The Enclave at Parkside

Sykesville, Maryland
May 23, 2023

Traffic Impact Analysis

Prepared for:
Elm Street Development
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Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 29931, Expiration Date: 1/8/2024.

Prepared by:	Carl R. Wilson, Jr., P.E., PTOE, RSP Richard Huang, P.E., PTOE

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EXECUTIVE SUMMARY

- The Enclave at Parkside is situated on the east side of MD 32 (Sykesville Road), north of Springfield Avenue within the Town of Sykesville, Maryland.

- A total of 47 townhouse units are proposed to be developed in conjunction with this project.

- Access to the property is proposed via an extension of Town Park Drive. A potential future connection is also shown for a new public road, however, that will not be constructed at this time.

- Two off-site intersections were analyzed for adequacy within this Traffic Impact Study (TIS).

- Historic growth was added to all roadway movements at a conservative 3% level.

- Consideration was given to potential future development of Warfield which has been approved, however, the development timeline remains unknown.

- Projected future trips were determined based on data contained on the Institute of Transportation Engineers (ITE) Trip Generation (11th Edition).

- All analysis was undertaken using both Critical Lane Volume (CLV) and Highway Capacity Manual (HCM) analysis at the signalized intersection and SIDRA for the roundabout.

- All intersections were found to operate at acceptable levels of service.

- No roadway improvements are necessary for this development to proceed.

INTRODUCTION AND SUMMARY OF FINDINGS

Study Purpose

The Traffic Group, Inc. has prepared this TIS to quantify the impact the proposed development of the Enclave at Parkside will have on the surrounding road network within the Town of Sykesville in Carroll County. The subject site is proposed to be developed with a total of 47 townhouse units. Access to the property is proposed via an extension of Town Park Drive. Full build-out of the Enclave at Parkside is expected within 3 years.

Study Criteria/Methodology

Representatives from the Town of Sykesville approved the Scope of Work for this TIS in email correspondence dated April 26, 2023. A copy of the correspondence can be found in Appendix A.

ITE's Trip Generation (11th Edition) was utilized to project future trips associated with all approved background developments and the development of this site.

CLV and HCM analysis were utilized to quantify levels of service at the signalized intersection within the study area. SIDRA methodology was used for the roundabout.

The Maryland Department of Transportation State Highway Administration (MDOT SHA) uses CLV as its typical standard for determining adequacy. Level of Service "D" or better is considered acceptable for state-maintained roadways. With regard to HCM and SIDRA methodologies, Level of Service "D" or better is typically also considered adequate.

Scope of Services

The principal scope of services undertaken for this project was as follows:

- Coordinate with representatives from the Town of Sykesville to quantify the scope of work.
- Undertake a site inspection to review the surrounding road system and developments.
- Collect intersection turning movement counts during the AM and PM peak periods at all study intersections.
- Review historic growth in the area and apply a growth rate to all roadway movements.

- Review approved background developments in the area and determine what portions have not been constructed.

- Prepare trip generation forecasts for all unbuilt background developments and for the development of this site.

- Undertake intersection capacity analysis to quantify existing and projected future levels of service at all study intersections.

- Provide an overall assessment of traffic operations.

Summary of Findings and Recommendations

This TIS will show that both study intersections currently exhibit acceptable levels of service using all methodologies. In the future, with the development of this site and with consideration given to regional growth and development of the Warfield Property, each intersection will operate at an optimal level of service.

Since the study intersections will be adequate and no new intersections are proposed in conjunction with this development, it is our opinion that the road system is capable of supporting the development of the Enclave at Parkside and no additional road improvements are required.

EXISTING TRAFFIC CONDITIONS

Site Information

The Enclave at Parkside is situated on the east side of MD 32 (Sykesville Road), north of Springfield Avenue in the Town of Sykesville, Maryland. The property is currently undeveloped and is adjacent to the townhouse development of Parkside at Warfield. Figure 1 contains a location map showing the subject site and study intersections. An aerial photograph detailing the property can be found in Figure 2.

Parkside at Warfield accesses the roadway system via a connection to the roundabout at Warfield Avenue/Springfield Avenue. In addition, a secondary right-in/right-out is available to the west of the existing roundabout.

Study Area

The following intersections were identified to be included in this analysis:

- MD 32 at Springfield Avenue/Warfield Avenue
- Springfield Avenue at Warfield Avenue (roundabout)

MD 32 traverses Carroll County from the Howard County line northward for a distance of 16.72 miles, ultimately terminating within the City of Westminster at Washington Road. In the vicinity of the subject site, MDOT SHA classifies MD 32 as an urban principle arterial on the State Secondary System. The posted speed for this segment of MD 32 is 50 MPH. While the roadway widens to the intersection at Springfield Avenue, there is generally 1 lane in each direction along with a wide shoulder. Specifically, the travel lanes are 12 ft in width along with a 12-ft shoulder totaling a 48-ft wide paved section.

MDOT SHA owns partial access controls within the MD 32 corridor extending from south of the subject site to a point along property frontage approximately 1,450 ft north of Springfield Avenue. As shown as Station 287+10 on MDOT SHA Plat No. 28703. A copy of this Plat can be found in Appendix A.

The intersection of MD 32 at Springfield Avenue is controlled by traffic signalization. MD 32 widens to facilitate separate left turn lanes in both the northbound and southbound directions. In addition, separate right turns are also available on the major street.

The westbound Springfield Avenue approach features 2 separate left turns lanes, 1 thru lane, and 1 separate right turn lane. Springfield Avenue extends for a short distance from MD 32 to the roundabout situated to the east, approximately 650 ft. Springfield Avenue is divided with 2 travel lanes in the eastbound direction approaching the roundabout. The constructed lane configuration suggests that the approach is intended to carry a very significant volume of traffic.

FIGURE 1 - LOCATION MAP FOR SITE AND STUDY INTERSECTIONS

FIGURE 2 - AERIAL PHOTO

The intersection of Springfield Avenue at Warfield Avenue features a two-lane roundabout. There are a total of five legs, however, the southern Warfield Avenue approach is a dead-end and carries minimal traffic. A Northrop Grumman facility features access on the East Springfield Avenue leg.

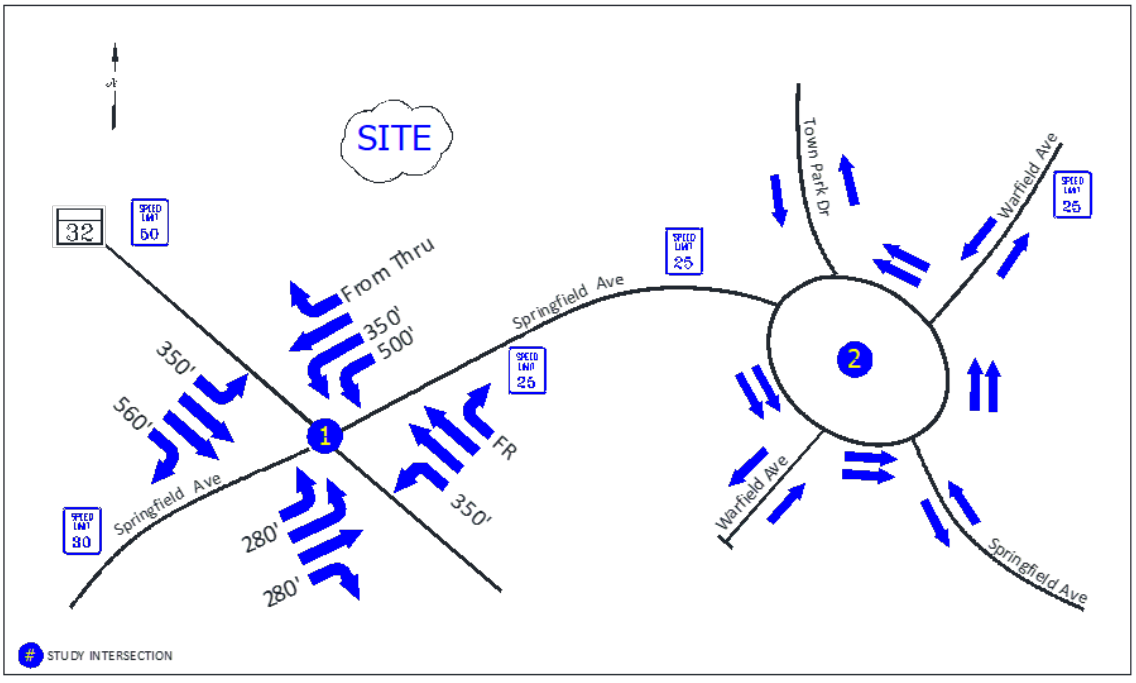
There are pedestrian facilities at the intersection of MD 32 at Springfield Avenue including crosswalks spanning the south and west legs of the intersection. A sidewalk is available on the south side of Springfield Avenue which provides connectivity to the Parkside at Warfield development via a crosswalk on the west leg of the roundabout. Additional sidewalk is available on the north leg of the roundabout as well.

The existing Parkside at Warfield development features approximately 145 townhomes that access the roadway system via Town Park Drive which generally runs in the north/south direction from the Springfield Avenue roundabout to a terminus within the neighborhood. The development also features a separate right-in/right-out access only along Springfield Avenue approximately 200 ft west of the roundabout.

Town Park Drive is approximately 20 ft in width and there is additional width provided in front of residential units to facilitate on-street parking. Several speed humps have been constructed approximately 500 ft north of the roundabout in an effort to slow speeds and calm traffic.

Figure 3 summarizes the existing lane uses at each of the study intersections along with the posted speed limits and traffic control devices. Aerial photographs providing additional information can be found in Appendix B.

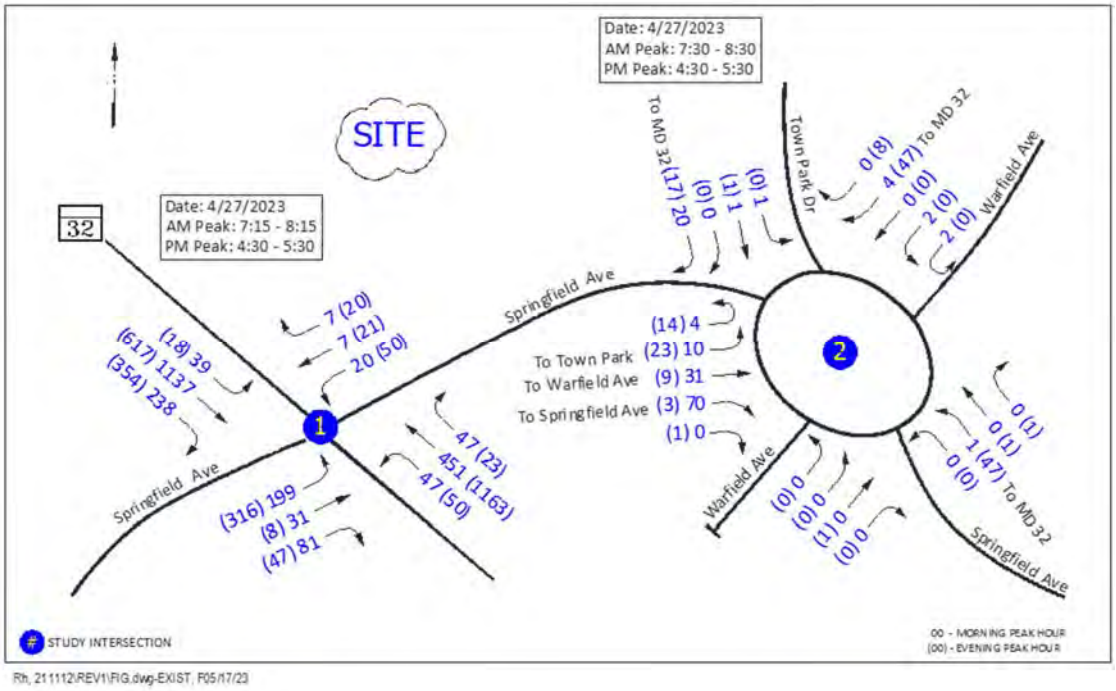
Figure 3. Existing Lane Use



Traffic Volumes

Intersection turning movement counts were collected at both of the study intersections from 6:30–9 AM and 3:30–6 PM on a typical weekday while public school was in session for a full day of in-person learning. Specifically, the counts were obtained on Thursday, April 27, 2023. The existing AM and PM peak hour volumes are summarized in Figure 4. Complete details on the turning movement counts can be found in Appendix B.

Figure 4. Existing Peak Hour Traffic Volumes



A review of the traffic volumes shows minimal traffic utilizes Springfield Avenue east of MD 32 during both peak periods. The morning peak period featured a total of 34 vehicles in the westbound direction. In the PM peak, the volume increased to 91.

Similarly, within the roundabout volumes are extremely low during both peak periods.

To review existing speeds along Town Park Drive, a 24-hour speed study was obtained north of the roundabout on April 27, 2023. Pneumatic tubes were placed across the roadway to measure the speed of each passing vehicle throughout the study duration. A full speed study can be found in Appendix B.

The 85th percentile speed is typically used in traffic engineering to determine a reasonable travel speed. It represents the speed at which 85% of all vehicles are travelling at or below. In this case, the 85th percentile speed was measured at 21 MPH for both northbound and southbound directions.

Given the residential nature of the community, the measured operating speed is appropriate.

BACKGROUND TRAFFIC CONDITIONS

Design Year

It is expected that full buildout of the Enclave at Parkside will be completed by 2026. Therefore, a 2026 design year is used to project future conditions.

Historic MDOT SHA traffic volumes were reviewed in the MD 32 corridor (.30 miles north of MD 851) and along Springfield Avenue between MD 32 and the Warfield Avenue roundabout. The historic volumes from 2013 through 2022 are shown in Figures 5 and 6, respectively.

A review of the volumes shows a relatively small increase along Springfield Avenue. The growth rate along MD 32 over the previous ten years has been negative, however, the most recent trend from 2021 to 2022 shows a small increase.

In order to present a conservative analysis, a full 3% annual growth rate was applied to all roads for a 3-year period. Figure 7 summarizes the regional growth. Adding the regional growth to the existing peak hour traffic volumes results in the 2026 base peak hour traffic volumes as shown in Figure 8.

FIGURE 5 - REGIONAL TRAFFIC GROWTH PROJECTION (MD 32)

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

County:	CARROLL		Municipality:	NONE	
Prefix:	MD	Route NO: 32	Suffix:		Mile Point: 1.42
Location:	MD32-.30 MI N OF MD851				
Begin Sect:	1.122		End Sect:	3.364	
Station Desc:	MD 851 TO MD 26				
Func Class:	14-URBAN OTHER PRINCIPAL ARTERIAL		Location ID:	B1599	

Year	AADT	AAWDT	Single Unit	Combination Unit	K Factor	D Factor	North East Split	South West Split	Dir In Peak Hour
2022	24,981	26,981	6	2	8.47	59.83	50.39	49.61	NORTH
2021	24,830	26,570	6	2	8.47	59.83	50.39	49.61	NORTH
2020	21,452	23,172	6	2	8.01	61.45	51.66	48.34	NORTH
2019	25,691	27,231	5	1	8.01	61.45	51.66	48.34	NORTH
2018	25,690	27,490	5	1	8.01	61.45	51.66	48.34	NORTH
2017	27,622	29,562	6	2	8.67	62.64	49.18	50.82	NORTH
2016	26,971	28,861	6	2	8.67	62.64	49.18	50.82	NORTH
2015	26,470	28,320	6	2	8.67	62.64	49.18	50.82	NORTH
2014	25,262	27,032	6	2	8.85	65.32	51.18	48.82	NORTH
2013	25,331	27,361	6	2	8.85	65.32	51.18	48.82	NORTH

Note

AADT: Annual Average Daily Traffic is the number of vehicles expected to pass a given location on an average day of the year.

AAWDT: Annual Average Weekday Traffic is the number of vehicles expected to pass a given location on an average Weekday (Monday – Friday).

Single Unit: Percentage of Trucks (FHWA Classes 4 -7).

Combination Unit: Percentage of Trucks (FHWA Classes 8-13).

K Factor: Proportion of Annual Average Daily Traffic occurring in the 30th highest hour volume for Continuous count station and Peak hour volume for Short duration count stations.

D Factor: Percentage of traffic moving in the peak direction during the 30th highest hour volume for Continuous count station and Peak hour volume for Short duration count stations.

North East Split: Percentage of traffic in the North or East Direction.

South West Split: Percentage of traffic in the South or West Direction.

Direction Peak Hour: The direction with largest volume in the peak hour.

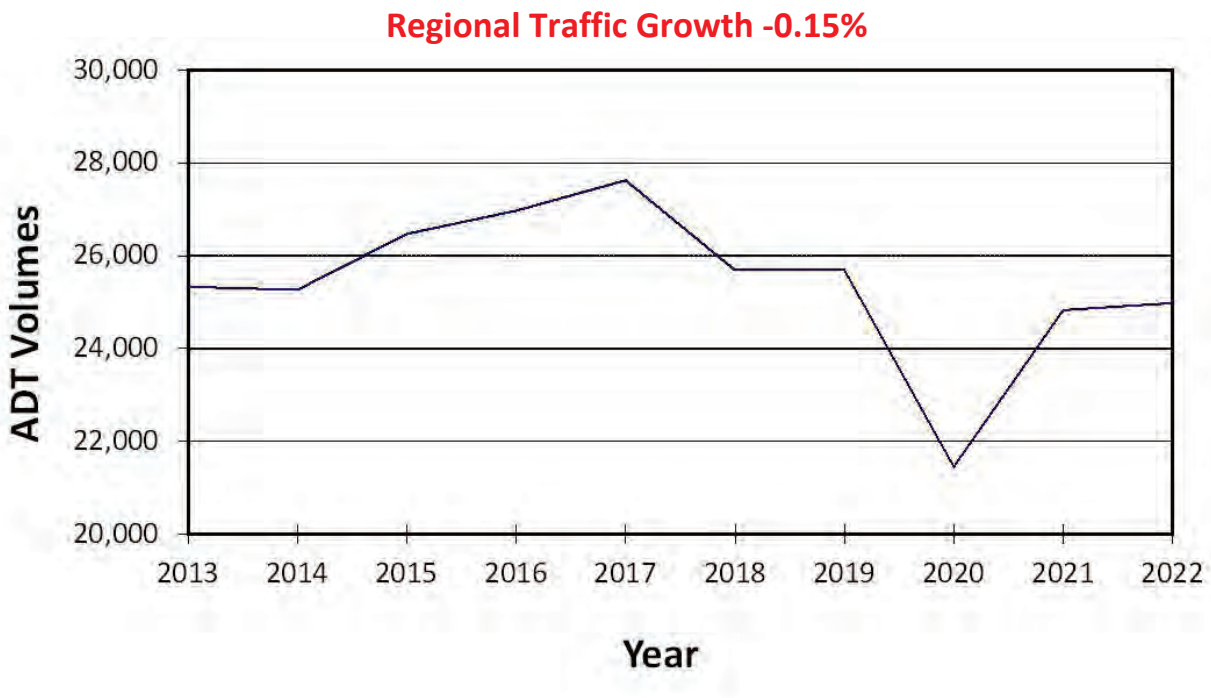


FIGURE 6 - REGIONAL TRAFFIC GROWTH PROJECTION (SPRINGFIELD AVE)

County:	CARROLL			Municipality:	SYKESVILLE
Prefix:	MU	Route NO:	303	Suffix:	Mile Point: 0.05
Location:	SPRINGFIELD AVE - Between MD 32 & Warfield Ave Roundabout				
Begin Sect:	0			End Sect:	0.283
Station Desc:	MD 32 TO ROAD END				
Func Class:	17-URBAN COLLECTOR			Location ID:	S2013060386

Year	AADT	AAWDT	Single Unit	Combination Unit	K Factor	D Factor	North East Split	South West Split	Dir In Peak Hour
2022	1,003	1,063			10.86	80.65	51.6	48.4	SOUTH
2021	992	1,042			10.86	80.65	51.6	48.4	SOUTH
2020	861	931			10.86	80.65	51.6	48.4	SOUTH
2019	1,030	1,130			10.86	80.65	51.6	48.4	SOUTH
2018	1,035	1,105			13.44	81.43	51.54	48.46	SOUTH
2017	1,034	1,104			13.44	81.43	51.54	48.46	SOUTH
2016	1,003	1,073			13.44	81.43	51.54	48.46	SOUTH
2015	982	1,052			13.44	81.43	51.54	48.46	SOUTH
2014	951	1,021			13.44	81.43	51.54	48.46	SOUTH
2013	950	1,030			13.44	81.43	51.54	48.46	SOUTH

Note

AADT: Annual Average Daily Traffic is the number of vehicles expected to pass a given location on an average day of the year.

AAWDT: Annual Average Weekday Traffic is the number of vehicles expected to pass a given location on an average Weekday (Monday – Friday).

Single Unit: Percentage of Trucks (FHWA Classes 4 -7).

Combination Unit: Percentage of Trucks (FHWA Classes 8-13).

K Factor: Proportion of Annual Average Daily Traffic occurring in the 30th highest hour volume for Continuous count station and Peak hour volume for Short duration count stations.

D Factor: Percentage of traffic moving in the peak direction during the 30th highest hour volume for Continuous count station and Peak hour volume for Short duration count stations.

North East Split: Percentage of traffic in the North or East Direction.

South West Split: Percentage of traffic in the South or West Direction.

Peak Hour Direction: The direction with largest volume in the peak hour.

Regional Traffic Growth 0.61%

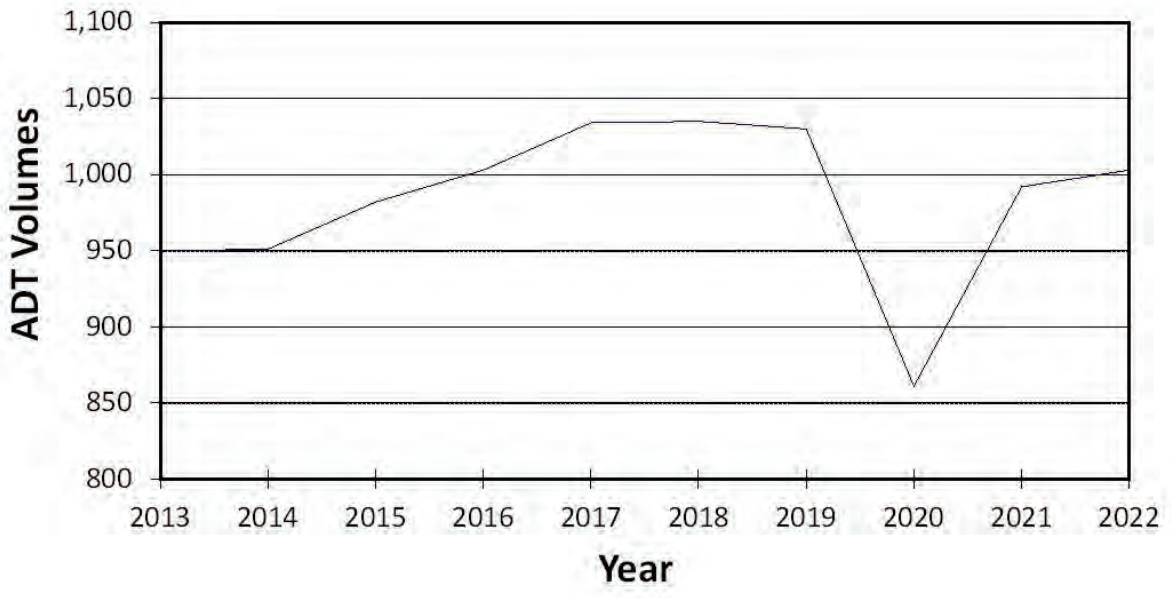


Figure 7. Regional Traffic Growth

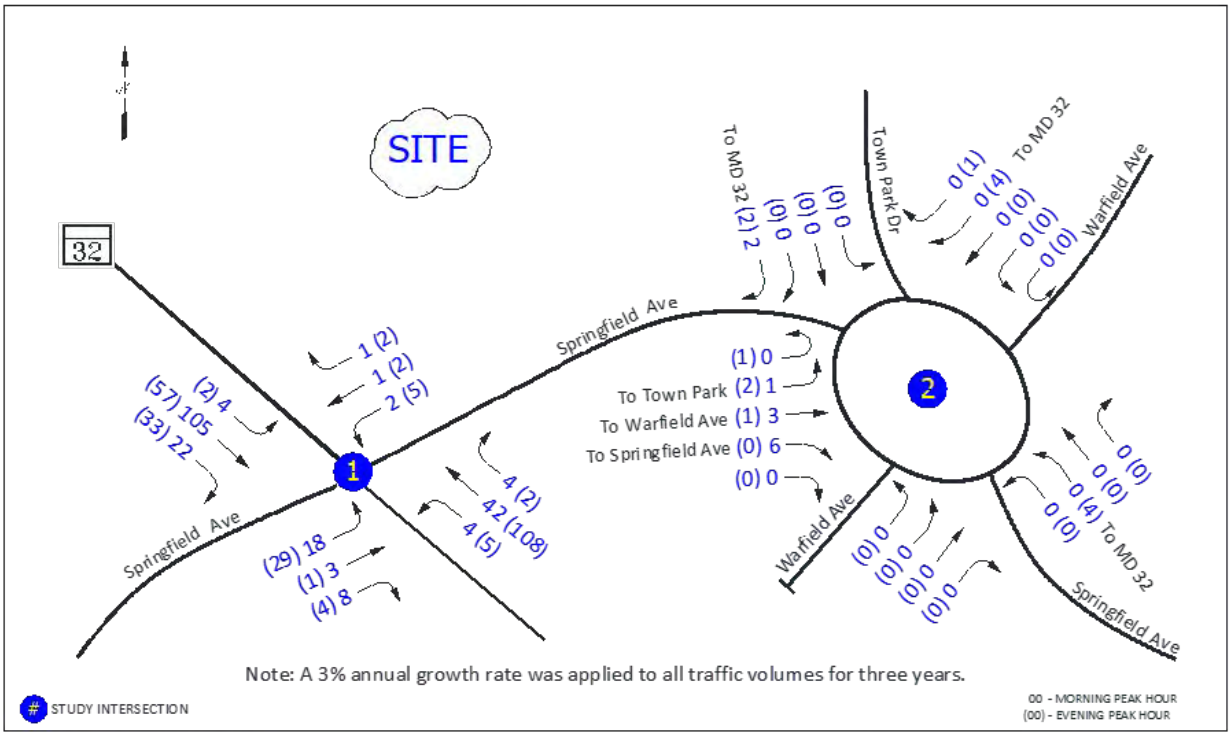


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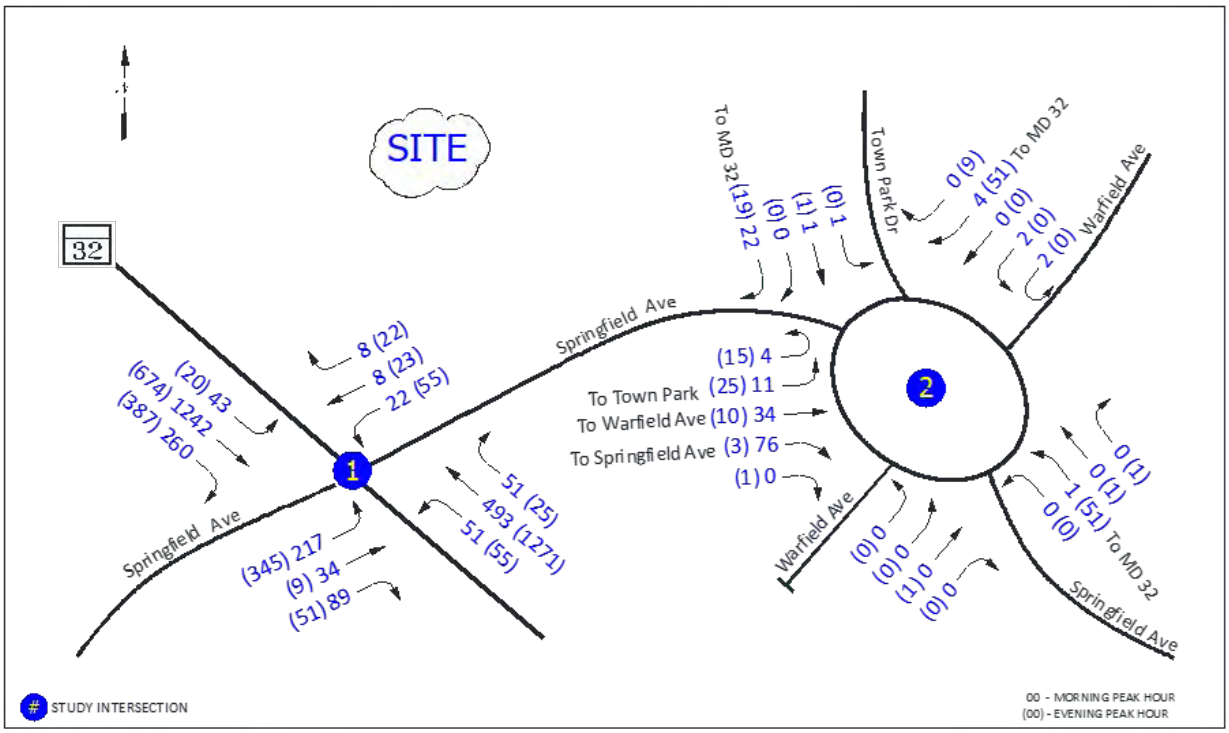
Figure 8. 2026 Base Peak Hour Traffic Volumes



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Background Traffic

A TIS was prepared by the Wilson T. Ballard Company consulting engineers for Warfield Development which is situated to the east of this site. It is our understanding that the development has been approved by the Town of Sykesville, however, it is unclear what portions will be built in the future. The development included a total of 7 separate parcels including:

- Parcel A/B – retail store consisting of 35,000 sq ft and 125 hotel rooms
- Parcels C, D, and H – 286,000 sq ft office
- Parcel E/F – 145 townhouse units – built and occupied
- State Police Training Facility

The approved trip generation from the October 2016 Traffic Impact Study is summarized in Table 1. As shown within the table, a total of 800 additional AM peak hour trips and 858 PM peak hour trips were approved for the site. Details on the trip assignment were also obtained from the approved traffic impact study. The total combined trip assignment for the background developments is shown in Figure 9. Adding the background trips to the base peak hour traffic volumes results in the 2026 background peak hour traffic volumes as shown in Figure 10.

Table 1. Trip Generation for Background Developments

Land Use	Size		AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Warfield Development								
Parcel A/B (Retail Store 35,000 sq.ft., Hotel 125 Rooms								
Retail Store	35,000	sq.ft.	21	13	34	62	68	130
Hotel	125	Rooms	29	51	80	38	34	72
Total Trips for Parcel A/B			***50***	***64***	***114***	***100***	***102***	***202***
Parcel C, D, & H (Office Existing Renovated Buildings 183,000 sq.ft. Proposed Buildings 103,000 sq.ft.)								
Office	286,000	sq.ft.	392	54	446	72	354	426
Total Trips for Parcel C, D, & H			***392***	***54***	***446***	***72***	***354***	***426***
Parcel E/F (Townhouses 145 units, All units have been built and occupied)								
Total Trips for Parcel E/F			***0***	***0***	***0***	***0***	***0***	***0***
State Police Training Faility	***1***	***Facility***	***211***	***29***	***240***	***39***	***191***	***230***
Total Trips for Adjacent Developments			**653**	**147**	**800**	**211**	**647**	**858**

Note: 1. Trip information obtianed from Warfield Development Traffic Impact Analysis at Existing MD 32/MD 851 Intersection. October 2016. By The Wilson T. Ballard Company Consulting Engineers.

Figure 9. Combined Trip Assignment for Background Developments

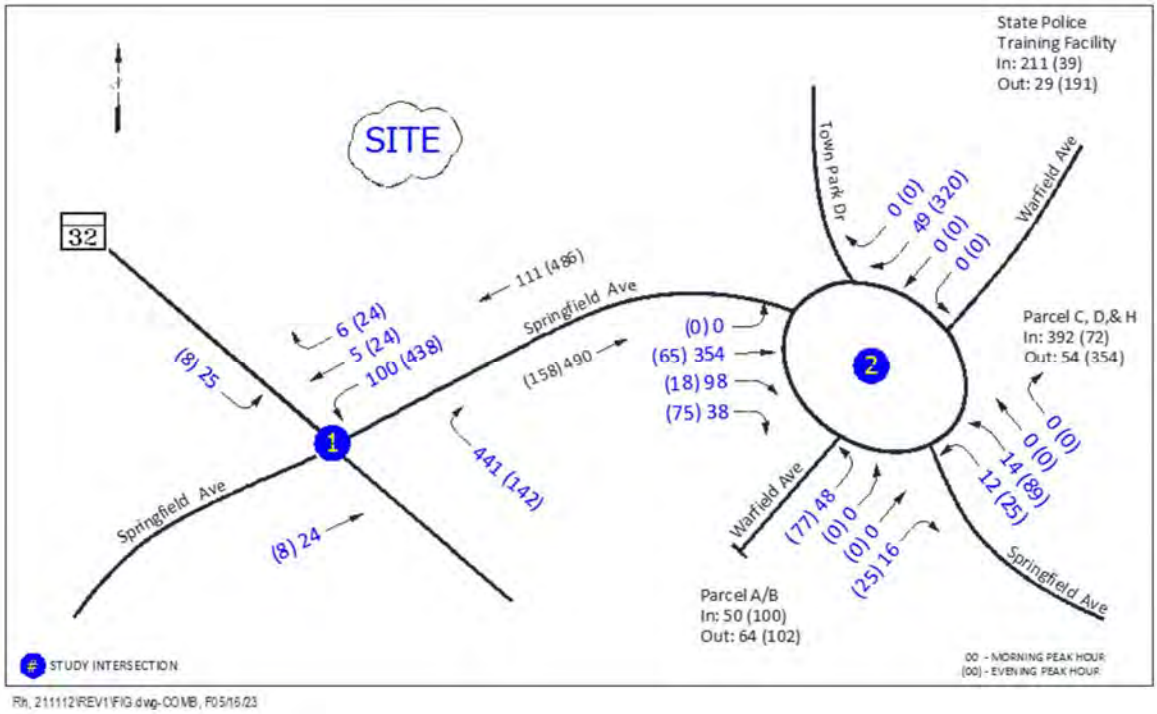

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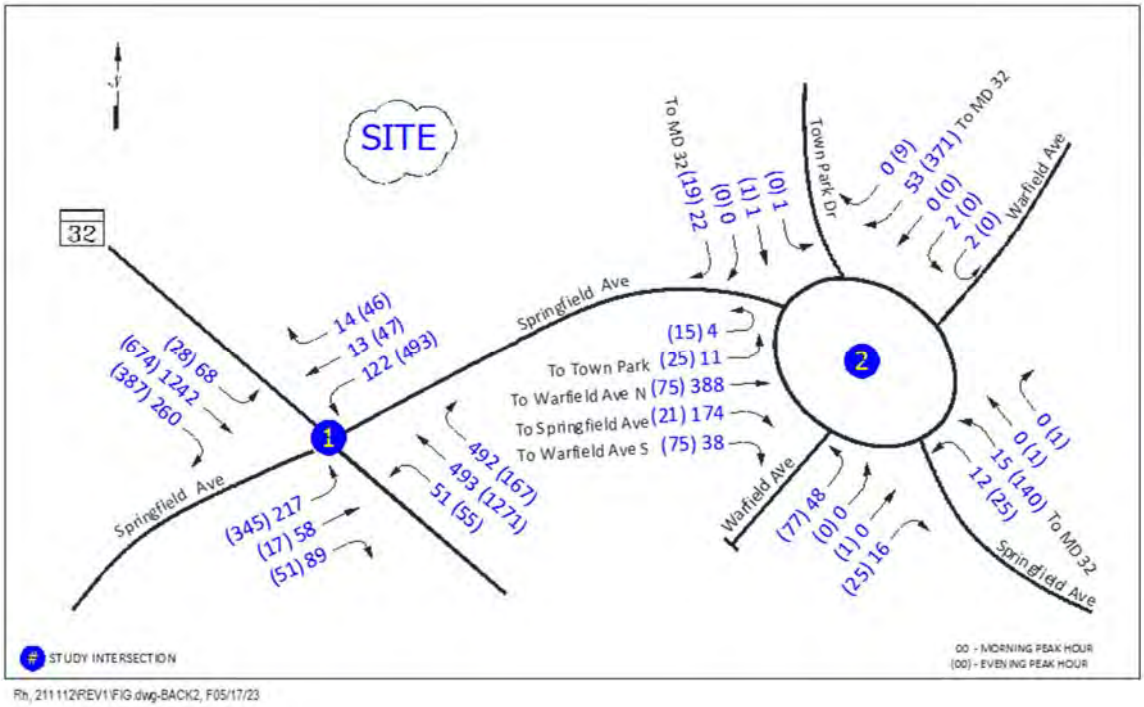
Figure 10. 2026 Background Peak Hour Traffic Volumes (with Warfield Development and State Police Training Facility)



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TOTAL TRAFFIC CONDITIONS

Site Information

The Enclave at Parkside is proposed to be developed with a total of 47 townhouse units. Access to the site is proposed via an extension of Town Park Drive. In addition, a potential future secondary point of access is shown via an extension of a future road approximately 625 ft south of Town Park Drive. This connection is not currently proposed but is shown on the Concept Plan for future planning purposes. The Concept Plan can be found in Figure 11.

Trip Generation/Distribution

ITE's Trip Generation (11th Edition) was utilized to project future trips associated with the proposed land use. Trip generation is based on data submitted for similar projects in which a rate or equation is developed to project the number of trips that a specific land use will generate. In this case, ITE's Land Use Code 215 (single family attached housing units) was utilized. Equations are provided for both the AM and PM peak period. Table 2 shows the equations for each period. Applying the equations to the proposed 47 units results in an increase of 19 AM peak hour trips and 24 PM peak hour trips.

Table 2. Trip Generation for Site

Trip Generation Rates

Formula/Rate	Directional Distribution			
	AM Peak Hour		PM Peak Hour	
	IN	OUT	IN	OUT
Single Family Attached Housing (units, ITE-215)				
AM Peak Hour Trips = 0.52 x Units - 5.70	31%	69%	57%	43%
PM Peak Hour Trips = 0.60 x Units - 3.93				

** ITE Trip Generation Manual 11th Edition, 2021.

Trip Generation

Land Use	Size		AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Townhouses	47	Units	6	13	19	14	10	24
Total Trips			**6**	**13**	**19**	**14**	**10**	**24**

FIGURE 11 - CONCEPT PLAN FOR SITE

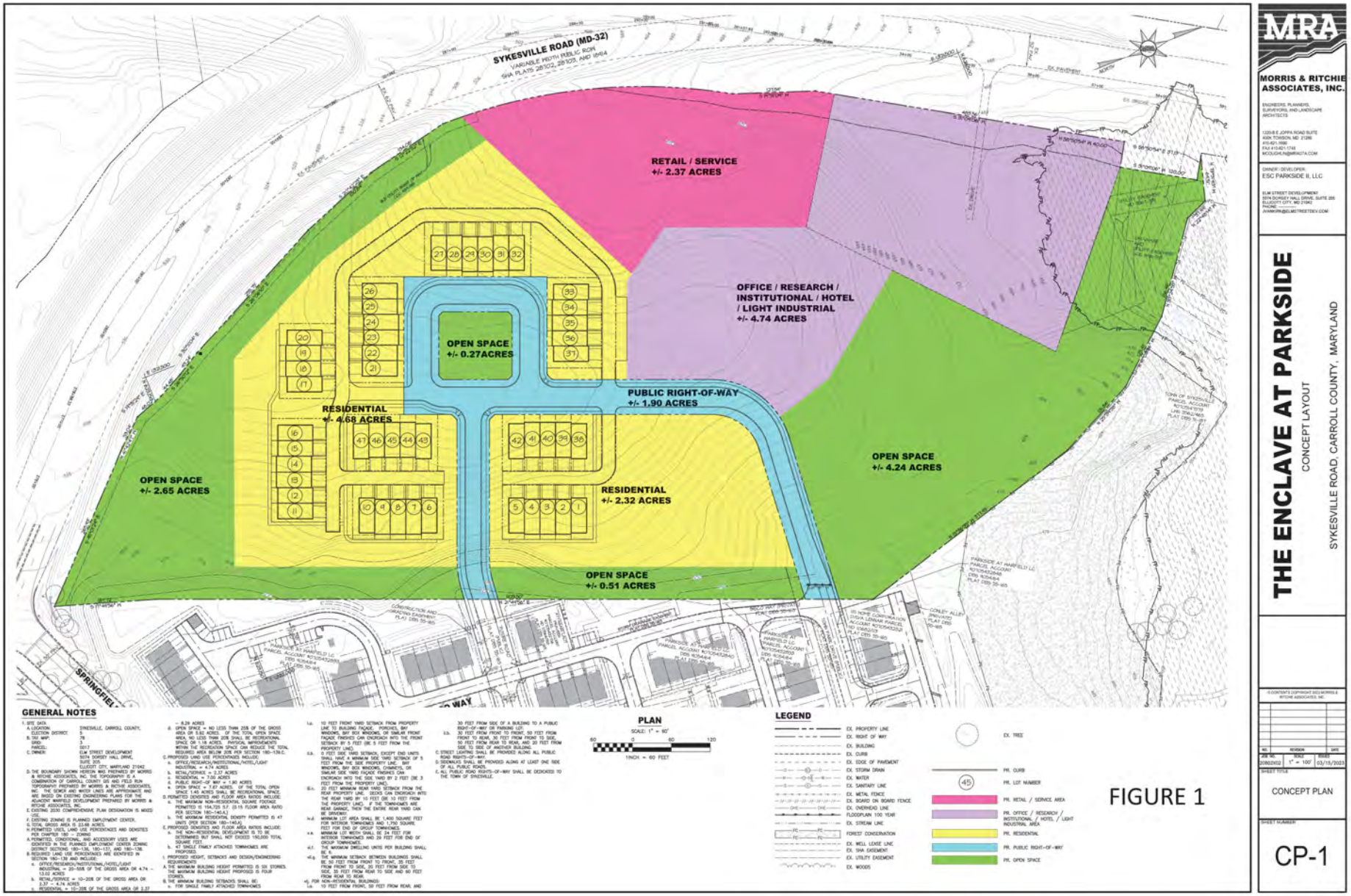


FIGURE 1

MRA
MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS, AND LANDSCAPE ARCHITECTS
1220-B E JOPPA ROAD SUITE 400K TOWSON, MD 21286
410-821-1690
FAX 410-821-1748
MCOUCH_N@MRAINCA.COM

OWNER / DEVELOPER:
ESC PARKSIDE II, LLC

ELM STREET DEVELOPMENT
5074 DORSEY HALL DRIVE, SUITE 205
ELLICOTT CITY, MD 21042
PHONE
AWARK@ELMSTREETDEV.COM

THE ENCLAVE AT PARKSIDE
CONCEPT LAYOUT
SYKESVILLE ROAD, CARROLL COUNTY, MARYLAND

NO.	REVISION	DATE

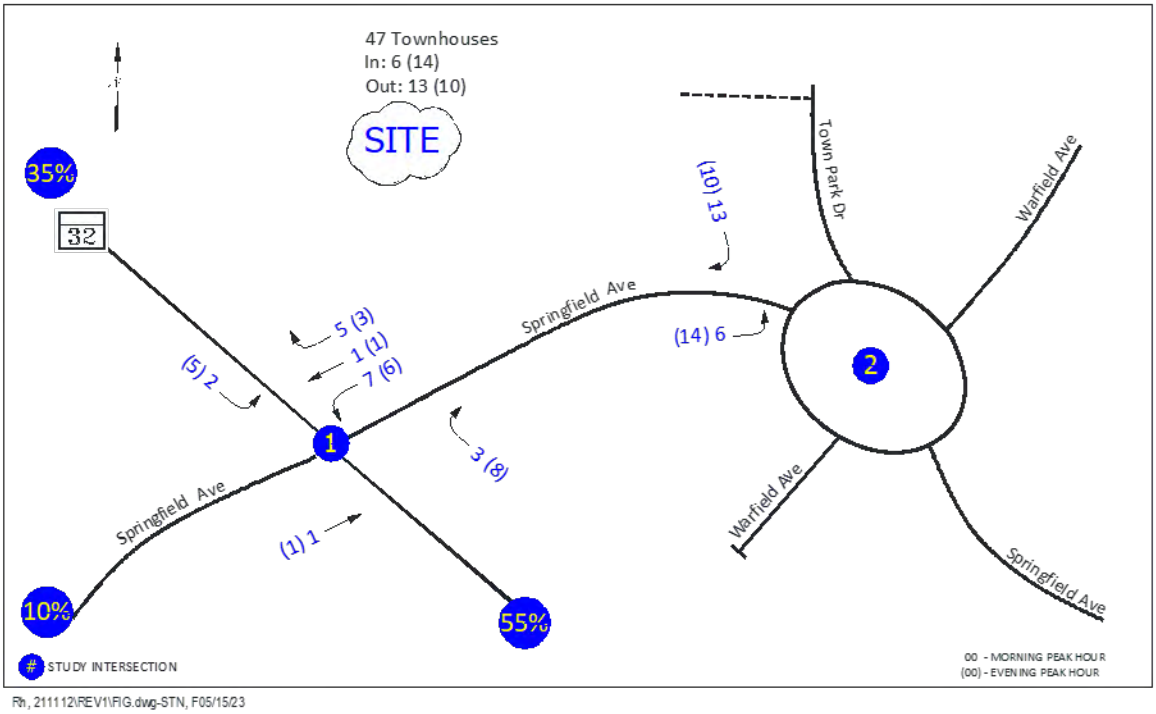
JOB NO. 22062003 | SCALE 1" = 100' | ISSUED 03/13/2023

SHEET TITLE
CONCEPT PLAN

SHEET NUMBER
CP-1

All site traffic was assigned to and from Town Park Drive, and then distributed at the intersection of MD 32 at Springfield Avenue. Figure 12 details the trip assignment for the site.

Figure 12. Trip Assignment for Site



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Since it is unknown what will ultimately be developed at the Warfield Property, two separate total conditions were reviewed: one without any approved background development and one with the development of Warfield. Figure 13 summarizes the 2026 total peak hour traffic volumes with background traffic. Figure 14 includes the total peak hour traffic volumes with the background developments.

Figure 13. 2026 Total Peak Hour Traffic Volumes (without Warfield Development and State Police Training Facility)

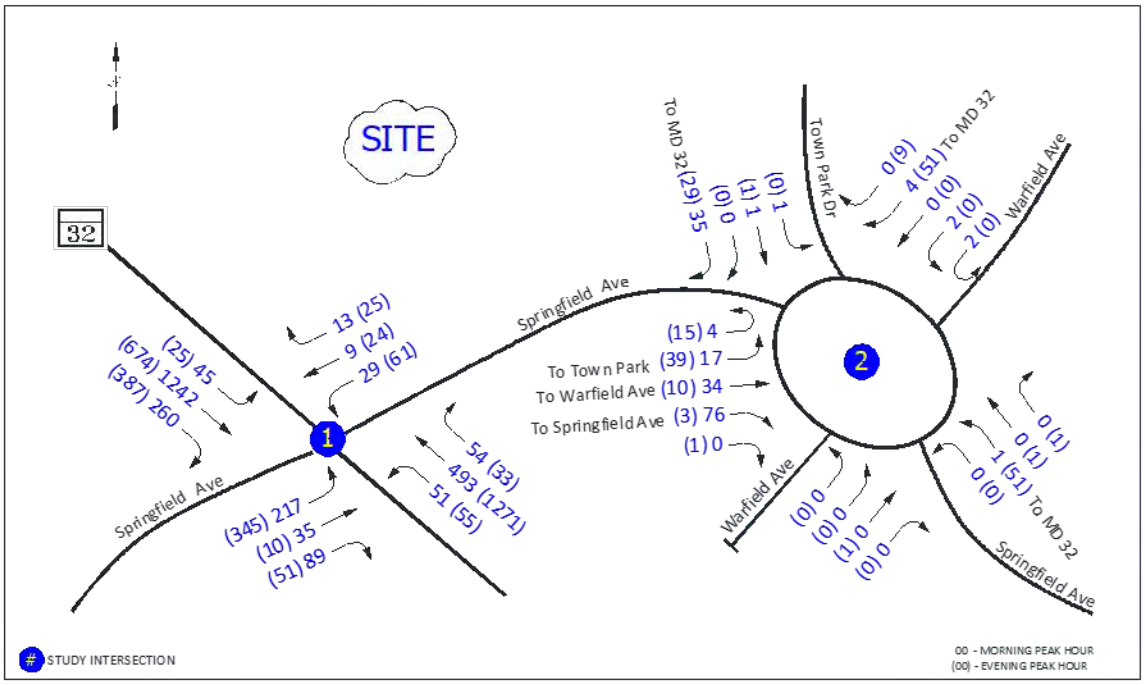

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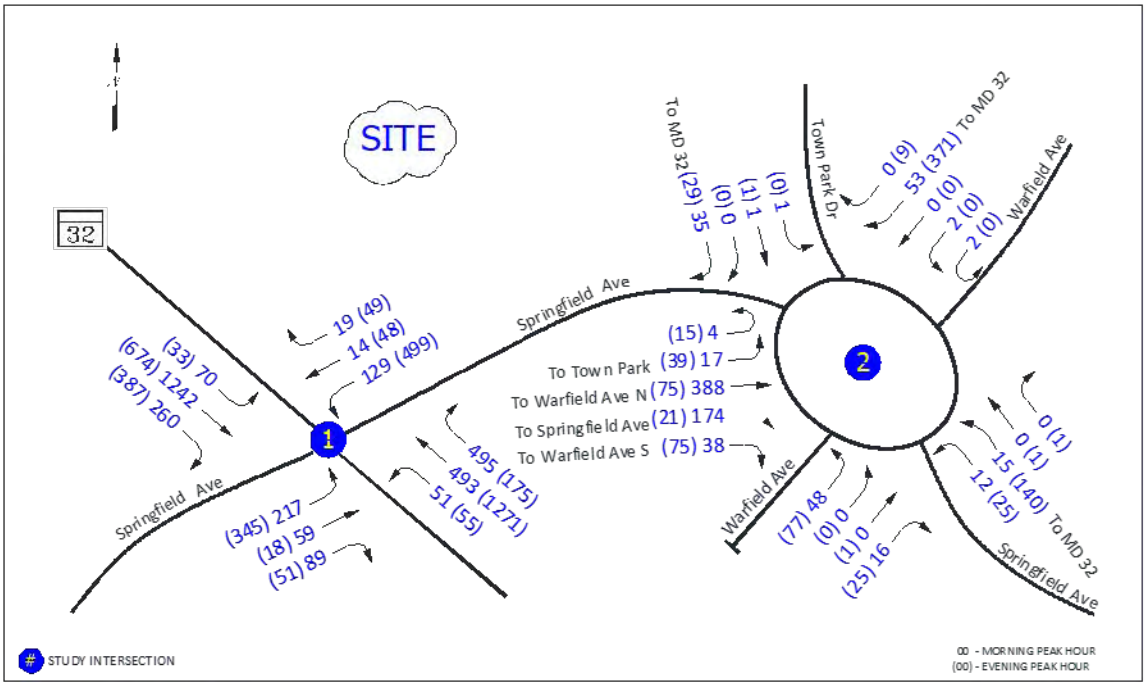
Figure 14. 2026 Total Peak Hour Traffic Volumes (with Warfield Development and State Police Training Facility)



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INTERSECTION CAPACITY ANALYSIS

Intersection capacity analysis was undertaken at both of the study intersections. CLV methodology was utilized at the intersection of MD 32 at Springfield Avenue. CLV presents a high-level planning analysis of the road system which quantifies a level of service based on conflicting traffic volumes and lane use. This methodology does not consider the traffic control device at the intersection. It is purely a future planning tool to ensure that adequate lane capacity is provided to accommodate existing and/or future conditions. Level of Service "A" is assigned to any intersections exhibiting a Critical Lane Volume of less than 1,000. As shown in Table 3, when considering the development of this site only, the intersection of MD 32 at Springfield Avenue will exhibit optimal Level of Service "A" conditions during the AM and PM peak periods. If all of the Warfield background development is added, adequate Level of Service "B" would occur under the background and total conditions during the PM peak.

Table 3. Summary of Intersection Capacity Analysis (without Warfield Development and State Police Training Facility)

Intersection	2023 Existing Traffic		2026 Background Traffic		2026 Total Traffic	
	AM	PM	AM	PM	AM	PM
1. MD 32 at Springfield Ave						
CLV - LOS/CLV	A/798	A/869	A/872	A/949	A/873	A/955
HCM - LOS/Delay (seconds)	C/25.3	C/25.0	C/26.6	C/26.2	C/26.7	C/26.5
EB/MD 32	C/26.1	C/22.0	C/27.6	C/22.0	C/27.6	C/21.8
WB/MD 32	B/18.7	C/24.3	B/18.7	C/25.8	B/18.8	C/26.3
NB/Springfield Ave	C/31.1	C/31.9	C/33.7	C/34.6	C/34.0	D/35.3
SB/Springfield Ave	D/42.8	D/39.8	D/44.8	D/41.9	D/44.4	D/42.3
2. Springfield Ave/Warfield Ave/Town Park Dr	LOS/Delay (seconds)					
Roundabout (Overall)	A/4.1	A/4.0	A/4.2	A/4.0	A/4.2	A/4.1
Springfield Ave (W. Leg)	A/4.3	A/3.8	A/4.4	A/3.8	A/4.5	A/4.0
Warfield Ave (S. W. Leg)	A/3.6	A/3.5	A/3.7	A/3.5	A/4.2	A/4.1
Springfield Ave (E. Leg)	A/3.4	A/4.0	A/3.5	A/4.0	A/3.5	A/4.1
Warfield Ave (N. Leg)	A/3.4	A/4.2	A/3.4	A/4.3	A/3.4	A/4.4
Town Park Drive	A/3.5	A/3.8	A/3.5	A/3.9	A/3.6	A/4.0

Table 4. Summary of Intersection Capacity Analysis (with Warfield Development and State Police Training Facility)

Intersection	2023 Existing Traffic		2026 Background Traffic		2026 Total Traffic	
	AM	PM	AM	PM	AM	PM
1. MD 32 at Springfield Ave						
CLV - LOS/CLV	A/798	A/869	A/877	B/1040	A/878	B/1049
HCM - LOS/Delay (seconds)	C/25.3	C/25.0	C/27.6	C/28.6	C/27.8	C/28.9
EB/MD 32	C/26.1	C/22.0	C/26.9	C/21.7	C/26.9	C/21.5
WB/MD 32	B/18.7	C/24.3	C/23.2	C/25.8	C/23.4	C/26.2
NB/Springfield Ave	C/31.1	C/31.9	D/36.2	D/37.3	D/36.2	D/37.9
SB/Springfield Ave	D/42.8	D/39.8	D/44.4	D/42.5	D/44.6	D/42.9
2. Springfield Ave/Warfield Ave/Town Park Dr						
Roundabout (Overall)	A/4.1	A/4.0	B/10.3	A/9.0	B/10.4	A/9.2
Springfield Ave (W. Leg)	A/4.3	A/3.8	B/11.9	A/5.8	B/12.0	A/6.0
Warfield Ave (S. W. Leg)	A/3.6	A/3.5	A/6.3	A/5.0	A/6.4	A/5.1
Springfield Ave (E. Leg)	A/3.4	A/4.0	A/5.1	A/6.3	A/5.1	A/6.5
Warfield Ave (N. Leg)	A/3.4	A/4.2	A/4.1	B/13.2	A/4.1	B/13.6
Town Park Drive	A/3.5	A/3.8	A/3.9	A/6.4	A/4.0	A/6.6

HCM analysis was also reviewed at the intersection of MD 32 at Springfield Avenue. HCM is a more detailed analytical methodology that accounts for traffic volumes, lane configuration, and traffic control devices to develop a level of service. The level of service is based on the average delay for each movement and for the overall intersection reported in seconds. As shown in Table 3, the intersection of MD 32 at Springfield Avenue exhibits an overall Level of Service "C" condition during AM and PM peak periods with or without the development of the site.

MDOT SHA controls the traffic signal timing at the intersection of MD 32 at Springfield Avenue. The top priority for MDOT SHA is to reduce delay along MD 32, often at the expense of additional delay on minor approaches. Since there are fewer minor vehicles, the average delays are slightly higher to accommodate mainline vehicles.

The Springfield Avenue/Warfield Avenue roundabout was reviewed using SIDRA methodology. SIDRA is the standard methodology utilized for roundabouts as it accounts for the geometry and lane configuration. Average delay is calculated for the overall roundabout as well as each of the approach legs. As shown in Tables 3 and 4, the overall roundabout operates at Level of Service "A" or "B" conditions during each peak period. Level of Service "A" or "B" is considered adequate with minimal delay.

SENSITIVITY ANALYSIS

As requested by representatives from the town, additional analysis was undertaken to determine the amount of additional traffic that could be accommodate by the current intersection designs within the study area.

For the purpose of this analysis, an additional 1,100 townhouse units were considered. It is important to recognize no additional development is proposed on any of the remaining outparcels at this time. The selection of this number of units was to establish a basis for a number of future trips.

ITE's Trip Generation (11th Edition) was utilized to project trips associated with this development. As shown in Table D1 (in Appendix D), a total of 566 AM peak hour trips and 656 PM peak hour trips are projected.

Based on the same trip assignment for the current proposed development, the trips were assigned to the study intersections as shown in Figure D1. Adding the 2026 total peak hour traffic volumes to the additional trips results in the theoretical future volumes shown in Figure D2.

Intersection capacity analysis was again undertaken for this scenario. As shown in Table D2, the intersection of MD 32 at Springfield Avenue would operate at acceptable Level of Service "D" conditions.

During the PM peak, the north leg of the Warfield Avenue approach of the roundabout will approach failing conditions but remain acceptable at Level of Service "D." Additional traffic would likely result in unacceptable conditions at the roundabout.

This number of trips could be used to represent other uses. They could include:

- 400,000 sq ft of general office space (552 AM peak hour trips; 525 PM peak hour trips)
- 140,000 sq ft of retail space (494 AM peak hour trips; 620 PM peak hour trips)
- 800,000 sq ft of general industrial space (548 AM peak hour trips; 180 PM peak hour trips)

It is important to recognize none of the uses identified above are proposed. They are simply listed to provide perspective on the amount of traffic that could potentially be accommodated at the study intersections.

RESULTS, RECOMMENDATIONS, AND CONCLUSIONS

Study Purpose

The Traffic Group, Inc. has prepared this TIS to quantify the impact the proposed development of the Enclave at Parkside will have on the surrounding road network within the Town of Sykesville in Carroll County. The subject site is proposed to be developed with a total of 47 townhouse units. Access to the property is proposed via an extension of Town Park Drive. Full build-out of the Enclave at Parkside is expected within 3 years.

Study Criteria/Methodology

Representatives from the Town of Sykesville approved the Scope of Work for this TIS in email correspondence dated April 26, 2023. A copy of the correspondence can be found in Appendix A.

ITE's Trip Generation (11th Edition) was utilized to project future trips associated with all approved background developments and the development of this site.

CLV and HCM analysis were utilized to quantify levels of service at the signalized intersection within the study area. SIDRA methodology was used for the roundabout.

MDOT SHA uses CLV as its typical standard for determining adequacy. Level of Service "D" or better is considered acceptable for state-maintained roadways. With regard to HCM and SIDRA methodologies, Level of Service "D" or better is typically also considered adequate.

Summary of Findings and Recommendations

This TIS has shown that both study intersections currently exhibit acceptable levels of service using all methodologies. In the future, with the development of this site and with consideration given to regional growth and development of the Warfield Property, each intersection will operate at an optimal level of service.

Since the study intersections will be adequate and no new intersections are proposed in conjunction with this development, it is our opinion that the road system is capable of supporting the development of the Enclave at Parkside and no additional road improvements are required.

APPENDIX A

Correspondence

A SERVICE DISABLED
VETERAN-OWNED
SMALL BUSINESS

MBE Certified
Charles County
Howard County
Prince George's County

MFD Certified
Montgomery County

CORPORATE OFFICE
Baltimore, MD
Suite H
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DELMARVA OFFICE
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SOUTH CAROLINA OFFICES
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Rock Hill: 803.693.4216

FIELD OFFICE LOCATIONS
Arkansas
Florida
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North Carolina
Ohio
Pennsylvania
South Carolina
Texas
Utah
Virginia
West Virginia

Merging Innovation and Excellence®
www.trafficgroup.com

April 7, 2023

Joe Cosentini
Town Manager
7547 Main Street
Sykesville, MD 21784

RE: The Enclave at Parkside
TRAFFIC IMPACT STUDY
SCOPING AGREEMENT
County, Maryland
Our Job No.: 2021-1112

Dear Mr. Cosentini:

In conjunction with the recently submitted Concept Plan for The Enclave at Parkside, it is our understanding that a Traffic Impact Study (TIS) is required. The purpose of this document is to establish the scoping parameters for the TIS.

The subject site is located on the north side of Springfield Avenue east of MD 32 (Sykesville Road) within the Town of Sykesville. A total of 47 townhouse units are proposed at this time.

Access to the property will be available through connections to existing Town Park Drive and a future public road. A Concept Plan showing the area can be found in Figure 1.

The adjacent Warfield Development located to the east of this site was evaluated by a TIS in October 2016. The following intersections were analyzed within the report:

- MD 32 at Springfield Avenue
- Springfield Avenue at Warfield Avenue (Roundabout)

For consistency with the previous document, we are proposing to incorporate those two intersections in the TIS for The Enclave at Parkside. Turning movement counts will be collected at each study intersection from 6:30 to 9:00 AM and 3:30 to 6:00 PM while public school is in session on a typical weekday to establish AM and PM peak hours.

Historic traffic volumes along the MD 32 corridor will be reviewed to establish a traffic growth rate.

With regard to background traffic, the previously approved components of Warfield Development will be included in this TIS. They include the following uses:

- 35,000 sq ft of retail space
- 125-room hotel
- 286,000-sq ft office
- 145 residential living units

A site investigation will be undertaken at the time of turning movement count collection to determine the existing built out portion of Warfield. Any units that are currently built and occupied will be reduced from the background total.

The Institute of Transportation Engineers (ITE) Trip Generation (11th Edition) will be used to project trips for background and site traffic. Additional consideration may be given to potential future development on this site, however, specific land uses have not been identified.

Intersection capacity analysis will be undertaken at the study intersections using both Critical Lane Volume (CLV) and Highway Capacity Manual (HCM) analysis. The roundabout will be reviewed using Sidra.

At this time, we are seeking your approval on the scoping parameters for this TIS. For reference, the original TIS for Warfield dated October 2016 is attached to this letter.

If you have any questions regarding this information, please do not hesitate to contact me. We look forward to receiving your approval so we can begin the TIS process.

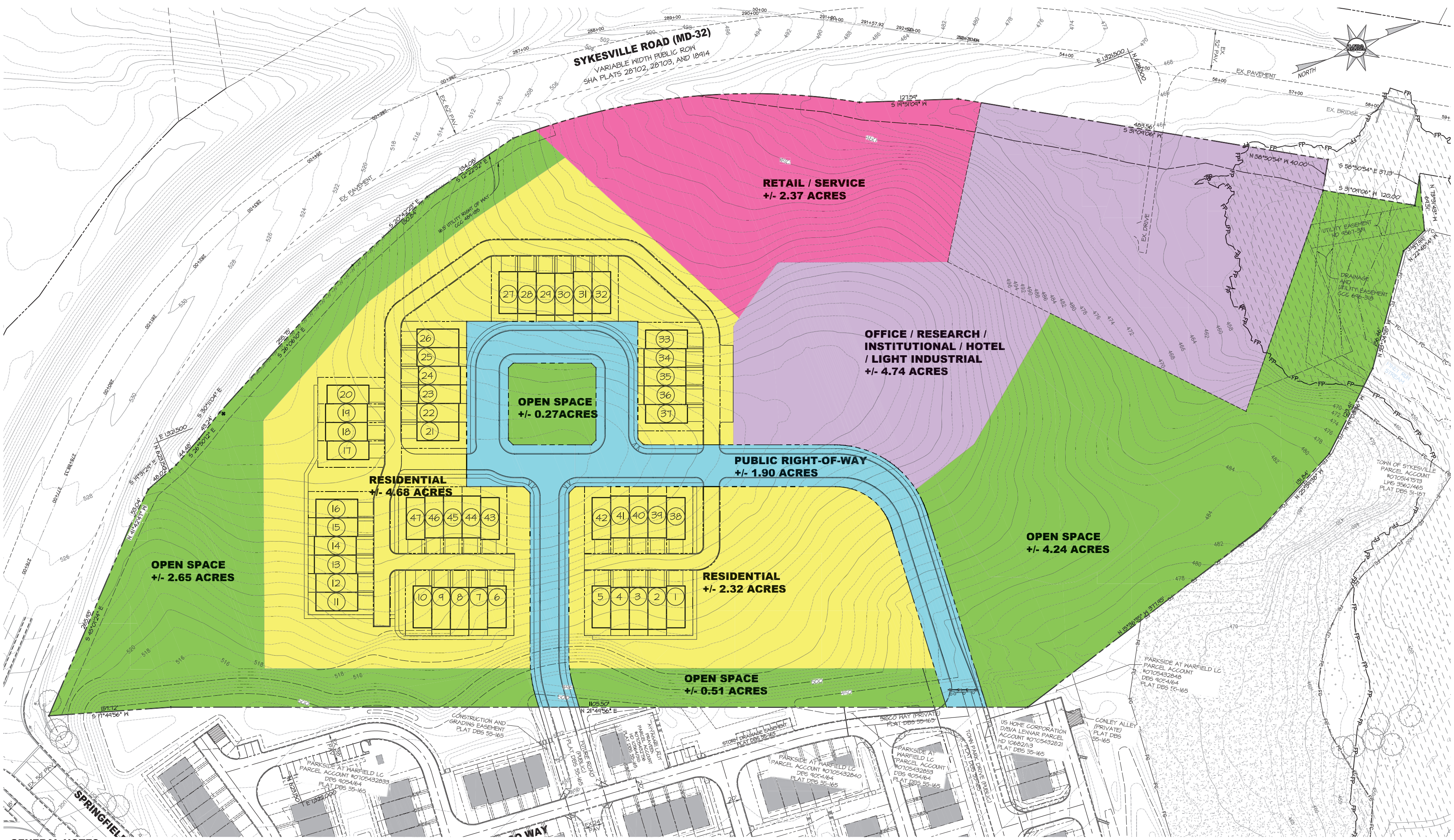
Sincerely,

Carl R. Wilson, Jr., P.E., PTOE, RSP
Vice President

CC: Taylor Faris
Jason Van Kirk
Sean Davis

CRW:amr/smb

(F:\2021\2021-1112_Warfield Townhouse Development\DOCS\CORRESP\ANALYST\TIS Scoping Agreement Ltr_Cosentini.docx)



GENERAL NOTES

1. SITE DATA
   - A. LOCATION: SYKESVILLE, CARROLL COUNTY, ELECTION DISTRICT 5
   - B. TAX MAP: 78; GRID: 3; PARCEL: 0017
   - C. OWNER: ELM STREET DEVELOPMENT, 5074 DORSEY HALL DRIVE, SUITE 205, ELLICOTT CITY, MARYLAND 21042
   - D. THE BOUNDARY SHOWN HEREON WAS PREPARED BY MORRIS & RITCHIE ASSOCIATES, INC. THE TOPOGRAPHY IS A COMBINATION OF CARROLL COUNTY GIS AND FIELD RUN TOPOGRAPHY PREPARED BY MORRIS & RICTHIE ASSOCIATES, INC. THE SEWER AND WATER LINES ARE APPROXIMATE AND ARE BASED ON EXISTING ENGINEERING PLANS FOR THE ADJACENT WARFIELD DEVELOPMENT PREPARED BY MORRIS & RITCHIE ASSOCIATES, INC.
   - E. EXISTING 2030 COMPREHENSIVE PLAN DESIGNATION IS MIXED USE.
   - F. EXISTING ZONING IS PLANNED EMPLOYMENT CENTER.
   - G. TOTAL GROSS AREA IS 23.68 ACRES.
   - H. PERMITTED USES, LAND USE PERCENTAGES AND DENSITIES PER CHAPTER 180 – ZONING
   - A. PERMITTED, CONDITIONAL, AND ACCESSORY USES ARE IDENTIFIED IN THE PLANNED EMPLOYMENT CENTER ZONING DISTRICT SECTIONS 180–136, 180–137, AND 180–138.
   - B. REQUIRED LAND USE PERCENTAGES ARE IDENTIFIED IN SECTION 180–139 AND INCLUDE:
     - a. OFFICE/RESEARCH/INSTITUTIONAL/HOTEL/LIGHT INDUSTRIAL = 20–55% OF THE GROSS AREA OR 4.74 – 13.02 ACRES
     - b. RETAIL/SERVICE = 10–20% OF THE GROSS AREA OR 2.37 – 4.74 ACRES
     - c. RESIDENTIAL = 10–35% OF THE GROSS AREA OR 2.37 – 8.29 ACRES
     - d. OPEN SPACE = NO LESS THAN 25% OF THE GROSS AREA OR 5.92 ACRES. OF THE TOTAL OPEN SPACE AREA, NO LESS THAN 20% SHALL BE RECREATIONAL SPACE OR 1.18 ACRES. PHYSICAL IMPROVEMENTS WITHIN THE RECREATION SPACE CAN REDUCE THE TOTAL REQUIRED AREA BELOW 20% PER SECTION 180–139.C.
   - C. PROPOSED LAND USE PERCENTAGES INCLUDE:
     - a. OFFICE/RESEARCH/INSTITUTIONAL/HOTEL/LIGHT INDUSTRIAL = 4.74 ACRES
     - b. RETAIL/SERVICE = 2.37 ACRES
     - c. RESIDENTIAL = 7.00 ACRES
     - d. PUBLIC RIGHT–OF WAY = 1.90 ACRES
     - e. OPEN SPACE = 7.67 ACRES. OF THE TOTAL OPEN SPACE 1.45 ACRES SHALL BE RECREATIONAL SPACE.
   - D. PERMITTED DENSITIES AND FLOOR AREA RATIOS INCLUDE:
     - a. THE MAXIMUM NON–RESIDENTIAL SQUARE FOOTAGE PERMITTED IS 154,725 S.F. (0.15 FLOOR AREA RATIO PER SECTION 180–140.A.)
     - b. THE MAXIMUM RESIDENTIAL DENSITY PERMITTED IS 47 UNITS (PER SECTION 180–140.A)
   - E. PROPOSED DENSITIES AND FLOOR AREA RATIOS INCLUDE:
     - a. THE NON–RESIDENTIAL DEVELOPMENT IS TO BE DETERMINED BUT SHALL NOT EXCEED 150,000 TOTAL SQUARE FEET.
     - b. 47 SINGLE FAMILY ATTACHED TOWNHOMES ARE PROPOSED.
   - I. PROPOSED HEIGHT, SETBACKS AND DESIGN/ENGINEERING REQUIREMENTS
   - A. THE MAXIMUM BUILDING HEIGHT PERMITTED IS SIX STORIES. THE MAXIMUM BUILDING HEIGHT PROPOSED IS FOUR STORIES.
   - B. THE MINIMUM BUILDING SETBACKS SHALL BE:
     - a. FOR SINGLE FAMILY ATTACHED TOWNHOMES
       - i.a. 10 FEET FRONT YARD SETBACK FROM PROPERTY LINE TO BUILDING FAÇADE. PORCHES, BAY WINDOWS, BAY BOX WINDOWS, OR SIMILAR FRONT FAÇADE FINISHES CAN ENCROACH INTO THE FRONT SETBACK BY 5 FEET (BE 5 FEET FROM THE PROPERTY LINE).
       - ii.b. 0 FEET SIDE YARD SETBACK, EXCEPT END UNITS SHALL HAVE A MINIMUM SIDE YARD SETBACK OF 5 FEET FROM THE SIDE PROPERTY LINE. BAY WINDOWS, BAY BOX WINDOWS, CHIMNEYS, OR SIMILAR SIDE YARD FAÇADE FINSIHES CAN ENCROACH INTO THE SIDE YARD BY 2 FEET (BE 3 FEET FROM THE PROPERTY LINE).
       - iii.c. 20 FEET MINIMUM REAR YARD SETBACK FROM THE REAR PROPERTY LINE. DECKS CAN ENCROACH INTO THE REAR YARD BY 10 FEET (BE 10 FEET FROM THE PROPERTY LINE). IF THE TOWNHOMES ARE REAR GARAGE, THEN THE ENTIRE REAR YARD CAN BE DRIVEWAY.
       - iv.d. MINIMUM LOT AREA SHALL BE 1,400 SQUARE FEET FOR INTERIOR TOWNHOMES AND 1,750 SQUARE FEET FOR END OF GROUP TOWNHOMES.
       - v.e. MINIMUM LOT WIDTH SHALL BE 24 FEET FOR INTERIOR TOWNHOMES AND 29 FEET FOR END OF GROUP TOWNHOMES.
       - vi.f. THE MAXIMUM DWELLING UNTIS PER BUILDING SHALL BE 6.
       - vii.g. THE MINIMUM SETBACK BETWEEN BUILDINGS SHALL BE 50 FEET FROM FRONT TO FRONT, 35 FEET FROM FRONT TO SIDE, 20 FEET FROM SIDE TO SIDE, 35 FEET FROM REAR TO SIDE AND 60 FEET FROM REAR TO REAR.
     - vij. FOR NON–RESIDENTIAL BUILDINGS:
       - i.a. 10 FEET FROM FRONT, 50 FEET FROM REAR, AND 30 FEET FROM SIDE OF A BUILDING TO A PUBLIC RIGHT–OF–WAY OR PARKING LOT.
       - ii.b. 30 FEET FROM FRONT TO FRONT, 50 FEET FROM FRONT TO REAR, 30 FEET FROM FRONT TO SIDE, 50 FEET FROM REAR TO REAR, AND 20 FEET FROM SIDE TO SIDE OF ANOTHER BUILDING.
   - C. STREET LIGHTING SHALL BE PROVIDED ALONG ALL PUBLIC ROAD RIGHTS–OF–WAY.
   - D. SIDEWALKS SHALL BE PROVIDED ALONG AT LEAST ONE SIDE OF ALL PUBLIC ROADS.
   - E. ALL PUBLIC ROAD RIGHTS–OF–WAY SHALL BE DEDICATED TO THE TOWN OF SYKESVILLE.

PLAN

SCALE: 1" = 60'

60 0 60 120

1INCH = 60 FEET

LEGEND

- EX. PROPERTY LINE
- EX. RIGHT OF WAY
- EX. BUILDING
- EX. CURB
- EX. EDGE OF PAVEMENT
- EX. STORM DRAIN
- EX. WATER
- EX. SANITARY LINE
- EX. METAL FENCE
- EX. BOARD ON BOARD FENCE
- EX. OVERHEAD LINE
- FLOODPLAIN 100 YEAR
- EX. STREAM LINE
- FOREST CONSERVATION
- EX. WELL LEASE LINE
- EX. SHA EASEMENT
- EX. UTILITY EASEMENT
- EX. WOODS
- EX. TREE
- PR. CURB
- 45 PR. LOT NUMBER
- PR. RETAIL / SERVICE AREA
- PR. OFFICE / RESEARCH / INSTITUTIONAL / HOTEL / LIGHT INDUSTRIAL AREA
- PR. RESIDENTIAL
- PR. PUBLIC RIGHT–OF–WAY
- PR. OPEN SPACE

FIGURE 1

MORRIS & RITCHIE ASSOCIATES, INC.

ENGINEERS, PLANNERS, SURVEYORS, AND LANDSCAPE ARCHITECTS

1220-B E JOPPA ROAD SUITE 400K TOWSON, MD 21286
410-821-1690
FAX 410-821-1748
MCOUGHLIN@MRAGTA.COM

OWNER / DEVELOPER:
ESC PARKSIDE II, LLC

ELM STREET DEVELOPMENT
5074 DORSEY HALL DRIVE, SUITE 205
ELLICOTT CITY, MD 21042
PHONE: -------------
JVANKIRK@ELMSTREETDEV.COM

THE ENCLAVE AT PARKSIDE

CONCEPT LAYOUT

SYKESVILLE ROAD, CARROLL COUNTY, MARYLAND

NO.	REVISION	DATE

JOB NO.	SCALE	ISSUED
20802X02	1" = 100'	03/15/2023

SHEET TITLE

CONCEPT PLAN

SHEET NUMBER

CP-1

Richard Huang

From: Carl Wilson
Sent: Wednesday, May 17, 2023 3:35 PM
To: Richard Huang
Subject: FW: The Enclave at Parkside TIS Scoping Agreement

From: Joe Cosentini <JCosentini@sykesville.net>
Sent: Wednesday, April 26, 2023 9:30 AM
To: Carl Wilson <cwilson@trafficgroup.com>
Cc: Van Kirk Jason <jvankirk@elmstreetdev.com>; Taylor Faris <tfaris@elmstreetdev.com>; Sean Davis <SDavis@mragta.com>
Subject: Re: The Enclave at Parkside TIS Scoping Agreement

Looks good, Carl.

Thanks,
Joe

From: Carl Wilson <cwilson@trafficgroup.com>
Sent: Tuesday, April 25, 2023 12:07 PM
To: Joe Cosentini <JCosentini@sykesville.net>
Cc: Van Kirk Jason <jvankirk@elmstreetdev.com>; Taylor Faris <tfaris@elmstreetdev.com>; Sean Davis <SDavis@mragta.com>
Subject: RE: The Enclave at Parkside TIS Scoping Agreement

Joe –

Thanks for meeting with us on 4/24/2023 to discuss the parameters of the TIS for The Enclave at Parkside. Our discussion was primarily related to the questions you asked by email on 4/21/2023. Below your questions are re-stated along with our responses.

- Will the number of trips specific to Town Park Drive be analyzed? Most public comments the Town anticipates will be specific to this question.
  Yes; we will use the Institute of Transportation Engineers (ITE) Trip Generation (11th Edition) to quantify trips projected to be generated by this site. They will be distributed to the roads with the peak hour volumes shown in a graphic format.
- Will the analysis only be done with both access points (Town Park Drive and future public road)? It was mentioned during the concept plan meeting that the "future public road" may not be necessary.
  Since the access points will be extensions of the existing roads, and not new intersections, there is not really an analysis that can be run. There will be relatively low volumes associated with the site and there would be no level of service deficiencies at internal intersections. This will be discussed in the TIS.
- The background traffic to be included from the Warfield Development seems unnecessary since the owners are not likely to build the project out in the stated configuration. Could a more general AM/PM peak analysis be done showing the capacity of the intersections of MD32 at Springfield Avenue and Springfield Ave at Warfield Ave (roundabout)?

We will run a scenario with regional traffic growth, a scenario with the full buildout of Warfield, since it is technically approved, and then sensitivity analysis to provide information on how much more potential traffic the study intersections could potentially handle as it is not likely that Warfield will be built out with the current proposed uses.

- We know that no specific commercial uses have been identified, but were estimates going to be included in this study? The scope letter only says "Additional consideration may be given...".
  Only 47 townhouse units are currently proposed. We will provide a sensitivity analysis to show how much more traffic the study intersections can accommodate and then back those trips into potential users. If a new use is proposed in the future an update to the TIS will be required.
- "Intersection capacity analysis will be undertaken at the study intersections using both Critical Lane Volume (CVL) and Highway Capacity Manual (HCM) analysis. The roundabout will be reviewed using Sidra." I don't know the differences between these methods or why different ones are being used. A brief explanation within the report would be beneficial.
  We will provide details on the analysis methodologies in the TIS.

It is our understanding that Carroll County may review the TIS, but they are not involved in setting the scoping parameters. Please confirm the original scoping documentation from 4/7/2023 and these responses are acceptable. If you have any questions or need any additional information at this point, please let me know. Thank you,

Carl Wilson, Jr., P.E, PTOE, RSP
Vice President
The Traffic Group, Inc.
9900 Franklin Square Dr. - Suite H
Baltimore, MD 21236
T 410.931.6600
M 410.292.5545
F 410.931.6601
cwilson@trafficgroup.com
www.trafficgroup.com

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From: Joe Cosentini <JCosentini@sykesville.net>
Sent: Friday, April 21, 2023 2:37 PM
To: Carl Wilson <cwilson@trafficgroup.com>
Cc: Van Kirk Jason <jvankirk@elmstreetdev.com>; Taylor Faris <tfaris@elmstreetdev.com>; Sean Davis <SDavis@mragta.com>
Subject: Re: The Enclave at Parkside TIS Scoping Agreement

Good afternoon Carl,

Thank you for sending this over and for your patience in my response. I have a few questions below that may only need a clarification or two, but am glad to discuss next week if needed.

- Will the number of trips specific to Town Park Drive be analyzed? Most public comments the Town anticipates will be specific to this question.
- Will the analysis only be done with both access points (Town Park Drive and future public road)? It was mentioned during the concept plan meeting that the "future public road" may not be necessary.
- The background traffic to be included from the Warfield Development seems unnecessary since the owners are not likely to build the project out in the stated configuration. Could a more general AM/PM peak analysis be done showing the capacity of the intersections of MD32 at Springfield Avenue and Springfield Ave at Warfield Ave (roundabout)?
- We know that no specific commercial uses have been identified, but were estimates going to be included in this study? The scope letter only says "Additional consideration may be given...".
- "Intersection capacity analysis will be undertaken at the study intersections using both Critical Lane Volume (CVL) and Highway Capacity Manual (HCM) analysis. The roundabout will be reviewed using Sidra." I don't know the differences between these methods or why different ones are being used. A brief explanation within the report would be beneficial.

Please let me know if you would like to discuss. I am around early next week.

Thanks again,

Joe Cosentini
Town Manager
Town of Sykesville
410-795-8959 (o)
443-286-2476 (c)

From: Carl Wilson <cwilson@trafficgroup.com>
Sent: Friday, April 7, 2023 3:01 PM
To: Joe Cosentini <JCosentini@sykesville.net>
Cc: Van Kirk Jason <jvankirk@elmstreetdev.com>; Taylor Faris <tfaris@elmstreetdev.com>; Sean Davis <SDavis@mragta.com>
Subject: The Enclave at Parkside TIS Scoping Agreement

Joe-

Attached please find a Scoping Agreement detailing the proposed parameters for the TIS for The Enclave at Parkside. Please review and let me know if you have any questions. We look forward to receiving your approval so we can begin the TIS.

Thanks!
Carl

Carl Wilson, Jr., P.E, PTOE, RSP
Vice President
The Traffic Group, Inc.
9900 Franklin Square Dr. - Suite H
Baltimore, MD 21236
T 410.931.6600
M 410.292.5545
F 410.931.6601
cwilson@trafficgroup.com
www.trafficgroup.com

LEGEND FOR DRAINAGE STRUCTURES

- REVERSIBLE EASEMENT FOR SUPPORTING SLOPES.
- RIPRAP EASEMENT OR RIGHT FOR SPECIAL PURPOSE AS INDICATED BY NOTATION ON THIS PLAT.
- PERPETUAL EASEMENT FOR SPECIAL PURPOSE AS INDICATED BY NOTATION ON THIS PLAT.
- PERPETUAL EASEMENT FOR DRAINAGE FACILITY AS INDICATED BY NOTATION ON THIS PLAT. (ARROW INDICATES GENERAL DRAINAGE FLOW PATTERN).
- PERPETUAL EASEMENT TO DISCHARGE FLOW OF WATER FROM OR INTO EXISTING WATERWAY OR NATURAL DRAINAGE COURSE.
- PERPETUAL EASEMENT TO DISCHARGE FLOW OF WATER UPON EXISTING GROUND.
- APPROXIMATE GENERAL DRAINAGE FLOW PATTERN. (NOT TO SCALE - FOR EXPLANATORY PURPOSE ONLY)

LAND HEREIN SOLD FOR, IN FEE DEED OR DEEDS TO THE STATE ROADS COMMISSION ARE PLANNED AT THIS TIME. THE STATE ROADS COMMISSION RESERVES THE RIGHT TO LOCATE OR LATER MOVE SAID DRAINAGE FACILITIES AND EASEMENTS FROM THIS PLAT.

THIS IS A CONTROLLED ACCESS ARTERIAL HIGHWAY AND NO ACCESS EITHER VEHICULAR, PEDESTRIAN AND/OR ANIMAL WILL BE PERMITTED ACROSS THE LINES DESIGNATED "RIGHT OF WAY LINE OF THROUGH HIGHWAY" EXCEPT BY MEANS OF SUCH PUBLIC ROAD CONNECTIONS AS THE COMMISSION MAY CONSTRUCT OR PERMIT TO BE CONSTRUCTED.

RIGHT OF WAY & EXISTING RIGHT OF WAY LINE

EXISTING SURFACING MD RTE. 32

ONE WAY

BASE LINE OF RIGHT OF WAY

EXISTING RIGHT OF WAY LINE

PIPE CULVERT

N 3°13'04" E

N77°30'34"W 61.59'

END RIGHT OF WAY LINE OF THROUGH HIGHWAY STA 43+00

CHD N 26°21'38" E R=5654.58'

FRANK BEASMAN, EST. 50562 SEC'y's # 40351 Cond. Case

N 13°00'03" W 75.91'

RIGHT OF WAY LINE

LINE OF HIGHWAY

RIGHT OF WAY THROUGH

N 23°45'11" W 115.50'

TO U.S. RTE. 40

MATCH MARK TO PLAT NO. 28702

EXIST. 4" WATER MAIN

EASEMENT AREA AS SHOWN ON PLATS 16593, 16594

957.58
L 958.73

449.39
L=454.73

S19°55'07" W 127.59

P.T. 291+57.92

P.T. 52+71.44 AHD
P.O.T. 292+83.04 B.K.

RIGHT OF WAY LINE

TO ELDERSBURG

BASE LINE OF RIGHT OF WAY
Δ = 76°10'31"
D = 06°00'00"
R = 954.93'
L = 1269.59'
T = 748.43'
E = 258.34

℄ MEDIAN EXISTING MD. RTE. 32
Δ = 10°52'45"
D = 01°00'00"
R = 5729.58'
L = 1087.92'
T = 545.60'
E = 25.92'

CHD S 15°58'48" W R=954.93'

134.08'

S 12°18'34" E

130.84'

S 20°38'25" E

255.73'

RIGHT OF WAY LINE OF THROUGH HIGHWAY

END RIGHT OF WAY LINE OF THROUGH HIGHWAY STA. 287+10

RIGHT OF WAY LINE OF THROUGH HIGHWAY

FEE SIMPLE AREA: 7.40± ACRES SHOWN THUS:

NAMES OF REPORTED PROPERTY OWNERS AS SHOWN ON THIS PLAT ARE THOSE OF ORIGINAL GRANTORS TO THE COMMISSION. THE APPROXIMATE PROPERTY LINES SHOWN WERE NOT ESTABLISHED BY ACTUAL SURVEY, BUT ARE INTENDED FOR AN APPROXIMATE GUIDE ONLY.

LOCATED IN CARROLL COUNTY

PREPARED BY
BUREAU OF DESIGN Henry N. Okeson
CHIEF - CONDEMNATION SECTION

APPROVED BY THE STATE ROADS COMMISSION PURSUANT TO CHAPTER 50, ACTS OF THE GENERAL ASSEMBLY OF MARYLAND, 1957 SESSION.

DATE

CHAIRMAN

BOOKS
21-253, 14688

REVISIONS
PART OF PLAT NOS.: 27475, 27476

STATE ROADS COMMISSION OF MARYLAND

STATE ROUTE 32
SYKESVILLE BYPASS

SCALE: 1" = 50'
ISSUED April 29 1963
LeRoy E. Moser
RIGHT OF WAY ENGINEER

HO 292-2-720
CONTRACT No. CL 341-5-720

PLAT No. 28703

MSA S1624-28703

K&E 150 IMPERIAL TRACING CLOTH T.M. 63673

1 2 3 4 5 6

APPENDIX B

Intersection Turning Movement Counts

and Aerial Photographs

TOTALS TURNING MOVEMENT COUNT - SUMMARY

Counted by: VCU

Intersection of: MD 32 | **Date: April 27, 2023** | **Thursday**

and: Springfield Avenue | **Weather: Sunny/Warm**

Location: Howard County, Maryland | **Entered by: SN** | **Star Rating: 4**

TIME	TRAFFIC FROM NORTH on: MD 32					TRAFFIC FROM SOUTH on: MD 32					TRAFFIC FROM EAST on: Springfield Avenue					TRAFFIC FROM WEST on: Springfield Avenue					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
6:30 - 6:45	25	262	1	0	288	8	70	9	0	87	0	0	4	0	4	13	5	28	0	46	425
6:45 - 7:00	24	301	9	0	334	7	74	7	0	88	0	1	7	0	8	12	8	56	0	76	506
7:00 - 7:15	35	289	3	0	327	9	78	9	0	96	0	1	6	0	7	14	6	56	0	76	506
7:15 - 7:30	47	301	11	0	359	7	108	12	0	127	0	0	2	0	2	18	4	36	0	58	546
7:30 - 7:45	47	309	13	0	369	8	108	9	0	125	2	0	16	0	18	18	7	44	0	69	581
7:45 - 8:00	71	258	12	0	341	16	132	10	0	158	3	0	0	0	3	24	10	50	0	84	586
8:00 - 8:15	73	269	3	0	345	16	103	16	0	135	2	7	2	0	11	21	10	69	0	100	591
8:15 - 8:30	43	227	11	0	281	9	129	10	0	148	2	1	5	0	8	29	1	74	0	104	541
8:30 - 8:45	52	218	6	0	276	9	144	6	0	159	9	1	5	0	15	24	7	79	0	110	560
8:45 - 9:00	51	205	2	0	258	7	143	11	0	161	8	1	4	0	13	19	1	77	0	97	529
2 Hr Totals	468	2639	71	0	3178	96	1089	99	0	1284	26	12	51	0	89	192	59	569	0	820	5371
1 Hr Totals																					
6:30 - 7:30	131	1153	24	0	1308	31	330	37	0	398	0	2	19	0	21	57	23	176	0	256	1983
6:45 - 7:45	153	1200	36	0	1389	31	368	37	0	436	2	2	31	0	35	62	25	192	0	279	2139
7:00 - 8:00	200	1157	39	0	1396	40	426	40	0	506	5	1	24	0	30	74	27	186	0	287	2219
7:15 - 8:15	238	1137	39	0	1414	47	451	47	0	545	7	7	20	0	34	81	31	199	0	311	2304
7:30 - 8:30	234	1063	39	0	1336	49	472	45	0	566	9	8	23	0	40	92	28	237	0	357	2299
7:45 - 8:45	239	972	32	0	1243	50	508	42	0	600	16	9	12	0	37	98	28	272	0	398	2278
8:00 - 9:00	219	919	22	0	1160	41	519	43	0	603	21	10	16	0	47	93	19	299	0	411	2221
PEAK HOUR																					
7:15 - 8:15	238	1137	39	0	1414	47	451	47	0	545	7	7	20	0	34	81	31	199	0	311	2304
PM																					
3:30 - 3:45	63	127	2	0	192	6	262	14	0	282	11	8	8	0	27	13	1	89	0	103	604
3:45 - 4:00	66	174	3	0	243	4	238	21	0	263	10	3	9	0	22	18	0	71	0	89	617
4:00 - 4:15	82	155	3	0	240	8	263	14	0	285	15	6	10	0	31	24	1	66	0	91	647
4:15 - 4:30	85	172	5	0	262	4	273	14	0	291	7	4	10	0	21	14	4	77	0	95	669
4:30 - 4:45	72	139	6	0	217	3	310	9	0	322	8	3	8	0	19	14	4	72	0	90	648
4:45 - 5:00	74	153	2	0	229	4	286	14	0	304	3	6	18	0	27	13	2	87	0	102	662
5:00 - 5:15	104	168	6	0	278	5	298	8	0	311	4	5	9	0	18	6	2	76	0	84	691
5:15 - 5:30	104	157	4	0	265	11	269	19	0	299	5	7	15	0	27	14	0	81	0	95	686
5:30 - 5:45	89	150	2	0	241	3	292	16	0	311	6	0	2	0	8	18	1	65	0	84	644
5:45 - 6:00	90	139	5	0	234	9	302	17	0	328	4	0	3	0	7	13	1	77	0	91	660
2 Hr Totals	829	1534	38	0	2401	57	2793	146	0	2996	73	42	92	0	207	147	16	761	0	924	6528
1 Hr Totals																					
3:30 - 4:30	296	628	13	0	937	22	1036	63	0	1121	43	21	37	0	101	69	6	303	0	378	2537
3:45 - 4:45	305	640	17	0	962	19	1084	58	0	1161	40	16	37	0	93	70	9	286	0	365	2581
4:00 - 5:00	313	619	16	0	948	19	1132	51	0	1202	33	19	46	0	98	65	11	302	0	378	2626
4:15 - 5:15	335	632	19	0	986	16	1167	45	0	1228	22	18	45	0	85	47	12	312	0	371	2670
4:30 - 5:30	354	617	18	0	989	23	1163	50	0	1236	20	21	50	0	91	47	8	316	0	371	2687
4:45 - 5:45	371	628	14	0	1013	23	1145	57	0	1225	18	18	44	0	80	51	5	309	0	365	2683
5:00 - 6:00	387	614	17	0	1018	28	1161	60	0	1249	19	12	29	0	60	51	4	299	0	354	2681
PEAK HOUR																					
4:30 - 5:30	354	617	18	0	989	23	1163	50	0	1236	20	21	50	0	91	47	8	316	0	371	2687

PEDESTRIAN AND BICYCLE OBSERVATIONS - SUMMARY

Counted by: VCU

Intersection of: MD 32 | **Date: April 27, 2023** | **Thursday**

and: Springfield Avenue | **Weather: Sunny/Warm**

Location: Howard County, Maryland | **Entered by: SN** | **Star Rating: 4**

TIME	NORTH LEG MD 32		SOUTH LEG MD 32	
	Pedestrians	Bicycles	Pedestrians	Bicycles
AM				
6:30 - 6:45	0	0	0	0
6:45 - 7:00	0	0	0	0
7:00 - 7:15	0	0	0	0
7:15 - 7:30	0	0	0	0
7:30 - 7:45	0	0	1	0
7:45 - 8:00	0	0	0	0
8:00 - 8:15	0	0	0	0
8:15 - 8:30	0	0	0	0
8:30 - 8:45	0	0	2	0
8:45 - 9:00	0	0	0	0
TOTALS	0	0	3	0
PM				
3:30 - 3:45	0	0	0	0
3:45 - 4:00	0	0	0	0
4:00 - 4:15	0	0	0	0
4:15 - 4:30	0	0	0	0
4:30 - 4:45	0	0	0	0
4:45 - 5:00	0	0	0	0
5:00 - 5:15	0	0	0	0
5:15 - 5:30	0	0	0	0
5:30 - 5:45	0	0	0	0
5:45 - 6:00	0	0	0	0
TOTALS	0	0	0	0

	EAST LEG Springfield Avenue		WEST LEG Springfield Avenue	
	Pedestrians	Bicycles	Pedestrians	Bicycles
AM				
6:30 - 6:45	0	0	0	0
6:45 - 7:00	0	0	0	0
7:00 - 7:15	0	0	0	0
7:15 - 7:30	0	0	0	0
7:30 - 7:45	0	0	0	0
7:45 - 8:00	0	0	0	0
8:00 - 8:15	0	0	0	0
8:15 - 8:30	0	0	0	0
8:30 - 8:45	0	0	0	0
8:45 - 9:00	0	0	0	0
TOTALS	0	0	0	0
PM				
3:30 - 3:45	0	0	0	0
3:45 - 4:00	0	0	0	0
4:00 - 4:15	0	0	0	0
4:15 - 4:30	0	0	0	0
4:30 - 4:45	0	0	0	0
4:45 - 5:00	0	0	0	0
5:00 - 5:15	0	0	0	0
5:15 - 5:30	0	0	0	0
5:30 - 5:45	0	0	0	0
5:45 - 6:00	0	0	0	0
TOTALS	0	0	0	0


N
200 ft

TOTAL VEHICLE TURNING MOVEMENT COUNT - SUMMARY

Intersection of: Springfield Avenue
and: Warfield Avenue
Location: Howard County, Maryland

Counted by: VCU
Date: April 27, 2023
Weather: Sunny/Cool
Entered by: SN

Day: Thursday

TIME	FROM NORTH						FROM SOUTH						FROM EAST						FROM WEST						FROM NORTHWEST						TOTAL
	Warfield Avenue						Warfield Avenue						Northrop Grumman Access						Springfield Avenue						Town Park Drive						N + S
	HARD								BEAR					BEAR								HARD			HARD	BEAR	BEAR	HARD			+
	RIGHT	RIGHT	THRU	LEFT	U-TURN	TOTAL	RIGHT	THRU	LEFT	LEFT	U-TURN	TOTAL	RIGHT	RIGHT	THRU	LEFT	U-TURN	TOTAL	RIGHT	THRU	LEFT	LEFT	U-TURN	TOTAL	RIGHT	RIGHT	LEFT	LEFT	U-TURN	TOTAL	E + W
AM																															
6:30-6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7	1	0	15	2	0	0	0	0	2	17
6:45-7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	15	7	1	1	24	7	0	0	0	0	7	32
7:00-7:15	0	2	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	1	0	11	8	0	1	20	4	0	1	0	0	5	28
7:15-7:30	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	16	3	2	0	21	4	0	0	0	0	4	26
7:30-7:45	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	16	9	2	0	27	8	0	0	0	0	8	37
7:45-8:00	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	25	7	3	0	35	2	0	0	0	0	2	39
8:00-8:15	0	1	0	0	1	2	0	0	0	0	0	0	0	0	1	0	0	1	0	14	12	3	3	32	4	0	1	0	0	5	40
8:15-8:30	0	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	15	3	2	1	21	6	0	0	1	0	7	30
8:30-8:45	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	1	0	1	0	5	11	5	1	22	11	0	0	0	0	11	36
8:45-9:00	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	3	0	8	6	0	0	0	0	6	16
3 Hr Totals	1	9	0	2	2	14	0	1	0	0	0	1	0	0	3	1	0	4	0	125	71	22	7	225	54	0	2	1	0	57	301
1 Hr Totals																															
6:30-7:30	1	2	0	0	0	3	0	0	0	0	0	0	0	0	2	0	0	2	0	49	25	4	2	80	17	0	1	0	0	18	103
6:45-7:45	1	4	0	0	0	5	0	0	0	0	0	0	0	0	2	0	0	2	0	58	27	5	2	92	23	0	1	0	0	24	123
7:00-8:00	1	4	0	2	0	7	0	0	0	0	0	0	0	0	1	0	0	1	0	68	27	7	1	103	18	0	1	0	0	19	130
7:15-8:15	1	3	0	2	1	7	0	0	0	0	0	0	0	0	1	0	0	1	0	71	31	10	3	115	18	0	1	0	0	19	142
7:30-8:30	0	4	0	2	2	8	0	0	0	0	0	0	0	0	1	0	0	1	0	70	31	10	4	115	20	0	1	1	0	22	146
7:45-8:45	0	3	0	2	2	7	0	1	0	0	0	1	0	0	1	1	0	2	0	59	33	13	5	110	23	0	1	1	0	25	145
8:00-9:00	0	5	0	0	2	7	0	1	0	0	0	1	0	0	1	1	0	2	0	35	30	13	5	83	27	0	1	1	0	29	122
PEAK HOUR																															
7:30-8:30	0	4	0	2	2	8	0	0	0	0	0	0	0	0	1	0	0	1	0	70	31	10	4	115	20	0	1	1	0	22	146
PM																															
3:30-3:45	3	8	0	0	0	11	0	0	0	0	0	0	0	0	16	0	0	16	0	0	1	8	0	9	4	0	0	0	0	4	40
3:45-4:00	1	6	0	0	0	7	0	0	0	0	0	0	0	0	12	0	0	12	0	0	1	5	1	7	5	0	0	0	0	5	31
4:00-4:15	1	8	0	0	0	9	0	0	0	0	0	0	0	1	12	0	0	13	0	1	0	8	2	11	4	0	0	0	0	4	37
4:15-4:30	1	10	0	0	0	11	0	0	0	0	0	0	0	0	5	0	0	5	0	0	2	10	1	13	2	0	0	0	0	2	31
4:30-4:45	2	12	0	0	0	14	0	0	0	0	0	0	0	1	12	0	0	13	0	0	2	5	5	12	3	0	0	0	0	3	42
4:45-5:00	1	11	0	0	0	12	0	0	0	0	0	0	0	0	8	0	0	8	1	1	0	4	2	8	5	0	1	0	0	6	34
5:00-5:15	4	10	0	0	0	14	0	1	0	0	0	1	1	0	10	0	0	11	0	1	5	4	2	12	3	0	0	0	0	3	41
5:15-5:30	1	14	0	0	0	15	0	0	0	0	0	0	0	0	17	0	0	17	0	1	2	10	5	18	6	0	0	0	0	6	56
5:30-5:45	0	4	0	0	1	5	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	3	1	4	3	0	0	0	0	3	17
5:45-6:00	1	4	0	0	0	5	0	0	0	0	0	0	0	0	8	0	0	8	0	0	1	15	1	17	2	0	0	1	0	3	33
3 Hr Totals	15	87	0	0	1	103	0	1	0	0	0	1	1	2	105	0	0	108	1	4	14	72	20	111	37	0	1	1	0	39	362
1 Hr Totals																															
3:30-4:30	6	32	0	0	0	38	0	0	0	0	0	0	0	1	45	0	0	46	0	1	4	31	4	40	15	0	0	0	0	15	139
3:45-4:45	5	36	0	0	0	41	0	0	0	0	0	0	0	2	41	0	0	43	0	1	5	28	9	43	14	0	0	0	0	14	141
4:00-5:00	5	41	0	0	0	46	0	0	0	0	0	0	0	2	37	0	0	39	1	2	4	27	10	44	14	0	1	0	0	15	144
4:15-5:15	8	43	0	0	0	51	0	1	0	0	0	1	1	1	35	0	0	37	1	2	9	23	10	45	13	0	1	0	0	14	148
4:30-5:30	8	47	0	0	0	55	0	1	0	0	0	1	1	1	47	0	0	49	1	3	9	23	14	50	17	0	1	0	0	18	173
4:45-5:45	6	39	0	0	1	46	0	1	0	0	0	1	1	0	40	0	0	41	1	3	7	21	10	42	17	0	1	0	0	18	148
5:00-6:00	6	32	0	0	1	39	0	1	0	0	0	1	1	0	40	0	0	41	0	2	8	32	9	51	14	0	0	1	0	15	147
PEAK HOUR																															
4:30-5:30	8	47	0	0	0	55	0	1	0	0	0	1	1	1	47	0	0	49	1	3	9	23	14	50	17	0	1	0	0	18	173

PEDESTRIAN - SUMMARY

Intersection of: Springfield Avenue
and: Warfield Avenue
Location: Howard County, Maryland

Counted by: VCU
Date: April 27, 2023
Weather: Sunny/Cool
Entered by: SN

Day: Thursday

AM	FROM NORTH Warfield Avenue	FROM SOUTH Warfield Avenue	FROM EAST Northrop Grumman Access	FROM WEST Springfield Avenue	FROM SOUTHEAST Town Park Drive	TOTALS
AM						
6:30-6:45	0	0	0	0	0	0
6:45-7:00	0	0	0	0	0	0
7:00-7:15	0	0	0	0	0	0
7:15-7:30	0	0	0	0	0	0
7:30-7:45	0	0	0	0	0	0
7:45-8:00	0	0	1	0	0	1
8:00-8:15	0	0	0	1	0	1
8:15-8:30	0	0	0	0	0	0
8:30-8:45	0	0	0	0	0	0
8:45-9:00	0	0	0	2	0	2
Totals	0	0	1	3	0	4
PM						
3:30-3:45	0	0	0	0	0	0
3:45-4:00	0	0	0	1	0	1
4:00-4:15	0	0	0	0	0	0
4:15-4:30	0	0	0	0	0	0
4:30-4:45	0	0	0	1	0	1
4:45-5:00	0	0	1	0	0	1
5:00-5:15	0	0	0	0	0	0
5:15-5:30	0	0	0	0	0	0
5:30-5:45	0	1	3	4	2	10
5:45-6:00	0	0	6	3	1	10
Totals	0	1	10	9	3	23


N
200 ft

The Traffic Group, Inc.

(800) 583-8411
www.trafficgroup.com

Merging Innovation and Excellence

Town Park Drive
South of Herman Way
Howard County, Maryland

Northbound

Start Time	0 5	6 10	11 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 250	Total
04/27/23	0	0	1	3	2	0	0	0	0	0	0	0	0	0	0	6
01:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
05:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
06:00	0	0	1	0	2	1	0	0	0	0	0	0	0	0	0	4
07:00	0	0	3	2	2	0	0	0	0	0	0	0	0	0	0	7
08:00	0	0	4	8	1	0	0	0	0	0	0	0	0	0	0	13
09:00	0	0	4	6	4	0	0	0	0	0	0	0	0	0	0	14
10:00	0	1	5	3	2	1	0	0	0	0	0	0	0	0	0	12
11:00	0	0	4	6	2	0	0	0	0	0	0	0	0	0	0	12
12 PM	0	0	9	3	1	0	0	0	0	0	0	0	0	0	0	13
13:00	0	2	4	4	2	0	0	0	0	0	0	0	0	0	0	12
14:00	0	4	4	5	4	0	0	0	0	0	0	0	0	0	0	17
15:00	0	0	9	19	5	0	0	0	0	0	0	0	0	0	0	33
16:00	0	1	8	15	4	0	0	0	0	0	0	0	0	0	0	28
17:00	0	1	8	16	6	1	1	0	0	0	0	0	0	0	0	33
18:00	0	2	7	16	3	0	0	0	0	0	0	0	0	0	0	28
19:00	0	3	12	10	3	0	0	0	0	0	0	0	0	0	0	28
20:00	0	1	7	15	6	1	0	0	0	0	0	0	0	0	0	30
21:00	0	0	1	6	4	0	0	0	0	0	0	0	0	0	0	11
22:00	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	8
23:00	0	0	1	1	5	0	0	0	0	0	0	0	0	0	0	7
Total	0	17	95	141	61	5	1	0	0	0	0	0	0	0	0	320
Grand Total	0	17	95	141	61	5	1	0	0	0	0	0	0	0	0	320

Stats

15th Percentile :	11 MPH
50th Percentile :	16 MPH
85th Percentile :	21 MPH
95th Percentile :	24 MPH
Mean Speed(Average) :	17 MPH
10 MPH Pace Speed :	11-20 MPH
Number in Pace :	236
Percent in Pace :	73.8%
Number of Vehicles > 25 MPH :	6
Percent of Vehicles > 25 MPH :	1.9%

Town Park Drive
South of Herman Way
Howard County, Maryland

The Traffic Group, Inc.
(800) 583-8411
www.trafficgroup.com
Merging Innovation and Excellence

Southbound

Start Time	0 5	6 10	11 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 250	Total
04/27/23	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
05:00	0	1	1	3	1	0	0	0	0	0	0	0	0	0	0	6
06:00	0	0	1	5	3	0	0	0	0	0	0	0	0	0	0	9
07:00	0	1	1	9	7	1	0	0	0	0	0	0	0	0	0	19
08:00	0	0	4	16	7	1	0	0	0	0	0	0	0	0	0	28
09:00	0	1	2	10	1	0	0	0	0	0	0	0	0	0	0	14
10:00	0	0	4	2	5	0	0	0	0	0	0	0	0	0	0	11
11:00	0	0	2	4	1	0	0	0	0	0	0	0	0	0	0	7
12 PM	0	1	2	4	0	1	0	0	0	0	0	0	0	0	0	8
13:00	0	2	5	3	2	0	0	0	0	0	0	0	0	0	0	12
14:00	0	0	1	4	2	0	0	0	0	0	0	0	0	0	0	7
15:00	0	0	7	8	4	0	0	0	0	0	0	0	0	0	0	19
16:00	0	0	3	11	3	0	0	0	0	0	0	0	0	0	0	17
17:00	0	2	6	5	2	0	0	0	0	0	0	0	0	0	0	15
18:00	0	0	4	16	4	0	0	0	0	0	0	0	0	0	0	24
19:00	0	0	9	10	1	0	0	0	0	0	0	0	0	0	0	20
20:00	0	0	2	7	2	0	0	0	0	0	0	0	0	0	0	11
21:00	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	3
22:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
23:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	11	57	120	46	4	0	0	0	0	0	0	0	0	0	238
Grand Total	0	11	57	120	46	4	0	0	0	0	0	0	0	0	0	238

Stats

15th Percentile :	12 MPH
50th Percentile :	17 MPH
85th Percentile :	21 MPH
95th Percentile :	24 MPH
Mean Speed(Average) :	17 MPH
10 MPH Pace Speed :	11-20 MPH
Number in Pace :	177
Percent in Pace :	74.4%
Number of Vehicles > 25 MPH :	4
Percent of Vehicles > 25 MPH :	1.7%

APPENDIX C

Intersection Capacity Analysis Worksheets

CRITICAL LANE VOLUME (CLV) METHODOLOGY

for MSHA

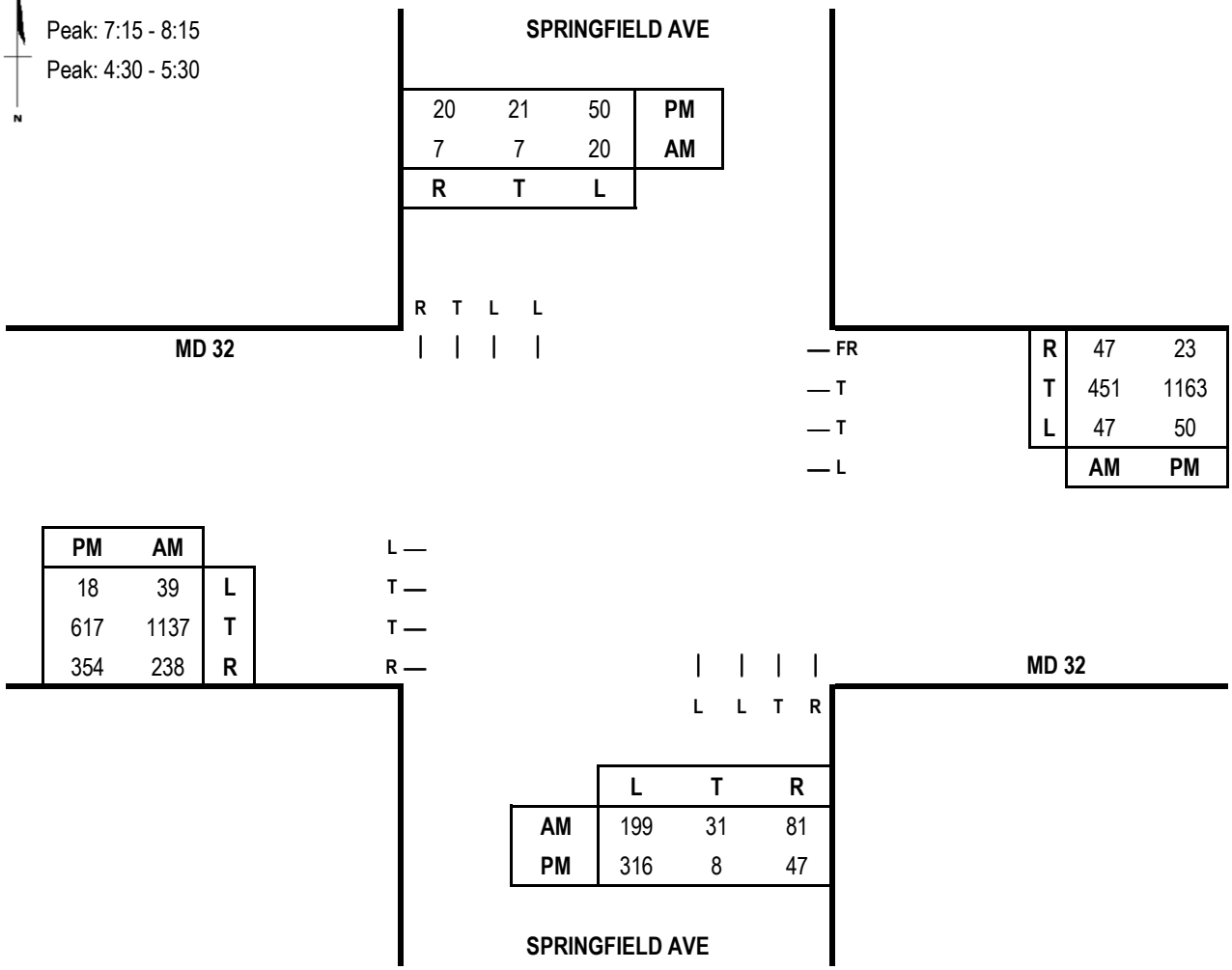
E/W Road: MD 32 **Date of Count:** 4/27/2023

N/S Road: Springfield Ave **Day of Count:** Thursday

Conditions: Existing Traffic **Analyst:** Richard Huang

Peak: 7:15 - 8:15

Peak: 4:30 - 5:30



Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	34	1.00	34	20	0.60	12	126
SB	7	1.00	7	199	0.60	119	
EB	1137	0.55	625	47	1.00	47	672
WB	451	0.55	248	39	1.00	39	

CLV TOTAL= **798**

Level of Service (LOS)= **A**

AM V/C =0.5

Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	8	1.00	8	50	0.60	30	211
SB	21	1.00	21	316	0.60	190	
EB	617	0.55	339	50	1.00	50	658
WB	1163	0.55	640	18	1.00	18	

CLV TOTAL= **869**

Level of Service (LOS)= **A**

PM V/C =0.54

Scenario ID - EXIST1

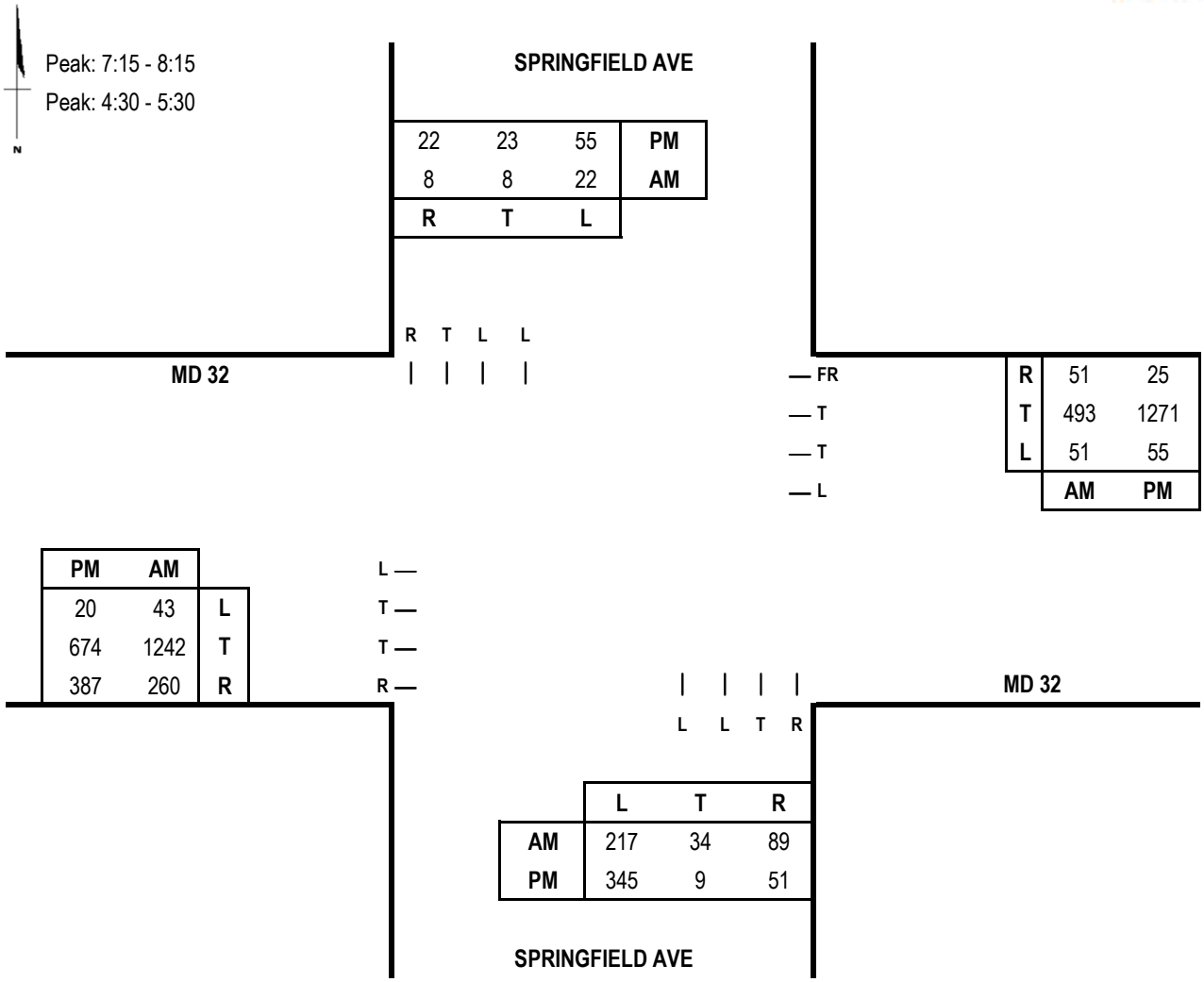
CRITICAL LANE VOLUME (CLV) METHODOLOGY

for MSHA

E/W Road: MD 32 **Date of Count:** 4/27/2023

N/S Road: Springfield Ave **Day of Count:** Thursday

Conditions: w/o Warfield Back'd Background Traffic **Analyst:** Richard Huang



Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	38	1.00	38	22	0.60	13	138
SB	8	1.00	8	217	0.60	130	
EB	1242	0.55	683	51	1.00	51	734
WB	493	0.55	271	43	1.00	43	
						CLV TOTAL=	872
						Level of Service (LOS)=	A

AM V/C =0.55

Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	9	1.00	9	55	0.60	33	230
SB	23	1.00	23	345	0.60	207	
EB	674	0.55	371	55	1.00	55	719
WB	1271	0.55	699	20	1.00	20	
						CLV TOTAL=	949
						Level of Service (LOS)=	A

PM V/C =0.59

Scenario ID - BACK11

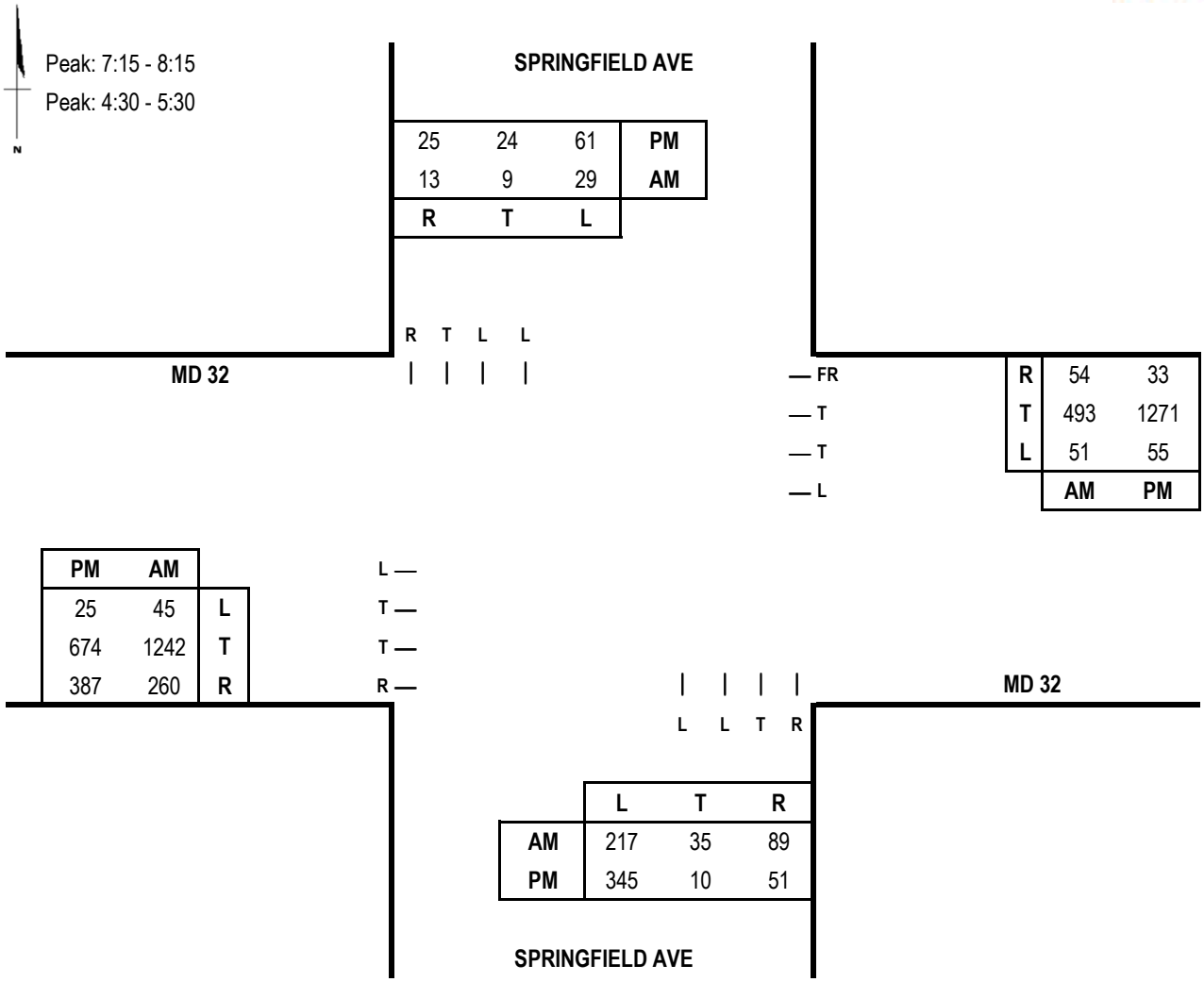
CRITICAL LANE VOLUME (CLV) METHODOLOGY

for MSHA

E/W Road: MD 32 **Date of Count:** 4/27/2023

N/S Road: Springfield Ave **Day of Count:** Thursday

Conditions: w/o Warfield Back'd Total Traffic **Analyst:** Richard Huang



Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	38	1.00	38	29	0.60	17	139
SB	9	1.00	9	217	0.60	130	
EB	1242	0.55	683	51	1.00	51	734
WB	493	0.55	271	45	1.00	45	
						CLV TOTAL=	873
						Level of Service (LOS)=	A

Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	10	1.00	10	61	0.60	37	231
SB	24	1.00	24	345	0.60	207	
EB	674	0.55	371	55	1.00	55	724
WB	1271	0.55	699	25	1.00	25	
						CLV TOTAL=	955
						Level of Service (LOS)=	A

Scenario ID - TOT11 AM V/C =0.55 PM V/C =0.6

CRITICAL LANE VOLUME (CLV) METHODOLOGY

for MSHA

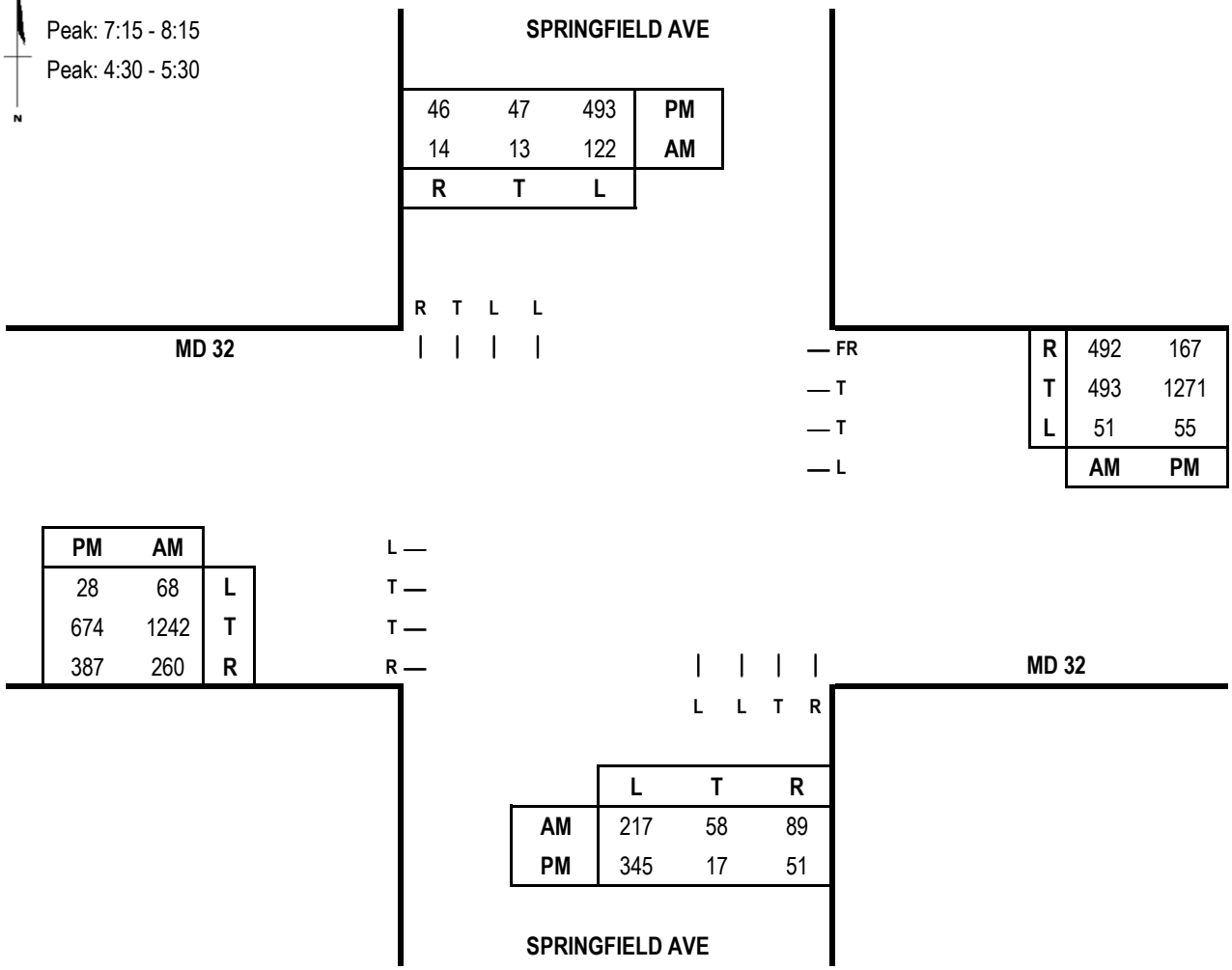
E/W Road: MD 32 **Date of Count:** 4/27/2023

N/S Road: Springfield Ave **Day of Count:** Thursday

Conditions: w/Warfield Back'd Background Traffic **Analyst:** Richard Huang

Peak: 7:15 - 8:15

Peak: 4:30 - 5:30



Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	58	1.00	58	122	0.60	73	143
SB	13	1.00	13	217	0.60	130	
EB	1242	0.55	683	51	1.00	51	734
WB	493	0.55	271	68	1.00	68	
						CLV TOTAL=	877
						Level of Service (LOS)=	A

Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	17	1.00	17	493	0.60	296	313
SB	47	1.00	47	345	0.60	207	
EB	674	0.55	371	55	1.00	55	727
WB	1271	0.55	699	28	1.00	28	
						CLV TOTAL=	1,040
						Level of Service (LOS)=	B

Scenario ID - BACK21

AM V/C =0.55

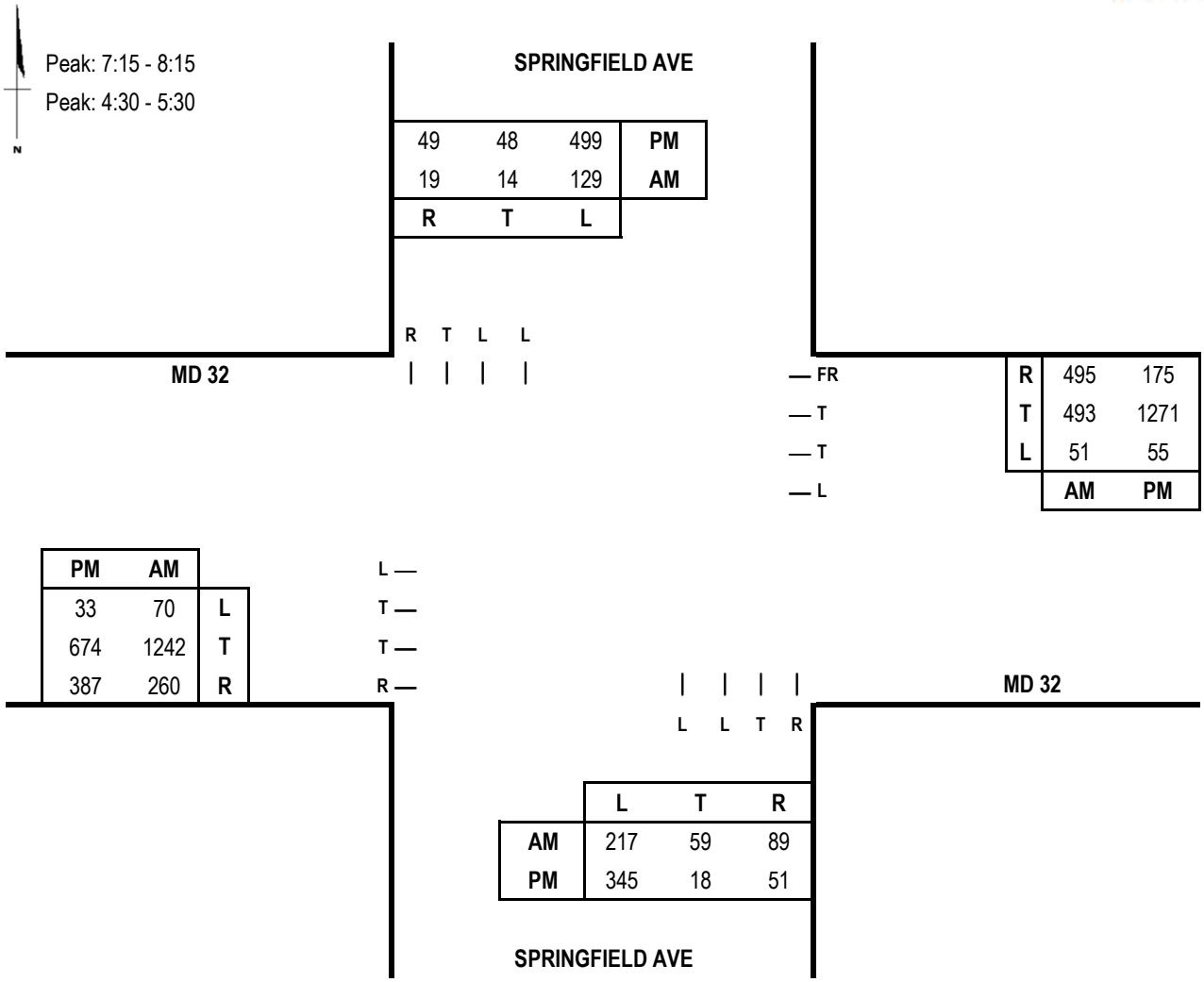
PM V/C =0.65

CRITICAL LANE VOLUME (CLV) METHODOLOGY
for MSHA

E/W Road: MD 32 **Date of Count:** 4/27/2023

N/S Road: Springfield Ave **Day of Count:** Thursday

Conditions: w/Warfield Back'd Total Traffic **Analyst:** Richard Huang



Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	59	1.00	59	129	0.60	77	144
SB	14	1.00	14	217	0.60	130	
EB	1242	0.55	683	51	1.00	51	734
WB	493	0.55	271	70	1.00	70	
						CLV TOTAL=	878
						Level of Service (LOS)=	A

AM V/C =0.55

Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	18	1.00	18	499	0.60	299	317
SB	48	1.00	48	345	0.60	207	
EB	674	0.55	371	55	1.00	55	732
WB	1271	0.55	699	33	1.00	33	
						CLV TOTAL=	1,049
						Level of Service (LOS)=	B

PM V/C =0.66

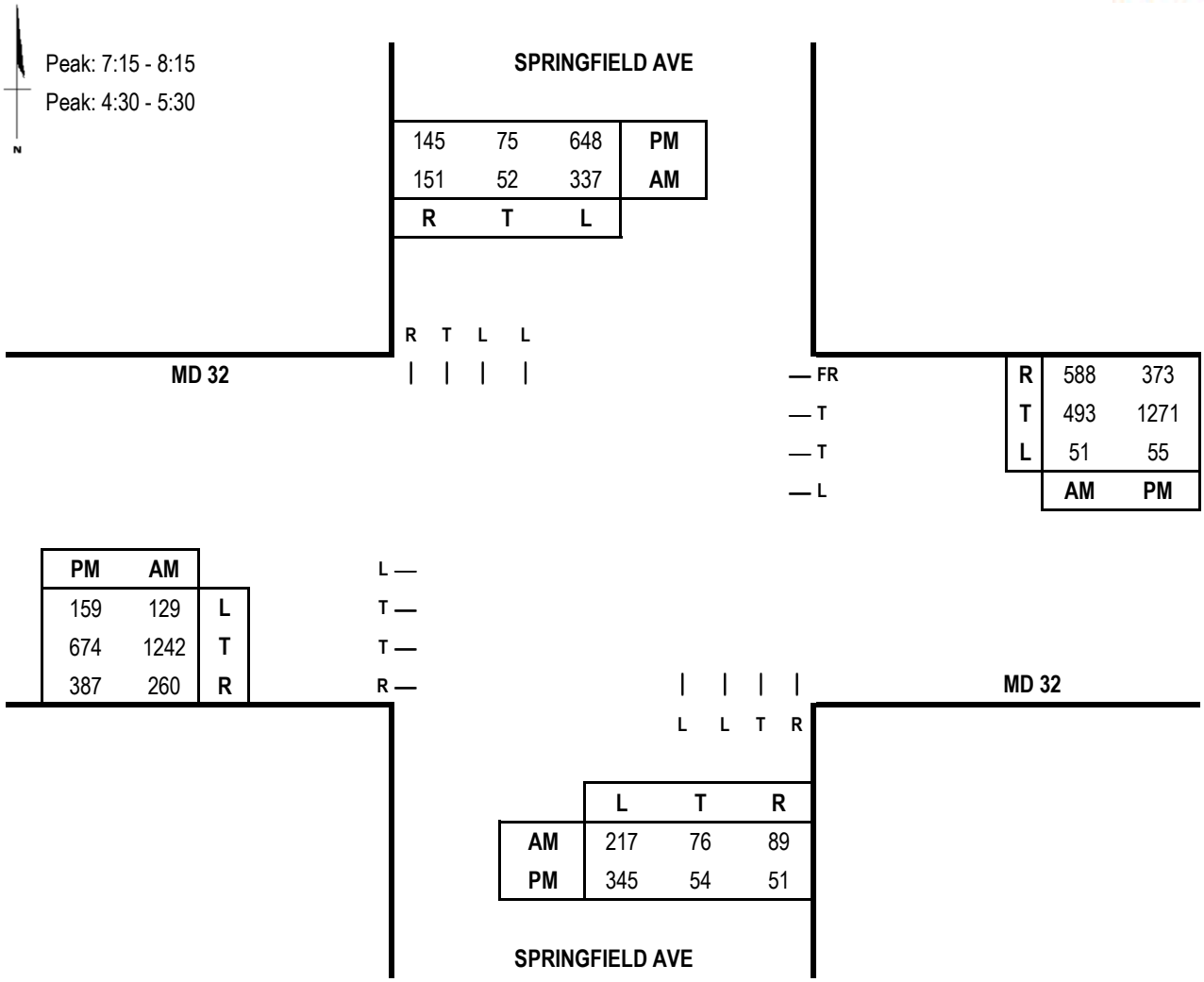
Scenario ID - TOT21

CRITICAL LANE VOLUME (CLV) METHODOLOGY
for MSHA

E/W Road: MD 32 **Date of Count:** 4/27/2023

N/S Road: Springfield Ave **Day of Count:** Thursday

Conditions: Total Traffic (1100 Townhouses) **Analyst:** Richard Huang
w/Full Background Developments



Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	76	1.00	76	337	0.60	202	278
SB	52	1.00	52	217	0.60	130	
EB	1242	0.55	683	51	1.00	51	734
WB	493	0.55	271	129	1.00	129	
						CLV TOTAL=	**1,012**
						Level of Service (LOS)=	**B**

AM V/C =0.63

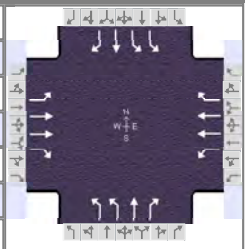
Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	54	1.00	54	648	0.60	389	443
SB	75	1.00	75	345	0.60	207	
EB	674	0.55	371	55	1.00	55	858
WB	1271	0.55	699	159	1.00	159	
						CLV TOTAL=	**1,301**
						Level of Service (LOS)=	**D**

PM V/C =0.81

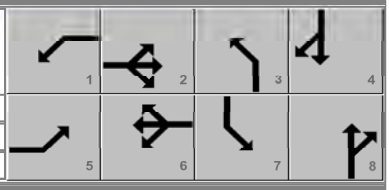
HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	The Traffic Group, Inc.			Duration, h	0.250
Analyst	RH	Analysis Date	5/18/2023	Area Type	Other
Jurisdiction	Carroll County, MD	Time Period	Existing AM	PHF	0.97
Urban Street	MD 32	Analysis Year	2023	Analysis Period	1> 7:00
Intersection	MD 32/Springfield Ave	File Name	1EA.xus		
Project Description	The Enclave Parkside				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	39	1137	238	47	451	47	199	31	81	20	7	7

Signal Information												
Cycle, s	97.0	Reference Phase	2									
Offset, s	0	Reference Point	End	Green	6.6	0.7	40.2	4.3	10.7	9.5		
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	0.0	4.0	4.0	4.0	4.0		
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	0.0	1.0	1.0	1.0	1.0		



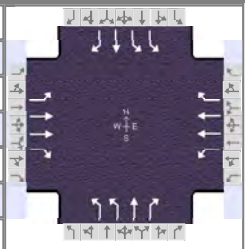
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	11.6	45.2	12.3	45.9	24.9	30.2	9.3	14.5
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	4.1	4.1	4.1	4.1	4.1	4.3	4.1	4.3
Queue Clearance Time (g_s), s	3.2	31.2	3.5	11.2	7.1	6.1	2.5	2.4
Green Extension Time (g_e), s	0.1	9.0	0.1	11.7	0.8	0.3	0.0	0.0
Phase Call Probability	0.66	1.00	0.73	1.00	1.00	1.00	0.43	0.98
Max Out Probability	0.00	0.33	0.00	0.07	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	40	1172	245	48	465	48	205	32	84	21	7	7
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1767	1724	1510	1682	1654	1610	1661	1856	1560	1757	1470	1434
Queue Service Time (g_s), s	1.2	29.2	11.0	1.5	9.2	1.7	5.1	1.3	4.1	0.5	0.4	0.4
Cycle Queue Clearance Time (g_c), s	1.2	29.2	11.0	1.5	9.2	1.7	5.1	1.3	4.1	0.5	0.4	0.4
Green Ratio (*g/C*)	0.48	0.42	0.42	0.49	0.42	0.42	0.21	0.26	0.26	0.04	0.10	0.10
Capacity (*c*), veh/h	478	1431	627	252	1396	679	683	481	405	155	144	141
Volume-to-Capacity Ratio (*X*)	0.084	0.819	0.392	0.192	0.333	0.071	0.301	0.066	0.206	0.133	0.050	0.051
Back of Queue (*Q*), ft/ln (95 th percentile)	20.9	454.9	180.7	26.7	166.4	28.3	96.2	25.6	70.2	10.9	8.8	8
Back of Queue (*Q*), veh/ln (95 th percentile)	0.8	17.4	6.8	1.0	6.1	1.1	3.6	1.0	2.7	0.4	0.3	0.3
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	13.8	25.1	19.8	17.9	18.8	16.7	32.6	27.1	28.1	44.6	39.6	39.6
Incremental Delay (d_2), s/veh	0.1	2.6	0.4	0.4	0.1	0.0	0.2	0.1	0.2	0.4	0.1	0.1
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	13.9	27.7	20.2	18.3	19.0	16.7	32.9	27.1	28.3	45.0	39.8	39.8
Level of Service (LOS)	B	C	C	B	B	B	C	C	C	D	D	D
Approach Delay, s/veh / LOS	26.1	C		18.7	B		31.1	C		42.8	D	
Intersection Delay, s/veh / LOS	25.3						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.27	B	2.27	B	2.44	B	2.46	B
Bicycle LOS Score / LOS	1.69	B	0.95	A	1.02	A	0.55	A

HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	The Traffic Group, Inc.			Duration, h	0.250
Analyst	RH	Analysis Date	5/18/2023	Area Type	Other
Jurisdiction	Carroll County, MD	Time Period	Existing PM	PHF	0.97
Urban Street	MD 32	Analysis Year	2023	Analysis Period	1> 7:00
Intersection	MD 32/Springfield Ave	File Name	1EP.xus		
Project Description	The Enclave Parkside				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	18	617	354	50	1163	23	316	8	47	50	21	20

Signal Information			
Cycle, s	94.1	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

								1	2	3	4	
Green	3.8	3.6	37.0	7.4	7.6	9.7						
Yellow	4.0	0.0	4.0	4.0	4.0	4.0						
Red	1.0	0.0	1.0	1.0	1.0	1.0						
							5	6	7	8		

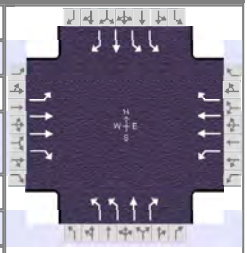
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	8.8	42.0	12.4	45.5	25.0	27.3	12.4	14.7
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	4.1	4.1	4.1	4.1	4.1	4.3	4.1	4.3
Queue Clearance Time (g_s), s	2.6	18.9	3.5	29.5	9.6	4.2	3.3	3.1
Green Extension Time (g_e), s	0.0	13.5	0.1	11.1	1.3	0.2	0.1	0.1
Phase Call Probability	0.38	1.00	0.74	1.00	1.00	1.00	0.74	0.98
Max Out Probability	0.00	0.22	0.00	0.40	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	19	636	365	52	1199	24	326	8	48	52	22	21
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1752	1598	1697	1766	1610	1757	1900	1610	1730	1900	1610
Queue Service Time (g_s), s	0.6	12.7	16.9	1.5	27.5	0.8	7.6	0.3	2.2	1.3	1.0	1.1
Cycle Queue Clearance Time (g_c), s	0.6	12.7	16.9	1.5	27.5	0.8	7.6	0.3	2.2	1.3	1.0	1.1
Green Ratio (*g/C*)	0.43	0.39	0.39	0.48	0.43	0.43	0.21	0.24	0.24	0.08	0.10	0.10
Capacity (*c*), veh/h	200	1379	628	406	1523	694	747	450	381	272	195	165
Volume-to-Capacity Ratio (*X*)	0.093	0.461	0.581	0.127	0.787	0.034	0.436	0.018	0.127	0.189	0.111	0.125
Back of Queue (*Q*), ft/ln (95 th percentile)	10.8	223.4	258	27.4	423	12.9	143	6.4	38.5	25.6	20.7	19.8
Back of Queue (*Q*), veh/ln (95 th percentile)	0.4	8.7	10.2	1.0	16.5	0.5	5.7	0.3	1.5	1.0	0.8	0.8
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	18.9	21.1	22.4	14.2	23.0	15.4	32.1	27.5	28.3	40.5	38.3	38.4
Incremental Delay (d_2), s/veh	0.2	0.2	0.9	0.1	1.9	0.0	0.4	0.0	0.1	0.3	0.2	0.3
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	19.1	21.4	23.3	14.3	24.9	15.5	32.5	27.5	28.4	40.9	38.5	38.7
Level of Service (LOS)	B	C	C	B	C	B	C	C	C	D	D	D
Approach Delay, s/veh / LOS	22.0	C		24.3	C		31.9	C		39.8	D	
Intersection Delay, s/veh / LOS	25.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.27	B	2.27	B	2.44	B	2.46	B
Bicycle LOS Score / LOS	1.33	A	1.54	B	1.12	A	0.64	A

HCS Signalized Intersection Results Summary

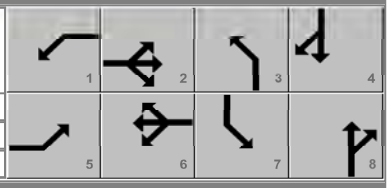
General Information				Intersection Information	
Agency	The Traffic Group, Inc.			Duration, h	0.250
Analyst	RH	Analysis Date	5/18/2023	Area Type	Other
Jurisdiction	Carroll County, MD	Time Period	Back'd AM w/o Full Back'd Dev	PHF	0.97
Urban Street	MD 32	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	MD 32/Springfield Ave	File Name	1BA1.xus		
Project Description	The Enclave Parkside				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	43	1242	260	51	493	51	217	34	89	22	8	8

Signal Information			
Cycle, s	101.5	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	7.1	0.6	44.2	4.7	10.2	9.5						
Yellow	4.0	0.0	4.0	4.0	4.0	4.0						
Red	1.0	0.0	1.0	1.0	1.0	1.0						



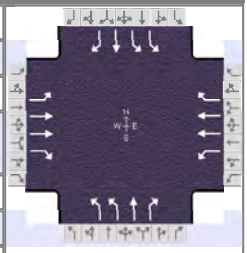
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	12.1	49.2	12.7	49.8	25.0	29.8	9.7	14.5
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	4.1	4.1	4.1	4.1	4.1	4.3	4.1	4.3
Queue Clearance Time (g_s), s	3.3	35.8	3.6	12.3	7.9	6.8	2.6	2.5
Green Extension Time (g_e), s	0.1	8.4	0.1	13.5	0.8	0.4	0.0	0.0
Phase Call Probability	0.71	1.00	0.77	1.00	1.00	1.00	0.47	0.99
Max Out Probability	0.00	0.53	0.00	0.12	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	44	1280	268	53	508	53	224	35	92	23	8	8
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1767	1724	1510	1682	1654	1610	1661	1856	1560	1757	1470	1434
Queue Service Time (g_s), s	1.3	33.8	12.4	1.6	10.3	1.9	5.9	1.5	4.8	0.6	0.5	0.5
Cycle Queue Clearance Time (g_c), s	1.3	33.8	12.4	1.6	10.3	1.9	5.9	1.5	4.8	0.6	0.5	0.5
Green Ratio (*g/C*)	0.51	0.44	0.44	0.51	0.44	0.44	0.20	0.24	0.24	0.05	0.09	0.09
Capacity (*c*), veh/h	479	1504	658	241	1461	712	653	453	381	164	138	135
Volume-to-Capacity Ratio (*X*)	0.093	0.852	0.407	0.218	0.348	0.074	0.342	0.077	0.241	0.139	0.060	0.061
Back of Queue (*Q*), ft/ln (95 th percentile)	23	523.3	202.6	29.2	187	31.2	112.7	30.4	83.9	12.6	10.7	9.6
Back of Queue (*Q*), veh/ln (95 th percentile)	0.9	20.0	7.6	1.1	6.9	1.2	4.3	1.2	3.3	0.5	0.3	0.3
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	13.4	25.7	19.6	18.9	18.7	16.3	35.1	29.6	30.8	46.4	41.9	41.9
Incremental Delay (d_2), s/veh	0.1	4.0	0.4	0.4	0.1	0.0	0.3	0.1	0.3	0.4	0.2	0.2
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	13.5	29.7	20.0	19.4	18.8	16.4	35.4	29.6	31.1	46.8	42.1	42.1
Level of Service (LOS)	B	C	C	B	B	B	D	C	C	D	D	D
Approach Delay, s/veh / LOS	27.6	C		18.7	B		33.7	C		44.8	D	
Intersection Delay, s/veh / LOS	26.6						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.27	B	2.27	B	2.45	B	2.46	B
Bicycle LOS Score / LOS	1.80	B	0.99	A	1.07	A	0.55	A

HCS Signalized Intersection Results Summary

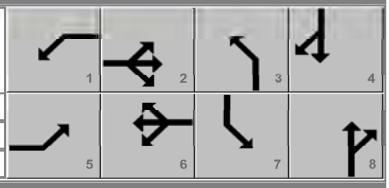
General Information				Intersection Information	
Agency	The Traffic Group, Inc.			Duration, h	0.250
Analyst	RH	Analysis Date	5/18/2023	Area Type	Other
Jurisdiction	Carroll County, MD	Time Period	Back'd PM w/o Full Back'd Dev.	PHF	0.97
Urban Street	MD 32	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	MD 32/Springfield Ave	File Name	1BP1.xus		
Project Description	Enclave Parkside				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	20	674	387	55	1271	25	345	9	51	55	23	22

Signal Information			
Cycle, s	98.4	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	4.3	3.6	40.8	7.9	7.1	9.7
Yellow	4.0	0.0	4.0	4.0	4.0	4.0
Red	1.0	0.0	1.0	1.0	1.0	1.0



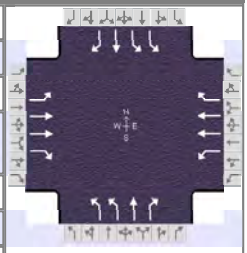
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	9.3	45.8	12.9	49.3	25.0	26.9	12.9	14.7
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	4.1	4.1	4.1	4.1	4.1	4.3	4.1	4.3
Queue Clearance Time (g_s), s	2.6	21.2	3.7	33.9	10.8	4.6	3.5	3.3
Green Extension Time (g_e), s	0.0	14.8	0.1	10.5	1.4	0.3	0.2	0.1
Phase Call Probability	0.43	1.00	0.79	1.00	1.00	1.00	0.79	0.99
Max Out Probability	0.00	0.34	0.00	0.59	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	21	695	399	57	1310	26	356	9	53	57	24	23
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1752	1598	1697	1766	1610	1757	1900	1610	1730	1900	1610
Queue Service Time (g_s), s	0.6	14.2	19.2	1.7	31.9	0.9	8.8	0.4	2.6	1.5	1.1	1.3
Cycle Queue Clearance Time (g_c), s	0.6	14.2	19.2	1.7	31.9	0.9	8.8	0.4	2.6	1.5	1.1	1.3
Green Ratio (*g/C*)	0.46	0.41	0.41	0.50	0.45	0.45	0.20	0.22	0.22	0.08	0.10	0.10
Capacity (*c*), veh/h	192	1453	662	402	1592	726	714	422	358	277	188	159
Volume-to-Capacity Ratio (*X*)	0.107	0.478	0.603	0.141	0.823	0.036	0.498	0.022	0.147	0.205	0.126	0.142
Back of Queue (*Q*), ft/ln (95 th percentile)	12.1	245.9	286.2	30.4	485.4	14.2	168.5	7.7	45.2	29.7	23.9	23.1
Back of Queue (*Q*), veh/ln (95 th percentile)	0.5	9.5	11.4	1.1	19.0	0.6	6.7	0.3	1.8	1.2	1.0	0.9
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	19.5	21.0	22.5	13.9	23.6	15.1	34.7	29.9	30.8	42.3	40.4	40.5
Incremental Delay (d_2), s/veh	0.2	0.2	0.9	0.2	2.9	0.0	0.5	0.0	0.2	0.4	0.3	0.4
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	19.8	21.3	23.4	14.1	26.5	15.1	35.3	29.9	31.0	42.7	40.7	40.9
Level of Service (LOS)	B	C	C	B	C	B	D	C	C	D	D	D
Approach Delay, s/veh / LOS	22.0	C		25.8	C		34.6	C		41.9	D	
Intersection Delay, s/veh / LOS	26.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.27	B	2.27	B	2.45	B	2.46	B
Bicycle LOS Score / LOS	1.41	A	1.64	B	1.18	A	0.66	A

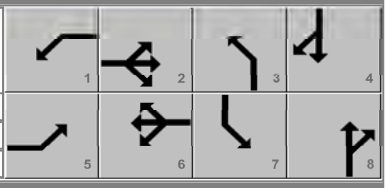
HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	The Traffic Group, Inc.			Duration, h	0.250
Analyst	RH	Analysis Date	5/18/2023	Area Type	Other
Jurisdiction	Carroll County, MD	Time Period	Total AM w/o Full Back'd Dev	PHF	0.97
Urban Street	MD 32	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	MD 32/Springfield Ave	File Name	1TA1.xus		
Project Description	The Enclave Parkside				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	45	1242	260	51	493	54	217	35	89	29	9	13

Signal Information			
Cycle, s	101.5	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	7.3	0.4	44.3	5.7	9.3	9.6
Yellow	4.0	0.0	4.0	4.0	4.0	4.0
Red	1.0	0.0	1.0	1.0	1.0	1.0

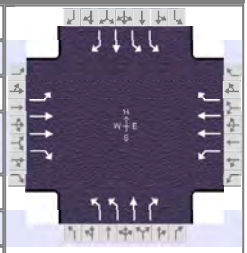
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	12.3	49.3	12.7	49.7	25.0	28.8	10.7	14.6
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	4.1	4.1	4.1	4.1	4.1	4.3	4.1	4.3
Queue Clearance Time (g_s), s	3.3	35.8	3.6	12.3	7.9	6.9	2.8	2.9
Green Extension Time (g_e), s	0.1	8.4	0.1	13.5	0.8	0.4	0.1	0.1
Phase Call Probability	0.73	1.00	0.77	1.00	1.00	1.00	0.57	0.99
Max Out Probability	0.00	0.53	0.00	0.12	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	46	1280	268	53	508	56	224	36	92	30	9	13
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1767	1724	1510	1682	1654	1610	1661	1856	1560	1757	1470	1434
Queue Service Time (g_s), s	1.3	33.8	12.4	1.6	10.3	2.0	5.9	1.5	4.9	0.8	0.6	0.9
Cycle Queue Clearance Time (g_c), s	1.3	33.8	12.4	1.6	10.3	2.0	5.9	1.5	4.9	0.8	0.6	0.9
Green Ratio (*g/C*)	0.51	0.44	0.44	0.51	0.44	0.44	0.20	0.23	0.23	0.06	0.09	0.09
Capacity (*c*), veh/h	480	1504	658	241	1456	709	653	436	366	197	139	135
Volume-to-Capacity Ratio (*X*)	0.097	0.852	0.407	0.218	0.349	0.079	0.343	0.083	0.251	0.152	0.067	0.099
Back of Queue (*Q*), ft/ln (95 th percentile)	24.1	523.3	202.8	29.3	187.7	33.3	112.7	31.8	85.2	16.4	12	15.8
Back of Queue (*Q*), veh/ln (95 th percentile)	0.9	20.0	7.6	1.1	6.9	1.3	4.3	1.2	3.3	0.7	0.4	0.6
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	13.4	25.7	19.6	18.9	18.8	16.5	35.1	30.3	31.6	45.6	41.9	42.0
Incremental Delay (d_2), s/veh	0.1	4.0	0.4	0.4	0.1	0.0	0.3	0.1	0.4	0.4	0.2	0.3
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	13.4	29.7	20.0	19.4	18.9	16.5	35.4	30.4	32.0	46.0	42.1	42.4
Level of Service (LOS)	B	C	C	B	B	B	D	C	C	D	D	D
Approach Delay, s/veh / LOS	27.6	C		18.8	B		34.0	C		44.4	D	
Intersection Delay, s/veh / LOS	26.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.27	B	2.27	B	2.45	B	2.46	B
Bicycle LOS Score / LOS	1.80	B	1.00	A	1.07	A	0.57	A

HCS Signalized Intersection Results Summary

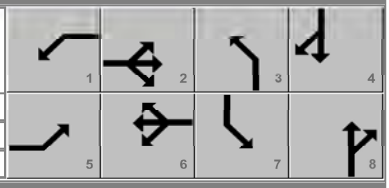
General Information				Intersection Information	
Agency	The Traffic Group, Inc.			Duration, h	0.250
Analyst	RH	Analysis Date	5/18/2023	Area Type	Other
Jurisdiction	Carroll County, MD	Time Period	Total PM w/o Full Back'd Dev.	PHF	0.97
Urban Street	MD 32	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	MD 32/Springfield Ave	File Name	1TP1.xus		
Project Description	Enclave Parkside				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	25	674	387	55	1271	33	345	10	51	61	24	25

Signal Information			
Cycle, s	99.5	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	5.1	2.8	41.8	8.2	6.8	9.8
Yellow	4.0	0.0	4.0	4.0	4.0	4.0
Red	1.0	0.0	1.0	1.0	1.0	1.0



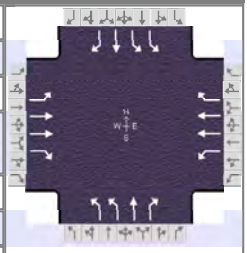
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	10.1	46.8	12.9	49.6	25.0	26.5	13.2	14.8
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	4.1	4.1	4.1	4.1	4.1	4.3	4.1	4.3
Queue Clearance Time (g_s), s	2.8	21.2	3.7	34.3	11.0	4.6	3.7	3.5
Green Extension Time (g_e), s	0.0	14.8	0.1	10.3	1.4	0.3	0.2	0.1
Phase Call Probability	0.51	1.00	0.79	1.00	1.00	1.00	0.82	0.99
Max Out Probability	0.00	0.34	0.00	0.60	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	26	695	399	57	1310	34	356	10	53	63	25	26
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1752	1598	1697	1766	1610	1757	1900	1610	1730	1900	1610
Queue Service Time (g_s), s	0.8	14.3	19.2	1.7	32.3	1.2	9.0	0.4	2.6	1.7	1.2	1.5
Cycle Queue Clearance Time (g_c), s	0.8	14.3	19.2	1.7	32.3	1.2	9.0	0.4	2.6	1.7	1.2	1.5
Green Ratio (*g/C*)	0.47	0.42	0.42	0.50	0.45	0.45	0.20	0.22	0.22	0.08	0.10	0.10
Capacity (*c*), veh/h	203	1473	671	405	1585	722	706	411	348	287	186	158
Volume-to-Capacity Ratio (*X*)	0.127	0.472	0.594	0.140	0.827	0.047	0.504	0.025	0.151	0.219	0.133	0.163
Back of Queue (*Q*), ft/ln (95 th percentile)	14.9	245.9	286.2	30.8	493.8	19.2	171.2	8.8	46.1	33.2	25.4	26.6
Back of Queue (*Q*), veh/ln (95 th percentile)	0.6	9.5	11.4	1.2	19.3	0.8	6.8	0.4	1.8	1.3	1.0	1.1
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	19.4	20.9	22.3	14.0	24.0	15.5	35.3	30.7	31.6	42.6	41.0	41.1
Incremental Delay (d_2), s/veh	0.3	0.2	0.8	0.2	3.1	0.0	0.6	0.0	0.2	0.4	0.3	0.5
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	19.7	21.1	23.1	14.1	27.1	15.5	35.9	30.8	31.8	43.0	41.3	41.6
Level of Service (LOS)	B	C	C	B	C	B	D	C	C	D	D	D
Approach Delay, s/veh / LOS	21.8	C		26.3	C		35.3	D		42.3	D	
Intersection Delay, s/veh / LOS	26.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.27	B	2.27	B	2.45	B	2.46	B
Bicycle LOS Score / LOS	1.41	A	1.64	B	1.18	A	0.67	A

HCS Signalized Intersection Results Summary

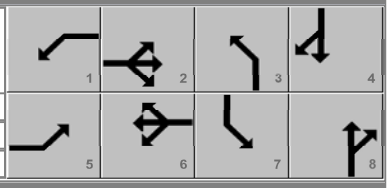
General Information				Intersection Information	
Agency	The Traffic Group, Inc.			Duration, h	0.250
Analyst	RH	Analysis Date	5/18/2023	Area Type	Other
Jurisdiction	Carroll County, MD	Time Period	Back'd AM w/Full Back'd Dev	PHF	0.97
Urban Street	MD 32	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	MD 32/Springfield Ave	File Name	1BA2.xus		
Project Description	The Enclave Parkside				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	68	1242	260	51	493	492	217	58	89	122	13	14

Signal Information			
Cycle, s	103.4	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	7.8	0.9	45.0	9.7	5.2	9.8
Yellow	4.0	0.0	4.0	4.0	4.0	4.0
Red	1.0	0.0	1.0	1.0	1.0	1.0



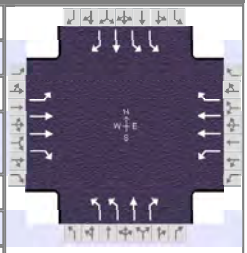
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	13.7	50.9	12.8	50.0	25.0	25.0	14.7	14.8
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	4.1	4.1	4.1	4.1	4.1	4.2	4.1	4.2
Queue Clearance Time (g_s), s	4.1	36.0	3.6	28.9	8.0	7.2	5.5	3.0
Green Extension Time (g_e), s	0.1	9.9	0.1	13.1	0.8	0.5	0.4	0.3
Phase Call Probability	0.87	1.00	0.78	1.00	1.00	1.00	0.97	1.00
Max Out Probability	0.00	0.70	0.00	0.53	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	70	1280	268	53	508	507	224	60	92	126	13	14
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1767	1724	1510	1682	1654	1610	1661	1856	1560	1757	1470	1434
Queue Service Time (g_s), s	2.1	34.0	12.4	1.6	10.6	26.9	6.0	2.8	5.2	3.5	0.9	1.0
Cycle Queue Clearance Time (g_c), s	2.1	34.0	12.4	1.6	10.6	26.9	6.0	2.8	5.2	3.5	0.9	1.0
Green Ratio (*g/C*)	0.52	0.44	0.44	0.51	0.43	0.43	0.19	0.19	0.19	0.09	0.09	0.09
Capacity (*c*), veh/h	512	1529	669	235	1439	700	641	359	302	331	139	136
Volume-to-Capacity Ratio (*X*)	0.137	0.837	0.400	0.223	0.353	0.724	0.349	0.166	0.304	0.380	0.096	0.106
Back of Queue (*Q*), ft/ln (95 th percentile)	36.7	524.5	203.6	30.1	194.3	388.9	115.8	58.1	92.8	68.7	17.8	17.3
Back of Queue (*Q*), veh/ln (95 th percentile)	1.4	20.0	7.7	1.1	7.1	15.6	4.4	2.3	3.6	2.7	0.6	0.6
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	13.1	25.5	19.5	19.6	19.5	24.1	36.1	34.7	35.7	44.0	42.8	42.8
Incremental Delay (d_2), s/veh	0.1	3.7	0.4	0.5	0.1	3.0	0.3	0.2	0.6	0.7	0.3	0.3
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	13.2	29.2	19.9	20.1	19.7	27.1	36.4	35.0	36.3	44.7	43.1	43.1
Level of Service (LOS)	B	C	B	C	B	C	D	C	D	D	D	D
Approach Delay, s/veh / LOS	26.9	C		23.2	C		36.2	D		44.4	D	
Intersection Delay, s/veh / LOS	27.6						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.27	B	2.27	B	2.45	B	2.46	B
Bicycle LOS Score / LOS	1.82	B	1.37	A	1.11	A	0.74	A

HCS Signalized Intersection Results Summary

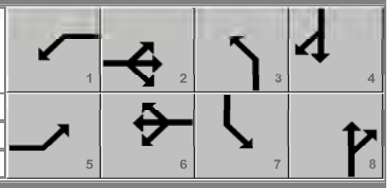
General Information				Intersection Information	
Agency	The Traffic Group, Inc.			Duration, h	0.250
Analyst	RH	Analysis Date	5/18/2023	Area Type	Other
Jurisdiction	Carroll County, MD	Time Period	Back'd PM w/Full Back'd Dev.	PHF	0.97
Urban Street	MD 32	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	MD 32/Springfield Ave	File Name	1BP2.xus		
Project Description	Enclave Parkside				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	28	674	387	55	1271	167	345	17	51	493	47	46

Signal Information			
Cycle, s	100.8	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	5.5	2.4	42.9	18.1	1.9	10.0
Yellow	4.0	0.0	4.0	4.0	0.0	4.0
Red	1.0	0.0	1.0	1.0	0.0	1.0



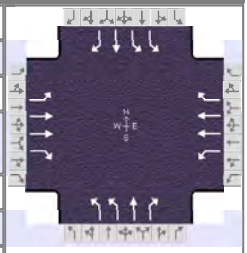
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	10.5	47.9	13.0	50.3	25.0	16.9	23.1	15.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	4.1	4.1	4.1	4.1	4.1	4.2	4.1	4.2
Queue Clearance Time (g_s), s	2.9	21.3	3.7	34.7	11.1	5.0	16.2	4.8
Green Extension Time (g_e), s	0.0	15.8	0.1	10.5	1.4	0.4	1.9	0.5
Phase Call Probability	0.55	1.00	0.80	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	0.40	0.00	0.66	0.00	0.00	0.02	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	29	695	399	57	1310	172	356	18	53	508	48	47
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1752	1598	1697	1766	1610	1757	1900	1610	1730	1900	1610
Queue Service Time (g_s), s	0.9	14.3	19.3	1.7	32.7	6.7	9.1	0.8	3.0	14.2	2.4	2.8
Cycle Queue Clearance Time (g_c), s	0.9	14.3	19.3	1.7	32.7	6.7	9.1	0.8	3.0	14.2	2.4	2.8
Green Ratio (*g/C*)	0.48	0.43	0.43	0.50	0.45	0.45	0.20	0.12	0.12	0.18	0.10	0.10
Capacity (*c*), veh/h	209	1490	679	408	1587	723	697	224	190	622	188	160
Volume-to-Capacity Ratio (*X*)	0.138	0.466	0.587	0.139	0.826	0.238	0.510	0.078	0.277	0.817	0.257	0.297
Back of Queue (*Q*), ft/ln (95 th percentile)	16.6	247.2	287.6	31	500.5	108.3	174.8	17.6	54.6	259.7	51.2	50.6
Back of Queue (*Q*), veh/ln (95 th percentile)	0.6	9.6	11.4	1.2	19.5	4.3	7.0	0.7	2.2	10.2	2.0	2.0
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	19.4	20.8	22.2	13.9	24.3	17.1	36.1	39.6	40.6	39.8	42.0	42.2
Incremental Delay (d_2), s/veh	0.3	0.2	0.8	0.2	3.1	0.2	0.6	0.1	0.8	2.7	0.7	1.0
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	19.7	21.0	23.0	14.1	27.4	17.3	36.6	39.8	41.4	42.5	42.7	43.2
Level of Service (LOS)	B	C	C	B	C	B	D	D	D	D	D	D
Approach Delay, s/veh / LOS	21.7	C		25.8	C		37.3	D		42.5	D	
Intersection Delay, s/veh / LOS	28.6						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.27	B	2.27	B	2.46	B	2.46	B
Bicycle LOS Score / LOS	1.41	A	1.76	B	1.19	A	1.48	A

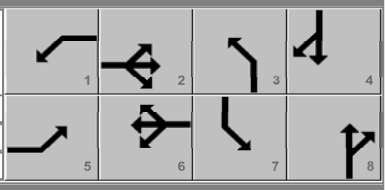
HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	The Traffic Group, Inc.			Duration, h	0.250
Analyst	RH	Analysis Date	5/18/2023	Area Type	Other
Jurisdiction	Carroll County, MD	Time Period	Total AM w/Full Back'd Dev	PHF	0.97
Urban Street	MD 32	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	MD 32/Springfield Ave	File Name	1TA2.xus		
Project Description	The Enclave Parkside				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	1242	260	51	493	495	217	59	89	129	14	19

Signal Information													
Cycle, s	103.5	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	7.8	0.9	44.9	9.8	5.2	9.8			
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	0.0	4.0	4.0	4.0	4.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	0.0	1.0	1.0	1.0	1.0			



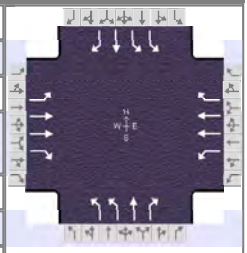
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	13.7	50.9	12.8	49.9	25.0	25.0	14.8	14.8
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	4.1	4.1	4.1	4.1	4.1	4.2	4.1	4.2
Queue Clearance Time (g_s), s	4.1	36.0	3.6	29.2	8.0	7.2	5.7	3.3
Green Extension Time (g_e), s	0.1	9.8	0.1	13.0	0.8	0.5	0.5	0.4
Phase Call Probability	0.87	1.00	0.78	1.00	1.00	1.00	0.98	1.00
Max Out Probability	0.00	0.70	0.00	0.54	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	72	1280	268	53	508	510	224	61	92	133	14	20
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1767	1724	1510	1682	1654	1610	1661	1856	1560	1757	1470	1434
Queue Service Time (g_s), s	2.1	34.0	12.4	1.6	10.6	27.2	6.0	2.8	5.2	3.7	0.9	1.3
Cycle Queue Clearance Time (g_c), s	2.1	34.0	12.4	1.6	10.6	27.2	6.0	2.8	5.2	3.7	0.9	1.3
Green Ratio (*g/C*)	0.52	0.44	0.44	0.51	0.43	0.43	0.19	0.19	0.19	0.09	0.10	0.10
Capacity (*c*), veh/h	512	1529	669	235	1436	699	641	359	302	332	140	136
Volume-to-Capacity Ratio (*X*)	0.141	0.838	0.400	0.224	0.354	0.730	0.349	0.169	0.304	0.400	0.103	0.144
Back of Queue (*Q*), ft/ln (95 th percentile)	37.9	525.1	203.8	30.2	195	393	116	59.2	93	72.9	19.2	23.6
Back of Queue (*Q*), veh/ln (95 th percentile)	1.5	20.0	7.7	1.1	7.2	15.7	4.4	2.3	3.6	2.9	0.6	0.9
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	13.1	25.5	19.5	19.7	19.6	24.3	36.1	34.8	35.8	44.1	42.8	43.0
Incremental Delay (d_2), s/veh	0.1	3.7	0.4	0.5	0.1	3.1	0.3	0.2	0.6	0.8	0.3	0.5
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	13.2	29.2	19.9	20.2	19.7	27.4	36.5	35.0	36.3	44.9	43.1	43.4
Level of Service (LOS)	B	C	B	C	B	C	D	D	D	D	D	D
Approach Delay, s/veh / LOS	26.9	C		23.4	C		36.2	D		44.6	D	
Intersection Delay, s/veh / LOS	27.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.27	B	2.27	B	2.45	B	2.46	B
Bicycle LOS Score / LOS	1.82	B	1.37	A	1.11	A	0.76	A

HCS Signalized Intersection Results Summary

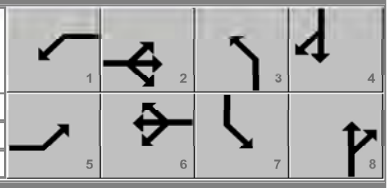
General Information				Intersection Information	
Agency	The Traffic Group, Inc.			Duration, h	0.250
Analyst	RH	Analysis Date	5/18/2023	Area Type	Other
Jurisdiction	Carroll County, MD	Time Period	Total PM w/Full Back'd Dev.	PHF	0.97
Urban Street	MD 32	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	MD 32/Springfield Ave	File Name	1TP2.xus		
Project Description	Enclave Parkside				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	33	674	387	55	1271	175	345	18	51	499	48	49

Signal Information			
Cycle, s	101.7	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	6.2	1.8	43.7	18.4	1.6	10.0						
Yellow	4.0	0.0	4.0	4.0	0.0	4.0						
Red	1.0	0.0	1.0	1.0	0.0	1.0						



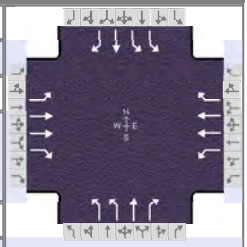
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	11.2	48.7	13.0	50.5	25.0	16.6	23.4	15.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	4.1	4.1	4.1	4.1	4.1	4.2	4.1	4.2
Queue Clearance Time (g_s), s	3.0	21.3	3.7	35.1	11.2	5.0	16.5	5.0
Green Extension Time (g_e), s	0.0	15.8	0.1	10.4	1.4	0.5	1.9	0.5
Phase Call Probability	0.62	1.00	0.80	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	0.40	0.00	0.67	0.00	0.00	0.02	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	34	695	399	57	1310	180	356	19	53	514	49	51
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1752	1598	1697	1766	1610	1757	1900	1610	1730	1900	1610
Queue Service Time (g_s), s	1.0	14.3	19.3	1.7	33.1	7.1	9.2	0.9	3.0	14.5	2.5	3.0
Cycle Queue Clearance Time (g_c), s	1.0	14.3	19.3	1.7	33.1	7.1	9.2	0.9	3.0	14.5	2.5	3.0
Green Ratio (*g/C*)	0.49	0.43	0.43	0.51	0.45	0.45	0.20	0.11	0.11	0.18	0.10	0.10
Capacity (*c*), veh/h	217	1506	686	410	1581	720	691	216	183	627	187	158
Volume-to-Capacity Ratio (*X*)	0.157	0.461	0.581	0.138	0.829	0.250	0.515	0.086	0.287	0.820	0.265	0.319
Back of Queue (*Q*), ft/ln (95 th percentile)	19.4	247.1	287.8	31	506.9	1.6	176.8	18.9	55.5	264.2	52.8	54.7
Back of Queue (*Q*), veh/ln (95 th percentile)	0.7	9.6	11.4	1.2	19.8	0.1	7.1	0.8	2.2	10.4	2.1	2.2
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	19.4	20.6	22.0	13.8	24.7	17.5	36.5	40.3	41.3	40.0	42.4	42.7
Incremental Delay (d_2), s/veh	0.3	0.2	0.8	0.2	3.3	0.2	0.6	0.2	0.9	2.8	0.7	1.1
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	19.8	20.8	22.9	14.0	27.9	17.7	37.1	40.5	42.1	42.8	43.2	43.8
Level of Service (LOS)	B	C	C	B	C	B	D	D	D	D	D	D
Approach Delay, s/veh / LOS	21.5	C		26.2	C		37.9	D		42.9	D	
Intersection Delay, s/veh / LOS	28.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.27	B	2.27	B	2.46	B	2.46	B
Bicycle LOS Score / LOS	1.42	A	1.76	B	1.19	A	1.50	B

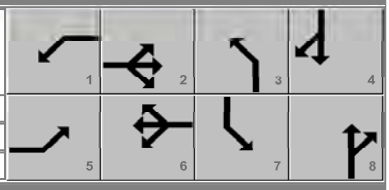
HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	The Traffic Group, Inc.			Duration, h	0.250
Analyst	RH	Analysis Date	5/18/2023	Area Type	Other
Jurisdiction	Carroll County, MD	Time Period	Total PM w/Full Back'd Dev.+1100 TH	PHF	0.97
Urban Street	MD 32	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	MD 32/Springfield Ave	File Name	1TP3.xus		
Project Description	Enclave Parkside				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	159	674	387	55	1271	373	345	54	51	648	75	145

Signal Information												
Cycle, s	112.8	Reference Phase	2									
Offset, s	0	Reference Point	End	Green	8.3	1.6	48.0	20.0	4.9	10.0		
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	0.0	4.0	4.0	0.0	4.0		
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	0.0	1.0	1.0	0.0	1.0		



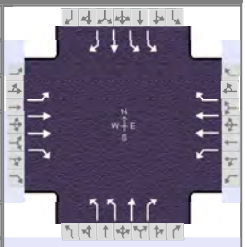
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	14.9	54.7	13.3	53.0	25.0	15.0	29.9	19.9
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	4.1	4.1	4.1	4.1	4.1	4.2	4.1	4.2
Queue Clearance Time (g_s), s	7.8	23.0	4.0	40.2	12.5	5.5	23.1	12.0
Green Extension Time (g_e), s	0.4	16.6	0.1	7.8	1.4	1.0	1.8	0.8
Phase Call Probability	0.99	1.00	0.83	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	0.51	0.00	0.85	0.00	0.01	0.40	0.15

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	164	695	399	57	1310	385	356	56	53	668	77	149
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1752	1598	1697	1766	1610	1757	1900	1610	1730	1900	1610
Queue Service Time (g_s), s	5.8	15.6	21.0	2.0	38.2	20.3	10.5	3.1	3.5	21.1	4.2	10.0
Cycle Queue Clearance Time (g_c), s	5.8	15.6	21.0	2.0	38.2	20.3	10.5	3.1	3.5	21.1	4.2	10.0
Green Ratio (*g/C*)	0.51	0.44	0.44	0.50	0.43	0.43	0.18	0.09	0.09	0.22	0.13	0.13
Capacity (*c*), veh/h	251	1543	703	392	1504	685	623	168	143	762	250	212
Volume-to-Capacity Ratio (*X*)	0.653	0.450	0.567	0.145	0.871	0.561	0.571	0.331	0.368	0.876	0.309	0.705
Back of Queue (*Q*), ft/ln (95 th percentile)	112.7	268.7	314.7	36.1	598.3	306.2	201.6	68.1	64.9	376.3	89.5	191.1
Back of Queue (*Q*), veh/ln (95 th percentile)	4.3	10.4	12.5	1.4	23.4	12.2	8.1	2.7	2.6	14.8	3.6	7.6
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	23.9	22.1	23.6	15.9	29.6	24.4	42.5	48.3	48.4	42.5	44.3	46.9
Incremental Delay (d_2), s/veh	2.9	0.2	1.1	0.2	5.5	0.9	0.8	1.1	1.6	8.3	0.7	5.0
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	26.8	22.3	24.6	16.0	35.1	25.4	43.3	49.4	50.0	50.8	45.0	51.8
Level of Service (LOS)	C	C	C	B	D	C	D	D	D	D	D	D
Approach Delay, s/veh / LOS	23.6	C		32.3	C		44.8	D		50.5	D	
Intersection Delay, s/veh / LOS	34.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.27	B	2.27	B	2.46	B	2.46	B
Bicycle LOS Score / LOS	1.53	B	1.93	B	1.25	A	1.96	B

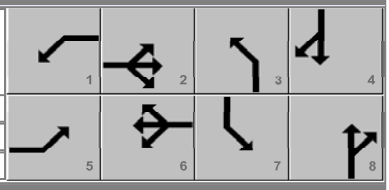
HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	The Traffic Group, Inc.			Duration, h	0.250
Analyst	RH	Analysis Date	5/18/2023	Area Type	Other
Jurisdiction	Carroll County, MD	Time Period	Total AM w/Full Back'd Dev+1100 TH	PHF	0.97
Urban Street	MD 32	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	MD 32/Springfield Ave	File Name	1TA3.xus		
Project Description	The Enclave Parkside				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	129	1242	260	51	493	588	217	76	89	337	52	151

Signal Information													
Cycle, s	112.3	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On										
Force Mode	Fixed	Simult. Gap N/S	On										
				Green	8.1	1.8	48.1	14.1	0.9	14.4			
				Yellow	4.0	0.0	4.0	4.0	4.0	4.0			
				Red	1.0	0.0	1.0	1.0	1.0	1.0			



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	14.8	54.8	13.1	53.1	25.0	25.3	19.1	19.4
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	4.1	4.1	4.1	4.1	4.1	4.3	4.1	4.3
Queue Clearance Time (g_s), s	6.4	38.9	3.8	40.8	8.7	7.7	12.8	13.9
Green Extension Time (g_e), s	0.3	8.5	0.1	7.3	0.8	1.1	1.3	0.5
Phase Call Probability	0.98	1.00	0.81	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	0.80	0.00	0.85	0.00	0.02	0.00	0.43

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	133	1280	268	53	508	606	224	78	92	347	54	156
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1767	1724	1510	1682	1654	1610	1661	1856	1560	1757	1470	1434
Queue Service Time (g_s), s	4.4	36.9	13.5	1.8	11.7	38.8	6.7	4.1	5.7	10.8	3.7	11.9
Cycle Queue Clearance Time (g_c), s	4.4	36.9	13.5	1.8	11.7	38.8	6.7	4.1	5.7	10.8	3.7	11.9
Green Ratio (*g/C*)	0.52	0.44	0.44	0.50	0.43	0.43	0.18	0.18	0.18	0.13	0.13	0.13
Capacity (*c*), veh/h	506	1530	670	225	1415	689	591	336	282	441	189	184
Volume-to-Capacity Ratio (*X*)	0.263	0.837	0.400	0.234	0.359	0.880	0.378	0.233	0.325	0.788	0.284	0.845
Back of Queue (*Q*), ft/ln (95 th percentile)	81.1	571.8	219.9	34.2	215.4	581.9	130	86.1	103.8	211.7	76.6	243.1
Back of Queue (*Q*), veh/ln (95 th percentile)	3.2	21.8	8.3	1.3	7.9	23.3	4.9	3.4	4.0	8.5	2.5	8.7
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	15.0	27.6	21.1	21.6	21.7	29.5	40.7	39.3	40.0	47.7	44.3	47.9
Incremental Delay (d_2), s/veh	0.3	4.2	0.4	0.5	0.2	11.9	0.4	0.4	0.7	3.2	0.8	16.7
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	15.2	31.8	21.5	22.1	21.9	41.3	41.1	39.7	40.7	50.8	45.1	64.5
Level of Service (LOS)	B	C	C	C	C	D	D	D	D	D	D	E
Approach Delay, s/veh / LOS	28.9	C		32.0	C		40.7	D		54.1	D	
Intersection Delay, s/veh / LOS	34.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.27	B	2.27	B	2.46	B	2.46	B
Bicycle LOS Score / LOS	1.87	B	1.45	A	1.14	A	1.41	A

Site: EA

Springfield Ave at Warfield Ave
Existing AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Springfield Ave											
3x	L2	1	3.0	0.004	3.4	LOS A	0.0	0.2	0.10	0.03	34.9
3ax	L1	1	3.0	0.004	3.4	LOS A	0.0	0.2	0.10	0.03	34.5
18ax	R1	1	3.0	0.004	3.4	LOS A	0.0	0.2	0.10	0.03	34.5
18x	R2	1	3.0	0.004	3.4	LOS A	0.0	0.2	0.10	0.03	33.8
Approach		4	3.0	0.004	3.4	LOS A	0.0	0.2	0.10	0.03	34.4
NorthEast: Warfield Ave											
1x	L2	4	3.0	0.010	3.4	LOS A	0.0	0.6	0.06	0.01	35.1
6x	T1	1	3.0	0.010	3.4	LOS A	0.0	0.6	0.06	0.01	35.0
16ax	R1	4	3.0	0.010	3.4	LOS A	0.0	0.6	0.06	0.01	34.7
16bx	R3	1	3.0	0.010	3.4	LOS A	0.0	0.6	0.06	0.01	33.5
Approach		11	3.0	0.010	3.4	LOS A	0.0	0.6	0.06	0.01	34.7
North: Town Park Dr											
7b	L3	1	3.0	0.023	3.5	LOS A	0.1	1.4	0.04	0.01	36.5
7a	L1	1	3.0	0.023	3.5	LOS A	0.1	1.4	0.04	0.01	35.5
14a	R1	1	3.0	0.023	3.5	LOS A	0.1	1.4	0.04	0.01	35.5
14	R2	22	3.0	0.023	3.5	LOS A	0.1	1.4	0.04	0.01	34.7
Approach		25	3.0	0.023	3.5	LOS A	0.1	1.4	0.04	0.01	34.9
West: Springfield Ave											
5	L2	15	3.0	0.117	4.3	LOS A	0.3	7.7	0.04	0.01	34.9
5a	L1	34	3.0	0.117	4.3	LOS A	0.3	7.7	0.04	0.01	34.4
12a	R1	77	3.0	0.117	4.3	LOS A	0.3	7.7	0.04	0.01	34.4
12b	R3	1	3.0	0.117	4.3	LOS A	0.3	7.7	0.04	0.01	33.3
Approach		127	3.0	0.117	4.3	LOS A	0.3	7.7	0.04	0.01	34.5
SouthWest: Warfield Ave											
5bx	L3	1	3.0	0.004	3.6	LOS A	0.0	0.3	0.17	0.07	35.1
5ax	L1	1	3.0	0.004	3.6	LOS A	0.0	0.3	0.17	0.07	34.2
2x	T1	1	3.0	0.004	3.6	LOS A	0.0	0.3	0.17	0.07	34.5
12x	R2	1	3.0	0.004	3.6	LOS A	0.0	0.3	0.17	0.07	33.5
Approach		4	3.0	0.004	3.6	LOS A	0.0	0.3	0.17	0.07	34.3
All Vehicles		173	3.0	0.117	4.1	LOS A	0.3	7.7	0.05	0.01	34.5

Site: EP

Springfield Ave at Warfield Ave
Existing PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Springfield Ave											
3x	L2	1	3.0	0.062	4.0	LOS A	0.2	3.9	0.12	0.05	33.7
3ax	L1	61	3.0	0.062	4.0	LOS A	0.2	3.9	0.12	0.05	33.3
18ax	R1	1	3.0	0.062	4.0	LOS A	0.2	3.9	0.12	0.05	33.3
18x	R2	1	3.0	0.062	4.0	LOS A	0.2	3.9	0.12	0.05	32.7
Approach		65	3.0	0.062	4.0	LOS A	0.2	3.9	0.12	0.05	33.3
NorthEast: Warfield Ave											
1x	L2	5	3.0	0.077	4.2	LOS A	0.2	4.9	0.17	0.09	35.7
6x	T1	1	3.0	0.077	4.2	LOS A	0.2	4.9	0.17	0.09	35.6
16ax	R1	61	3.0	0.077	4.2	LOS A	0.2	4.9	0.17	0.09	35.3
16bx	R3	10	3.0	0.077	4.2	LOS A	0.2	4.9	0.17	0.09	34.1
Approach		78	3.0	0.077	4.2	LOS A	0.2	4.9	0.17	0.09	35.1
North: Town Park Dr											
7b	L3	1	3.0	0.026	3.8	LOS A	0.1	1.6	0.17	0.09	36.2
7a	L1	1	3.0	0.026	3.8	LOS A	0.1	1.6	0.17	0.09	35.3
14a	R1	1	3.0	0.026	3.8	LOS A	0.1	1.6	0.17	0.09	35.3
14	R2	22	3.0	0.026	3.8	LOS A	0.1	1.6	0.17	0.09	34.5
Approach		26	3.0	0.026	3.8	LOS A	0.1	1.6	0.17	0.09	34.7
West: Springfield Ave											
5	L2	48	3.0	0.060	3.8	LOS A	0.1	3.7	0.04	0.01	33.5
5a	L1	12	3.0	0.060	3.8	LOS A	0.1	3.7	0.04	0.01	33.1
12a	R1	4	3.0	0.060	3.8	LOS A	0.1	3.7	0.04	0.01	33.1
12b	R3	1	3.0	0.060	3.8	LOS A	0.1	3.7	0.04	0.01	32.1
Approach		65	3.0	0.060	3.8	LOS A	0.1	3.7	0.04	0.01	33.4
SouthWest: Warfield Ave											
5bx	L3	1	3.0	0.005	3.5	LOS A	0.0	0.3	0.12	0.04	35.1
5ax	L1	1	3.0	0.005	3.5	LOS A	0.0	0.3	0.12	0.04	34.3
2x	T1	1	3.0	0.005	3.5	LOS A	0.0	0.3	0.12	0.04	34.6
12x	R2	1	3.0	0.005	3.5	LOS A	0.0	0.3	0.12	0.04	33.6
Approach		5	3.0	0.005	3.5	LOS A	0.0	0.3	0.12	0.04	34.4
All Vehicles		239	3.0	0.077	4.0	LOS A	0.2	4.9	0.12	0.05	34.1

Site: BA1

Springfield Ave at Warfield Ave
Background AM Peak w/o Warfield Development
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Springfield Ave											
3x	L2	1	3.0	0.004	3.5	LOS A	0.0	0.2	0.11	0.03	34.9
3ax	L1	1	3.0	0.004	3.5	LOS A	0.0	0.2	0.11	0.03	34.5
18ax	R1	1	3.0	0.004	3.5	LOS A	0.0	0.2	0.11	0.03	34.5
18x	R2	1	3.0	0.004	3.5	LOS A	0.0	0.2	0.11	0.03	33.8
Approach		4	3.0	0.004	3.5	LOS A	0.0	0.2	0.11	0.03	34.4
NorthEast: Warfield Ave											
1x	L2	4	3.0	0.010	3.4	LOS A	0.0	0.6	0.06	0.01	35.1
6x	T1	1	3.0	0.010	3.4	LOS A	0.0	0.6	0.06	0.01	35.0
16ax	R1	4	3.0	0.010	3.4	LOS A	0.0	0.6	0.06	0.01	34.7
16bx	R3	1	3.0	0.010	3.4	LOS A	0.0	0.6	0.06	0.01	33.5
Approach		11	3.0	0.010	3.4	LOS A	0.0	0.6	0.06	0.01	34.7
North: Town Park Dr											
7b	L3	1	3.0	0.025	3.5	LOS A	0.1	1.5	0.04	0.01	36.5
7a	L1	1	3.0	0.025	3.5	LOS A	0.1	1.5	0.04	0.01	35.5
14a	R1	1	3.0	0.025	3.5	LOS A	0.1	1.5	0.04	0.01	35.5
14	R2	24	3.0	0.025	3.5	LOS A	0.1	1.5	0.04	0.01	34.7
Approach		27	3.0	0.025	3.5	LOS A	0.1	1.5	0.04	0.01	34.9
West: Springfield Ave											
5	L2	16	3.0	0.127	4.4	LOS A	0.3	8.5	0.04	0.01	34.8
5a	L1	37	3.0	0.127	4.4	LOS A	0.3	8.5	0.04	0.01	34.4
12a	R1	84	3.0	0.127	4.4	LOS A	0.3	8.5	0.04	0.01	34.4
12b	R3	1	3.0	0.127	4.4	LOS A	0.3	8.5	0.04	0.01	33.2
Approach		138	3.0	0.127	4.4	LOS A	0.3	8.5	0.04	0.01	34.4
SouthWest: Warfield Ave											
5bx	L3	1	3.0	0.004	3.7	LOS A	0.0	0.3	0.18	0.08	35.0
5ax	L1	1	3.0	0.004	3.7	LOS A	0.0	0.3	0.18	0.08	34.2
2x	T1	1	3.0	0.004	3.7	LOS A	0.0	0.3	0.18	0.08	34.5
12x	R2	1	3.0	0.004	3.7	LOS A	0.0	0.3	0.18	0.08	33.5
Approach		4	3.0	0.004	3.7	LOS A	0.0	0.3	0.18	0.08	34.3
All Vehicles		186	3.0	0.127	4.2	LOS A	0.3	8.5	0.05	0.01	34.5

Site: BP1

Springfield Ave at Warfield Ave
Background PM Peak w/o Warfield Developments
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Springfield Ave											
3x	L2	1	3.0	0.067	4.0	LOS A	0.2	4.2	0.12	0.05	33.7
3ax	L1	66	3.0	0.067	4.0	LOS A	0.2	4.2	0.12	0.05	33.3
18ax	R1	1	3.0	0.067	4.0	LOS A	0.2	4.2	0.12	0.05	33.3
18x	R2	1	3.0	0.067	4.0	LOS A	0.2	4.2	0.12	0.05	32.6
Approach		70	3.0	0.067	4.0	LOS A	0.2	4.2	0.12	0.05	33.3
NorthEast: Warfield Ave											
1x	L2	1	3.0	0.080	4.3	LOS A	0.2	5.1	0.18	0.10	35.9
6x	T1	1	3.0	0.080	4.3	LOS A	0.2	5.1	0.18	0.10	35.8
16ax	R1	66	3.0	0.080	4.3	LOS A	0.2	5.1	0.18	0.10	35.4
16bx	R3	12	3.0	0.080	4.3	LOS A	0.2	5.1	0.18	0.10	34.2
Approach		81	3.0	0.080	4.3	LOS A	0.2	5.1	0.18	0.10	35.2
North: Town Park Dr											
7b	L3	1	3.0	0.029	3.9	LOS A	0.1	1.8	0.18	0.09	36.2
7a	L1	1	3.0	0.029	3.9	LOS A	0.1	1.8	0.18	0.09	35.3
14a	R1	1	3.0	0.029	3.9	LOS A	0.1	1.8	0.18	0.09	35.3
14	R2	25	3.0	0.029	3.9	LOS A	0.1	1.8	0.18	0.09	34.5
Approach		29	3.0	0.029	3.9	LOS A	0.1	1.8	0.18	0.09	34.7
West: Springfield Ave											
5	L2	52	3.0	0.064	3.8	LOS A	0.2	4.0	0.03	0.01	33.5
5a	L1	13	3.0	0.064	3.8	LOS A	0.2	4.0	0.03	0.01	33.1
12a	R1	4	3.0	0.064	3.8	LOS A	0.2	4.0	0.03	0.01	33.1
12b	R3	1	3.0	0.064	3.8	LOS A	0.2	4.0	0.03	0.01	32.0
Approach		70	3.0	0.064	3.8	LOS A	0.2	4.0	0.03	0.01	33.3
SouthWest: Warfield Ave											
5bx	L3	1	3.0	0.005	3.5	LOS A	0.0	0.3	0.12	0.04	35.1
5ax	L1	1	3.0	0.005	3.5	LOS A	0.0	0.3	0.12	0.04	34.3
2x	T1	1	3.0	0.005	3.5	LOS A	0.0	0.3	0.12	0.04	34.6
12x	R2	1	3.0	0.005	3.5	LOS A	0.0	0.3	0.12	0.04	33.6
Approach		5	3.0	0.005	3.5	LOS A	0.0	0.3	0.12	0.04	34.4
All Vehicles		255	3.0	0.080	4.0	LOS A	0.2	5.1	0.12	0.06	34.1

Site: TA1

Springfield Ave at Warfield Ave
Total AM Peak w/o Warfield Development
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Springfield Ave											
3x	L2	1	3.0	0.004	3.5	LOS A	0.0	0.2	0.11	0.04	34.9
3ax	L1	1	3.0	0.004	3.5	LOS A	0.0	0.2	0.11	0.04	34.5
18ax	R1	1	3.0	0.004	3.5	LOS A	0.0	0.2	0.11	0.04	34.5
18x	R2	1	3.0	0.004	3.5	LOS A	0.0	0.2	0.11	0.04	33.8
Approach		4	3.0	0.004	3.5	LOS A	0.0	0.2	0.11	0.04	34.4
NorthEast: Warfield Ave											
1x	L2	4	3.0	0.010	3.4	LOS A	0.0	0.6	0.07	0.02	35.1
6x	T1	1	3.0	0.010	3.4	LOS A	0.0	0.6	0.07	0.02	35.0
16ax	R1	4	3.0	0.010	3.4	LOS A	0.0	0.6	0.07	0.02	34.6
16bx	R3	1	3.0	0.010	3.4	LOS A	0.0	0.6	0.07	0.02	33.5
Approach		11	3.0	0.010	3.4	LOS A	0.0	0.6	0.07	0.02	34.7
North: Town Park Dr											
7b	L3	1	3.0	0.038	3.6	LOS A	0.1	2.3	0.05	0.01	36.5
7a	L1	1	3.0	0.038	3.6	LOS A	0.1	2.3	0.05	0.01	35.5
14a	R1	1	3.0	0.038	3.6	LOS A	0.1	2.3	0.05	0.01	35.5
14	R2	38	3.0	0.038	3.6	LOS A	0.1	2.3	0.05	0.01	34.8
Approach		42	3.0	0.038	3.6	LOS A	0.1	2.3	0.05	0.01	34.8
West: Springfield Ave											
5	L2	23	3.0	0.133	4.5	LOS A	0.4	9.0	0.04	0.01	34.7
5a	L1	37	3.0	0.133	4.5	LOS A	0.4	9.0	0.04	0.01	34.3
12a	R1	84	3.0	0.133	4.5	LOS A	0.4	9.0	0.04	0.01	34.2
12b	R3	1	3.0	0.133	4.5	LOS A	0.4	9.0	0.04	0.01	33.1
Approach		145	3.0	0.133	4.5	LOS A	0.4	9.0	0.04	0.01	34.3
SouthWest: Warfield Ave											
5bx	L3	1	3.0	0.004	3.7	LOS A	0.0	0.3	0.18	0.08	35.0
5ax	L1	1	3.0	0.004	3.7	LOS A	0.0	0.3	0.18	0.08	34.2
2x	T1	1	3.0	0.004	3.7	LOS A	0.0	0.3	0.18	0.08	34.5
12x	R2	1	3.0	0.004	3.7	LOS A	0.0	0.3	0.18	0.08	33.5
Approach		4	3.0	0.004	3.7	LOS A	0.0	0.3	0.18	0.08	34.3
All Vehicles		207	3.0	0.133	4.2	LOS A	0.4	9.0	0.05	0.01	34.4

Site: TP1

Springfield Ave at Warfield Ave
Total PM Peak w/o Warfield Developments
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Springfield Ave											
3x	L2	1	3.0	0.068	4.1	LOS A	0.2	4.3	0.14	0.07	33.6
3ax	L1	66	3.0	0.068	4.1	LOS A	0.2	4.3	0.14	0.07	33.2
18ax	R1	1	3.0	0.068	4.1	LOS A	0.2	4.3	0.14	0.07	33.2
18x	R2	1	3.0	0.068	4.1	LOS A	0.2	4.3	0.14	0.07	32.6
Approach		70	3.0	0.068	4.1	LOS A	0.2	4.3	0.14	0.07	33.2
NorthEast: Warfield Ave											
1x	L2	1	3.0	0.081	4.4	LOS A	0.2	5.2	0.19	0.11	35.8
6x	T1	1	3.0	0.081	4.4	LOS A	0.2	5.2	0.19	0.11	35.7
16ax	R1	66	3.0	0.081	4.4	LOS A	0.2	5.2	0.19	0.11	35.4
16bx	R3	12	3.0	0.081	4.4	LOS A	0.2	5.2	0.19	0.11	34.1
Approach		81	3.0	0.081	4.4	LOS A	0.2	5.2	0.19	0.11	35.2
North: Town Park Dr											
7b	L3	1	3.0	0.042	4.0	LOS A	0.1	2.6	0.18	0.10	36.3
7a	L1	1	3.0	0.042	4.0	LOS A	0.1	2.6	0.18	0.10	35.3
14a	R1	1	3.0	0.042	4.0	LOS A	0.1	2.6	0.18	0.10	35.3
14	R2	38	3.0	0.042	4.0	LOS A	0.1	2.6	0.18	0.10	34.5
Approach		42	3.0	0.042	4.0	LOS A	0.1	2.6	0.18	0.10	34.6
West: Springfield Ave											
5	L2	70	3.0	0.081	4.0	LOS A	0.2	5.2	0.03	0.01	33.3
5a	L1	13	3.0	0.081	4.0	LOS A	0.2	5.2	0.03	0.01	32.9
12a	R1	4	3.0	0.081	4.0	LOS A	0.2	5.2	0.03	0.01	32.9
12b	R3	1	3.0	0.081	4.0	LOS A	0.2	5.2	0.03	0.01	31.9
Approach		88	3.0	0.081	4.0	LOS A	0.2	5.2	0.03	0.01	33.2
SouthWest: Warfield Ave											
5bx	L3	1	3.0	0.005	3.5	LOS A	0.0	0.3	0.14	0.05	35.1
5ax	L1	1	3.0	0.005	3.5	LOS A	0.0	0.3	0.14	0.05	34.2
2x	T1	1	3.0	0.005	3.5	LOS A	0.0	0.3	0.14	0.05	34.6
12x	R2	1	3.0	0.005	3.5	LOS A	0.0	0.3	0.14	0.05	33.6
Approach		5	3.0	0.005	3.5	LOS A	0.0	0.3	0.14	0.05	34.4
All Vehicles		286	3.0	0.081	4.1	LOS A	0.2	5.2	0.13	0.06	34.0

Site: BA2

Springfield Ave at Warfield Ave
Background AM Peak w/full Background Developments
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95 % Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Springfield Ave											
3x	L2	13	3.0	0.042	5.1	LOS A	0.1	2.6	0.36	0.30	33.0
3ax	L1	16	3.0	0.042	5.1	LOS A	0.1	2.6	0.36	0.30	32.6
18ax	R1	1	3.0	0.042	5.1	LOS A	0.1	2.6	0.36	0.30	32.6
18x	R2	1	3.0	0.042	5.1	LOS A	0.1	2.6	0.36	0.30	32.0
Approach		32	3.0	0.042	5.1	LOS A	0.1	2.6	0.36	0.30	32.8
NorthEast: Warfield Ave											
1x	L2	4	3.0	0.064	4.1	LOS A	0.2	4.0	0.15	0.08	35.9
6x	T1	1	3.0	0.064	4.1	LOS A	0.2	4.0	0.15	0.08	35.7
16ax	R1	58	3.0	0.064	4.1	LOS A	0.2	4.0	0.15	0.08	35.4
16bx	R3	1	3.0	0.064	4.1	LOS A	0.2	4.0	0.15	0.08	34.2
Approach		65	3.0	0.064	4.1	LOS A	0.2	4.0	0.15	0.08	35.4
North: Town Park Dr											
7b	L3	1	3.0	0.028	3.9	LOS A	0.1	1.7	0.18	0.10	36.3
7a	L1	1	3.0	0.028	3.9	LOS A	0.1	1.7	0.18	0.10	35.3
14a	R1	1	3.0	0.028	3.9	LOS A	0.1	1.7	0.18	0.10	35.3
14	R2	24	3.0	0.028	3.9	LOS A	0.1	1.7	0.18	0.10	34.5
Approach		27	3.0	0.028	3.9	LOS A	0.1	1.7	0.18	0.10	34.7
West: Springfield Ave											
5	L2	16	3.0	0.626	11.9	LOS B	3.6	91.5	0.15	0.05	30.8
5a	L1	426	3.0	0.626	11.9	LOS B	3.6	91.5	0.15	0.05	30.4
12a	R1	191	3.0	0.626	11.9	LOS B	3.6	91.5	0.15	0.05	30.4
12b	R3	42	3.0	0.626	11.9	LOS B	3.6	91.5	0.15	0.05	29.5
Approach		676	3.0	0.626	11.9	LOS B	3.6	91.5	0.15	0.05	30.4
SouthWest: Warfield Ave											
5bx	L3	53	3.0	0.105	6.3	LOS A	0.3	6.8	0.42	0.42	32.7
5ax	L1	1	3.0	0.105	6.3	LOS A	0.3	6.8	0.42	0.42	31.9
2x	T1	1	3.0	0.105	6.3	LOS A	0.3	6.8	0.42	0.42	32.2
12x	R2	18	3.0	0.105	6.3	LOS A	0.3	6.8	0.42	0.42	31.3
Approach		73	3.0	0.105	6.3	LOS A	0.3	6.8	0.42	0.42	32.3
All Vehicles		873	3.0	0.626	10.3	LOS B	3.6	91.5	0.16	0.09	31.1

Site: BP2

Springfield Ave at Warfield Ave
Background PM Peak w/Full Background Developments
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Springfield Ave											
3x	L2	32	3.0	0.237	6.3	LOS A	0.7	17.6	0.30	0.24	32.5
3ax	L1	182	3.0	0.237	6.3	LOS A	0.7	17.6	0.30	0.24	32.1
18ax	R1	1	3.0	0.237	6.3	LOS A	0.7	17.6	0.30	0.24	32.1
18x	R2	1	3.0	0.237	6.3	LOS A	0.7	17.6	0.30	0.24	31.5
Approach		217	3.0	0.237	6.3	LOS A	0.7	17.6	0.30	0.24	32.1
NorthEast: Warfield Ave											
1x	L2	1	3.0	0.590	13.2	LOS B	2.9	73.9	0.53	0.56	31.5
6x	T1	1	3.0	0.590	13.2	LOS B	2.9	73.9	0.53	0.56	31.4
16ax	R1	482	3.0	0.590	13.2	LOS B	2.9	73.9	0.53	0.56	31.1
16bx	R3	12	3.0	0.590	13.2	LOS B	2.9	73.9	0.53	0.56	30.2
Approach		496	3.0	0.590	13.2	LOS B	2.9	73.9	0.53	0.56	31.1
North: Town Park Dr											
7b	L3	1	3.0	0.046	6.4	LOS A	0.1	2.9	0.45	0.44	34.8
7a	L1	1	3.0	0.046	6.4	LOS A	0.1	2.9	0.45	0.44	34.0
14a	R1	1	3.0	0.046	6.4	LOS A	0.1	2.9	0.45	0.44	33.9
14	R2	25	3.0	0.046	6.4	LOS A	0.1	2.9	0.45	0.44	33.3
Approach		29	3.0	0.046	6.4	LOS A	0.1	2.9	0.45	0.44	33.4
West: Springfield Ave											
5	L2	52	3.0	0.257	5.8	LOS A	0.8	20.0	0.11	0.04	33.6
5a	L1	97	3.0	0.257	5.8	LOS A	0.8	20.0	0.11	0.04	33.2
12a	R1	27	3.0	0.257	5.8	LOS A	0.8	20.0	0.11	0.04	33.2
12b	R3	97	3.0	0.257	5.8	LOS A	0.8	20.0	0.11	0.04	32.1
Approach		274	3.0	0.257	5.8	LOS A	0.8	20.0	0.11	0.04	32.9
SouthWest: Warfield Ave											
5bx	L3	100	3.0	0.140	5.0	LOS A	0.4	9.5	0.23	0.15	33.3
5ax	L1	1	3.0	0.140	5.0	LOS A	0.4	9.5	0.23	0.15	32.5
2x	T1	1	3.0	0.140	5.0	LOS A	0.4	9.5	0.23	0.15	32.8
12x	R2	32	3.0	0.140	5.0	LOS A	0.4	9.5	0.23	0.15	31.9
Approach		135	3.0	0.140	5.0	LOS A	0.4	9.5	0.23	0.15	32.9
All Vehicles		1151	3.0	0.590	9.0	LOS A	2.9	73.9	0.35	0.33	32.0

Site: TA2

Springfield Ave at Warfield Ave
Total AM Peak w/full Background Developments
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Springfield Ave											
3x	L2	13	3.0	0.042	5.1	LOS A	0.1	2.6	0.36	0.31	33.0
3ax	L1	16	3.0	0.042	5.1	LOS A	0.1	2.6	0.36	0.31	32.6
18ax	R1	1	3.0	0.042	5.1	LOS A	0.1	2.6	0.36	0.31	32.6
18x	R2	1	3.0	0.042	5.1	LOS A	0.1	2.6	0.36	0.31	32.0
Approach		32	3.0	0.042	5.1	LOS A	0.1	2.6	0.36	0.31	32.8
NorthEast: Warfield Ave											
1x	L2	4	3.0	0.064	4.1	LOS A	0.2	4.0	0.16	0.08	35.8
6x	T1	1	3.0	0.064	4.1	LOS A	0.2	4.0	0.16	0.08	35.7
16ax	R1	58	3.0	0.064	4.1	LOS A	0.2	4.0	0.16	0.08	35.4
16bx	R3	1	3.0	0.064	4.1	LOS A	0.2	4.0	0.16	0.08	34.1
Approach		65	3.0	0.064	4.1	LOS A	0.2	4.0	0.16	0.08	35.4
North: Town Park Dr											
7b	L3	1	3.0	0.042	4.0	LOS A	0.1	2.6	0.19	0.10	36.3
7a	L1	1	3.0	0.042	4.0	LOS A	0.1	2.6	0.19	0.10	35.3
14a	R1	1	3.0	0.042	4.0	LOS A	0.1	2.6	0.19	0.10	35.3
14	R2	38	3.0	0.042	4.0	LOS A	0.1	2.6	0.19	0.10	34.6
Approach		42	3.0	0.042	4.0	LOS A	0.1	2.6	0.19	0.10	34.6
West: Springfield Ave											
5	L2	23	3.0	0.632	12.0	LOS B	3.7	93.7	0.15	0.05	30.7
5a	L1	426	3.0	0.632	12.0	LOS B	3.7	93.7	0.15	0.05	30.4
12a	R1	191	3.0	0.632	12.0	LOS B	3.7	93.7	0.15	0.05	30.4
12b	R3	42	3.0	0.632	12.0	LOS B	3.7	93.7	0.15	0.05	29.5
Approach		682	3.0	0.632	12.0	LOS B	3.7	93.7	0.15	0.05	30.3
SouthWest: Warfield Ave											
5bx	L3	53	3.0	0.105	6.4	LOS A	0.3	6.8	0.43	0.43	32.7
5ax	L1	1	3.0	0.105	6.4	LOS A	0.3	6.8	0.43	0.43	31.9
2x	T1	1	3.0	0.105	6.4	LOS A	0.3	6.8	0.43	0.43	32.2
12x	R2	18	3.0	0.105	6.4	LOS A	0.3	6.8	0.43	0.43	31.3
Approach		73	3.0	0.105	6.4	LOS A	0.3	6.8	0.43	0.43	32.3
All Vehicles		893	3.0	0.632	10.4	LOS B	3.7	93.7	0.18	0.09	31.1

Site: TP2

Springfield Ave at Warfield Ave
Total PM Peak w/Full Background Developments
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Springfield Ave											
3x	L2	32	3.0	0.240	6.5	LOS A	0.7	17.8	0.31	0.26	32.4
3ax	L1	182	3.0	0.240	6.5	LOS A	0.7	17.8	0.31	0.26	32.0
18ax	R1	1	3.0	0.240	6.5	LOS A	0.7	17.8	0.31	0.26	32.0
18x	R2	1	3.0	0.240	6.5	LOS A	0.7	17.8	0.31	0.26	31.4
Approach		217	3.0	0.240	6.5	LOS A	0.7	17.8	0.31	0.26	32.1
NorthEast: Warfield Ave											
1x	L2	1	3.0	0.598	13.6	LOS B	3.0	75.6	0.55	0.58	31.3
6x	T1	1	3.0	0.598	13.6	LOS B	3.0	75.6	0.55	0.58	31.3
16ax	R1	482	3.0	0.598	13.6	LOS B	3.0	75.6	0.55	0.58	31.0
16bx	R3	12	3.0	0.598	13.6	LOS B	3.0	75.6	0.55	0.58	30.0
Approach		496	3.0	0.598	13.6	LOS B	3.0	75.6	0.55	0.58	31.0
North: Town Park Dr											
7b	L3	1	3.0	0.067	6.6	LOS A	0.2	4.3	0.46	0.46	34.8
7a	L1	1	3.0	0.067	6.6	LOS A	0.2	4.3	0.46	0.46	33.9
14a	R1	1	3.0	0.067	6.6	LOS A	0.2	4.3	0.46	0.46	33.9
14	R2	38	3.0	0.067	6.6	LOS A	0.2	4.3	0.46	0.46	33.2
Approach		42	3.0	0.067	6.6	LOS A	0.2	4.3	0.46	0.46	33.3
West: Springfield Ave											
5	L2	70	3.0	0.274	6.0	LOS A	0.8	21.7	0.11	0.04	33.4
5a	L1	97	3.0	0.274	6.0	LOS A	0.8	21.7	0.11	0.04	33.0
12a	R1	27	3.0	0.274	6.0	LOS A	0.8	21.7	0.11	0.04	33.0
12b	R3	97	3.0	0.274	6.0	LOS A	0.8	21.7	0.11	0.04	31.9
Approach		292	3.0	0.274	6.0	LOS A	0.8	21.7	0.11	0.04	32.7
SouthWest: Warfield Ave											
5bx	L3	100	3.0	0.142	5.1	LOS A	0.4	9.6	0.24	0.17	33.2
5ax	L1	1	3.0	0.142	5.1	LOS A	0.4	9.6	0.24	0.17	32.5
2x	T1	1	3.0	0.142	5.1	LOS A	0.4	9.6	0.24	0.17	32.7
12x	R2	32	3.0	0.142	5.1	LOS A	0.4	9.6	0.24	0.17	31.8
Approach		135	3.0	0.142	5.1	LOS A	0.4	9.6	0.24	0.17	32.9
All Vehicles		1182	3.0	0.598	9.2	LOS A	3.0	75.6	0.36	0.34	31.9

Site: TA4

Springfield Ave at Warfield Ave
Total AM Peak w/full Background Developments & 1100 TH
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg Satn v/c	Average Delay sec	Level of Service	95 % Back of Queue Vehicles Veh	Distance ft	Prop. Queued	Effective Stop Rate per Veh	Average Speed mph
SouthEast: Springfield Ave											
3x	L2	13	3.0	0.048	5.9	LOS A	0.1	3.0	0.42	0.40	32.7
3ax	L1	16	3.0	0.048	5.9	LOS A	0.1	3.0	0.42	0.40	32.3
18ax	R1	1	3.0	0.048	5.9	LOS A	0.1	3.0	0.42	0.40	32.3
18x	R2	1	3.0	0.048	5.9	LOS A	0.1	3.0	0.42	0.40	31.7
Approach		32	3.0	0.048	5.9	LOS A	0.1	3.0	0.42	0.40	32.4
NorthEast: Warfield Ave											
1x	L2	4	3.0	0.073	4.7	LOS A	0.2	4.6	0.28	0.21	35.5
6x	T1	1	3.0	0.073	4.7	LOS A	0.2	4.6	0.28	0.21	35.4
16ax	R1	58	3.0	0.073	4.7	LOS A	0.2	4.6	0.28	0.21	35.0
16bx	R3	1	3.0	0.073	4.7	LOS A	0.2	4.6	0.28	0.21	33.8
Approach		65	3.0	0.073	4.7	LOS A	0.2	4.6	0.28	0.21	35.0
North: Town Park Dr											
7b	L3	1	3.0	0.463	9.1	LOS A	1.8	46.2	0.30	0.21	33.6
7a	L1	1	3.0	0.463	9.1	LOS A	1.8	46.2	0.30	0.21	32.8
14a	R1	1	3.0	0.463	9.1	LOS A	1.8	46.2	0.30	0.21	32.8
14	R2	454	3.0	0.463	9.1	LOS A	1.8	46.2	0.30	0.21	32.2
Approach		457	3.0	0.463	9.1	LOS A	1.8	46.2	0.30	0.21	32.2
West: Springfield Ave											
5	L2	209	3.0	0.804	19.4	LOS C	8.0	203.8	0.25	0.09	27.8
5a	L1	426	3.0	0.804	19.4	LOS C	8.0	203.8	0.25	0.09	27.5
12a	R1	191	3.0	0.804	19.4	LOS C	8.0	203.8	0.25	0.09	27.5
12b	R3	42	3.0	0.804	19.4	LOS C	8.0	203.8	0.25	0.09	26.8
Approach		868	3.0	0.804	19.4	LOS C	8.0	203.8	0.25	0.09	27.5
SouthWest: Warfield Ave											
5bx	L3	53	3.0	0.121	7.4	LOS A	0.3	7.8	0.48	0.48	32.2
5ax	L1	1	3.0	0.121	7.4	LOS A	0.3	7.8	0.48	0.48	31.5
2x	T1	1	3.0	0.121	7.4	LOS A	0.3	7.8	0.48	0.48	31.8
12x	R2	18	3.0	0.121	7.4	LOS A	0.3	7.8	0.48	0.48	30.9
Approach		73	3.0	0.121	7.4	LOS A	0.3	7.8	0.48	0.48	31.9
All Vehicles		1495	3.0	0.804	14.7	LOS B	8.0	203.8	0.28	0.16	29.4

Site: TP4

Springfield Ave at Warfield Ave
Total PM Peak w/Full Background Developments & 1100 TH
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Springfield Ave											
3x	L2	32	3.0	0.337	10.1	LOS B	1.0	26.5	0.52	0.54	30.8
3ax	L1	182	3.0	0.337	10.1	LOS B	1.0	26.5	0.52	0.54	30.5
18ax	R1	1	3.0	0.337	10.1	LOS B	1.0	26.5	0.52	0.54	30.5
18x	R2	1	3.0	0.337	10.1	LOS B	1.0	26.5	0.52	0.54	30.0
Approach		217	3.0	0.337	10.1	LOS B	1.0	26.5	0.52	0.54	30.6
NorthEast: Warfield Ave											
1x	L2	1	3.0	0.837	33.9	LOS D	5.6	143.5	0.82	1.02	24.4
6x	T1	1	3.0	0.837	33.9	LOS D	5.6	143.5	0.82	1.02	24.4
16ax	R1	482	3.0	0.837	33.9	LOS D	5.6	143.5	0.82	1.02	24.2
16bx	R3	12	3.0	0.837	33.9	LOS D	5.6	143.5	0.82	1.02	23.6
Approach		496	3.0	0.837	33.9	LOS D	5.6	143.5	0.82	1.02	24.2
North: Town Park Dr											
7b	L3	1	3.0	0.640	18.8	LOS C	2.9	75.1	0.67	0.75	29.3
7a	L1	1	3.0	0.640	18.8	LOS C	2.9	75.1	0.67	0.75	28.7
14a	R1	1	3.0	0.640	18.8	LOS C	2.9	75.1	0.67	0.75	28.7
14	R2	391	3.0	0.640	18.8	LOS C	2.9	75.1	0.67	0.75	28.2
Approach		395	3.0	0.640	18.8	LOS C	2.9	75.1	0.67	0.75	28.2
West: Springfield Ave											
5	L2	538	3.0	0.712	14.8	LOS B	5.0	127.9	0.25	0.11	29.0
5a	L1	97	3.0	0.712	14.8	LOS B	5.0	127.9	0.25	0.11	28.7
12a	R1	27	3.0	0.712	14.8	LOS B	5.0	127.9	0.25	0.11	28.7
12b	R3	97	3.0	0.712	14.8	LOS B	5.0	127.9	0.25	0.11	27.9
Approach		760	3.0	0.712	14.8	LOS B	5.0	127.9	0.25	0.11	28.8
SouthWest: Warfield Ave											
5bx	L3	100	3.0	0.199	7.6	LOS A	0.5	13.7	0.46	0.46	32.1
5ax	L1	1	3.0	0.199	7.6	LOS A	0.5	13.7	0.46	0.46	31.4
2x	T1	1	3.0	0.199	7.6	LOS A	0.5	13.7	0.46	0.46	31.6
12x	R2	32	3.0	0.199	7.6	LOS A	0.5	13.7	0.46	0.46	30.8
Approach		135	3.0	0.199	7.6	LOS A	0.5	13.7	0.46	0.46	31.8
All Vehicles		2003	3.0	0.837	19.3	LOS C	5.6	143.5	0.52	0.53	27.8

APPENDIX D

Sensitivity Analysis

TABLE D1 – TRIP GENERATION FOR SITE (1100 TOWNHOUSES)

Trip Generation Rates

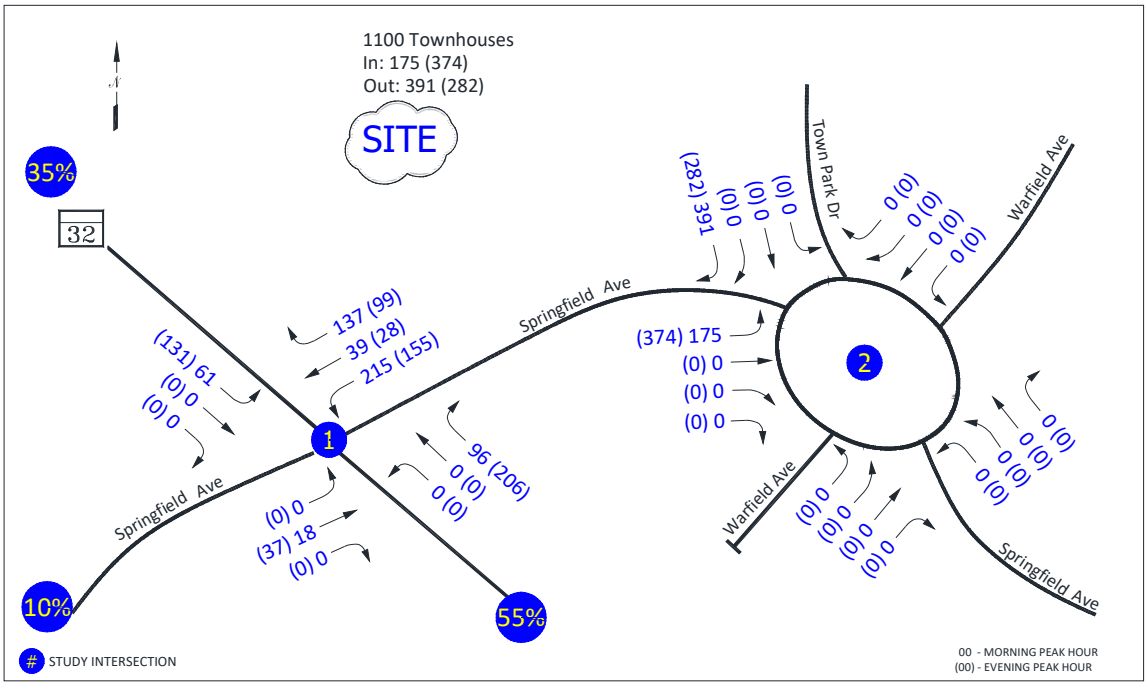
Formula/Rate	Directional Distribution			
	AM Peak Hour		PM Peak Hour	
	IN	OUT	IN	OUT
Single Family Attached Housing (units, ITE-215)				
AM Peak Hour Trips = 0.52 x Units - 5.70	31%	69%	57%	43%
PM Peak Hour Trips = 0.60 x Units - 3.93				

** ITE Trip Generation Manual 11th Edition, 2021.

Trip Generation

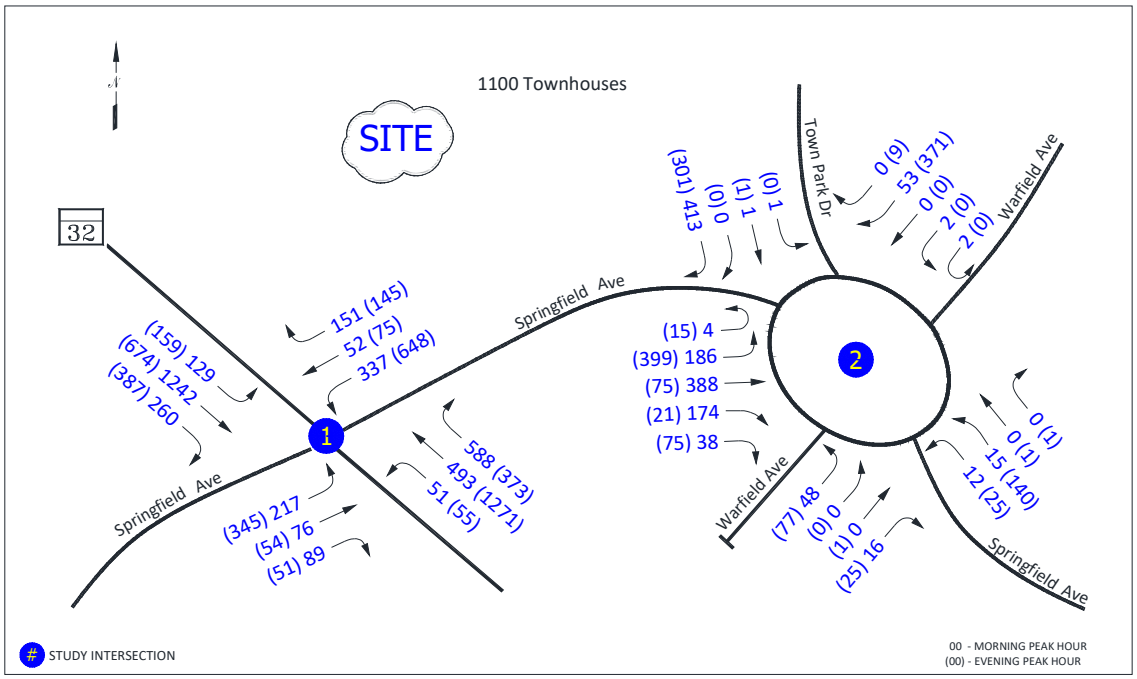
Land Use	Size	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Townhouses	1,100 Units	175	391	566	374	282	656
Total Trips		**175**	**391**	**566**	**374**	**282**	**656**

FIGURE D1 – TRIP ASSIGNMENT FOR 1100 TOWNHOUSES



Rh, 211112\REV1\FIG.dwg-STP1, F05/16/23

FIGURE D2 – 2026 TOTAL PEAK HOUR TRAFFIC VOLUME (W/WARFIELD DEVELOPMENT & STATE POLICE TRAINING FACILITY & 1100 TOWNHOUSES)



Rh, 211112\REV1\FIG.dwg-TOT4, F05/17/23

TABLE D2 – SUMMARY OF INTERSECTION CAPACITY ANALYSIS (WITH WARFIELD DEVELOPMENT, STATE POLICE TRAINING FACILITY AND 1100 TOWNHOUSES SITE)

Intersection	2023 Existing Traffic		2026 Background Traffic		2026 Total Traffic	
	AM	PM	AM	PM	AM	PM
1. MD 32 at Springfield Ave						
CLV - LOS/CLV	A/798	A/869	A/877	B/1040	B/1012	D/1301
HCM - LOS/Delay (seconds)	C/25.3	C/25.0	C/27.6	C/28.6	C/34.9	C/34.8
EB/MD 32	C/26.1	C/22.0	C/26.9	C/21.7	C/23.6	C/28.9
WB/MD 32	B/18.7	C/24.3	C/23.2	C/25.8	C/32.3	C/32.0
NB/Springfield Ave	C/31.1	C/31.9	D/36.2	D/37.3	D/44.8	D/40.7
SB/Springfield Ave	D/42.8	D/39.8	D/44.4	D/42.5	D/50.5	D/54.1
2. Springfield Ave/Warfield Ave/Town Park Dr						
Roundabout (Overall)	A/4.1	A/4.0	B/10.3	A/9.0	B/14.7	C/19.3
Springfield Ave (W. Leg)	A/4.3	A/3.8	B/11.9	A/5.8	C/19.4	B/14.8
Warfield Ave (S. W. Leg)	A/3.6	A/3.5	A/6.3	A/5.0	A/7.4	A/7.6
Springfield Ave (E. Leg)	A/3.4	A/4.0	A/5.1	A/6.3	A/5.9	B/10.1
Warfield Ave (N. Leg)	A/3.4	A/4.2	A/4.1	B/13.2	A/4.7	D/33.9
Town Park Drive	A/3.5	A/3.8	A/3.9	A/6.4	A/9.1	C/18.8