

Technical Memorandum

Date: 4/10/2024

To: Nicholas Hartley, P.E. (Osceola County)

From: Max Sheets P.E., PTOE (HNTB)

CC: Robert Denney, P.E. (HNTB), Kyle Dorris, P.E. (HNTB)

Re: Polynesian Isle Boulevard at Barefoot Path Memorandum

Introduction

On March 6, 2024, HNTB Corporation conducted a field review at the intersection of Polynesian Isle Boulevard and Barefoot Path in Osceola County to observe the traffic operations during the AM and PM peak periods and during school bus pick-up and drop-off times.

Field Observations

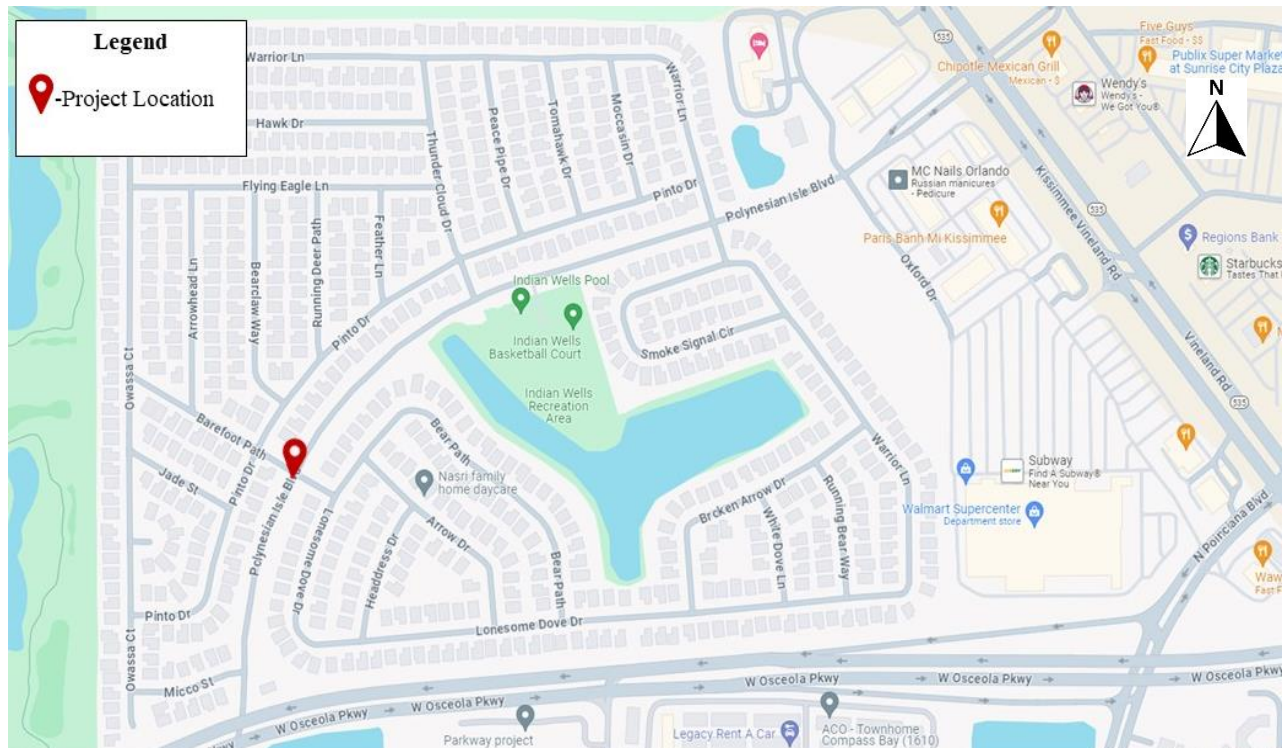


Figure 1 – Project Location

As part of the field review activities, a spot speed study and turning movement counts were conducted.

Several safety issues were identified during the field review including illegal passing of school buses during pick-up and drop-off operations, missing warning and regulatory signs, existing signs in need of inspection and/or repair, limited sight distance for the westbound approach at Barefoot Path, speeding, and pedestrian movements at unmarked locations.

Failure to Stop for School Buses

On numerous occasions, vehicles were observed driving around stopped school buses (with red flashing lights and stop arms activated) during student pick-up and drop-off activities, as shown in Figures 2 and 3. This is a direct violation of Florida Statute 316.172. These traffic infractions were observed northbound and southbound along Polynesian Isle Boulevard. In some instances, multiple vehicles were observed passing the stopped school buses. School buses observed during the field review were in compliance with Florida Statute 316.172.3. and were entirely visible for a distance of 200 feet in either direction.

Existing Speed Signage



Figure 2 – Vehicle Passing Stopped School Bus



Figure 3 – Vehicle Passing Stopped School Bus

Two (2) “YOUR SPEED” sign assemblies are located along Polynesian Isle Boulevard. One (1) is located 1,650-feet north of Barefoot Path for southbound traffic and the other is located 305-feet south of Barefoot Path serving northbound traffic. The sign assembly for the southbound direction is missing the “YOUR SPEED” sign and overhanging leaves from nearby palm trees partially obstruct the solar panel, as shown in Figure 4. In addition, the “YOUR SPEED” sign in the northbound direction was inoperational, as shown in Figure 5.



Figure 4 – Missing “YOUR SPEED” Sign - SB Direction



Figure 5 – Inoperational “YOUR SPEED” Sign - NB Direction

Sight Distance

Sight distance is the length of road surface a driver can see with an acceptable level of clarity. It's crucial for safety as it allows drivers to see and react to obstacles, changes in road conditions, or another vehicle on the road. Sight distance is measured along the centerline of the road, measuring the visible distance from a driver's perspective. Reduced sight distance was observed for the westbound approach of Barefoot Path. Several near misses including rear-ends, angle collisions, and sideswipes were witnessed during the field observations. Vehicles positioned at the stop bar at this approach, have approximately 160-feet of visibility to the south and 170-feet of visibility to the north. The required sight distance per the FDOT Design Manual (FDM) is 500-feet. Sight distance increases to approximately 300-feet (to the south and the north) when motorists pull forward passed the stop bar into the crosswalk. Refer to Figure 6.



Figure 6 – Reduced Sight Distance WB Approach

Spot Speed Study

A spot speed study is used to determine the speed distribution of traffic at a specific location. The data gathered in spot speed studies are used to determine vehicle speed percentiles, which are useful in making many speed-related decisions. The spot speed study was performed along Polynesian Isle Boulevard only and not along Barefoot Path as the approaches on the side street are stop-controlled and speeding concerns are not present. It should be noted that a 30 mph Advisory Speed Warning sign is located along northbound Polynesian Isle Boulevard approaching the Barefoot Path intersection.

During the AM Peak period from 7:00 am to 9:00 am, a total of 183 spot speed readings were recorded, 100 of which came from the northbound direction and 83 coming from the southbound direction. During the AM period, the 85th percentile speed for the northbound direction was calculated to be 41 mph, and the 85th percentile speed for the southbound direction was calculated to be 43 mph. The 85th percentile speed, the speed at or below which 85 percent of motorists travel along a road segment, is one of the best indicators of a reasonable and safe speed for road and traffic conditions.

During the Afternoon Peak period between 1:00 pm to 3:00 pm (school drop-off time), a total of 287 spot speed readings were recorded, 136 of which came from the northbound direction and 151 coming from the southbound direction. The 85th percentile speed for the northbound and southbound directions were also calculated to be 41 mph and 43 mph, respectively, during this two-hour window.

Lastly, during the PM Peak period between 4:00 pm and 6:00 pm, a total of 328 spot speed observations were recorded, 163 from the northbound direction and 165 from the southbound direction. During the PM peak period, the 85th percentile speed for the northbound and southbound directions were calculated to be 43 mph and 45 mph respectively.

Overall, aside from the outliers that were observed and summarized in this section, the 85th percentile speed along this segment of Polynesian Isle Boulevard fluctuated between 41 to 45 mph.

The detailed Spot Speed Study can be found in Appendix A.

Turning Movement Counts (TMC)

Turning movement counts (TMC) were performed at the study intersection between 7:00 am to 9:00 am, 1:00 pm to 3:00 pm, and 4:00 pm to 6:00 pm. The counts included pedestrian movements. A detailed breakdown of the counts can be found in Appendix B.

During the TMC, a total of eighteen (18) pedestrians were observed crossing the eastbound approach at Barefoot Path, nine (9) of which came from the 7-9 AM Peak period, three (3) from the 1-3 PM Peak period, and six (6) from the 4-6 PM Peak period. There were twenty-four (24) pedestrian crossings observed from the westbound approach, twelve (12) from the 7-9 AM Peak period, three (3) from the 1-3 PM Peak period, and nine (9) from the 4-6 PM Peak period. Both approaches of Barefoot Path at Polynesian Isle Boulevard display marked crosswalks.

Throughout the day, it should be noted that a total of eight (8) pedestrians were observed crossing Polynesian Isle Boulevard at various unmarked locations north of Barefoot Path.

Recommendations

As part of this technical memorandum, the following list of recommended improvements are being presented to the County for consideration in an effort to enhance safety and mobility for all road-users within and surrounding the studied intersection.

1. Install two (2) new SCHOOL BUS STOP AHEAD (S3-1) sign assemblies on Polynesian Isle Boulevard as shown in the Improvements Diagram (Appendix C). This improvement is intended to reduce the number of motorists driving past stopped school buses.
2. On southbound Polynesian Isle Boulevard, install a new sign assembly encompassing an Intersection Warning (W2-1), a 30 mph Advisory Speed plaque (W13-1p), and a Your Speed Warning plaque (W13-20aP), as shown in the Improvements Diagram (Appendix C).
3. On southbound Polynesian Isle Boulevard, remove the existing Intersection Warning sign and Advisory Speed Warning sign assembly located north of the Barefoot Path intersection as shown in the Improvements Diagram (Appendix C).
4. Remove the existing "YOUR SPEED" sign assembly on northbound Polynesian Isle Boulevard located south of the Barefoot Path intersection as shown in the Improvements Diagram (Appendix C).

5. On northbound Polynesian Isle Boulevard, relocate the existing 40 mph Speed Limit sign (R2-1), as shown in the Improvements Diagram (Appendix C).
6. On northbound Polynesian Isle Boulevard, install a new sign assembly encompassing an Intersection Warning (W2-1), a 30 mph Advisory Speed plaque (W13-1p), and a Your Speed Warning plaque (W13-20aP), as shown in the Improvements Diagram (Appendix C).
7. On northbound Polynesian Isle Boulevard, remove the existing Intersection Warning sign and Advisory Speed Warning sign assembly located south of the Barefoot Path intersection as shown in the Improvements Diagram (Appendix C).
8. To improve the sight distance for the westbound approach, trim the tree canopies to satisfy FDOT Florida Design Manual (FDM) Section 212.11.6 which requires there to be no part of the canopy below 8.5 feet.
9. Coordinate with the Osceola County School District to determine the feasibility of relocating the school bus pick-up and drop-off operations away from Polynesian Isle Boulevard to the intersections of Barefoot Path and Pinto Drive and Barefoot Path and Bear Path. This will eliminate students from crossing Polynesian Isle Boulevard. Should the Osceola County School District move the school bus pick-up and drop-off locations to the recommended intersections, the installation of SCHOOL BUS STOP AHEAD (S3-1) signs on Polynesian Isle Boulevard would not be necessary.
10. Implement a directional median on Polynesian Isle Boulevard at Barefoot Path. This improvement will direct the westbound left turns leaving the residential development to the northernmost access point (Warrior Lane), which provides enhanced sight distance for motorists. The use of flexible delineators to create a temporary directional median (and close off the westbound left turn lane) is a cost-effective solution. The County may also consider the use of a lane separator system for additional emphasis.

Appendices

DRAFT

Appendix A – Spot Speed Study

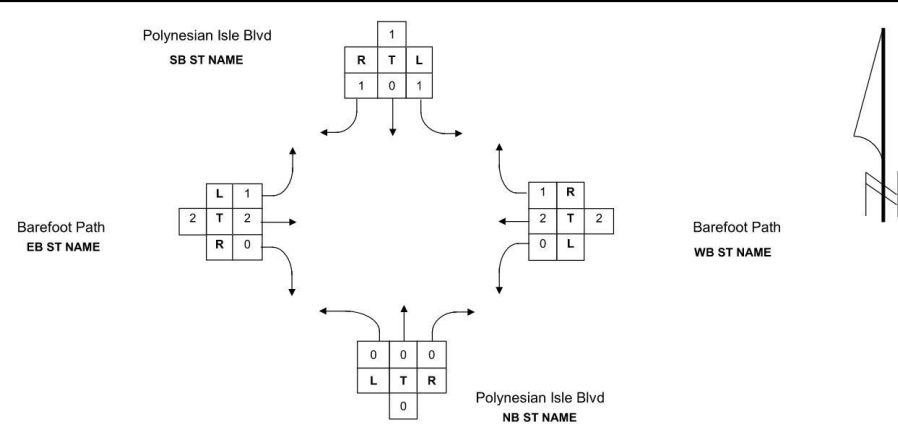
State of Florida Department of Transportation														Form 750-010-03 TRAFFIC ENGINEERING March 2020					
VEHICLE SPOT SPEED STUDY																			
General Information										Site Information									
Analyst/Observer: <u>Max Sheets</u>					Location: <u>Polynesian Isle Blvd at Barefoot Path</u>														
Agency or Company: <u>HNTB Corporation</u>					City: <u>Kissimmee</u> County: <u>Osceola</u>														
Date Performed: <u>Wednesday, March 6, 2024</u>					Roadway ID: _____														
Time Period From: <u>7:00am</u> To: <u>9:00am</u>					Milepost: _____					Posted Speed (mph): <u>40</u>									
Weather/Road Condition: <u>Cloudy</u>					Remarks: <u>AM Peak</u>														
		Vehicles traveling Northbound				bound						Vehicles traveling Southbound				bound		Both Directions	
Cum Total	Total	20	15	10	5	Speed (mph)	5	10	15	20	Total	Cum Total	Total	Cum Total					
0						≥ 80					0			183					
0						78 - 79.9					0			183					
0						76 - 77.9					0			183					
0						74 - 75.9					0			183					
0						72 - 73.9					0			183					
0						70 - 71.9					0			183					
0						68 - 69.9					0			183					
0						66 - 67.9					0			183					
0						64 - 65.9					0			183					
0						62 - 63.9					0			183					
0						60 - 61.9					0			183					
0						58 - 59.9	1				1	83	1	183					
0						56 - 57.9					0			182					
0						54 - 55.9	1				1	82	1	182					
0						52 - 53.9					0			181					
100	1					50 - 51.9	1				1	81	2	181					
99	1					48 - 49.9					0		1	179					
98	1					46 - 47.9	1	1	1		4	80	5	178					
97	3					44 - 45.9	1				1	76	4	173					
94	9					42 - 43.9	1	1	1	1	8	75	17	169					
85	16		1	1	1	40 - 41.9	1	1	1	1	8	67	24	152					
69	22	1	1	1	1	38 - 39.9	1	1	1	1	17	59	39	128					
47	20	1	1	1	1	36 - 37.9	1	1	1	1	15	42	35	89					
27	13		1	1	1	34 - 35.9	1	1	1	1	15	27	28	54					
14	7			1	1	32 - 33.9	1	1	1	1	7	12	14	26					
7	4				1	30 - 31.9	1	1			3	5	7	12					
3	3				1	28 - 29.9					0		3	5					
0						26 - 27.9	1	1			2	2	2	2					
0						24 - 25.9					0								
0						22 - 23.9					0								
0						20 - 21.9					0								
0						18 - 19.9					0								
0						16 - 17.9					0								
0						14 - 15.9					0								
0						12 - 13.9					0								
0						10 - 11.9					0								
0						≤ 10					0								
100		TOTALS										83		183					
Travel Direction 1 →		Northbound		Speed Data Summary		Southbound		← Travel Direction 2				Both Directions							
		85		85 th Percentile Vehicle		71		85 th Percentile Vehicle				156							
		41		85 th Percentile Speed		43		85 th Percentile Speed				43							
		50		50 th Percentile Vehicle		42		50 th Percentile Vehicle				92							
		39		50 th Percentile Speed		37		50 th Percentile Speed				39							
		34-44		10 mph pace		34-44		10 mph pace				34-44							
		OK				OK						OK							

State of Florida Department of Transportation														Form 750-010-03 TRAFFIC ENGINEERING March 2020						
VEHICLE SPOT SPEED STUDY																				
General Information										Site Information										
Analyst/Observer: Max Sheets										Location: Polynesian Isle Blvd at Barefoot Path										
Agency or Company: HNTB Corporation										City: Kissimmee				County: Osceola						
Date Performed: Wednesday, March 6, 2024										Roadway ID: _____										
Time Period From: 1:00pm To: 3:00pm										Milepost: _____ Posted Speed (mph): 40										
Weather/Road Condition: Cloudy										Remarks: Bus Drop-off										
Vehicles traveling		Northbound				bound				Speed (mph)	Vehicles traveling		Southbound				bound		Both Directions	
Cum Total	Total	20	15	10	5	5	10	15	20		Total	Cum Total	Total	Cum Total						
0										≥ 80							0	287		
0										78 - 79.9							0	287		
0										76 - 77.9							0	287		
0										74 - 75.9							0	287		
0										72 - 73.9							0	287		
0										70 - 71.9							0	287		
0										68 - 69.9							0	287		
0										66 - 67.9							0	287		
0										64 - 65.9							0	287		
0										62 - 63.9							0	287		
0										60 - 61.9							0	287		
0										58 - 59.9							0	287		
136	1									56 - 57.9	1						1	151		
0										54 - 55.9							0	285		
135	1									52 - 53.9	1						0	1		
0										50 - 51.9	1	1	1	1			5	150		
0										48 - 49.9							0	5		
134	3								1	46 - 47.9	1	1	1				4	145		
131	3								1	44 - 45.9	1	1	1	1	1	1	1	13		
128	11					1	1	1	1	42 - 43.9	1	1	1	1	1	1	1	12		
117	9					1	1	1	1	40 - 41.9	1	1	1	1	1	1	1	20		
108	26	1	1	1	1	1	1	1	1	38 - 39.9	2	2	2	2	2	2	2	24		
82	24	1	1	1	1	1	1	1	1	36 - 37.9	2	2	2	2	2	2	2	21		
58	33	1	1	1	1	1	1	1	1	34 - 35.9	2	2	2	2	2	2	2	24		
25	10					1	1	1	1	32 - 33.9	1	1	1	1	1	1	1	17		
15	6					1	1	1	1	30 - 31.9	1	1	1	1	1	1	1	7		
9	6					1	1	1	1	28 - 29.9	1	1	1	1	1	1	1	2		
3	2								1	26 - 27.9								0		
0										24 - 25.9	1						1	1		
1	1									22 - 23.9	1						0	1		
0										20 - 21.9							0			
0										18 - 19.9							0			
0										16 - 17.9							0			
0										14 - 15.9							0			
0										12 - 13.9							0			
0										10 - 11.9							0			
0	0									≤ 10							0			
136	TOTALS													151	287					
Travel Direction 1 →	Northbound	Speed Data Summary			Southbound	← Travel Direction 2			Both Directions											
	116	85 th Percentile Vehicle			128	85 th Percentile Vehicle			244											
	41	85 th Percentile Speed			43	85 th Percentile Speed			43											
	68	50 th Percentile Vehicle			76	50 th Percentile Vehicle			144											
	37	50 th Percentile Speed			39	50 th Percentile Speed			37											
	34-44	10 mph pace			32-42	10 mph pace			32-42											
	OK			OK				OK												

State of Florida Department of Transportation														Form 750-010-03 TRAFFIC ENGINEERING March 2020						
VEHICLE SPOT SPEED STUDY																				
General Information										Site Information										
Analyst/Observer: Max Sheets										Location: Polynesian Isle Blvd at Barefoot Path										
Agency or Company: HNTB Corporation										City: Kissimmee				County: Osceola						
Date Performed: Wednesday, March 6, 2024										Roadway ID: _____										
Time Period From: 4:00pm To: 6:00pm										Milepost: _____ Posted Speed (mph): 40										
Weather/Road Condition: Cloudy										Remarks: PM Peak										
Vehicles traveling		Northbound				bound				Speed (mph)	Vehicles traveling		Southbound				bound		Both Directions	
Cum Total	Total	20	15	10	5	5	10	15	20		Total	Cum Total	Total	Cum Total						
0	0									≥ 80							0		328	
0	0									78 - 79.9							0		328	
0	0									76 - 77.9							0		328	
0	0									74 - 75.9							0		328	
0	0									72 - 73.9							0		328	
0	0									70 - 71.9							0		328	
0	0									68 - 69.9							0		328	
0	0									66 - 67.9							0		328	
0	0									64 - 65.9							0		328	
0	0									62 - 63.9							0		328	
0	0									60 - 61.9	1						1	165	1	328
163	1									58 - 59.9	1						0		1	327
0	0									56 - 57.9	1						1	164	1	326
0	0									54 - 55.9	1						1	163	1	325
0	0									52 - 53.9							0			324
0	0									50 - 51.9	1						1	162	1	324
162	3								1	48 - 49.9	1	1	1	1			4	161	7	323
159	2								1	46 - 47.9	1	1	1	1	1	1	1	1	1	316
157	8							1	1	44 - 45.9	1	1	1	1	1	1	1	1	1	304
149	25	1	1	1	1	1	1	1	1	42 - 43.9	1	1	1	1	1	1	1	1	1	278
124	14								1	40 - 41.9	2	2	2	2	2	2	2	2	2	239
110	30	1	1	1	1	1	1	1	1	38 - 39.9	2	2	2	2	2	2	2	2	2	195
80	30	1	1	1	1	1	1	1	2	36 - 37.9	1	1	1	1	1	1	1	1	1	132
50	24	1	1	1	1	1	1	1	1	34 - 35.9	1	1	1	1	1	1	1	1	1	82
26	14								1	32 - 33.9	1	1	1	1			5	13	19	39
12	7								1	30 - 31.9	1	1	1				4	8	11	20
5	5								1	28 - 29.9	1	1					2	4	7	9
0	0									26 - 27.9	1						1	2	1	2
0	0									24 - 25.9	1						1	1	1	1
0	0									22 - 23.9							0			
0	0									20 - 21.9							0			
0	0									18 - 19.9							0			
0	0									16 - 17.9							0			
0	0									14 - 15.9							0			
0	0									12 - 13.9							0			
0	0									10 - 11.9							0			
0	0									≤ 10							0			
163	TOTALS													165	328					
Travel Direction 1 →	Northbound	Speed Data Summary			Southbound	← Travel Direction 2			Both Directions											
	139	85 th Percentile Vehicle			140	85 th Percentile Vehicle			279											
	43	85 th Percentile Speed			45	85 th Percentile Speed			45											
	82	50 th Percentile Vehicle			83	50 th Percentile Vehicle			164											
	39	50 th Percentile Speed			39	50 th Percentile Speed			39											
	34-44	10 mph pace			34-44	10 mph pace			34-44											
	OK			OK				OK												

Appendix B – Turning Movement Count

FLORIDA DEPARTMENT OF TRANSPORTATION																			
SUMMARY OF VEHICLE MOVEMENTS																			
SECTION		N/A		CITY				Kissimmee				COUNTY				Osceola			
STATE ROUTE		Polynesian Isle Blvd		INTERSECTING ROUTE				Barefoot Path				MILEPOST				N/A			
OBSERVER				DATE				3/7/2024				MILEPOST				N/A			
WEATHER		Fair		ROAD CONDITION				Good											
REMARKS																			
FORM COMPLETED BY MS										DATE 03/11/24									



TIME	NORTHBOUND					SOUTHBOUND					TOTAL	EASTBOUND					WESTBOUND					TOTAL		
	BEGIN/END	L	T	R	U	TOT	L	T	R	U		TOT	N/S	L	T	R	U	TOT	L	T	R		U	TOT
4 - 5																								
5 - 6																								
6 - 7																								
7 - 8		3	314	5	0	322	6	151	4	0	161	483	17	0	18	0	35	7	0	24	0	31	66	
8 - 9		8	349	12	0	369	9	177	6	0	192	561	14	0	13	0	27	19	0	16	0	35	62	
9 - 10																								
10 - 11																								
11 - 12																								
12 - 1																								
1 - 2		14	249	15	0	278	8	357	11	0	376	654	14	1	18	0	33	13	1	15	0	29	62	
2 - 3		17	282	17	0	316	17	438	22	0	477	793	14	2	15	0	31	7	0	19	0	26	57	
3 - 4																								
4 - 5		14	287	7	0	308	26	609	21	0	656	964	15	0	12	0	27	10	0	18	0	28	55	
5 - 6		18	339	15	0	372	32	612	22	0	666	1,038	14	0	19	0	33	5	1	13	0	19	52	
6 - 7																								
7 - 8																								
8 - 9																								
9 - 10																								
10 - 11																								
11 - 12																								
TOTAL		74	1,820	71	0	1,965	98	2,344	86	0	2,528	4,493	88	3	95	0	186	61	2	105	0	168	354	

Percentage	4%	93%	4%	0%		4%	93%	3%	0%			47%	2%	51%	0%		36%	1%	63%	0%			
Maximum	18	349	17	0		32	612	22	0			17	2	19	0		19	1	24	0			
Minimum	3	249	5	0		6	151	4	0			14	0	12	0		5	0	13	0			

FLORIDA DEPARTMENT OF TRANSPORTATION										
PEDESTRIAN MOVEMENT SUMMARY										
SECTION	N/A			CITY	Kissimmee			COUNTY	Osceola	
STATE ROUTE	Polynesian Isle Blvd			INTERSECTING ROUTE	Barefoot Path			MILEPOST	N/A	
OBSERVER	0			DATE	3/7/2024			MILEPOST	N/A	
REMARKS										
FORM COMPLETED BY MS					DATE 03/11/24					

Polynesian Isle Blvd

SB ST NAME

7:00-8:00	8:00-9:00		1:00-2:00	2:00-3:00		4:00-5:00	5:00-6:00	Total
1	0		0	0		0	0	1
0	0		0	0		0	0	0
1	0	0	0	0	0	0	0	1

7:00-8:00	2	1	3
8:00-9:00	4	2	6
			0
1:00-2:00	0	1	1
2:00-3:00	1	1	2
			0
4:00-5:00	0	0	0
5:00-6:00	2	4	6
Total	9	9	18

Barefoot Path

EB ST NAME

Barefoot Path

WB ST NAME

7:00-8:00	1	2	3
8:00-9:00	3	6	9
			0
1:00-2:00	2	1	3
2:00-3:00	0	0	0
			0
4:00-5:00	3	2	5
5:00-6:00	3	1	4
Total	12	12	24

Polynesian Isle Blvd

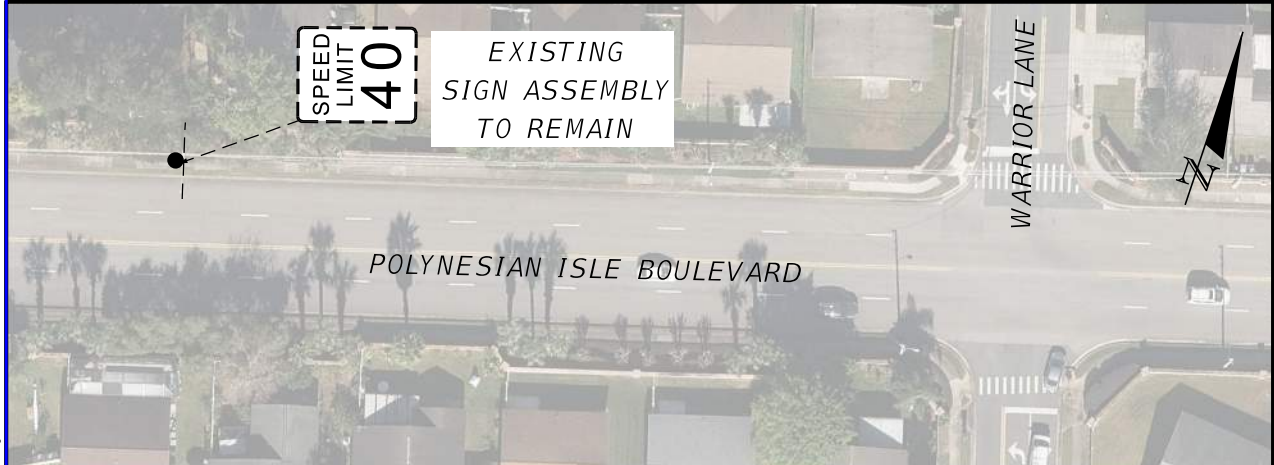
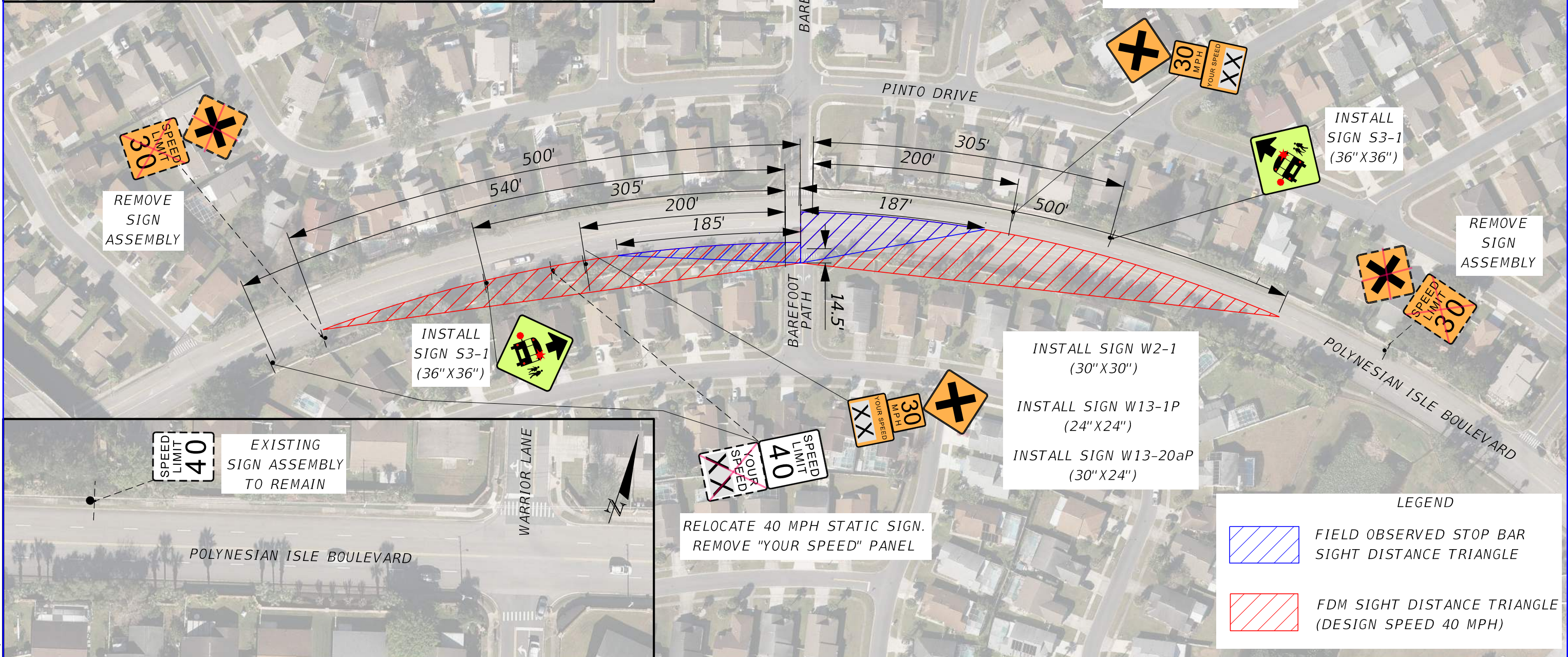
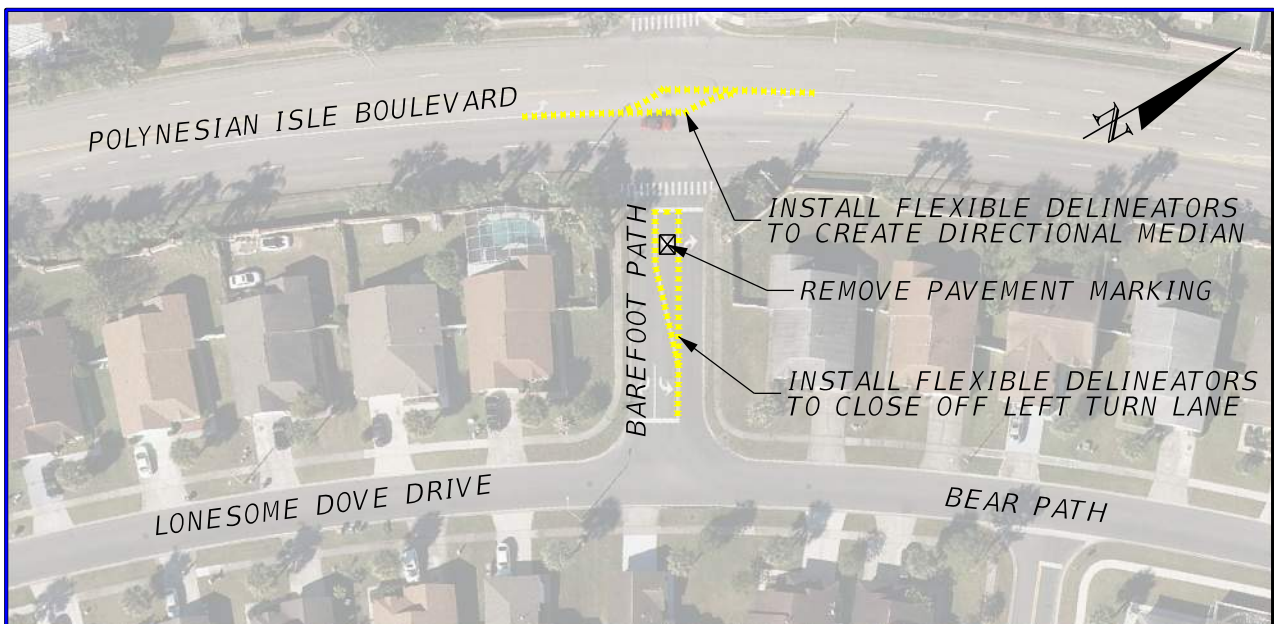
NB ST NAME

7:00-8:00	8:00-9:00		1:00-2:00	2:00-3:00		4:00-5:00	5:00-6:00	Total
0	0		0	1		1	1	3
0	1		0	0		0	0	1
0	1	0	0	1	0	1	1	4

Appendix C - Improvements Diagram

DRAFT

4/2/2024 10:36:43 mahe
 U:\Jobs\76985 - Osceola County GECYTECHPROD.001 General Engineering & Project Support\Polynesian Isle Blvd and Barefoot
 Path\CADD\BDF\SP01.dgn



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
 200 COLONIAL CENTER PKWY, STE 200
 LAKE MARY, FL 32746

OSCEOLA COUNTY DEPARTMENT OF TRANSPORTATION AND TRANSIT		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

IMPROVEMENTS DIAGRAM

SHEET NO.
1

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.