TRAFFIC IMPACT STUDY FOR

DRI 3160
SOUTHEASTERN DATA CENTER

DATE:
November 20, 2020

LOCATION:

SR 54 at Veterans Parkway and Tyrone Road
Fayetteville, Fayette County, Georgia

PREPARED FOR:
Thomas & Hutton Engineering Company

PREPARED BY:
NV5 Engineers and Consultants, Inc.
1255 Canton Street, Suite G Roswell, GA 30075

NV5
nv5.com

Executive Summary

The new 1,015,000 square feet of data center storage buildings will be located north of SR 54, west of Veterans Memorial Parkway, east of Tyrone Road and Flat Creek Trail in western Fayetteville, Fayette County, Georgia. The new development will have two (2) vehicular access points, the main access point on Tyrone Road, and a secondary right-in/right-out access point on SR 54. The project will be developed in a single phase by 2027.

When completed, the development is expected to generate a total of 1,006 daily trips. During the AM peak hour, the site is expected to generate 112 trips (62 entering and 50 exiting). During the PM peak hour, this site is expected to generate 91 trips (27 entering and 64 exiting).

Traffic operations at the study intersections are satisfactory in the Existing Conditions except that some approaches to the intersections operate with undesirable delay during the AM and PM peak hours. The conditions are expected to worsen as evidenced in the No-Build scenario due to the anticipated growth in the study area, particularly at the Veterans Parkway at SR 54 intersection during both the AM and PM peak hours. The Tyrone Road at Flat Creek Trail intersection is expected to improve with installation of the roundabout.

The addition of project traffic is expected to have an impact on the Levels of Service and delays at the study intersections particularly the Veterans Parkway at SR 54 intersection. The proposed full access driveway intersection along Tyrone Road and the right-in/right-out access driveway on SR 54 are expected to have minimal impact on traffic operations

While the analysis prepared for the proposed development indicates some impact on traffic operations in the study area, improvements at the study intersections are not required to mitigate the impact of the proposed development other than the possibility of reconfiguring the southbound approach to the Tyrone Road at SR 54 intersection to a left-turn lane, a shared left-turn/through lane and a right-turn lane, and changing to split phase operation.

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Introduction

A new 1,015,000 square feet of data center storage buildings will be located north of SR 54, west of Veterans Memorial Parkway, east of Tyrone Road and Flat Creek Trail in western Fayetteville, Fayette County, Georgia. The new development will have two (2) vehicular access points, the main access point on Tyrone Road, and a secondary right-in/right-out access point on SR 54. The project will be developed in a single phase by 2027.

The purpose of this study is to identify the traffic impacts associated with the development – both existing traffic, future background growth traffic, and full future traffic in the completion year to assess if any mitigation is needed. The traffic impact study analyzes the levels of service at the development access points. Figures 1 and 2 show the site location. A copy of the site plan is included in Appendix A.

This report summarizes the data collected, projected traffic at the study locations, analysis of traffic impacts including Level of Service (LOS), turn lane analysis, and conclusions from the analysis.

Figure 1: Vicinity Map

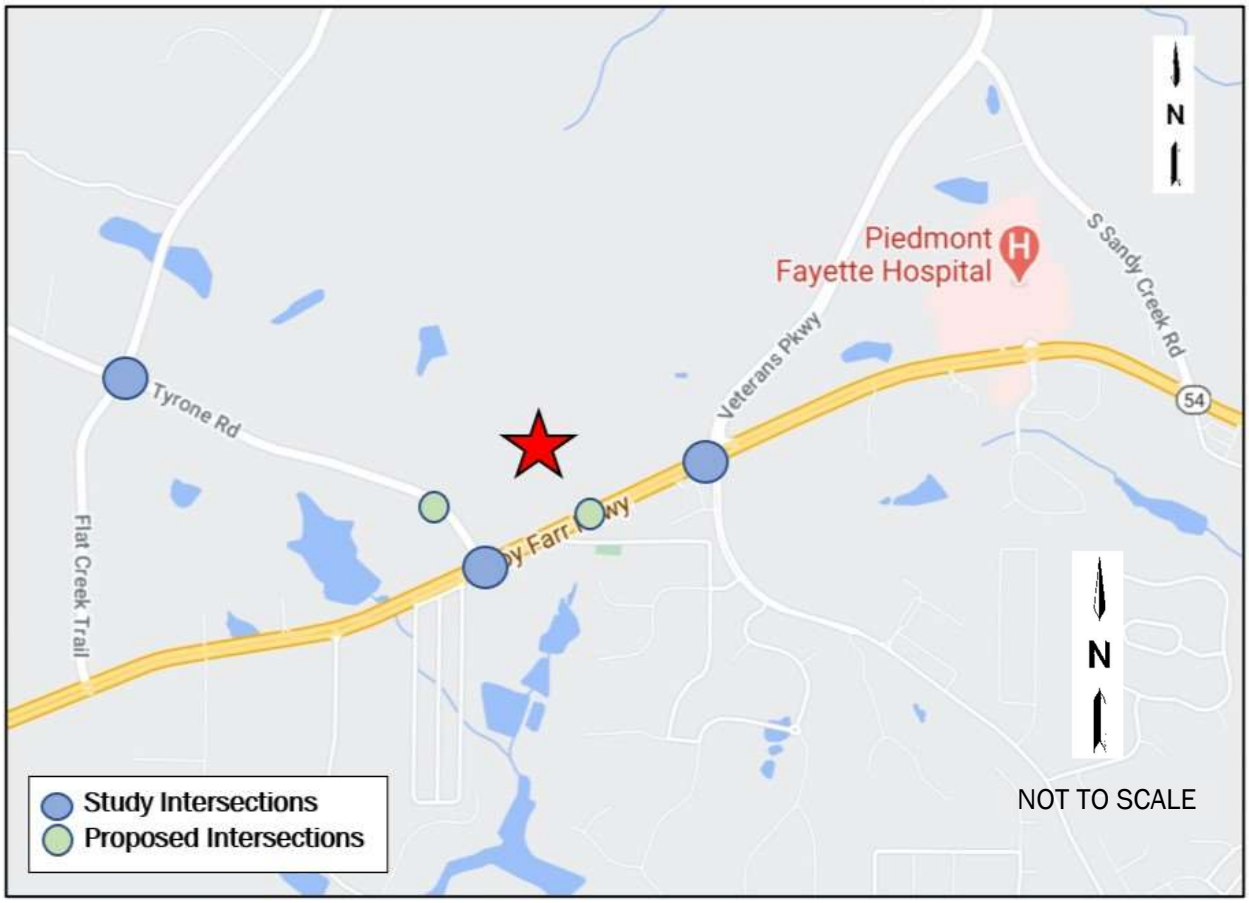


Figure 2: Site Location Aerial

Existing Conditions

B.1 Phasing

The development is planned to be completed in a single phase by 2027.

B.2 Transportation Facilities

Tyrone Road is a two-lane, north-south roadway with a 40-mph posted speed limit. Tyrone Road connects SR 74 and SR 54. A dedicated southbound left turn lane at the intersection of Tyrone Road at SR 54, and a single lane roundabout at the intersection of Flat Creek Trail and Tyrone Road is currently planned to be completed by 2027. These two improvements are included in all future condition analyses (Build and No-Build).

Flat Creek Trail is a two-lane, north-south roadway with a 40-mph posted speed limit. Flat Creek Trail runs between SR 54 and Sandy Creek Road.

SR 54 is a four-lane, east-west roadway with a grassed median and 55-mph posted speed limit.

Veterans Parkway/Lester Road is a four-lane, north-south roadway with a raised median and 45-mph posted speed limit near its intersection with SR 54. Veterans Parkway connects SR 54 and Sandy Creek Road. North of SR 54, the roadway is called Veterans Parkway and south of it is called Lester Road.

LOS D will be considered the minimum standard unless existing conditions are lower.

B.3. Transit

There are no transit facilities adjacent to the site.

B.3. Pedestrian and Bicycle Facilities

There are no sidewalks along the site frontage. There are no bicycle lanes adjacent to the site.

B.4. Traffic Volumes

As discussed at the Methodology Meeting held on September 14, 2020 for DRI #3160 Southeastern Data Center the previously collected 2014, 2015 and 2018 existing counts would be increased by a 1.0% annual background growth rate between the year of the traffic counts and the project build out year of 2027.

In addition, new trips expected from the DRI #2480 Pinewood Atlanta Studios transportation

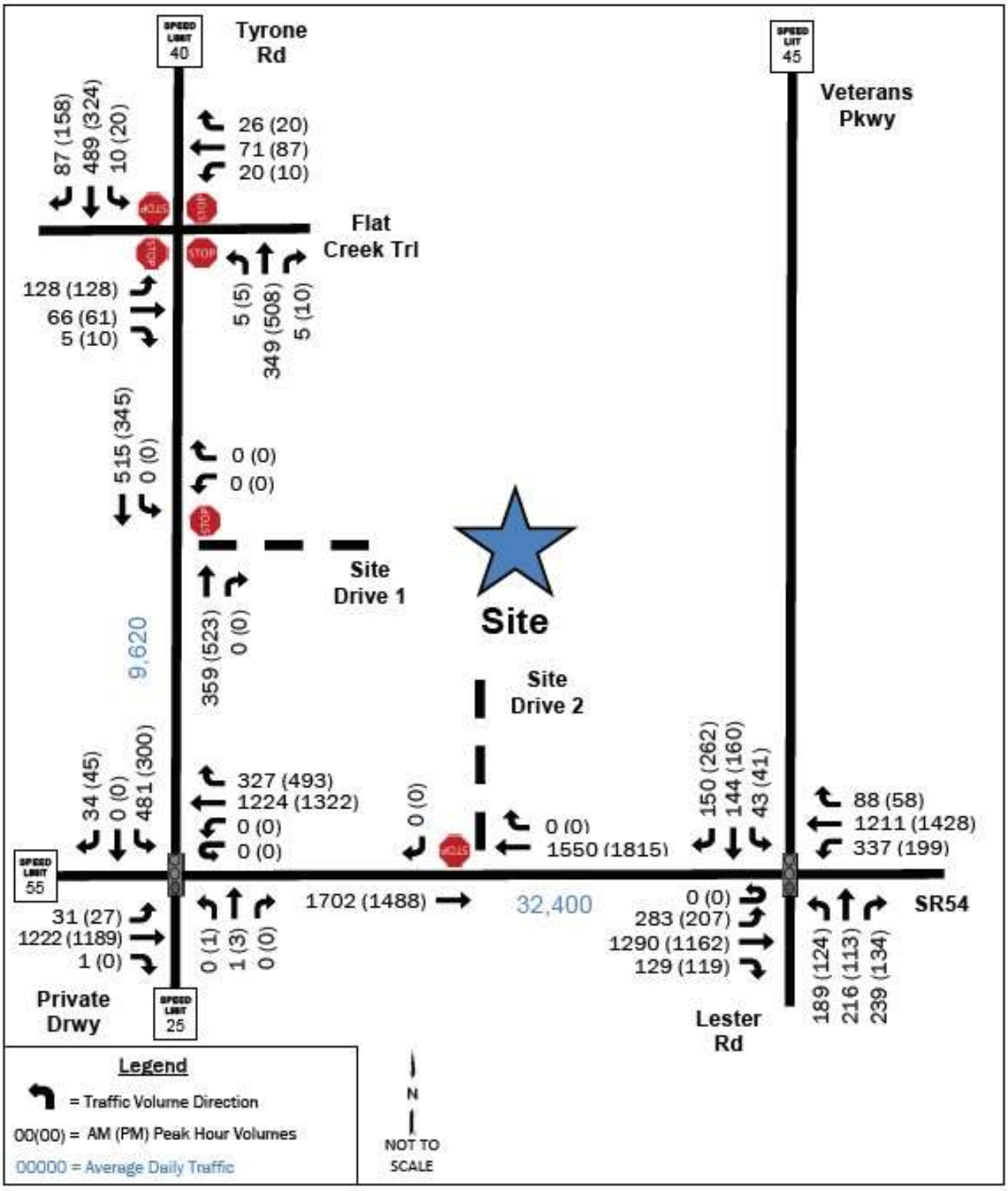
study dated May 2015 (Project Trips Map on page 35) are included in the analysis. 60% of the project volumes are included for existing (2020) conditions and 100% of the project volumes for future (2027) conditions.

As outlined in the Letter of Understanding, the study area includes the following study intersections

1. Veterans Parkway at SR 54 (signalized)
2. Tyrone Road at SR 54 (signalized). Includes a southbound left-turn lane in No-Build and Build conditions
3. Tyrone Road at Flat Creek Trail (all-way stop controlled). Includes a roundabout in No-Build and Build conditions.
4. Main full access entrance on Tyrone Road,
5. Secondary right in/right-out entrance on SR 54.

Figure 3 shows the existing turning movement counts, modified as discussed above. The diagrams of the previously collected traffic counts are included in Appendix B.

Figure 3: Existing Traffic Volumes



Future Conditions

C.1. Background Data Collection

The existing calculated 2020 volumes were increased by 1.0% annually for seven (7) years and from DRI #2480, 100% of the project traffic was included for the No Build (background) traffic volumes as shown in Figure 4.

The study assumes existing lane configurations, and existing and planned traffic control at the study intersections, which includes for future (Build and No-Build) conditions: a southbound left-turn lane on Tyrone Road at SR 54; and a single lane roundabout at Flat Creek Trail and Tyrone Road.

C.2. Project Trip Generation

Table 1 summarizes the project trip generation calculated using the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 10th Edition, 2017.

Table 1: Project Trip Generation

Data Center (1,015,000 sf)		Project Trips		
		Total	Inbound	Outbound
Total Trips Generated	Daily	1,006	503	503
	AM Peak Hour	112	61	51
	PM Peak Hour	91	27	64

C.3. Trip Distribution and Assignment

As outlined in the Letter of Understanding and subsequently updated on September 25, 2020, the new project trips were assigned to the study area as follows:

AM Peak Hour:

- 55% to/from the north on Tyrone Road
  - 3% to/from the northeast on Flat Creel Trail
  - 7% to/from south on Flat Creek Trail
  - 45% to/from the northwest on Tyrone Road
- 35% to/from the east on SR 54
  - 4% to/from the north on Veterans Parkway
  - 25% to/from the east on SR 54
  - 4% to/from the south on Lester Road

    - 2% u-turn travel westbound on SR 54 to do a u-turn at Veterans Parkway to access the right-in/right-out entrance from the east.
- 10% to/from the west on SR 54 turning left onto Tyron Road to access the main entrance.

PM Peak Hour:

- 55% to/from the north on Tyrone Road
    - 3% from the northeast on Flat Creel Trail
    - 7% from south on Flat Creek Trail
    - 45% from the northwest on Tyrone Road
- 35% to/from the east on SR 54
    - 15% right-out movement travels westbound to the left-turn/u-turn on SR 54 at Tyrone Road to travel eastbound on SR 54
        - 2% to/from the north on Veterans Parkway
        - 13.5% to/from the east on SR 54
        - 2% to/from the south on Lester Road
    - 20% exits from main entrance, turns left on Tyrone Road and then turns left at SR 54
        - 2% to/from the north on Veterans Parkway
        - 13.5% to/from the east on SR 54
        - 2% to/from the south on Lester Road
- 10 to/from the west on SR 54 via southbound right-turn lane from Tyrone Road to SR 54.

The new project trips distribution is shown in Figure 5. It should be noted that the AM and PM peak hour trip distributions are slightly different based on the existing traffic patterns within the study area. Therefore, the AM peak hour trip distributions are illustrated in Figure 5A and PM peak distributions are illustrated in Figure 5B.

The future site traffic (project trips) is shown in Figure 6 and the Build traffic volumes is shown in Figure 7. The trip generation details are included in Appendix C.

Figure 4: No Build Traffic Volumes

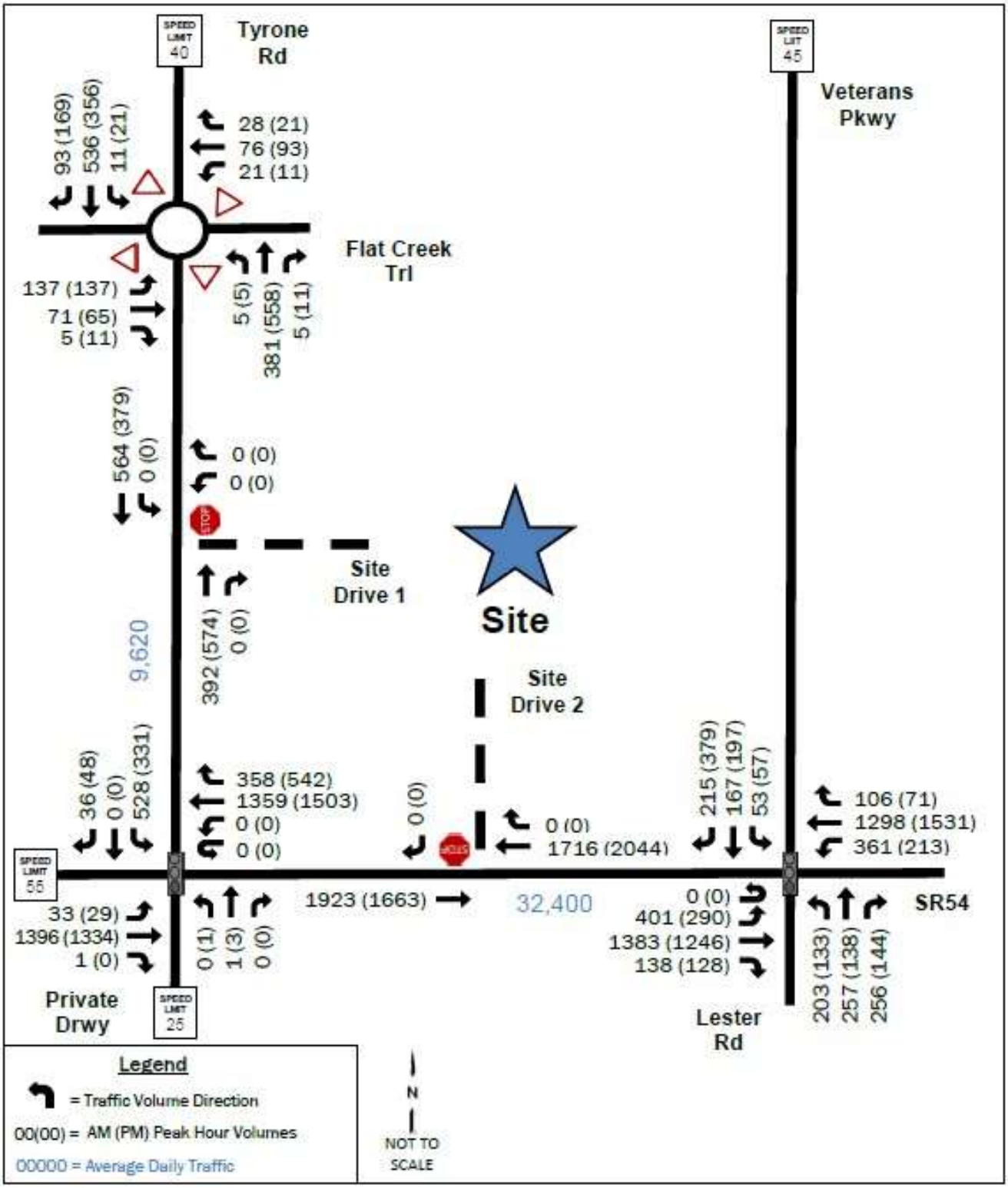


Figure 5A: Project Trips Distribution – AM Peak Hour

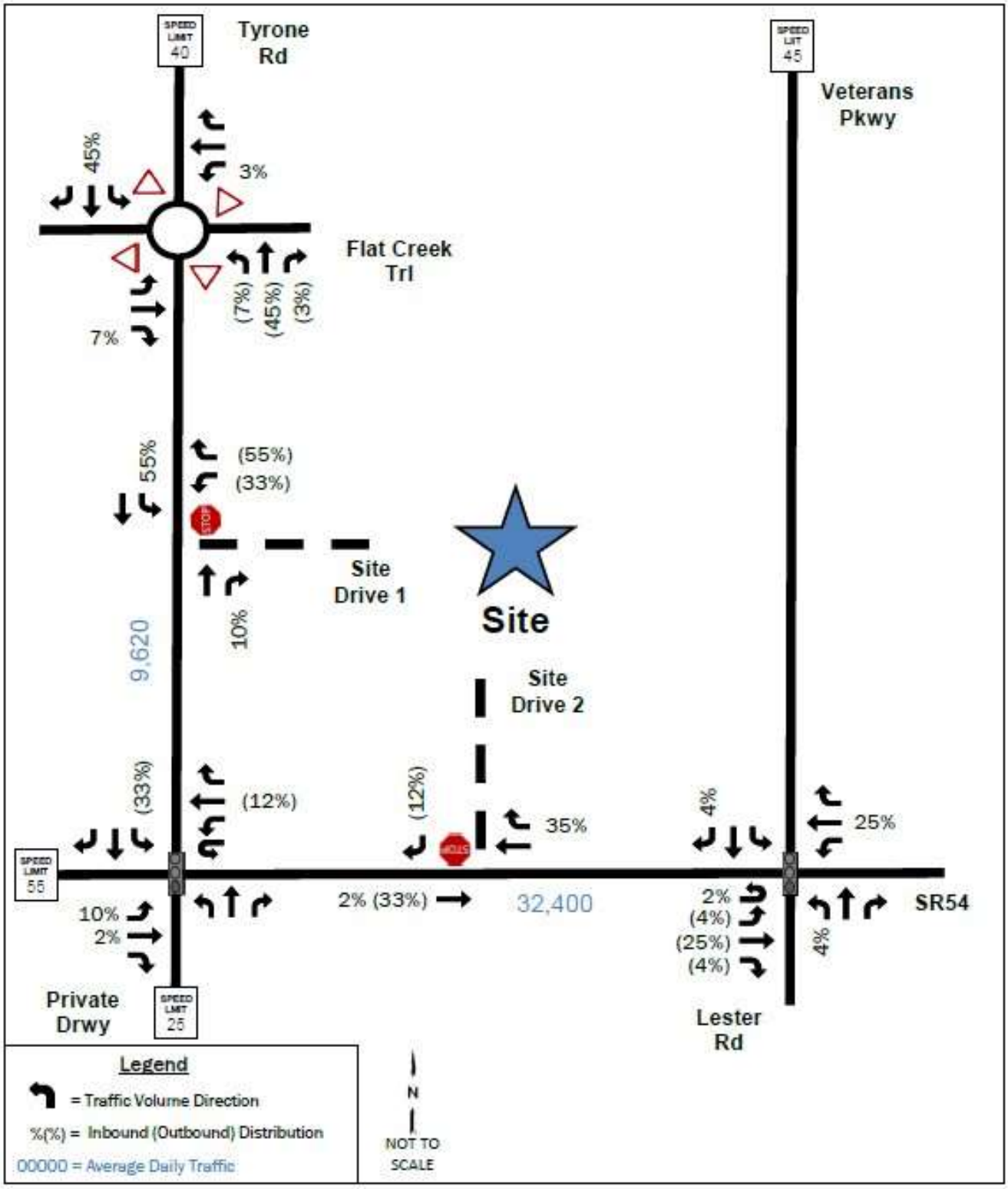


Figure 6B: Project Trips Distribution – PM Peak Hour

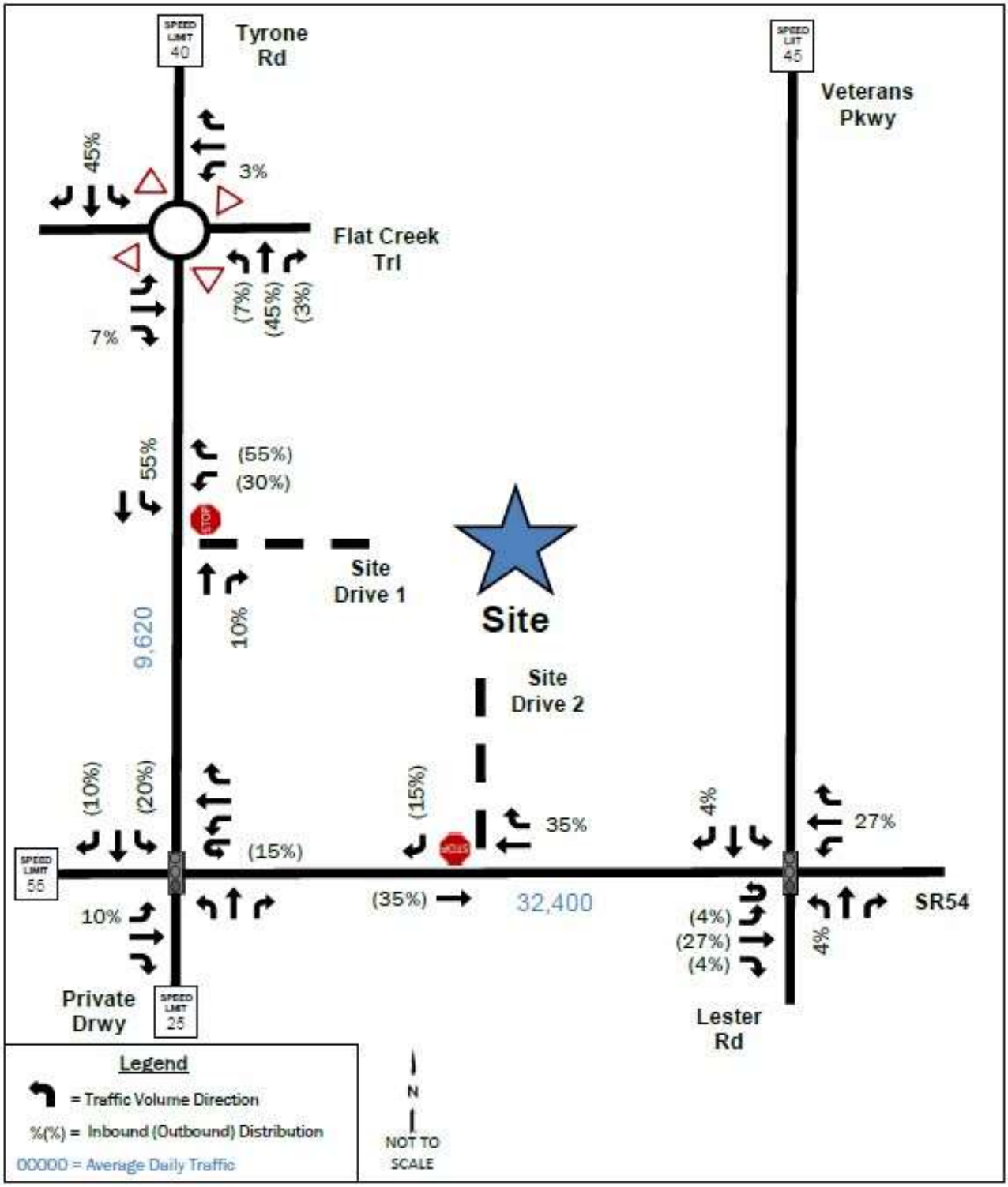


Figure 7: Project Trips Volumes

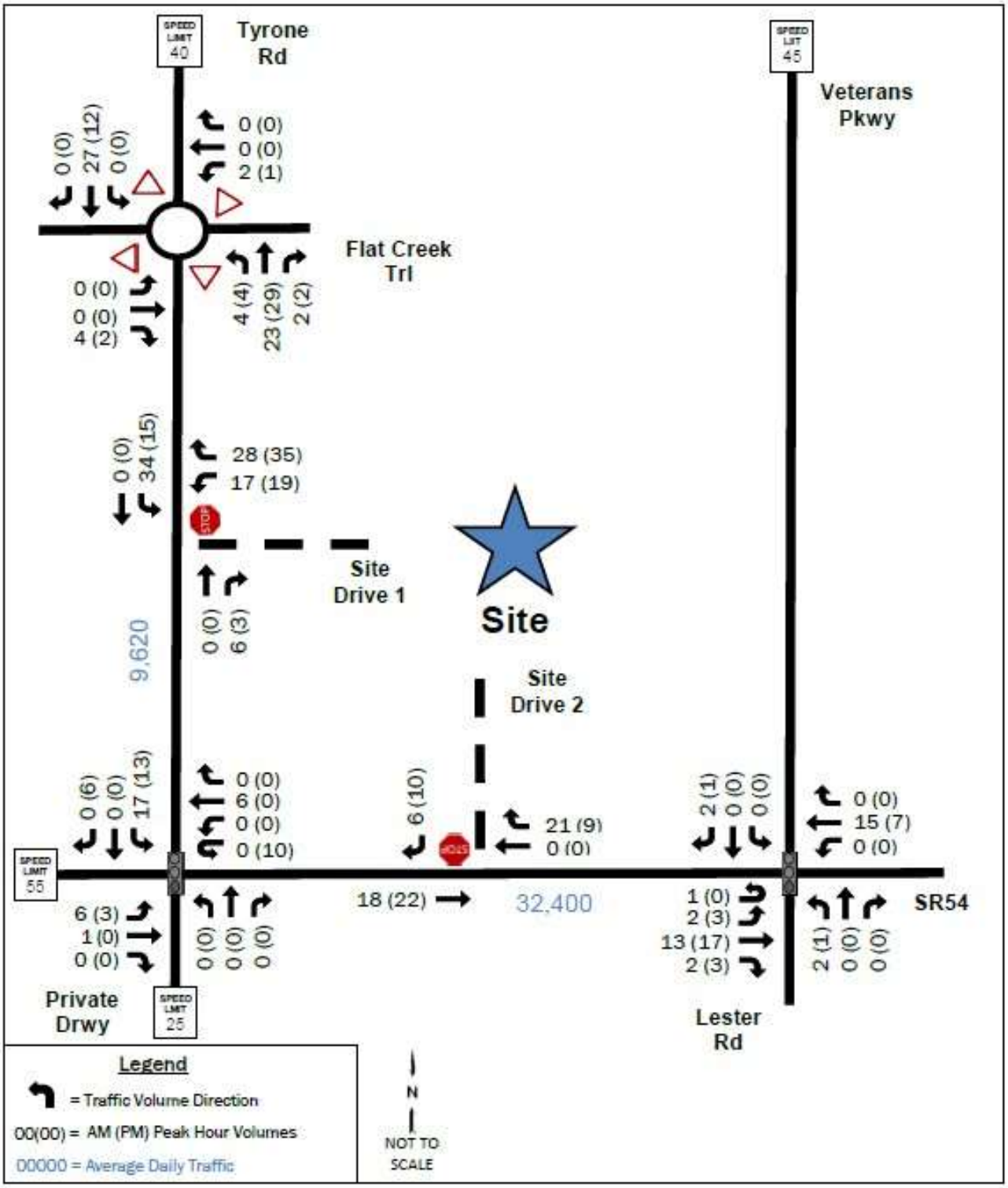
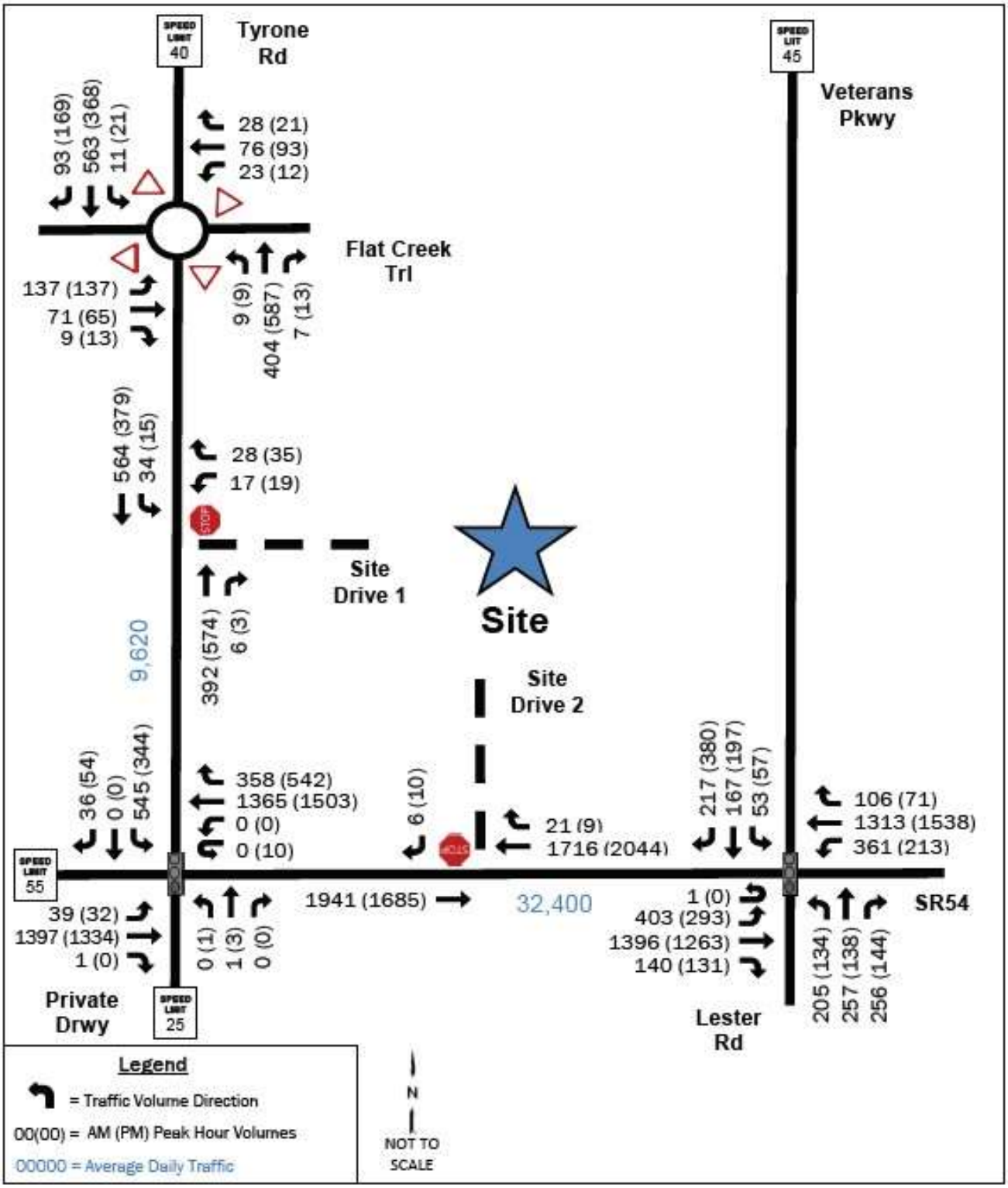


Figure 8: Build Traffic Volumes



Traffic Impact Analyses

The analysis in each of the scenarios for the study was performed using the traffic analysis software Synchro® 11. Average vehicular delays are calculated and reported as Levels of Service (LOS) as defined by the Highway Capacity Manual (HCM). Capacity analysis worksheets are included in Appendix D.

D.1. Existing Conditions Capacity Analysis

The results of the Existing conditions capacity analysis are shown in Table 2. The analysis utilizes the volumes depicted in Figure 3.

Table 2: Existing Capacity Analysis

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	Veterans Parkway/Lester Road at SR 54	Signal	**Overall**	**E**	**60.9**	**C**	**28.1**
			EB	D	49.2	C	22.0
			WB	E	56.4	C	22.3
			NB	F	115.3	E	71.1
			SB	E	58.3	E	62.0
2	Tyrone Road/ Private Driveway at SR 54	Signal	**Overall**	**D**	**35.0**	**B**	**19.4**
			EB	C	33.6	B	14.9
			WB	C	31.6	B	16.6
			NB	C	25.1	D	37.4
			SB	D	51.8	D	54.9
3	Tyrone Road at Flat Creek Trail	Stop Control - AWSC	**Overall**	**F**	**52.2**	**F**	**58.2**
			EB	C	16.8	C	18.4
			WB	B	13.8	B	14.9
			NB	C	24.4	F	81.3
			SB	F	88.9	F	59.9

As shown in Table 2, the Veterans Parkway at SR 54 intersection currently operates at undesirable overall Levels of Services (LOS) E during the AM peak hour with several approaches operating at undesirable LOS during the AM and PM peak hours. This is somewhat expected as there is significant amount of through and turning traffic at the intersection which needs to be serviced.

The Tyrone Road at Flat Creek Trail intersection operates with undesirable LOS F during both the AM and PM peak hours with several approaches operating with undesirable LOS during the AM and PM peak hours.

D.2. No-Build Conditions Capacity Analysis

The results of the No-Build conditions capacity analysis are shown in Table 3 below. The analysis utilizes the volumes in Figure 4.

Table 3: No-Build Capacity Analysis

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	Veterans Parkway/Lester Road at SR 54	Signal	**Overall**	**E**	**69.2**	**E**	**61.6**
			EB	E	65.5	D	53.8
			WB	E	67.2	E	65.7
			NB	F	94.4	E	77.9
			SB	E	55.6	E	57.7
2	Tyrone Road/ Private Driveway at SR 54	Signal	**Overall**	**C**	**34.3**	**B**	**12.2**
			EB	C	30.3	B	14.3
			WB	C	27.7	A	3.0
			NB	E	68.3	E	66.2
			SB	E	68.1	E	66.9
3	Tyrone Road at Flat Creek Trail	Roundabout	**Overall**	**A**	**9.3**	**A**	**9.6**
			EB	A	9.6	A	7.1
			WB	A	7.0	A	8.8
			NB	A	8.0	B	11.7
			SB	B	10.4	A	8.6

As shown in Table 3, the traffic operations at the study intersections are anticipated to be somewhat affected by the increase in traffic from the applied traffic growth. In that, the overall Levels of Service (LOS) and delay at the Veterans Parkway at SR 54 intersection changes from C to E during the PM peak hour with several more approaches operating at undesirable LOS during the AM and PM peak hours.

The Tyrone Road at SR 54 intersection operates with undesirable LOS E during both the AM and PM peak hours for the northbound and southbound approaches with the installation of the southbound left-turn lane.

The Tyrone Road at Flat Creek Trail intersection improves significantly with the installation of the roundabout.

D.3. Build Conditions Capacity Analysis

The Build conditions capacity analysis is shown in Table 4. The analysis utilizes the volumes in Figure 7.

Table 4: Build Capacity Analysis

ID	Intersection	Control	Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	Veterans Parkway/Lester Road at SR 54	Signal	**Overall**	**F**	**89.8**	**E**	**62.7**
			EB	F	93.1	D	54.8
			WB	F	93.6	E	67.2
			NB	F	85.6	E	78.6
			SB	E	65.5	E	57.7
2	Tyrone Road/ Private Driveway at SR 54	Signal	**Overall**	**D**	**35.7**	**B**	**19.3**
			EB	C	30.7	B	13.6
			WB	C	27.9	A	6.6
			NB	E	68.3	E	65.3
			SB	E	75.2	F	114.4
3	Tyrone Road at Flat Creek Trail	Roundabout	**Overall**	**A**	**9.9**	**B**	**10.2**
			EB	B	10.2	A	7.2
			WB	A	7.4	A	9.3
			NB	A	8.5	B	12.7
			SB	B	11.2	A	8.9
4	Tyrone Road at Site Drive 1	Stop-Control	WB	C	17.1	C	17.6
			SBL	A	8.4	A	8.9
5	SR 54 at Site Drive 2	Stop-Control	SB	C	21.8	D	31.3

As shown in Table 4, the addition of project traffic to the study intersections is anticipated to have an impact on the operation of the study intersections. The project traffic at the Veterans Parkway at SR 54 intersection changes the overall Levels of Service from E to F during the AM peak hour.

The Tyrone Road at SR 54 intersection continues to operate with undesirable LOS E during both the AM and PM peak hours for the northbound and southbound approaches.

The addition of the full access driveway on Tyrone Road and the right-in/right-out driveway on SR 54 do not impact the functionality of traffic operations along Tyrone Road or along SR 54.

At the Tyrone Road at SR 54 intersection, converting the southbound through lane to a shared left-turn /though lane, and changing the intersection to split phase operation would improve traffic operating conditions as shown in Table 5.

Table 5: Build Capacity Analysis with Improvements

ID	Intersection	Mitigation Measure	Movement	AM		PM	
				LOS	Delay	LOS	Delay
2	Tyrone Road/Private Driveway at SR 54	Redesign Signal - Add Split Phasing	**Overall**	**B**	**18.5**	**B**	**14.8**
			EB	B	15.8	B	13.1
			WB	A	4.9	A	6.3
			NB	E	62.0	E	65.0
			SB	E	68.5	E	69.9

Recommendations and Conclusions

The new 1,015,000 square feet of data center storage buildings will be located north of SR 54, west of Veterans Memorial Parkway, east of Tyrone Road and Flat Creek Trail in western Fayetteville, Fayette County, Georgia. The development will generate a total of 62 entering trips and 50 exiting trips during the AM peak hour, and 27 entering trips and 64 exiting trips during the PM peak hour. The new development will have two (2) vehicular access points, the main access point on Tyrone Road, and a secondary right-in/right-out access point on SR 54. The project will be developed in a single phase by 2027.

Traffic operations at the study intersections are satisfactory in the Existing Conditions except that some approaches to the intersections operate with undesirable delay during the AM and PM peak hours. The conditions are expected to worsen as evidenced in the No-Build scenario due to the anticipated growth in the study area, particularly at the Veterans Parkway at SR 54 intersection during both the AM and PM peak hours. The Tyrone Road at Flat Creek Trail intersection is expected to improve with installation of the roundabout.

The addition of project traffic is expected to have an impact on the Levels of Service and delays at the study intersections particularly the Veterans Parkway at SR 54 intersection. The proposed full access driveway intersection along Tyrone Road and the right-in/right-out access driveway on SR 54 are expected to have minimal impact on traffic operations

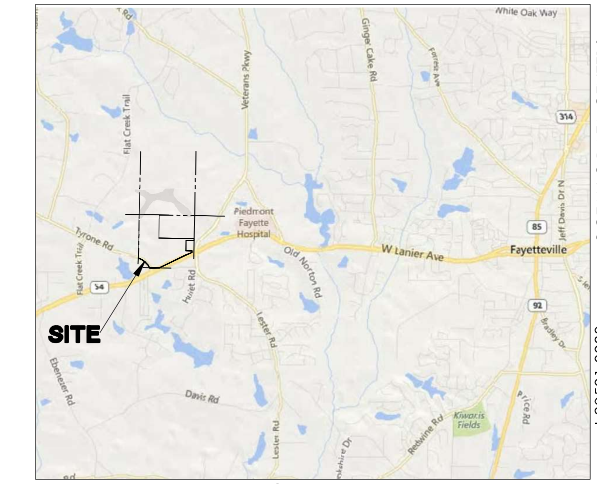
While the analysis prepared for the proposed development indicates some impact on traffic operations in the study area, improvements at the study intersections are not required to mitigate the impact of the proposed development other than the possibility of reconfiguring the southbound approach to the Tyrone Road at SR 54 intersection to a left-turn lane, a shared left-turn/through lane and a right-turn lane, and changing to split phase operation.

APPENDIX

APPENDIX A

SITE PLAN


N/F
JAN A TRAMMELL
PIN: 0705 003
ZONED: R-70
APPROX. LIMITS FLOOD ZONE 'A' PER FEMA MAP
APPROX. LIMITS 100-YR FLOOD PLAIN PER MNGWPD
N/F
LARRY & CAROL WALLS
PIN: 0713 020
ZONED: R-70
N/F
PAS HOLDINGS FAYETTE, LLC
PIN: 0705 002
ZONED: R-70
DB 4316 PG 593
N/F
PAS HOLDINGS FAYETTE, LLC
PIN: 0705 022
ZONED: R-70
DB 4316 PG 593
N/F
FAYETTE COUNTY BOARD OF EDUCATION
PB 36 PG 150
ZONED: BP
N/F
ARC ENTERPRISES, LLLP
DB 1307 PG 223
ZONED: BP
N/F
JAN T. HUTTO
PB 36 PG 174
ZONED: BP
N/F
LESTER FAMILY PARTNERSHIP, LTD
DB 1153 PG 409
ZONED: BP
N/F
WILLIAM & FAYE HESTER
PIN: 0704 019
ZONED: R-70
DB 4384 PG 265
N/F
REAL ESTATE ACQUISITION, LTD
PIN: 0704 006
ZONED: R-70
STREAM
EXISTING POND
DETENTION POND
OPEN SPACE
FUTURE SUBSTATION
POWER SUBSTATION
±140,000 SF
±50,000 SF
±75,000 SF
S01°16'32"W 1303.09'
S88°44'58"E 1996.37'
PARKING:
PROVIDED: 89 STALLS
NEEDED: 25 EMPLOYEES(2)= 50 STALLS
PARKING:
PROVIDED: 40 STALLS
NEEDED: 10 EMPLOYEES(2)= 20 STALLS
PARKING:
PROVIDED: 90 STALLS
NEEDED: 15 EMPLOYEES(2)= 30 STALLS
PARKING:
PROVIDED: 71 STALLS
NEEDED: 10 EMPLOYEES(2)= 20 STALLS
MAIN ACCESS POINT (DRIVEWAY 1)
SECONDARY ACCESS POINT (DRIVEWAY 2)
TYRONE ROAD (60' R/W)
(PAVED PUBLIC ROAD)
VETERANS PKWY (120' R/W)
(PAVED PUBLIC ROAD)
S.R. 54 (R/W VARIES)
(PAVED PUBLIC ROAD)
BARB WIRE FENCE
N
E
S
W



VICINITY MAP
SCALE: NOT TO SCALE

OCEANIC DATA CENTERS J-28501.0000

SITE INFORMATION NOTES:

1. DRI #: 3160
2. ACREAGE: 123 ACRES
3. IMPERVIOUS AREA: 31.7%(39 AC)
4. STREET WIDTHS: 32'
5. TOTAL SQUARE FOOTAGE: 1,015,000 SF
6. ALL BUILDINGS/STRUCTURES WILL BE ONE-STORY.
7. THE DEVELOPMENT IS PLANNED FOR ONE PHASE.

OWNER INFORMATION:

OCEANIC DATA CENTERS
4446 HENDRICK AVENUE, SUITE I-A, BOX 389
JACKSONVILLE, FLORIDA 32207

TRAFFIC CONSULTANT INFORMATION:

NV5
1255 CANTON STREET, SUITE G,
ROSWELL, GA 30075
PHONE: 770.316.1452

GRAPHIC SCALE
(IN FEET)
1 inch = 200 ft.

GRTA DRI SITE PLAN

OCEANIC DATA CENTERS
FAYETTEVILLE, GA
PREPARED FOR:
OCEANIC DATA CENTERS
PREPARED BY:

THOMAS & HUTTON
5553 Peachtree Road • Suite 175
Chamblee, GA 30341 • 470.893.1700
www.thomasandhutton.com

JOB NO:	J-28501.0000	DATE:	11/13/2020
DRAWN:	ZMS	SCALE:	1" = 200'
REVIEWED:	ACW	SHEET:	1

APPENDIX B

TRAFFIC
COUNT DATA

A & R Engineering, Inc.

2160 Kingston Court,Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at Veterans Pkwy/
Lester Road
07 - 09 AM - 04 - 06 PM

File Name : 20180033
Site Code : 20180033
Start Date : 3/6/2018
Page No : 1

Groups Printed- Unshifted

	Lester Road Northbound				Veterans Parkway Southbound				SR 54 (W. Lanier Avenue Eastbound				SR 54 (W. Lanier Avenue Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	38	34	36	108	6	26	19	51	31	213	46	290	55	221	9	285	734
07:15 AM	51	37	42	130	7	30	23	60	28	225	52	305	69	232	15	316	811
07:30 AM	69	74	75	218	12	60	21	93	46	361	43	450	114	374	26	514	1275
07:45 AM	33	30	61	124	6	16	10	32	30	300	16	346	105	279	13	397	899
Total	191	175	214	580	31	132	73	236	135	1099	157	1391	343	1106	63	1512	3719
08:00 AM	32	34	56	122	6	16	14	36	28	332	15	375	42	211	14	267	800
08:15 AM	38	27	49	114	7	14	10	31	28	328	11	367	22	255	6	283	795
08:30 AM	14	14	33	61	8	13	11	32	16	327	10	353	24	233	10	267	713
08:45 AM	31	14	25	70	4	10	22	36	24	272	23	319	16	285	6	307	732
Total	115	89	163	367	25	53	57	135	96	1259	59	1414	104	984	36	1124	3040
*** BREAK ***																	
04:00 PM	29	16	29	74	5	21	23	49	15	237	18	270	36	329	15	380	773
04:15 PM	38	26	32	96	4	24	26	54	25	260	19	304	34	310	9	353	807
04:30 PM	39	19	23	81	3	29	25	57	36	226	29	291	30	336	9	375	804
04:45 PM	23	17	15	55	2	25	20	47	19	254	25	298	37	326	12	375	775
Total	129	78	99	306	14	99	94	207	95	977	91	1163	137	1301	45	1483	3159
05:00 PM	26	19	36	81	7	34	28	69	28	274	29	331	60	358	8	426	907
05:15 PM	38	25	28	91	8	26	36	70	36	339	34	409	54	320	13	387	957
05:30 PM	35	24	52	111	5	36	28	69	21	272	29	322	44	285	11	340	842
05:45 PM	26	12	25	63	9	31	29	69	34	270	26	330	35	214	9	258	720
Total	125	80	141	346	29	127	121	277	119	1155	118	1392	193	1177	41	1411	3426
Grand Total	560	422	617	1599	99	411	345	855	445	4490	425	5360	777	4568	185	5530	13344
Apprch %	35	26.4	38.6		11.6	48.1	40.4		8.3	83.8	7.9		14.1	82.6	3.3		
Total %	4.2	3.2	4.6	12	0.7	3.1	2.6	6.4	3.3	33.6	3.2	40.2	5.8	34.2	1.4	41.4	

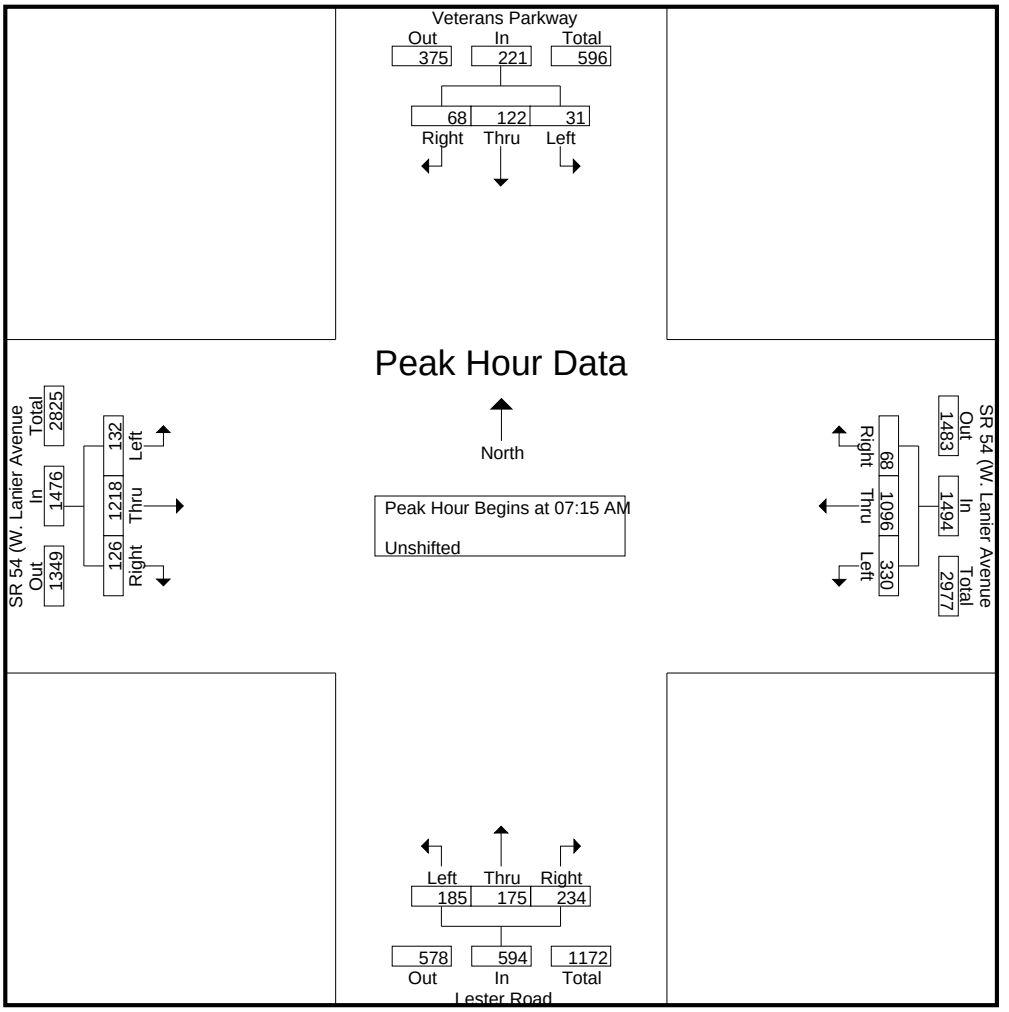
A & R Engineering, Inc.

2160 Kingston Court,Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at Veterans Pkwy/
Lester Road
07 - 09 AM - 04 - 06 PM

File Name : 20180033
Site Code : 20180033
Start Date : 3/6/2018
Page No : 2

	Lester Road Northbound				Veterans Parkway Southbound				SR 54 (W. Lanier Avenue Eastbound				SR 54 (W. Lanier Avenue Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	51	37	42	130	7	30	**23**	60	28	225	**52**	305	69	232	15	316	811
07:30 AM	**69**	**74**	**75**	**218**	**12**	**60**	21	**93**	**46**	**361**	43	**450**	**114**	**374**	**26**	**514**	**1275**
07:45 AM	33	30	61	124	6	16	10	32	30	300	16	346	105	279	13	397	899
08:00 AM	32	34	56	122	6	16	14	36	28	332	15	375	42	211	14	267	800
Total Volume	185	175	234	594	31	122	68	221	132	1218	126	1476	330	1096	68	1494	3785
% App. Total	31.1	29.5	39.4		14	55.2	30.8		8.9	82.5	8.5		22.1	73.4	4.6		
PHF	.670	.591	.780	.681	.646	.508	.739	.594	.717	.843	.606	.820	.724	.733	.654	.727	.742



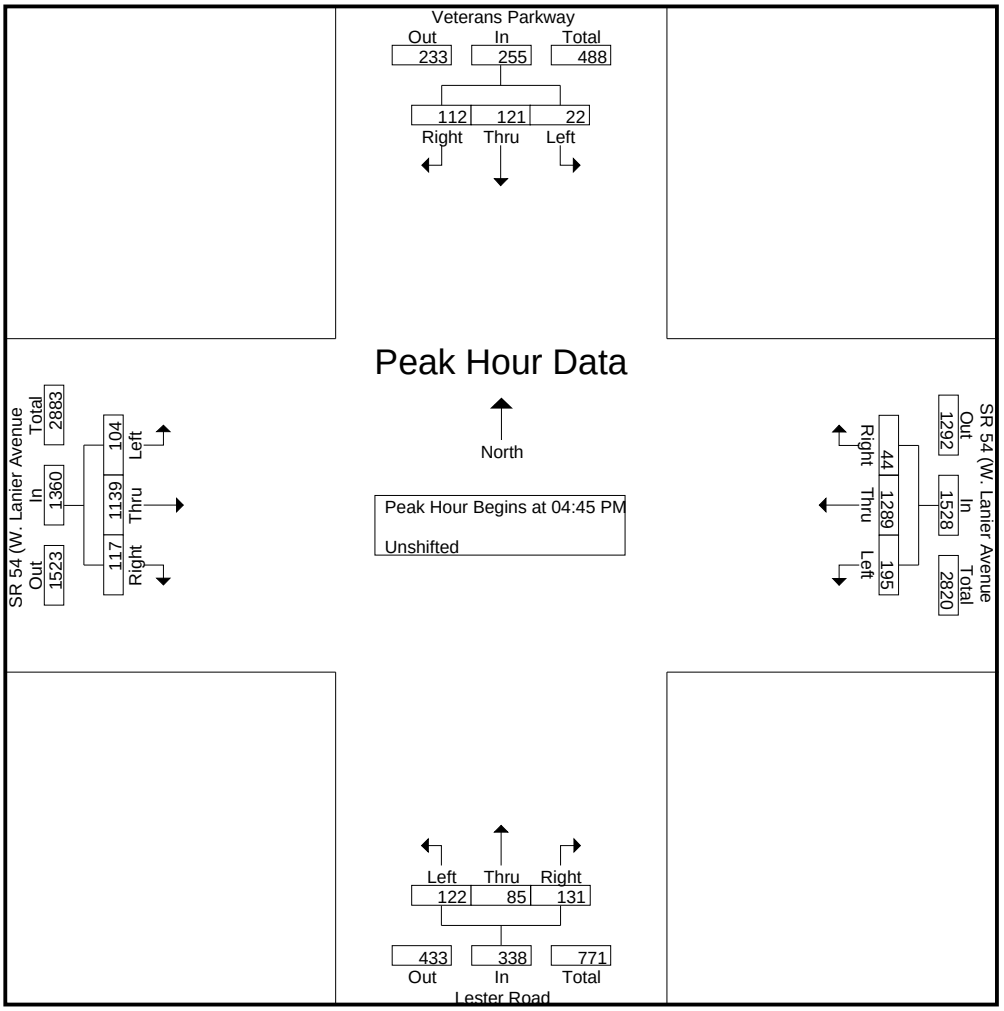
A & R Engineering, Inc.

2160 Kingston Court,Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Avenue) at Veterans Pkwy/
Lester Road
07 - 09 AM - 04 - 06 PM

File Name : 20180033
Site Code : 20180033
Start Date : 3/6/2018
Page No : 3

	Lester Road Northbound				Veterans Parkway Southbound				SR 54 (W. Lanier Avenue Eastbound				SR 54 (W. Lanier Avenue Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	23	17	15	55	2	25	20	47	19	254	25	298	37	326	12	375	775
05:00 PM	26	19	36	81	7	34	28	69	28	274	29	331	**60**	**358**	8	**426**	907
05:15 PM	**38**	**25**	28	91	**8**	26	**36**	**70**	**36**	**339**	**34**	**409**	54	320	**13**	387	**957**
05:30 PM	35	24	**52**	**111**	5	**36**	28	69	21	272	29	322	44	285	11	340	842
Total Volume	122	85	131	338	22	121	112	255	104	1139	117	1360	195	1289	44	1528	3481
% App. Total	36.1	25.1	38.8		8.6	47.5	43.9		7.6	83.8	8.6		12.8	84.4	2.9		
PHF	.803	.850	.630	.761	.688	.840	.778	.911	.722	.840	.860	.831	.813	.900	.846	.897	.909



A & R Engineering, Inc.

2160 Kingston Court,Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Ave) at Tyrone Road
07 - 09 AM - 04 - 06 PM

File Name : 20180031
Site Code : 20180031
Start Date : 3/6/2018
Page No : 1

Groups Printed- Unshifted

	Private Driveway Northbound				Tyrone Road Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	102	0	5	107	6	215	0	221	0	235	52	287	615
07:15 AM	0	0	0	0	105	0	4	109	9	221	0	230	0	248	57	305	644
07:30 AM	0	0	0	0	108	0	10	118	8	258	0	266	0	301	68	369	753
07:45 AM	0	0	0	0	117	0	8	125	11	250	0	261	0	310	71	381	767
Total	0	0	0	0	432	0	27	459	34	944	0	978	0	1094	248	1342	2779
08:00 AM	0	0	0	0	110	0	7	117	5	254	0	259	0	226	73	299	675
08:15 AM	0	1	0	1	113	0	8	121	4	250	1	255	0	278	99	377	754
08:30 AM	0	0	0	0	113	0	10	123	10	316	0	326	0	316	67	383	832
08:45 AM	0	0	0	0	94	0	6	100	9	236	0	245	0	289	88	377	722
Total	0	1	0	1	430	0	31	461	28	1056	1	1085	0	1109	327	1436	2983
*** BREAK ***																	
04:00 PM	0	0	0	0	53	0	16	69	7	198	0	205	0	310	88	398	672
04:15 PM	0	0	0	0	47	0	5	52	14	204	0	218	0	296	96	392	662
04:30 PM	0	0	0	0	80	1	9	90	5	194	0	199	0	266	99	365	654
04:45 PM	1	1	0	2	72	0	10	82	4	172	0	176	0	289	105	394	654
Total	1	1	0	2	252	1	40	293	30	768	0	798	0	1161	388	1549	2642
05:00 PM	0	0	0	0	61	0	9	70	8	246	0	254	0	290	141	431	755
05:15 PM	0	2	0	2	81	0	9	90	7	239	0	246	0	312	109	421	759
05:30 PM	0	0	0	0	67	0	8	75	7	225	0	232	0	278	110	388	695
05:45 PM	0	0	0	0	72	0	9	81	13	228	0	241	0	239	67	306	628
Total	0	2	0	2	281	0	35	316	35	938	0	973	0	1119	427	1546	2837
Grand Total	1	4	0	5	1395	1	133	1529	127	3706	1	3834	0	4483	1390	5873	11241
Apprch %	20	80	0		91.2	0.1	8.7		3.3	96.7	0		0	76.3	23.7		
Total %	0	0	0	0	12.4	0	1.2	13.6	1.1	33	0	34.1	0	39.9	12.4	52.2	

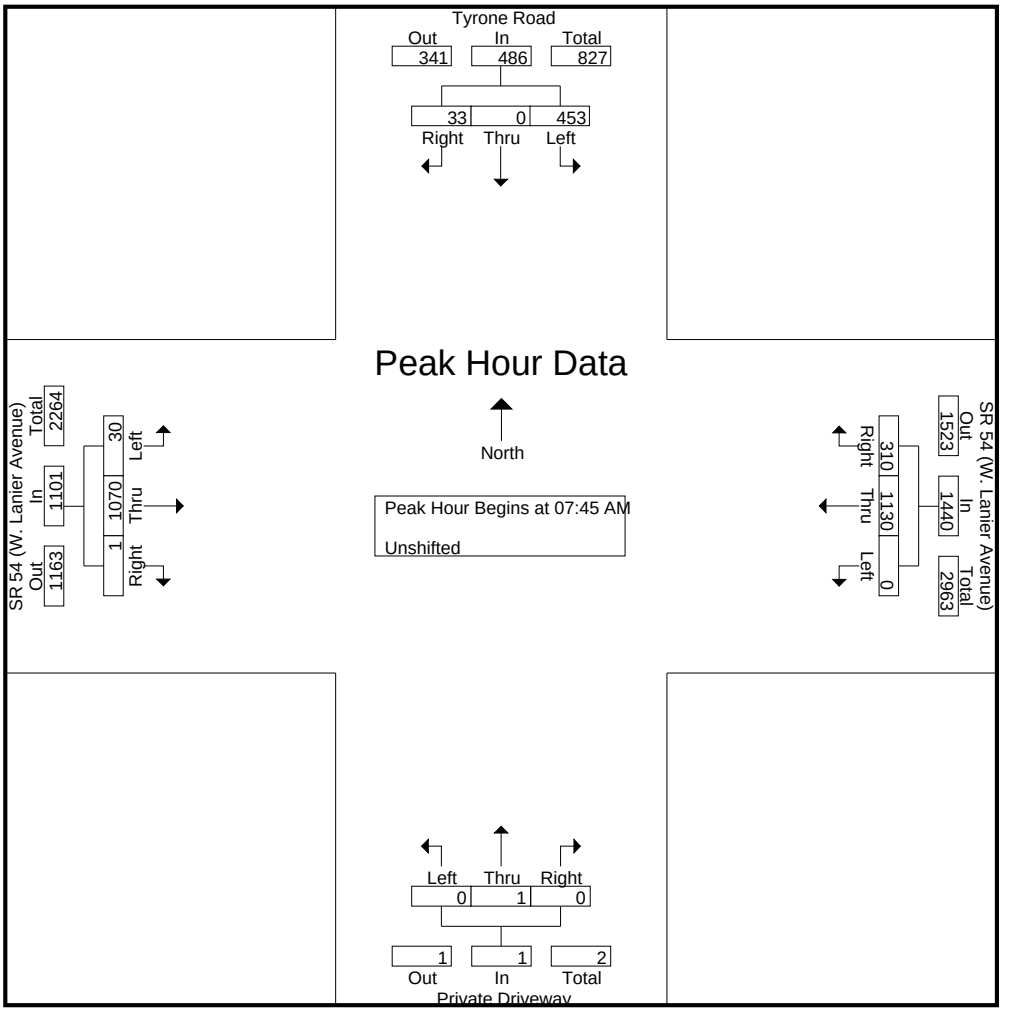
A & R Engineering, Inc.

2160 Kingston Court,Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Ave) at Tyrone Road
07 - 09 AM - 04 - 06 PM

File Name : 20180031
Site Code : 20180031
Start Date : 3/6/2018
Page No : 2

	Private Driveway Northbound				Tyrone Road Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	**117**	0	8	**125**	**11**	250	0	261	0	310	71	381	767
08:00 AM	0	0	0	0	110	0	7	117	5	254	0	259	0	226	73	299	675
08:15 AM	0	**1**	0	**1**	113	0	8	121	4	250	**1**	255	0	278	**99**	377	754
08:30 AM	0	0	0	0	113	0	**10**	123	10	**316**	0	**326**	0	**316**	67	**383**	**832**
Total Volume	0	1	0	1	453	0	33	486	30	1070	1	1101	0	1130	310	1440	3028
% App. Total	0	100	0		93.2	0	6.8		2.7	97.2	0.1		0	78.5	21.5		
PHF	.000	.250	.000	.250	.968	.000	.825	.972	.682	.847	.250	.844	.000	.894	.783	.940	.910



A & R Engineering, Inc.

2160 Kingston Court,Suite 'O',
Marietta, GA 30067

TMC Data
SR 54 (W. Lanier Ave) at Tyrone Road
07 - 09 AM - 04 - 06 PM

File Name : 20180031
Site Code : 20180031
Start Date : 3/6/2018
Page No : 3

	Private Driveway Northbound				Tyrone Road Southbound				SR 54 (W. Lanier Avenue) Eastbound				SR 54 (W. Lanier Avenue) Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**1**	1	0	**2**	72	0	**10**	82	4	172	0	176	0	289	105	394	654
05:00 PM	0	0	0	0	61	0	9	70	**8**	**246**	0	**254**	0	290	**141**	**431**	755
05:15 PM	0	**2**	0	2	**81**	0	9	**90**	7	239	0	246	0	**312**	109	421	**759**
05:30 PM	0	0	0	0	67	0	8	75	7	225	0	232	0	278	110	388	695
Total Volume	1	3	0	4	281	0	36	317	26	882	0	908	0	1169	465	1634	2863
% App. Total	25	75	0		88.6	0	11.4		2.9	97.1	0		0	71.5	28.5		
PHF	.250	.375	.000	.500	.867	.000	.900	.881	.813	.896	.000	.894	.000	.937	.824	.948	.943

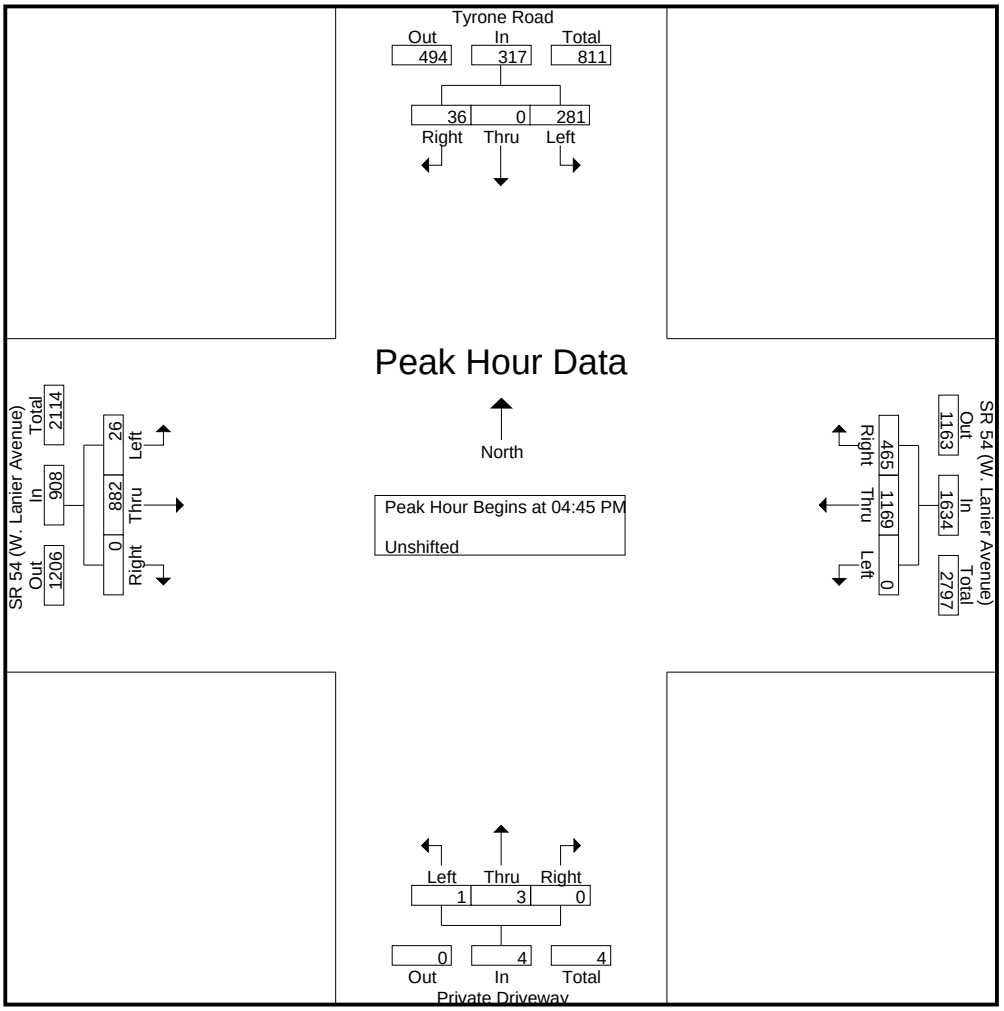
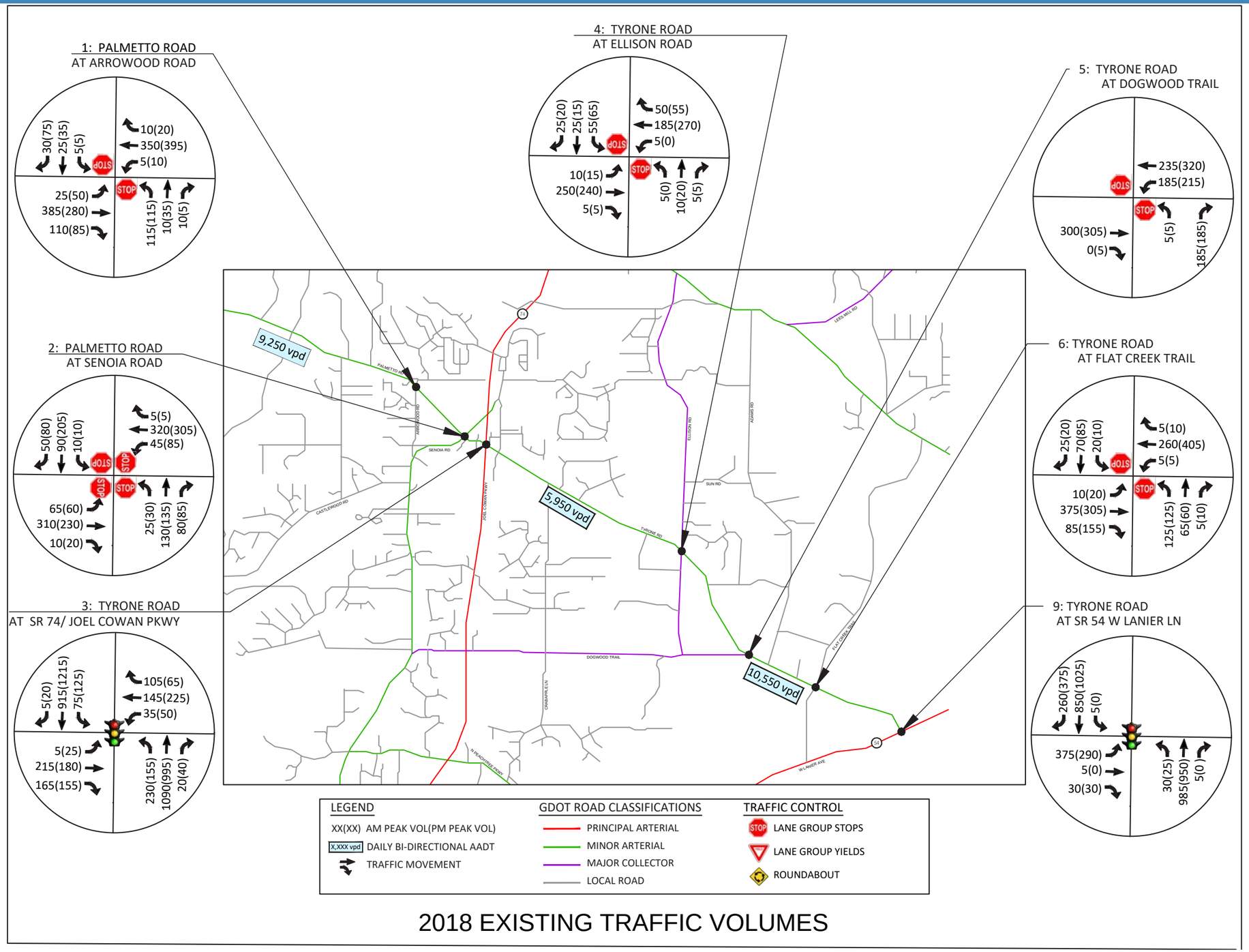
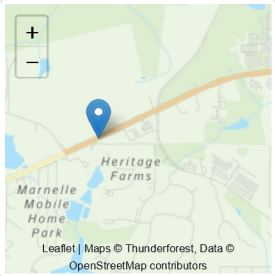


Figure 1.2 - Tyrone Road-Palmetto Road - 2018 Existing Traffic Volumes



0000113_0188 - 113-0188
County: Fayette
Route number: 00005400
LRS section: 1131005400
Functional class: 3U - Principal Arterial - Other (Urban)
Coordinates: 33.4458011064448, -84.52356210898

Site Data



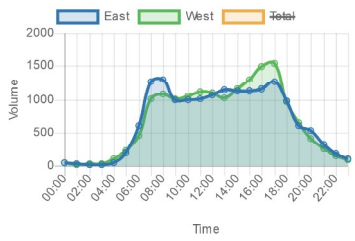
Count History

Year	Month	Count type	Duration	Count
2019	January	Class	48 hours	32515
2017	June	Class	48 hours	33026
2015	September	Class	48 hours	33313
2013	October	Class	48 hours	31172
2011	September	Class	48 hours	31174

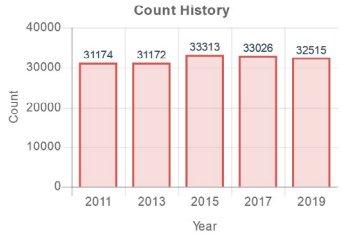
Annual Statistics

Data Item	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Statistics type	-	-	-	-	-	Actual	Estimated	Actual	Estimated	**Actual**
AADT	27500	29600	29200	28400	28400	30600	31600	30200	30200	**32400**
K-Factor	-	-	-	0.080	0.080	0.091	0.091	0.091	0.091	**0.088**
D-Factor	-	-	-	0.500	0.500	0.500	0.500	0.520	0.520	**0.530**
Future AADT	-	-	-	-	-	-	35900	33100	38000	**40800**

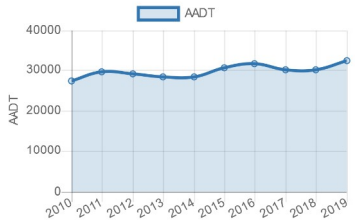
Average Hourly Volume



Count History



AADT Trend



FHWA Vehicle Classification

1. Motorcycles 2 axles, 2 or 3 wheels.	**0.06%**
2. Passenger cars 2 axles. Can have 1- or 2-axle trailers.	**75.55%**
3. Pickups, panels, vans 2-axle, 4-tire single units. Can have 1- or 2-axle trailers.	**20.28%**
4. Buses 2- or 3-axle, full length.	**0.47%**
5. Single-unit trucks 2-axle, 6-tire, (dual rear tires), single-unit trucks.	**2.56%**
6. Single-unit trucks 3-axle, single-unit trucks.	**0.35%**
7. Single-unit trucks 4 or more axle, single-unit trucks.	**0%**
8. Single-trailer trucks 3- or 4-axle, single-trailer trucks.	**0.45%**
9. Single-trailer trucks 5-axle, single-trailer trucks.	**0.26%**
10. Single-trailer trucks 6 or more axle, single-trailer trucks.	**0.01%**
11. Multi-trailer trucks 5 or less axle, multi-trailer trucks.	**0%**
12. Multi-trailer trucks 6-axle, multi-trailer trucks.	**0%**
13. Multi-trailer trucks 7 or more axle, multi-trailer trucks.	**0%**

0000113_0178 - 113-0178
Description: Tyrone Rd
County: Fayette
Route number: 00035800
LRS section: 1132035800
Functional class: 4R - Minor Arterial (Rural)
Coordinates: 33.4514309, -84.54241623

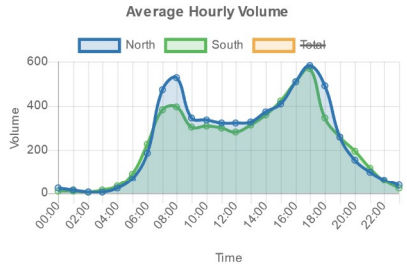
Site Data

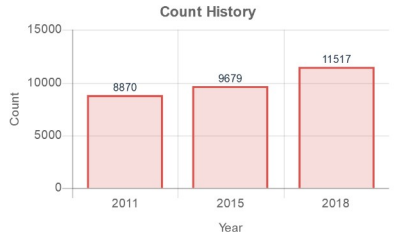
Count History

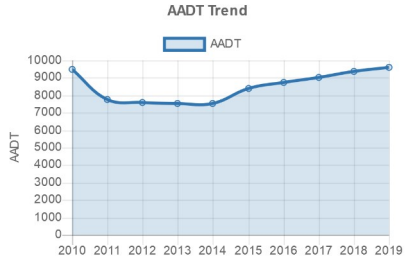
Year	Month	Count type	Duration	Count
2018	March	Volume	48 hours	11517
2015	March	Volume	48 hours	9679
2011	March	Volume	48 hours	8870

Annual Statistics

Data Item	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Statistics type	-	-	-	-	-	Actual	Estimated	Estimated	Actual	**Estimated**
AADT	9490	7730	7600	7550	7550	8400	8750	9020	9350	**9620**
K-Factor	-	-	-	-	-	0.112	0.112	-	0.115	**0.115**
D-Factor	-	-	-	-	-	0.500	0.500	-	0.540	**0.540**
Future AADT	-	-	-	-	-	-	9190	11400	11800	**12100**







APPENDIX C

TRIP GENERATION & VOLUME CALCULATIONS

Data Center (1,015,000 sf)		Project Trips		
		Total	Inbound	Outbound
Total Trips Generated	Daily	1,006	503	503
	AM Peak Hour	112	61	51
	PM Peak Hour	91	27	64

ITETripGen Web-based App

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Graph Look Up

ITETripGen Web-based App

- Graph Look Up
- Technical Support
- Add Users
- Comments

Query Filter

DATA SOURCE:
Trip Gen Manual, 10th Ed + Supplement

SEARCH BY LAND USE CODE:
160

LAND USE GROUP:
(100-199) Industrial

LAND USE :
160 - Data Center

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

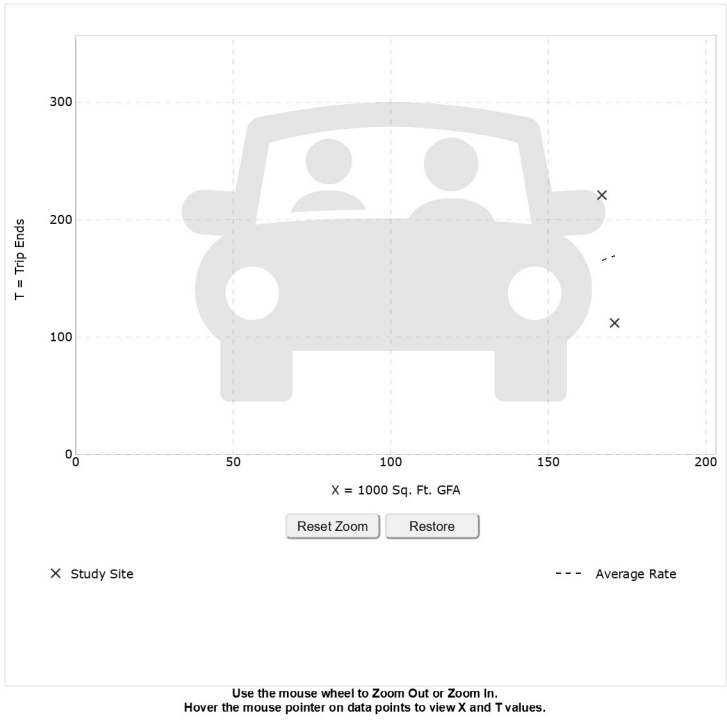
TIME PERIOD:
Weekday

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
1015 Calculate

Data Plot and Equation *Caution – Small Sample Size*



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Data Center (160) Click for more details

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
2

Avg. 1000 Sq. Ft. GFA:
169

Average Rate:
0.99

Range of Rates:
0.65 - 1.32

Standard Deviation:
****

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 1005 (Total), 502 (Entry), 503 (Exit)

- Add-ons to do more
- Try OTISS Pro

Graph Look Up

Query Filter

DATA SOURCE:
Trip Gen Manual, 10th Ed + Supplement

SEARCH BY LAND USE CODE:
160

LAND USE GROUP:
(100-199) Industrial

LAND USE :
160 - Data Center

LAND USE SUBCATEGORY:
All Sites

INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

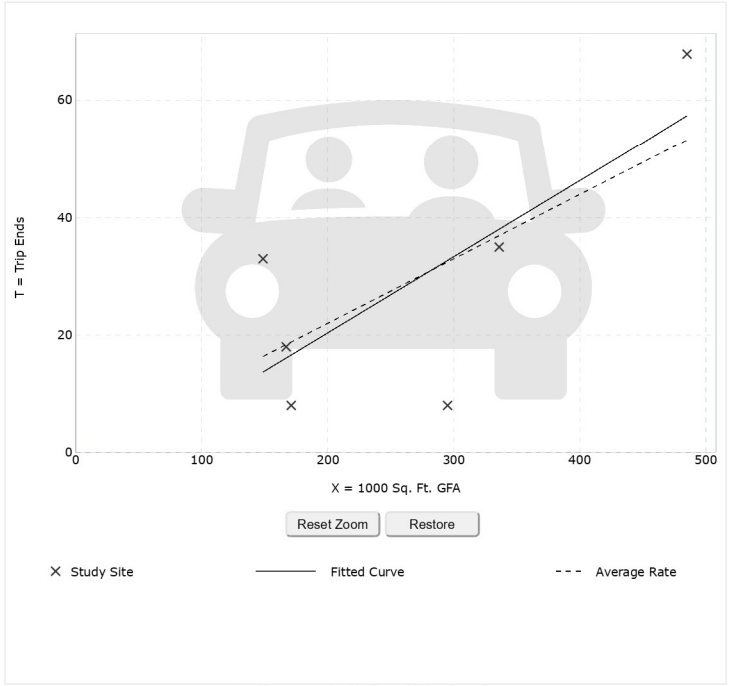
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traf

SETTING/LOCATION:
General Urban/Suburban

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
1015 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Data Center (160) Click for more details

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
6

Avg. 1000 Sq. Ft. GFA:
267

Average Rate:
0.11

Range of Rates:
0.03 - 0.22

Standard Deviation:
0.06

Fitted Curve Equation:
T = 0.13(X) - 5.63

R^2:
0.54

Directional Distribution:
55% entering, 45% exiting

Calculated Trip Ends:
Average Rate: 112 (Total), 61 (Entry), 51 (Exit)
Fitted Curve: 126 (Total), 69 (Entry), 57 (Exit)

ITETripGen Web-based App

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Graph Look Up

ITETripGen Web-based App

- Graph Look Up
- Technical Support
- Add Users
- Comments

Query Filter

DATA SOURCE: Trip Gen Manual, 10th Ed + Supplement

SEARCH BY LAND USE CODE: 160

LAND USE GROUP: (100-199) Industrial

LAND USE : 160 - Data Center

LAND USE SUBCATEGORY: All Sites

INDEPENDENT VARIABLE (IV): 1000 Sq. Ft. GFA

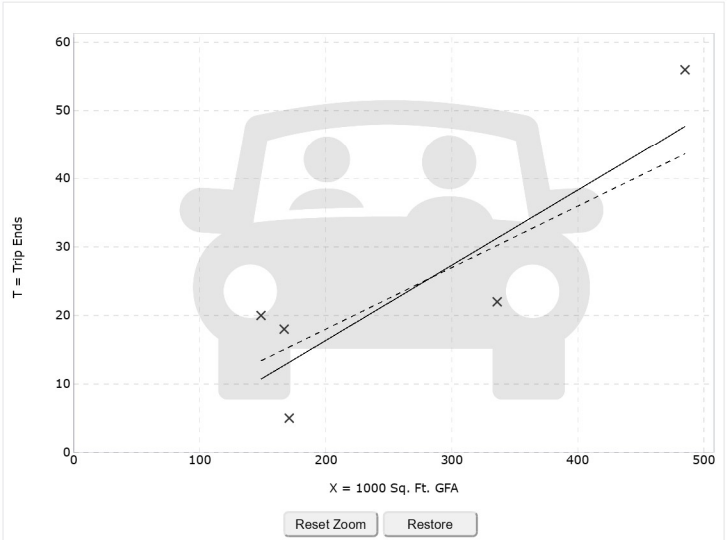
TIME PERIOD: Weekday, Peak Hour of Adjacent Street Traf

SETTING/LOCATION: General Urban/Suburban

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 1015 Calculate

Data Plot and Equation *Caution – Small Sample Size*



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Data Center (160) Click for more details

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
5

Avg. 1000 Sq. Ft. GFA:
262

Average Rate:
0.09

Range of Rates:
0.03 - 0.13

Standard Deviation:
0.04

Fitted Curve Equation:
T = 0.11(X) - 5.65

R^2:
0.77

Directional Distribution:
30% entering, 70% exiting

Calculated Trip Ends:
Average Rate: 91 (Total), 27 (Entry), 64 (Exit)
Fitted Curve: 106 (Total), 32 (Entry), 74 (Exit)

- Add-ons to do more
- Try OTISS Pro

Historical Volume Calculations

	INPUT		INPUT		INPUT		INPUT					
Put figure title here -->	Raw Traffic Counts		Balancing		Balanced Volumes		Existing Volumes wo Adj Dev					
Put figure # here -->												
Veterans Parkway/Lester Road & SR 54									Raw Data		2018	
Node #	1								Existing		2020	
Turning Mvmt	AM	PM			AM	PM	AM	PM	Annual Growth		1.0%	
SBL	31	22			31	22	32	22				
SBT	122	121			122	121	124	123				
SBR	68	112			68	112	69	114				
SBU	0	0			0	0	0	0				
NBL	185	122			185	122	189	124				
NBT	175	85			175	85	179	87				
NBR	234	131			234	131	239	134				
NBU	0	0			0	0	0	0				
EBL	132	104			132	104	135	106				
EBT	1218	1139	47		1265	1139	1,290	1,162	1476	1360	1523	1360
EBR	126	117			126	117	129	119	1523	1163	1523	1360
EBU	0	0			0	0	0	0				
WBL	330	195			330	195	337	199				
WBT	1096	1289	91	111	1187	1400	1,211	1,428				
WBR	68	44			68	44	69	45				
WBU	0	0			0	0	0	0				
Tyrone Road/Private Driveway & SR 54												
Node #												
Turning Mvmt	AM	PM										
SBL	453	281			453	281	462	287				
SBT	0	0			0	0	0	0	486	317	486	325
SBR	33	36		8	33	44	34	45	400	325	486	325
SBU	0	0			0	0	0	0				
NBL	0	1			0	1	0	1				
NBT	1	3			1	3	1	3				
NBR	0	0			0	0	0	0				
NBU	0	0			0	0	0	0				
EBL	30	26			30	26	31	27				
EBT	1070	882		197	1070	1079	1,092	1,101				
EBR	1	0			1	0	1	0				
EBU	0	0			0	0	0	0				
WBL	0	0			0	0	0	0				
WBT	1130	1169			1130	1169	1,153	1,192	1440	1634	1440	1634
WBR	310	465			310	465	316	474	1398	1532	1489	1643
WBU	0	0			0	0	0	0				
Tyrone Road & Flat Creek Trail												
Node #												
Turning Mvmt	AM	PM										
SBL	10	20			10	20	10	20				
SBT	375	305	86		461	305	470	311				
SBR	85	155			85	155	87	158				
SBU	0	0			0	0	0	0				
NBL	5	5			5	5	5	5				
NBT	260	405	71	74	331	479	338	489	270	420	341	494
NBR	5	10			5	10	5	10	341	494	341	494
NBU	0	0			0	0	0	0				
EBL	125	125			125	125	128	128				
EBT	65	60			65	60	66	61				
EBR	5	10			5	10	5	10				
EBU	0	0			0	0	0	0				
WBL	20	10			20	10	20	10				
WBT	70	85			70	85	71	87				
WBR	25	20			25	20	26	20				
WBU	0	0			0	0	0	0				
Tyrone Road & Site Drive 1												
Node #	4											
Turning Mvmt	AM	PM										
SBL	0	0			0	0	0	0				
SBT	0	0	486	325	486	325	496	332				
SBR	0	0			0	0	0	0				
SBU	0	0			0	0	0	0				
NBL	0	0			0	0	0	0				
NBT	0	0	341	494	341	494	348	504				
NBR	0	0			0	0	0	0				
NBU	0	0			0	0	0	0				
EBL	0	0			0	0	0	0				
EBT	0	0			0	0	0	0				
EBR	0	0			0	0	0	0				
EBU	0	0			0	0	0	0				
WBL	0	0			0	0	0	0				
WBT	0	0			0	0	0	0				
WBR	0	0			0	0	0	0				
WBU	0	0			0	0	0	0				
SR 54 & Site Drive 2												
Node #	5											
Turning Mvmt	AM	PM										
SBL	0	0			0	0	0	0				
SBT	0	0			0	0	0	0				
SBR	0	0			0	0	0	0				
SBU	0	0			0	0	0	0				
NBL	0	0			0	0	0	0				
NBT	0	0			0	0	0	0				
NBR	0	0			0	0	0	0				
NBU	0	0			0	0	0	0				
EBL	0	0			0	0	0	0				
EBT	0	0	1523	1360	1523	1360	1,554	1,387	0	0		
EBR	0	0			0	0	0	0	1523	1163		
EBU	0	0			0	0	0	0				
WBL	0	0			0	0	0	0				
WBT	0	0	1440	1634	1440	1634	1,469	1,667				
WBR	0	0			0	0	0	0				
WBU	0	0			0	0	0	0				

Adjacent Development Volumes

		INPUT		INPUT		INPUT	
Put figure title here -->		Total Adj Trips		Existing 2020		Future 2027	
Put figure # here -->		Figure 6		Figure 6		Figure 6	
Veterans Parkway & SR 54							
	Node #	1		1		1	
Turning Mvmt		AM	PM	AM	PM	AM	PM
SBL		18	32	11	19	18	32
SBT		33	62	20	37	33	62
SBR		135	246	81	148	135	246
SBU		0	0	0	0	0	0
NBL		0	0	0	0	0	0
NBT		62	43	37	26	62	43
NBR		0	0	0	0	0	0
NBU		0	0	0	0	0	0
EBL		246	169	148	101	246	169
EBT		0	0	0	0	0	0
EBR		0	0	0	0	0	0
EBU		0	0	0	0	0	0
WBL		0	0	0	0	0	0
WBT		0	0	0	0	0	0
WBR		31	22	19	13	31	22
WBU		0	0	0	0	0	0
Tyrone Road & SR 54							
	Node #	2		2		2	
Turning Mvmt		AM	PM	AM	PM	AM	PM
SBL		31	22	19	13	31	22
SBT		0	0	0	0	0	0
SBR		0	0	0	0	0	0
SBU		0	0	0	0	0	0
NBL		0	0	0	0	0	0
NBT		0	0	0	0	0	0
NBR		0	0	0	0	0	0
NBU		0	0	0	0	0	0
EBL		0	0	0	0	0	0
EBT		216	147	130	88	216	147
EBR		0	0	0	0	0	0
EBU		0	0	0	0	0	0
WBL		0	0	0	0	0	0
WBT		118	216	71	130	118	216
WBR		18	32	11	19	18	32
WBU		0	0	0	0	0	0
Tyrone Road & Flat Creek Trail							
	Node #	3		3		3	
Turning Mvmt		AM	PM	AM	PM	AM	PM
SBL		0	0	0	0	0	0
SBT		31	22	19	13	31	22
SBR		0	0	0	0	0	0
SBU		0	0	0	0	0	0
NBL		0	0	0	0	0	0
NBT		18	32	11	19	18	32
NBR		0	0	0	0	0	0
NBU		0	0	0	0	0	0
EBL		0	0	0	0	0	0
EBT		0	0	0	0	0	0
EBR		0	0	0	0	0	0
EBU		0	0	0	0	0	0
WBL		0	0	0	0	0	0
WBT		0	0	0	0	0	0
WBR		0	0	0	0	0	0
WBU		0	0	0	0	0	0
Tyrone Road & Site Drive 1							
	Node #	4		4		4	
Turning Mvmt		AM	PM	AM	PM	AM	PM
SBL		0	0	0	0	0	0
SBT		31	22	19	13	31	22
SBR		0	0	0	0	0	0
SBU		0	0	0	0	0	0
NBL		0	0	0	0	0	0
NBT		18	32	11	19	18	32
NBR		0	0	0	0	0	0
NBU		0	0	0	0	0	0
EBL		0	0	0	0	0	0
EBT		0	0	0	0	0	0
EBR		0	0	0	0	0	0
EBU		0	0	0	0	0	0
WBL		0	0	0	0	0	0
WBT		0	0	0	0	0	0
WBR		0	0	0	0	0	0
WBU		0	0	0	0	0	0
SR 54 & Site Drive 2							
	Node #	5		5		5	
Turning Mvmt		AM	PM	AM	PM	AM	PM
SBL		0	0	0	0	0	0
SBT		0	0	0	0	0	0
SBR		0	0	0	0	0	0
SBU		0	0	0	0	0	0
NBL		0	0	0	0	0	0
NBT		0	0	0	0	0	0
NBR		0	0	0	0	0	0
NBU		0	0	0	0	0	0
EBL		0	0	0	0	0	0
EBT		246	169	148	101	246	169
EBR		0	0	0	0	0	0
EBU		0	0	0	0	0	0
WBL		0	0	0	0	0	0
WBT		135	246	81	148	135	246
WBR		0	0	0	0	0	0
WBU		0	0	0	0	0	0

Existing - 2020	60%
Future - 2027	100%

APPENDIX D

SYNCHRO REPORTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	283	1290	129	337	1211	88	189	216	239	43	144	150
Future Volume (veh/h)	283	1290	129	337	1211	88	189	216	239	43	144	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	345	1573	0	455	1636	0	278	318	0	73	244	0
Peak Hour Factor	0.82	0.82	0.82	0.74	0.74	0.74	0.68	0.68	0.68	0.59	0.59	0.59
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	345	1753		399	1880		234	441		201	405	
Arrive On Green	0.14	0.49	0.00	0.18	0.53	0.00	0.07	0.12	0.00	0.06	0.11	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	345	1573	0	455	1636	0	278	318	0	73	244	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	20.0	56.3	0.0	25.0	56.3	0.0	10.0	12.1	0.0	4.9	9.1	0.0
Cycle Q Clear(g_c), s	20.0	56.3	0.0	25.0	56.3	0.0	10.0	12.1	0.0	4.9	9.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	345	1753		399	1880		234	441		201	405	
V/C Ratio(X)	1.00	0.90		1.14	0.87		1.19	0.72		0.36	0.60	
Avail Cap(c_a), veh/h	345	1753		399	1880		234	685		206	660	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	43.0	32.3	0.0	45.6	28.8	0.0	57.8	59.0	0.0	50.1	59.0	0.0
Incr Delay (d2), s/veh	48.5	7.7	0.0	89.0	5.8	0.0	119.4	2.2	0.0	1.1	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.3	24.0	0.0	23.3	23.2	0.0	11.1	5.5	0.0	2.2	4.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	91.6	40.0	0.0	134.6	34.6	0.0	177.2	61.2	0.0	51.2	60.5	0.0
LnGrp LOS	F	D		F	C		F	E		D	E	
Approach Vol, veh/h		1918	A		2091	A		596	A		317	A
Approach Delay, s/veh		49.2			56.4			115.3			58.3	
Approach LOS		D			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	74.0	15.0	21.0	25.0	79.0	13.6	22.4
Change Period (Y+Rc), s	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Max Green Setting (Gmax), s	23.0	57.0	8.0	24.0	18.0	62.0	7.0	25.0
Max Q Clear Time (g_c+I1), s	27.0	58.3	12.0	11.1	22.0	58.3	6.9	14.1
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.0	2.9	0.0	1.3

Intersection Summary

HCM 6th Ctrl Delay	60.9
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	1222	1	0	1224	327	0	1	0	481	0	34
Future Volume (veh/h)	31	1222	1	0	1224	327	0	1	0	481	0	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1841	1841	1870	1841	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	1455	1	0	1569	419	0	4	0	534	0	0
Peak Hour Factor	0.84	0.84	0.84	0.78	0.78	0.78	0.25	0.25	0.25	0.90	0.90	0.90
Percent Heavy Veh, %	2	4	4	2	4	2	2	2	2	2	2	2
Cap, veh/h	82	1888	1	51	1841	834	0	752	0	618	0	
Arrive On Green	0.53	0.53	0.53	0.00	0.53	0.53	0.00	0.40	0.00	0.40	0.00	0.00
Sat Flow, veh/h	218	3586	2	365	3497	1585	0	1870	0	1408	0	1585
Grp Volume(v), veh/h	37	709	747	0	1569	419	0	4	0	534	0	0
Grp Sat Flow(s),veh/h/ln	218	1749	1840	365	1749	1585	0	1870	0	1408	0	1585
Q Serve(g_s), s	19.7	45.3	45.3	0.0	54.0	23.8	0.0	0.2	0.0	51.0	0.0	0.0
Cycle Q Clear(g_c), s	73.7	45.3	45.3	0.0	54.0	23.8	0.0	0.2	0.0	51.2	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	0.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	82	920	969	51	1841	834	0	752	0	618	0	
V/C Ratio(X)	0.45	0.77	0.77	0.00	0.85	0.50	0.00	0.01	0.00	0.86	0.00	
Avail Cap(c_a), veh/h	82	920	969	51	1841	834	0	788	0	645	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	61.8	26.4	26.4	0.0	28.5	21.3	0.0	25.1	0.0	40.4	0.0	0.0
Incr Delay (d2), s/veh	16.8	6.2	5.9	0.0	5.2	2.2	0.0	0.0	0.0	11.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	18.8	19.7	0.0	21.9	8.7	0.0	0.1	0.0	19.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.6	32.6	32.3	0.0	33.7	23.5	0.0	25.1	0.0	51.8	0.0	0.0
LnGrp LOS	E	C	C	A	C	C	A	C	A	D	A	
Approach Vol, veh/h		1493			1988			4			534	A
Approach Delay, s/veh		33.6			31.6			25.1			51.8	
Approach LOS		C			C			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		78.7		61.3		78.7		61.3				
Change Period (Y+Rc), s		7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s		69.0		57.0		69.0		57.0				
Max Q Clear Time (g_c+I1), s		75.7		53.2		56.0		2.2				
Green Ext Time (p_c), s		0.0		1.2		9.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			35.0									
HCM 6th LOS			D									

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	52.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	128	66	5	20	71	26	5	349	5	10	489	87
Future Vol, veh/h	128	66	5	20	71	26	5	349	5	10	489	87
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	142	73	6	22	79	29	6	388	6	11	543	97
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	16.8	13.8	24.4	88.9
HCM LOS	C	B	C	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	64%	17%	2%
Vol Thru, %	97%	33%	61%	83%
Vol Right, %	1%	3%	22%	15%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	359	199	117	586
LT Vol	5	128	20	10
Through Vol	349	66	71	489
RT Vol	5	5	26	87
Lane Flow Rate	399	221	130	651
Geometry Grp	1	1	1	1
Degree of Util (X)	0.712	0.447	0.273	1.094
Departure Headway (Hd)	6.639	7.701	7.892	6.051
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	546	471	458	606
Service Time	4.639	5.701	5.892	4.074
HCM Lane V/C Ratio	0.731	0.469	0.284	1.074
HCM Control Delay	24.4	16.8	13.8	88.9
HCM Lane LOS	C	C	B	F
HCM 95th-tile Q	5.7	2.3	1.1	19.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	207	1162	119	199	1428	58	124	113	134	41	160	262
Future Volume (veh/h)	207	1162	119	199	1428	58	124	113	134	41	160	262
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1841	1870	1870	1841	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	249	1400	0	234	1680	0	168	149	0	46	178	0
Peak Hour Factor	0.83	0.83	0.83	0.85	0.85	0.85	0.74	0.76	0.76	0.90	0.90	0.90
Percent Heavy Veh, %	2	4	2	2	4	2	2	2	2	2	2	2
Cap, veh/h	294	2215		338	2160		207	323		214	293	
Arrive On Green	0.09	0.63	0.00	0.08	0.62	0.00	0.06	0.09	0.00	0.06	0.08	0.00
Sat Flow, veh/h	1781	3497	1585	1781	3497	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	249	1400	0	234	1680	0	168	149	0	46	178	0
Grp Sat Flow(s),veh/h/ln	1781	1749	1585	1781	1749	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	8.8	34.3	0.0	6.5	49.5	0.0	9.0	5.6	0.0	3.2	6.8	0.0
Cycle Q Clear(g_c), s	8.8	34.3	0.0	6.5	49.5	0.0	9.0	5.6	0.0	3.2	6.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	294	2215		338	2160		207	323		214	293	
V/C Ratio(X)	0.85	0.63		0.69	0.78		0.81	0.46		0.21	0.61	
Avail Cap(c_a), veh/h	320	2215		417	2160		207	660		229	660	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.5	15.7	0.0	16.9	19.7	0.0	58.5	60.4	0.0	53.4	62.0	0.0
Incr Delay (d2), s/veh	17.5	1.4	0.0	3.6	2.8	0.0	21.1	1.0	0.0	0.5	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	12.4	0.0	3.3	18.4	0.0	2.7	2.5	0.0	1.4	3.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.0	17.1	0.0	20.5	22.5	0.0	79.6	61.4	0.0	53.9	64.1	0.0
LnGrp LOS	D	B		C	C		E	E		D	E	
Approach Vol, veh/h		1649	A		1914	A		317	A		224	A
Approach Delay, s/veh		22.0			22.3			71.1			62.0	
Approach LOS		C			C			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.8	93.7	14.0	16.5	18.0	91.5	12.8	17.7
Change Period (Y+Rc), s	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Max Green Setting (Gmax), s	15.0	66.0	7.0	24.0	13.0	68.0	7.0	24.0
Max Q Clear Time (g_c+I1), s	8.5	36.3	11.0	8.8	10.8	51.5	5.2	7.6
Green Ext Time (p_c), s	0.3	11.1	0.0	0.8	0.1	10.2	0.0	0.6

Intersection Summary

HCM 6th Ctrl Delay	28.1
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	1189	0	0	1322	493	1	3	0	300	0	45
Future Volume (veh/h)	27	1189	0	0	1322	493	1	3	0	300	0	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1841	1841	1870	1841	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	30	1336	0	0	1612	601	2	6	0	341	0	0
Peak Hour Factor	0.89	0.89	0.89	0.82	0.82	0.82	0.50	0.50	0.50	0.88	0.88	0.88
Percent Heavy Veh, %	2	4	4	2	4	2	2	2	2	2	2	2
Cap, veh/h	115	2301	0	51	2301	1043	136	392	0	434	0	
Arrive On Green	0.66	0.66	0.00	0.00	0.66	0.66	0.27	0.27	0.00	0.27	0.00	0.00
Sat Flow, veh/h	175	3589	0	410	3497	1585	385	1449	0	1414	0	1585
Grp Volume(v), veh/h	30	1336	0	0	1612	601	8	0	0	341	0	0
Grp Sat Flow(s),veh/h/ln	175	1749	0	410	1749	1585	1834	0	0	1414	0	1585
Q Serve(g_s), s	18.4	29.6	0.0	0.0	41.0	29.3	0.0	0.0	0.0	32.0	0.0	0.0
Cycle Q Clear(g_c), s	59.4	29.6	0.0	0.0	41.0	29.3	0.4	0.0	0.0	32.4	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	0.25		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	115	2301	0	51	2301	1043	529	0	0	434	0	
V/C Ratio(X)	0.26	0.58	0.00	0.00	0.70	0.58	0.02	0.00	0.00	0.79	0.00	
Avail Cap(c_a), veh/h	115	2301	0	51	2301	1043	666	0	0	546	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.0	13.3	0.0	0.0	15.2	13.2	37.4	0.0	0.0	49.0	0.0	0.0
Incr Delay (d2), s/veh	5.4	1.1	0.0	0.0	1.8	2.3	0.0	0.0	0.0	5.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	10.4	0.0	0.0	14.5	9.7	0.2	0.0	0.0	11.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.5	14.3	0.0	0.0	17.0	15.5	37.4	0.0	0.0	54.9	0.0	0.0
LnGrp LOS	D	B	A	A	B	B	D	A	A	D	A	
Approach Vol, veh/h		1366			2213			8			341	A
Approach Delay, s/veh		14.9			16.6			37.4			54.9	
Approach LOS		B			B			D			D	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		97.1		42.9		97.1		42.9				
Change Period (Y+Rc), s		7.0		7.0		7.0		7.0				
Max Green Setting (Gmax), s		79.0		47.0		79.0		47.0				
Max Q Clear Time (g_c+I1), s		61.4		34.4		43.0		2.4				
Green Ext Time (p_c), s		9.2		1.5		18.9		0.0				

Intersection Summary

HCM 6th Ctrl Delay	19.4
HCM 6th LOS	B

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	58.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	128	61	10	10	87	20	5	508	10	20	324	158
Future Vol, veh/h	128	61	10	10	87	20	5	508	10	20	324	158
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	142	68	11	11	97	22	6	564	11	22	360	176
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	18.4	14.9	81.3	59.9
HCM LOS	C	B	F	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	64%	9%	4%
Vol Thru, %	97%	31%	74%	65%
Vol Right, %	2%	5%	17%	31%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	523	199	117	502
LT Vol	5	128	10	20
Through Vol	508	61	87	324
RT Vol	10	10	20	158
Lane Flow Rate	581	221	130	558
Geometry Grp	1	1	1	1
Degree of Util (X)	1.061	0.48	0.293	0.984
Departure Headway (Hd)	6.573	8.123	8.441	6.552
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	552	447	429	558
Service Time	4.627	6.123	6.441	4.552
HCM Lane V/C Ratio	1.053	0.494	0.303	1
HCM Control Delay	81.3	18.4	14.9	59.9
HCM Lane LOS	F	C	B	F
HCM 95th-tile Q	16.9	2.5	1.2	13.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	401	1383	138	361	1298	106	203	257	256	53	167	215
Future Volume (veh/h)	401	1383	138	361	1298	106	203	257	256	53	167	215
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1841	1870	1870	1841	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	483	1666	0	425	1527	0	274	338	0	59	186	0
Peak Hour Factor	0.83	0.83	0.83	0.85	0.85	0.85	0.74	0.76	0.76	0.90	0.90	0.90
Percent Heavy Veh, %	2	4	2	2	4	2	2	2	2	2	2	2
Cap, veh/h	419	1766		360	1666		256	457		195	439	
Arrive On Green	0.19	0.51	0.00	0.16	0.48	0.00	0.06	0.13	0.00	0.06	0.12	0.00
Sat Flow, veh/h	1781	3497	1585	1781	3497	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	483	1666	0	425	1527	0	274	338	0	59	186	0
Grp Sat Flow(s),veh/h/ln	1781	1749	1585	1781	1749	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	27.0	63.0	0.0	23.0	56.8	0.0	9.0	12.8	0.0	3.9	6.8	0.0
Cycle Q Clear(g_c), s	27.0	63.0	0.0	23.0	56.8	0.0	9.0	12.8	0.0	3.9	6.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	419	1766		360	1666		256	457		195	439	
V/C Ratio(X)	1.15	0.94		1.18	0.92		1.07	0.74		0.30	0.42	
Avail Cap(c_a), veh/h	419	1766		360	1666		256	635		204	635	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.6	32.7	0.0	46.7	34.1	0.0	58.4	58.7	0.0	48.9	56.7	0.0
Incr Delay (d2), s/veh	92.7	11.6	0.0	105.7	9.5	0.0	76.3	2.9	0.0	0.9	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.9	27.1	0.0	22.8	24.3	0.0	10.0	5.9	0.0	1.8	3.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	138.3	44.4	0.0	152.4	43.5	0.0	134.7	61.7	0.0	49.8	57.4	0.0
LnGrp LOS	F	D		F	D		F	E		D	E	
Approach Vol, veh/h		2149	A		1952	A		612	A		245	A
Approach Delay, s/veh		65.5			67.2			94.4			55.6	
Approach LOS		E			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.0	75.7	14.0	22.3	32.0	71.7	13.3	23.0
Change Period (Y+Rc), s	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Max Green Setting (Gmax), s	21.0	61.0	7.0	23.0	25.0	57.0	7.0	23.0
Max Q Clear Time (g_c+I1), s	25.0	65.0	11.0	8.8	29.0	58.8	5.9	14.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.8	0.0	0.0	0.0	1.2

Intersection Summary

HCM 6th Ctrl Delay	69.2
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	1396	1	0	1359	358	0	1	0	528	0	36
Future Volume (veh/h)	33	1396	1	0	1359	358	0	1	0	528	0	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	1569	1	0	1657	437	0	2	0	600	0	0
Peak Hour Factor	0.89	0.89	0.89	0.82	0.82	0.82	0.50	0.50	0.50	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	2043	1	51	1992	888	0	34	0	635	688	
Arrive On Green	0.56	0.56	0.56	0.00	0.56	0.56	0.00	0.02	0.00	0.31	0.00	0.00
Sat Flow, veh/h	196	3644	2	327	3554	1585	0	1870	0	1781	1870	1585
Grp Volume(v), veh/h	37	765	805	0	1657	437	0	2	0	600	0	0
Grp Sat Flow(s),veh/h/ln	196	1777	1870	327	1777	1585	0	1870	0	1781	1870	1585
Q Serve(g_s), s	24.7	46.5	46.5	0.0	53.7	23.4	0.0	0.1	0.0	44.0	0.0	0.0
Cycle Q Clear(g_c), s	78.5	46.5	46.5	0.0	53.7	23.4	0.0	0.1	0.0	44.0	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	0.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	86	996	1048	51	1992	888	0	34	0	635	688	
V/C Ratio(X)	0.43	0.77	0.77	0.00	0.83	0.49	0.00	0.06	0.00	0.94	0.00	
Avail Cap(c_a), veh/h	86	996	1048	51	1992	888	0	120	0	635	775	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.4	23.7	23.7	0.0	25.3	18.7	0.0	67.6	0.0	45.2	0.0	0.0
Incr Delay (d2), s/veh	14.9	5.7	5.4	0.0	4.2	1.9	0.0	0.7	0.0	22.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	19.1	20.1	0.0	21.5	9.2	0.0	0.1	0.0	24.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.3	29.4	29.1	0.0	29.6	20.6	0.0	68.3	0.0	68.1	0.0	0.0
LnGrp LOS	E	C	C	A	C	C	A	E	A	E	A	
Approach Vol, veh/h		1607			2094			2			600	A
Approach Delay, s/veh		30.3			27.7			68.3			68.1	
Approach LOS		C			C			E			E	
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		83.5		56.5		83.5	49.0	7.5				
Change Period (Y+Rc), s		7.0		7.0		7.0	7.0	7.0				
Max Green Setting (Gmax), s		70.0		56.0		70.0	42.0	7.0				
Max Q Clear Time (g_c+I1), s		80.5		0.0		55.7	46.0	2.1				
Green Ext Time (p_c), s		0.0		0.0		10.1	0.0	0.0				

Intersection Summary	
HCM 6th Ctrl Delay	34.3
HCM 6th LOS	C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	9.3
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	237	138	445	724
Demand Flow Rate, veh/h	242	141	454	738
Vehicles Circulating, veh/h	656	603	248	115
Vehicles Exiting, veh/h	197	99	650	629
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.6	7.0	8.0	10.4
Approach LOS	A	A	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	242	141	454	738
Cap Entry Lane, veh/h	707	746	1071	1227
Entry HV Adj Factor	0.981	0.981	0.981	0.981
Flow Entry, veh/h	237	138	445	724
Cap Entry, veh/h	693	732	1051	1204
V/C Ratio	0.342	0.189	0.424	0.601
Control Delay, s/veh	9.6	7.0	8.0	10.4
LOS	A	A	A	B
95th %tile Queue, veh	2	1	2	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	290	1246	128	213	1531	71	133	138	144	57	197	379
Future Volume (veh/h)	290	1246	128	213	1531	71	133	138	144	57	197	379
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1841	1870	1870	1841	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	354	1520	0	288	2069	0	196	203	0	97	334	0
Peak Hour Factor	0.82	0.82	0.82	0.74	0.74	0.74	0.68	0.68	0.68	0.59	0.59	0.59
Percent Heavy Veh, %	2	4	2	2	4	2	2	2	2	2	2	2
Cap, veh/h	242	1974		413	1937		210	469		259	469	
Arrive On Green	0.21	1.00	0.00	0.10	0.55	0.00	0.06	0.13	0.00	0.06	0.13	0.00
Sat Flow, veh/h	1781	3497	1585	1781	3497	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	354	1520	0	288	2069	0	196	203	0	97	334	0
Grp Sat Flow(s),veh/h/ln	1781	1749	1585	1781	1749	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	15.0	0.0	0.0	9.4	77.5	0.0	9.0	7.4	0.0	6.5	12.6	0.0
Cycle Q Clear(g_c), s	15.0	0.0	0.0	9.4	77.5	0.0	9.0	7.4	0.0	6.5	12.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	242	1974		413	1937		210	469		259	469	
V/C Ratio(X)	1.46	0.77		0.70	1.07		0.93	0.43		0.37	0.71	
Avail Cap(c_a), veh/h	242	1974		420	1937		210	965		259	965	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	43.3	0.0	0.0	10.2	31.2	0.0	55.9	55.9	0.0	48.0	58.2	0.0
Incr Delay (d2), s/veh	228.8	3.0	0.0	4.9	41.5	0.0	44.1	0.6	0.0	0.9	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.6	0.8	0.0	3.9	40.2	0.0	5.0	3.3	0.0	2.9	5.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	272.2	3.0	0.0	15.1	72.7	0.0	100.0	56.6	0.0	48.9	60.2	0.0
LnGrp LOS	F	A		B	F		F	E		D	E	
Approach Vol, veh/h		1874	A		2357	A		399	A		431	A
Approach Delay, s/veh		53.8			65.7			77.9			57.7	
Approach LOS		D			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.5	84.0	14.0	23.5	20.0	82.5	14.0	23.5
Change Period (Y+Rc), s	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Max Green Setting (Gmax), s	12.0	57.0	7.0	36.0	13.0	56.0	7.0	36.0
Max Q Clear Time (g_c+I1), s	11.4	2.0	11.0	14.6	17.0	79.5	8.5	9.4
Green Ext Time (p_c), s	0.1	14.9	0.0	1.9	0.0	0.0	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	61.6
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	1334	0	0	1503	542	1	3	0	331	0	48
Future Volume (veh/h)	29	1334	0	0	1503	542	1	3	0	331	0	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1841	1841	1870	1841	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	35	1588	0	0	1927	695	4	12	0	368	0	0
Peak Hour Factor	0.84	0.84	0.84	0.78	0.78	0.78	0.25	0.25	0.25	0.90	0.90	0.90
Percent Heavy Veh, %	2	4	4	2	4	2	2	2	2	2	2	2
Cap, veh/h	131	2392	0	51	2392	1084	47	51	0	438	457	
Arrive On Green	0.68	0.68	0.00	0.00	1.00	1.00	0.04	0.04	0.00	0.17	0.00	0.00
Sat Flow, veh/h	116	3589	0	321	3497	1585	393	1352	0	1781	1870	1585
Grp Volume(v), veh/h	35	1588	0	0	1927	695	16	0	0	368	0	0
Grp Sat Flow(s),veh/h/ln	116	1749	0	321	1749	1585	1745	0	0	1781	1870	1585
Q Serve(g_s), s	19.1	36.8	0.0	0.0	0.0	0.0	0.7	0.0	0.0	24.0	0.0	0.0
Cycle Q Clear(g_c), s	19.1	36.8	0.0	0.0	0.0	0.0	1.2	0.0	0.0	24.0	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	0.25		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	131	2392	0	51	2392	1084	97	0	0	438	457	
V/C Ratio(X)	0.27	0.66	0.00	0.00	0.81	0.64	0.16	0.00	0.00	0.84	0.00	
Avail Cap(c_a), veh/h	131	2392	0	51	2392	1084	144	0	0	438	508	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.0	12.8	0.0	0.0	0.0	0.0	65.4	0.0	0.0	53.2	0.0	0.0
Incr Delay (d2), s/veh	4.9	1.5	0.0	0.0	3.0	2.9	0.8	0.0	0.0	13.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	12.5	0.0	0.0	1.0	0.9	0.6	0.0	0.0	14.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.0	14.3	0.0	0.0	3.0	2.9	66.2	0.0	0.0	66.9	0.0	0.0
LnGrp LOS	B	B	A	A	A	A	E	A	A	E	A	
Approach Vol, veh/h		1623			2622			16			368	A
Approach Delay, s/veh		14.3			3.0			66.2			66.9	
Approach LOS		B			A			E			E	
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		100.8		39.2		100.8	29.0	10.2				
Change Period (Y+Rc), s		7.0		7.0		7.0	7.0	7.0				
Max Green Setting (Gmax), s		90.0		36.0		90.0	22.0	7.0				
Max Q Clear Time (g_c+I1), s		38.8		0.0		2.0	26.0	3.2				
Green Ext Time (p_c), s		20.7		0.0		38.4	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	12.2
HCM 6th LOS	B

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	236	138	638	607
Demand Flow Rate, veh/h	240	140	650	619
Vehicles Circulating, veh/h	439	793	251	123
Vehicles Exiting, veh/h	303	108	428	810
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.1	8.8	11.7	8.6
Approach LOS	A	A	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	240	140	650	619
Cap Entry Lane, veh/h	882	615	1068	1217
Entry HV Adj Factor	0.982	0.985	0.981	0.981
Flow Entry, veh/h	236	138	638	607
Cap Entry, veh/h	866	606	1048	1194
V/C Ratio	0.272	0.228	0.608	0.509
Control Delay, s/veh	7.1	8.8	11.7	8.6
LOS	A	A	B	A
95th %tile Queue, veh	1	1	4	3

HCM 6th Edition cannot analyze u-turn movements.

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	403	1396	140	361	1313	106	205	257	256	53	167
Future Volume (vph)	1	403	1396	140	361	1313	106	205	257	256	53	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		260		290	275		155	115		160	280	
Storage Lanes		1		1	1		1	1		1	1	
Taper Length (ft)		100			100			100			100	
Lane Util. Factor	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Frt				0.850			0.850			0.850		
Flt Protected		0.950			0.950			0.950			0.950	
Satd. Flow (prot)	0	1770	3471	1583	1770	3471	1583	1770	3539	1583	1770	3539
Flt Permitted		0.065			0.069			0.568			0.426	
Satd. Flow (perm)	0	121	3471	1583	129	3471	1583	1058	3539	1583	794	3539
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			55			55			45			45
Link Distance (ft)			1016			1196			831			628
Travel Time (s)			12.6			14.8			12.6			9.5
Peak Hour Factor	0.83	0.83	0.83	0.83	0.85	0.85	0.85	0.74	0.76	0.76	0.90	0.90
Heavy Vehicles (%)	2%	2%	4%	2%	2%	4%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1	486	1682	169	425	1545	125	277	338	337	59	186
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	487	1682	169	425	1545	125	277	338	337	59	186
Turn Type	custom	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		5	2		1	6		3	8		7	4
Permitted Phases	5	2		2	6		6	8		8	4	
Detector Phase	5	5	2	2	1	6	6	3	8	8	7	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	14.0	14.0	7.0	14.0	14.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	14.0	21.0	21.0	14.0	21.0	21.0	14.0	14.0	14.0	14.0	14.0
Total Split (s)	32.0	32.0	68.0	68.0	28.0	64.0	64.0	14.0	30.0	30.0	14.0	30.0
Total Split (%)	22.9%	22.9%	48.6%	48.6%	20.0%	45.7%	45.7%	10.0%	21.4%	21.4%	10.0%	21.4%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)		90.0	63.0	63.0	82.0	59.0	59.0	35.0	27.8	27.8	34.0	25.0
Actuated g/C Ratio		0.64	0.45	0.45	0.59	0.42	0.42	0.25	0.20	0.20	0.24	0.18
v/c Ratio		1.23	1.08	0.24	1.23	1.06	0.19	0.89	0.48	1.07	0.23	0.29
Control Delay		150.7	83.1	26.4	165.3	79.3	26.4	78.0	53.4	124.2	40.3	51.3
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		150.7	83.1	26.4	165.3	79.3	26.4	78.0	53.4	124.2	40.3	51.3
LOS		F	F	C	F	E	C	E	D	F	D	D
Approach Delay			93.1			93.6			85.6			65.5
Approach LOS			F			F			F			E
Queue Length 50th (ft)		~500	~901	112	~426	~808	71	217	148	~370	40	78

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	217
Future Volume (vph)	217
Ideal Flow (vphpl)	1900
Storage Length (ft)	300
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	2%
Adj. Flow (vph)	241
Shared Lane Traffic (%)	
Lane Group Flow (vph)	241
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Detector Phase	4
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	30.0
Total Split (%)	21.4%
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	25.0
Actuated g/C Ratio	0.18
v/c Ratio	0.85
Control Delay	82.7
Queue Delay	0.0
Total Delay	82.7
LOS	F
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	215

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Length 95th (ft)		m#573	m#871	m122	#584	#855	109	#252	166	#436	78	116
Internal Link Dist (ft)			936			1116			751			548
Turn Bay Length (ft)		260		290	275		155	115		160	280	
Base Capacity (vph)		395	1561	712	345	1462	667	310	702	314	255	631
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		1.23	1.08	0.24	1.23	1.06	0.19	0.89	0.48	1.07	0.23	0.29

Intersection Summary

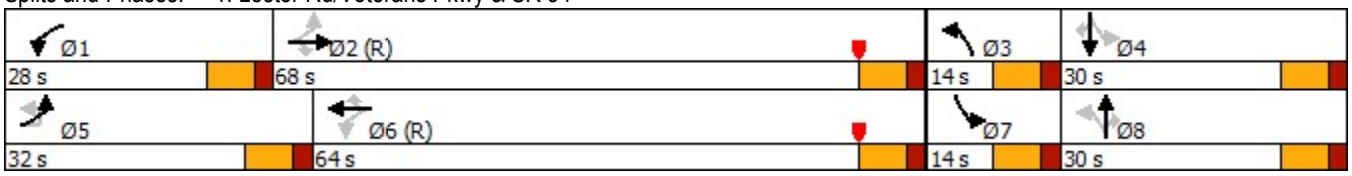
Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.23
Intersection Signal Delay: 89.8 Intersection LOS: F
Intersection Capacity Utilization 100.1% ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

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

Splits and Phases: 1: Lester Rd/Veterans Pkwy & SR 54



Lane Group	SBR
Queue Length 95th (ft)	#362
Internal Link Dist (ft)	
Turn Bay Length (ft)	300
Base Capacity (vph)	282
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.85

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	1397	1	0	1365	358	0	1	0	545	0	36
Future Volume (veh/h)	39	1397	1	0	1365	358	0	1	0	545	0	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	44	1570	1	0	1665	437	0	2	0	619	0	0
Peak Hour Factor	0.89	0.89	0.89	0.82	0.82	0.82	0.50	0.50	0.50	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	85	2043	1	51	1992	888	0	34	0	635	688	
Arrive On Green	0.56	0.56	0.56	0.00	0.56	0.56	0.00	0.02	0.00	0.31	0.00	0.00
Sat Flow, veh/h	195	3644	2	327	3554	1585	0	1870	0	1781	1870	1585
Grp Volume(v), veh/h	44	765	806	0	1665	437	0	2	0	619	0	0
Grp Sat Flow(s),veh/h/ln	195	1777	1870	327	1777	1585	0	1870	0	1781	1870	1585
Q Serve(g_s), s	24.2	46.6	46.6	0.0	54.2	23.4	0.0	0.1	0.0	44.0	0.0	0.0
Cycle Q Clear(g_c), s	78.5	46.6	46.6	0.0	54.2	23.4	0.0	0.1	0.0	44.0	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	0.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	85	996	1048	51	1992	888	0	34	0	635	688	
V/C Ratio(X)	0.52	0.77	0.77	0.00	0.84	0.49	0.00	0.06	0.00	0.97	0.00	
Avail Cap(c_a), veh/h	85	996	1048	51	1992	888	0	120	0	635	775	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	60.7	23.7	23.8	0.0	25.4	18.7	0.0	67.6	0.0	46.0	0.0	0.0
Incr Delay (d2), s/veh	20.6	5.7	5.4	0.0	4.3	1.9	0.0	0.7	0.0	29.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	19.2	20.1	0.0	21.7	9.2	0.0	0.1	0.0	26.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.4	29.4	29.2	0.0	29.8	20.6	0.0	68.3	0.0	75.2	0.0	0.0
LnGrp LOS	F	C	C	A	C	C	A	E	A	E	A	
Approach Vol, veh/h		1615			2102			2			619	A
Approach Delay, s/veh		30.7			27.9			68.3			75.2	
Approach LOS		C			C			E			E	
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		83.5		56.5		83.5	49.0	7.5				
Change Period (Y+Rc), s		7.0		7.0		7.0	7.0	7.0				
Max Green Setting (Gmax), s		70.0		56.0		70.0	42.0	7.0				
Max Q Clear Time (g_c+I1), s		80.5		0.0		56.2	46.0	2.1				
Green Ext Time (p_c), s		0.0		0.0		9.9	0.0	0.0				

Intersection Summary	
HCM 6th Ctrl Delay	35.7
HCM 6th LOS	D

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	241	141	477	755
Demand Flow Rate, veh/h	246	145	486	770
Vehicles Circulating, veh/h	692	633	248	123
Vehicles Exiting, veh/h	201	101	690	655
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.2	7.4	8.5	11.2
Approach LOS	B	A	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	246	145	486	770
Cap Entry Lane, veh/h	681	724	1071	1217
Entry HV Adj Factor	0.981	0.975	0.981	0.981
Flow Entry, veh/h	241	141	477	755
Cap Entry, veh/h	669	705	1051	1194
V/C Ratio	0.361	0.200	0.454	0.633
Control Delay, s/veh	10.2	7.4	8.5	11.2
LOS	B	A	A	B
95th %tile Queue, veh	2	1	2	5

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	17	28	392	6	34	564
Future Vol, veh/h	17	28	392	6	34	564
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	88	90	90	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	31	445	7	38	641

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1166	449	0	0	452	0
Stage 1	449	-	-	-	-	-
Stage 2	717	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	214	610	-	-	1109	-
Stage 1	643	-	-	-	-	-
Stage 2	484	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	203	610	-	-	1109	-
Mov Cap-2 Maneuver	203	-	-	-	-	-
Stage 1	643	-	-	-	-	-
Stage 2	458	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.1	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	347	1109	-
HCM Lane V/C Ratio	-	-	0.144	0.034	-
HCM Control Delay (s)	-	-	17.1	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Vol, veh/h	0	1941	1716	21	0	6
Future Vol, veh/h	0	1941	1716	21	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	83	82	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2339	2093	23	0	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	1058
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	221
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	221
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	21.8
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	221
HCM Lane V/C Ratio	-	-	-	0.03
HCM Control Delay (s)	-	-	-	21.8
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	293	1263	131	213	1538	71	134	138	144	57	197	380
Future Volume (veh/h)	293	1263	131	213	1538	71	134	138	144	57	197	380
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1841	1870	1870	1841	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	357	1540	0	288	2078	0	197	203	0	97	334	0
Peak Hour Factor	0.82	0.82	0.82	0.74	0.74	0.74	0.68	0.68	0.68	0.59	0.59	0.59
Percent Heavy Veh, %	2	4	2	2	4	2	2	2	2	2	2	2
Cap, veh/h	242	1974		410	1937		210	469		259	469	
Arrive On Green	0.21	1.00	0.00	0.10	0.55	0.00	0.06	0.13	0.00	0.06	0.13	0.00
Sat Flow, veh/h	1781	3497	1585	1781	3497	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	357	1540	0	288	2078	0	197	203	0	97	334	0
Grp Sat Flow(s),veh/h/ln	1781	1749	1585	1781	1749	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	15.0	0.0	0.0	9.4	77.5	0.0	9.0	7.4	0.0	6.5	12.6	0.0
Cycle Q Clear(g_c), s	15.0	0.0	0.0	9.4	77.5	0.0	9.0	7.4	0.0	6.5	12.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	242	1974		410	1937		210	469		259	469	
V/C Ratio(X)	1.47	0.78		0.70	1.07		0.94	0.43		0.37	0.71	
Avail Cap(c_a), veh/h	242	1974		416	1937		210	965		259	965	
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	43.3	0.0	0.0	10.2	31.2	0.0	56.0	55.9	0.0	48.0	58.2	0.0
Incr Delay (d2), s/veh	234.1	3.1	0.0	5.2	43.2	0.0	45.2	0.6	0.0	0.9	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.9	0.9	0.0	3.9	40.6	0.0	5.1	3.3	0.0	2.9	5.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	277.4	3.1	0.0	15.4	74.4	0.0	101.2	56.6	0.0	48.9	60.2	0.0
LnGrp LOS	F	A		B	F		F	E		D	E	
Approach Vol, veh/h		1897	A		2366	A		400	A		431	A
Approach Delay, s/veh		54.8			67.2			78.6			57.7	
Approach LOS		D			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.5	84.0	14.0	23.5	20.0	82.5	14.0	23.5
Change Period (Y+Rc), s	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Max Green Setting (Gmax), s	12.0	57.0	7.0	36.0	13.0	56.0	7.0	36.0
Max Q Clear Time (g_c+I1), s	11.4	2.0	11.0	14.6	17.0	79.5	8.5	9.4
Green Ext Time (p_c), s	0.1	15.3	0.0	1.9	0.0	0.0	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	62.7
HCM 6th LOS	E

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Edition cannot analyze u-turn movements.

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	32	1334	0	10	0	1503	542	1	3	0	344	0
Future Volume (vph)	32	1334	0	10	0	1503	542	1	3	0	344	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160		0		225		150	0		0	300	
Storage Lanes	1		0		1		1	0		0	1	
Taper Length (ft)	100				100			100			100	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt							0.850					
Flt Protected	0.950				0.950				0.988		0.950	
Satd. Flow (prot)	1770	3471	0	0	1770	3471	1583	0	1840	0	1770	1863
Flt Permitted	0.052				0.104				0.914		0.615	
Satd. Flow (perm)	97	3471	0	0	194	3471	1583	0	1703	0	1146	1863
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		55				55			25			40
Link Distance (ft)		1568				1660			105			735
Travel Time (s)		19.4				20.6			2.9			12.5
Peak Hour Factor	0.84	0.84	0.84	0.78	0.78	0.78	0.78	0.25	0.25	0.25	0.90	0.90
Heavy Vehicles (%)	2%	4%	2%	2%	2%	4%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	38	1588	0	13	0	1927	695	4	12	0	382	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	1588	0	0	13	1927	695	0	16	0	382	0
Turn Type	Perm	NA		Perm	Perm	NA	Perm	Perm	NA		pm+pt	
Protected Phases		2				6			8		7	4
Permitted Phases	2			6	6		6	8			4	
Detector Phase	2	2		6	6	6	6	8	8		7	4
Switch Phase												
Minimum Initial (s)	14.0	14.0		14.0	14.0	14.0	14.0	7.0	7.0		7.0	7.0
Minimum Split (s)	21.0	21.0		21.0	21.0	21.0	21.0	14.0	14.0		14.0	14.0
Total Split (s)	97.0	97.0		97.0	97.0	97.0	97.0	14.0	14.0		29.0	43.0
Total Split (%)	69.3%	69.3%		69.3%	69.3%	69.3%	69.3%	10.0%	10.0%		20.7%	30.7%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0			-2.0	-2.0	-2.0		-2.0		-2.0	-2.0
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0		5.0		5.0	5.0
Lead/Lag								Lag	Lag		Lead	
Lead-Lag Optimize?								Yes	Yes		Yes	
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	C-Max	None	None		None	None
Act Effct Green (s)	100.4	100.4			100.4	100.4	100.4		9.0		29.6	
Actuated g/C Ratio	0.72	0.72			0.72	0.72	0.72		0.06		0.21	
v/c Ratio	0.55	0.64			0.09	0.77	0.61		0.15		1.09	
Control Delay	47.6	12.8			4.6	7.1	5.1		65.2		125.4	
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0		0.0	
Total Delay	47.6	12.8			4.6	7.1	5.1		65.2		125.4	
LOS	D	B			A	A	A		E		F	
Approach Delay		13.6				6.6			65.3			114.4
Approach LOS		B				A			E			F
Queue Length 50th (ft)	12	300			2	208	119		14		~435	

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Storage Length (ft)	130
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	2%
Adj. Flow (vph)	60
Shared Lane Traffic (%)	
Lane Group Flow (vph)	60
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Detector Phase	4
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	43.0
Total Split (%)	30.7%
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	29.6
Actuated g/C Ratio	0.21
v/c Ratio	0.18
Control Delay	44.4
Queue Delay	0.0
Total Delay	44.4
LOS	D
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	48

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Length 95th (ft)	#82	463			m2	m202	m130		10		#533	
Internal Link Dist (ft)		1488				1580			25			655
Turn Bay Length (ft)	160				225		150				300	
Base Capacity (vph)	69	2489			138	2489	1135		109		349	
Starvation Cap Reductn	0	0			0	0	0		0		0	
Spillback Cap Reductn	0	0			0	0	0		0		0	
Storage Cap Reductn	0	0			0	0	0		0		0	
Reduced v/c Ratio	0.55	0.64			0.09	0.77	0.61		0.15		1.09	

Intersection Summary

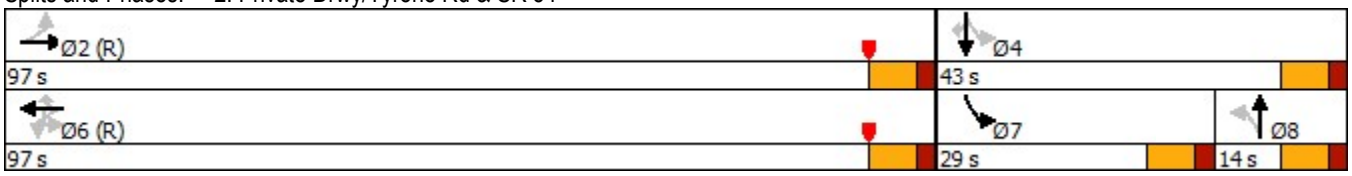
Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 33 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 19.3 Intersection LOS: B
Intersection Capacity Utilization 75.6% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

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

Splits and Phases: 2: Private Drwy/Tyrone Rd & SR 54



Lane Group	SBR
Queue Length 95th (ft)	81
Internal Link Dist (ft)	
Turn Bay Length (ft)	130
Base Capacity (vph)	429
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.14

Intersection Summary

Intersection	
Intersection Delay, s/veh	10.2
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	238	139	676	620
Demand Flow Rate, veh/h	242	141	689	632
Vehicles Circulating, veh/h	453	830	251	128
Vehicles Exiting, veh/h	307	110	444	843
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.2	9.3	12.7	8.9
Approach LOS	A	A	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	242	141	689	632
Cap Entry Lane, veh/h	869	592	1068	1211
Entry HV Adj Factor	0.982	0.985	0.981	0.981
Flow Entry, veh/h	238	139	676	620
Cap Entry, veh/h	853	583	1048	1188
V/C Ratio	0.278	0.238	0.645	0.522
Control Delay, s/veh	7.2	9.3	12.7	8.9
LOS	A	A	B	A
95th %tile Queue, veh	1	1	5	3

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	35	574	3	15	379
Future Vol, veh/h	19	35	574	3	15	379
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	39	638	3	17	421

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1095	640	0	0	641	0
Stage 1	640	-	-	-	-	-
Stage 2	455	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	236	475	-	-	943	-
Stage 1	525	-	-	-	-	-
Stage 2	639	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	230	475	-	-	943	-
Mov Cap-2 Maneuver	230	-	-	-	-	-
Stage 1	525	-	-	-	-	-
Stage 2	624	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.6	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	346	943	-
HCM Lane V/C Ratio	-	-	0.173	0.018	-
HCM Control Delay (s)	-	-	17.6	8.9	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Vol, veh/h	0	1685	2044	9	0	10
Future Vol, veh/h	0	1685	2044	9	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	82	78	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2055	2621	10	0	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	1316
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	148
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	148
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	31.3
HCM LOS			D

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	148
HCM Lane V/C Ratio	-	-	-	0.075
HCM Control Delay (s)	-	-	-	31.3
HCM Lane LOS	-	-	-	D
HCM 95th %tile Q(veh)	-	-	-	0.2

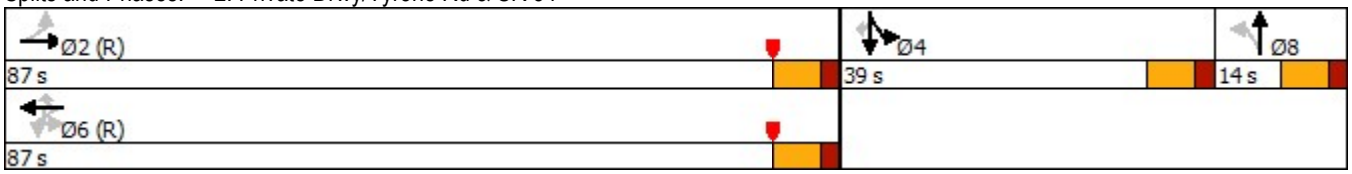
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	1397	1	0	1365	358	0	1	0	545	0	36
Future Volume (vph)	39	1397	1	0	1365	358	0	1	0	545	0	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160		0	225		150	0		0	300		130
Storage Lanes	1		0	1		1	0		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt						0.850						0.850
Flt Protected	0.950									0.950	0.950	
Satd. Flow (prot)	1770	3539	0	1863	3539	1583	0	1863	0	1681	1681	1583
Flt Permitted	0.078									0.950	0.950	
Satd. Flow (perm)	145	3539	0	1863	3539	1583	0	1863	0	1681	1681	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			25			40	
Link Distance (ft)		1568			1660			105			735	
Travel Time (s)		19.4			20.6			2.9			12.5	
Peak Hour Factor	0.89	0.89	0.89	0.82	0.82	0.82	0.50	0.50	0.50	0.88	0.88	0.88
Adj. Flow (vph)	44	1570	1	0	1665	437	0	2	0	619	0	41
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	44	1571	0	0	1665	437	0	2	0	309	310	41
Turn Type	Perm	NA		Perm	NA	Perm		NA		Split	NA	Perm
Protected Phases		2			6			8		4	4	
Permitted Phases	2			6		6	8					4
Detector Phase	2	2		6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	14.0	14.0		14.0	14.0	14.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	21.0	21.0		21.0	21.0	21.0	14.0	14.0		14.0	14.0	14.0
Total Split (s)	87.0	87.0		87.0	87.0	87.0	14.0	14.0		39.0	39.0	39.0
Total Split (%)	62.1%	62.1%		62.1%	62.1%	62.1%	10.0%	10.0%		27.9%	27.9%	27.9%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0		5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Act Effct Green (s)	96.0	96.0			96.0	96.0		9.0		31.2	31.2	31.2
Actuated g/C Ratio	0.69	0.69			0.69	0.69		0.06		0.22	0.22	0.22
v/c Ratio	0.44	0.65			0.69	0.40		0.02		0.83	0.83	0.12
Control Delay	31.8	15.3			5.4	2.9		62.0		70.1	70.4	42.8
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	31.8	15.3			5.4	2.9		62.0		70.1	70.4	42.8
LOS	C	B			A	A		E		E	E	D
Approach Delay		15.8			4.9			62.0			68.5	
Approach LOS		B			A			E			E	
Queue Length 50th (ft)	17	392			86	14		2		276	277	29
Queue Length 95th (ft)	#86	617			m611	m161		6		385	386	61

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1488			1580			25			655	
Turn Bay Length (ft)	160					150				300		130
Base Capacity (vph)	99	2426			2426	1085		119		408	408	384
Starvation Cap Reductn	0	0			0	0		0		0	0	0
Spillback Cap Reductn	0	0			0	0		0		0	0	0
Storage Cap Reductn	0	0			0	0		0		0	0	0
Reduced v/c Ratio	0.44	0.65			0.69	0.40		0.02		0.76	0.76	0.11

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 77 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 18.5 Intersection LOS: B
Intersection Capacity Utilization 68.7% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Private Drwy/Tyrone Rd & SR 54



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	32	1334	0	10	0	1503	542	1	3	0	344	0
Future Volume (vph)	32	1334	0	10	0	1503	542	1	3	0	344	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	160		0		225		150	0		0	300	
Storage Lanes	1		0		1		1	0		0	1	
Taper Length (ft)	100				100			100			100	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95
Frt							0.850					
Flt Protected	0.950				0.950				0.988		0.950	0.950
Satd. Flow (prot)	1770	3471	0	0	1770	3471	1583	0	1840	0	1681	1681
Flt Permitted	0.056				0.108				0.851		0.950	0.950
Satd. Flow (perm)	104	3471	0	0	201	3471	1583	0	1585	0	1681	1681
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		55				55			25			40
Link Distance (ft)		1568				1660			105			735
Travel Time (s)		19.4				20.6			2.9			12.5
Peak Hour Factor	0.84	0.84	0.84	0.78	0.78	0.78	0.78	0.25	0.25	0.25	0.90	0.90
Heavy Vehicles (%)	2%	4%	2%	2%	2%	4%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	38	1588	0	13	0	1927	695	4	12	0	382	0
Shared Lane Traffic (%)											50%	
Lane Group Flow (vph)	38	1588	0	0	13	1927	695	0	16	0	191	191
Turn Type	Perm	NA		Perm	Perm	NA	Perm	Perm	NA		Split	NA
Protected Phases		2				6			8		4	4
Permitted Phases	2			6	6		6	8				
Detector Phase	2	2		6	6	6	6	8	8		4	4
Switch Phase												
Minimum Initial (s)	14.0	14.0		14.0	14.0	14.0	14.0	7.0	7.0		7.0	7.0
Minimum Split (s)	21.0	21.0		21.0	21.0	21.0	21.0	14.0	14.0		14.0	14.0
Total Split (s)	95.0	95.0		95.0	95.0	95.0	95.0	15.0	15.0		30.0	30.0
Total Split (%)	67.9%	67.9%		67.9%	67.9%	67.9%	67.9%	10.7%	10.7%		21.4%	21.4%
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0			-2.0	-2.0	-2.0		-2.0		-2.0	-2.0
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0		5.0		5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max		C-Max	C-Max	C-Max	C-Max	None	None		None	None
Act Effct Green (s)	102.3	102.3			102.3	102.3	102.3		9.3		21.8	21.8
Actuated g/C Ratio	0.73	0.73			0.73	0.73	0.73		0.07		0.16	0.16
v/c Ratio	0.51	0.63			0.09	0.76	0.60		0.15		0.73	0.73
Control Delay	41.1	12.4			4.9	6.8	4.9		65.0		72.5	72.5
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0		0.0	0.0
Total Delay	41.1	12.4			4.9	6.8	4.9		65.0		72.5	72.5
LOS	D	B			A	A	A		E		E	E
Approach Delay		13.1				6.3			65.0			69.9
Approach LOS		B				A			E			E
Queue Length 50th (ft)	11	290			1	197	113		14		174	174

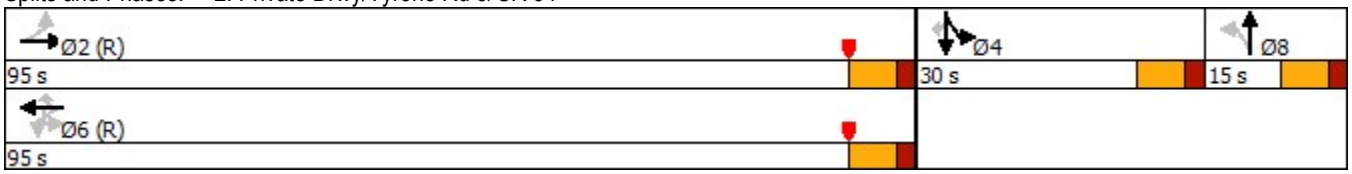
Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Storage Length (ft)	130
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	2%
Adj. Flow (vph)	60
Shared Lane Traffic (%)	
Lane Group Flow (vph)	60
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Detector Phase	4
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	30.0
Total Split (%)	21.4%
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	21.8
Actuated g/C Ratio	0.16
v/c Ratio	0.24
Control Delay	53.2
Queue Delay	0.0
Total Delay	53.2
LOS	D
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	48

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Length 95th (ft)	#79	485			m2	m202	m139		10		262	262
Internal Link Dist (ft)		1488				1580			25			655
Turn Bay Length (ft)	160				225		150				300	
Base Capacity (vph)	75	2535			146	2535	1156		113		300	300
Starvation Cap Reductn	0	0			0	0	0		0		0	0
Spillback Cap Reductn	0	0			0	0	0		0		0	0
Storage Cap Reductn	0	0			0	0	0		0		0	0
Reduced v/c Ratio	0.51	0.63			0.09	0.76	0.60		0.14		0.64	0.64

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 33 (24%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 14.8 Intersection LOS: B
Intersection Capacity Utilization 66.1% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Private Drwy/Tyrone Rd & SR 54



Lane Group	SBR
Queue Length 95th (ft)	92
Internal Link Dist (ft)	
Turn Bay Length (ft)	130
Base Capacity (vph)	282
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.21

Intersection Summary