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To: City of Fort Pierce

From: Shaun G. MacKenzie, P.E.

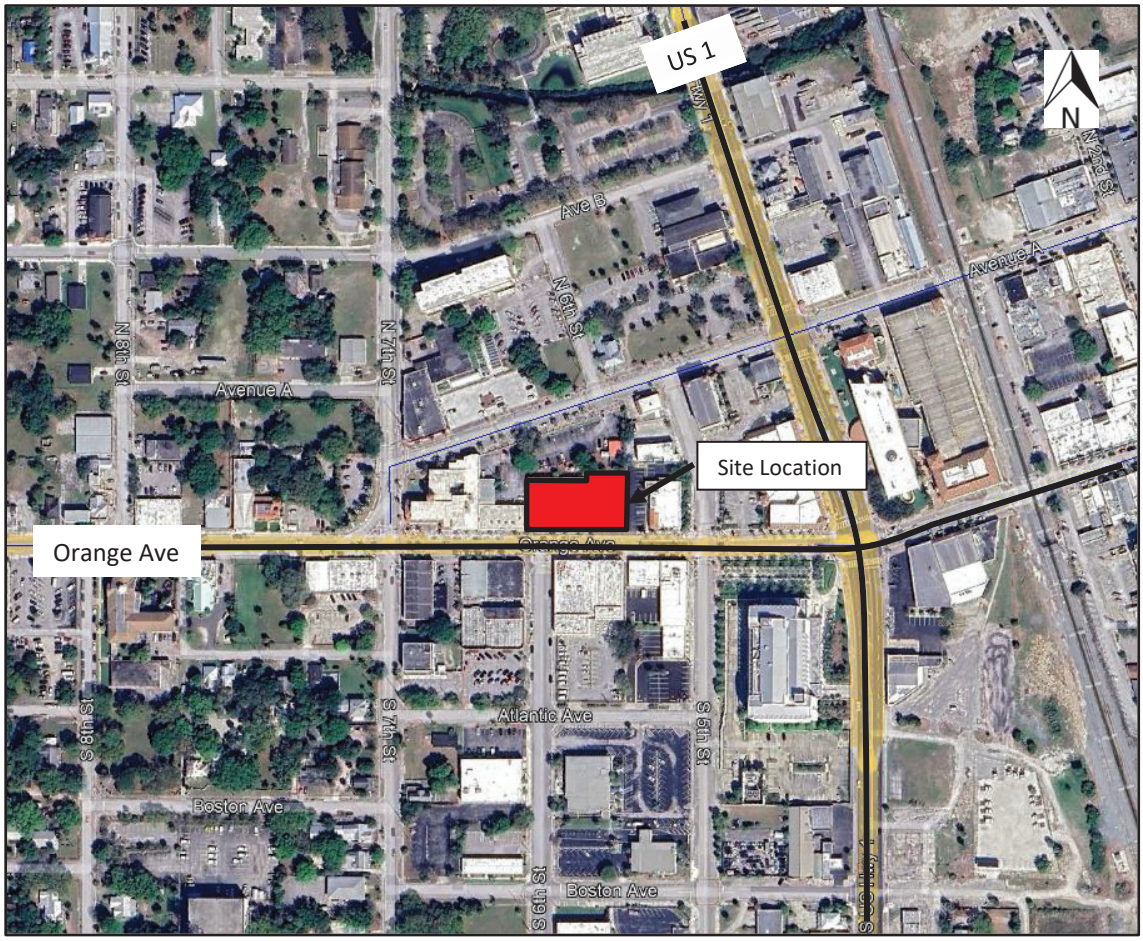
Date: February 17, 2026

Re: 510 Orange Avenue
Traffic Statement (MEP Job: 320001)

INTRODUCTION

MacKenzie Engineering and Planning, Inc. performed an analysis of the traffic impacts resulting from 510 Orange Avenue. The project is located at 510 Orange Avenue, Fort Pierce, Florida. The project proposes to convert 12,515 SF of existing retail to a 200-student K-8 Private school. The project location is shown in Figure1.

Figure 1. Site Location



TRAFFIC GENERATION

The study uses the following trip generation rates published in the Institute of Traffic Engineers' (ITE) report, *Trip Generation (12th Edition)*:

- Private School (K-8) (ITE Land Use 530)
- Strip Retail Plaza (<40k) (ITE Land Use 822)

Existing Uses

- 12,515 SF of Retail (ITE Land Use 822)

The existing site is expected to generate the following external trips:

- 455 daily, 29 AM peak hour (16 in/13 out), and 53 PM peak hour (27 in/26 out) trips.

The existing site is expected to generate the following driveway trips:

- 758 daily, 49 AM peak hour (27 in/22 out), and 89 PM peak hour (45 in/44 out) trips.

Proposed Uses

- 200 Students of K-8 Private School (ITE Land Use 530)

The proposed project is expected to generate the following net new external and driveway trips:

- 822 daily, 181 AM peak hour (101 in/80 out), and 52 PM peak hour (24 in/28 out) trips.

Net Change

The change of net new external trips:

- 367 daily, 152 AM peak hour (85 in/67 out), and -1 PM peak hour (-3 in/2 out) trips.

The change of driveway trips:

- 64 daily, 132 AM peak hour (74 in/58 out), and -37 PM peak hour (-21 in/-16 out) trips.

The project trips will be spread over multiple time periods and are not projected to impact the PM peak hour (4-6 PM).

Internal Capture

The proposed internal capture is 0.

Pass-by Trip Capture

The ITE Trip Generation Manual *(12th Edition)* doesn't include the pass-by rate of Strip Retail Plaza (<40k) (Land Use 822). To be conservative, the proposed pass-by capture of 40 percent is used for commercial uses and is in accordance with the ITE pass-by rates for the land-use Shopping Plaza (40-150k) (Land Use 821).

Table 1. Trip Generation

Land Use	Intensity	Daily Trips	AM Peak Hour Total	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out
Existing Site Traffic								
Strip Retail Plaza (<40 ksf)	12.515 1000 SF	758	49	27	22	89	45	44
Pass-By Traffic								
Strip Retail Plaza (<40 ksf)	40.0%	303	20	11	9	36	18	18
NET EXISTING TRIPS		***455***	***29***	***16***	***13***	***53***	***27***	***26***
Total Existing Driveway Volumes		***758***	***49***	***27***	***22***	***89***	***45***	***44***
Proposed Site Traffic								
Private School (K-8)	200 Students	822	181	101	80	52	24	28
NET PROPOSED TRIPS		***822***	***181***	***101***	***80***	***52***	***24***	***28***
Total Proposed Driveway Volumes		***822***	***181***	***101***	***80***	***52***	***24***	***28***
NET CHANGE IN EXTERNAL TRIPS		**367**	**152**	**85**	**67**	**(1)**	**(3)**	**2**
NET CHANGE IN DRIVEWAY VOLUMES		**64**	**132**	**74**	**58**	**(37)**	**(21)**	**(16)**

Note: Trip generation was calculated using the following data:

Land Use	ITE Code	Unit	Daily Rate	Pass-by Rate	AM Peak Hour in/out	AM Peak Hour Rate	PM Peak Hour in/out	PM Peak Hour Equation
Strip Retail Plaza (<40 ksf)	822	1000 SF	T = 42.2 (X) + 229.68	40%	55/45	3.93	50/50	Ln(T) = 0.68 Ln(X) +
Private School (K-8)	530	Students	4.11	0%	56/44	T = 1.11(X) - 40.99	46/54	0.26

Avenue A is analyzed in order to evaluate the concurrency impact of the project.

Table 2. 2027 Roadway Analysis – Avenue A

Roadway	From	To	E + C Lanes	Capacity	Existing Peak Hour Volumes(1)	Count Year	Growth Rate	2027 Background	Assign ment	Project Traffic	2027 Buildout	2027 LOS	Acceptable ?
Avenue A	7th Street	US 1	2	790	231	2025	2.5%	243	100%	85	328	C	YES

(1) St. Lucie County Traffic Counts and Level of Service Report (2025)

Avenue A is project to operate acceptably in the AM peak hour as shown in Table 2 and is not projected to impact the PM peak hour as shown in Table 1 (-1 PM peak hour trips).

QUEUING ANALYSIS

All vehicles will travel westbound on Avenue A and enter the Methodist Church parking lot, which will be used as the staging/queuing area for both arrival and dismissal. Vehicles will queue in three organized lanes inside the church lot, under staff direction. All vehicles will exit by turning left onto Avenue A and continuing west.

There are four drop-off and pick-up periods shown in Tables 3A and 3B. Each queue will resolve prior to the next pick-up drop-off period. Therefore, all four cases were examined to ensure that there are no backups onto Avenue A.

The queues were estimated using the Municipal and School Transportation Assistance (MSTA) School Traffic Calculator. The queues assume that all students are driven (no bus) and that staff park in the Orange Avenue parking lot or arrive/leave during alternative time periods. The estimated queues for each dismissal period are shown in the table. Table 4 shows the average maximum queue. The recommended queue storage is 355 feet.

Table 3A. Arrival Times Summary

Arrival Times	Grade	Num of Student	Total
8:00 AM	Grade 2	18	80
	Grade 3	18	
	Grade 4	22	
	Grade 5	22	
8:30 AM	Kindergarten	18	36
	Grade 1	18	
8:45 AM	Grade 6	22	66
	Grade 7	22	
	Grade 8	22	
9:00 AM	Pre K	18	18

Table 3B. Dismissal Times Summary

Dismissal Times	Grade	Num of Student	Total
12:30 PM	Pre K	18	18
1:50 PM	Kindergarten	18	36
	Grade 1	18	
3:00 PM	Grade 2	18	80
	Grade 3	18	
	Grade 4	22	
	Grade 5	22	
3:30 PM	Grade 6	22	66
	Grade 7	22	
	Grade 8	22	

Table 4. Queue Analysis Results

Required Storage (Feet)	Storage Provided (Feet)	Acceptable ?
355	400	Yes

CONCLUSION

Based on the above analysis, the net change in PM Peak hour trips between the existing use and the proposed traffic use is negative. The AM peak hour shows acceptable operation on Avenue A. Therefore, transportation concurrency is met.

The 200-student private school will operate with four arrival and dismissal periods. Pick-up and drop-off will occur in the Methodist Church parking lot along Avenue A. Based on the analysis, 355 of queue storage for parent pick-up is recommended. The parking lot will provide three (3) queuing pickup lines that provide 400 feet of storage. Therefore, on-site queuing is projected to be adequate.

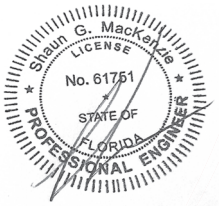
The applicant meets the City of Fort Pierce's requirements.

EXHIBIT

Exhibit A - Queue Storage Graphic

Exhibit B - MSTA School Traffic Calculations

Exhibit C - St. Lucie County Traffic Counts and Level of Service Report (2025)

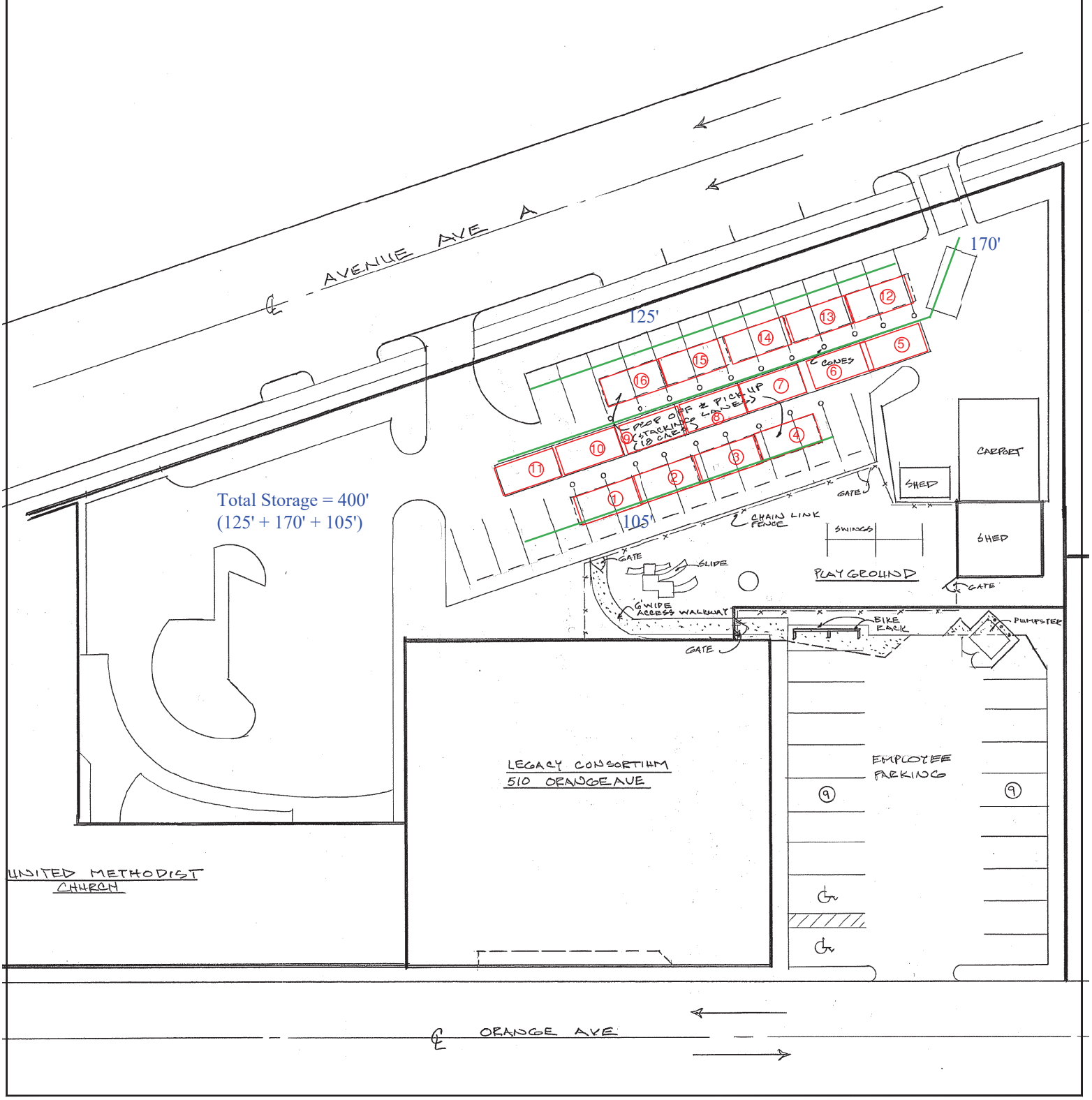


Digitally signed by Shaun G MacKenzie
Date: 2026.02.17 16:23:08 -05'00'

Shaun G. MacKenzie
Florida P.E. 61751
CA#29013

EXHIBIT "A"

UNITED METHODIST CHURCH
LEGACY CONSORTIUM



MSTA School Traffic Calculations

AM and PM Peak Traffic Estimates

(These numbers do not reflect peak hour traffic volumes)

AM Cars / Student	PM Cars / Student	Avg. Car Length	PM At one Time
55.94%	39.15%	22.19	48.67%
52.91%	47.50%	22.19	46.12%
50.08%	47.58%	22.83	55.71%

School Name:

Type: **Urban Charter**

Version: 04012021

Maximum Queue (Average)

MSTA School Queue Input

Calculations

Grade Level	Student Population	Number of Buses	Staff Members	Student Drivers	PM Total Vehicles	PM Peak Vehicles	Average Queue Length	Total AM Trips	Total PM Trips	High Demand Length
										30%
K - 10	80				32	16	355	90	64	462
11th										
12th										
Sum >>	80				32	16	355	90	64	462
										107

Grade K-10

Direction	AM Trips Generated: Parents	Buses	Staff	Trips	PM Trips Generated: Parents	Buses	Staff	Trips
IN	45			45	32			32
OUT	45			45	32			32
		AM K-10 Trips		90		PM K-10 Trips		64

ADT
154

Direction	AM Trips Generated: Parents	Buses	Staff		Trips	PM Trips Generated: Parents	Buses	Staff		Trips
IN										
OUT										
			AM 11th Trips					PM 11th Trips		

Direction	AM Trips Generated: Parents	Buses	Staff		Trips	PM Trips Generated: Parents	Buses	Staff		Trips
IN										
OUT										
			AM 12th Trips					PM 12th Trips		

All AM TRIPS	In	45
	Out	45
	Total	90

All PM TRIPS	In	32
	Out	32
	Total	64

ADT
154

NOTES

- **Average Queue Length does not** include an alternative traffic pattern required for high traffic demand days which is usually 30% additional length.
- **Average Queue Length does not** include the Student Loading Zone.
- Peak traffic volumes at schools normally occur within a 30-minute time period. (justifying a PHF of 0.5)

Calculated 2/17/2026 By:_____

St. Lucie Transportation Planning Organization

Coco Vista Centre
466 SW Port St. Lucie Blvd, Suite 111
Port St. Lucie, FL 34953
772-462-1593 www.stlucietpo.org

Traffic Counts and Level of Service Report
2025

Roadway Name	Location	STATION ID	2025 AADT *	Last Physical Count Year	Pk Hr Service Capacity	AM Pk Hr Pk Dir			PM Pk Hr Pk Dir		
						Volume	LOS	V/C	Volume	LOS	V/C
25TH ST	VIRIGINIA AVE to NEBRASKA AVE	529	23,683	2023	2,000	1,393	C	0.70	1,147	C	0.57
25TH ST	NEBRASKA AVE to OKEECHOBEE RD	609	21,514	2024	2,000	1,108	C	0.55	1,080	C	0.54
25TH ST	OKEECHOBEE RD to GEORGIA AVE	609	21,514	2024	1,630	1,108	D	0.68	1,080	D	0.66
25TH ST	GEORGIA AVE to DELAWARE AVE	609	21,514	2024	1,630	1,108	D	0.68	1,080	D	0.66
25TH ST	DELAWARE AVE to ORANGE AVE	780	22,500	2025	1,630	1,088	D	0.67	1,149	D	0.70
25TH ST	ORANGE AVE to AVENUE D	610	20,161	2023	1,630	1,003	D	0.62	1,161	D	0.71
25TH ST	AVENUE D to AVENUE Q	781	18,500	2025	1,630	1,005	D	0.62	1,196	D	0.73
25TH ST	AVENUE Q to JUANITA AVE	781	18,500	2025	2,000	1,005	C	0.50	1,196	C	0.60
25TH ST	JUANITA AVE to ST LUCIE BLVD	782	13,000	2025	2,100	805	C	0.38	959	C	0.46
25TH ST	ST LUCIE BLVD to US 1	783	7,700	2025	2,100	479	C	0.23	433	C	0.21
29TH ST	AVENUE D to ORANGE AVE	774	4,100	2025	790	216	C	0.27	220	C	0.28
29TH ST	AVENUE D to AVENUE Q	774	4,100	2025	790	216	C	0.27	220	C	0.28
33RD ST	OKEECHOBEE RD to DELAWARE AVE	611	6,596	2023	750	374	D	0.50	336	C	0.45
33RD ST	DELAWARE AVE to ORANGE AVE	763	6,400	2025	790	368	C	0.47	389	C	0.49
35TH ST	KIRBY LOOP RD to CORTEZ BLVD	612	5,334	2023	540	386	D	0.71	332	D	0.61
35TH ST	CORTEZ BLVD to VIRGINIA AVE	612	5,334	2023	790	386	C	0.49	332	C	0.42
35TH ST	VIRGINIA AVE to OKEECHOBEE RD	613	4,730	2021	750	232	C	0.31	250	C	0.33
53RD ST	ANGLE RD to JUANITA AVE	614	2,334	2022	540	152	C	0.28	157	C	0.29
AE BACKUS AVE	7TH ST to US 1	632	931	2022	750	66	C	0.09	68	C	0.09
AIROSO BLVD	PORT ST LUCIE BLVD to THORNHILL DR	303	16,500	2025	2,100	1,104	C	0.53	909	C	0.43
AIROSO BLVD	THORNHILL DR to CROSSTOWN PKWY	303	16,500	2025	2,100	1,104	C	0.53	909	C	0.43
AIROSO BLVD	CROSSTOWN PKWY to PRIMA VISTA BLVD	243	19,858	2024	2,100	1,007	C	0.48	1,025	C	0.49
AIROSO BLVD	PRIMA VISTA BLVD to FLORESTA DR	101	15,445	2024	2,000	820	C	0.41	873	C	0.44
AIROSO BLVD	FLORESTA DR to ST JAMES DR	301	21,000	2025	2,100	1,186	C	0.56	1,111	C	0.53
ANGLE RD	ORANGE AVE to AVENUE D	100	8,834	2024	790	476	D	0.60	464	D	0.59
ANGLE RD	AVENUE D to AVENUE Q	100	8,834	2024	540	476	D	0.88	464	D	0.86
ANGLE RD	AVENUE Q to 53RD ST	615	8,345	2023	600	559	D	0.93	503	D	0.84
ANGLE RD	53RD ST to KEEN RD	616	5,931	2023	630	373	C	0.59	321	C	0.51
ANGLE RD	KEEN RD to KINGS HWY	616	5,931	2023	880	373	C	0.42	321	C	0.36
ANGLE RD	KINGS HWY to JOHNSTON RD	617	3,811	2022	1,070	237	B	0.22	228	B	0.21
ANGLE RD	JOHNSTON RD to FLORIDA'S TURNPIKE	770	2,400	2025	1,070	161	B	0.15	155	B	0.14
AVENUE A	7TH ST to US 1	765	2,000	2025	790	231	C	0.29	234	C	0.30

* **NOTE:** A six digit number in the "STATION ID" column identifies segment counted by FDOT.
Peak hour data is not available for locations on State roads due to differences in data availability, LOS Methodologies, and service level thresholds.
Please refer to FDOT sources for detailed data on FDOT traffic counts.

* Volumes shown were adjusted using FDOT Seasonal Factors
* AADT = Annual Average Daily Traffic (volumes for both directions where applicable)

*** NOTE:** If the Last Count Year is older than the year of the report, the AADT is projected from historical traffic count data.