TRANSPORTATION ANALYSIS

Keiser – New Port Richey

Prepared for:

Tampa Civil Design

Palm Traffic
Engineering + Planning

Transportation Analysis

Keiser – New Port Richey

May 2020
Revised June 2020
Revised July 2021

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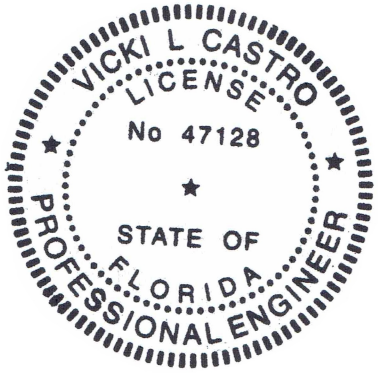

Vicki L Castro

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Vicki L. Castro, P.E.
P.E. No. 47128

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INTRODUCTION

The purpose of this report is to provide the Transportation Analysis to support the FDOT connection permit application for the property located east of US 19 and south of Main Street in the City of New Port Richey, Pasco County, as shown in Figure 1. This property is currently owned by the City of New Port Richey.

PROJECT DESCRIPTION

The project site is currently occupied by three vacant buildings. The proposed connection permit application is for an approximate 41,000 square foot Keiser University building. The City of New Port Richey will retain the two remaining parcels that will share the proposed driveway connections. At the current time, the exact use of the remaining land is not defined. However, based on the information provided by the City, we have assumed the following uses on these parcels:

- 89 room hotel
- 270 space parking garage.

The accesses for the project are proposed to be as follows:

- One (1) right-in/right-out access to US 19
- One (1) full cross access to Main Street.

A conceptual site plan is included in the Appendix of this report.

Figure 1. Project Location

ESTIMATED PROJECT TRAFFIC

The trip rates utilized in this report for the university and hotel were obtained from the latest computerized version of "OTISS" which utilizes the Institute of Transportation Engineers' (ITE) Trip Generation, 10th Edition, 2017, as its data base. ITE Trip Generation does not have rates for parking garage. Therefore, the hourly utilization was assumed based on the location and anticipated use of the garage. The assumptions are included in the appendix. Based on these trip rates, it is estimated that the proposed project will attract approximately 2,927 daily trip ends, as shown in Table 1. The proposed project would attract approximately 152 trip ends during the AM peak hour with 92 inbound and 60 outbound, as shown in Table 1. During the PM peak hour, the proposed project would attract approximately 157 trip ends with 70 inbound and 87 outbound, as shown in Table 1.

ANALYSIS PERIOD

The study period will be for the AM and PM peak hours.

PROJECT TRIP DISTRIBUTION / ASSIGNMENT

The following distribution of the AM and PM peak hour trip ends were based on the existing traffic and development patterns with hand assignment to the local network:

- 35% to and from the north (via US 19)
- 35% to and from the south (via US 19)
- 30% to and from the east (via Main Street).

Table 2 shows the distribution of the AM and PM peak hour project trip ends. Figure 2 illustrates the project trip ends on the adjacent roadway network for the AM and PM peak hour.

Table 1. Estimated Project Traffic

Land Use	ITE LUC	Size	Daily Trip Ends (1)	AM Peak Hour Trip Ends (1) In	AM Peak Hour Trip Ends (1) Out	AM Peak Hour Trip Ends (1) Total	PM Peak Hour Trip Ends (1) In	PM Peak Hour Trip Ends (1) Out	PM Peak Hour Trip Ends (1) Total
University	550	41,000 SF	1,068	35	10	45	15	33	48
Hotel	310	89 Rooms	744	23	16	39	21	20	41
Parking Garage (2)	NA	270 Spaces	1,115	34	34	68	34	34	68
		Total	2,927	92	60	152	70	87	157

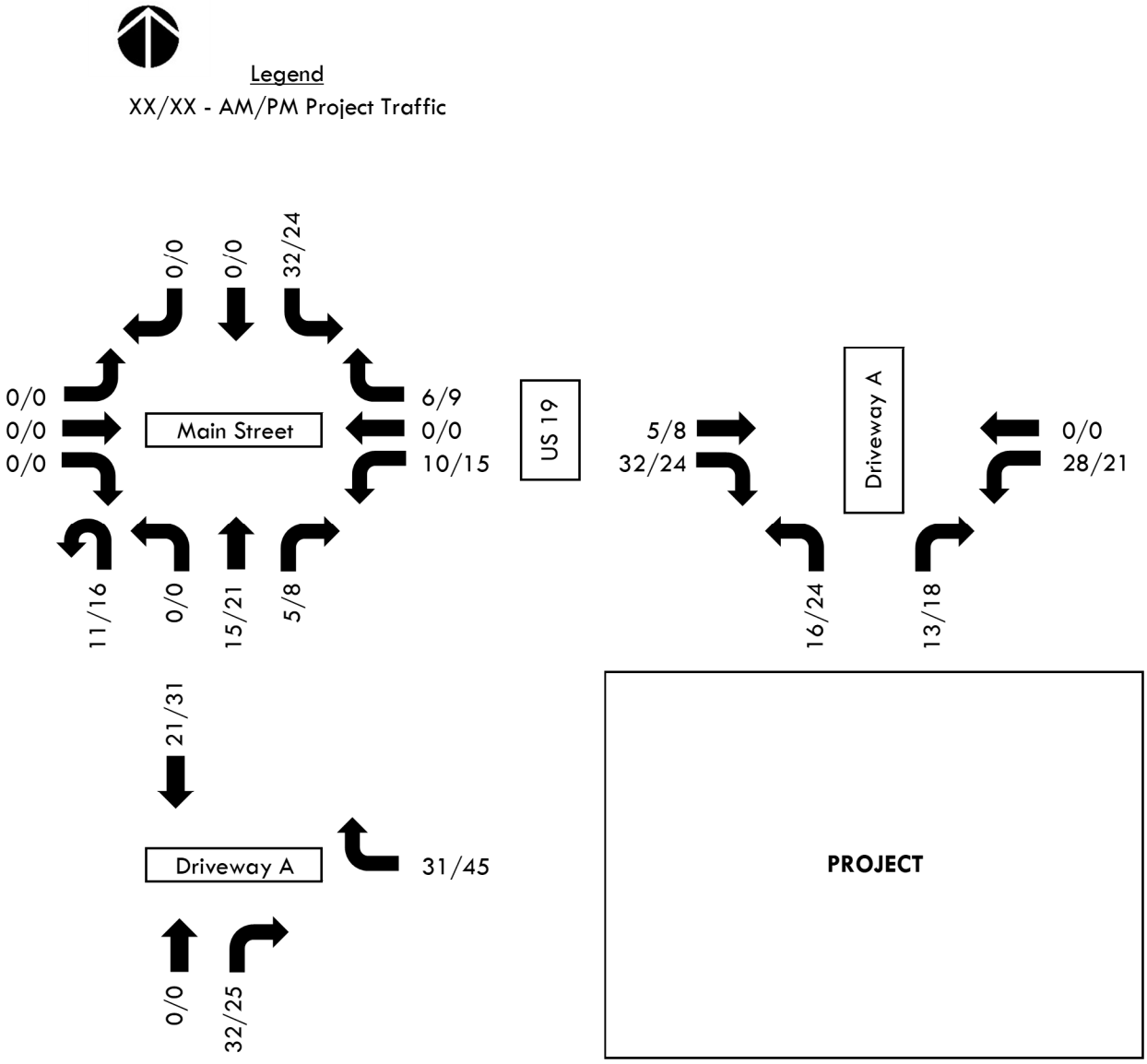
(1) Source: ITE Trip Generation, 10th Edition, 2017.

(2) ITE does not have trip generation. Assumed certain percent utilization hourly to determine daily, AM and PM trips.

Table 2. Estimated Peak Hour Project Traffic Distribution

Time	North (35%)		South (35%)		East (30%)		Total	
Period	In	Out	In	Out	In	Out	In	Out
AM	32	21	32	21	28	18	92	60
PM	24	30	25	31	21	26	70	87

Figure 2. Peak Hour Project Traffic



ADJACENT ROADWAYS

As stated previously, the site is located east of US 19 and south of Main Street. US 19 is a six (6) lane divided roadway and Main Street is a four (4) lane divided roadway in the vicinity of the project. According to Pasco County and the Florida Department of Transportation (FDOT) Capital Improvement Programs, there are no capacity adding improvements budgeted in the vicinity of the project.

PEAK SEASON TRAFFIC

The following methodology was utilized to estimate the existing volumes within the study area:

1. PALM TRAFFIC obtained AM and PM turning movement counts at the following intersections:

    - US 19 and Main Street.

    Due the current Coronavirus Pandemic, realistic data collection was not feasible. Historic counts were available at the intersection from 2017. The count was adjusted to peak season based on the 2017 FDOT Peak Season Correction Factor (PSCF) for Pasco County. Figure 3 illustrates the existing traffic and Figure 4 illustrates the peak season traffic.

2. The FDOT Historical AADT were used to calculate the annual growth rate to adjust the 2017 data to 2020. Based on the data, there has be no growth over the past ten years in the area with some years showing negative growth. To be conservative, a 1.0% annual growth was used to determine the 2020 peak season traffic. Figure 5 illustrates the 2020 peak season traffic and Figure 6 illustrates the 2020 Peak Season plus project traffic.

Figure 3. Existing Traffic

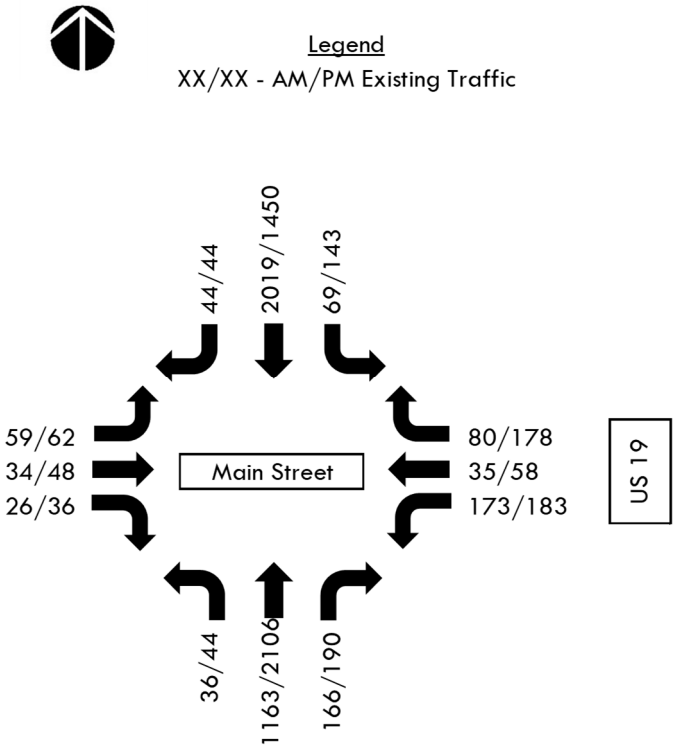


Figure 4. Peak Season Traffic

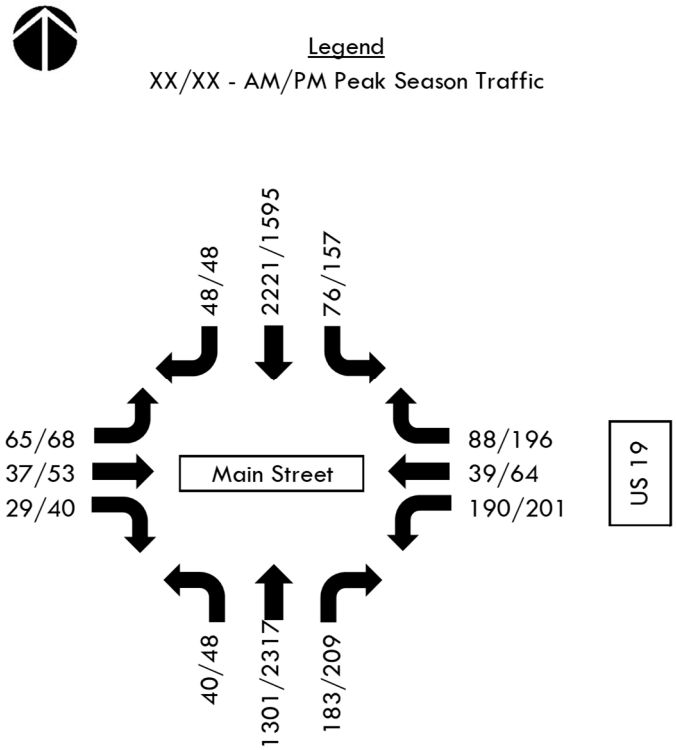


Figure 5. 2020 Peak Season

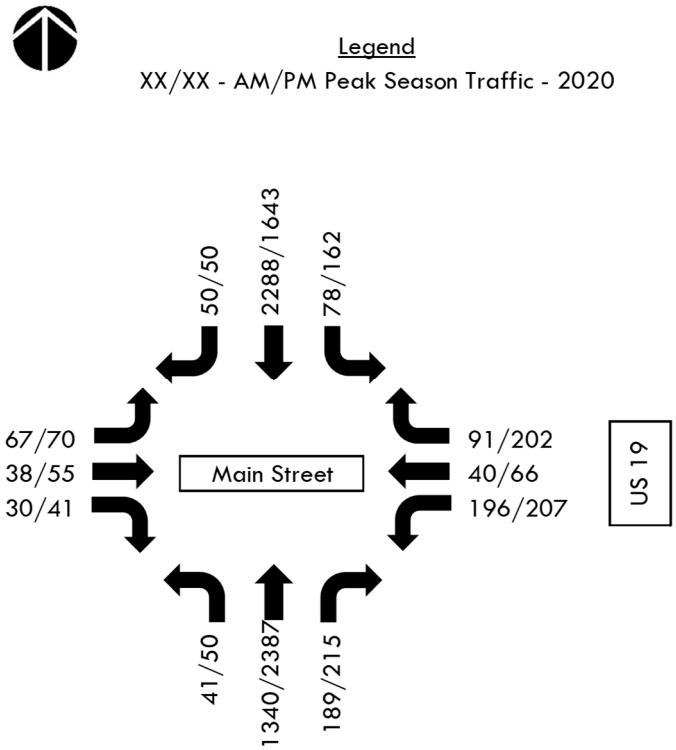
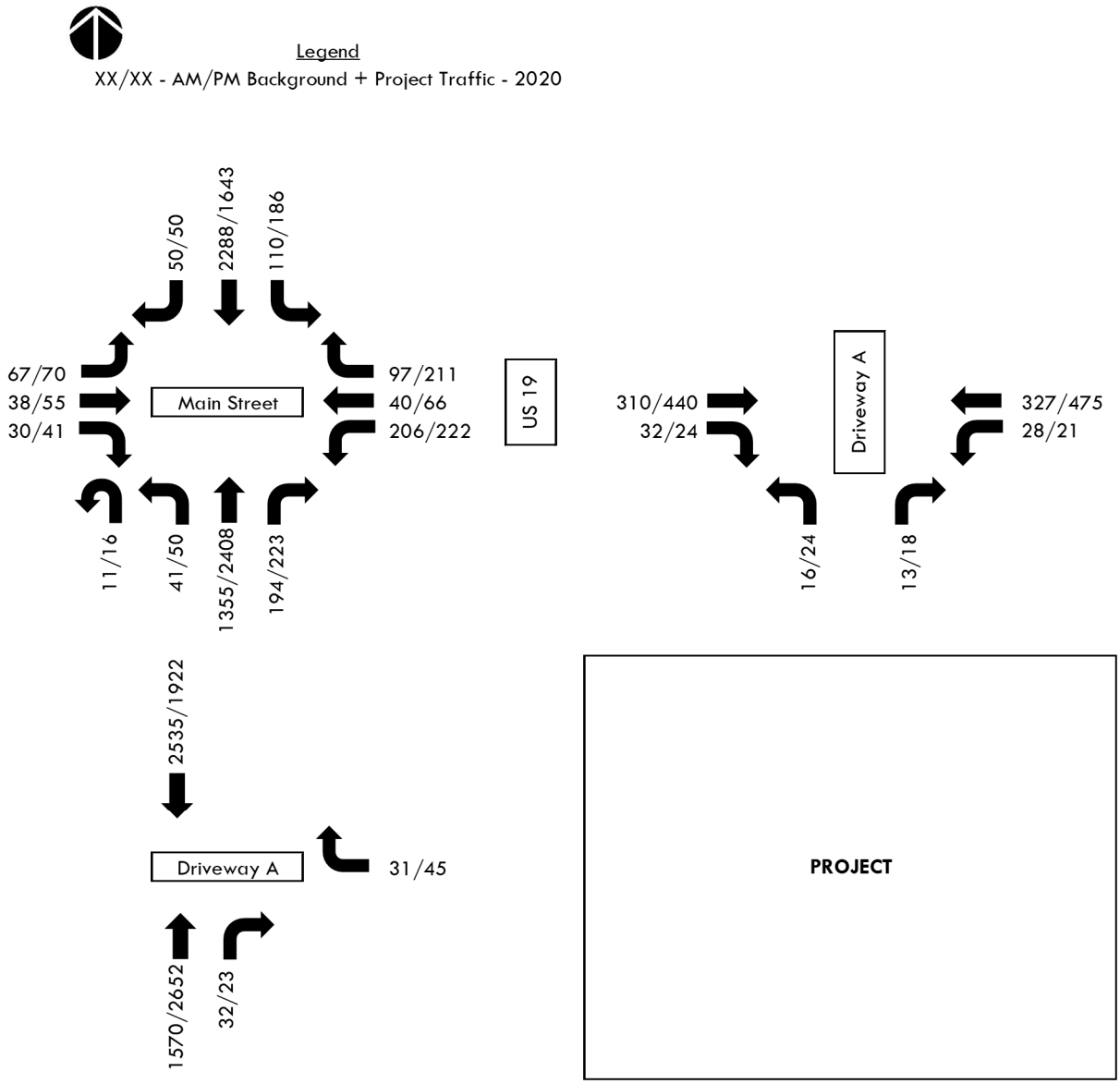


Figure 6. 2020 Peak Season + Project Traffic



INTERSECTION ANALYSIS

Intersection analysis was conducted for the AM and PM peak hours at the following intersections within the study network:

- US 19 and Main Street
- US 19 and Project Driveway A
- Main Street and Project Driveway B.

The analysis was based on SYNCHRO with the proposed project traffic. Table 3 summarizes the analysis for the intersections and are described in detail in the following paragraphs.

US 19 and Main Street

This intersection is signalized. Signalized intersection analysis indicates the intersection should operates with a LOS D during the AM and PM peak hours. In addition, all movements should operate with a volume to capacity ratio less than 1.0 during the AM and PM peak hours with the peak season plus project traffic, as shown in Table 3.

US 19 and Project Driveway A

This proposed driveway is unsignalized with right-in/right-out access to US 19. Unsignalized intersection analysis indicates the intersection should operate with a LOS A during the AM peak hour and a LOS B during the PM peak hour. In addition, all movements should operate with a volume to capacity ratio less than 1.0 during the AM and PM peak hours with the peak season plus project traffic, as shown in Table 3.

Main Street and Project Driveway B

This proposed driveway is unsignalized with full access to Main Street. Unsignalized intersection analysis indicates the intersection should operate with a LOS A during the AM and PM peak hours. In addition, all the movements at this intersection should operate an acceptable level of service during the AM and PM peak hours with the peak season plus project traffic, as shown in Table 3.

Table 3. Estimated Volume to Capacity Ratio

Intersection	AM Peak Hour Peak Season + Project Volume to Capacity Ratio					PM Peak Hour Peak Season + Project Volume to Capacity Ratio			
	LOS	Direction	Left	Through	Right	LOS	Left	Through	Right
US 19 and Main Street	D	EB	0.35	0.33	0.33	D	0.50	0.61	0.61
		WB	0.42	0.43	0.27		0.74	0.74	0.66
		NB	0.50	0.59	0.24		0.58	0.96	0.26
		SB	0.52	0.96	0.06		0.63	0.61	0.06
US 19 and Driveway A	A	WB	-	-	0.07	B	-	-	0.18
		NB	-	0.39	0.21		-	0.66	0.34
		SB	-	0.52	-		-	0.40	-
Main Street and Driveway B	A	EB	-	0.13	0.08	A	-	0.01	0.28
		WB	0.02	0.08	-		0.02	0.12	-
		NB	0.05	-	0.05		0.07	-	0.07

ACCESS RECOMMENDATIONS

The recommendations included in this report are based on a field review of the site, the proposed site plan and the Transportation Analysis. The FDOT Access Management Guidebook 2019 was utilized to determine the need for right turn lanes on US 19 and Pasco County LDC 6.04.04.D was utilized to determine the need for right and left turn lanes on Main Street. The access recommendations are summarized in Table 4 and described in the following paragraph:

US 19 and Project Driveway A

The project driveway is proposed to have right-in/right-out access to US 19. Based on the estimated project traffic, a northbound right turn lane is not warranted.

Main Street and Project Driveway B

The project driveway is proposed to have full access to Main Street. Based on the estimated project traffic, an eastbound right turn lane is not warranted and a westbound left turn lane is not warranted. There is an existing eastbound left turn lane that is approximately 95 feet, which includes a 50-foot taper.

Table 4. Access Recommendations

Intersection	Movement	Peak Hour Volume (1)	Warranted?
US 19 and Project Driveway A	NBR	32/23	N
	EBR	32/24	N
Main Street and Project Driveway B	WBL	28/21	N

(1) See Figure 6, 2020 Peak Season Plus Project Traffic, from the report.

QUEUE LENGTH DETERMINATION

The existing northbound and southbound turn lanes which contain project traffic at the intersection of US 19 and Main Street were evaluated to determine the 95th percentile queue for the 2020 peak season plus project traffic based on the Synchro analysis. Table 5 summarizes the results of the queue length determination.

Table 5. Queue Length Evaluation

Intersection	Movement	Volume (1)	Queue Storage (2)	Total Deceleration Length (3)	Total Length	Existing Length (4)	Proposed Length
US 19 and Main Street	NBL	52/66	111'/121'	240'	365'	375'	365'
	NBR	194/223	64'/99'	240'	340'	420'	340'
	SBL	110/186	100'/138'	240'	380'	540'	540'

(1) 2020 Peak Season plus project traffic, see Figure 6 of this report.

(2) Based on 95th percentile queue storage from Synchro, minimum of 50' for left turn lanes.

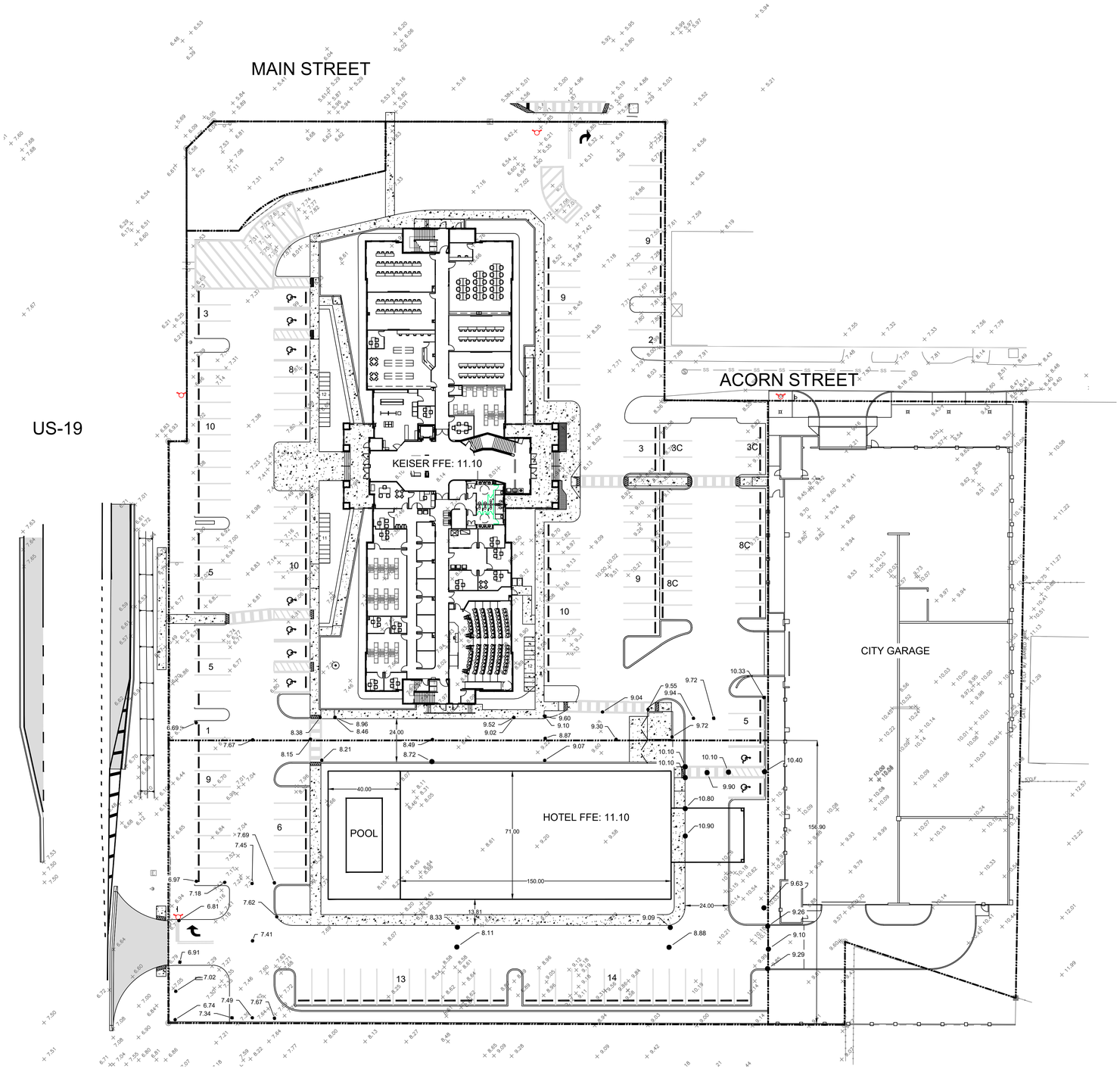
(3) Based on FDOT Standard Plans 711-001 and the posted speed limit of 45 mph on US 19.

(4) Existing turn lane tapers are not the 50' design.

APPENDIX

APPENDIX

CONCEPTUAL SITE PLAN



NORTH

SCALE: 1"= 30'

0' 15' 30' 60'

GRAPHIC SCALE
(IN FEET)

TAMPA CIVIL DESIGN
17937 HUNTING BOW CIR. S-102
LUTZ, FL 33558
(813) 920-2005 PHONE
(813) 482-9128 FAX
WWW.TAMPACIVIL.COM
COA: 28971

PROJECT: 499

CLIENT:

KEENAN DEVELOPMENT GROUP
1900 WEST COMMERCIAL BOULEVARD SUITE-200
FT. LAUDERDALE FL, 33309

REVISION	DATE
HOTEL CONCEPT	05-21-2021

DES. J.C. DRFT. J.O.

HOTEL CONCEPT

SHEET NO:
HCP-1

APPENDIX

TRIP GENERATION

TABLE A-1

PARKING UTILIZATION - 270 SPACES

Time	Percent Utilization	Trips
12-1 AM	5%	14
1-2 AM	5%	14
2-3 AM	5%	14
3-4 AM	5%	14
4-5 AM	5%	14
5-6 AM	10%	27
6-7 AM	10%	27
7-8 AM	15%	41
8-9 AM	25%	68
9-10 AM	25%	68
10-11 AM	25%	68
11 - noon	30%	81
noon-1 PM	30%	81
1-2 PM	30%	81
2-3 PM	25%	68
3-4 PM	25%	68
4-5 PM	25%	68
5-6 PM	25%	68
6-7 PM	25%	68
7-8 PM	20%	54
8-9 PM	20%	54
9-10 PM	10%	27
10-11 PM	5%	14
11-12 PM	5%	14
	Total Trips	1,115

PERIOD SETTING

Analysis Name :	Daily		
Project Name :	Keiser University - New Port Richey Buildout	**No :**	
Date:	7/19/2021	**City:**	
State/Province:		**Zip/Postal Code:**	
Country:		**Client Name:**	
Analyst's Name:		**Edition:**	Trip Gen Manual, 10th Ed

Land Use	Independent Variable	Size	Time Period	Method	Entry	Exit	Total
550 - University/College (General Urban/Suburban)	1000 Sq. Ft. GFA	41(0)	Weekday	Average 26.04	534(1) 50%	534(1) 50%	1068(1)
310 - Hotel (General Urban/Suburban)	Rooms	89(0)	Weekday	Average 8.36	372 50%	372 50%	744

(0) indicates size out of range.
(1) indicates small sample size, use carefully.

TRAFFIC REDUCTIONS

Land Use	Entry Reduction	Adjusted Entry	Exit Reduction	Adjusted Exit
550 - University/College	0 %	534	0 %	534
310 - Hotel	0 %	372	0 %	372

INTERNAL TRIPS

550 - University/College

Exit	534	Demand Exit:	0 % (0)	Balanced: 0	Demand Entry:	0 % (0)	**Entry** 372
Entry	534	Demand Entry:	0 % (0)	Balanced: 0	Demand Exit:	0 % (0)	**Exit** 372

310 - Hotel

550 - University/College

	Total Trips	Internal Trips 310 - Hotel	Internal Trips Total	External Trips
Entry	534 (100%)	0 (0%)	0 (0%)	534 (100%)
Exit	534 (100%)	0 (0%)	0 (0%)	534 (100%)
Total	1068 (100%)	0 (0%)	0 (0%)	1068 (100%)

310 - Hotel

	Total Trips	Internal Trips 550 - University/College	Internal Trips Total	External Trips
Entry	372 (100%)	0 (0%)	0 (0%)	372 (100%)

Exit	372 (100%)	0 (0%)	0 (0%)	372 (100%)
Total	744 (100%)	0 (0%)	0 (0%)	744 (100%)

EXTERNAL TRIPS

Land Use	External Trips	Pass-by%	Pass-by Trips	Non-pass-by Trips
550 - University/College	1068	0	0	1068
310 - Hotel	744	0	0	744

ITE DEVIATION DETAILS

Weekday

Landuse — No deviations from ITE.

Methods — No deviations from ITE.

External Trips — 550 - University/College (General Urban/Suburban)
ITE does not recommend a particular pass-by% for this case.

310 - Hotel (General Urban/Suburban)
ITE does not recommend a particular pass-by% for this case.

SUMMARY

Total Entering	906
Total Exiting	906
Total Entering Reduction	0
Total Exiting Reduction	0
Total Entering Internal Capture Reduction	0
Total Exiting Internal Capture Reduction	0
Total Entering Pass-by Reduction	0
Total Exiting Pass-by Reduction	0
Total Entering Non-Pass-by Trips	906
Total Exiting Non-Pass-by Trips	906

PERIOD SETTING

Analysis Name :	AM Peak Hour		
Project Name :	Keiser University - New Port Richey Buildout	**No :**	
Date:	7/19/2021	**City:**	
State/Province:		**Zip/Postal Code:**	
Country:		**Client Name:**	
Analyst's Name:		**Edition:**	Trip Gen Manual, 10th Ed

Land Use	Independent Variable	Size	Time Period	Method	Entry	Exit	Total
550 - University/College (General Urban/Suburban)	1000 Sq. Ft. GFA	41(0)	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Average 1.09	35(1) 78%	10(1) 22%	45(1)
310 - Hotel (General Urban/Suburban)	Rooms	89	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.	Best Fit (LIN) T = 0.5 (X)+-5.34	23 59%	16 41%	39

(0) indicates size out of range.
(1) indicates small sample size, use carefully.

TRAFFIC REDUCTIONS

Land Use	Entry Reduction	Adjusted Entry	Exit Reduction	Adjusted Exit
550 - University/College	0 %	35	0 %	10
310 - Hotel	0 %	23	0 %	16

INTERNAL TRIPS

550 - University/College **310 - Hotel**

Exit	10	Demand Exit: 0 % (0)	Balanced: 0	Demand Entry: 0 % (0)	**Entry**	23
Entry	35	Demand Entry: 0 % (0)	Balanced: 0	Demand Exit: 0 % (0)	**Exit**	16

550 - University/College

	Total Trips	Internal Trips		External Trips
		310 - Hotel	Total	
Entry	35 (100%)	0 (0%)	0 (0%)	35 (100%)
Exit	10 (100%)	0 (0%)	0 (0%)	10 (100%)
Total	45 (100%)	0 (0%)	0 (0%)	45 (100%)

310 - Hotel

	Total Trips	Internal Trips		External Trips
		550 - University/College	Total	
Entry	23 (100%)	0 (0%)	0 (0%)	23 (100%)
Exit	16 (100%)	0 (0%)	0 (0%)	16 (100%)
Total	39 (100%)	0 (0%)	0 (0%)	39 (100%)

EXTERNAL TRIPS

Land Use	External Trips	Pass-by%	Pass-by Trips	Non-pass-by Trips
550 - University/College	45	0	0	45
310 - Hotel	39	0	0	39

ITE DEVIATION DETAILS

Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.

Landuse — No deviations from ITE.

Methods — No deviations from ITE.

External Trips — 550 - University/College (General Urban/Suburban)
ITE does not recommend a particular pass-by% for this case.

310 - Hotel (General Urban/Suburban)
ITE does not recommend a particular pass-by% for this case.

SUMMARY

Total Entering	58
Total Exiting	26
Total Entering Reduction	0
Total Exiting Reduction	0
Total Entering Internal Capture Reduction	0
Total Exiting Internal Capture Reduction	0
Total Entering Pass-by Reduction	0
Total Exiting Pass-by Reduction	0
Total Entering Non-Pass-by Trips	58
Total Exiting Non-Pass-by Trips	26

PERIOD SETTING

Analysis Name :	PM Peak Hour		
Project Name :	Keiser University - New Port Richey Buildout	**No :**	
Date:	7/19/2021	**City:**	
State/Province:		**Zip/Postal Code:**	
Country:		**Client Name:**	
Analyst's Name:		**Edition:**	Trip Gen Manual, 10th Ed

Land Use	Independent Variable	Size	Time Period	Method	Entry	Exit	Total
550 - University/College (General Urban/Suburban)	1000 Sq. Ft. GFA	41(0)	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Average 1.17	15(1) 31%	33(1) 69%	48(1)
310 - Hotel (General Urban/Suburban)	Rooms	89	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.	Best Fit (LIN) T = 0.75 (X)+-26.02	21 51%	20 49%	41

(0) indicates size out of range.
(1) indicates small sample size, use carefully.

TRAFFIC REDUCTIONS

Land Use	Entry Reduction	Adjusted Entry	Exit Reduction	Adjusted Exit
550 - University/College	0 %	15	0 %	33
310 - Hotel	0 %	21	0 %	20

INTERNAL TRIPS

550 - University/College **310 - Hotel**

Exit	33	Demand Exit: 0 % (0)	Balanced: 0	Demand Entry: 0 % (0)	**Entry**	21
Entry	15	Demand Entry: 0 % (0)	Balanced: 0	Demand Exit: 0 % (0)	**Exit**	20

550 - University/College

	Total Trips	Internal Trips		External Trips
		310 - Hotel	Total	
Entry	15 (100%)	0 (0%)	0 (0%)	15 (100%)
Exit	33 (100%)	0 (0%)	0 (0%)	33 (100%)
Total	48 (100%)	0 (0%)	0 (0%)	48 (100%)

310 - Hotel

	Total Trips	Internal Trips		External Trips
		550 - University/College	Total	
Entry	21 (100%)	0 (0%)	0 (0%)	21 (100%)
Exit	20 (100%)	0 (0%)	0 (0%)	20 (100%)
Total	41 (100%)	0 (0%)	0 (0%)	41 (100%)

EXTERNAL TRIPS

Land Use	External Trips	Pass-by%	Pass-by Trips	Non-pass-by Trips
550 - University/College	48	0	0	48
310 - Hotel	41	0	0	41

ITE DEVIATION DETAILS

Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.

Landuse — No deviations from ITE.

Methods — No deviations from ITE.

External Trips — 550 - University/College (General Urban/Suburban)
ITE does not recommend a particular pass-by% for this case.

310 - Hotel (General Urban/Suburban)
ITE does not recommend a particular pass-by% for this case.

SUMMARY

Total Entering	36
Total Exiting	53
Total Entering Reduction	0
Total Exiting Reduction	0
Total Entering Internal Capture Reduction	0
Total Exiting Internal Capture Reduction	0
Total Entering Pass-by Reduction	0
Total Exiting Pass-by Reduction	0
Total Entering Non-Pass-by Trips	36
Total Exiting Non-Pass-by Trips	53

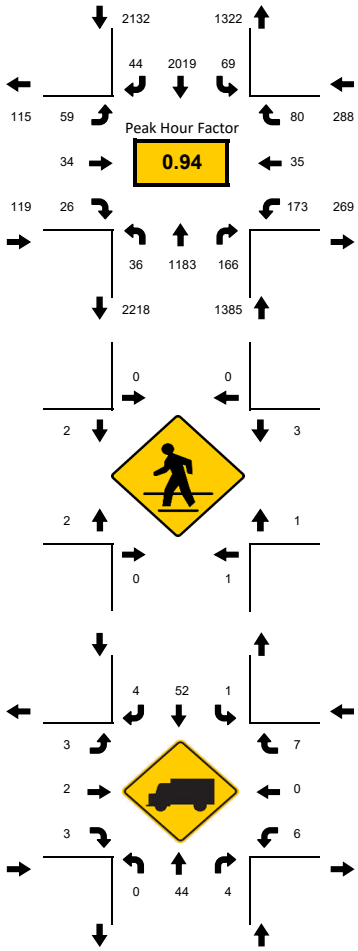
APPENDIX

TURNING MOVEMENT COUNTS

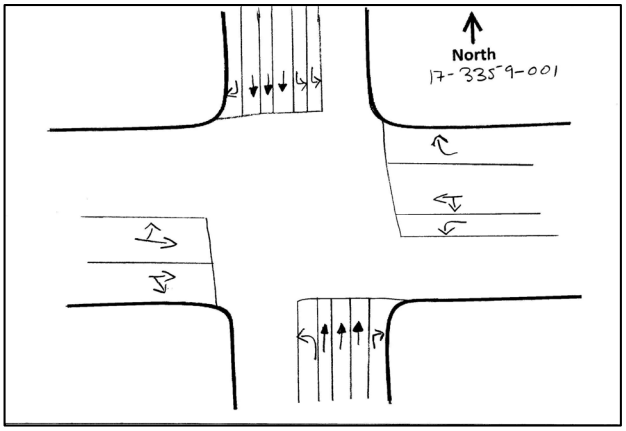
LOCATION: US 19 & Main St
CITY/STATE: New Port Richey, FL

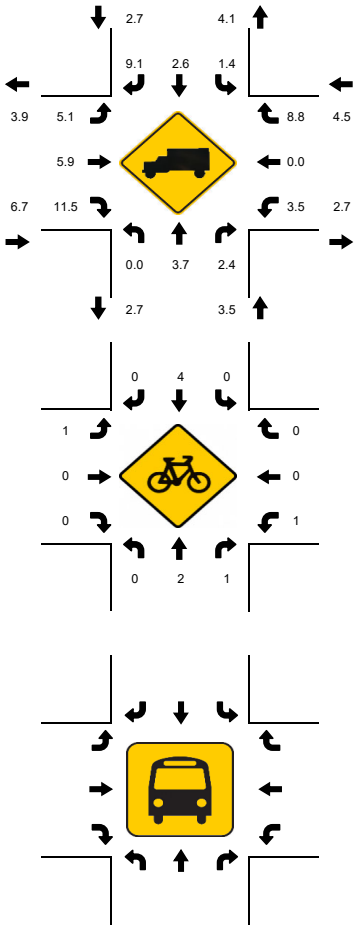
PROJECT ID: 17-3359-001
DATE: 08/16/2017

Peak-Hour: 07:15 AM - 08:15 AM
Peak 15-Minute: 07:30 AM - 07:45 AM



National Data & Surveying Services





15-Min Count Period Beginning At	US 19 Northbound					US 19 Southbound					Main St Eastbound					Main St Westbound					Total	Hourly Total
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
07:00 AM	2	220	22	1		14	500	7	1		10	9	12	0		35	2	11	0		846	3802
07:15 AM	4	248	30	0		8	494	11	1		15	9	2	0		48	10	22	0		902	3924
07:30 AM	3	330	42	2		16	544	7	2		13	7	9	0		45	4	18	0		1042	3865
07:45 AM	6	301	40	2		21	520	15	1		17	12	10	0		39	12	16	0		1012	3723
08:00 AM	11	304	54	8		17	461	11	3		14	6	5	0		41	9	24	0		968	3698
08:15 AM	1	241	33	4		21	452	6	1		8	8	7	0		35	8	18	0		843	2730
08:30 AM	7	309	36	4		22	422	5	2		10	16	5	0		33	8	21	0		900	1887
08:45 AM	8	341	37	5		40	405	9	2		19	12	16	0		52	12	29	0		987	987
Peak 15-Min Flowrates	**Northbound**					**Southbound**					**Eastbound**					**Westbound**					**Total**	
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
All Vehicles	44	1320	216	32		84	2176	60	12		68	48	40	0		192	48	96	0		**4436**	
Heavy Trucks	0	64	8			4	64	4			8	8	8			12	0	12			**192**	
Pedestrians		4					0					12					8				**24**	
Bicycles	0	4	4			0	8	0			4	0	0			4	0	0			**24**	
Railroad Stopped Buses																						

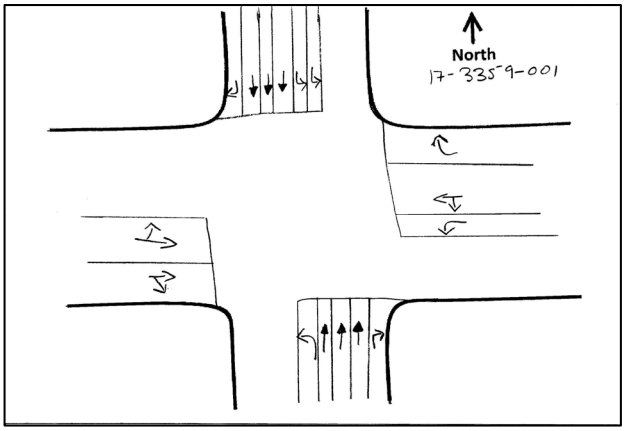
LOCATION: US 19 & Main St
CITY/STATE: New Port Richey, FL

PROJECT ID: 17-3359-001
DATE: 08/16/2017

Peak-Hour: 04:30 PM - 05:30 PM
Peak 15-Minute: 04:30 PM - 04:45 PM

Peak Hour Factor: **0.97**

National Data & Surveying Services



15-Min Count Period Beginning At	US 19 Northbound					US 19 Southbound					Main St Eastbound					Main St Westbound					Total	Hourly Total
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
04:00 PM	15	464	28	4		29	312	7	6		21	17	7	0		73	16	45	0		1044	4459
04:15 PM	4	491	38	4		22	374	14	9		9	16	6	0		39	18	53	0		1097	4528
04:30 PM	10	575	63	3		30	361	11	6		8	11	10	0		36	13	39	0		1176	4542
04:45 PM	9	495	46	10		33	360	14	11		28	11	16	0		39	15	55	0		1142	4478
05:00 PM	6	518	42	2		32	347	11	5		15	12	5	0		51	19	48	0		1113	4422
05:15 PM	3	518	39	1		21	382	8	5		11	14	5	0		57	11	36	0		1111	3309
05:30 PM	11	520	39	10		36	379	5	5		11	12	9	0		41	10	24	0		1112	2198
05:45 PM	9	476	43	3		30	365	5	13		7	18	7	0		53	17	40	0		1086	1086
Peak 15-Min Flowrates	**Northbound**					**Southbound**					**Eastbound**					**Westbound**					**Total**	
	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*	Left	Thru	Rgt	U	R*		
All Vehicles	40	2300	252	40		132	1528	56	44		112	56	64	0		228	76	220	0		**5148**	
Heavy Trucks	4	92	16			0	44	0			8	4	4			4	0	12			**188**	
Pedestrians		20					0					28					12				**60**	
Bicycles	0	8	0			4	12	0			0	4	0			4	0	0			**32**	
Railroad																						
Stopped Buses																						

APPENDIX

FDOT SEASONAL ADJUSTMENT FACTORS

2017 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
CATEGORY: 1400 PASCO COUNTYWIDE

MOCF: 0.96

WEEK	DATES	SF	PSCF
1	01/01/2017 - 01/07/2017	0.99	1.03
2	01/08/2017 - 01/14/2017	1.01	1.05
3	01/15/2017 - 01/21/2017	1.03	1.07
4	01/22/2017 - 01/28/2017	1.02	1.06
5	01/29/2017 - 02/04/2017	1.00	1.04
* 6	02/05/2017 - 02/11/2017	0.99	1.03
* 7	02/12/2017 - 02/18/2017	0.97	1.01
* 8	02/19/2017 - 02/25/2017	0.96	1.00
* 9	02/26/2017 - 03/04/2017	0.95	0.99
*10	03/05/2017 - 03/11/2017	0.94	0.98
*11	03/12/2017 - 03/18/2017	0.93	0.97
*12	03/19/2017 - 03/25/2017	0.93	0.97
*13	03/26/2017 - 04/01/2017	0.94	0.98
*14	04/02/2017 - 04/08/2017	0.95	0.99
*15	04/09/2017 - 04/15/2017	0.96	1.00
*16	04/16/2017 - 04/22/2017	0.97	1.01
*17	04/23/2017 - 04/29/2017	0.98	1.02
*18	04/30/2017 - 05/06/2017	0.99	1.03
19	05/07/2017 - 05/13/2017	1.00	1.04
20	05/14/2017 - 05/20/2017	1.01	1.05
21	05/21/2017 - 05/27/2017	1.02	1.06
22	05/28/2017 - 06/03/2017	1.03	1.07
23	06/04/2017 - 06/10/2017	1.03	1.07
24	06/11/2017 - 06/17/2017	1.04	1.08
25	06/18/2017 - 06/24/2017	1.04	1.08
26	06/25/2017 - 07/01/2017	1.04	1.08
27	07/02/2017 - 07/08/2017	1.04	1.08
28	07/09/2017 - 07/15/2017	1.05	1.09
29	07/16/2017 - 07/22/2017	1.05	1.09
30	07/23/2017 - 07/29/2017	1.05	1.09
31	07/30/2017 - 08/05/2017	1.05	1.09
32	08/06/2017 - 08/12/2017	1.05	1.09
33	08/13/2017 - 08/19/2017	1.06	1.10
34	08/20/2017 - 08/26/2017	1.05	1.09
35	08/27/2017 - 09/02/2017	1.05	1.09
36	09/03/2017 - 09/09/2017	1.05	1.09
37	09/10/2017 - 09/16/2017	1.05	1.09
38	09/17/2017 - 09/23/2017	1.04	1.08
39	09/24/2017 - 09/30/2017	1.03	1.07
40	10/01/2017 - 10/07/2017	1.02	1.06
41	10/08/2017 - 10/14/2017	1.01	1.05
42	10/15/2017 - 10/21/2017	1.01	1.05
43	10/22/2017 - 10/28/2017	1.00	1.04
44	10/29/2017 - 11/04/2017	0.99	1.03
45	11/05/2017 - 11/11/2017	0.98	1.02
46	11/12/2017 - 11/18/2017	0.97	1.01
47	11/19/2017 - 11/25/2017	0.98	1.02
48	11/26/2017 - 12/02/2017	0.98	1.02
49	12/03/2017 - 12/09/2017	0.99	1.03
50	12/10/2017 - 12/16/2017	0.99	1.03
51	12/17/2017 - 12/23/2017	1.00	1.04
52	12/24/2017 - 12/30/2017	1.02	1.06
53	12/31/2017 - 12/31/2017	1.03	1.07

* PEAK SEASON

APPENDIX

FDOT HISTORICAL AADT

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2019 HISTORICAL AADT REPORT

COUNTY: 14 - PASCO

SITE: 0199 - SR-55/US-19,1.4 MI N SR-54,NEWPORT RICHEY,PASCO CO

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2019	56418 C	N 28544	S 27874	9.00	56.30	4.50
2018	55965 C	N 28065	S 27900	9.00	56.30	4.50
2017	55805 C	N 27793	S 28012	9.00	55.50	4.70
2016	54343 C	N 27084	S 27259	9.00	55.30	4.30
2015	51682 C	N 25670	S 26012	9.00	57.90	3.80
2014	51500 F			9.00	56.30	3.80
2013	51271 C	N 25510	S 25761	9.00	56.30	3.80
2012	52645 C	N 26445	S 26200	9.00	56.30	3.80
2011	54279 C	N 27272	S 27007	9.00	54.80	3.50
2010	57148 C	N 28720	S 28428	8.58	53.44	3.50
2009	58130 C	N 29221	S 28909	8.61	53.42	3.40
2008	57767 C	N 28951	S 28816	8.54	53.41	3.70
2007	61390 C	N 30807	S 30583	8.29	54.04	4.00
2006	62017 C	N 30986	S 31031	8.35	53.22	4.00
2005	63041 C	N 31642	S 31399	8.40	53.80	3.70
2004	63362 C	N 31925	S 31437	8.50	57.00	3.50

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2019 HISTORICAL AADT REPORT

COUNTY: 14 - PASCO

SITE: 5022 - SR 55/US 19, SOUTH OF MAIN ST

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2019	57000 C	N 28500	S 28500	9.00	56.20	3.70
2018	58500 C	N 29000	S 29500	9.00	57.10	3.90
2017	57500 F	N 28500	S 29000	9.00	57.30	4.70
2016	54500 C	N 27000	S 27500	9.00	57.90	4.70
2015	51500 C	N 26000	S 25500	9.00	57.90	3.00
2014	57000 C	N 28500	S 28500	9.00	56.10	3.00
2013	54000 C	N 27000	S 27000	9.00	60.00	3.50
2012	55000 C	N 27500	S 27500	9.00	59.00	3.10
2011	59000 C	N 29500	S 29500	9.00	58.20	2.90
2010	57000 C	N 28500	S 28500	9.07	58.18	3.30
2009	63000 C	N 31500	S 31500	9.17	58.07	3.50
2008	61500 C	N 31000	S 30500	9.52	56.97	3.20
2007	66500 C	N 33000	S 33500	9.26	52.68	3.20
2006	64500 C	N 32500	S 32000	9.38	56.87	6.60
2005	62000 C	N 30000	S 32000	9.40	55.20	3.00
2004	64500 C	N 32000	S 32500	9.40	57.90	3.00

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

APPENDIX

SIGNAL TIMINGS

WO#:	514					LAST UPDATE	1/7/2020
LOCATION:	US19 & MAIN ST						
CONT:	ATC 2070-1C	SER#:	2243	TYPE:	SIG	REPAIR PRIORITY:	2
MONITOR:	EDI 2010 ECL	SER#:	051107898	SOP:	9	TURN ON DATE:	
DETQUAN:	4	DETDELAY:		POWER COMPANY:	PE	ACCT:	03330 81691
OTHER1:	VIDEO DET			OPTICOM:	YES	STREET LIGHTS:	NO
OTHER2:				ENFORCEMENT LIGHTS:	YES	STREET LIGHT QTY:	
SOLAR WARNING FLASHERS:	NO			MASTARMS:	YES	ILLUMINATED SIGNS:	NO
SOLAR WARNING FLASHERS QTY:				UPS:	YES	ILLUMINATED SIGNS QTY	

PHASE	DIRECTION	MIN	PASG	YEL	RC	MAX1	MAX2	WALK	PC
1	SBLT	7	3	4.8	2	20			
2	NB	20	4	4.8	2	60		7	36
3	WB LT/ THRU	7	3	3.4	3.9	30			
4	EB LT/ THRU	7	3	3.4	3.9	15		7	45
5	NBLT	7	3	4.8	2	20			
6	SB	20	4	4.8	2	60		7	16
7									
8									

PHASE	MIN REC	MAX REC	MEM ON	MEM OFF	CNA	DET SWITCH	FLASH COLOR
1			X				R
2	X			X			Y
3			X				R
4			X				R
5			X				R
6	X			X			Y
7							
8							

OVERLAP				
	A		+	
	B		+	
	C		+	
	D		+	

FLASH TIMES	
FROM:	
TO:	

SYSTEM DATA	
SYS#:	CEN
ID#:	26

JURIS:	FDOT
VALUE:	290,000
REIMBURSEMENT:	50%

NOTES:

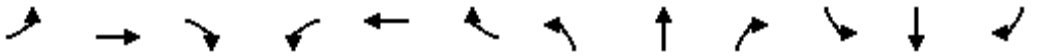
332 CABINET. L1 PH 4 EBLT HAS 3 SEC DELAY AND L2 PH 4 EB HAS 8 SEC AND L9 PH 3 WBRT HAS 10 SEC DELAY DONE IN CONTROLLER. SIGNAL RUNS LEAD-LAG BY TOD.

POLE DATA

CORNER1:	
CORNER2:	*-
CORNER3:	
CORNER4:	

APPENDIX

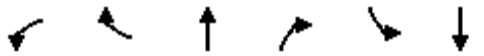
INTERSECTION ANALYSIS



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	38	30	206	40	97	52	1355	194	110	2288	50
Future Volume (vph)	67	38	30	206	40	97	52	1355	194	110	2288	50
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)				41%								
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		5	2		1	6	
Permitted Phases						4			2			6
Detector Phase	3	3		4	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	14.6	14.6		14.6	14.6	14.6	17.1	27.4	27.4	18.2	27.4	27.4
Total Split (s)	27.0	27.0		38.0	38.0	38.0	21.0	84.0	84.0	21.0	84.0	84.0
Total Split (%)	15.9%	15.9%		22.4%	22.4%	22.4%	12.4%	49.4%	49.4%	12.4%	49.4%	49.4%
Yellow Time (s)	3.4	3.4		3.4	3.4	3.4	4.8	4.8	4.8	4.8	4.8	4.8
All-Red Time (s)	3.9	3.9		3.9	3.9	3.9	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.3	7.3		7.3	7.3	7.3	6.8	6.8	6.8	6.8	6.8	6.8
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max		Max	Max	Max	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.7	19.7		30.7	30.7	30.7	10.6	80.3	80.3	11.1	83.6	83.6
Actuated g/C Ratio	0.12	0.12		0.18	0.18	0.18	0.06	0.47	0.47	0.07	0.49	0.49
v/c Ratio	0.35	0.33		0.42	0.43	0.27	0.50	0.59	0.24	0.52	0.96	0.06
Control Delay	74.5	55.1		66.7	66.7	8.4	91.9	34.4	5.5	84.8	53.1	0.1
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	74.5	55.1		66.7	66.7	8.4	91.9	34.4	5.5	84.8	53.1	0.1
LOS	E	E		E	E	A	F	C	A	F	D	A
Approach Delay		64.7			50.3			32.8			53.4	
Approach LOS		E			D			C			D	

Intersection Summary	
Cycle Length: 170	
Actuated Cycle Length: 170	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 46.2	Intersection LOS: D
Intersection Capacity Utilization 72.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: US 19 & Main Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	31	1570	32	0	2535
Future Volume (Veh/h)	0	31	1570	32	0	2535
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	33	1653	34	0	2668
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						325
pX, platoon unblocked	0.53					
vC, conflicting volume	2559	568			1687	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	833	568			1687	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	93			100	
cM capacity (veh/h)	163	466			375	

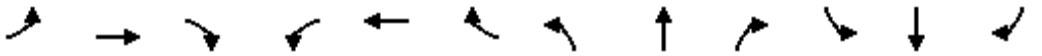
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	33	661	661	365	889	889	889
Volume Left	0	0	0	0	0	0	0
Volume Right	33	0	0	34	0	0	0
cSH	466	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.07	0.39	0.39	0.21	0.52	0.52	0.52
Queue Length 95th (ft)	6	0	0	0	0	0	0
Control Delay (s)	13.3	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	13.3	0.0			0.0		
Approach LOS	B						

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	310	32	28	327	16	13
Future Volume (Veh/h)	310	32	28	327	16	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	326	34	29	344	17	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	235					
pX, platoon unblocked						
vC, conflicting volume			360		516	180
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			360		516	180
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		96	98
cM capacity (veh/h)			1195		477	832

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	217	143	98	138	138	31
Volume Left	0	0	29	0	0	17
Volume Right	0	34	0	0	0	14
cSH	1700	1700	1195	1700	1700	591
Volume to Capacity	0.13	0.08	0.02	0.08	0.08	0.05
Queue Length 95th (ft)	0	0	2	0	0	4
Control Delay (s)	0.0	0.0	2.5	0.0	0.0	11.4
Lane LOS			A			B
Approach Delay (s)	0.0		0.7			11.4
Approach LOS						B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	55	41	222	60	211	66	2408	223	186	1643	50
Future Volume (vph)	70	55	41	222	60	211	66	2408	223	186	1643	50
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)				37%								
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		5	2		1	6	
Permitted Phases						4			2			6
Detector Phase	3	3		4	4	4	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	14.6	14.6		14.6	14.6	14.6	17.1	27.4	27.4	18.2	27.4	27.4
Total Split (s)	20.0	20.0		25.0	25.0	25.0	18.0	82.0	82.0	23.0	87.0	87.0
Total Split (%)	13.3%	13.3%		16.7%	16.7%	16.7%	12.0%	54.7%	54.7%	15.3%	58.0%	58.0%
Yellow Time (s)	3.4	3.4		3.4	3.4	3.4	4.8	4.8	4.8	4.8	4.8	4.8
All-Red Time (s)	3.9	3.9		3.9	3.9	3.9	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.3	7.3		7.3	7.3	7.3	6.8	6.8	6.8	6.8	6.8	6.8
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	Max	Max		Max	Max	Max	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	12.7	12.7		17.7	17.7	17.7	10.0	77.8	77.8	13.6	84.2	84.2
Actuated g/C Ratio	0.08	0.08		0.12	0.12	0.12	0.07	0.52	0.52	0.09	0.56	0.56
v/c Ratio	0.50	0.61		0.74	0.74	0.66	0.58	0.96	0.26	0.63	0.61	0.06
Control Delay	77.6	70.1		86.2	85.8	27.3	87.6	45.3	8.4	74.9	23.8	0.1
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	77.6	70.1		86.2	85.8	27.3	87.6	45.3	8.4	74.9	23.8	0.1
LOS	E	E		F	F	C	F	D	A	E	C	A
Approach Delay		73.3			60.9			43.3			28.2	
Approach LOS		E			E			D			C	

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 40.5	Intersection LOS: D
Intersection Capacity Utilization 84.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: US 19 & Main Street

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	45	2652	23	0	1922
Future Volume (Veh/h)	0	45	2652	23	0	1922
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	47	2792	24	0	2023
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						325
pX, platoon unblocked	0.77					
vC, conflicting volume	3478	943			2816	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3170	943			2816	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	82			100	
cM capacity (veh/h)	6	264			134	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	47	1117	1117	582	674	674	674
Volume Left	0	0	0	0	0	0	0
Volume Right	47	0	0	24	0	0	0
cSH	264	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.18	0.66	0.66	0.34	0.40	0.40	0.40
Queue Length 95th (ft)	16	0	0	0	0	0	0
Control Delay (s)	21.6	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C						
Approach Delay (s)	21.6	0.0			0.0		
Approach LOS	C						

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	61.8%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	24	440	21	475	24	18
Future Volume (Veh/h)	24	440	21	475	24	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	25	463	22	500	25	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	235					
pX, platoon unblocked						
vC, conflicting volume			488		467	244
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			488		467	244
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		95	97
cM capacity (veh/h)			1071		514	757

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	17	471	122	200	200	44
Volume Left	0	0	22	0	0	25
Volume Right	0	463	0	0	0	19
cSH	1700	1700	1071	1700	1700	596
Volume to Capacity	0.01	0.28	0.02	0.12	0.12	0.07
Queue Length 95th (ft)	0	0	2	0	0	6
Control Delay (s)	0.0	0.0	1.7	0.0	0.0	11.5
Lane LOS			A			B
Approach Delay (s)	0.0		0.4			11.5
Approach LOS						B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX

TURN LANE WARRANTS

When Not to Consider Exclusive Right-Turn Lanes

- Dense or built-out corridors with limited space
- Right-turn lane that would negatively impact pedestrians or bicyclists
- Vehicular movements from driveways or median openings that cross the right-turn lane resulting in multiple threat crashes
- *Context classifications C2T, C4, C5, or C6*

When Exclusive Right-Turn Lanes are Beneficial

There are instances when adding an exclusive right-turn lane for unsignalized driveways are beneficial to traffic operations and safety. ***Table 27*** provides some guidance for this situation based on the speed limit of the roadway and how many right turns occur per hour. Locations where the Auto and Truck Modal Emphasis is "High" may be appropriate for consideration of Exclusive Right Turn Lanes.

Table 27 – Recommended Guidelines for Exclusive Right-Turn Lanes to Unsignalized Driveway[10]

Roadway Posted Speed Limit	Number of Right Turns Per Hour
45 mph or less	80 – 125[1]
Over 45 mph	35 – 55[2]
Note: A posted speed limit of 45 mph may be used with these thresholds if the operating speeds are known to be over 45 mph during the time of peak right turn demand.	
Note on traffic projections: Projecting turning volumes is, at best, a knowledgeable estimate. Keep this in mind especially if the projections of right turns are close to meeting the guidelines. In that case, consider requiring the turn lane.	
[1] The lower threshold of 80 right-turn vehicles per hour would be most used for higher volume (greater than 600 vehicles per hour, per lane in one direction on the major roadway) or two-lane roads where lateral movement is restricted. The 125 right-turn vehicles per hour upper threshold would be most appropriate on lower volume roadways, multilane highways, or driveways with a large entry radius (50 feet or greater).	
[2] The lower threshold of 35 right-turn vehicles per hour would be most appropriately used on higher volume two-lane roadways where lateral movement is restricted. The 55 right-turn vehicles per hour upper threshold would be most appropriate on lower volume roadways, multilane highways, or driveways with large entry radius (50 feet or greater).	

Source: NCHRP Report 420 (Impacts of Access Management Techniques)

These recommendations are primarily based on the research done in NCHRP Report 420, Impacts of Access Management Techniques, Chapter 4 – Unsignalized Access Spacing (Technique 1B), and Use of Speed Differential as a Measure to Evaluate the Need for Right-Turn Deceleration Lane at Unsignalized Intersections.

In the *NCHRP Report 420*, the observed high-speed roads, 30 to 40 right-turn vehicles per hour caused evasive maneuvers on 5 - 10 percent of the following through vehicles. For lower speed roadways, 80 to 110 right-turn vehicles caused 15 - 20 percent of the following through vehicles to make evasive maneuvers. The choice of acceptable percentages of through vehicles impacted is a decision based on reasonable expectations of the different roadways.

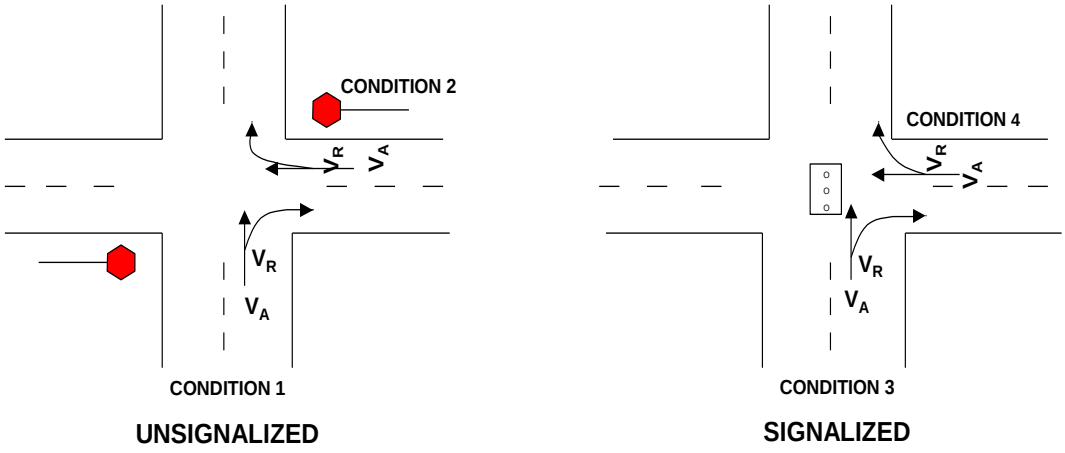
In this study, by modeling speed differentials, a better understanding of the impacts of through volume and driveway radius was discovered.

[10] May not be appropriate for signalized locations where signal phasing plays an important role in determining the need for right turn lanes.

TABLE 1

Right-Turn Warrants

Unsignalized		
Condition 1	On major roads without stop control (approach).	See Graph Nos. 1A and 1B
Condition 2	Access roads or major through roads with stop control (approach).	V_R ≥150 **OR** There are 5 or more related accidents in 1 year.
Signalized		
Condition 3	On major roads (approach).	V_R ≥150 **AND** The total outside lane approach volume (VA) is at least 200 VPH (including right turn). **OR** There are 5 or more related accidents in 1 year.
Condition 4	On access roads approach.	V_R ≥150 **OR** There are 5 or more related accidents in 1 year.



NOTES:

1. When public safety so requires due to site-specific conditions, such as limited sight distance, high-traveling speed, or the presence of a significant percentage of heavy vehicles, a turn lane may be required by the County Engineer even though the criteria in Graphs 1A and 1B are not met.

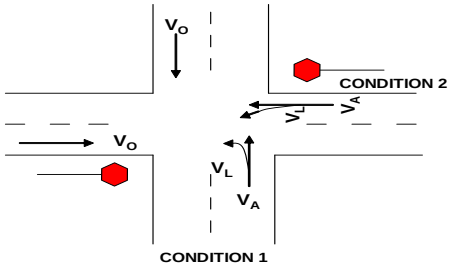
2. The provisions of the right-turn warrants may be modified by the County Engineer if it is determined that due to site-specific constraints, the implementation will not be feasible or practical.

3. At high speed (forty-five [45] mph or greater), unsignalized/signalized intersections, a separate right turn lane may be required by the County Engineer for safe operations. A high speed shall be the greater of the posted or operating speed where an operating speed study has been conducted.

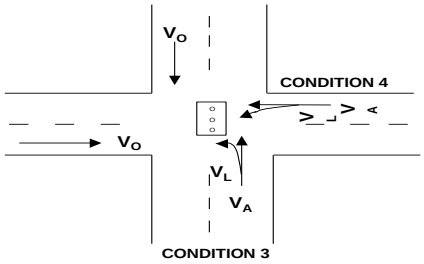
TABLE 2

Left-Turn Warrants

Unsignalized		
Condition 1	On major roads without stop control (approach).	See Graph Nos. 2A through 2D
Condition 2	On access roads or through roads (approach).	V_L ≥100 **OR** There are 4 or more related accidents in 1 year.
Signalized		
Condition 3	On major roads (approach).	V_L ≥100 **OR** 20 percent or more of the total approach volume in the inside lane is left turn. **OR** There are 5 or more related accidents in 1 year.
Condition 4	On access roads or through roads approach.	V_L ≥100 **OR** There are 5 or more related accidents in 1 year.



UNSIGNALIZED



SIGNALIZED

NOTES:

1. An exclusive left-turn lane at signalized intersections or on access roads and through roads with stop control are more often needed to reduce the total delay to the approaching vehicles; therefore, use of traffic engineering software, with the approval of the County Engineer, may be used.

2. When public safety so requires due to site-specific conditions, such as limited sight distance, high-traveling speed, or the presence of a significant percentage of heavy vehicles, a turn lane may be required by the County Engineer even though the criteria in Graphs 2A through 2D are not met.

3. The provisions of the left-turn warrants may be modified by the County Engineer if it is determined that due to site-specific constraints, the implementation will not be feasible or practical.

4. A dual left-turn lane may be required by the County Engineer when the left-turn volume exceeds 300 VPH.

5. At high speed (forty-five [45] mph or greater), unsignalized/signalized intersections, a separate left-turn lane may be required by the County Engineer for safe operations. A high speed shall be the greater of the posted or operating speed where an operating speed study has been conducted.

TABLE 3

Right-Turn Lane Length
(Deceleration and Storage)

Unsignalized		
Condition 1	On major roads without stop control and on major through roads with stop control (approach).	Deceleration Length: FDOT Index 301 Storage Length: 25 feet desirable unless there are site-specific conditions that require a longer storage length.
Condition 2	On access roads (approach).	Deceleration Length: Taper only Storage Length = $V_R/2$
Signalized		
Condition 3	On major roads (approach).	Deceleration Length: FDOT Index 301 Storage Length = $V_R/2$
Condition 4	On access roads (approach).	Deceleration Length: FDOT Index 301 Storage Length = $V_R/2$

NOTES:

1. In many instances, the storage length of a right-turn lane at signalized intersections or access/major roads with stop control is dictated by the required storage length for left and/or through movements. Refer to the left-turn section for determining the storage length for a left turn.

2. If the right-turn flow is limited due to heavy volume of conflicting movements, then the storage length shall be based on the left-turn storage length formula.

3. The provision of storage lengths and deceleration lengths may be modified or waived by the County Engineer if it is determined that, due to site-specific constraints, the implementation will not be feasible or practical.

4. Traffic engineering software, with the approval of the County Engineer, may be used to determine the storage length for right turns.

TABLE 4

Left-Turn Lane Lengths
(Deceleration and Storage)

Unsignalized		
Condition 1	On major roads (approach).	Deceleration Length: FDOT Index 301 Storage Length = 25 X V_L/30
Condition 2	On access roads (approach).	Deceleration Length: Taper only Storage Length = 25 X V_L/30
Signalized		
Condition 3	On major roads (approach).	Deceleration Length: FDOT Index 301 Storage Length = 2 X 25 X V_L/N
Condition 4	On access roads (approach).	Deceleration Length: FDOT Index 301 Storage Length = 2 X 25 X V_L/N

NOTES:

1. N = The number of traffic signal cycles per hour. Use thirty (30) as a default (assumes 120-second cycle length).

2. If the formula yields a storage length of less than fifty (50) feet for unsignalized intersections, then a minimum storage of fifty (50) feet shall be provided.

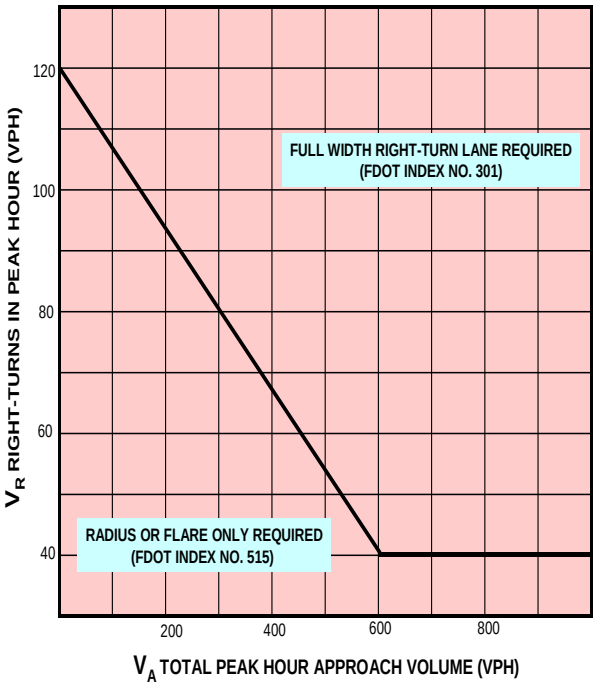
3. If the formula yields a storage length of less than 100 feet for signalized intersections, then a minimum storage of 100 feet shall be provided.

4. The provision of storage and deceleration lengths may be modified or waived by the County Engineer if it is determined that due to site-specific constraints, the implementation will not be feasible or practical.

5. In some instances at signalized intersections or on access/major roads with stop control, the storage length of the left turn is dictated by the through or right movements. Unless otherwise approved by the County Engineer, the storage length for all movements shall be calculated and the highest length shall be used. For through-storage length, the same formula as the left turn can be used. Refer to right-turn section for determining the storage length for right turns.

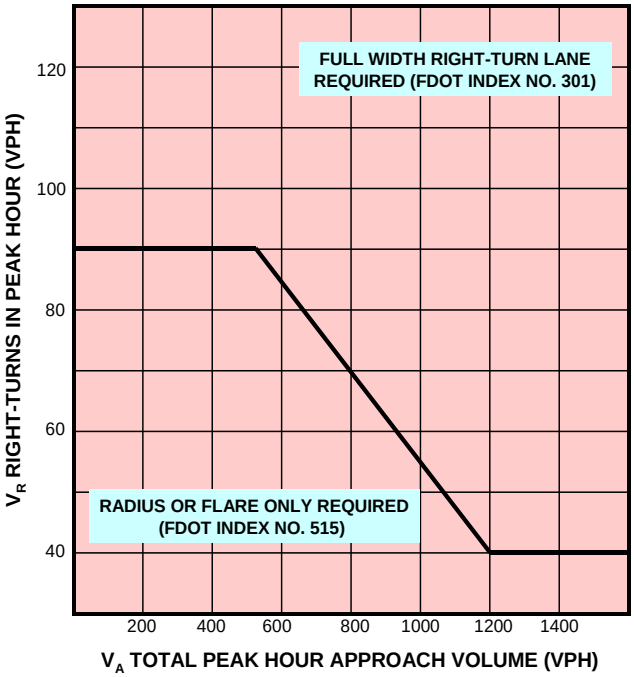
6. Traffic engineering software, with the approval of the County Engineer, may be used to determine the storage length for right turns.

GRAPH 1A. RIGHT-TURN LANE WARRANTS – TWO-LANE FACILITIES



NOTE: For posted speeds at or under forty-five (45) mph, peak hour right turns greater than forty (40) VPH, and total peak hour approach less than 300 VPH, adjust right turn volumes. Adjust peak hour right turns = peak hour right turns-twenty (20).

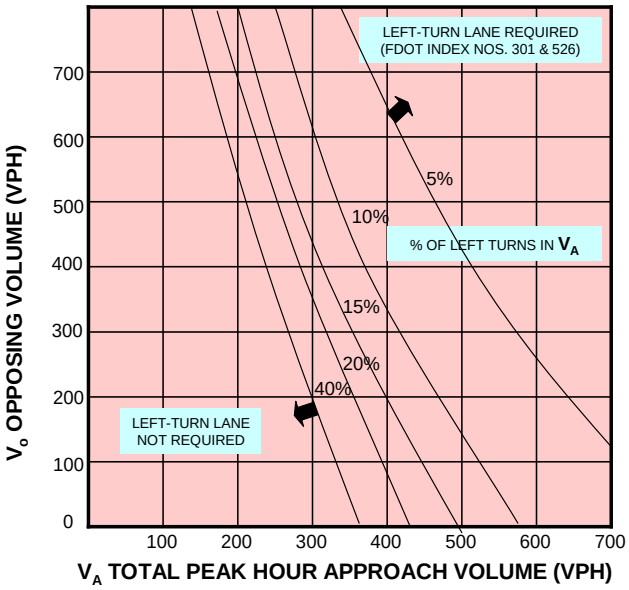
GRAPH 1B. RIGHT-TURN LANE WARRANTS
FOUR- OR SIX-LANE FACILITIES



NOTE: For application on high speed highways.

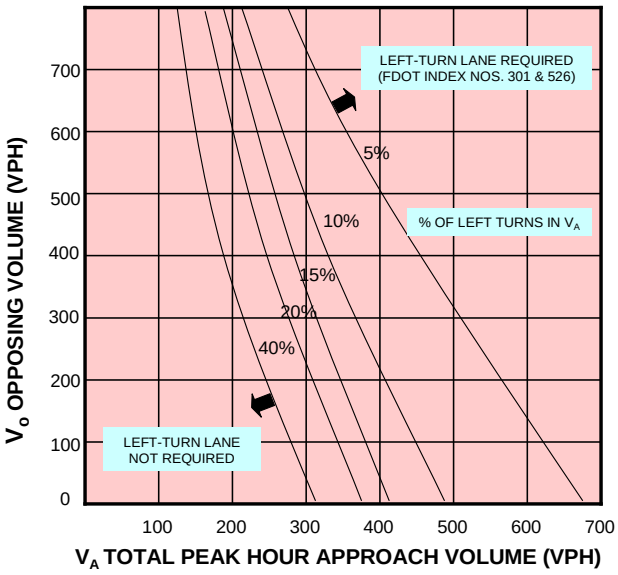
Graphs 1A & 1B Source: National Cooperative Highway Research Program, Report No. 279.

GRAPH 2A. LEFT-TURN LANE WARRANTS – TWO-LANE FACILITIES (≤ 40 MPH)



NOTE: Left-turn lane not required when intersection of V_A and V_O is below the curve corresponding to the % of left turns in V_A.

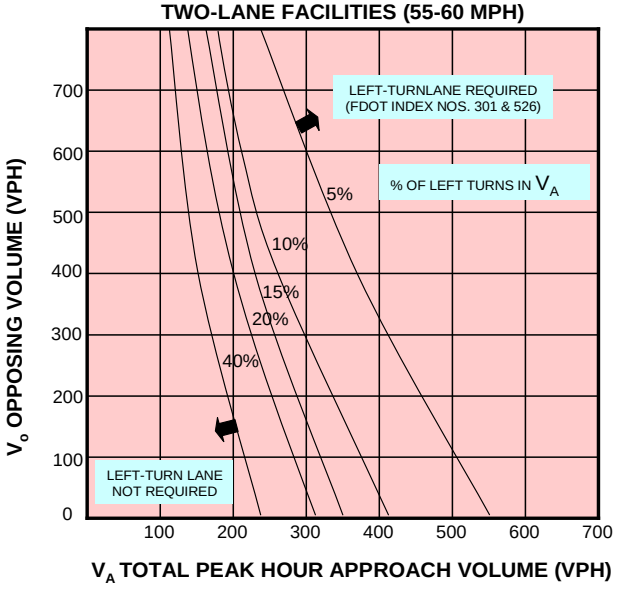
GRAPH 2B. LEFT-TURN LANE WARRANTS – TWO-LANE FACILITIES (45-50 MPH)



NOTE: Left-turn lane not required when intersection of V_A and V_O is below the curve corresponding to the % of left turns in V_A.

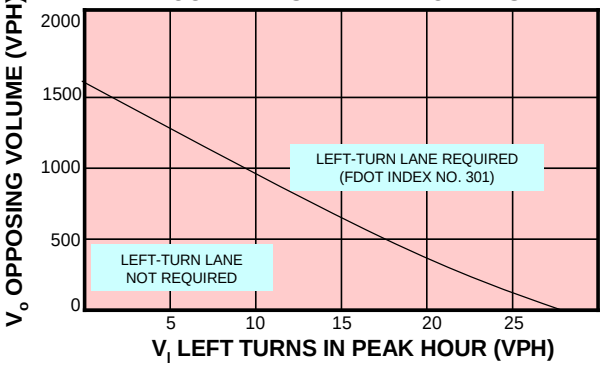
Graphs 2A & 2B Source: National Cooperative Highway Research Program, Report No. 279.

GRAPH 2C. LEFT-TURN LANE WARRANTS – TWO-LANE FACILITIES (55-60 MPH)



NOTE: Left-turn lane not required when intersection of V_A and V_O is below the curve corresponding to the % of left turns in V_A.

GRAPH 2D. LEFT-TURN LANE WARRANTS – FOUR- AND SIX-LANE FACILITIES

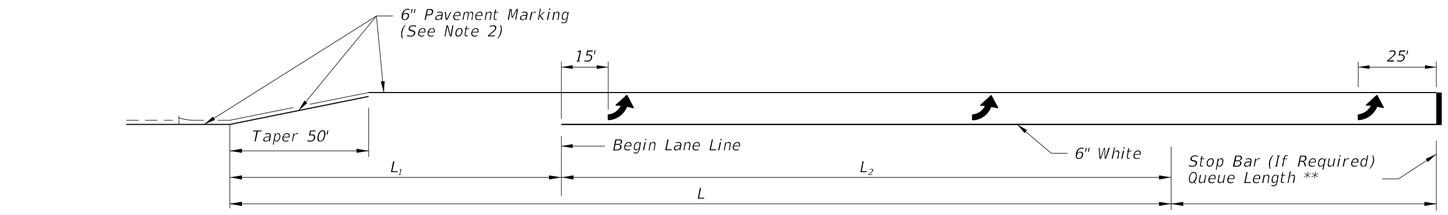


NOTE: When V_O < 400 VPH, a left-turn lane is not normally warranted unless the advancing volume (V_A) in the same direction as left-turning traffic exceeds 400 VPH. (V_A > 400 VPH).

Graphs 2C & 2D Source: National Cooperative Highway Research Program, Report No. 279.

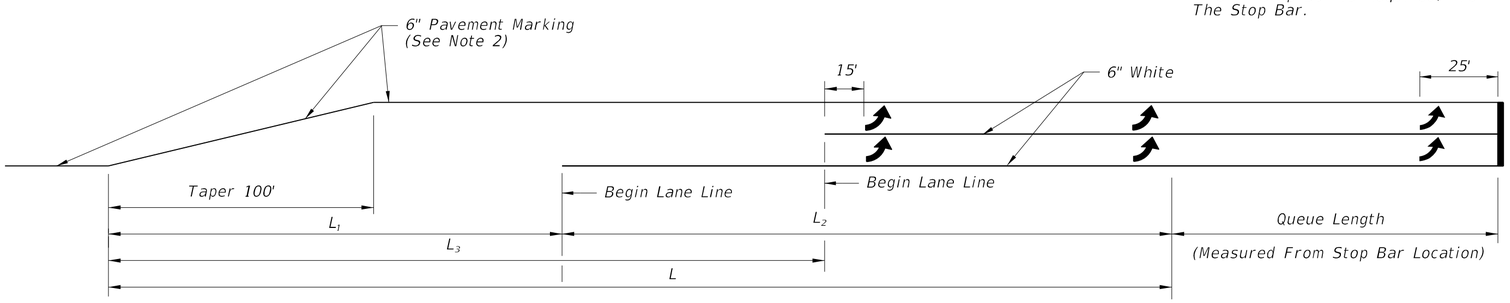
APPENDIX

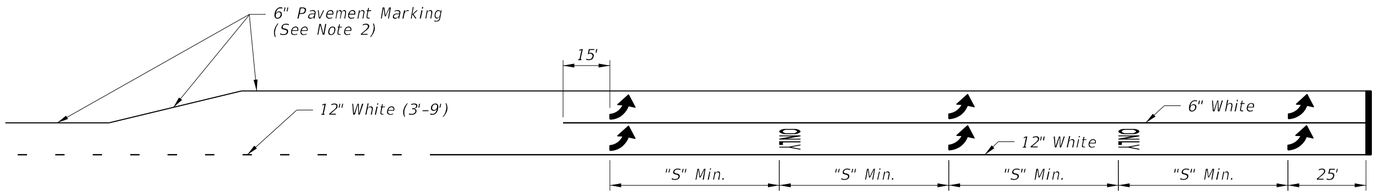
FDOT STANDARD PLANS 711-001



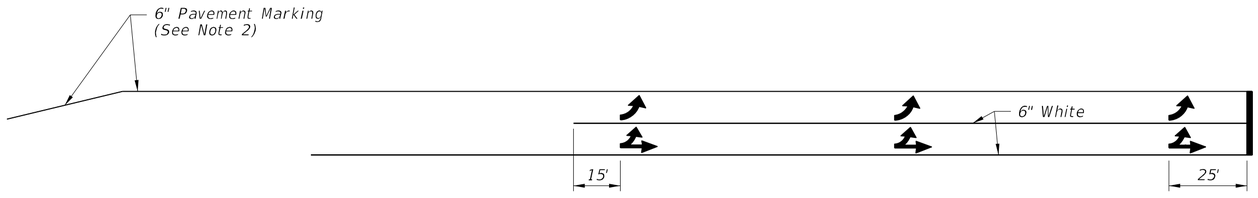
SINGLE LEFT TURNS

** Queue Length Is Measured From The Median Nose Radial Point Or, When A Stop Bar Is Required, From The Stop Bar.





Through Lane Becomes Exclusive Left Turn



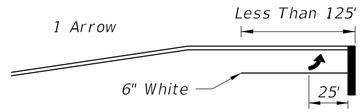
Through Lane Becomes Optional Left Turn

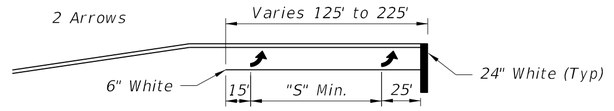
DOUBLE LEFT TURNS

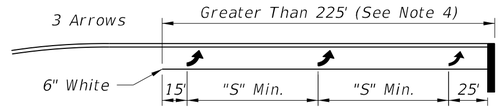
TURN LANES ◦ CURBED AND UNCURBED MEDIANS

Posted Speed (mph)	Clearance Distance L_1	URBAN CONDITIONS			RURAL CONDITIONS		
		Brake To Stop Distance L_2	Total Decel. Distance L	Clearance Distance L_3	Brake To Stop Distance L_2	Total Decel. Distance L	Clearance Distance L_3
≤30	70'	75'	145'	110'	— —	— —	— —
35	80'	75'	155'	120'	— —	— —	— —
40	85'	100'	185'	135'	— —	— —	— —
45	105'	135'	240'	160'	185'	290'	160'
50	125'	— —	— —	— —	225'	350'	195'
55	145'	— —	— —	— —	260'	405'	230'
≥60	170'	— —	— —	— —	290'	460'	270'

NOTE: When installing lane lines for turn lanes, use the dimensions in the Plans, or use the above values for turn lanes not dimensioned in the Plans.







ARROW SPACING

NOTES:

1. This Index also applies to right turn lanes.
2. Make pavement marking yellow for left-turn lanes and white for right-turn lanes.
3. See Sheet 1 for "S" value.
4. Space arrows evenly between the first and last arrow with a minimum spacing of "S" between arrows.
5. For turn lanes greater than 225' in length, use a minimum of three arrows. Use additional arrows in accordance with the Plans or as directed by the Engineer. Space arrows evenly throughout the available length with a minimum spacing of "S" between arrows.

TURN LANE MARKINGS

12/18/2019 3:10:06 PM

LAST REVISION	REVISION	DESCRIPTION:	FY 2020-21 STANDARD PLANS	PAVEMENT MARKINGS	INDEX	SHEET
11/01/19					711-001	11 of 13

APPENDIX

QUEUE ANALYSIS

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	71	72	128	131	102	55	1426	204	116	2408	53
v/c Ratio	0.35	0.33	0.42	0.43	0.27	0.50	0.59	0.24	0.52	0.96	0.06
Control Delay	74.5	55.1	66.7	66.7	8.4	91.9	34.4	5.5	84.8	53.1	0.1
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	74.5	55.1	66.7	66.7	8.4	91.9	34.4	5.5	84.8	53.1	0.1
Queue Length 50th (ft)	74	55	134	137	0	61	421	13	65	968	0
Queue Length 95th (ft)	131	110	212	215	43	110	488	64	100	#1137	0
Internal Link Dist (ft)		1920		155			245			1920	
Turn Bay Length (ft)	150					250		275	490		150
Base Capacity (vph)	205	218	303	308	380	147	2401	843	286	2499	838
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.33	0.42	0.43	0.27	0.37	0.59	0.24	0.41	0.96	0.06

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	74	101	147	150	222	69	2535	235	196	1729	53
v/c Ratio	0.50	0.61	0.74	0.74	0.66	0.58	0.96	0.26	0.63	0.61	0.06
Control Delay	77.6	70.1	86.2	85.8	27.3	87.6	45.3	8.4	74.9	23.8	0.1
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	77.6	70.1	86.2	85.8	27.3	87.6	45.3	8.4	74.9	23.8	0.1
Queue Length 50th (ft)	70	78	148	151	48	66	855	44	96	425	0
Queue Length 95th (ft)	127	145	#260	#262	143	121	#1019	99	138	475	0
Internal Link Dist (ft)		1920		155			245			1920	
Turn Bay Length (ft)	150					250		275	490		150
Base Capacity (vph)	149	165	198	202	335	132	2638	891	370	2852	946
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.61	0.74	0.74	0.66	0.52	0.96	0.26	0.53	0.61	0.06

Intersection Summary

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