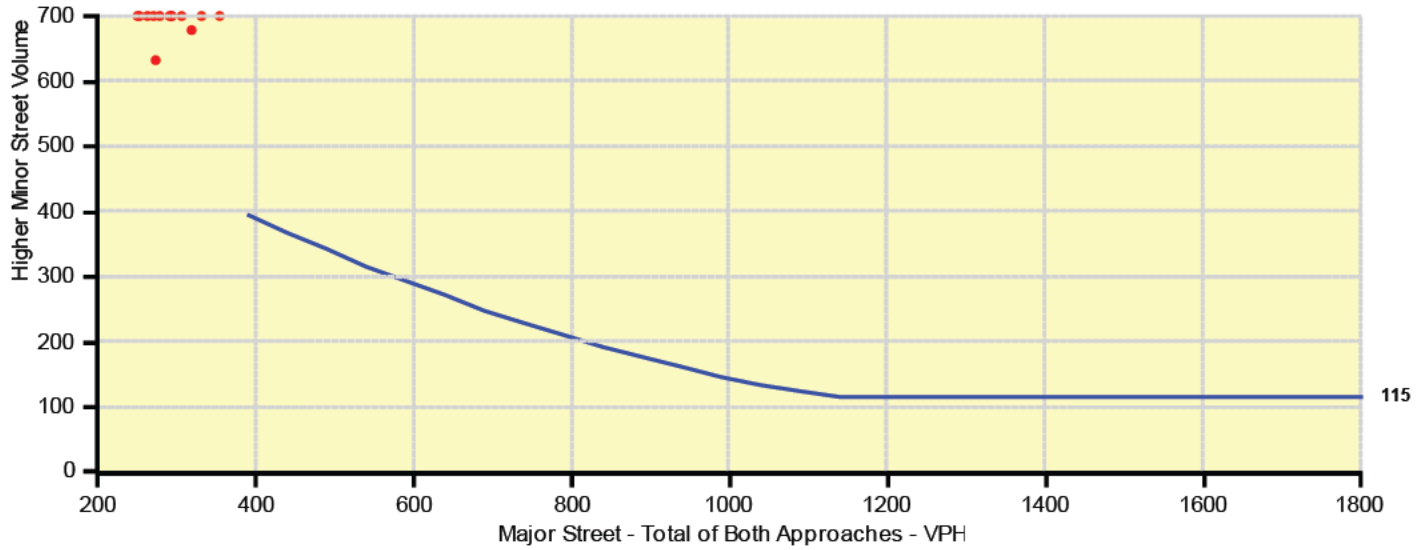
Summary

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **1**
Number of Minor Lanes = **2 or more**

	Major Road					Minor Road		
						Spout Springs Rd		
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met?
07:30 - 08:30	0	+	354	=	354	752	765	No
07:15 - 08:15	0	+	332	=	332	817	766	No
07:45 - 08:45	0	+	320	=	320	670	677	No
15:30 - 16:30	0	+	307	=	307	545	856	No
15:15 - 16:15	0	+	294	=	294	509	851	No
07:00 - 08:00	0	+	294	=	294	794	651	No
15:00 - 16:00	0	+	292	=	292	474	855	No
14:45 - 15:45	0	+	278	=	278	457	775	No
08:00 - 09:00	0	+	273	=	273	632	601	No
17:00 - 18:00	0	+	271	=	271	672	820	No
16:45 - 17:45	0	+	264	=	264	695	811	No
16:15 - 17:15	0		254		254	668	815	No



Spout Springs Road at Union Circle

Signal Warrant Analysis

Background 2028

Study Name: Spout @ Union Background 2028 (100% RT Reduction)

Study Date : 9/4/2026

Signal Warrants - Summary

Major Street Approaches

Northbound: Spout Springs Rd
Number of Lanes : 2+

Total Approach Volume: 7,986

Southbound: Spout Springs Rd
Number of Lanes :2+

Total Approach Volume: 7,613

Minor Street Approaches

Westbound: Union Circle
Number of Lanes :1

Total Approach Volume: 845

Warrant Summary (Urban Values Apply)

Warrant 1 - Eight Hour Vehicular Volumes.....**Not Satisfied**

Warrant 1A - Minimum Vehicular Volume.....**Not Satisfied**
Required volumes reached for 0 hours, 8 are needed

Warrant 1B - Interruption Of Continuous Traffic.....**Not Satisfied**
Required volumes reached for 4 hours, 8 are needed

Warrant 1C - Combination Of Warrants.....**Not Satisfied**
Required 1A volumes reached for 0 hours, 8 are needed
Required 1B volumes reached for 10 hours, 8 are needed

Warrant 2 - Four Hour Volumes.....**Satisfied**
Number of hours (4) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour.....**Satisfied**

Warrant 3A - Peak Hour Delay.....**Satisfied**
Number of one hour periods (4) volumes exceed minimum >= required (1). Delay data not evaluated.

Warrant 3B - Peak Hour Volumes.....**Not Satisfied**
Volumes do not exceed minimums for any one hour period.

Warrant 4 - Pedestrian Volumes.....**Not Evaluated**

Warrant 5 - School Crossing.....**Not Evaluated**

Warrant 6 - Coordinated Signal System.....**Not Evaluated**

Warrant 7 - Crash Experience.....**Not Evaluated**

Warrant 8 - Roadway Network.....**Not Evaluated**

Warrant 9 - Intersection Near a Grade Crossing.....**Not Evaluated**

Spout Springs Road at Union Circle

Signal Warrant Analysis

Background 2028

Study Name: Spout @ Union Background 2028 (100% RT Reduction)

Study Date : 9/4/2026

Warrant 1A - Minimum Volumes

Description

Intended For sites where the volume Of intersecting traffic Is the principal reason For consideration Of a signal installation.

Summary

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number Of Major Lanes = **2 or more**
Number Of Minor Lanes = **1**

Volume Requirements

Veh/Hr Major = **600**

Veh/Hr Minor = **150**

	Major Road Spout Springs Rd					Minor Road Union Circle		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
07:15 - 08:15	1055	+	820	=	1875	0	79	No
07:30 - 08:30	977	+	820	=	1797	0	89	No
16:30 - 17:30	858	+	893	=	1751	0	85	No
16:45 - 17:45	874	+	871	=	1745	0	88	No
17:00 - 18:00	865	+	880	=	1745	0	98	No
16:15 - 17:15	827	+	874	=	1701	0	97	No
07:00 - 08:00	988	+	696	=	1684	0	61	No
15:45 - 16:45	744	+	884	=	1628	0	91	No
07:45 - 08:45	886	+	726	=	1612	0	89	No
16:00 - 17:00	795	+	815	=	1610	0	88	No
15:30 - 16:30	672	+	916	=	1588	0	109	No
15:15 - 16:15	633	+	910	=	1543	0	107	No
15:00 - 16:00	617	+	915	=	1532	0	114	No
08:00 - 09:00	809	+	644	=	1453	0	84	No
14:45 - 15:45	616	+	830	=	1446	0	105	No
06:45 - 07:45	873	+	572	=	1445	0	47	No
14:30 - 15:30	629	+	756	=	1385	0	79	No
14:15 - 15:15	618	+	717	=	1335	0	72	No
14:00 - 15:00	600	+	708	=	1308	0	66	No
17:15 - 18:15	656	+	646	=	1302	0	77	No
13:45 - 14:45	585	+	698	=	1283	0	60	No
08:15 - 09:15	729	+	549	=	1278	0	68	No
13:30 - 14:30	565	+	649	=	1214	0	67	No
12:00 - 13:00	590	+	595	=	1185	0	56	No
06:30 - 07:30	756		415		1171	0	40	No

Spout Springs Road at Union Circle

Signal Warrant Analysis

Background 2028

Study Name: Spout @ Union Background 2028 (100% RT Reduction)

Study Date : 9/4/2026

Warrant 1B - Interruption Of Continuous Traffic

Description

Intended For sites where the volume Of the major street Is so heavy that traffic On the minor street suffers excessive delay Or hazard.

Summary

Only 4 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number Of Major Lanes = **2 or more**
Number Of Minor Lanes = **1**

Volume Requirements

Veh/Hr Major = **900**

Veh/Hr Minor = **75**

	Major Road Spout Springs Rd					Minor Road Union Circle		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
07:15 - 08:15	1055	+	820	=	1875	0	79	Yes
16:30 - 17:30	858	+	893	=	1751	0	85	Yes
15:30 - 16:30	672	+	916	=	1588	0	109	Yes
14:30 - 15:30	629	+	756	=	1385	0	79	Yes
07:00 - 08:00	988	+	696	=	1684	0	61	No
06:45 - 07:45	873	+	572	=	1445	0	47	No
14:15 - 15:15	618	+	717	=	1335	0	72	No
14:00 - 15:00	600	+	708	=	1308	0	66	No
13:45 - 14:45	585	+	698	=	1283	0	60	No
08:15 - 09:15	729	+	549	=	1278	0	68	No
13:30 - 14:30	565	+	649	=	1214	0	67	No
12:00 - 13:00	590	+	595	=	1185	0	56	No
06:30 - 07:30	756	+	415	=	1171	0	40	No
13:15 - 14:15	543	+	626	=	1169	0	63	No
12:15 - 13:15	567	+	600	=	1167	0	55	No
08:30 - 09:30	687	+	478	=	1165	0	70	No
11:45 - 12:45	582	+	578	=	1160	0	61	No
08:45 - 09:45	657	+	486	=	1143	0	67	No
11:30 - 12:30	594	+	546	=	1140	0	59	No
13:00 - 14:00	532	+	606	=	1138	0	60	No
12:30 - 13:30	534	+	599	=	1133	0	56	No
12:45 - 13:45	533	+	587	=	1120	0	63	No
11:15 - 12:15	565	+	535	=	1100	0	69	No
09:15 - 10:15	580	+	513	=	1093	0	61	No
09:00 - 10:00	604		483		1087	0	61	No

Spout Springs Road at Union Circle

Signal Warrant Analysis

Background 2028

Study Name: Spout @ Union Background 2028 (100% RT Reduction)

Study Date : 9/4/2026

Warrant 1C Combination Of Warrants

Description

Intended For sites where the traffic volumes don't meet individual warrants but where Warrants 1A and 1B are both met to 80% of their stated values.

Summary

Only 0 hours meet 1A minimums.
10 hours meet 1B minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply =	**False**
Number Of Major Lanes =	**2 or more**
Number Of Minor Lanes =	**1**

Volume Requirements

Warrant	1A	1B
Veh/Hr Major =	**480**	**720**
Veh/Hr Minor =	**120**	**60**

Major Road: Spout Springs Rd | **Minor Road: Union Circle**

Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met1A?
07:15 - 08:15	1055	+	820	=	1875	0	79	No
07:30 - 08:30	977	+	820	=	1797	0	89	No
16:30 - 17:30	858	+	893	=	1751	0	85	No
16:45 - 17:45	874	+	871	=	1745	0	88	No
17:00 - 18:00	865	+	880	=	1745	0	98	No
16:15 - 17:15	827	+	874	=	1701	0	97	No
07:00 - 08:00	988	+	696	=	1684	0	61	No
15:45 - 16:45	744	+	884	=	1628	0	91	No
07:45 - 08:45	886	+	726	=	1612	0	89	No
16:00 - 17:00	795	+	815	=	1610	0	88	No
15:30 - 16:30	672	+	916	=	1588	0	109	No
15:15 - 16:15	633	+	910	=	1543	0	107	No

Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met1B?
16:45 - 17:45	874	+	871	=	1745	0	88	Yes
07:00 - 08:00	988	+	696	=	1684	0	61	Yes
15:45 - 16:45	744	+	884	=	1628	0	91	Yes
08:00 - 09:00	809	+	644	=	1453	0	84	Yes
14:45 - 15:45	616	+	830	=	1446	0	105	Yes
13:45 - 14:45	585	+	698	=	1283	0	60	Yes
11:45 - 12:45	582	+	578	=	1160	0	61	Yes
12:45 - 13:45	533	+	587	=	1120	0	63	Yes
09:00 - 10:00	604	+	483	=	1087	0	61	Yes
10:30 - 11:30	489	+	496	=	985	0	65	Yes
06:45 - 07:45	873	+	572	=	1445	0	47	No
06:30 - 07:30	756	+	415	=	1171	0	40	No

Spout Springs Road at Union Circle

Signal Warrant Analysis

Background 2028

Study Name: Spout @ Union Background 2028 (100% RT Reduction)

Study Date : 9/4/2026

Warrant 2 - Four Hour Volumes

Description

Intended for sites where the volume of intersecting traffic during any four hours of the day is the principal reason for consideration of a signal installation.

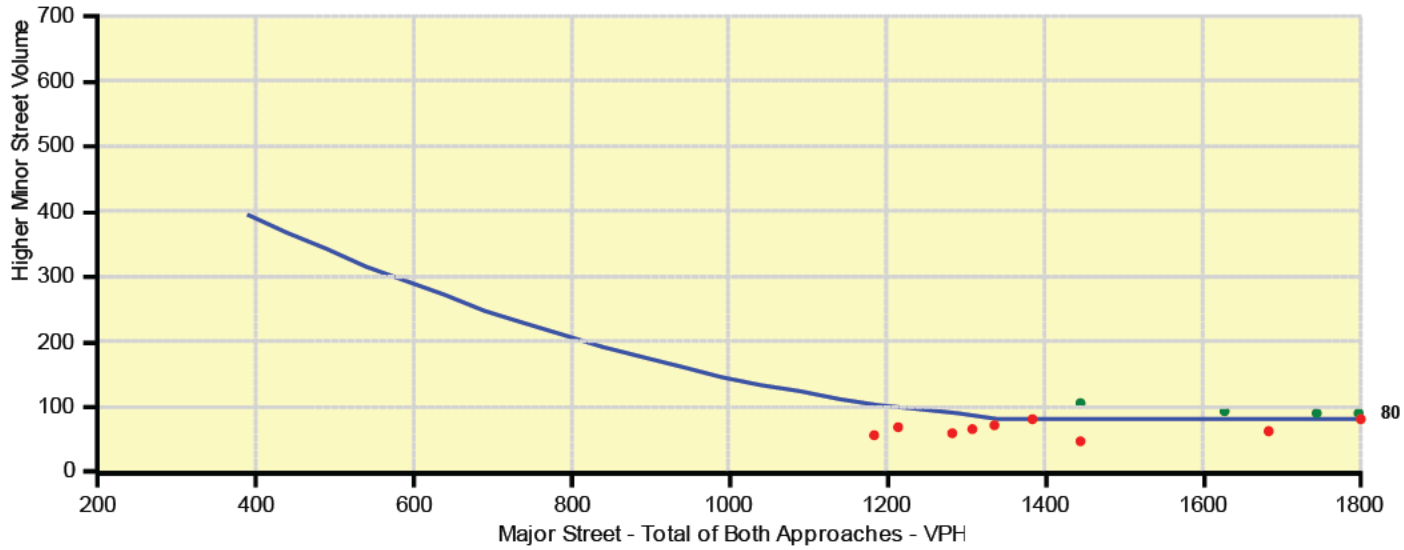
Summary

4 one hour periods meet minimums.
Warrant IS met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

	Major Road Spout Springs Rd					Minor Road Union Circle		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
07:30 - 08:30	977	+	820	=	1797	0	89	Yes
16:45 - 17:45	874	+	871	=	1745	0	88	Yes
15:45 - 16:45	744	+	884	=	1628	0	91	Yes
14:45 - 15:45	616	+	830	=	1446	0	105	Yes
07:15 - 08:15	1055	+	820	=	1875	0	79	No
07:00 - 08:00	988	+	696	=	1684	0	61	No
06:45 - 07:45	873	+	572	=	1445	0	47	No
14:30 - 15:30	629	+	756	=	1385	0	79	No
14:15 - 15:15	618	+	717	=	1335	0	72	No
14:00 - 15:00	600	+	708	=	1308	0	66	No
13:45 - 14:45	585	+	698	=	1283	0	60	No
13:30 - 14:30	565		649		1214	0	67	No



Spout Springs Road at Union Circle

Signal Warrant Analysis

With Project 2028

Study Name: Spout @ Union WP 2028 (100% Reduced Rights)

Study Date : 9/4/2026

Signal Warrants - Summary

Major Street Approaches

Northbound: Spout Springs Rd
Number of Lanes : 2+

Total Approach Volume: 8,114

Southbound: Spout Springs Rd
Number of Lanes :2+

Total Approach Volume: 7,753

Minor Street Approaches

Westbound: Union Circle
Number of Lanes :1

Total Approach Volume: 977

Warrant Summary (Urban Values Apply)

Warrant 1 - Eight Hour Vehicular Volumes.....**Not Satisfied**

Warrant 1A - Minimum Vehicular Volume.....**Not Satisfied**
Required volumes reached for 0 hours, 8 are needed

Warrant 1B - Interruption Of Continuous Traffic.....**Not Satisfied**
Required volumes reached for 7 hours, 8 are needed

Warrant 1C - Combination Of Warrants.....**Not Satisfied**
Required 1A volumes reached for 1 hours, 8 are needed
Required 1B volumes reached for 11 hours, 8 are needed

Warrant 2 - Four Hour Volumes.....**Satisfied**
Number of hours (6) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour.....**Satisfied**

Warrant 3A - Peak Hour Delay.....**Satisfied**
Number of one hour periods (12) volumes exceed minimum >= required (1). Delay data not evaluated.

Warrant 3B - Peak Hour Volumes.....**Satisfied**
Volumes exceed minimums for at least one hour period.

Warrant 4 - Pedestrian Volumes.....**Not Evaluated**

Warrant 5 - School Crossing.....**Not Evaluated**

Warrant 6 - Coordinated Signal System.....**Not Evaluated**

Warrant 7 - Crash Experience.....**Not Evaluated**

Warrant 8 - Roadway Network.....**Not Evaluated**

Warrant 9 - Intersection Near a Grade Crossing.....**Not Evaluated**

Spout Springs Road at Union Circle

Signal Warrant Analysis

With Project 2028

Study Name: Spout @ Union WP 2028 (100% Reduced Rights)

Study Date : 9/4/2026

Warrant 1A - Minimum Volumes

Description

Intended For sites where the volume Of intersecting traffic Is the principal reason For consideration Of a signal installation.

Summary

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number Of Major Lanes = **2 or more**
Number Of Minor Lanes = **1**

Volume Requirements

Veh/Hr Major = **600**

Veh/Hr Minor = **150**

	Major Road Spout Springs Rd					Minor Road Union Circle		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
07:15 - 08:15	1063	+	832	=	1895	0	98	No
07:30 - 08:30	985	+	832	=	1817	0	107	No
16:30 - 17:30	878	+	911	=	1789	0	97	No
17:00 - 18:00	885	+	900	=	1785	0	110	No
16:45 - 17:45	894	+	890	=	1784	0	100	No
16:15 - 17:15	847	+	891	=	1738	0	109	No
07:00 - 08:00	996	+	708	=	1704	0	81	No
15:45 - 16:45	763	+	900	=	1663	0	102	No
16:00 - 17:00	815	+	831	=	1646	0	100	No
07:45 - 08:45	894	+	738	=	1632	0	106	No
15:30 - 16:30	690	+	932	=	1622	0	119	No
15:15 - 16:15	650	+	926	=	1576	0	116	No
15:00 - 16:00	633	+	931	=	1564	0	122	No
14:45 - 15:45	631	+	845	=	1476	0	114	No
08:00 - 09:00	817	+	656	=	1473	0	100	No
06:45 - 07:45	880	+	582	=	1462	0	64	No
14:30 - 15:30	643	+	770	=	1413	0	89	No
14:15 - 15:15	631	+	730	=	1361	0	83	No
17:15 - 18:15	671	+	661	=	1332	0	86	No
14:00 - 15:00	612	+	720	=	1332	0	78	No
13:45 - 14:45	596	+	709	=	1305	0	71	No
08:15 - 09:15	737	+	560	=	1297	0	83	No
13:30 - 14:30	575	+	659	=	1234	0	77	No
12:00 - 13:00	598	+	607	=	1205	0	64	No
13:15 - 14:15	552		635		1187	0	72	No

Spout Springs Road at Union Circle

Signal Warrant Analysis

With Project 2028

Study Name: Spout @ Union WP 2028 (100% Reduced Rights)

Study Date : 9/4/2026

Warrant 1B - Interruption Of Continuous Traffic

Description

Intended For sites where the volume Of the major street Is so heavy that traffic On the minor street suffers excessive delay Or hazard.

Summary

Only 7 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number Of Major Lanes = **2 or more**
Number Of Minor Lanes = **1**

Volume Requirements

Veh/Hr Major = **900**

Veh/Hr Minor = **75**

	Major Road					Minor Road		
	Spout Springs Rd					Union Circle		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
16:30 - 17:30	878	+	911	=	1789	0	97	Yes
07:00 - 08:00	996	+	708	=	1704	0	81	Yes
15:30 - 16:30	690	+	932	=	1622	0	119	Yes
08:00 - 09:00	817	+	656	=	1473	0	100	Yes
14:30 - 15:30	643	+	770	=	1413	0	89	Yes
13:30 - 14:30	575	+	659	=	1234	0	77	Yes
11:00 - 12:00	536	+	532	=	1068	0	82	Yes
06:45 - 07:45	880	+	582	=	1462	0	64	No
12:00 - 13:00	598	+	607	=	1205	0	64	No
13:15 - 14:15	552	+	635	=	1187	0	72	No
12:15 - 13:15	575	+	611	=	1186	0	63	No
06:30 - 07:30	762	+	423	=	1185	0	54	No
13:00 - 14:00	540	+	614	=	1154	0	68	No
12:30 - 13:30	542	+	609	=	1151	0	64	No
12:45 - 13:45	541	+	596	=	1137	0	71	No
09:15 - 10:15	588	+	521	=	1109	0	72	No
09:00 - 10:00	612	+	491	=	1103	0	73	No
09:30 - 10:30	569	+	525	=	1094	0	64	No
09:45 - 10:45	549	+	516	=	1065	0	67	No
10:45 - 11:45	522	+	506	=	1028	0	68	No
10:00 - 11:00	518	+	508	=	1026	0	58	No
10:30 - 11:30	497	+	506	=	1003	0	73	No
10:15 - 11:15	490	+	501	=	991	0	59	No
06:15 - 07:15	624	+	285	=	909	0	51	No
17:30 - 18:30	434		428		862	0	65	No

Spout Springs Road at Union Circle

Signal Warrant Analysis

With Project 2028

Study Name: Spout @ Union WP 2028 (100% Reduced Rights)

Study Date : 9/4/2026

Warrant 1C Combination Of Warrants

Description

Intended For sites where the traffic volumes don't meet individual warrants but where Warrants 1A and 1B are both met to 80% of their stated values.

Summary

Only 1 hours meet 1A minimums.
11 hours meet 1B minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply =	**False**
Number Of Major Lanes =	**2 or more**
Number Of Minor Lanes =	**1**

Volume Requirements

Warrant	1A	1B
Veh/Hr Major =	**480**	**720**
Veh/Hr Minor =	**120**	**60**

Major Road	Minor Road
Spout Springs Rd	Union Circle

Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met1A?
15:00 - 16:00	633	+	931	=	1564	0	122	Yes
07:15 - 08:15	1063	+	832	=	1895	0	98	No
07:30 - 08:30	985	+	832	=	1817	0	107	No
16:30 - 17:30	878	+	911	=	1789	0	97	No
17:00 - 18:00	885	+	900	=	1785	0	110	No
16:45 - 17:45	894	+	890	=	1784	0	100	No
16:15 - 17:15	847	+	891	=	1738	0	109	No
07:00 - 08:00	996	+	708	=	1704	0	81	No
16:00 - 17:00	815	+	831	=	1646	0	100	No
07:45 - 08:45	894	+	738	=	1632	0	106	No
14:45 - 15:45	631	+	845	=	1476	0	114	No
08:00 - 09:00	817	+	656	=	1473	0	100	No

Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met1B?
16:45 - 17:45	894	+	890	=	1784	0	100	Yes
15:45 - 16:45	763	+	900	=	1663	0	102	Yes
07:45 - 08:45	894	+	738	=	1632	0	106	Yes
14:45 - 15:45	631	+	845	=	1476	0	114	Yes
06:45 - 07:45	880	+	582	=	1462	0	64	Yes
13:45 - 14:45	596	+	709	=	1305	0	71	Yes
11:45 - 12:45	590	+	590	=	1180	0	69	Yes
08:45 - 09:45	665	+	495	=	1160	0	80	Yes
12:45 - 13:45	541	+	596	=	1137	0	71	Yes
09:45 - 10:45	549	+	516	=	1065	0	67	Yes
10:45 - 11:45	522	+	506	=	1028	0	68	Yes
06:30 - 07:30	762	+	423	=	1185	0	54	No

Spout Springs Road at Union Circle

Signal Warrant Analysis

With Project 2028

Study Name: Spout @ Union WP 2028 (100% Reduced Rights)

Study Date : 9/4/2026

Warrant 2 - Four Hour Volumes

Description

Intended for sites where the volume of intersecting traffic during any four hours of the day is the principal reason for consideration of a signal installation.

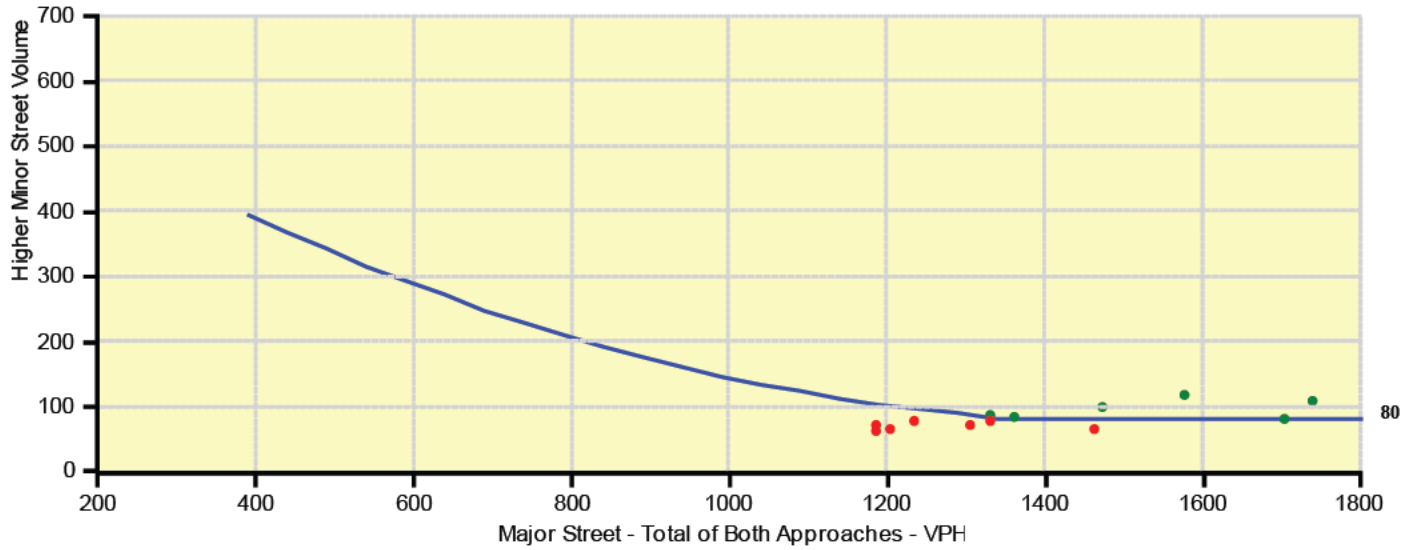
Summary

6 one hour periods meet minimums.
Warrant IS met.

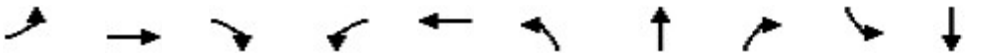
Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

	Major Road Spout Springs Rd					Minor Road Union Circle		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
16:15 - 17:15	847	+	891	=	1738	0	109	Yes
07:00 - 08:00	996	+	708	=	1704	0	81	Yes
15:15 - 16:15	650	+	926	=	1576	0	116	Yes
08:00 - 09:00	817	+	656	=	1473	0	100	Yes
14:15 - 15:15	631	+	730	=	1361	0	83	Yes
17:15 - 18:15	671	+	661	=	1332	0	86	Yes
06:45 - 07:45	880	+	582	=	1462	0	64	No
14:00 - 15:00	612	+	720	=	1332	0	78	No
13:45 - 14:45	596	+	709	=	1305	0	71	No
13:30 - 14:30	575	+	659	=	1234	0	77	No
12:00 - 13:00	598	+	607	=	1205	0	64	No
13:15 - 14:15	552		635		1187	0	72	No



APPENDIX F – MITIGATION OPENING YEAR 2028 OPERATIONAL ANALYSIS REPORTS



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	210	20	147	113	61	145	979	197	86	660
v/c Ratio	0.76	0.05	0.33	0.40	0.16	0.30	0.53	0.21	0.25	0.38
Control Delay (s/veh)	54.3	29.1	7.1	36.9	9.3	6.2	12.0	1.5	10.2	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	54.3	29.1	7.1	36.9	9.3	6.2	12.0	1.5	10.2	18.0
Queue Length 50th (ft)	129	10	0	64	1	10	234	17	19	134
Queue Length 95th (ft)	185	27	41	102	29	29	237	2	43	203
Internal Link Dist (ft)		278			371		1263			1000
Turn Bay Length (ft)	100		100			350		200	350	
Base Capacity (vph)	363	506	537	376	476	637	1857	919	503	1746
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	0.58	0.04	0.27	0.30	0.13	0.23	0.53	0.21	0.17	0.38

Intersection Summary



Lane Group	SBR
Lane Group Flow (vph)	137
v/c Ratio	0.16
Control Delay (s/veh)	3.8
Queue Delay	0.0
Total Delay (s/veh)	3.8
Queue Length 50th (ft)	0
Queue Length 95th (ft)	33
Internal Link Dist (ft)	
Turn Bay Length (ft)	275
Base Capacity (vph)	850
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.16

Intersection Summary

HCM 7th Signalized Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations										
Traffic Volume (veh/h)	181	17	126	97	2	51	125	842	169	74
Future Volume (veh/h)	181	17	126	97	2	51	125	842	169	74
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	210	20	147	113	2	59	145	979	197	86
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	313	395	335	319	11	325	456	1864	831	317
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.06	0.52	0.52	0.05
Sat Flow, veh/h	1341	1870	1585	1218	52	1541	1781	3554	1585	1781
Grp Volume(v), veh/h	210	20	147	113	0	61	145	979	197	86
Grp Sat Flow(s),veh/h/ln	1341	1870	1585	1218	0	1593	1781	1777	1585	1781
Q Serve(g_s), s	15.2	0.9	8.1	8.2	0.0	3.1	3.7	18.1	6.7	2.2
Cycle Q Clear(g_c), s	18.4	0.9	8.1	9.0	0.0	3.1	3.7	18.1	6.7	2.2
Prop In Lane	1.00		1.00	1.00		0.97	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	313	395	335	319	0	336	456	1864	831	317
V/C Ratio(X)	0.67	0.05	0.44	0.35	0.00	0.18	0.32	0.53	0.24	0.27
Avail Cap(c_a), veh/h	395	509	431	393	0	433	680	1864	831	551
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.84	0.84	0.84	1.00
Uniform Delay (d), s/veh	39.9	31.5	34.3	35.0	0.0	32.4	10.5	15.6	12.9	11.7
Incr Delay (d2), s/veh	3.1	0.1	0.9	0.7	0.0	0.3	0.3	0.9	0.6	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.4	3.2	2.5	0.0	1.2	1.4	7.2	2.5	0.9
Unsig. Movement Delay, s/veh										
LnGrp Delay(d), s/veh	42.9	31.5	35.2	35.7	0.0	32.6	10.8	16.5	13.5	12.2
LnGrp LOS	D	C	D	D		C	B	B	B	B
Approach Vol, veh/h		377			174			1321		
Approach Delay, s/veh		39.3			34.6			15.4		
Approach LOS		D			C			B		

Timer - Assigned Phs	1	2		4	5	6		8		
Phs Duration (G+Y+Rc), s	11.8	59.2		28.9	12.4	58.7		28.9		
Change Period (Y+Rc), s	7.3	6.8		7.8	6.5	6.8		7.8		
Max Green Setting (Gmax), s	17.7	33.2		27.2	18.5	33.2		27.2		
Max Q Clear Time (g_c+I1), s	4.2	20.1		20.4	5.7	13.0		11.0		
Green Ext Time (p_c), s	0.1	6.3		0.7	0.3	5.0		0.6		

Intersection Summary			
HCM 7th Control Delay, s/veh		19.5	
HCM 7th LOS		B	



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (veh/h)	568	118
Future Volume (veh/h)	568	118
Initial Q (Qb), veh	0	0
Lane Width Adj.	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	660	137
Peak Hour Factor	0.86	0.86
Percent Heavy Veh, %	2	2
Cap, veh/h	1843	822
Arrive On Green	0.52	0.52
Sat Flow, veh/h	3554	1585
Grp Volume(v), veh/h	660	137
Grp Sat Flow(s),veh/h/ln	1777	1585
Q Serve(g_s), s	11.0	4.6
Cycle Q Clear(g_c), s	11.0	4.6
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	1843	822
V/C Ratio(X)	0.36	0.17
Avail Cap(c_a), veh/h	1843	822
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	14.2	12.7
Incr Delay (d2), s/veh	0.5	0.4
Initial Q Delay(d3), s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	1.7
Unsig. Movement Delay, s/veh		
LnGrp Delay(d), s/veh	14.8	13.1
LnGrp LOS	B	B
Approach Vol, veh/h	883	
Approach Delay, s/veh	14.3	
Approach LOS	B	
Timer - Assigned Phs		

Queues



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	100	315	911	195	199	675
v/c Ratio	0.51	0.69	0.46	0.20	0.43	0.26
Control Delay (s/veh)	50.0	13.2	14.9	2.7	7.3	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.0	13.2	14.9	2.7	7.3	5.6
Queue Length 50th (ft)	62	0	170	0	52	127
Queue Length 95th (ft)	109	78	275	38	103	194
Internal Link Dist (ft)	161		815			1263
Turn Bay Length (ft)				200	390	
Base Capacity (vph)	534	697	1995	977	518	2627
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.45	0.46	0.20	0.38	0.26

Intersection Summary



Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	96	302	0	875	187	191	648
Future Volume (veh/h)	96	302	0	875	187	191	648
Initial Q (Qb), veh	0	0		0	0	0	0
Lane Width Adj.	1.00	1.00		1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00			1.00	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870
Adj Flow Rate, veh/h	100	315		911	195	199	675
Peak Hour Factor	0.96	0.96		0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	397	353		1715	765	362	2244
Arrive On Green	0.22	0.22		0.48	0.48	0.08	0.63
Sat Flow, veh/h	1781	1585		3647	1585	1781	3647
Grp Volume(v), veh/h	100	315		911	195	199	675
Grp Sat Flow(s),veh/h/ln	1781	1585		1777	1585	1781	1777
Q Serve(g_s), s	4.6	19.3		17.8	7.3	5.3	8.6
Cycle Q Clear(g_c), s	4.6	19.3		17.8	7.3	5.3	8.6
Prop In Lane	1.00	1.00			1.00	1.00	
Lane Grp Cap(c), veh/h	397	353		1715	765	362	2244
V/C Ratio(X)	0.25	0.89		0.53	0.25	0.55	0.30
Avail Cap(c_a), veh/h	538	479		1715	765	489	2244
HCM Platoon Ratio	1.00	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00		1.00	1.00	0.94	0.94
Uniform Delay (d), s/veh	32.0	37.7		18.0	15.3	13.2	8.4
Incr Delay (d2), s/veh	0.3	15.0		1.2	0.8	1.2	0.3
Initial Q Delay(d3), s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	8.8		7.3	2.7	2.1	3.2
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	32.3	52.7		19.2	16.1	14.5	8.7
LnGrp LOS	C	D		B	B	B	A
Approach Vol, veh/h	415			1106			874
Approach Delay, s/veh	47.8			18.6			10.0
Approach LOS	D			B			B

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.9	55.1				69.9		30.1
Change Period (Y+Rc), s	7.3	6.8				6.8		7.8
Max Green Setting (Gmax), s	14.7	33.2				55.2		30.2
Max Q Clear Time (g_c+I1), s	7.3	19.8				10.6		21.3
Green Ext Time (p_c), s	0.3	5.9				5.5		1.0

Intersection Summary	
HCM 7th Control Delay, s/veh	20.5
HCM 7th LOS	C

Notes

User approved ignoring U-Turning movement.

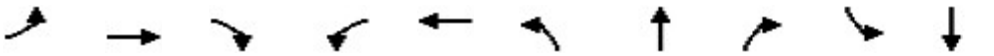
Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	364	10	2	356	2	28	0	5	8	0	43
Future Vol, veh/h	16	364	10	2	356	2	28	0	5	8	0	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	18	409	11	2	400	2	31	0	6	9	0	48

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	402	0	0	420	0	0	855	857	415	849	861	400
Stage 1	-	-	-	-	-	-	451	451	-	404	404	-
Stage 2	-	-	-	-	-	-	404	407	-	445	456	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.15	6.55	6.25	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.545	4.045	3.345	3.545	4.045	3.345
Pot Cap-1 Maneuver	1140	-	-	1123	-	-	275	291	631	277	290	643
Stage 1	-	-	-	-	-	-	582	566	-	617	594	-
Stage 2	-	-	-	-	-	-	617	592	-	586	563	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1140	-	-	1123	-	-	248	285	631	269	283	643
Mov Cap-2 Maneuver	-	-	-	-	-	-	248	285	-	269	283	-
Stage 1	-	-	-	-	-	-	570	555	-	615	592	-
Stage 2	-	-	-	-	-	-	569	591	-	569	551	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.34	0.05	20.21	12.65
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	274	73	-	-	10	-	-	528
HCM Lane V/C Ratio	0.136	0.016	-	-	0.002	-	-	0.109
HCM Ctrl Dly (s/v)	20.2	8.2	0	-	8.2	0	-	12.6
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.4



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	14	2	12	52	57	22	808	147	157	906
v/c Ratio	0.11	0.01	0.05	0.40	0.29	0.04	0.36	0.14	0.30	0.34
Control Delay (s/veh)	42.1	39.0	0.4	51.0	16.0	3.0	6.1	0.9	5.3	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	42.1	39.0	0.4	51.0	16.0	3.0	6.1	0.9	5.3	6.8
Queue Length 50th (ft)	8	1	0	32	1	2	47	0	22	78
Queue Length 95th (ft)	27	8	0	68	38	m8	111	8	45	196
Internal Link Dist (ft)		278			378		1263			1000
Turn Bay Length (ft)	100		100			350		200	350	
Base Capacity (vph)	368	511	523	387	477	666	2261	1065	677	2690
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	0.04	0.00	0.02	0.13	0.12	0.03	0.36	0.14	0.23	0.34

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	SBR
Lane Group Flow (vph)	16
v/c Ratio	0.01
Control Delay (s/veh)	0.0
Queue Delay	0.0
Total Delay (s/veh)	0.0
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	275
Base Capacity (vph)	1236
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations										
Traffic Volume (veh/h)	13	2	11	48	2	51	20	751	137	146
Future Volume (veh/h)	13	2	11	48	2	51	20	751	137	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	14	2	12	52	2	55	22	808	147	157
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	111	120	102	160	4	98	481	2392	1067	499
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.02	0.67	0.67	0.05
Sat Flow, veh/h	1357	1885	1598	1411	56	1550	1795	3582	1598	1795
Grp Volume(v), veh/h	14	2	12	52	0	57	22	808	147	157
Grp Sat Flow(s),veh/h/ln	1357	1885	1598	1411	0	1606	1795	1791	1598	1795
Q Serve(g_s), s	1.0	0.1	0.7	3.6	0.0	3.4	0.3	9.7	3.4	2.7
Cycle Q Clear(g_c), s	4.5	0.1	0.7	3.7	0.0	3.4	0.3	9.7	3.4	2.7
Prop In Lane	1.00		1.00	1.00		0.96	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	111	120	102	160	0	102	481	2392	1067	499
V/C Ratio(X)	0.13	0.02	0.12	0.32	0.00	0.56	0.05	0.34	0.14	0.31
Avail Cap(c_a), veh/h	394	513	435	454	0	437	772	2392	1067	728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.92	0.92	0.92	1.00
Uniform Delay (d), s/veh	47.6	43.9	44.2	45.6	0.0	45.5	4.3	7.1	6.1	5.0
Incr Delay (d2), s/veh	0.5	0.1	0.5	1.2	0.0	4.7	0.0	0.4	0.2	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.3	1.3	0.0	1.5	0.1	3.4	1.1	0.9
Unsig. Movement Delay, s/veh										
LnGrp Delay(d), s/veh	48.1	43.9	44.7	46.8	0.0	50.2	4.4	7.5	6.3	5.4
LnGrp LOS	D	D	D	D		D	A	A	A	A
Approach Vol, veh/h		28			109			977		
Approach Delay, s/veh		46.4			48.6			7.2		
Approach LOS		D			D			A		

Timer - Assigned Phs	1	2		4	5	6		8		
Phs Duration (G+Y+Rc), s	12.3	73.6		14.2	8.8	77.1		14.2		
Change Period (Y+Rc), s	7.3	6.8		7.8	6.5	6.8		7.8		
Max Green Setting (Gmax), s	17.7	33.2		27.2	18.5	33.2		27.2		
Max Q Clear Time (g_c+I1), s	4.7	11.7		6.5	2.3	12.1		5.7		
Green Ext Time (p_c), s	0.3	6.4		0.0	0.0	6.7		0.4		

Intersection Summary			
HCM 7th Control Delay, s/veh		9.3	
HCM 7th LOS		A	



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (veh/h)	843	15
Future Volume (veh/h)	843	15
Initial Q (Qb), veh	0	0
Lane Width Adj.	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1885	1885
Adj Flow Rate, veh/h	906	16
Peak Hour Factor	0.93	0.93
Percent Heavy Veh, %	1	1
Cap, veh/h	2517	1122
Arrive On Green	0.70	0.70
Sat Flow, veh/h	3582	1598
Grp Volume(v), veh/h	906	16
Grp Sat Flow(s),veh/h/ln	1791	1598
Q Serve(g_s), s	10.1	0.3
Cycle Q Clear(g_c), s	10.1	0.3
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	2517	1122
V/C Ratio(X)	0.36	0.01
Avail Cap(c_a), veh/h	2517	1122
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	5.9	4.5
Incr Delay (d2), s/veh	0.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.1
Unsig. Movement Delay, s/veh		
LnGrp Delay(d), s/veh	6.3	4.5
LnGrp LOS	A	A
Approach Vol, veh/h	1079	
Approach Delay, s/veh	6.2	
Approach LOS	A	
Timer - Assigned Phs		

Queues



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	116	213	742	171	212	719
v/c Ratio	0.55	0.57	0.36	0.17	0.40	0.27
Control Delay (s/veh)	50.9	11.7	13.2	2.5	12.1	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.9	11.7	13.2	2.5	12.1	4.7
Queue Length 50th (ft)	71	0	126	0	33	63
Queue Length 95th (ft)	122	63	201	33	127	101
Internal Link Dist (ft)	161		815			1263
Turn Bay Length (ft)				200	390	
Base Capacity (vph)	432	548	2036	984	590	2630
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.39	0.36	0.17	0.36	0.27

Intersection Summary



Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	113	207	0	720	166	206	697
Future Volume (veh/h)	113	207	0	720	166	206	697
Initial Q (Qb), veh	0	0		0	0	0	0
Lane Width Adj.	1.00	1.00		1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00			1.00	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No
Adj Sat Flow, veh/h/ln	1885	1885		1885	1885	1885	1885
Adj Flow Rate, veh/h	116	213		742	171	212	719
Peak Hour Factor	0.97	0.97		0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1		1	1	1	1
Cap, veh/h	282	251		1981	883	468	2497
Arrive On Green	0.16	0.16		0.55	0.55	0.07	0.70
Sat Flow, veh/h	1795	1598		3676	1598	1795	3676
Grp Volume(v), veh/h	116	213		742	171	212	719
Grp Sat Flow(s),veh/h/ln	1795	1598		1791	1598	1795	1791
Q Serve(g_s), s	5.8	13.0		11.7	5.4	4.8	7.6
Cycle Q Clear(g_c), s	5.8	13.0		11.7	5.4	4.8	7.6
Prop In Lane	1.00	1.00			1.00	1.00	
Lane Grp Cap(c), veh/h	282	251		1981	883	468	2497
V/C Ratio(X)	0.41	0.85		0.37	0.19	0.45	0.29
Avail Cap(c_a), veh/h	434	387		1981	883	605	2497
HCM Platoon Ratio	1.00	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00		1.00	1.00	0.95	0.95
Uniform Delay (d), s/veh	38.0	41.0		12.6	11.2	8.6	5.7
Incr Delay (d2), s/veh	1.0	10.4		0.5	0.5	0.7	0.3
Initial Q Delay(d3), s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	5.8		4.6	1.9	1.8	2.6
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	38.9	51.4		13.1	11.7	9.3	6.0
LnGrp LOS	D	D		B	B	A	A
Approach Vol, veh/h	329			913			931
Approach Delay, s/veh	47.0			12.9			6.8
Approach LOS	D			B			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.4	62.1				76.5		23.5
Change Period (Y+Rc), s	7.3	6.8				6.8		7.8
Max Green Setting (Gmax), s	14.7	39.2				61.2		24.2
Max Q Clear Time (g_c+I1), s	6.8	13.7				9.6		15.0
Green Ext Time (p_c), s	0.4	6.2				6.0		0.7

Intersection Summary		
HCM 7th Control Delay, s/veh	15.4	
HCM 7th LOS	B	

Notes
User approved ignoring U-Turning movement.

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	328	32	6	290	7	19	0	3	5	0	29
Future Vol, veh/h	44	328	32	6	290	7	19	0	3	5	0	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	46	345	34	6	305	7	20	0	3	5	0	31

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	313	0	0	379	0	0	773	780	362	756	789	305
Stage 1	-	-	-	-	-	-	455	455	-	318	318	-
Stage 2	-	-	-	-	-	-	318	325	-	438	472	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.15	6.55	6.25	7.15	6.55	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.15	5.55	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.545	4.045	3.345	3.545	4.045	3.345
Pot Cap-1 Maneuver	1231	-	-	1163	-	-	313	323	676	321	319	728
Stage 1	-	-	-	-	-	-	579	564	-	687	648	-
Stage 2	-	-	-	-	-	-	687	644	-	592	554	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1231	-	-	1163	-	-	283	306	676	302	302	728
Mov Cap-2 Maneuver	-	-	-	-	-	-	283	306	-	302	302	-
Stage 1	-	-	-	-	-	-	552	537	-	683	644	-
Stage 2	-	-	-	-	-	-	654	639	-	561	528	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.88	0.16	17.65	11.35
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	308	193	-	-	36	-	-	603
HCM Lane V/C Ratio	0.075	0.038	-	-	0.005	-	-	0.059
HCM Ctrl Dly (s/v)	17.7	8	0	-	8.1	0	-	11.3
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	0.2