Silvestri Property
Cocoa, Florida

Traffic Calming Study

Prepared for: Taylor Morrison of Florida, Inc.
By: LTG, Inc.
***Revised* January 2024**

LTG Engineering & Planning

PROFESSIONAL ENGINEERING CERTIFICATION

I hereby certify that I am a Professional Engineer properly registered in the State of Florida practicing with LTG, Inc., a corporation authorized to operate as an engineering business, EB 0009227, by the State of Florida Department of Professional Regulation, Board of Professional Engineers, and that I have prepared or approved the evaluations, findings, opinions, conclusions, or technical advice attached hereto for:

PROJECT: Silvestri Property – Traffic Calming Study
LOCATION: Cocoa, Florida
CLIENT: Taylor Morrison of Florida, Inc.
JOB #: 5799.16

I hereby acknowledge that the procedures and references used to develop the results contained in these computations are standard to the professional practice of Transportation Engineering as applied through professional judgment and experience.

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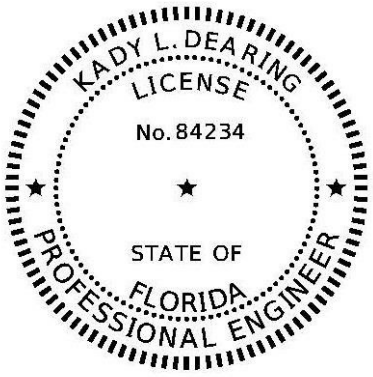

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY:

Kady L Dearing

Digitally signed by Kady L Dearing
DN: CN=Kady L Dearing, dnQualifier=A01410D000001812611234200027 7B9, O=LASSITER TRANSPORTATION GROUP INC, C=US
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INTRODUCTION

LTG, Inc. (LTG) has been retained by Taylor Morrison of Florida, Inc. to prepare a Traffic Calming Study (TCS) on behalf of the residential development known as the Silvestri Property, located in the City of Cocoa, Florida. Traffic calming is the implementation of physical roadway features for the purpose of slowing motor vehicle speeds and altering driver behavior. These features can be installed to help to reduce the speed at which vehicles travel, discourage through traffic, improve traffic safety, and improve the comfort level for non-motorized users. The purpose of the analysis is to identify any operational concerns as it relates to speeding, safety and driver behavior in the study area and provide recommendations for improvement. The limits of the study area are graphically depicted in **Figure 1** and described below.

Study Area

The study area includes the following intersections and roadway segments as approved in the submitted methodology. The approved methodology is included as **Appendix A**.

Intersections:

- Friday Road at Rayburn Road
- Friday Road at Rector Road
- Friday Road at James Road
- James Road at Cox Road

Roadway Segments:

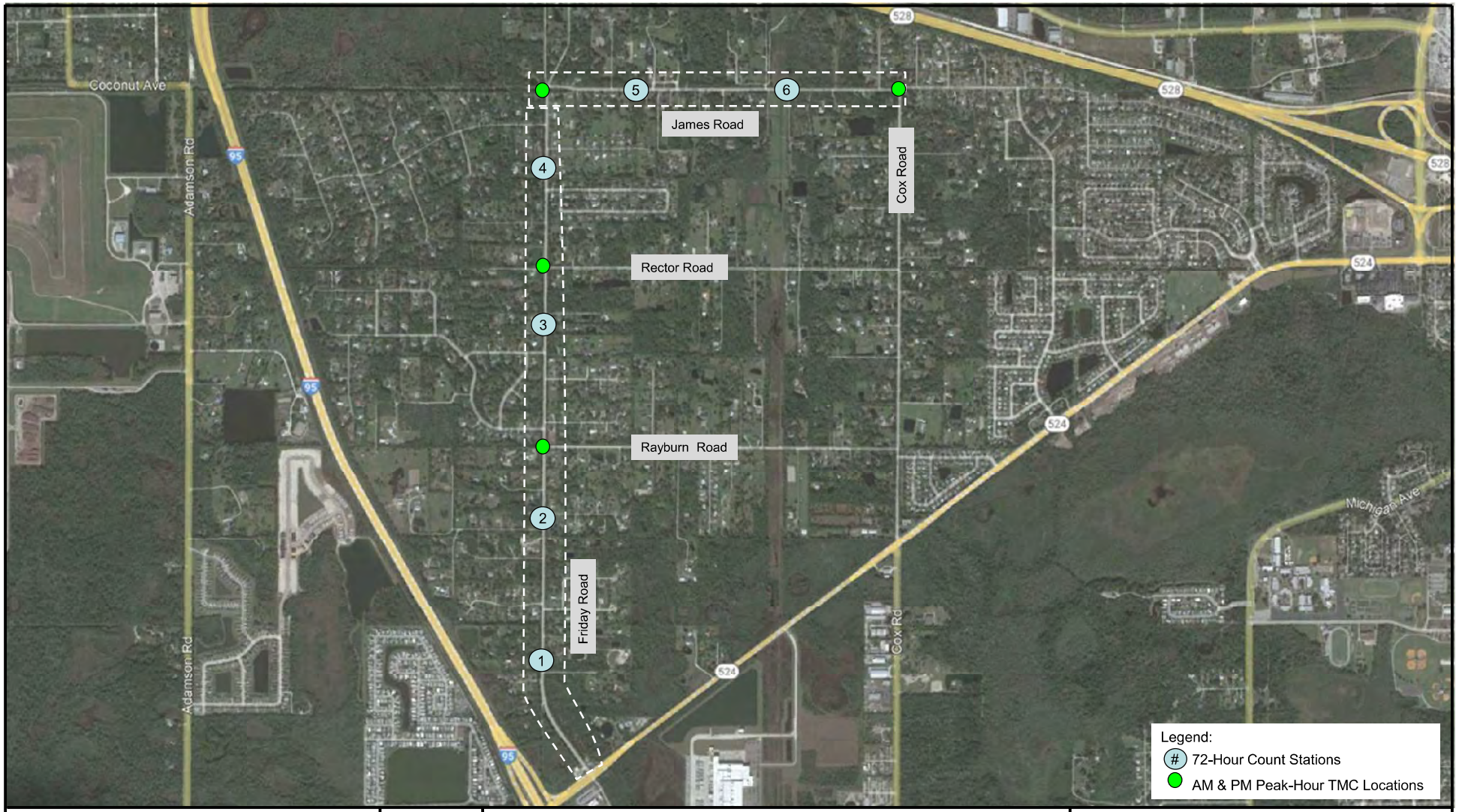
- Friday Road from SR 524 to James Road
- James Road from Friday Road to Cox Road

Study Procedures

Standard engineering and planning procedures outlined in the Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Street and Highways commonly known as the Florida Greenbook (FDOT), the Brevard County Traffic Engineering Department, and the U.S. Department of Transportation Federal Highway Administration (FHWA), including FHWA Traffic Calming ePrimer, were used.

Planned Roadway Improvements

FDOT's Five Year Work Program, SCTPO Transportation Improvement Program, and the Brevard County Capital Improvement Plan were reviewed to ascertain if there were any programmed or planned roadway improvements funded for construction within the next five (5) years within the area of interest. According to the Brevard County Capital Improvement Plan, the southbound approach at the intersection of SR 524 and Friday Road is currently funded to be reconfigured to an exclusive southbound right-turn lane and a shared left-through lane.



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Traffic Calming Study

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Study Area

Project No.: 5799.16

Figure: 1

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EXISTING CONDITIONS ASSESSMENT

The following section documents the existing roadway characteristics and traffic operations as it relates to segments and intersections within the study area. The assessment is included to develop a base condition and understanding of the area type and for determining applicable treatments for implementation.

Existing Roadway Conditions

Friday Road:

Within the limits of the study area, Friday Road is classified as a two-lane, undivided urban local roadway with a posted speed limit varying from 45 and 40 miles per hour (mph). The segment provides access to primarily single-family residential uses. The roadway topography is primarily flat terrain. A typical section includes one 12 ft. travel lane in each direction (average total width of 24 ft.), an average 6 ft. shoulder on each side, no bicycle lanes, and no existing sidewalk. The roadway is designed as an open-drainage system, with no curb or gutter present, and includes a combination of large drainage canals and swales on both sides of the roadway. The average apparent right-of-way width is approximately 100 ft. Residential mailboxes, vegetation and private landscaping are often located directly adjacent to the travel way edge-of-pavement (EOP). The typical section is shown in **Figure 2A**. A picture of the existing drainage system is shown in **Figure 2B**.

Figure 2A: Friday Road - Typical Section (facing south)

Figure 2B: Friday Road – Open Drainage System (facing north)

In addition, there are overhead utilities located at varied lengths from the edge-of-travel lane along the segment. The varied utility location can be described as follows: from SR 524 to Weekend Lane, poles are located approximately 20 ft. from the edge-of-travel lane on the west side of Friday Road and cross to the east side of the road at the horizontal curve (approximately ¼ mile north of SR 524); from Weekend Lane to Pinewood Place, poles are located approximately 6 ft. from the edge-of-travel lane on the east; from Pinewood Place to Friday Circle, poles are located approximately 15 ft. from the edge-of-travel lane on the east, and from Friday Circle to James Road, poles extend approximately 20 ft. from the edge-of-travel lane on the east.

James Road:

Within the limits of the study area, James Road is classified as a two-lane, undivided local roadway with a posted speed limit of 35 mph and primarily provides access to single-family residential uses. The roadway topography is primarily flat terrain. A typical section includes one 11 ft. travel lane in each direction (average total width of 22 ft.), an average 4 ft. shoulder on each side, no bicycle lanes, and no existing sidewalk. The roadway was designed as an open-drainage system, with no curb or gutter present, and includes a large canal on the north side of the Road. The location of the edge of the canal varies between 3 ft. and 5 ft. from the EOP and extends approximately 4,875 ft. before crossing under the roadway to the south side of the road near Friday Road and Cox Road. The apparent right-of-way varies from 100 ft. to 75 ft. and includes the width of the canal. Residential mailboxes, vegetation and private landscaping are often located directly adjacent to the EOP. The typical section is shown in **Figure 3A**. A picture of the existing drainage system is shown in **Figure 3B**.

In addition, there are overhead utilities, supported by rectangular concrete poles, located approximately 5 ft. from the edge of the travel lane on the south side. The distance between the power poles placed on James Road varies along the segment, but the average spacing was measured at approximately 135 ft.

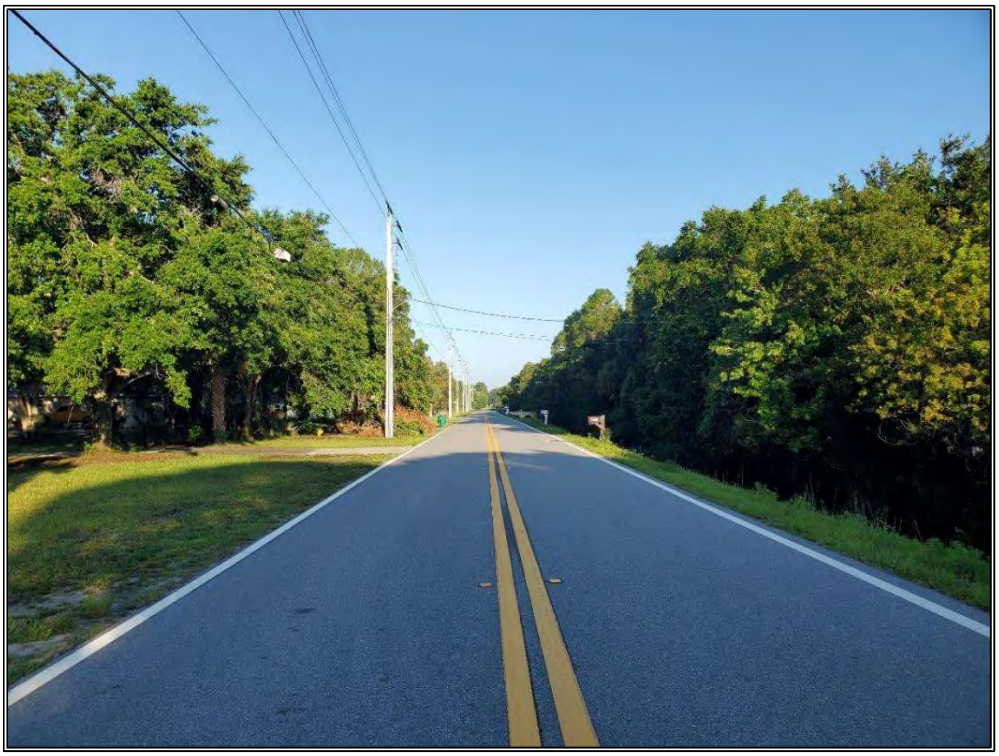

Figure 3A: James Road - Typical Section (facing west)

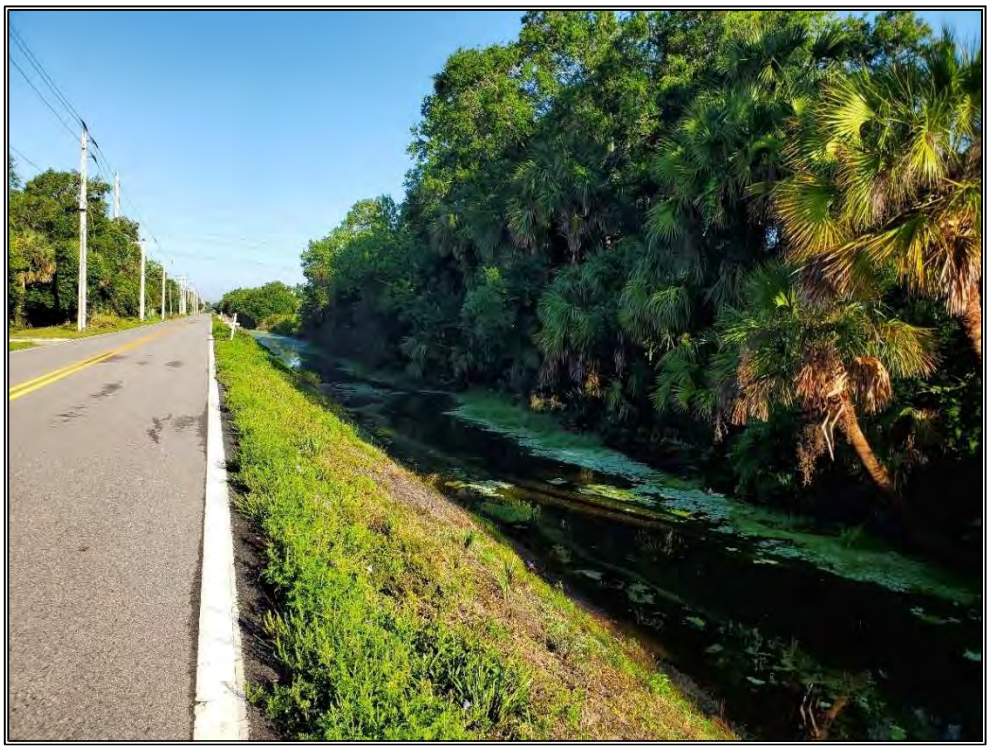

Figure 3B: James Road – Open Drainage System (facing west)

Existing Traffic Control

The following section describes the existing traffic control measures in the study area that help notify drivers of the operational laws and standards currently in place.

The southern end of the study area, at SR 524 and Friday Road, currently operates under signal control. The minor street intersections at Rayburn Road and Rector Road on Friday Road operate under TWO-WAY STOP control. The five-way intersection at Friday Road and James Road, and the three-way intersection at James Road and Cox Road, currently operate under ALL-WAY STOP control. All other side-street approaches have regulatory STOP signs present.
A total of six (6) posted speed limit signs are located along Friday Road to notify drivers of their travel speed in both travel directions. All signs are located within 325 ft. from minor street intersections along the segment, with no visibility obstructions present. In addition to the regulatory speed signs, a horizontal and stop control ahead warning sign, recreational warning signs, bicycle facility sign, and business notification sign are present.

A total of three (3) posted speed limit signs are located along James Road to display and notify drivers of their travel speed in both travel directions, with no visibility obstructions present. Signs are located near the Friday Road and Cox Road intersections, and one located in the middle of the segment for the westbound direction of travel. In addition to the regulatory speed signs, a recreational warning sign, horizontal warning sign and stop sign ahead warning sign are present. The approximate location of the existing traffic control signs in the study area are graphically depicted in **Figure 4**.

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Existing Traffic Control

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Qualitative Assessment

A field visit on Friday Road and James Road was conducted on June 8th, 2023, during the a.m. and p.m. peak time period to assess the existing operating and roadway conditions. The following summary is based on the overall traffic assessment within the study area.

Friday Road:

General Observations:

- Even though the roadway is classified as urban, the area type and traffic volume observed appeared to be more rural in nature.
- The intersections at Rayburn Road and Rector Road currently operate under TWO-WAY STOP control with single approach lanes in each direction. Sufficient gaps were observed for minor street traffic to perform turning movement onto Friday Road.
- Low traffic volume was observed at the intersections at Rayburn Road and Rector Road.
- No aggressive or unlawful traffic operations were observed.
- One bicyclist was observed near the Rayburn Road intersection during a.m. peak hour. Vehicular drivers slowed down and shared the road; passed with ease.
- Two pedestrians were observed walking their dogs along the east side of Friday Road, by use of the shoulder and the street, between 6:45 a.m. and 7:00 a.m.
- Multiple heavy trucks were observed during a.m. peak hour and no indication of off-tracking or difficulty navigating the roadway system.

Safety:

- No evidence of tire skid marks, broken glass or debris was observed.
- Overhead luminaries for street lighting observed on a few of the existing power poles located on the east side of the street; located primarily near connecting minor streets (Shady Place, Rayburn Road, between Dalehurst Drive and Hidden Pine Place, Pinewood Place, Rector Road, N. Friday Circle, Janet Road, James Road).
- While natural landscape buffers appear overgrown, the vegetation within the apparent right-of-way was mowed/trimmed. No indication of blocked sight distance was observed.
- The speed limit and roadway signs placed within clear view.
- Pavement markings are visible, no fading or damage.
- Guardrails are located on the east and west side of the street at James Road intersection.

James Road:

General Observations:

- The intersections of James Road at Friday Road and Cox Road currently operate under ALL-WAY STOP control with single approach lanes in each direction.
- A very low traffic volume was observed during a.m. and p.m. peak hours.
- Two pedestrians were observed walking their dogs, using the street for access, between 7:30 a.m. and 7:45 a.m. on the south side of James Road.
- No Bicyclists observed during a.m. and p.m. peak hours.
- A few heavy trucks were observed during a.m. peak hour and no indication of off-tracking or difficulty navigating the roadway system.

Safety:

- Evidence of sudden stopping, by tire track skid marks, were observed at four locations along the segment;
    - Multiple marks at and within the James Road at Friday Road intersection,
    - In the westbound and eastbound travel lanes, approximately 630 ft. east of the Friday Road intersection (**Figure 5**),
    - Near Quiet Lane, on the east side of the project boundary (approximately 975 ft. west of the Cox Road intersection), and
    - At the Cox Road intersection.
- Overhead luminaries for street lighting only provided on a few of the existing power poles located on the south side of the street; primarily located near connecting minor streets (Shady Oak Trail, Offshore Lane, Cox Road) and sparingly along the segment.
- No indication of blocked sight distance was observed.
- The speed limit and roadway signs placed within clear view.
- Pavement markings are visible, no fading or damage.
- Aggressive speeding was observed during the a.m. (5 vehicles) and p.m. peak hours (3 vehicles). Two drivers were observed operating their vehicles in the middle of the road during the p.m. peak hour.
- Guardrails are located at the Fox Trail Court intersection for additional protection/separation from the canal for operations at the intersection.
- While conducting the observation, one of the local residents stopped to raise concerns of speeding on James Road. The resident informed LTG staff that skid marks at the intersection of James Road at Friday Road are due to driving at high speeds. The resident elaborated and believed people feel inclined to speed on James Road due to recent traffic calming measuring being implemented on Rayburn Road and Rector Road (speed hump).

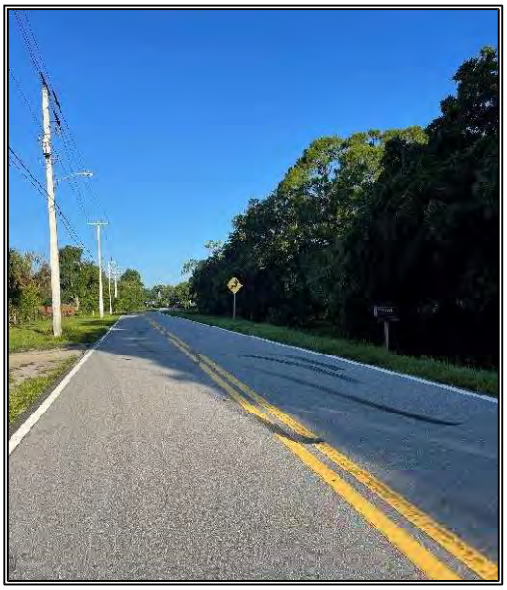

Figure 5: James Road – Tire Marks (facing west)

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EXISTING CONDITIONS TRAFFIC ANALYSIS

Data Collection

Turning movement counts for the AM and PM peak hours were conducted at the study area intersections on October 20, 2022, May 16, 2023, and June 1, 2023. Additionally, 72-hour machine counts were collected at six (6) locations within the study area, in accordance with the approved methodology letter, and include data sets for 85th percentile speed, average daily traffic (ADT), and vehicle classification. The FDOT Seasonal Factor (SF) recorded for the time the data was collected equates to 0.99. Therefore, no adjustments were made to the raw data collection. The turning movement counts, and 72-hour data collection reports are included as **Appendix B**. The 72-hour data was collected from Tuesday, May 16, 2023, through Thursday, May 18, 2023. The daily traffic count summary is provided in **Table 1**.

Table 1
Daily Traffic Volume Summary
Silvestri Property – TCS

Station ID	Roadway	General Location	Posted Speed Limit (mph)	Daily Traffic Counts			
				May 16th	May 17th	May 18th	
				NB & SB			ADT
1	Friday Rd.	S. of Weekend Ln	45	2,809	2,787	2,737	2,778
2		From Craig Rd. and Shade Tree St.	45	2,454	2,456	2,376	2,429
3		From Yorkshire Rd. and Pinewood Pl	45	1,564	1,554	1,526	1,548
4		From N Friday Cir. and Janet Rd.	40	1,073	1,135	1,046	1,085
Station ID	**Roadway**	**General Location**	**Posted Speed Limit (mph)**	**Daily Traffic Counts**			
				May 16th	May 17th	May 18th	
				EB & WB			ADT
5	James Rd.	West of Pine Lily Ln	35	677	617	645	646
6		West of Cox Rd.	35	714	654	692	687

Additionally, the collected data for vehicle classification includes vehicle type as motorcycles, cars and trailers, 2 axle long, buses, 2 axle 6 tire, 3 axle single, 4 axles single, <5 axle double, 5 axle double, >6 axle double, <6 axle multi, and 6 axle multi. Based on the collected data the highest percentage for vehicle classification consists of cars and trailers.

Crash Data

The latest crash history reports were collected on the study area roadway segments and intersections using Signal Four Analytics. The data includes the last five-years of available crash data from January 1, 2018, to December 31, 2022. The crash data summaries for each segment are provided below.

In summary, there were ten (10) crashes reported on Friday Road and consisted of the following types:

- 2 left-turning,
- 2 single vehicles (other; non-collision),
- 3 off road (fence and utility pole/light support),
- 1 right angle,
- 1 rollover, and
- 1 other.

Of the crashes reported, one (1) occurred under wet pavement conditions, one (1) driver was reported Driving Under the Influence (DUI), and three (3) occurred at night.

The James Road reported a total of five (5) crashes over the five-year period and consisted of the following types:

- 4 off road (fixed object, traffic sign support and ditch), and
- 1 left-turning crash.

Of the crashes reported on James Road, one (1) occurred under wet pavement conditions, and two (2) occurred at night. The detailed collision summary for Friday Road is provided as **Table 2**, while the collision summary for James Road is provided in **Table 3**. **Figure 5** graphically depicts the locations of the crash sites.

Table 2
Collision Summary – Friday Road
Silvestri Property – TCS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION — FORM 750-020-06
TRAFFIC ENGINEERING
CRASH SUMMARY — 6/7/2023

LOCATION:			Friday Road		S.R. NO.:					
INTERSECTING ROUTE:					M.P.:			ENGINEER: Kady Dearing		
STUDY PERIOD FROM:			1/1/2018		TO:		12/31/2022	COUNTY: Brevard		
NO.	DATE	DAY	TIME	FATAL	INJURY	PROPERTY DAMAGE	DAY / NIGHT	WET/ DRY	CONTRIBUTING CAUSE	
1	5/26/2018	Saturday	2:00 PM	-	2	$ 14,000.00	DAY	Dry	Motor Vehicle in Transport	
2	7/18/2018	Wednesday	7:32 AM	-	-	$ 1,200.00	DAY	Wet	Other Non-Collision	
3	5/4/2019	Saturday	1:20 PM	-	2	$ 200.00	DAY	Dry	Fence	
4	9/12/2019	Thursday	1:05 PM	-	-	$ 2,500.00	DAY	Dry	Motor Vehicle in Transport	
5	10/19/2019	Saturday	8:30 PM	-	-	$ 15,000.00	NIGHT	Dry	Motor Vehicle in Transport	
6	4/8/2020	Wednesday	12:40 AM	-	2	$ 25,000.00	NIGHT	Dry	Overturn/Rollover	
7	10/1/2020	Thursday	10:48 AM	-	1	$ 60,000.00	DAY	Dry	Utility Pole/Light Support	
8	10/13/2021	Wednesday	8:24 PM	-	-	$ 500.00	NIGHT	Dry	Other Non-Collision	
9	5/19/2022	Thursday	9:29 AM	-	-	$ 20,000.00	DAY	Dry	Motor Vehicle in Transport	
10	6/7/2022	Tuesday	3:04 PM	-	1	$ 7,700.00	DAY	Dry	Utility Pole/Light Support	
TOTAL				0	8	$ 146,100.00				

TOTAL NO.	FATAL	INJURY	P.D.	ANGLE	LEFT TURN	RIGHT TURN	REAR END	SIDE SWIPE
10	0	8	5	0	0	0	0	0

ONE VEHICLE	PED	DAY	NIGHT	WET	DRY	EXCESS SPEED	FTY R/W	DUI
6	0	7	3	1	9	0	0	1

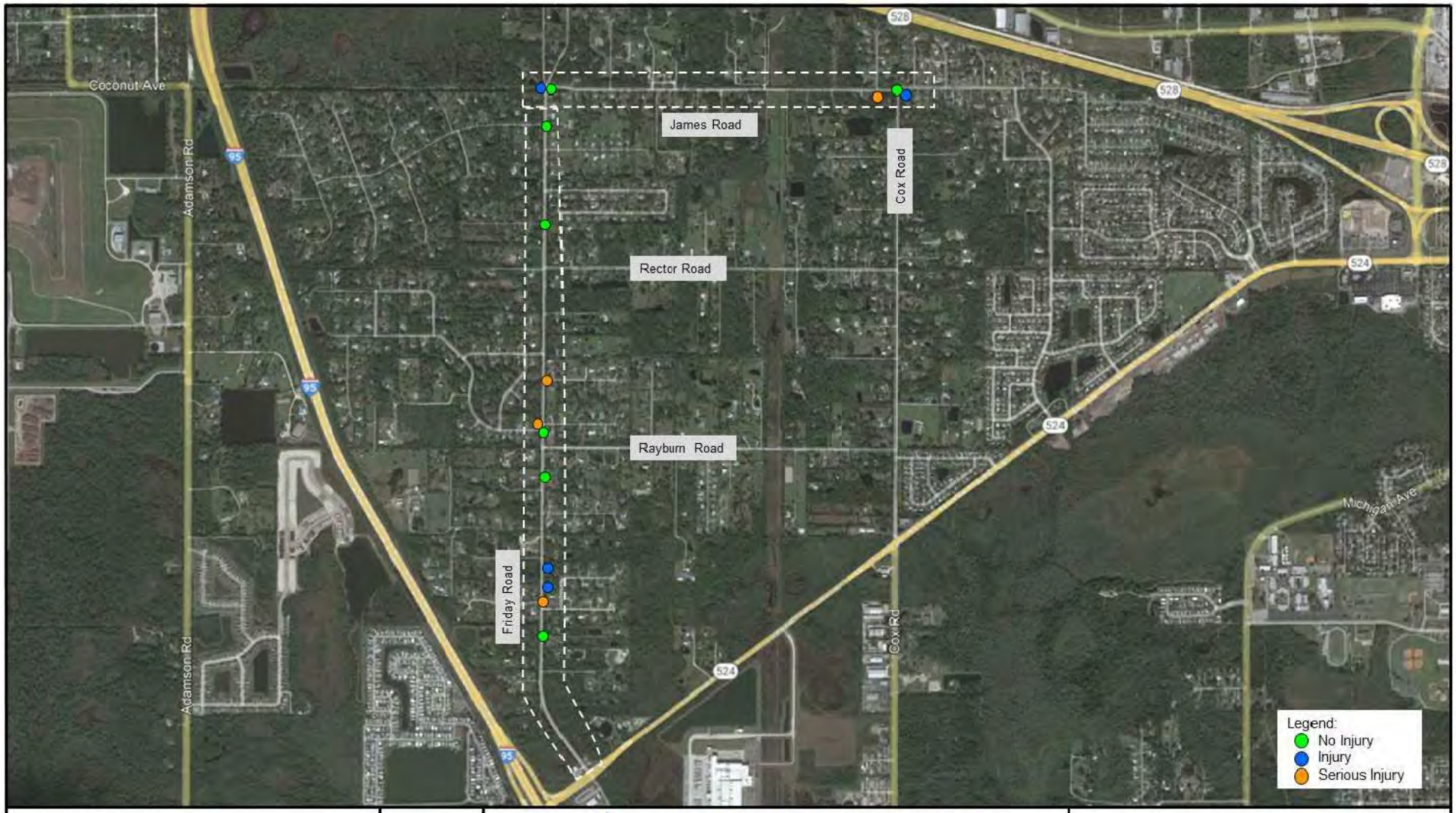
TOTAL VEHICLES ENTERING/ADT:	2,778	CRASH RATE: MVMT	1.01	

Table 3
Collision Summary – James Road
Silvestri Property – TCS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION									FORM 750-020-06
									TRAFFIC ENGINEERING
CRASH SUMMARY									6/6/2023
LOCATION:			James Road		S.R. NO.:				
INTERSECTING ROUTE:					M.P.:			ENGINEER: Kady Dearing	
STUDY PERIOD FROM:			1/1/2018		TO:		12/31/2022	COUNTY: Brevard	
NO.	DATE	DAY	TIME	FATAL	INJURY	PROPERTY DAMAGE	DAY / NIGHT	WET/ DRY	CONTRIBUTING CAUSE
1	4/7/2019	Sunday	1:31 PM	-	2	$ 500.00	DAY	Dry	Other Fixed Object
2	10/12/2020	Monday	8:25 PM	-	-	$ 11,500.00	NIGHT	Dry	Traffic Sign Support
3	2/6/2021	Saturday	4:35 PM	-	1	$ 1,000.00	DAY	Wet	Ditch
4	2/19/2021	Friday	10:00 PM	-	1	$ 5,000.00	NIGHT	Dry	Ditch
5	3/12/2022	Saturday	5:45 PM	-	-	$ 200.00	DAY	Dry	Motor Vehicle in Transport
TOTAL				0	4	$ 18,200.00			

TOTAL NO.	FATAL	INJURY	P.D.	ANGLE	LEFT TURN	RIGHT TURN	REAR END	SIDE SWIPE
5	0	4	2	0	0	0	0	0
ONE VEHICLE	PED	DAY	NIGHT	WET	DRY	EXCESS SPEED	FTY R/W	DUI
4	0	3	2	1	4	0	0	0

TOTAL VEHICLES ENTERING/ADT:	665	CRASH RATE: MVMT	4.13



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Crash Data Locations

Project No.: 5799.16 | Figure: 6

Safety Data Analysis

The average number of vehicles per day compared to the average number of crashes along a segment can be used to determine a crash specific to a particular segment. The crash rate analysis can give insight to the relative level of safety on the segment by considering driver exposure. The crash rate is then compared to statewide and local level data collected for similar roadways to determine relative safety of the roadway in question. For an urban 2-3 lane, two-way undivided roadway, the Brevard County five-year average crash rate equates to 6.62 crashes per Million Vehicle Miles Traveled (MVMT). Whereas the statewide average for the same roadway type equates to 3.85 MVMT. Based on the crash data, ADT and length of the segment, Friday Road resulted in a crash rate of 1.01 crashes per MVMT. James Road resulted in 4.13 crashes per MVMT. The crash rate analysis concludes that Friday Road is within the local (County) and statewide averages, while James Road is not within the statewide average, but is within the local average.

In addition to the crash rate analysis, the reported 85th percentile speed along each segment helps determine the typical speed of all vehicles observed to travel under free-flow conditions. Free-flow conditions can be defined as a condition when drivers are unaffected by downstream traffic, with no incidents occurring, and under clear/good weather. The 85th percentile speed indicates the speed that most motorists on the road consider safe and reasonable under ideal/free-flow conditions. Using the 72-hour machine data, the 85th percentile speed was provided at each station location, for each travel direction on each collection day. The summary of the data collection is provided in **Table 4** for Friday Road, and in **Table 5** for James Road.

In summary, the posted speed limit of 45-mph on Friday Road appears to be sufficient as the average 85th percentile speed on the segment exceeds the +/- 5 mph range by one (1) mile per hour at two locations. It should be noted that the excess speed is primarily in the southbound direction; the northbound direction is within the posted speed limit range. However, the posted 40-mph speed limit zone consistently results in 85th percentile speeds within the 45-mph posted speed limit range. The resulting 85th percentile speed on James Road indicates that a majority of the motorists traveling on the roadway are comfortable driving on the segment at operating speeds between 44-mph and 46-mph; approximately 10-mph over the posted speed limit.

The total average 85th percentile travel speed for each posted speed limit zone – 45-mph posted speed zone on Friday Road, the 40-mph posted speed zone on Friday Road, and the 35-mph posted speed on James Road are presented in **Figures 7A, 7B, and 7C**. The Figures visually represent the average number of vehicles and speeds on an hourly basis over the time period of the data collection. The data concludes that higher travel speeds are occurring during the a.m. and p.m. peak hours on Friday Road and are consistently high throughout the day on James Road.

Table 4
85th Percentile Speed Summary – Friday Road
Silvestri Property – TCS

Station ID	Roadway	General Location	Posted Speed Limit (mph)	85th Percentile Speed (mph)									Overall Average 85th Percentile Speed (mph)	Within ±5 Posted Speed limit?
				May 16th	May 17th	May 18th	May 16th	May 17th	May 18th	May 16th	May 17th	May 18th		
				Direction										
				NB			SB			Average NB & SB				
1	Friday Rd.	S. of Weekend Ln	45	49	49	49	51	51	51	50	50	50	50	Yes
2		Between Craig Rd. and Shade Tree St.	45	49	49	49	52	52	52	51	51	51	51	No
3		Between Yorkshire Rd. and Pinewood Pl	45	50	50	50	51	51	51	51	51	51	51	No
4		Between N Friday Cir. and Janet Rd.	40	47	47	47	46	46	46	47	47	47	47	No

Table 5
85th Percentile Speed Summary – James Road
Silvestri Property – TCS

Station ID	Roadway	General Location	Posted Speed Limit (mph)	85th Percentile Speed (mph)									Overall Average 85th Percentile Speed (mph)	Within ±5 Posted Speed limit?
				May 16th	May 17th	May 18th	May 16th	May 17th	May 18th	May 16th	May 17th	May 18th		
				Direction										
				EB			WB			EB & WB				
5	James Rd.	West of Pine Lily Ln	35	43	43	43	44	44	44	44	44	44	44	No
6		West of Cox Rd.	35	45	45	45	47	47	47	46	46	46	46	No

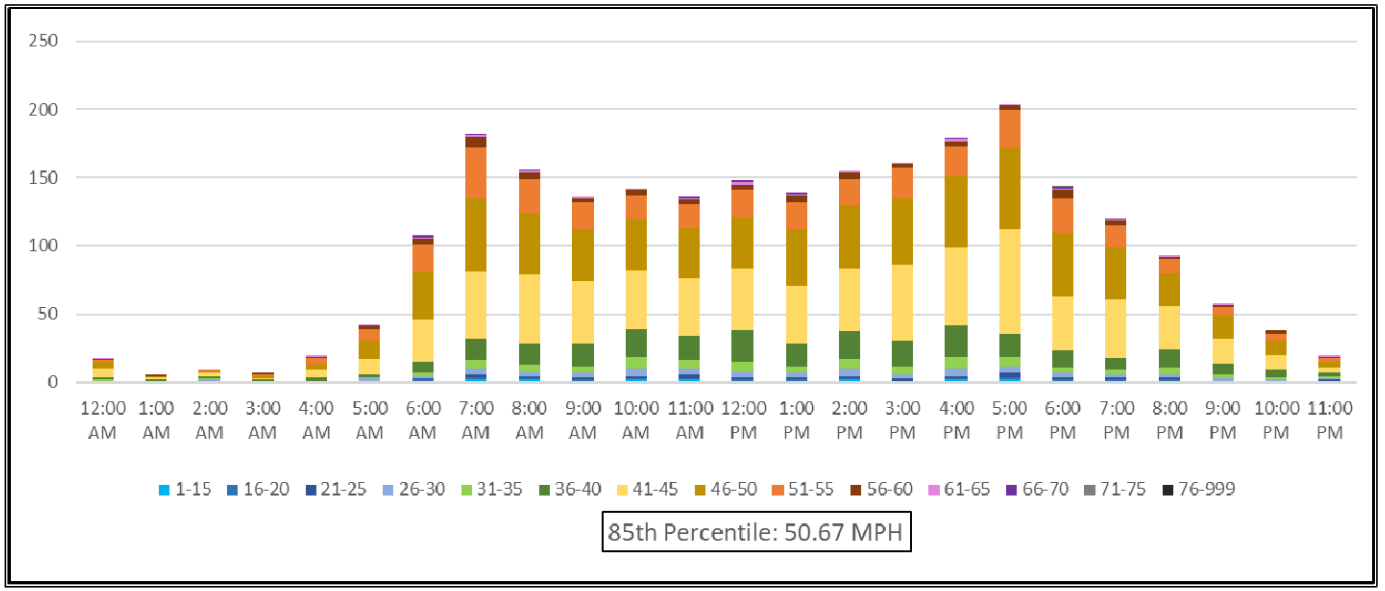


Figure 7A – Friday Road: Number of Vehicles and Reported Speeds by Hour;
Within the 45-mph Posted Speed Zone (from SR 524 to Rector Rd.)

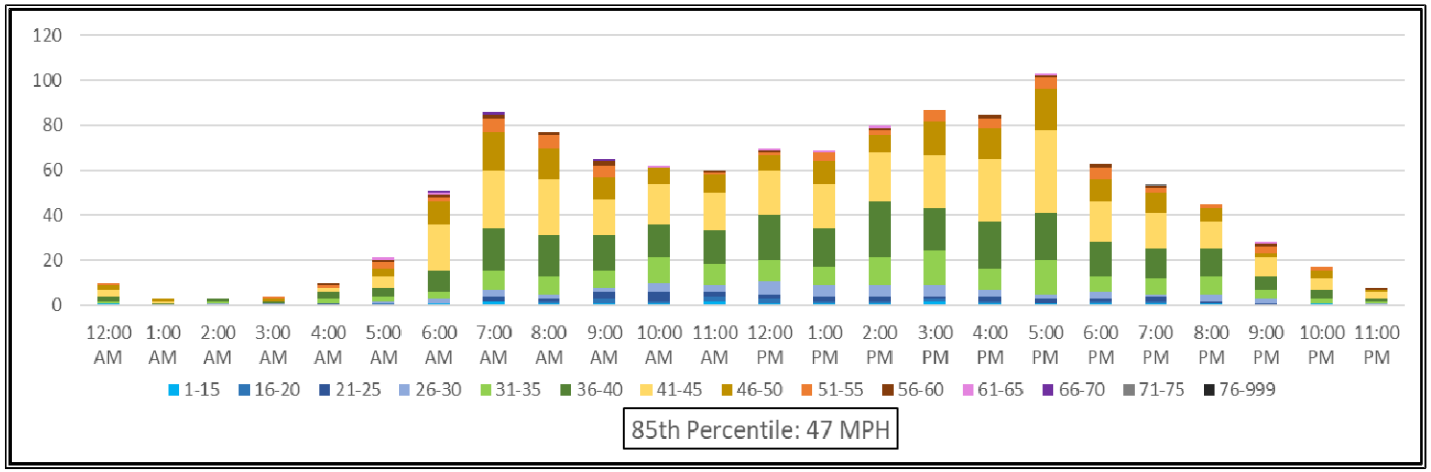


Figure 7B – Friday Road: Number of Vehicles and Reported Speeds by Hour;
Within 40-mph Posted Speed Zone (from Rector Rd. to James Rd.)

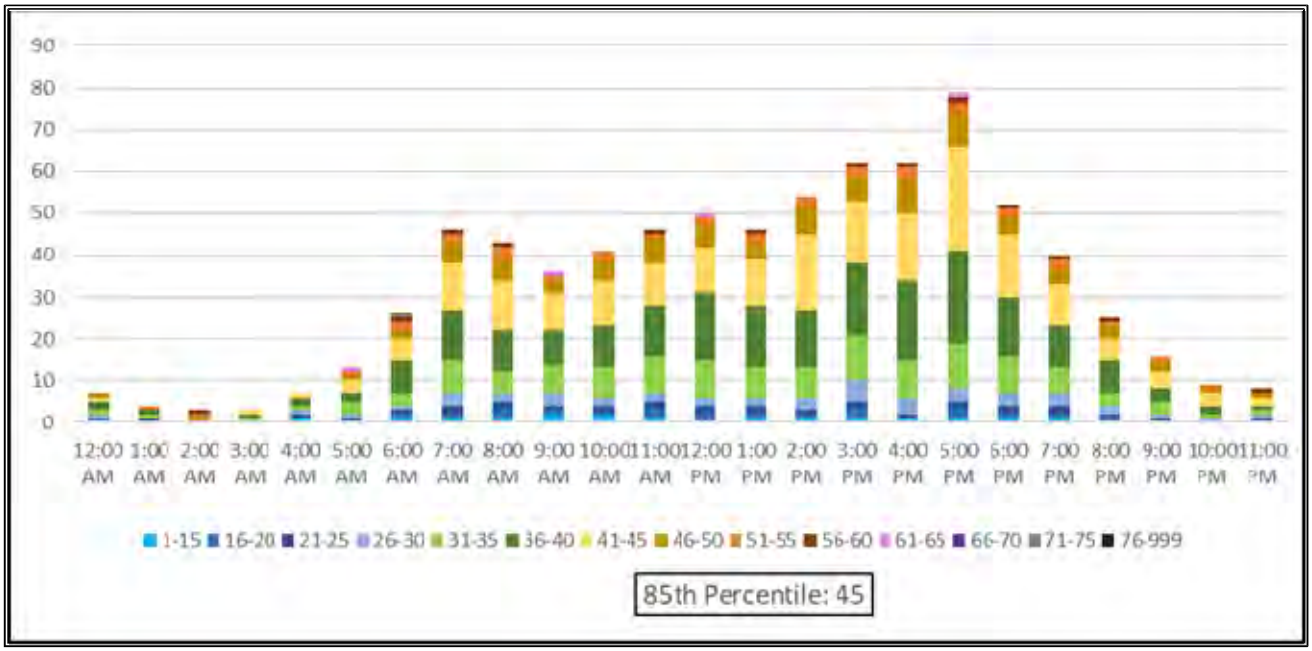


Figure 7C – James Road: Number of Vehicles and Reported Speeds by Hour

Intersection Analysis

The study area intersections were analyzed using *Synchro 11* (Synchro) software. The Synchro software utilizes the procedures outlined in the *Highway Capacity Manual, 6th Edition*. The existing AM and PM peak hour level-of-service (LOS) at the intersections is presented in **Table 6**. The Synchro output summary sheets are included as **Appendix C**. As shown in Table 6, all intersections have sufficient capacity and are operating within the adopted LOS.

Table 6
Peak Hour Intersection LOS
Silvestri Property - TCS

Intersection	Control Type	Adopted LOS	AM Peak Hour				PM Peak Hour			
			Critical Approach	Delay (sec.)	LOS	Overall Highest V/C	Critical Approach	Delay (sec.)	LOS	Overall Highest V/C
Friday Rd. at Rayburn Rd.	Two-Way Stop	E	WB	9.8	A	0.02	WB	9.3	A	0.031
Friday Rd. at Rector Rd.	Two-Way Stop	E	WB	9.1	A	0.012	WB	9.2	A	0.02
Friday Rd. at James Rd.[1]	All-Way Stop	E	N/A	N/A	A	N/A	N/A	N/A	A	N/A
James Rd. at Cox Rd.	All-Way Stop	E	WB	7.3	A	0.036	WB	7.4	A	0.084

[1]The HCM 6th methodology is not compatible with intersections with more than 4 legs. Therefore, critical approach, delay, and v/c ratio are not reported.

Roadway Segment Analysis

Roadway LOS describes the operating condition determined from the number of vehicles passing over a given section of roadway during a specified time period. It is a qualitative measure of several factors which include speed, travel time, traffic interruptions, freedom to maneuver, driver comfort, convenience, safety, and vehicle operating costs. Six levels of service have been established as standards by which to gauge roadway performance, designated by the letters A through F. The level of service categories is defined as follows:

Level of Service A: Free flow, individual users virtually unaffected by the presence of others.
Level of Service B: Stable flow with a high degree of freedom to select operating conditions.
Level of Service C: Flow remains stable, but with significant interactions with others.
Level of Service D: High-density stable flow in which the freedom to maneuver is severely restricted.
Level of Service E: This condition represents the capacity level of the road.
Level of Service F: Forced flow in which the traffic exceeds the amount that can be served.

The Average Daily Traffic (ADT) for the roadway segments was obtained from the 72-hour counts. The existing PM peak hour two-way LOS for the roadway segments is shown in **Table 7**. As indicated in the table, all roadway segments currently operate within the peak hour two-way capacities.

Table 7
Peak Hour Two-Way Roadway Segment LOS
Silvestri Property – TCS

Roadway	Segment		72-hour Station ID	Jurisdiction	Classification	No. of Lanes	Adopted LOS	Current MAV[1]	Peak Hour Two-Way Capacity[2]	Average Daily Traffic (ADT)	Peak Hour Two-Way Volume	Existing V/C Ratio	Existing Volume Exceeds Peak Capacity?
Friday Road	SR 524	Weekend Ln	1	Brevard County	Urban Local	2	E	17,700	1,600	2,778	237	0.15	No
	Weekend Ln	Shade Tree St.	2	Brevard County	Urban Local	2	E	17,700	1,600	2,428	213	0.13	No
	Shade Tree St.	Pinewood Pl	3	Brevard County	Urban Local	2	E	17,700	1,600	1,548	137	0.09	No
	Pinewood Pl	James Rd.	4	Brevard County	Urban Local	2	E	17,700	1,600	1,084	98	0.06	No
James Road	Friday Rd.	Pine Lily Ln	5	Brevard County	Local	2	E	15,600[3]	1,410	646	67	0.05	No
	Pine Lily Ln	Cox Rd.	6	Brevard County	Local	2	E	15,600[3]	1,410	687	78	0.06	No

[1]Obtained from SCTPO Historical Counts from 2012-2021.
[2]Obtained from Table 4 in the FDOT QLOS Handbook.
[3]Based upon comparable roadway segment of Rosetine Street (Link ID 74) reported in SCTPO Historical Counts from 2012-2021.

4

TRAFFIC CALMING TREATMENTS

The Federal Highway Administration (FHWA) and the Institute of Transportation Engineers (ITE) have collaborated to produce the Traffic Calming ePrimer. For this ePrimer, physical traffic calming measures are grouped within four categories: horizontal deflection, vertical deflection, street width reduction, and routing restriction. The category descriptions and the measures are presented below:

A horizontal deflection hinders the ability of a motorist to drive in a straight line by creating a horizontal shift in the roadway. This shift forces a motorist to slow the vehicle in order to comfortably navigate the measure. The types of horizontal deflections described in this ePrimer are:

- Lateral shift,
- Chicane,
- Realigned intersection,
- Traffic circle,
- Small modern roundabout and mini roundabout, and
- Standard roundabout

A vertical deflection creates a change in the height of the roadway that forces a motorist to slow down in order to maintain an acceptable level of comfort. The types of vertical deflections described in this ePrimer are:

- Speed hump,
- Speed cushion,
- Speed table,
- Offset speed table,
- Raised pedestrian crosswalk, and
- Raised intersection.

A street width reduction narrows the width of a vehicle travel lane. As a result, a motorist slows the vehicle in order to maintain an acceptable level of comfort and safety. The measure can also reduce the distance for pedestrian walks to cross a street, reducing exposure to pedestrian/vehicle conflicts. The types of street width reductions included in this ePrimer are:

- Corner extension,
- Choker,
- Median island,
- On-street parking, and
- Road diet

A routing restriction prevents particular vehicle movements at an intersection and is intended to eliminate some portions of cut-through traffic. The types of routing restrictions described in this ePrimer are:

- Diagonal diverter,
- Full closure,
- Half closure,
- Median barrier, and
- Forced turn island.

Applicable Treatment Options

Of the four physical traffic calming groups, each type has been examined against the appropriate applications for each treatment using the roadway classification, roadway cross section and posted speed limit of the study area segments. Due to the results summarized in the Safety Data Analysis section of the report, the segment of Friday Road with a posted speed limit of 40 mph, and James Road (posted speed limit of 35 mph) have been included in the applicable assessment exercise. The treatment comparison and applicability for each segment is summarized in **Table 8.**

Based on the results, the following traffic calming measures are applicable and are included in the evaluation for feasibility for implementation:

- Horizontal Deflection
  - Lateral Shift (James Road)
  - Chicane (James Road)
  - Small Modern/Mini Roundabout (James Road)
- Vertical Deflection
  - Speed Table (Friday Road and James Road)
  - Offset Speed Table (Friday Road and James Road)

The vertical deflections are evaluated for Friday Road and James Road, even though the speed criteria are not met to include those treatments in the evaluation. For instance, Friday Road has a posted speed limit of 40 mph, when the maximum accepted posted speed limit is 35 mph, and speed tables are not generally accepted when the 85th percentile speed is 45 mph or more. Additionally, as requested by County staff, the evaluation of small modern and mini roundabouts was included.

Table 8
Applicable Applications for Traffic Calming
Silvestri Property – TCS

Traffic Calming Measure	Types of Traffic Calming Treatments	Application Criteria									Applicable for Open Cross Section and Urban Local Classification?	
		Type of Street	Intersection or Roadway Segment	Roadway Cross Section	Posted Speed Limit (mph)	Vehicle Traffic Volume	Emergency Route	Transit Route	Access Route	Max. Grade% Recommended**	Friday Rd. (40 mph)	James Rd. (35 mph)
Horizontal Deflection	Lateral shift	Local Road, Collector and Arterial Roadway	Segment (Mid-Block)	An open or urban cross section	35	Appropriate for all levels of traffic volume	Appropriate	Appropriate	Commercial or industrial site	Local Standard	No	Yes
	Chicane	Local Road and Low Volume Collector	Segment midblock or the entire block if the block length is short	An open or urban cross section	35	Low traffic volume (Recommended max. of 3,500 vehicles per day)	Appropriate	Appropriate	Residential Only	Local Standard	No	Yes
	Realigned intersection	Local Road, Collector and Subdivision Street	T-intersection Only	Urban cross section	25	Not applicable	Appropriate	Appropriate with adequate turning radii	Residential and commercial or industrial with adequate turning radii	Local Standard	No	No
	Traffic circle	Junction of two local roads	Intersection Only	Urban cross section	30	Traffic volume is relatively low (Recommended max. of 3,500 vehicles per day for each leg)	Not appropriate	Appropriate with no left turn	Residential Only	Local Standard	No	No
	Small modern roundabout and mini roundabout	Junction of two local roads, local road, and collector	Intersection Only	Urban cross section	Require slow approach vehicles	Low traffic volume	Appropriate	Appropriate with no left turn	Commercial or industrial site	Local Standard	No	No
	Roundabout	Junction arterial streets and of arterial streets with collector streets	Intersection Only	Urban cross section	Appropriate for any urban operating speed	Appropriate at all levels of traffic volume	Appropriate	Appropriate	Commercial or industrial site	Local Standard	No	No
Vertical Deflection	Speed hump	Residential local road or residential collectors	Segment	Urban cross section or placed six inches from the edge of a non-curbed	30 or less	Low traffic volume	Not appropriate	Not appropriate	Residential Only	8% or less	No	No
	Speed cushion	Local Road and Collector	Segment	Urban cross section	30 or less	Low traffic volume	Appropriate	Appropriate	Commercial or industrial site	8% or less	No	No
	Speed table	Local Road, Collector and Arterial Roadway	Segment	An open or urban cross section	35*	No more than 5% of the traffic flow consists of long-wheelbase vehicles	Not appropriate	Not appropriate	Residential Only	8% or less	No	Yes
	Offset speed table	Local Road, Collector and Arterial Roadway	Segment	An open or urban cross section	35*	No more than 5% of the traffic flow consists of long-wheelbase vehicles	Appropriate	Not appropriate	Residential Only	8% or less	No	Yes
	Raised crosswalk	Residential local and collector (appropriate if there is an existing crosswalk or it is warranted)	Segment and intersection	An open or urban cross section	35*	Appropriate locations with high pedestrian volume, high vehicle volume, and low vehicle speed (for example, in a downtown)	Not appropriate	Appropriate for a bus transit route if typical bus operating speeds are in 25 mph range	Residential Only	8% or less	No	No
	Raised intersection	Local Road, Collector and Subdivision Street (appropriate if there are existing crosswalks on all four legs of the intersection or if crosswalks are warranted)	Intersection Only	Urban cross section	30	Low traffic volume	Appropriate	Appropriate	Residential Only	8%	No	No
Street Width Reduction	Corner extension	Local Road, Collector and Arterial Roadway	Intersection Only	Urban cross section	35 or Max. 40 when travel lanes are not narrowed.	Appropriate for all levels of traffic volume	Appropriate	May not be appropriate if an adequate turning radius cannot be provided	Residential and it is not appropriate if an adequate turning radius cannot be provided for commercial	Local Standard	No	No
	Choker	Local Road, Collector and Arterial Roadway	Segment	Urban cross section	Appropriate for any speed limit with an adequate sight distance between the travel lane and the choker curb (recommended 35 & 40)	Appropriate for all levels of traffic volume	Appropriate	Appropriate	Commercial or industrial site	Local Standard	No	No
	Median island	Local Road, Collector and Arterial Roadway	Segment and intersection	Urban cross section	Appropriate for any speed limit with an adequate sight distance between the travel lane and the median island curb.	Appropriate for all levels of traffic volume	Appropriate	Appropriate	Residential and Commercial	Local Standard	No	No
	On-street parking	Local Road, Collector and Arterial Roadway	Segment	Urban cross section	Appropriate for any speed limit with an adequate sight distance between the travel lane and the parking lane.	Appropriate for all levels of traffic volume	Appropriate	Appropriate	Commercial or industrial site	Local Standard	No	No
	Road diet	Local Road, Collector and Arterial Roadway	Segment and intersection	Most common on a four-lane section; can be applied on a wide two-lane section.	Appropriate for any common urban speed limit	Appropriate for any volume that can be accommodated by revised cross-section; commonly referenced threshold is a peak hour volume of 1,000 vehicles per post-implementation through travel lane.	Appropriate	Appropriate	Commercial or industrial site	Local Standard	No	No
Routing Restriction	Diagonal diverter	Local Road and minor collector	Intersection Only	Urban cross section	25	Low traffic volume	Not appropriate	Not appropriate	Residential Only	Local Standard	No	No
	Full closure	Local Road and subdivision	Intersection Only	Urban cross section	Appropriate for any urban speed limit with adequate advance warning (recommended for 30 mph)	Low traffic volume	Not appropriate	Not appropriate	Residential Only	Local Standard	No	No
	Half closure	Local Road and subdivision	Intersection Only	Urban cross section	Appropriate for any urban speed limit with adequate advance warning (recommended for 30 mph)	Low traffic volume	Not appropriate	Not appropriate	Residential Only	Local Standard	No	No
	Median barrier and Forced turn island	Local Road, Collector and Arterial Roadway	Intersection Only	Urban cross section	25	No maximum volume for side street blocked by median barrier or configured with forced-turn island.	Not appropriate	Not appropriate	Residential Only	Local Standard	No	No

**Typically, only on streets with a posted speed limit of 30-mph, however 35-mph posted speed limit has been accepted as maximum in some cases.*

***Maximum grade should comply with local standards and criteria; Maximum grades shown are based on ITE Guidelines.*

Traffic Calming Effects and Feasibility

To determine the level of effectiveness and potential concerns for implementing an applicable treatment, each alternative was examined based on certain criteria as outlined by the FHWA. The assessment is based on anticipated travel speed reduction, effect on traffic volume, pedestrian and motorist safety and mobility, emergency and large vehicle safety and mobility, effect of reducing accessibility to adjacent property, environmental effect, and design considerations/constraints. The comparison of effectiveness is provided in **Table 9**.

In addition, an evaluation matrix was developed to determine the feasibility and likelihood of a treatment being recommended and accepted for implementation. The matrix includes the public likelihood of acceptability, estimated cost, estimated maintenance cost, right-of-way impacts, and potential speed reduction shown in mph. The public likelihood of acceptability has been provided by roadway type (which includes thoroughfare/major, collector/residential collector, and local/local residential types for comparison purposes) and street function (emergency and transit). The positive impacts (pros+) and negative impacts (cons-) for each alternative are also summarized in the evaluation matrix, provided in **Table 10**.

As summarized in Table 9 and Table 10, inclusion of a small modern or mini roundabout was determined to be an unfeasible option for traffic calming due to physical constraints within the study area. Implementing either design option will cause significant impact to the adjacent canal system and will ultimately interfere with the existing flow characteristics of the West Cocoa Basin. In this basin, the canal plays a crucial role in the local drainage system, and any alteration could potentially result in flooding. Furthermore, based on the canal impact assessment provided by Madden, Moorhead & Stokes, LLC Civil Engineering, the estimated cost of impacting the canal system would exceed $33 million dollars **(Please see Appendix D)**. Due to the paramount importance of preserving the integrity of the drainage basin and mitigating potential flood risks, roundabouts are not recommended at this time. It's crucial to emphasize that the infeasibility primarily stems from the potential impacts on the floodplain. Installing small sections of pipe or culvert could lead to tailwater conditions that may have adverse effects on the drainage basin. The associated cost of altering the drainage is significant, even when breaking down the cost per foot, as indicated by the canal impact assessment provided by Madden, Moorhead & Stokes, LLC Civil Engineering.

Based on the results of the traffic calming evaluation, the speed table treatment is recommended for James Road and best suited for the roadway conditions. The calming measure includes a total of eight (8) speed tables along the segment with recommendations to include guardrails on the canal side of each speed table. Based on the FDOT Design Manual semi-rigid type TL-2 guardrails are recommended for low speed with an estimated length of 80 feet. It is noted that the County has expressed concern about the maintenance costs associated with guardrails. Alternatives may be explored during the design phase of the guardrails. The locations and spacing detail of speed tables and guardrails are depicted graphically in **Figure 8A** through **Figure 8D**. No traffic calming treatments are recommended on Friday Road. It should be noted that the proposed traffic calming measures are for county recommendation and the County may prefer alternatives. The final calming measures to be designed for the project will be determined and approved by the county prior to implementation.

Temporary Traffic Calming

In addition to the physical measures, other non-physical or temporary measures include, but are not limited to, speed enforcement, lane striping, signage, raised pavement markers and angled parking. Based on the Manual on Uniform Minimum Standards for Design, Construct, and Maintenance for Street and Highway Administration (known as FDOT Greenbook), and the FHWA, such treatments have been shown to be ineffective over longer periods of time. However, speed enforcement by use of radar speed signs with speed displays and the physical presence of law enforcement are recommended before and after implementing the traffic calming treatment. The recommended placement of speed radar sign should be located where they do not block pedestrians, bicyclists, motor vehicle traffic, or other vital traffic control signs. The recommended placement of the radar speed sign is shown in Figure 8A through Figure 8D.

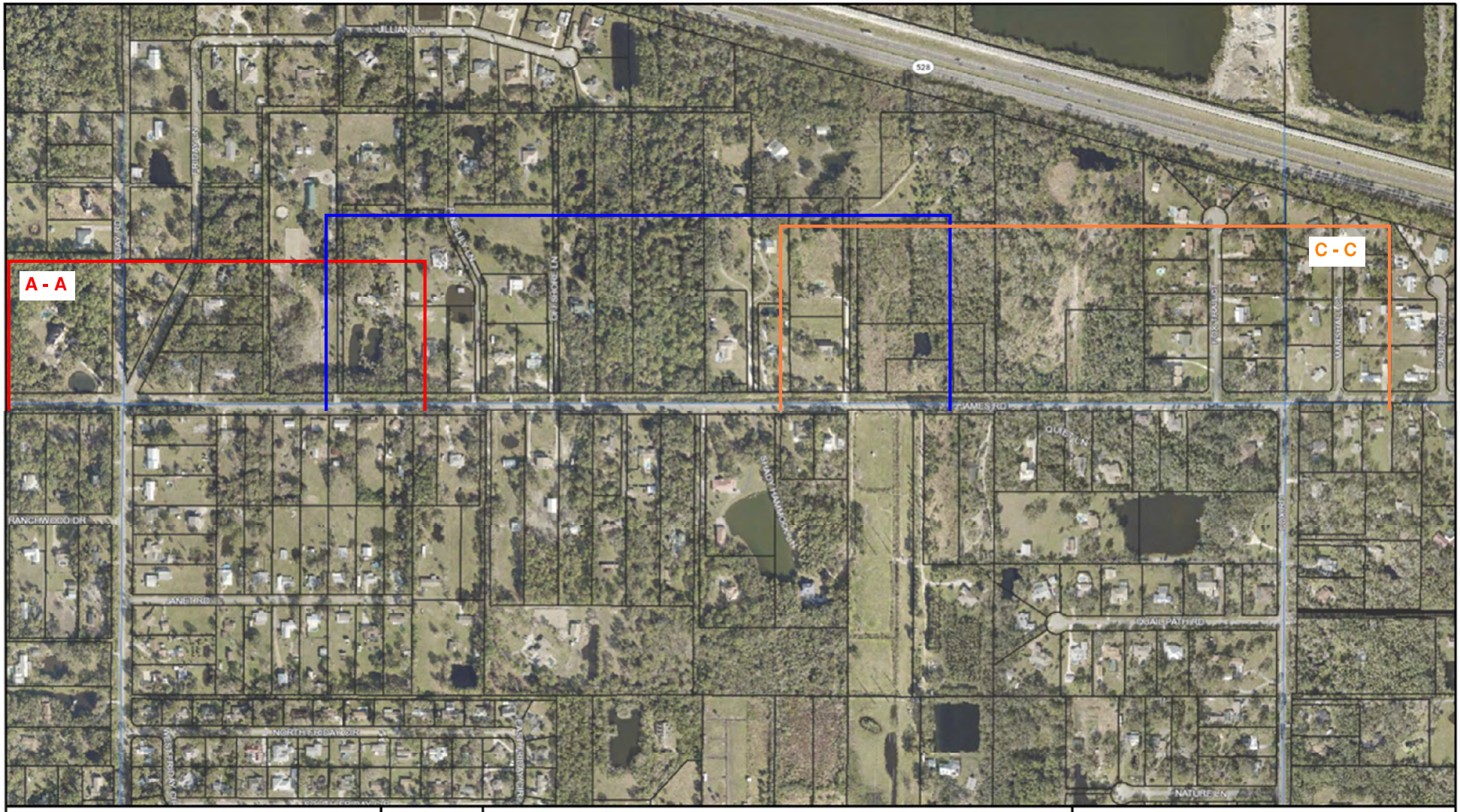
Table 9
Traffic Calming Effectiveness Comparison
Silvestri Property – TCS

Traffic Calming Measure	Types of Traffic Calming Treatments	Vehicle Speed	Vehicle Volume	Pedestrian Safety and Mobility	Motorist Safety and Mobility	Emergency Vehicle Safety and Mobility	Large Vehicle Safety and Mobility	Accessibility of Adjacent Property	Environment	Design Constraints
Horizontal Deflection	Lateral shift	Can slow traffic by encouraging a motorist to moderate vehicle speed through the horizontal deflection; amount of speed reduction (or the final speed) depends on the length of the alignment shift, as well as the volume and distribution of traffic.	Amount of traffic diversion depends on the amount of speed reduction, the increased travel time for non-local traffic and the availability of a quicker, alternative route	Can be a location for a crosswalk	Minimal	Retains sufficient width to allow for the continued flow of emergency vehicles	Retains sufficient width to allow for the continued flow of large vehicles like combination trucks	Reduce the accessibility to adjacent property	Physical features can also be used as a landscaping opportunity	Attention needed to avoid need to relocate drainage features (catch basins, concrete channels, valley gutters, inlets, and trench drains).
	Chicane	Can slow traffic by encouraging a motorist to moderate vehicle speed through a series of horizontal deflections; amount of speed reduction (or the final speed) depends on the length of the alignment shift, as well as the volume and distribution of traffic	As a single installation, there is little traffic diversion from the street	Typically, not a preferred location for a crosswalk because motorist attention should be focused on the horizontal deflection	Minimal	Should retain sufficient width to allow for the continued easy flow of emergency vehicles; should have little effect on emergency response times	Retains sufficient width to allow for the continued easy flow of large vehicles	Reduce the accessibility to adjacent property	Opportunity for landscaping	Attention needed to avoid need to relocate drainage features such as catch basins, concrete channels, valley gutters, inlets, and trench drains.
	Small modern roundabout and mini roundabout	Speed reduction largely dependent on proper design of approach lanes to deflect each vehicle as it passes through intersection; without adequate deflection, motorists can pass through small modern roundabout and mini roundabout without lowering vehicle speed.	As single traffic calming treatment, there is little traffic diversion from the street.	Fewer vehicle/pedestrian conflict points than traditional four-leg intersection. Horizontal deflection may force motor vehicles into pedestrian crossing area on the cross street; may be necessary to move crosswalks further away from mini roundabout to prevent vehicles from encroaching on the crosswalk.	Minimal	Turns made smoothly across small modern roundabout apron or mini-roundabout center island	Lateral deflection for through movements may discourage large vehicle operator from using small modern roundabout or mini roundabout if alternative path is available	Should not affect the accessibility of nearby driveways	Opportunity for landscaping	Drainage typically better if cross-section slopes away from center island; reverse superelevation can reduce vehicle speed. The construction and design of a small modern roundabout and mini roundabout will impact the adjacent canal system, will require a redesign of access and modifications to existing utility structures, and may require additional street lighting.
Vertical Deflection	Speed table	Single speed table reduces 85th percentile speeds to the range of 25 to 35 mph when crossing the table; speed reduction effects decline at the rate of approximately 0.5 to 1 mph every 100 feet beyond the 200 ft. approach and exit of a speed table; to retain slower vehicle speeds over a longer distance, a series of speed tables is needed.	There is little traffic diversion from the street; as part of a series, typical volume reductions of 20 percent observed	Appropriate location for a crosswalk	Produces sufficient discomfort to a motorist driving above the speed table design speed to discourage speeding	The estimated delay is between 0.0 and 9.2 seconds of delay per vehicle per speed table	Larger vehicle typically crosses at slower speed than does a personal passenger motor vehicle	May result in the removal of on-street parking adjacent to speed table, on both sides of the street	Potential for increased noise due to vehicle braking and accelerating and to the vibration of loose items in truck beds or trailers	Should not be located as to require the relocation of above-ground and below-ground utilities Typically, does not interfere with drainage because table does not extend from curb to curb; however, if drainage gutter or flow of water is in the center of the roadway, drainage and hydraulic impacts need to be evaluated
	Offset speed table	Single offset speed table reduces 85th percentile speeds to the range of 20 to 30 mph when crossing the table; speed reduction effects decline at the rate of approximately 0.5 to 1 mph every 100 feet beyond the 200 ft. approach and exit of a speed table; to retain slower vehicle speeds over a longer distance, a series of speed tables is needed	As single installation, there is little traffic diversion from the street; as part of a series, typical volume reductions of 20 percent observed	Not a preferred location for a crosswalk	Produces sufficient discomfort to a motorist driving above the speed table design speed to discourage speeding	Minimal delay for emergency service vehicle that bypasses tables	Larger vehicle typically crosses at slower speed than does a personal passenger motor vehicle	May result in the removal of on-street parking adjacent to offset speed table, on both sides of the street	Potential for increased noise due to vehicle braking and accelerating and to the vibration of loose items in truck beds or trailers	Should not be located as to require the relocation of above-ground and below-ground utilities Typically, does not interfere with drainage; but roadway, drainage and hydraulic impacts should be evaluated

Table 10
Evaluation Matrix
Silvestri Property – TCS

Traffic Calming Measure	Types of Traffic Calming Treatments	Public Like hood of Acceptability of Traffic Calming Measure*						Estimated Cost			Estimated Maintenance	Feasible Within Available Right of Way?	Potential Speed Reduction**		Estimated 85th Percentile Speed Post Installation (mph)		Pros +	Cons -
		Functional Classification			Street Function		Total Ranked	Low (<$6 K)	Medium ($6k-$15K)	High (>$15K)			Friday Rd (40 mph)	James Rd (35 mph)	Friday Rd (40 mph)	James Rd (35 mph)		
		Thoroughfare or Major	Collector or Residential Collector	Local or Local Residential	Emergency Access	Transit Route												
Horizontal Deflection	Lateral shift	3	5	5	5	5	23	-	Medium	-	High	No	-7 to -9	-2 to -4	38 to 40	41 to 43	Significantly slows speed	Buses and heavy trucks including emergency vehicles have difficulty, realigned roadway includes impact to drainage and utility structures, also increases maintenance costs.
	Chicane	1	5	5	3	3	17	-	Medium	-	High	No	-4 to -5	-1 to -2	42 to 43	43 to 44	Significantly slows speed & design does not require relocation of Utility.	Buses and heavy trucks including emergency vehicles have difficulty, modifies the existing drainage system, and increases maintenance cost
	Small modern roundabout and mini roundabout	3	3	3	5	5	19	-	-	High	High	No	-7 to -5	-7 to -5	40 to 42	38 to 40	Slow vehicular traffic at intersections and it can reduce crash severity	Buses and heavy trucks including emergency vehicles, have difficulty moving through roundabouts; Design constraints with existing canal/drainage system and utility.
Vertical Deflection	Speed table	3	5	5	1	3	17	-	Medium	-	Low	Yes	-5 to -8	-3 to -5	39 to 42	40 to 42	Forces a significant speed reduction & low cost	Speeds may increase between speed table & forces emergency vehicle to slow down
	Offset speed table	3	5	5	5	3	21	-	Medium	-	Low	Yes	-5 to -8	-3 to -5	39 to 42	40 to 42	Forces a significant speed reduction & low cost	Speeds increase more between offset speed table compared to speed table & emergency vehicle to slow down is less compared to speed table

** Based on information provided by FHWA, ePrimer (Table 3.1. Like hood of Acceptability of Traffic Calming Measure).*
Ranking System:
5 = traffic calming measure may be appropriate
3 = caution; traffic calming measure could be inappropriate
1 = traffic calming measure is likely inappropriate
*** Based on information provided by FHWA, ePrimer (Model 4: Effects of Traffic Calming Measures on Motor Vehicle Speed and Volume).*



Silvestri Property
Traffic Calming Study

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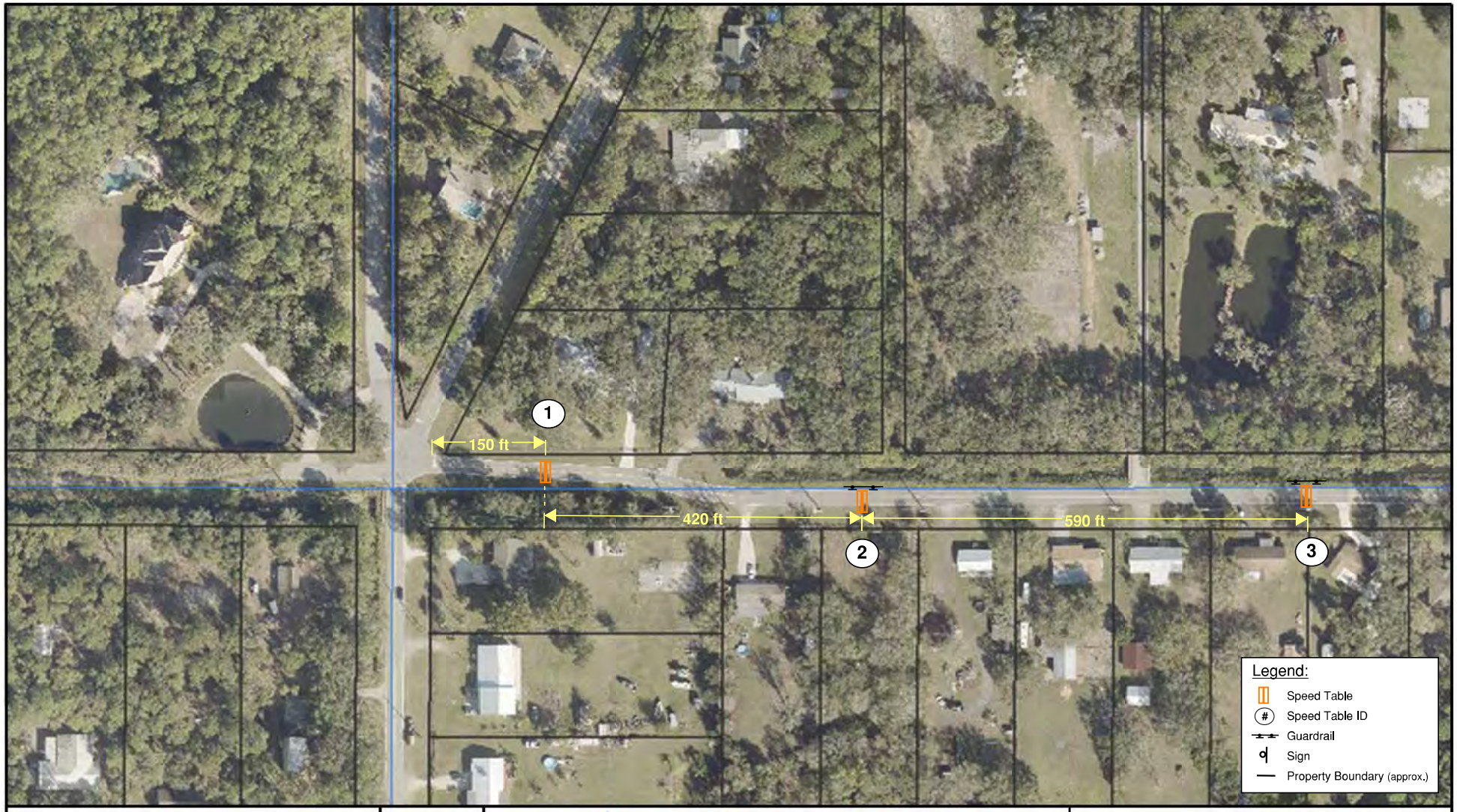
James Road Key Sheet

Project No.: 5799.16

Figure: 8a



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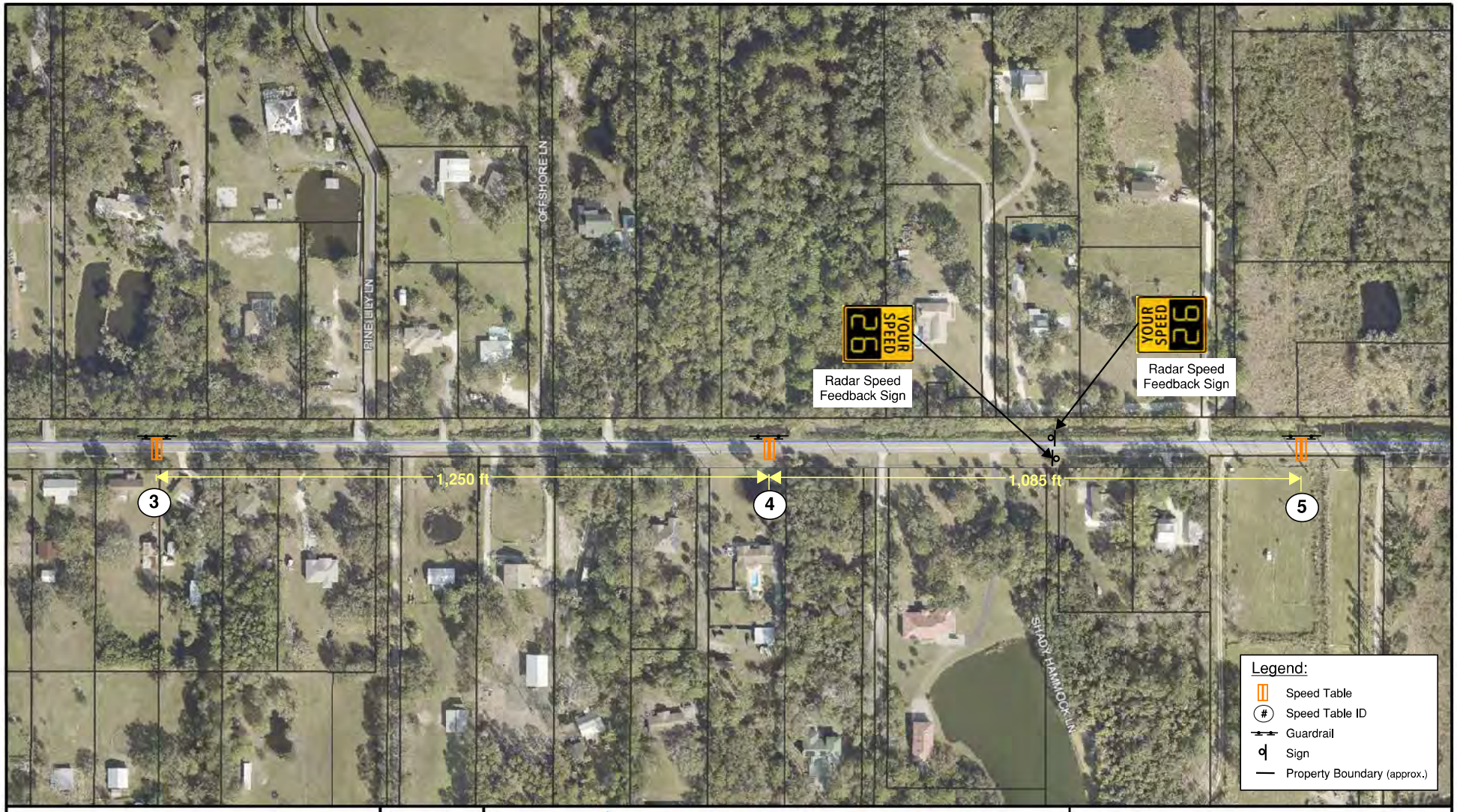
James Road Section A-A

Project No.: 5799.16

Figure: 8b



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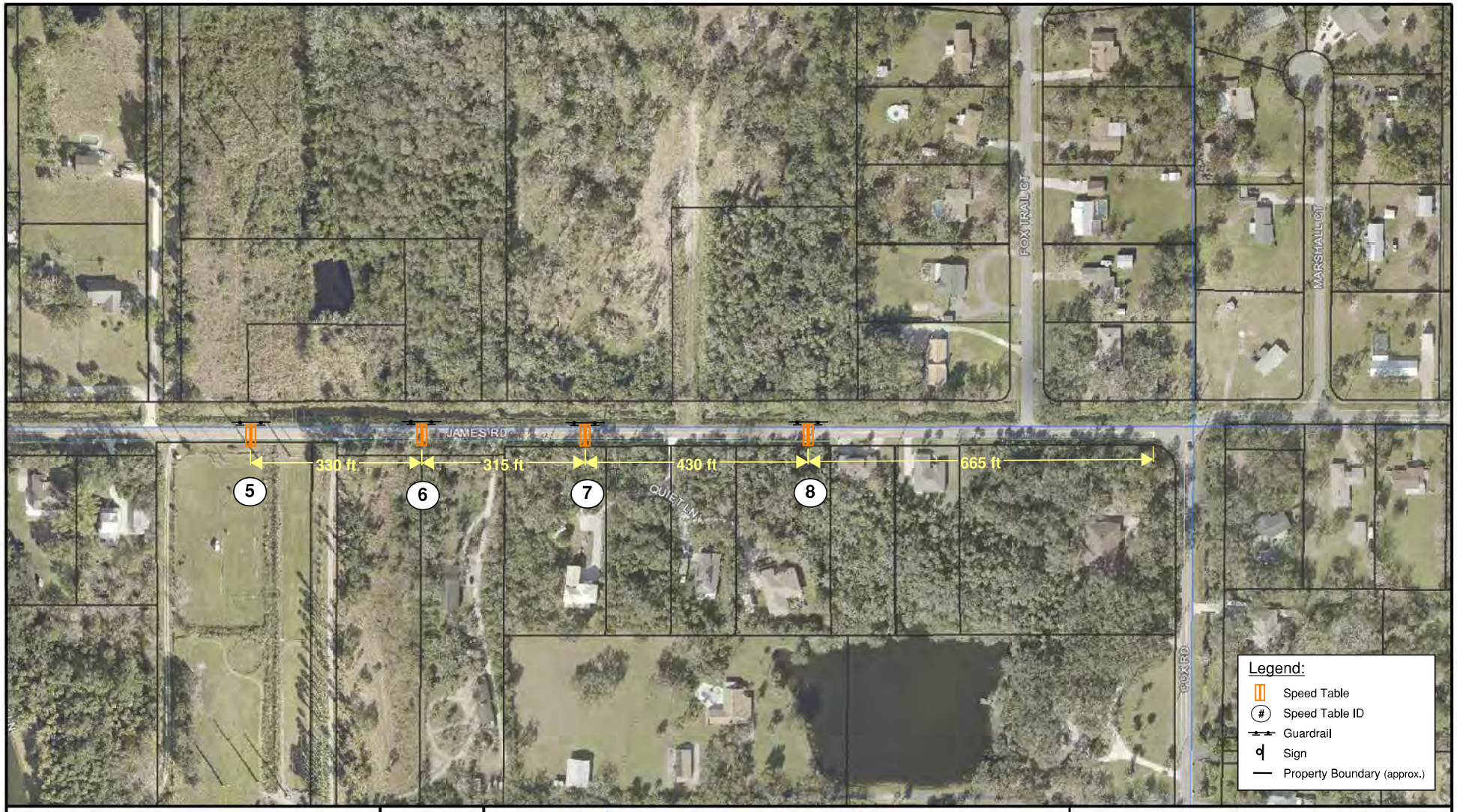
James Road Section B-B

Project No.: 5799.16 | Figure: 8c



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James Road Section C-C

Project No.: 5799.16

Figure: 8d

TRAFFIC CALMING RECOMMENDATIONS & CONCLUSIONS

Based on the existing conditions assessment, safety data analysis, and traffic calming measure analysis, the following recommendations are provided in order to help reduce the 85th percentile travel speeds observed in the study area.

Friday Road:

- The average 85th percentile speeds on Friday Road are within +/- 5mph of the posted speed limit in the 45-mph posted speed limit at one location, while the other two locations exceed the target range by one (1) and two (2) mph in the southbound direction.

- The average 85th percentile speed on Friday Road within the 40-mph posted speed limit zone equates to an average of 47 mph, indicating that excessive speeds occur. However, due to constraints with right-of-way and existing access management, no physical calming treatments are recommended at this time.

- The crash rate analysis concludes that Friday Road is within the local (County) and statewide averages reported for similar roadway types.

James Road:

- The average 85th percentile speed reported on James Road (posted speed limit of 35-mph) is 45-mph and indicates that excessive speeding is prominent on the segment. While drivers may feel comfortable operating at 45-mph, there are safety concerns associated with higher speeds on the segment as it relates to the canal system on the north side of the road and the over-head utility poles on the south side.

- The crash rate analysis concludes that James Road (4.13 MVMT) is within the local (County) average reported for similar roadway types but exceeds the statewide average (3.85 MVMT).

- Based on the design constraints and the positive impacts (pros+) and negative impacts (cons-) for each alternative, speed tables are recommended on James Road to help reduce travel speed along the segment. Speed tables should be designed in accordance with local agency standards or (as recommended by the FHWA) with heights as great as 6 inches, ramps of up to 10 feet, and plateaus between 18 and 23 feet in length to better accommodate large vehicles with long wheelbases (such as fire trucks and emergency vehicles).

    - Based on guidelines in the FHWA ePrimer, the first speed table in a series is recommended to be located in a position where it cannot be approached at a high speed from either direction. It is also recommended that a distance of 150 ft. be provided from an unsignalized intersection.
    - Additionally, in order to retain slower speeds over a long distance a series of speed tables are recommended. FHWA recommends spacing between 260 and 500 feet.
    - Therefore, a series of speed tables (8 total) are recommended. The approximate location of each speed table is graphically depicted in Figures 8A-8D. Additionally, semi-rigid type TL-2 guardrails are recommended on the canal side of the speed table, for an estimated length of 80 feet, to add separation and safety.
    - The pavement marking design and advance marking for the speed tables should be based on the standard guidelines outlined in the MUTCD. Including warning signs and supplementary signs.
    - It should be noted that the proposed traffic calming measures are for county recommendation and the County may prefer alternatives. The final calming measures to be designed for the project will be determined and approved by the county prior to implementation.

- In addition to the sequence of speed tables along James Road, it is recommended that the travel lane width be reduced from 11 ft. lanes to 10 ft. lanes to assist in speed reduction along the segment.

- A concept plan of the recommended traffic calming measures, including the signing and pavement markings, is attached as **Appendix E**. Other design elements requested by County staff such as modified pavement texture at the Friday Road and Cox Road intersections, and longitudinal rumble strips are also shown. It should be noted that the final design is to be negotiated with County staff prior to implementation.

- It is recommended that the traffic calming design be discussed with the neighborhood to notify the public of the adopted treatment plan before construction. The applicant will conduct a neighborhood meeting to present the recommended design to the public for notification purposes as requested by the County staff.

- It is also recommended that a temporary calming technique, such as speed law enforcement and speed radar signs, be implemented prior to installation of the permanent speed tables to encourage and remind residents to follow the posted speed limit, and to bring awareness of future completion of the speed tables.