2024 STATEWIDE MEETING

February 2024

Non-Motorized Traffic Monitoring Program Development

How much staff is needed to run a Non-Motorized Traffic Monitoring Program?

FDOT TDA

Ed Hutchinson
MANAGER, TRANSPORTATION DATA & ANALYTICS

TRANSPORTATION MONITORING PROGRAM

Eric Griffin
MANAGER, TRANSPORTATION MONITORING PROGRAM

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TRAFFIC DATA ANALYSIS SUPERVISOR

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TRAFFIC DATA ANALYST

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Continuous Count Station & Weigh-in-Motion Coordinator

Leon Wells
TRAFFIC SUPPORT SPECIALIST

Jotan Borms
BIKE & PED TRAFFIC DATA COLLECTION COORDINATOR

Consultants

MARLIN

REKOR

FDOT

Agenda

1. **Program Purpose & Structure**
   - Statewide Repository
   - Statewide Outreach
   - Statewide Short-term Count Program
   - Statewide Continuous Count Program
2. **What's Next?**
3. **FAQ**
4. **Questions**

FDOT

FDOT District 2: *Duval County, Jacksonville, FL*

Program Purpose & Structure

To collect statistically valid bicycle and pedestrian (non-motorized) volume data so that statistics can be calculated and published annually

- STATEWIDE REPOSITORY
- STATEWIDE OUTREACH
- STATEWIDE SHORT-TERM COUNT PROGRAM
- STATEWIDE CONTINUOUS COUNT PROGRAM

STATEWIDE REPOSITORY

STATEWIDE OUTREACH

STATEWIDE SHORT-TERM COUNT PROGRAM

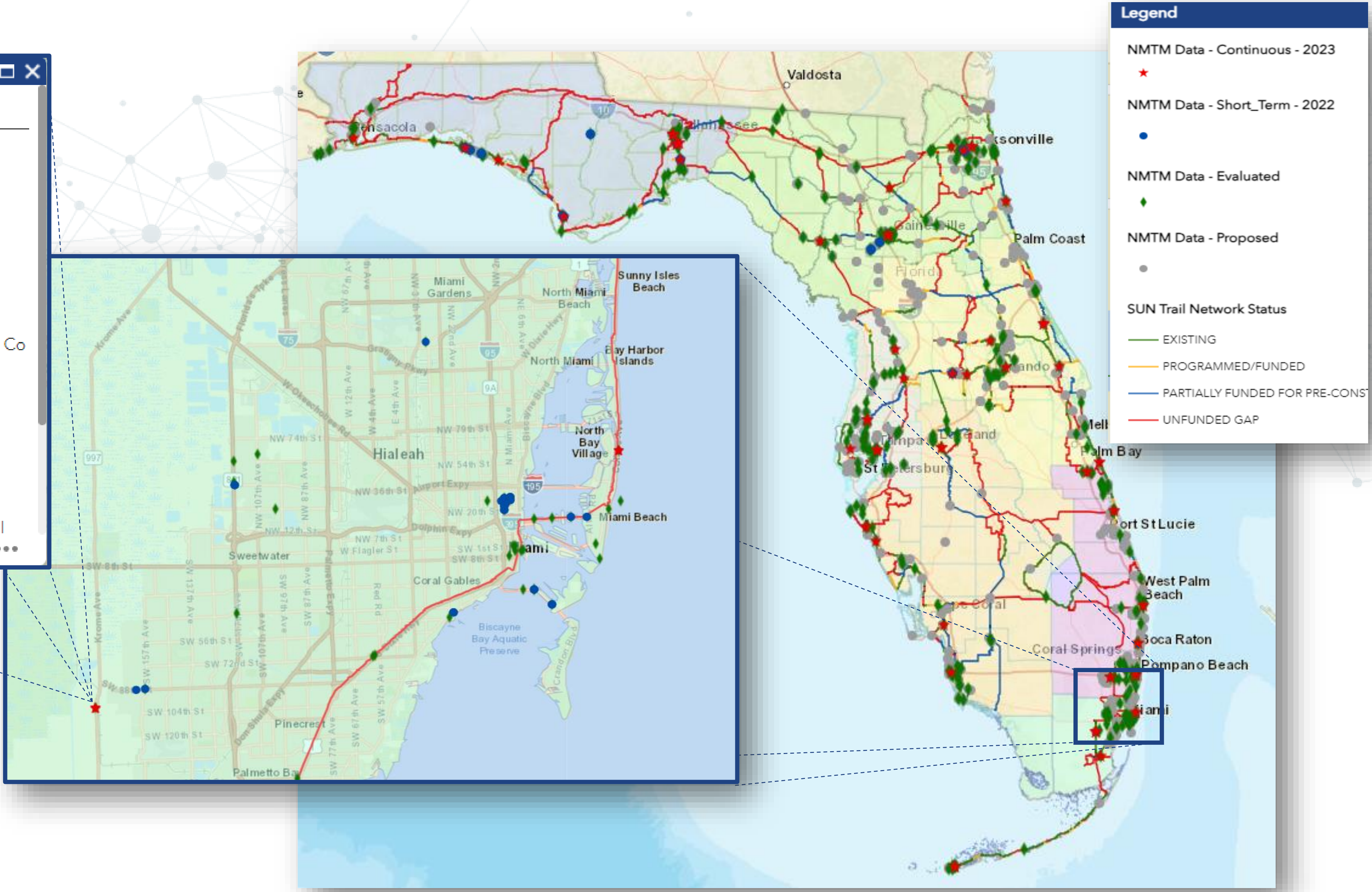
STATEWIDE CONTINUOUS COUNT PROGRAM

(1 of 7)

Krome Path, Miami-Dade Co

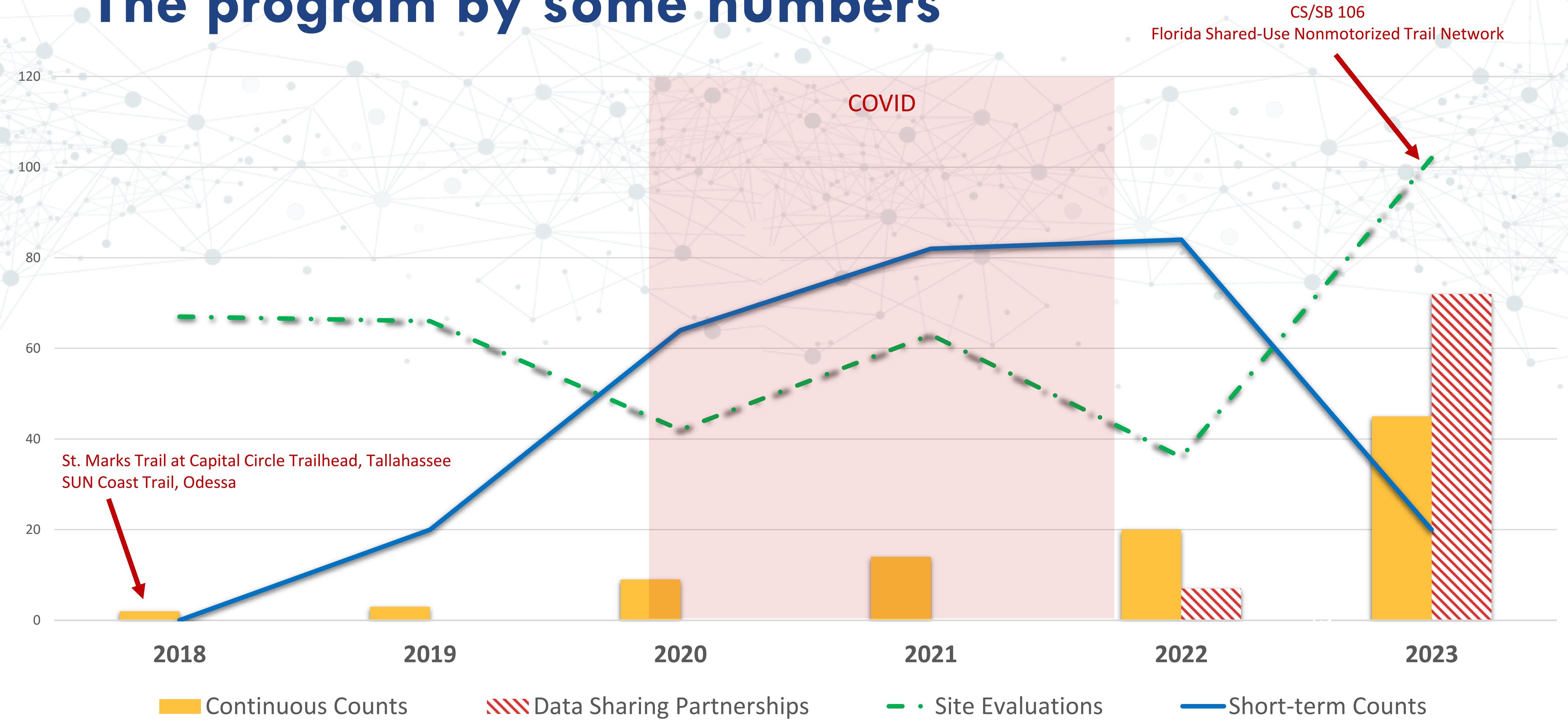
OBJECTID	23
Year	2022
District	6
County	Miami-Dade (87)
COSITE	87C001
Site_Name	Krome Path, Miami-Dade Co
Bike_Ped_Split_Data	More info
Bike_Ped_Split_Data_Status	
Count_Type	Continuous
Site_Visit_Form	More info
Site_Num	145
City	West Kendall

Zoom to

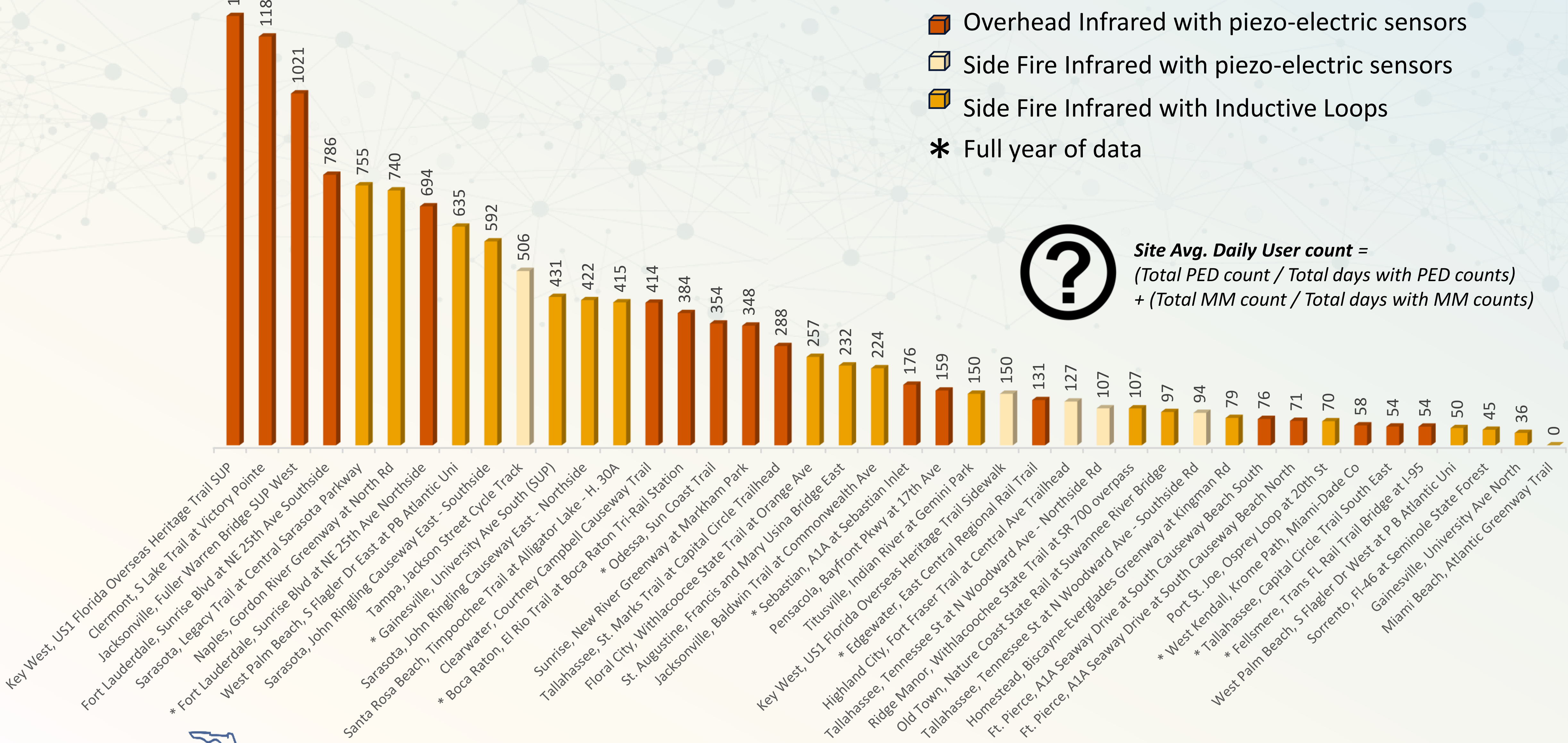


SCAN ME

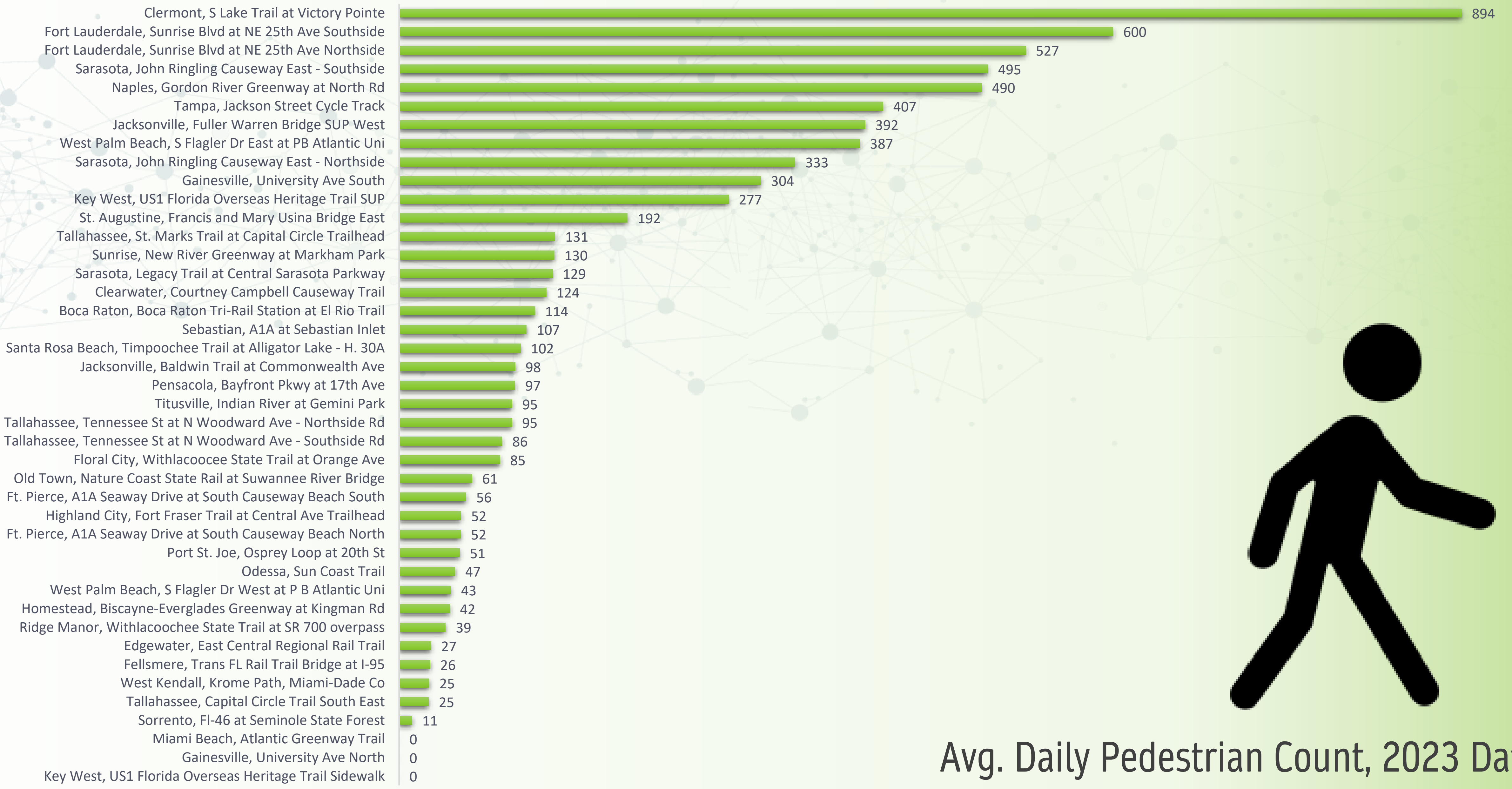
The program by some numbers



Avg. Daily User, 2023 data



Site Avg. Daily User count *=*
(Total PED count / Total days with PED counts)
+ (Total MM count / Total days with MM counts)



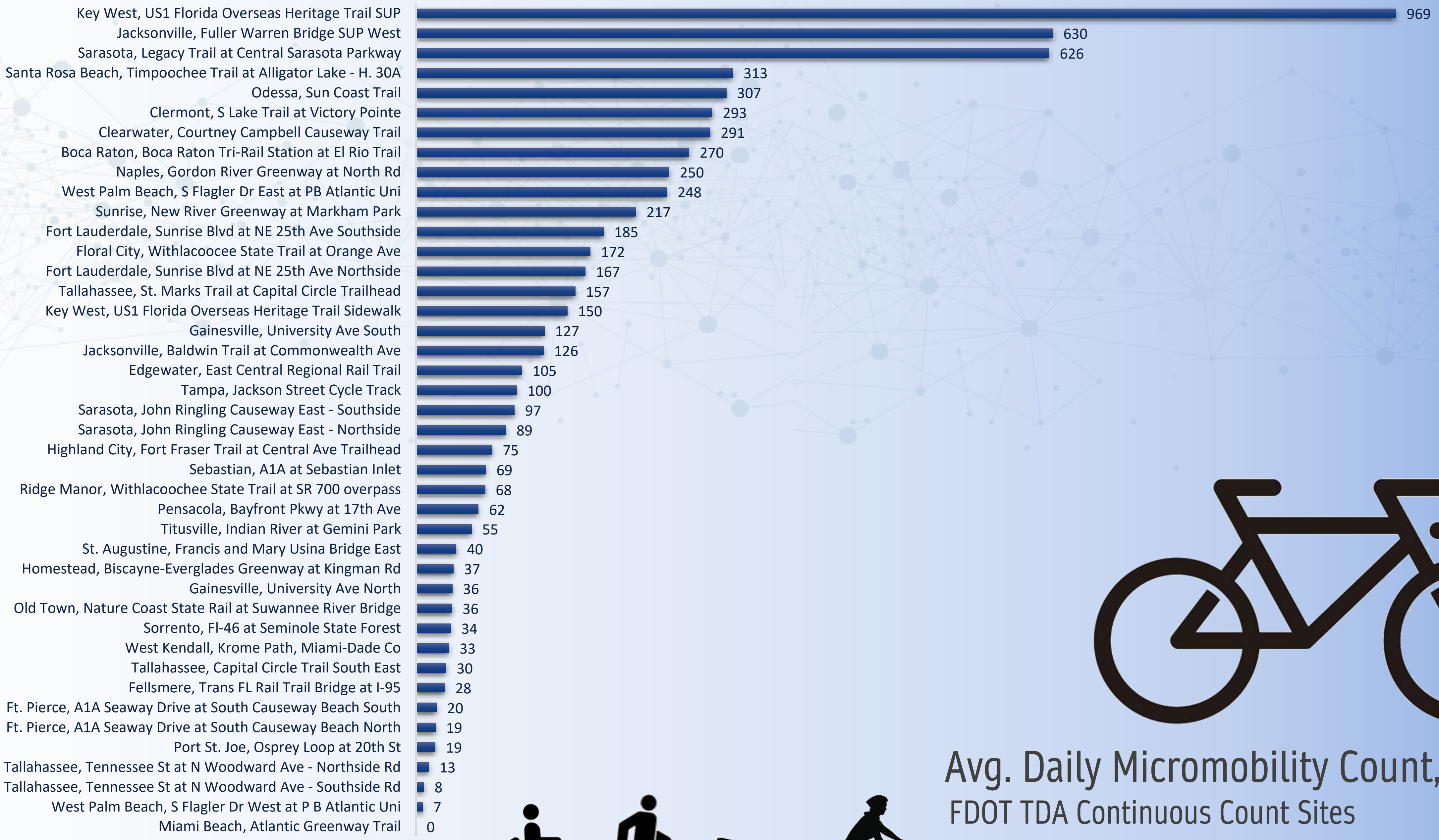
Avg. Daily Pedestrian Count, 2023 Data

FDOT TDA Continuous Count Sites

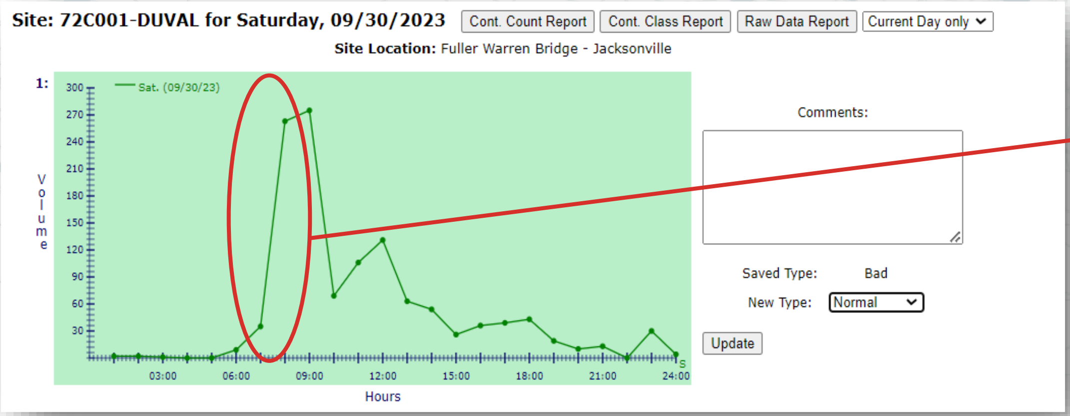
FDOT

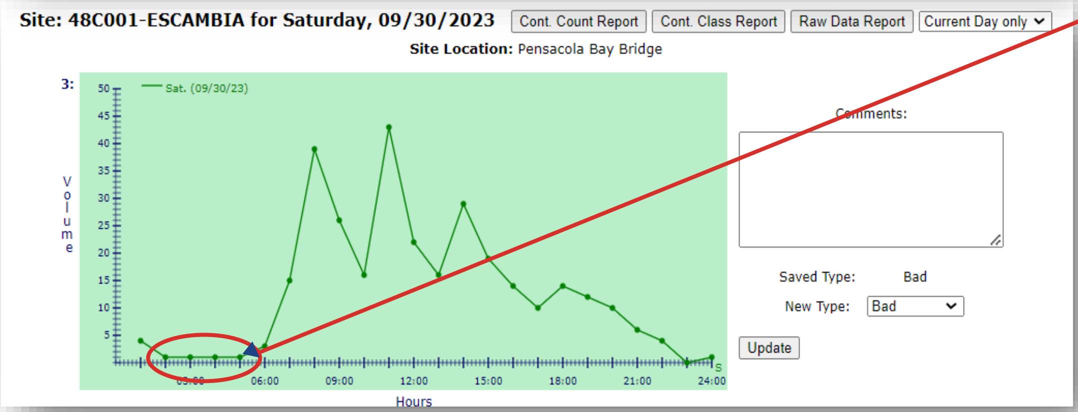
Avg. Daily Micromobility Count, 2023 Data

FDOT TDA Continuous Count Sites



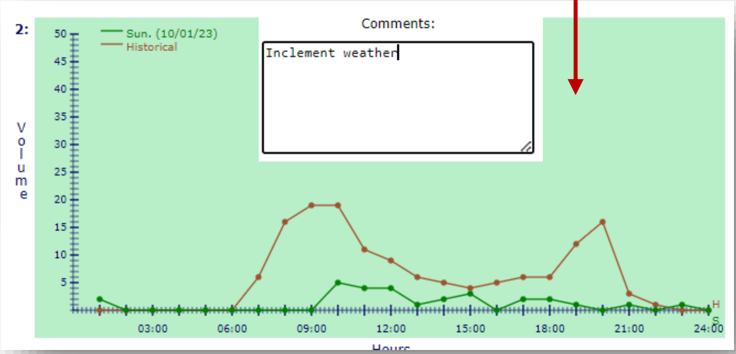
Data Wrangling





QC Rules

- Number of zeros allowed
- Percentage change vs Previous volume
- Minimum Daily volume
- Maximum Daily volume
- Maximum Hourly volume
- DOW Check
- Consecutive zeros
- Consecutive Identical hours
- 3 AM vs 3 PM
- Maximum Adjacent volume
- 90 Day moving Average



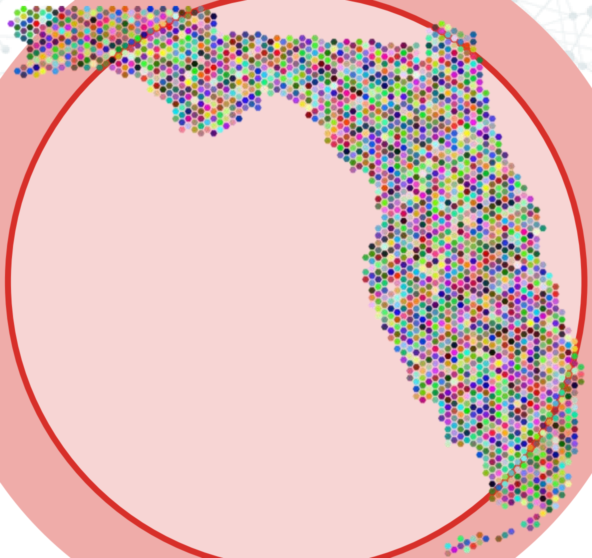
Special Events Table

Weather data

Data Validation


STATEWIDE REPOSITORY
STATEWIDE OUTREACH
STATEWIDE SHORT-TERM COUNT PROGRAM
STATEWIDE CONTINUOUS COUNT PROGRAM

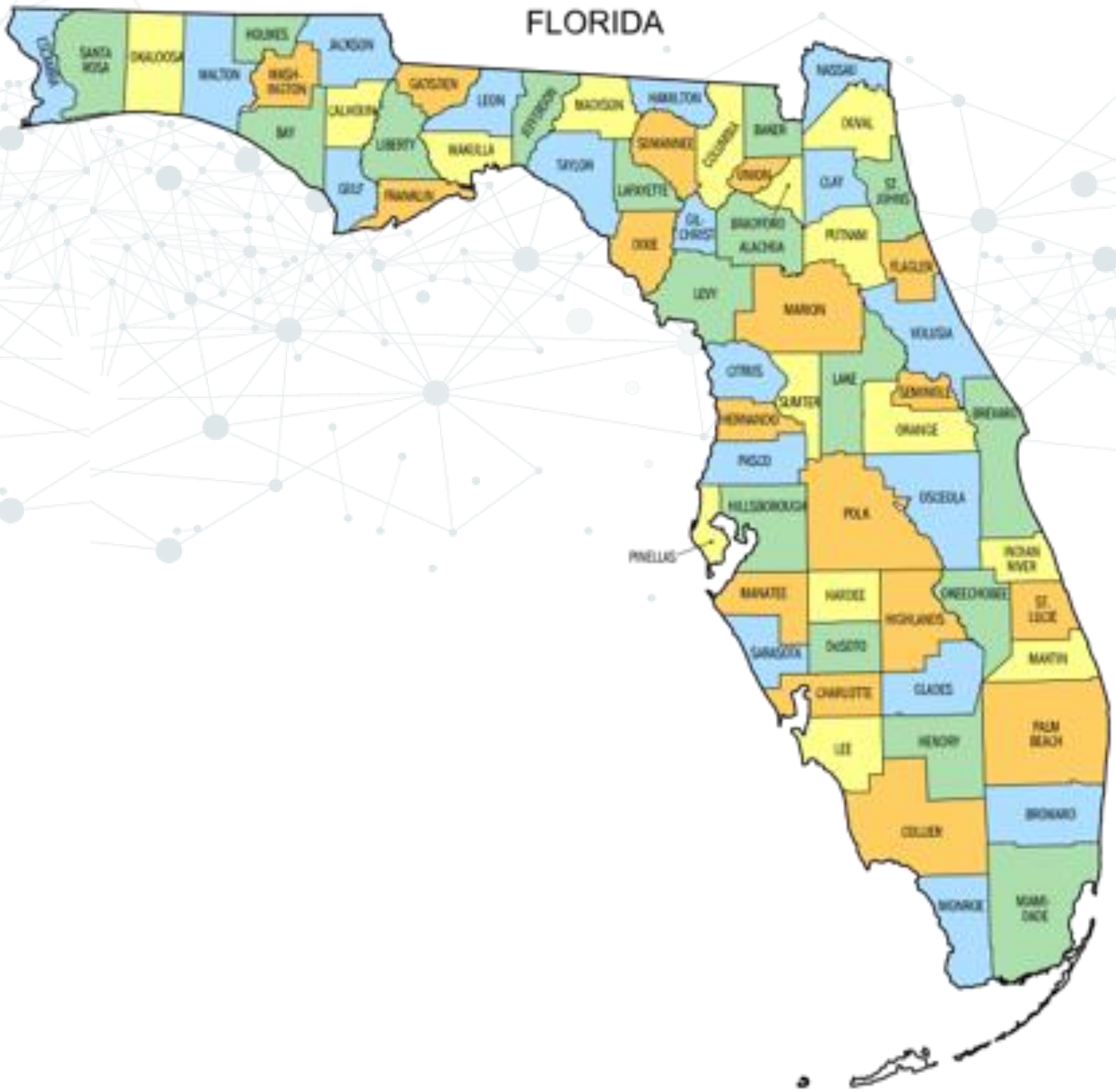
Outreach: Purpose



Data Customers

- **State DOT Customers**
  - Systems Implementation Office
  - Design Office
  - Policy Planning
  - Public Transit
  - Traffic Operations
  - Emergency Management
  - State Materials Office
  - FDOT Districts

- **Non-State DOT Customers**
  - FHWA
  - DEP
  - MPOs
  - Counties
  - Cities
  - Public Heatlh Organizations
  - Advocacy Organizations
  - Universities
  - Consultants
  - Vendors



Program Website

FDOT

OFFICES MAPS & DATA CONTACT ABOUT PROJECTS RESOURCES NEWSROOM

Home / TDA / traffic Information

Statewide Non-Motorized Traffic Monitoring Program

Program Overview

The Florida Department of Transportation (FDOT) Transportation Data and Analytics (TDA) Office began the development of a Statewide Non-Motorized Traffic Monitoring Program (NMTMP) in May 2018 with a need to provide bicycle and pedestrian (non-motorized) volume counts, supporting statistics and information to new and existing data customers. TDA intends to develop the NMTMP similar to the Motorized Traffic Monitoring Program so the data can be used for the same types of analyses such as Safety studies, planning and programming of FDOT facilities, road and trail maintenance and enhancements, etc.

Purpose

TDA aims to collect statistically valid bicycle and pedestrian (non-motorized) volume data so that statistics can be calculated and published annually.

Program Structure

SCAN ME

Questionnaire – Proposed Installations

Non-Motorized Count Station Survey

1. What Agency/Organization do you represent?

Enter your answer

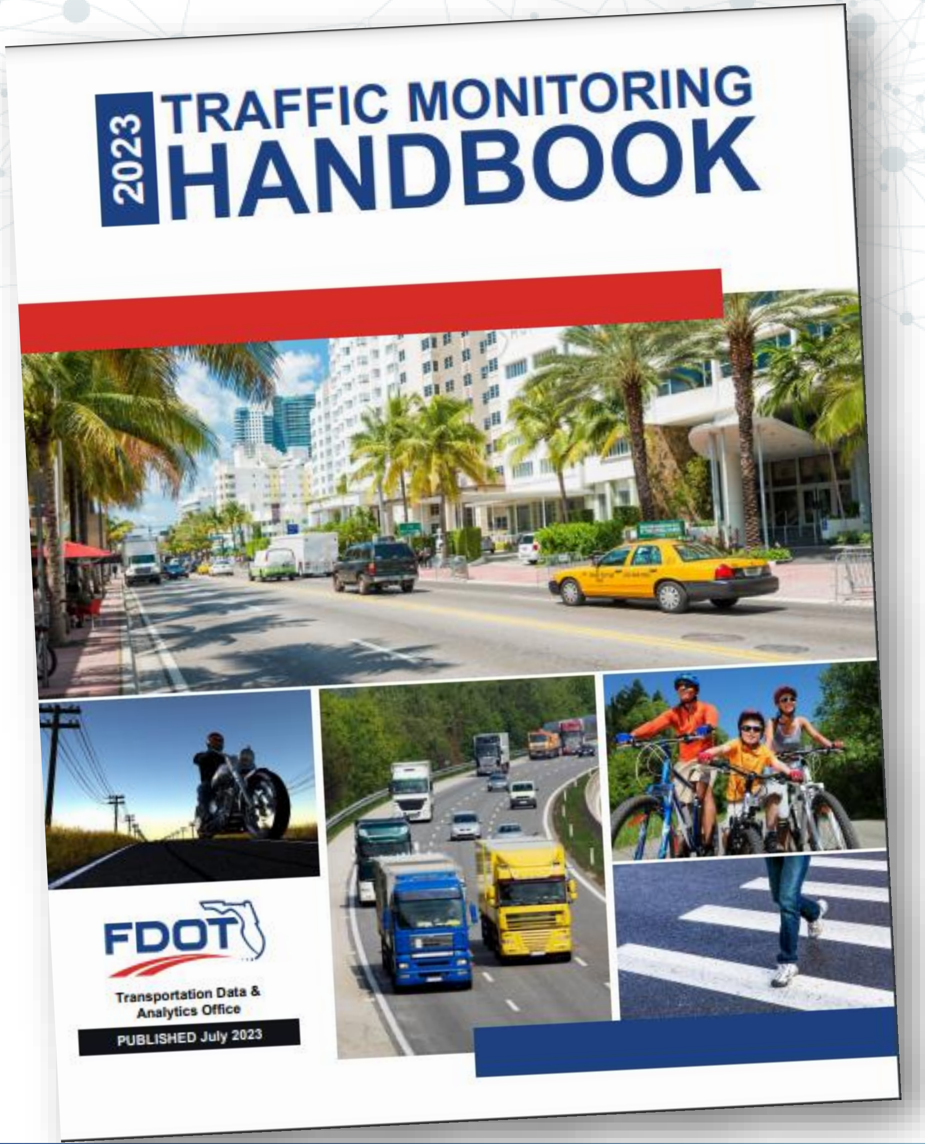
2. Within your jurisdiction, where do you recommend FDOT place a data collection device? Please list Facility Name, Nearest Cross Street, and GPS coordinates if possible. (Ex. Capital Cascades Trail; Suwannee Street @ E Lafayette Street; 30.4376617,-84.2754362)

Enter your answer

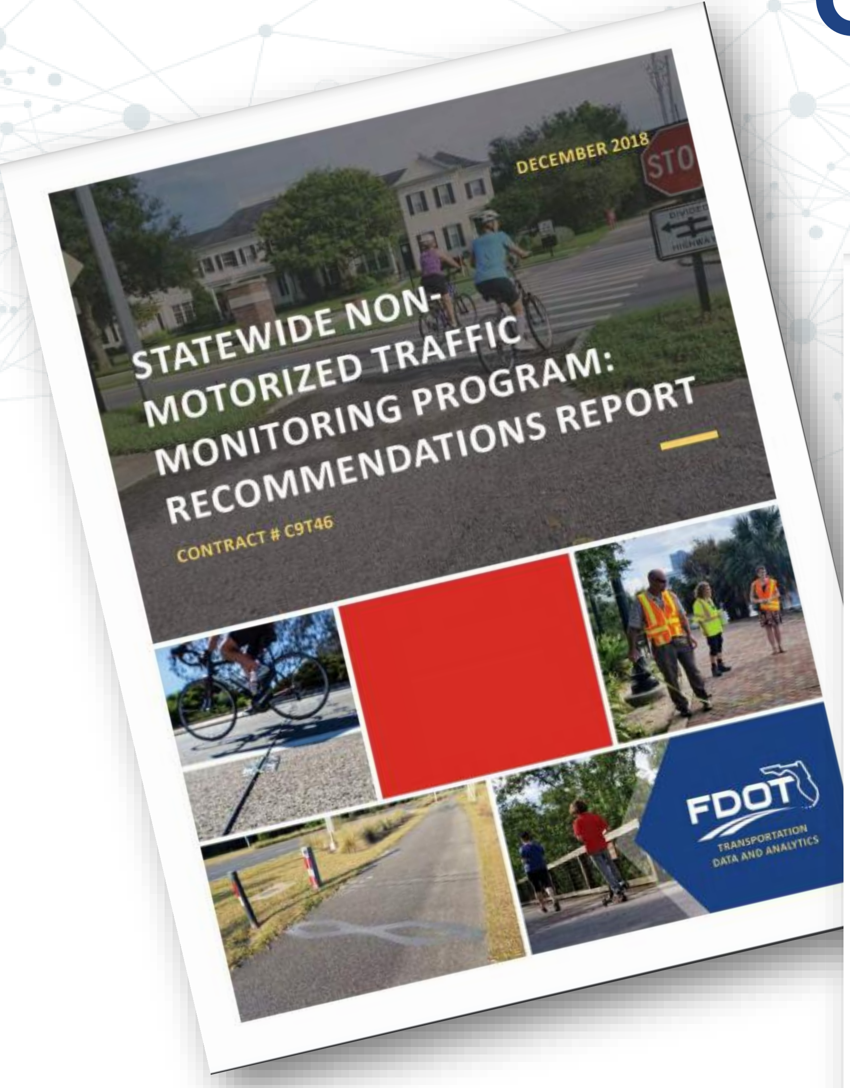
SCAN ME

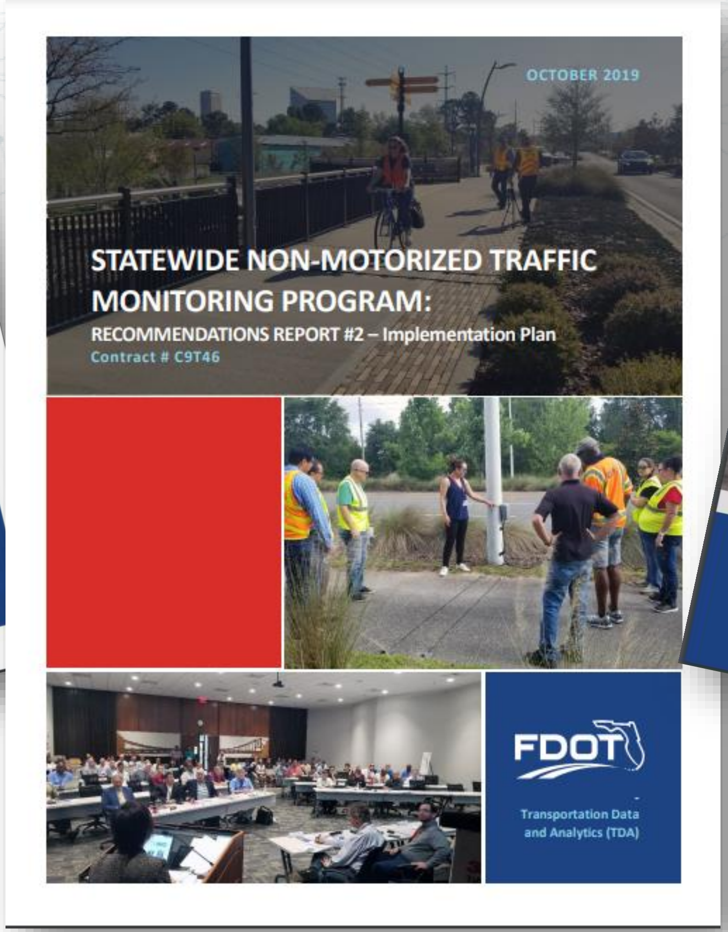
Outreach Events – Virtual & In-person

Traffic Monitoring Handbook

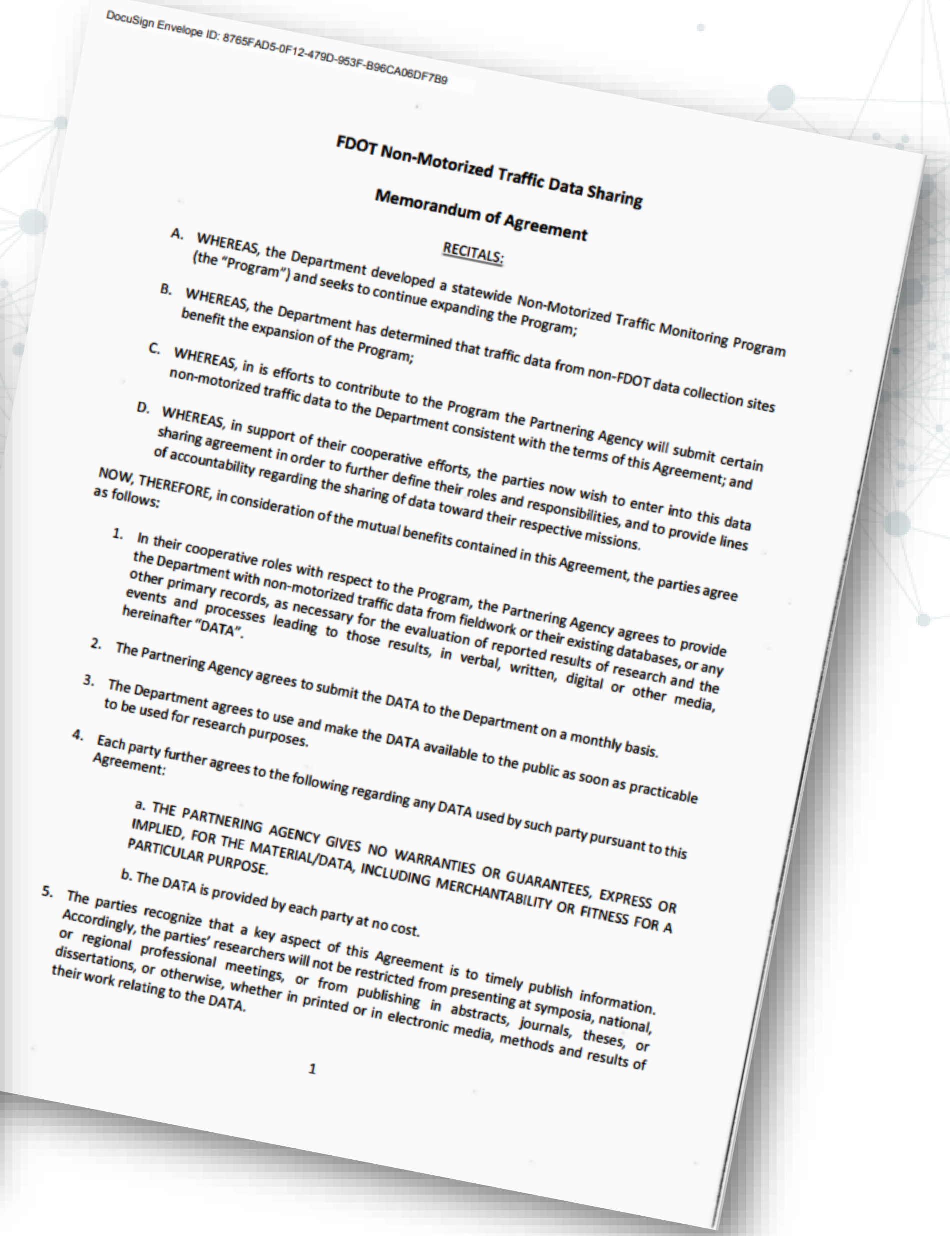


Other Reports & Resources





Memorandums of Agreement



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FDOT Non-Motorized Traffic Data Sharing

Memorandum of Agreement

RECITALS:

A. WHEREAS, the Department developed a statewide Non-Motorized Traffic Monitoring Program (the "Program") and seeks to continue expanding the Program;

B. WHEREAS, the Department has determined that traffic data from non-FDOT data collection sites benefit the expansion of the Program;

C. WHEREAS, in is efforts to contribute to the Program the Partnering Agency will submit certain non-motorized traffic data to the Department consistent with the terms of this Agreement; and

D. WHEREAS, in support of their cooperative efforts, the parties now wish to enter into this data sharing agreement in order to further define their roles and responsibilities, and to provide lines of accountability regarding the sharing of data toward their respective missions.

NOW, THEREFORE, in consideration of the mutual benefits contained in this Agreement, the parties agree as follows:

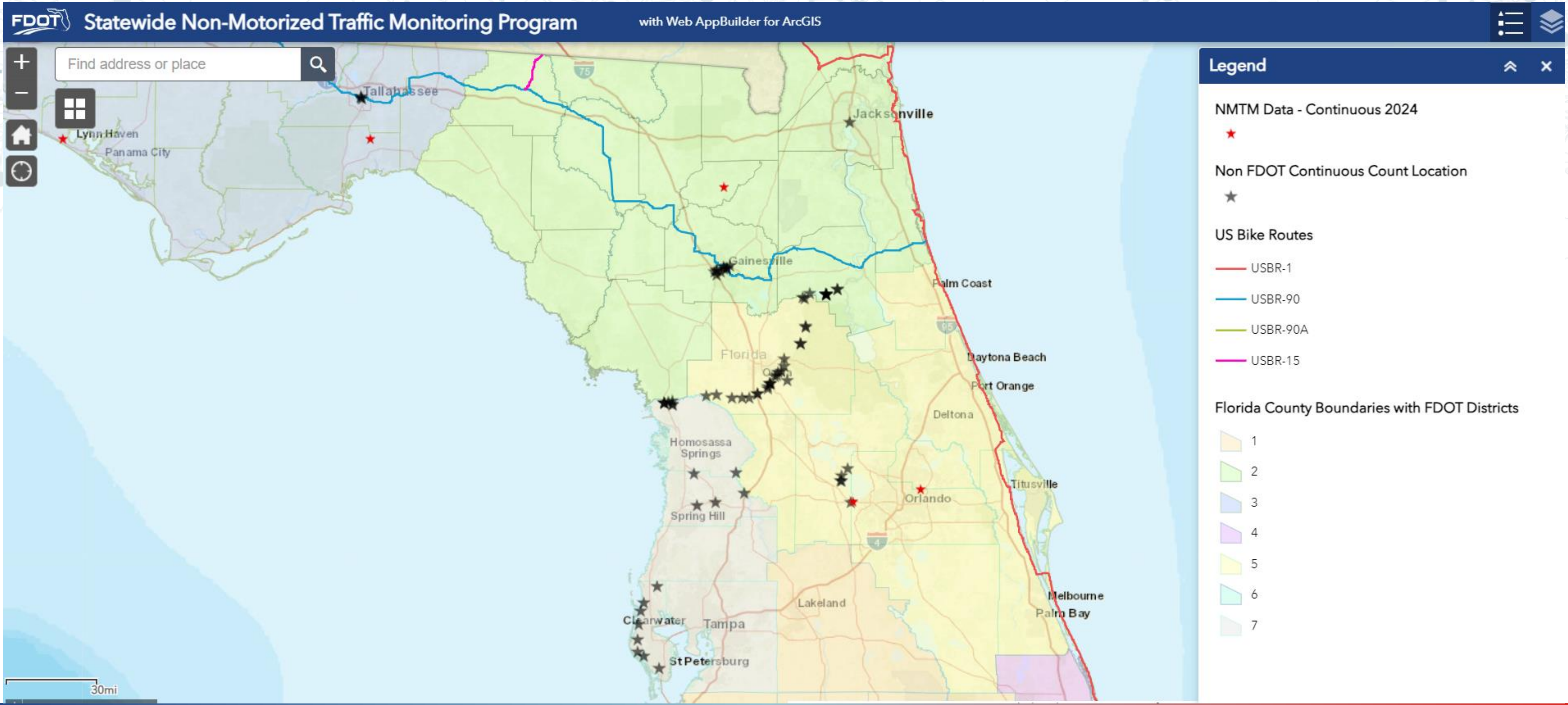
1. In their cooperative roles with respect to the Program, the Partnering Agency agrees to provide the Department with non-motorized traffic data from fieldwork or their existing databases, or any other primary records, as necessary for the evaluation of reported results of research and the events and processes leading to those results, in verbal, written, digital or other media, hereinafter "DATA".
2. The Partnering Agency agrees to submit the DATA to the Department on a monthly basis.
3. The Department agrees to use and make the DATA available to the public as soon as practicable to be used for research purposes.
4. Each party further agrees to the following regarding any DATA used by such party pursuant to this Agreement:

   a. THE PARTNERING AGENCY GIVES NO WARRANTIES OR GUARANTEES, EXPRESS OR IMPLIED, FOR THE MATERIAL/DATA, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

   b. The DATA is provided by each party at no cost.
5. The parties recognize that a key aspect of this Agreement is to timely publish information. Accordingly, the parties' researchers will not be restricted from presenting at symposia, national, or regional professional meetings, or from publishing in abstracts, journals, theses, or dissertations, or otherwise, whether in printed or in electronic media, methods and results of their work relating to the DATA.

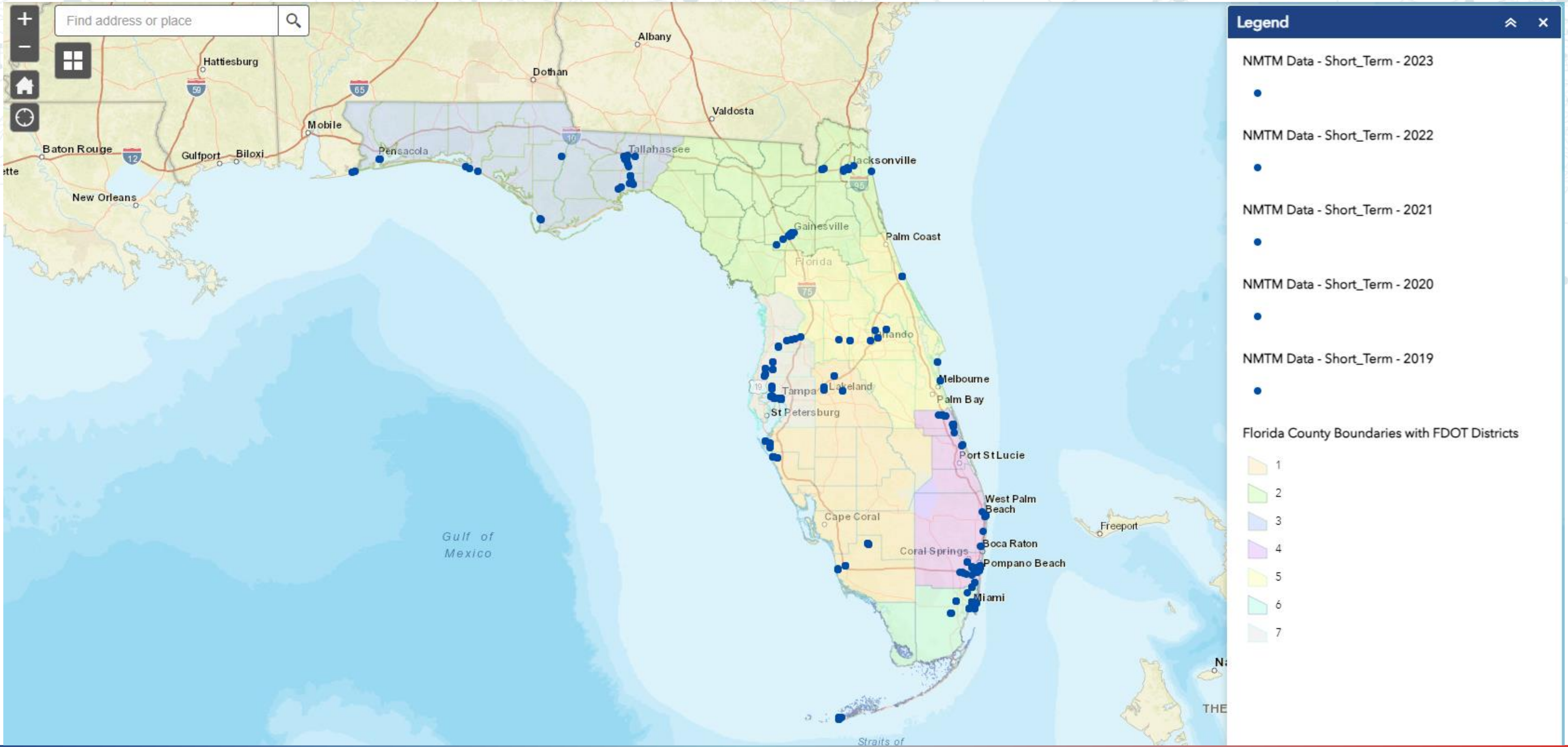
1

Data Sharing Agreements




STATEWIDE REPOSITORY
STATEWIDE OUTREACH
STATEWIDE SHORT-TERM COUNT PROGRAM
STATEWIDE CONTINUOUS COUNT PROGRAM

Statewide Short-term Counts



Short-term Counts: Purpose & Equipment

FDOT D2: Gainesville, FL

FDOT District 1: Collier County, FL

FDOT District 6: Miami-Dade County, FL

Short-term Equipment

Benefits

- Affordable, non-intrusive, and easily deployed compared to other counters.
- Counts pedestrians and bicyclists on diverse types of paths and sidewalks.
- Compact, unobtrusive, and resistant to rain, dust, and extreme temperatures
- Long battery life, approximately 1-2 years.
- The maximum range is approximately 20 feet.
- Large data storage capacity.

Constraints

- Does not detect speed, direction, or classify modes.
- Staff time is required for manual data extraction.
- Powerlines, windows, and water bodies can interfere with the unit' s detection field.
- Dependent on appropriately placed infrastructure (poles, signs, trees)
- Both the benefits and constraints of the infrared counter should be considered throughout the deployment process.

Benefits

Some of the key benefits of this device are:

- Affordable and long lasting compared to other counting technologies.
- Detects volume, speed, and direction.
- Easy to moderate difficulty to install.
- Resistant metallic casing for protection from weather and vandalism.
- Large data storage capacity
- Can be installed for extended periods of time with a battery life of up to 3-4 years.

Constraints

Despite the benefits discussed above, the technology has constraints.

- Materials used in the installation process (nails/screws, tape, tube) can be intrusive.
- Deployment requires trained and dedicated staff to install, maintain, monitor, deinstall, and manually extract data. Materials used in installation require safety precautions.
- Data from on-road facilities such as unprotected bike lanes may be more prone to error if motor vehicles drive over tubes.
- Dependent on appropriately placed infrastructure (poles, signs, trees).

Short-term Counts Site Selection

5.9 FDOT TDA Site Selection Methodology

Virtual Site Visit Best Practices

- Visit locations virtually using Arc GIS, Google Earth, Google Maps, etc.
- Log the following:
  - Site Name
  - Site GPS coordinates
  - Anticipated Factor Group
  - Anticipated Volumes
  - Anticipated Equipment
  - Managing Agency(ies)
  - Roadway/Land use characteristics
- Other observations to consider:
  - Bike/Ped crash proximity
  - Context Classification
  - Transit stop proximity
  - US Bike Route and/or regional trails
  - Demographic Information

Short-term mobilization

Figure 61: Non-Motorized Deployment Supplies

Figure 62: Non-Motorized Infrared Deployment Materials

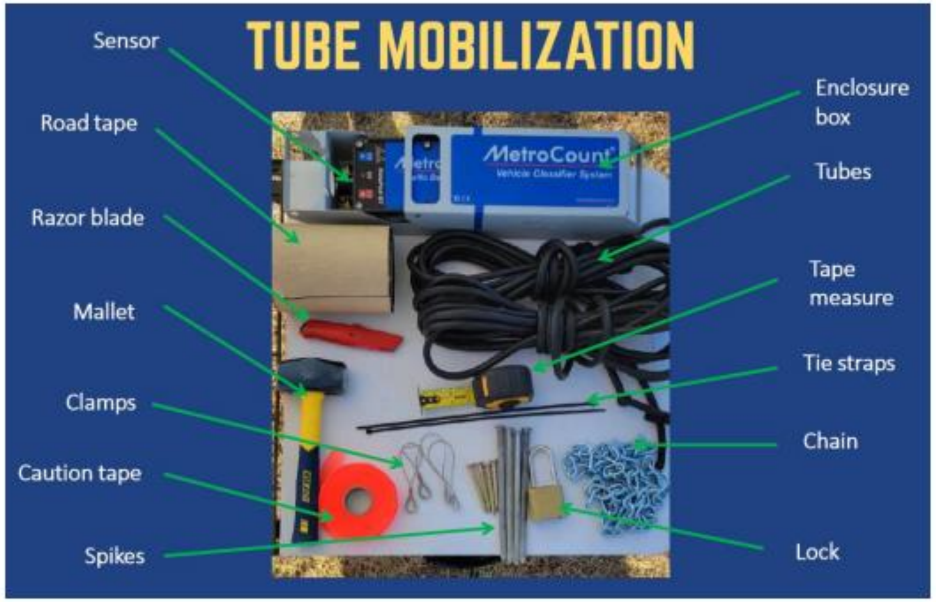


Figure 70: Non-Motorized Bicycle Tube Materials

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Short-term Deployment

Figure 63: Non-Motorized Deployment Work zone

Figure 72: Non-Motorized Bicycle Tube Spike Technique

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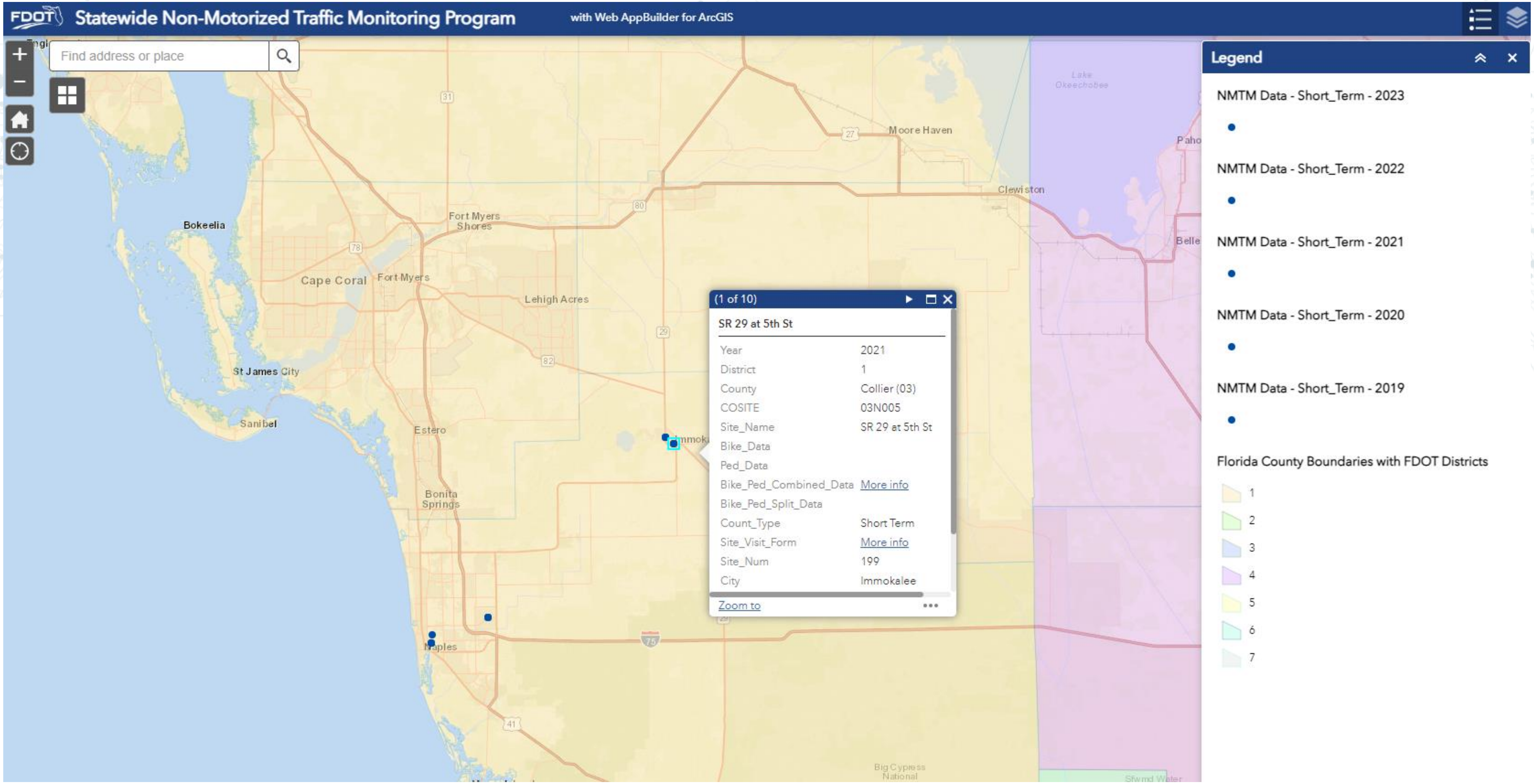
- Put sensor receiver back into the receiver case and close the receiver case.
- Perform a quick test to ensure the counter is functioning by having a person walk through the detection field. You should see a small green light flash on the sensor.
- Close the enclosure box and secure the unit to the post with a lock and chain.

Figure 65: Non-Motorized Infrared Deployment Lock and Chain

- Tilt the sensor box slightly towards the facility to assist with drainage.

Figure 66: Non-Motorized Infrared Tilt Technique

- Clean any debris from the installation process and ensure the site is clean before leaving.


FDOT Statewide Non-Motorized Traffic Monitoring Program
with Web AppBuilder for ArcGIS
Find address or place
Bokeelia
Cape Coral
Fort Myers
Fort Myers Shores
Lehigh Acres
St James City
Sanibel
Estero
Bonita Springs
Naples
Moore Haven
Clewiston
(1 of 10)
SR 29 at 5th St
Year 2021
District 1
County Collier (03)
COSITE 03N005
Site_Name SR 29 at 5th St
Bike_Data
Ped_Data
Bike_Ped_Combined_Data More info
Bike_Ped_Split_Data
Count_Type Short Term
Site_Visit_Form More info
Site_Num 199
City Immokalee
Zoom to
Legend
NMTM Data - Short_Term - 2023
NMTM Data - Short_Term - 2022
NMTM Data - Short_Term - 2021
NMTM Data - Short_Term - 2020
NMTM Data - Short_Term - 2019
Florida County Boundaries with FDOT Districts
1
2
3
4
5
6
7

FLORIDA DEPARTMENT OF TRANSPORTATION
SHORT-TERM NON-MOTORIZED VOLUME COUNTS

SITE CODE:	03N005	DISTRICT:	D1
LOCATION:	SR 29 @ 5th St	COUNTY:	Collier
GPS:	26.418399°, -81.421180°	TYPE:	Sidewalk
COUNT TYPE:	Ped+Bike (Trafx IR)	DIRECTION/SIDE:	Combined
START DATE:	12/4/2021	END DATE:	12/17/2021

Time	Sat 4-Dec	Sun 5-Dec	Mon 6-Dec	Tue 7-Dec	Wed 8-Dec	Thu 9-Dec	Fri 10-Dec	Sat 11-Dec	Sun 12-Dec	Mon 13-Dec	Tue 14-Dec	Wed 15-Dec	Thu 16-Dec	Fri 17-Dec	Total
12:00 AM	9	18	5	2	1	1	12	20	15	6	2	5	3	5	104
1:00 AM	15	20	6	0	0	2	6	12	38	2	0	1	5	5	112
2:00 AM	9	12	3	0	2	0	1	10	9	0	1	1	4	5	57
3:00 AM	2	4	4	5	6	5	8	4	4	7	7	1	8	8	73
4:00 AM	26	6	27	30	27	26	25	18	4	23	35	21	20	19	307
5:00 AM	65	11	73	57	66	62	70	59	19	48	58	70	50	72	780
6:00 AM	44	28	43	42	49	35	38	52	20	37	31	57	40	68	584
7:00 AM	51	34	15	43	37	26	27	62	46	25	36	40	29	24	495
8:00 AM	49	68	24	38	33	24	42	49	56	27	17	35	32	47	541
9:00 AM	65	73	39	45	38	18	31	57	92	26	39	67	26	23	639
10:00 AM	99	117	28	57	35	37	63	78	115	37	38	66	36	38	844
11:00 AM	106	120	47	49	35	30	39	104	113	41	31	28	30	45	818
12:00 PM	94	119	48	33	15	29	30	84	99	54	16	25	29	31	706
1:00 PM	54	101	30	47	25	34	57	57	93	20	37	40	39	46	680
2:00 PM	78	104	43	56	38	38	57	69	86	41	36	40	28	50	764
3:00 PM	79	113	44	44	50	52	45	62	88	46	42	47	40	51	803
4:00 PM	97	113	72	78	43	61	80	104	101	62	54	47	50	73	1035
5:00 PM	131	136	81	97	72	82	96	165	132	72	95	91	73	97	1420
6:00 PM	131	143	102	134	113	99	117	228	151	108	105	100	99	138	1768
7:00 PM	98	106	88	87	95	72	112	93	106	78	75	82	90	128	1310
8:00 PM	78	54	45	43	73	60	86	65	60	41	66	51	50	73	845
9:00 PM	56	43	33	29	37	24	52	63	26	24	30	34	36	52	539
10:00 PM	27	20	13	17	12	10	34	44	21	20	22	11	17	39	307
11:00 PM	33	13	3	3	5	9	26	28	14	4	3	11	12	19	183
Total	**1496**	**1576**	**916**	**1036**	**907**	**836**	**1154**	**1587**	**1508**	**849**	**876**	**971**	**846**	**1156**	**15714**

WEEKDAY DAILY AVG:	**912**	**AVG AM PEAK:**	**77**	**WEEKDAY TOTAL:**	5472	**AM Peak:**	**10:00 AM**
WEEKEND DAILY AVG:	**1542**	**AVG PM PEAK:**	**126**	**WEEKEND TOTAL:**	6167	**PM Peak:**	**6:00 PM**

NOTES:

*** Weekday Daily Average based on Tuesday, Wednesday and Thursday Daily Volume*
*** Weekend Daily Average based on Saturday and Sunday Daily Volume*

Transit Study I – Boca Tri-Rail station

93N001 - Boca Raton Tril -Rail Station - Trajectories

93N001 - Boca Raton Tril -Rail Station -Lines & Zones Configuratio

Transit Study II – JTA

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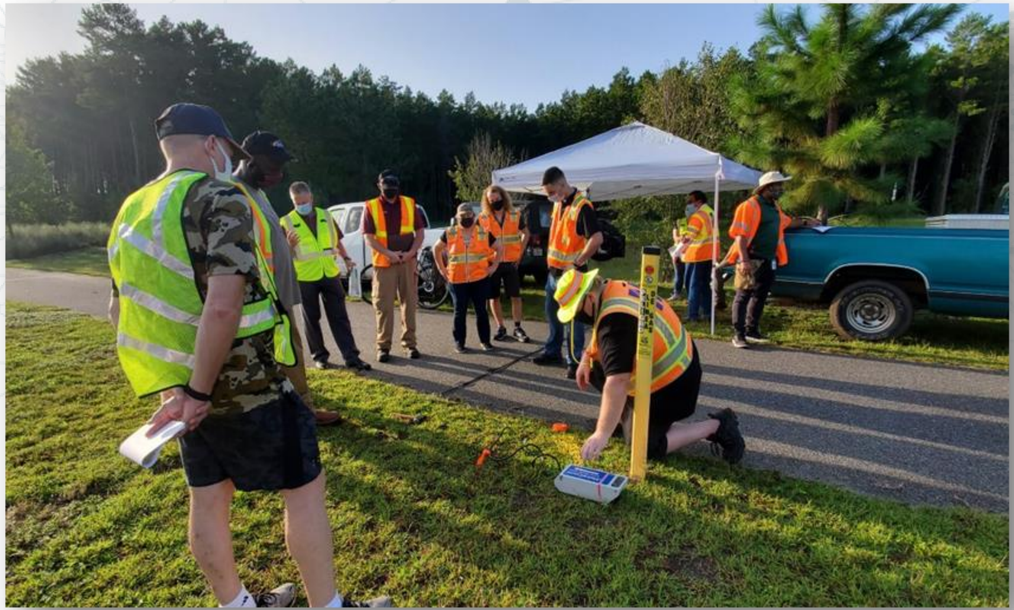
Short-term Counts: Methods

Stn ID	Location Name	Coordinates	Equipment	DAY -1	DAY 0	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10	DAY 11	DAY 12	DAY 13	DAY 14	DAY 15	DAY 16	DAY 17
				Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri
XXXXXX	LOCATION 1	xx.xx,-xx.xx	IR + Tubes																			
XXXXXX	LOCATION 2	xx.xx,-xx.xx	IR + Tubes																			

LEGEND
Equipment Preparation
Equipment installation
Data Collection
Equipment check /Data Extraction/pick up camera*
Device Pickup
Data Analysis + submitting

1	COSITE	SITE NR	COUNTY	CITY	LOCATION NAME	LATLONG COORDINATES
2	87N001	163	Miami-Dade (87)	Opa Locka	Opa-Locka Tri Rail 1	25.900204, -80.25349
3	87N004	218	Miami-Dade (87)	Miami Gardens	Snake Creek Trail at 441 West	25.959306, -80.206548
4	87N005	213	Miami-Dade (87)	Miami	Commodore Trail at Aviation Ave	25.731936, -80.233952
5	87N006	270	Miami-Dade (87)	Miami Beach	Venetian Cswy at Rivo Alto Dr	25.791219, -80.153190
6	87N007	42	Miami-Dade (87)	Miami Beach	Miami - Venetian 2_West Ave at Lincoln Rd	25.791504, -80.142417
7	87N008	217	Miami-Dade (87)	Miami Dade	Rickenbacker Causeway at William Powell bridge approach	25.746336, -80.178355
8	87N009	216	Miami-Dade (87)	Miami Dade	Rickenbacker Causeway at Author Lamb Jr Rd	25.737166, -80.165963
9	87N010	91	Miami-Dade (87)	Doral	Turnpike Trail at 41st St South	25.810895, -80.385436
10	87N012	181	Miami-Dade (87)	City of Miami	North Miami Ave at NW 27th	25.801978,-80.195069
11	87N013	182	Miami-Dade (87)	City of Miami	North Miami Ave between NW 29 St and 28th St	25.803532, -80.195215
12	87N014	183	Miami-Dade (87)	City of Miami	NW 2nd Ave between 20th St and 20th Terr	25.795722, -80.198905
13	87N015	184	Miami-Dade (87)	City of Miami	NW 2nd Ave at Perimeter Rd	25.798222,-80.199030
14	87N016	176	Miami-Dade (87)	City of Miami	NW 24th St at 1st St	25.799148, -80.198092
15	87N017	177	Miami-Dade (87)	Miami	NW 2nd Ave between 25th St and 26 St	25.800965, -80.199090
16	87N018	178	Miami-Dade (87)	Miami	NW 3rd Ave between 25th St and NW 26th St	25.801037, -80.201112
17	87N019	179	Miami-Dade (87)	Miami	NW 2nd Ave between NW 28th St and NW 29th St	25.803365, -80.199182
18	87N020	214	Miami-Dade (87)	Miami Dade	Kendall Dr at SW 162nd Ave	25.683972,-80.453097
19	87N021	242	Miami-Dade (87)	Miami Dade	Kendall Dr at SW 157th Ave	25.684275,-80.446925
20	90N001	215	Monroe (90)	Key West	Overseas Heritage Trail at Cow Bridge	24.57182, -81.74622
21	90N002	50	Monroe (90)	Key West	Overseas Heritage Trail - Home Depot	24.566656, -81.771442
22	90N003	36	Monroe (90)	Key West	Staples Bridge_Key West	24.559943, -81.772125
23	90N004	219	Monroe (90)	Key West	A1A South Roosevelt at Bertha St_Key West	24.550595, -81.775428
24	90N005	243	Monroe (90)	Key West	College Rd at A1A	24.572210, -81.748672
25						

TDA/District Short-term counts




STATEWIDE REPOSITORY
STATEWIDE OUTREACH
STATEWIDE SHORT-TERM COUNT PROGRAM
STATEWIDE CONTINUOUS COUNT PROGRAM

Site Evaluation & Selection

FDOT TDA - NEW SITE EVALUATION FORM					
DATE OF VISIT				TIME	
SITE NAME				LATLONG COORD.	
DISTRICT		COUNTY		CITY	
EVALUATION TYPE	☐ Virtual ☐ On-Site	TRAFFIC	☐ URBAN ☐ RURAL	PROJECTIVE BASELINE ACTIVITY LEVELS	☐ Low (< 150) ☐ Medium (151 - 600) ☐ High (> 600)
ROADWAY					
FUNCT. CLASS*				LOC. OF COUNT*	
DIR OF MVMT*				SUN Trail	
EVALUATOR		FDOT SITE ID		SITE EVALUATION #	

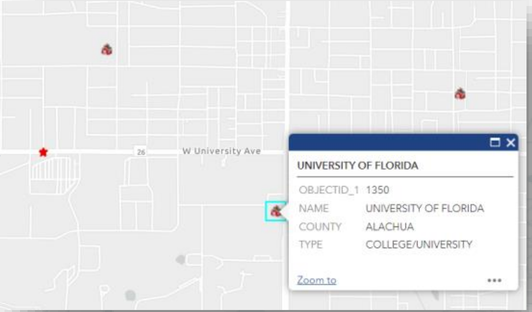
ON-SITE CHARACTERISTICS	
☐ Good mid-block location ☐ Posted Speed:	☐ Parks and/or recreation facilities nearby
☐ Choke points (point of congestion)	☐ School or university nearby
☐ Waterbodies	☐ Major employer(s) nearby or downtown business area
☐ Hills	☐ Transit stops nearby
☐ Curves	☐ Landmark (historic, touristic, ...)
☐ Powerlines ☐ EMI test:	☐ Hospital nearby
☐ Motorized traffic present	☐ Shopping area
☐ People milling around	☐ Beach area
☐ Bollards, obstacles, poles or trees present	☐ Intersection nearby
☐ Parallel parking present	☐ Location good for solar panel, enough sunlight available
☐ Outdoor seating nearby	☐ Commute ☐ Recreational ☐ Mixed

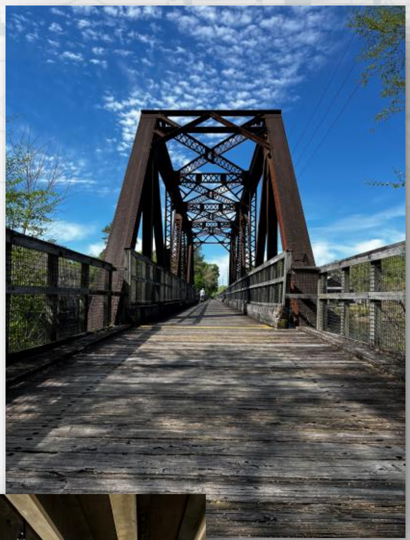
INSTALLATION DETAILS					
☐ Within the 12' - 15' detection zone	☐ Easy access for technicians (Car access)		☐ Post installation required		
MANAGING AGENCY OF SITE (ROW)					
FACILITY	☐ Trail not within ROW of adjacent road (funct Class. 8) ☐ Shared Roadway lane (bicycle blvd/ neighborhood grnwy) ☐ Exclusively crosswalk ☐ Sidewalk primarily Pedestrians ☐ Striped bicycle lane (no vertical separation with Mot. Tr) ☐ Overpass or ☐ Underpass ☐ Physically separated bicycle lane (Bicycle only) ☐ Side path for shared use, roadway ROW ☐ General area ☐ Shared Trail right of way (potentially open for Mot. Tr) ☐ Roadway shoulder not exclusively for BP travel)		SHORT-TERM COUNTS	☐ YES ☐ NO ☐ PARTNER AGENCY	
			DIRECTION OF ROUTE	☐ E/W or SE/NW ☐ NORTH ☐ NORTHEAST ☐ EAST ☐ SOUTHEAST ☐ SOUTH ☐ SOUTHWEST ☐ WEST ☐ NORTHWEST ☐ N/S or NE/SW	
PROPOSED EQUIPMENT FOR CCS	☐ Side-fire passive infrared ☐ Overhead passive infrared ☐ Piezoelectric sensors ☐ Inductive loops ☐ Camera / AI		SURFACE	☐ Asphalt ☐ Concrete ☐ Dirt ☐ Tiles	
SIDEWALK WIDTH	A:	B:	BIKELANE WIDTH	A: B:	TRAIL WIDTH

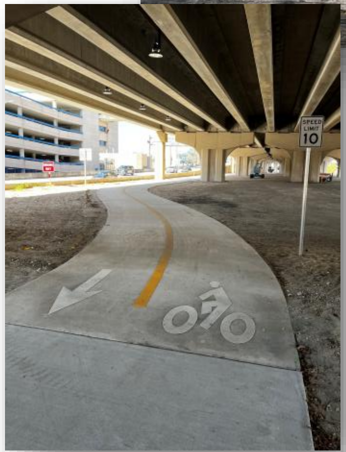
*Use the approriate TMG tables to complete these fields

Version 3.2 – September 2023

FDOT





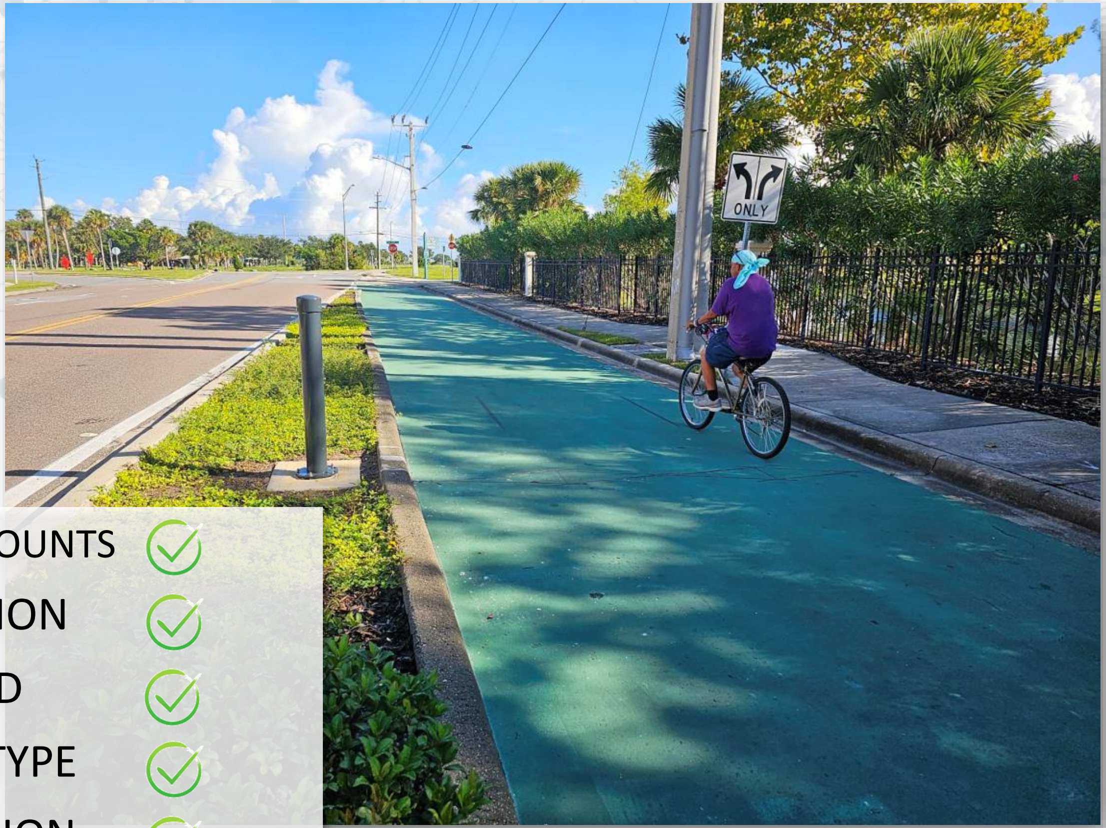


FDOT

Overhead Infra-red counter
Piezo-electric sensors

Side fire Infra-red counter
Inductance loops

Pinellas County, Courtney Campbell Causeway



Brevard County, Indian River Ave at Gemini Park

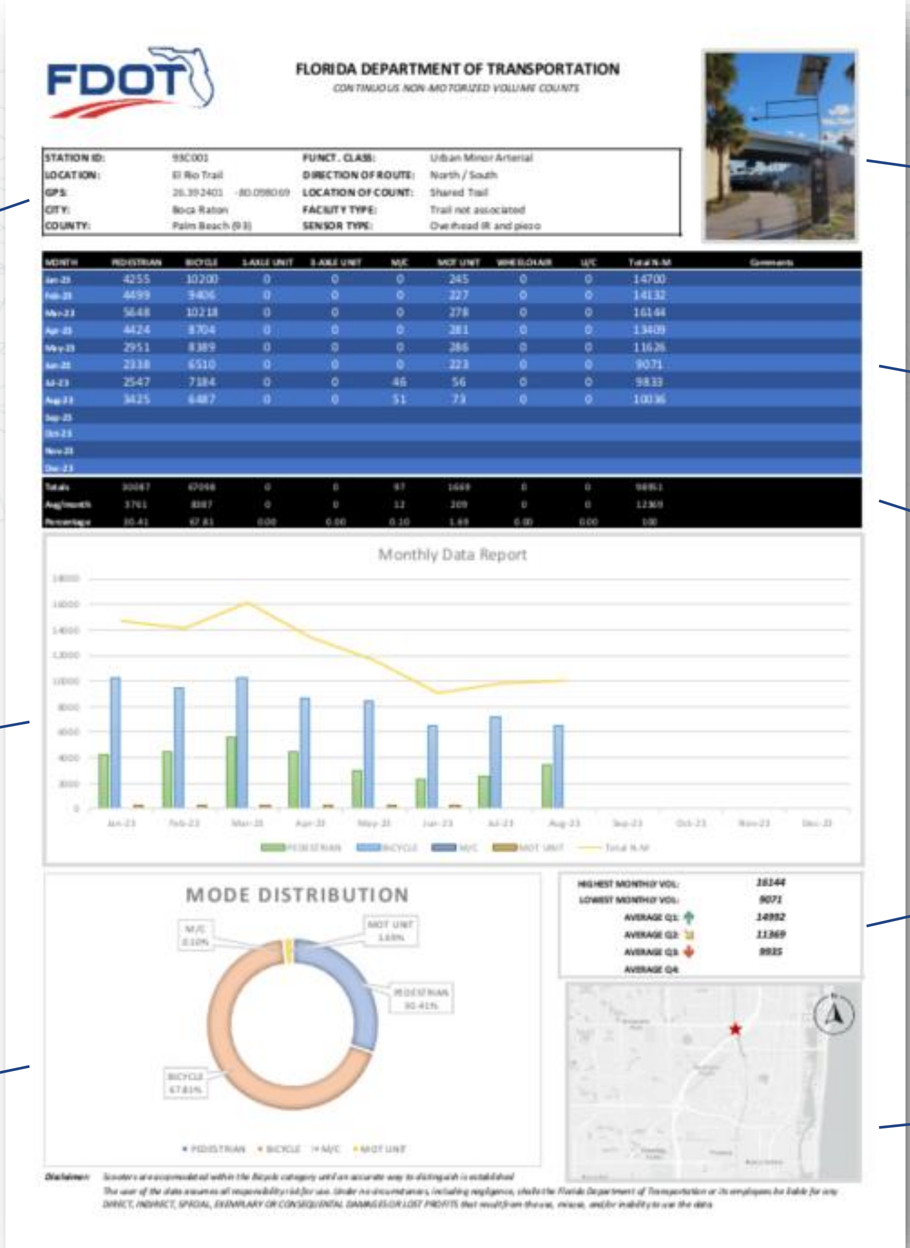
✓	VOLUME COUNTS	✓
✓	DIRECTION	✓
✓	SPEED	✓
✓	MODE TYPE	✓
✗	OCCLUSION	✓
$$	PRICE	$
✓	SOLAR POWER	✗

Data Reports

General site information

Visualization of the monthly totals

Mode distribution



Picture of the site

Monthly totals by mode

Totals and averages

Quarterly averages

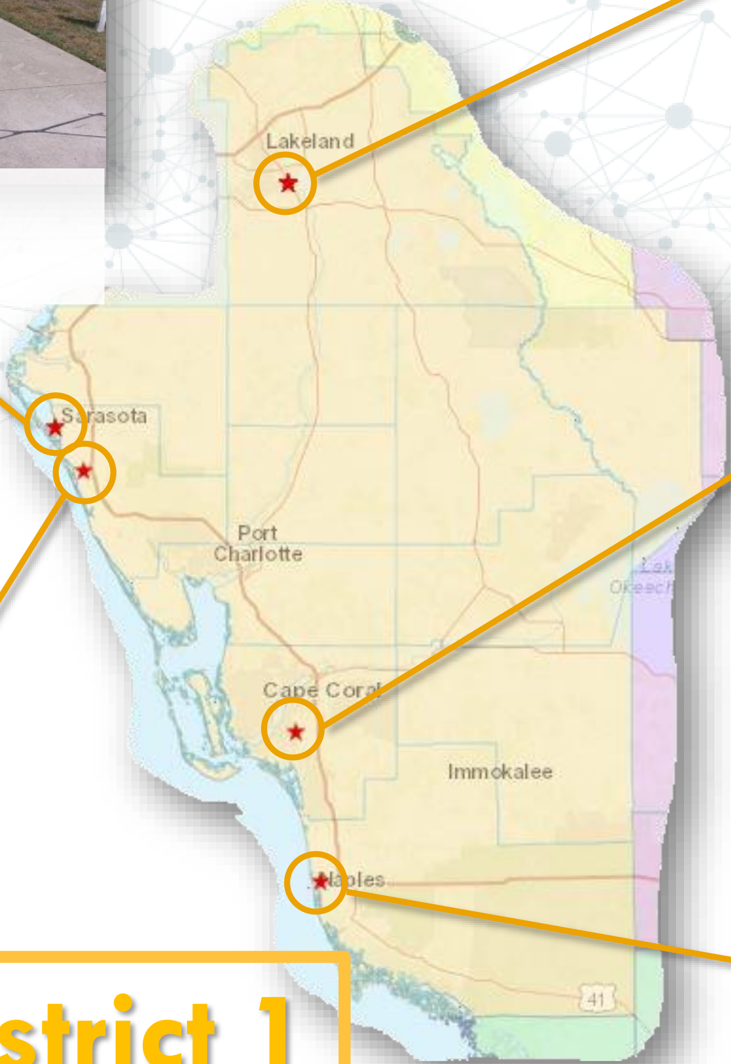
Map and compass

Where?

Continuous Count sites by FDOT District

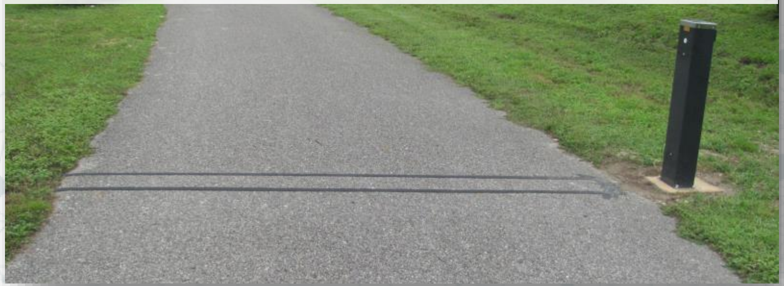
John Ringling Causeway, Sarasota, Sarasota County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 1,014* *(dual site)*

Legacy Trail, Sarasota, Sarasota County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 755



District 1

Fort Fraser Trail, Highland City, Polk County
Side Fire Infrared with piezo-electric sensors
2023 Avg. Daily Users: 127



John Yarbrough Linear Park, Fort Myers, Lee County
Overhead Infrared with piezo-electric sensors
Installation to be finished Q1, 2024

Gordon River Greenway, Naples, Collier County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 740

FDOT

Palatka-Lake Butler State Trail, Lake Butler, Union County
Side Fire Infrared with Inductive Loops
Installed January 2024

Baldwin Trail, Jacksonville, Duval County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 224

University Blvd, Jacksonville, Duval County
Overhead Infrared with piezo-electric sensors
Installation to be finished Q1, 2024

Fuller Warren Bridge, Jacksonville, Duval County
Overhead Infrared with piezo-electric sensors
2023 Avg. Daily Users: 1,024

District 2

Nature Coast State Trail, Old Town, Dixie County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 97

University Ave, Gainesville, Alachua County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 431* *(South side only)*

Francis and Mary Usina Bridge, St. Augustine, St. Johns County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 232

District 3

Tennessee St, Tallahassee, Leon County
Side Fire Infrared with piezo-electric sensors
2023 Avg. Daily Users: 201* *(dual site)*

Bayfront Pkwy, Pensacola, Escambia County
Overhead Infrared with piezo-electric sensors
2023 Avg. Daily Users: 159

Capital Circle Trail, Tallahassee, Leon County
Overhead Infrared with piezo-electric sensors
2023 Avg. Daily Users: 54

Timpoochee Trail, Santa Rosa Beach, Walton County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 415

Gayle's Trail, Panama City Beach, Bay County
Overhead Infrared with piezo-electric sensors
Installation to be finished Q1, 2024

Osprey Loop, Port St Joe, Gulf County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 70

St. Marks Trail, Tallahassee, Leon County
Overhead Infrared with Piezo-electric sensors
2023 Avg. Daily Users: 288

St Marks Trail, Wakulla, Wakulla County
Overhead Infrared with piezo-electric Sensors
Installation to be finished Q1, 2024

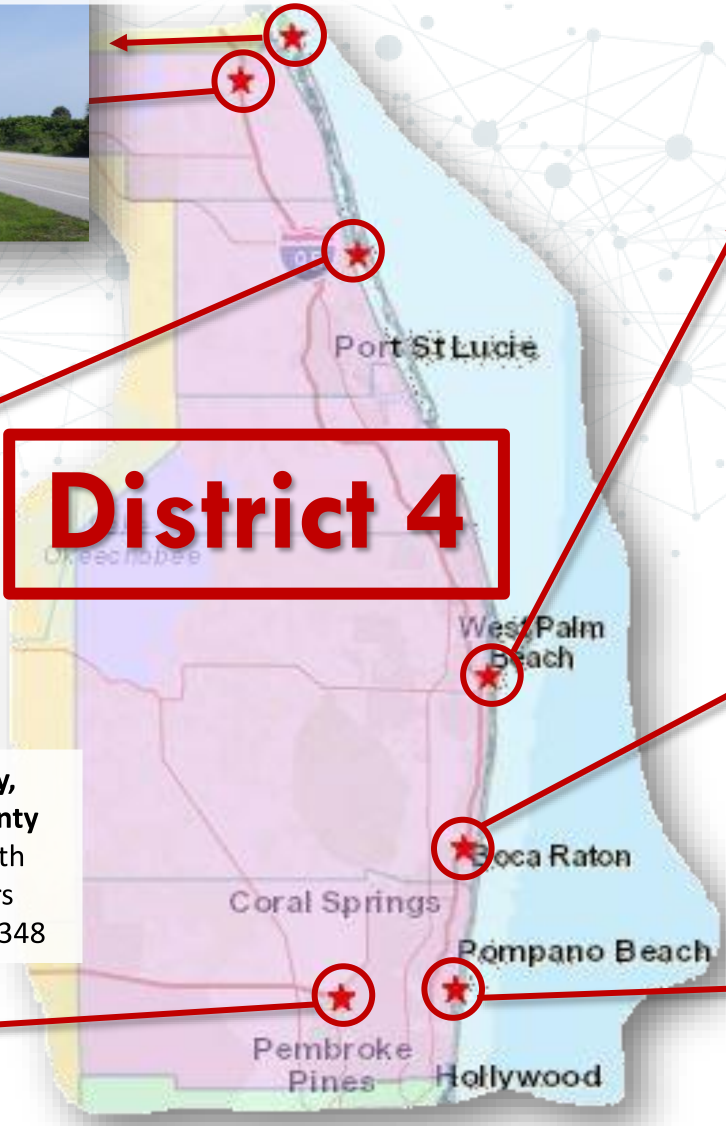
District 4

Trans FL Rail Trail, Fellsmere, Indian River County
Overhead Infrared with piezo-electric sensors
2023 Avg. Daily Users: 54

A1A Sebastian Inlet, Sebastian, Indian River County
Overhead Infrared with piezo-electric sensors
2023 Avg. Daily Users: 176

S Flagler Dr, West Palm Beach, Palm Beach County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 685* *(dual site)*

A1A Seaway Drive, Ft. Pierce, St. Lucie County
Overhead Infrared with piezo-electric sensors
2023 Avg. Daily Users: 113* *(dual site)*

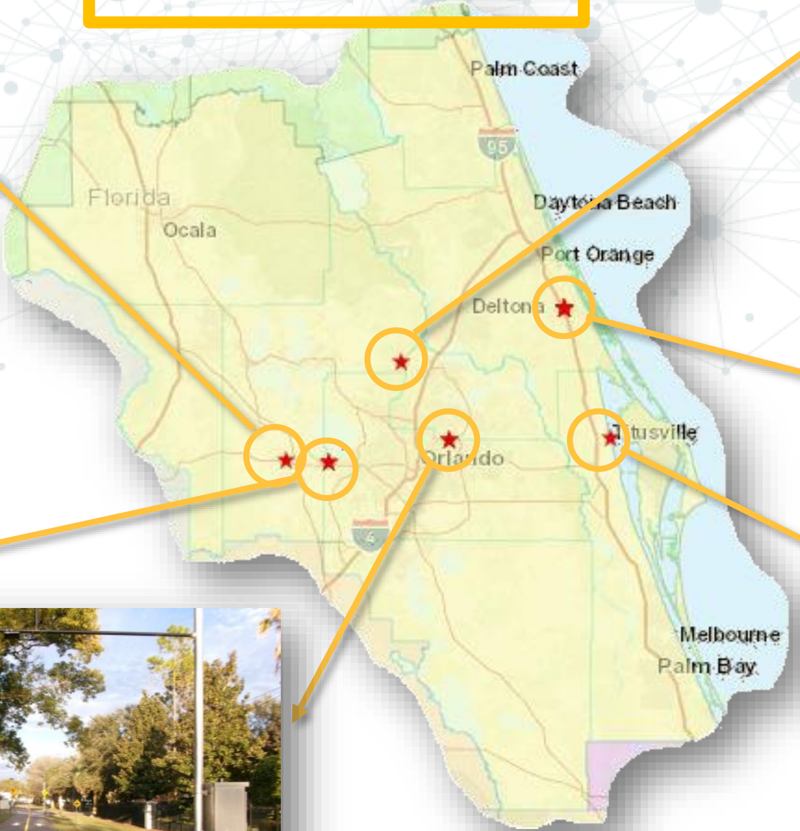


El Rio Trail, Boca Raton, Palm Beach County
Overhead Infrared with piezo-electric sensors
2023 Avg. Daily Users: 384

New River Greenway, Sunrise, Broward County
Overhead Infrared with piezo-electric sensors
2023 Avg. Daily Users: 348

Sunrise Blvd, Ft. Lauderdale, Broward County
Overhead Infrared with piezo-electric sensors
2023 Avg. Daily Users: 1,215* *(dual site)*

District 5



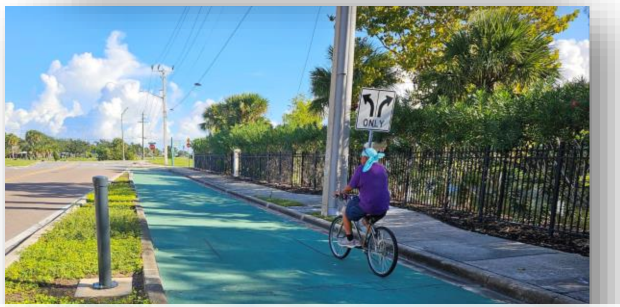
West Orange Trail bridge, Oakland, Orange County
Side Fire Infrared with Inductive Loops
Installation finished Jan. 2024

Wekiva Trail, Sorrento, Lake County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 45

S Lake Trail, Clermont, Lake County
Overhead Infrared with piezo-electric sensors
2023 Avg. Daily Users: 1,186

East Central Regional Rail Trail, Edgewater, Volusia County
Overhead Infrared with piezo-electric sensors
2023 Avg. Daily Users: 131

Cady Way Trail, Orlando, Orange County
Overhead Infrared with piezo-electric sensors
Installation finished Jan. 2024

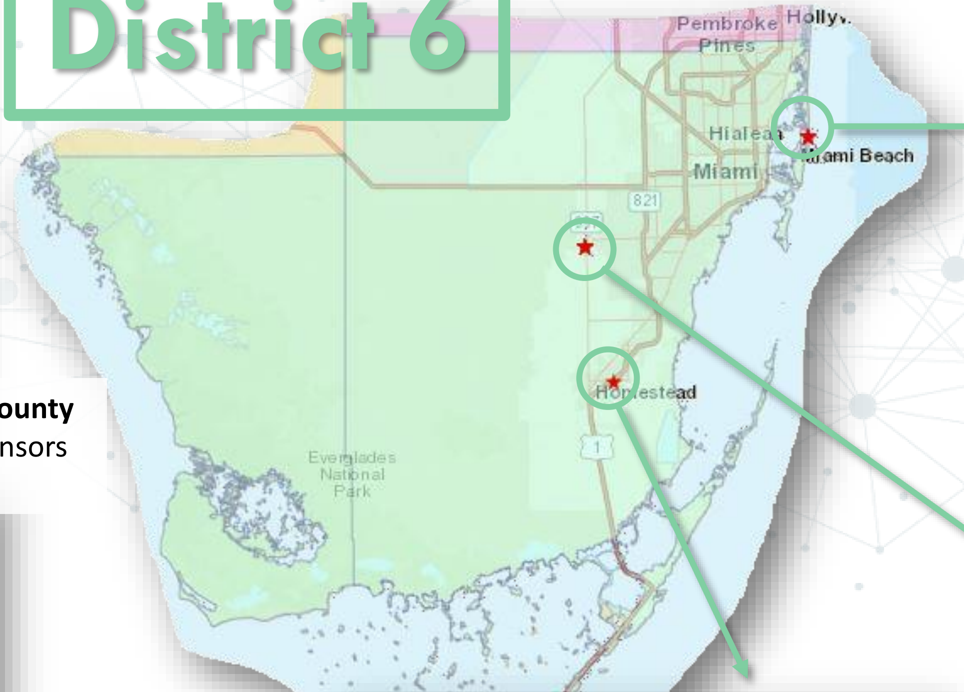


Indian River Ave, Titusville, Brevard County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 150

FDOT

District 6

US-1 Overseas Heritage Trail, Key West, Monroe County
Overhead + side fire Infrared with piezo-electric sensors
Sensors issues throughout 2023* (dual site)



Atlantic Greenway, Miami Beach, Miami-Dade County
Side Fire Infrared with piezo-electric sensors
Sensor issues throughout 2023

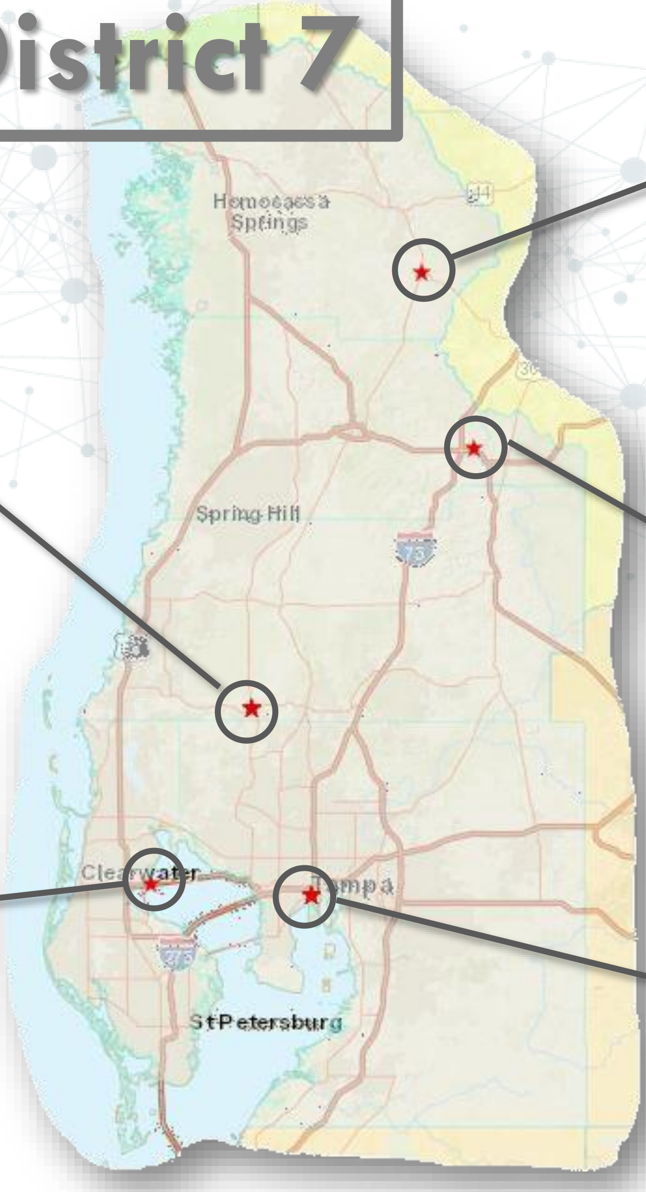
Biscayne-Everglades Greenway, Homestead, Miami-Dade County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 79

Krome Path, West Kendall, Miami-Dade County
Overhead Infrared with piezo-electric sensors
2023 Avg. Daily Users: 58

District 7

SUN Coast Trail, Odessa, Pasco County
Overhead Infrared with piezo-electric sensors
2023 Avg. Daily Users: 354

Courtney Campbell Causeway, Clearwater, Pinellas County
Overhead Infrared with piezo-electric sensors
2023 Avg. Daily Users: 414



Withlacoochee State Trail, Floral City, Citrus County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 257

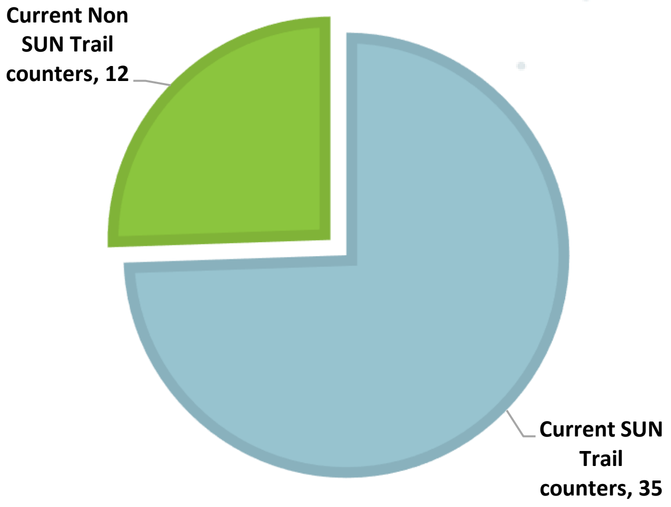
Withlacoochee State Trail, Ridge Manor, Hernando County
Side Fire Infrared with Inductive Loops
2023 Avg. Daily Users: 107

Jackson Street Cycle, Tampa, Hillsborough County
Side Fire Infrared with piezo-electric sensors
2023 Avg. Daily Users: 506

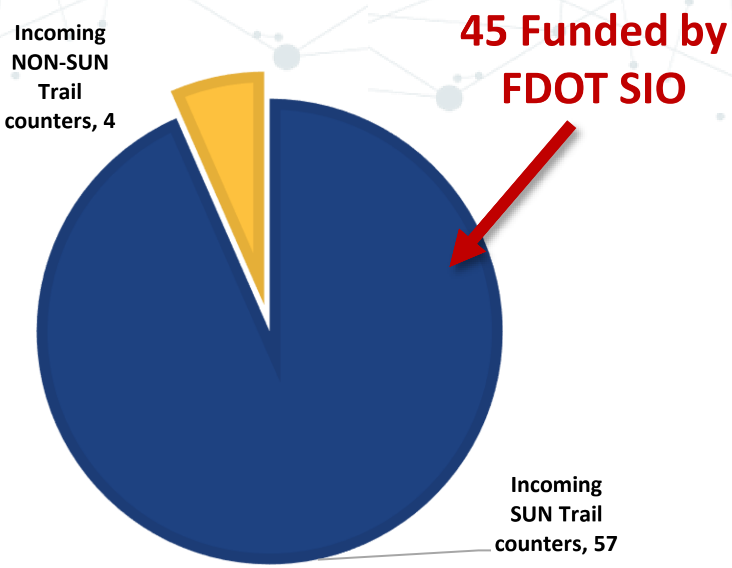
FDOT

SUN Trail and SB106

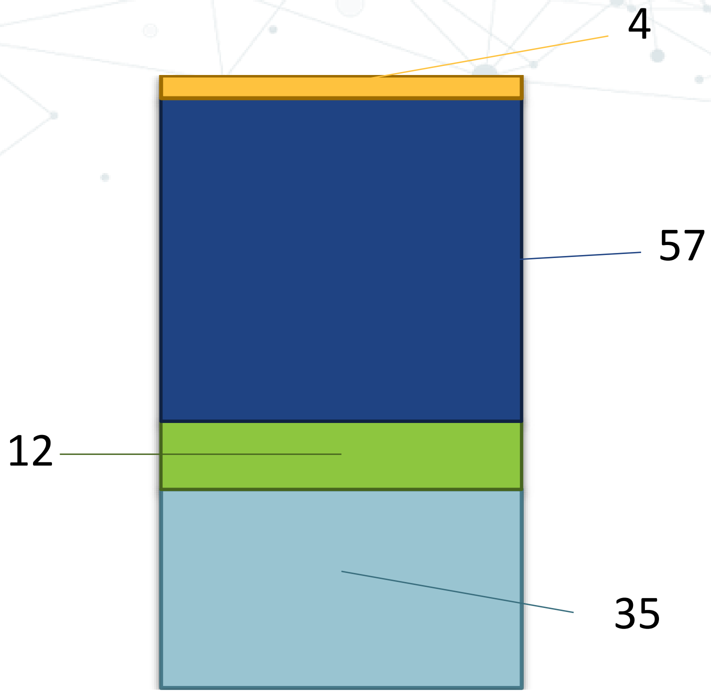
- $ 500,000 to FDOT TDA for Continuous Counters on SUN Trail network
  - ↳ 45 Side Fire Infrared counters with Inductive loops



Current Situation



Incoming Counters



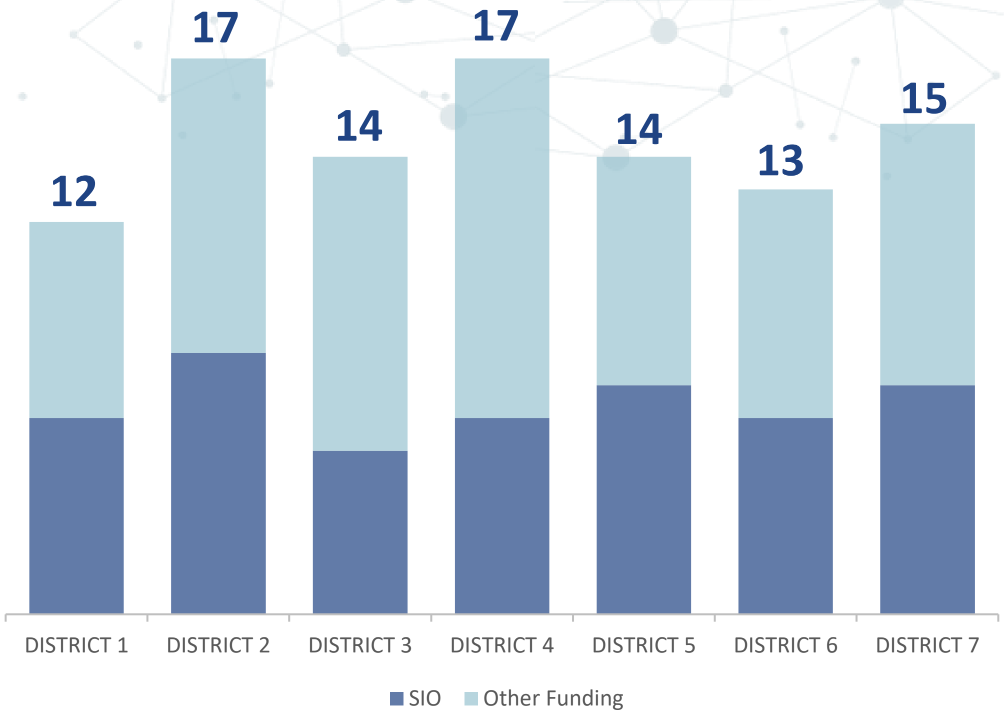
Total Continuous Counters
102* Projected

* 6 incoming counters will replace old installations

Continuous Count Sites - Trails

- Gainesville-Hawthorne State Trail
- Waldo Rd Greenway
- Great NW Coastal Trail
- East Coast Greenway
- Cypress Creek Greenway
- Rich King Memorial Greenway
- S-Line
- Good Neighbor Trail
- Withlacoochee State Trail
- Upper Tampa Bay Trail
- South Tampa Greenway
- Monticello Bike Trail
- Atlantic Greenway
- Miami River Greenway
- Snake Creek Trail
- South Dade Trail
- Florida Keys Overseas Heritage Trail
- Orlando Downtown Connector
- Pine Hills Trail
- Shingle Creek Regional Trail
- Pinellas Trail
- North Bay Trail
- Fort Fraser Trail
- Chain of Lakes Trail
- Palatka-Lake Butler State Trail
- Blackwater Heritage Trail
- Seminole Wekiva Trail
- Cross Seminole Trail
- Live Oak Heritage Rail Trail
- US 17 Trail
- Sweetheart Trail
- Coast Trail
- …

Continuous Count Sites with SIO Funding



Continuous Count Sites
SIO Funding vs Other funding sources

Standard Specifications FY 2024-2025

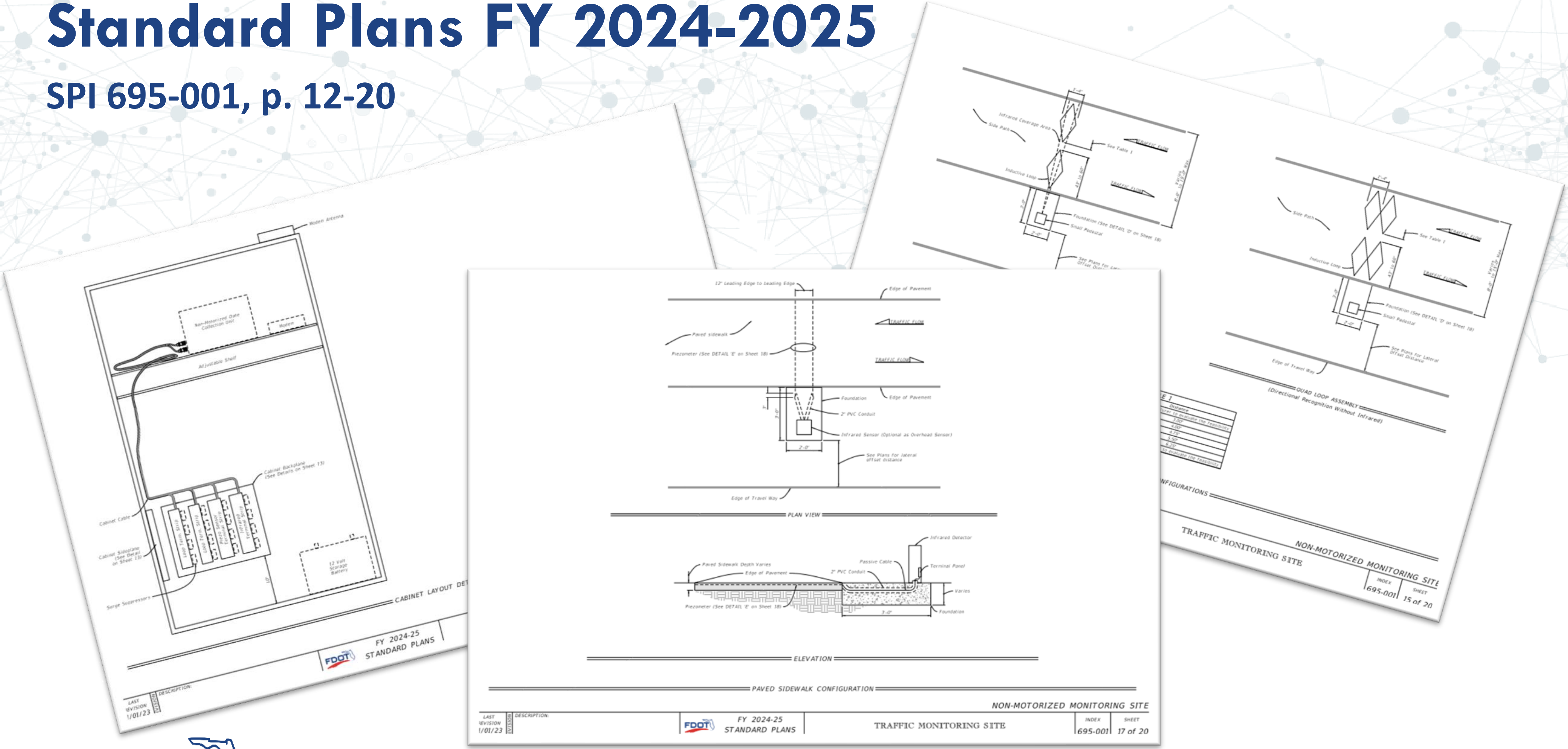
- **695**: Traffic Monitoring Site Equipment and Materials
- **997**: Traffic Monitoring Site Materials

Item Nr.	Item Description
695-11-A	TMS Non-Motorized Data collection unit
695-12-A	TMS Non-Motorized Axle Sensor
695-13-A	TMS Non-Motorized Infrared Sensor
695-14-AB	TMS Non-Motorized Inductive Loop Assembly (Diamond Loops)
695-15-A	TMS Non-Motorized Solar Power Unit

SCAN ME

Standard Plans FY 2024-2025

SPI 695-001, p. 12-20

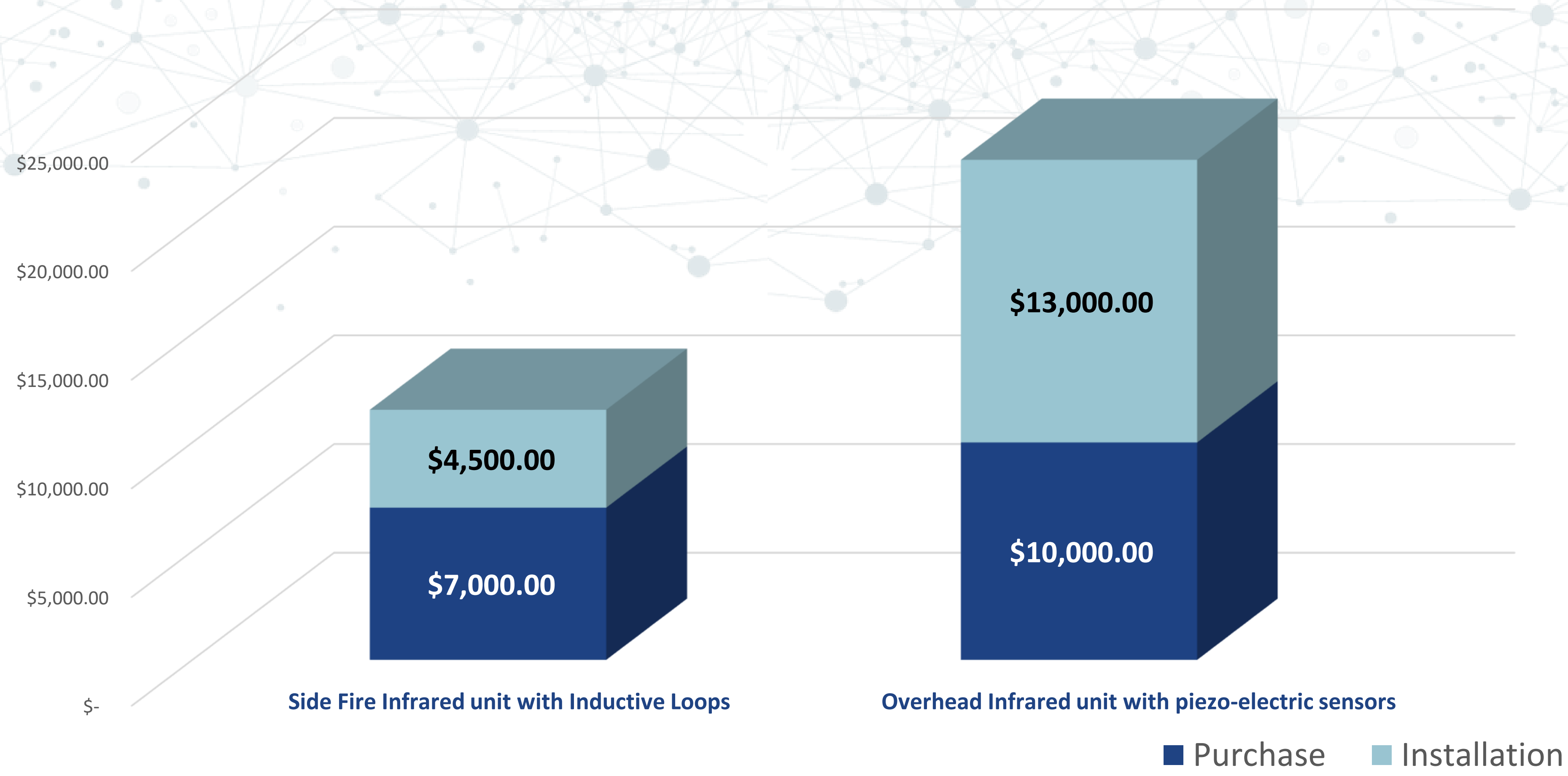


What is next?

- **Automated** Traffic Data Management System
- Establish **AADT's** and on-going **FHWA Reporting**
- **Historical Data sets** statewide with easy access for users
- **Accurately** counting all modes (Motorized, Micro mobility, Non-Motorized)
- More and stronger formal statewide District/Agency **partnerships**
- **AI** Technology use, new technologies
- Increase NMTMP **continuous counters** to mirror the Motorized Program
- Motorized/Non-Motorized Data **Integration**
- **Document and Share** non-motorized data application case studies
- More regular outreach

Frequently Asked Questions

How much does a Continuous Count site cost?



How long is a Short-term Count?

- **FDOT TDA strongly recommends 2-weeks**
  - Accounts for weather disruptions
  - Collect weekday and weekend traffic
  - Account for anomalies/special events
- **FDOT TDA considers 1-week sufficient**

Do you collect intersection (Turning Movement Counts)?

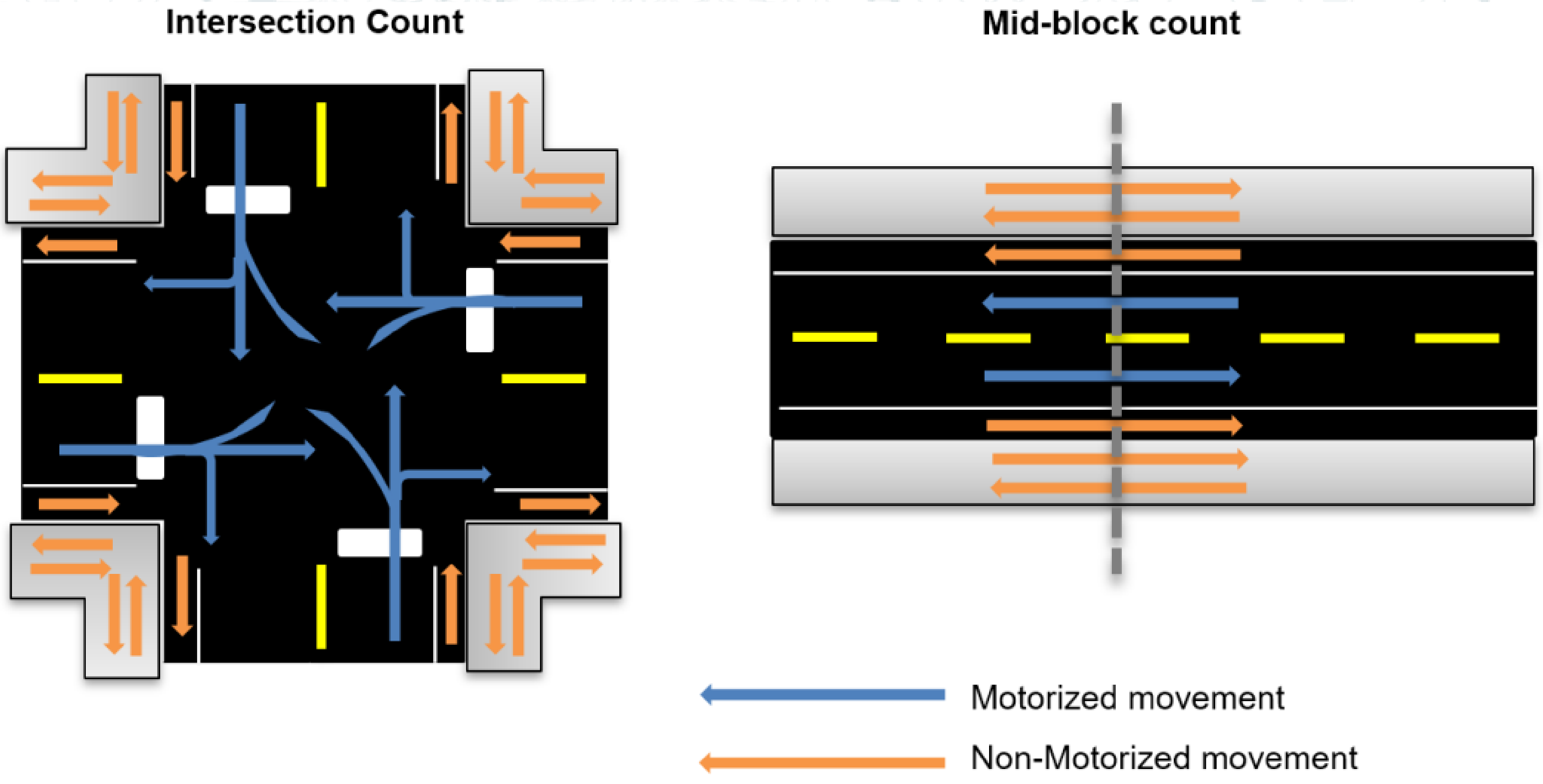


Figure 42: Intersection counts and Mid-block count sample

Note: The FDOT Transportation Data and Analytics Office only performs counts at the mid-block

How much maintenance is needed?

- Minimal 2 Maintenance visits/year
- If needed, additional visits

Hi,

This automatic email has been sent to let you know that some of your counters provided data that deserve your attention.

The table below gives the list of alerts sent.

1 data alert :

Site	Alert	27 December 2023
26C002 (Gainesville: University Ave - North Side) Y2H23046135	Maximum exceeded (> 2,500) (Yesterday = 25,861)	60163

"Zero Counts" and "Large Variations" alerts are now activated on all counting flows. Do you receive too many alerts? You can modify the scope of your alerts in the "Alert Management" module.

Setup my alerts

48 hours

FDOT

Why do we Count?

1. Safety
2. Understanding Traffic Patterns Traffic Volumes (ADTs/AADTs)
3. Traffic Operations
4. Economic Development and Funding
5. Transit Improvements
6. Performance Measures

FDOT

Do you count E-bikes, scooters, ...?

Yes… and No

- Certain equipment does not count micromobility, while some sensors are being updated. Testing and evaluation still required
- Camera detection and AI technology can distinguish micromobility as well

FDOT

Thank You

Have any questions?

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Jotan Borms

FDOT Non-Motorized data collection Coordinator
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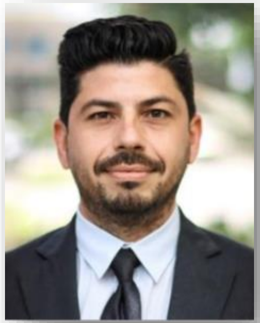
LinkedIn: https://www.linkedin.com/in/jotanmaborms



Eric Katz AICP, PMP

Consultant Project Manager
MARLIN Engineering Inc.
(305) 609-2784
Eric.Katz@dot.state.fl.us | ekatz@marlinengineering.co
m

LinkedIn: https://www.linkedin.com/in/eric-r-katz

FDOT

SUNTRAX®

WELCOME TO AMERICA'S NEW CENTER FOR TRANSPORTATION INNOVATION

FEBRUARY 2024

FDOT

FLORIDA'S TURNPIKE

SUNTRAX®

ARRIVAL AND CONFERENCE BUILDING

Safety Briefing

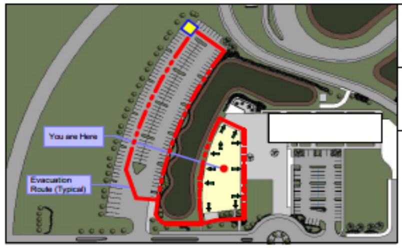
SUNTRAX ARRIVAL AND CONFERENCE BUILDING EVACUATION PLAN

NORTH

SCALE 1' = 3/64"

0' 4' 8' 16' 28'

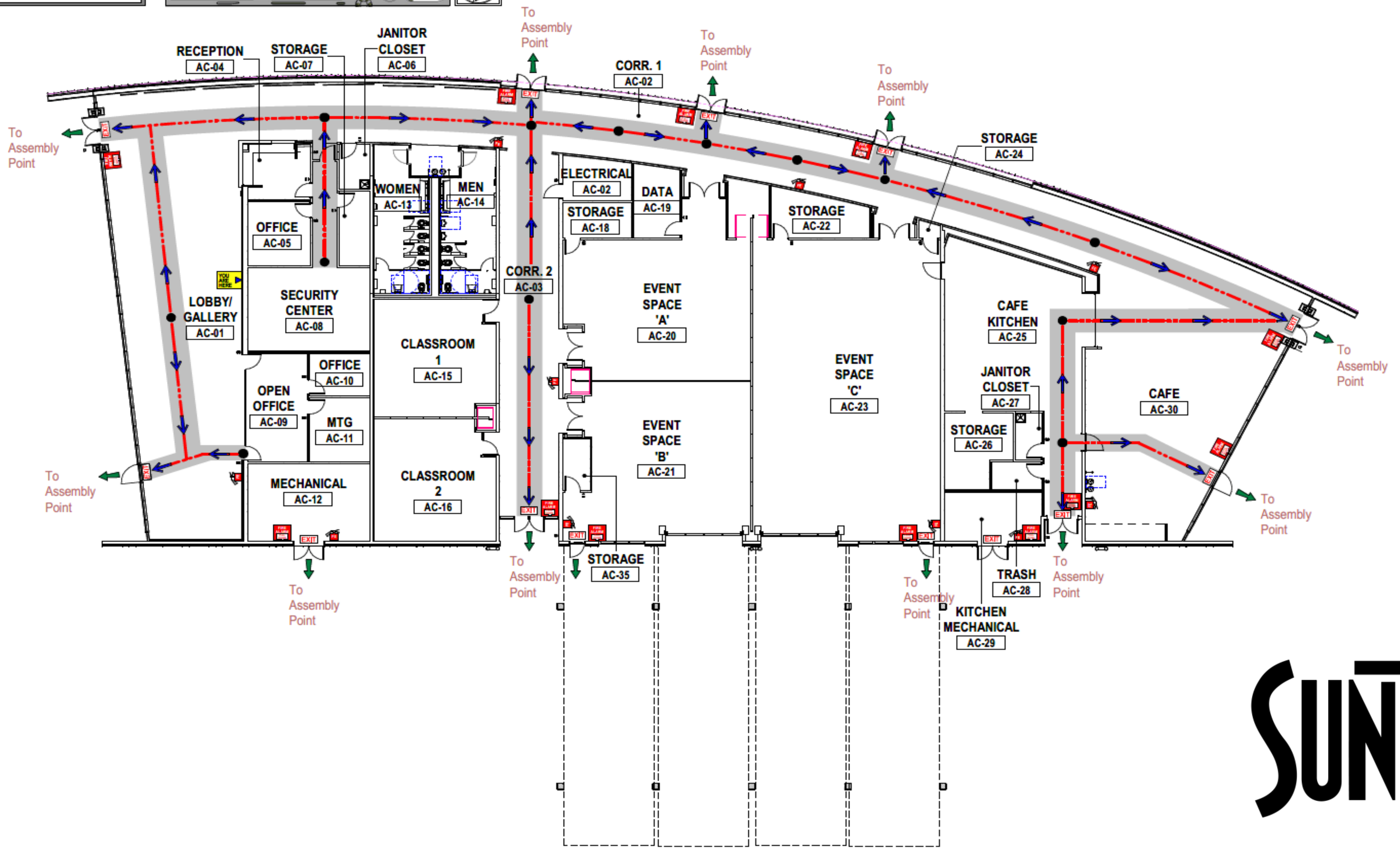
EVACUATION LEGEND	
SYMBOL	DESCRIPTION
	FIRE EXTINGUISHER
	FIRE ALARM PULL STATION (MANUAL)
	ESCAPE ROUTE
	EXIT SIGN
	YOUR LOCATION
	PATH OF TRAVEL



EXIT TO ADJACENT PARKING LOT.
KEEP SAFE DISTANCE AWAY FROM BUILDING

ASSEMBLY POINT
SOUTHWEST CORNER OF PARKING LOT

NORTH



SUNTRAX®

ARRIVAL AND CONFERENCE BUILDING

- PULL STATIONS – **PUSH IN PULL DOWN**
- FIRE EXTINGUISHERS
- EXIT SIGNS - ILLUMINATED
- FIRE ALARM ANNUCIATORS
- FIRE SUPPRESSION SYSTEM
- UPS BACKUP POWER EMERGENCY LIGHTING

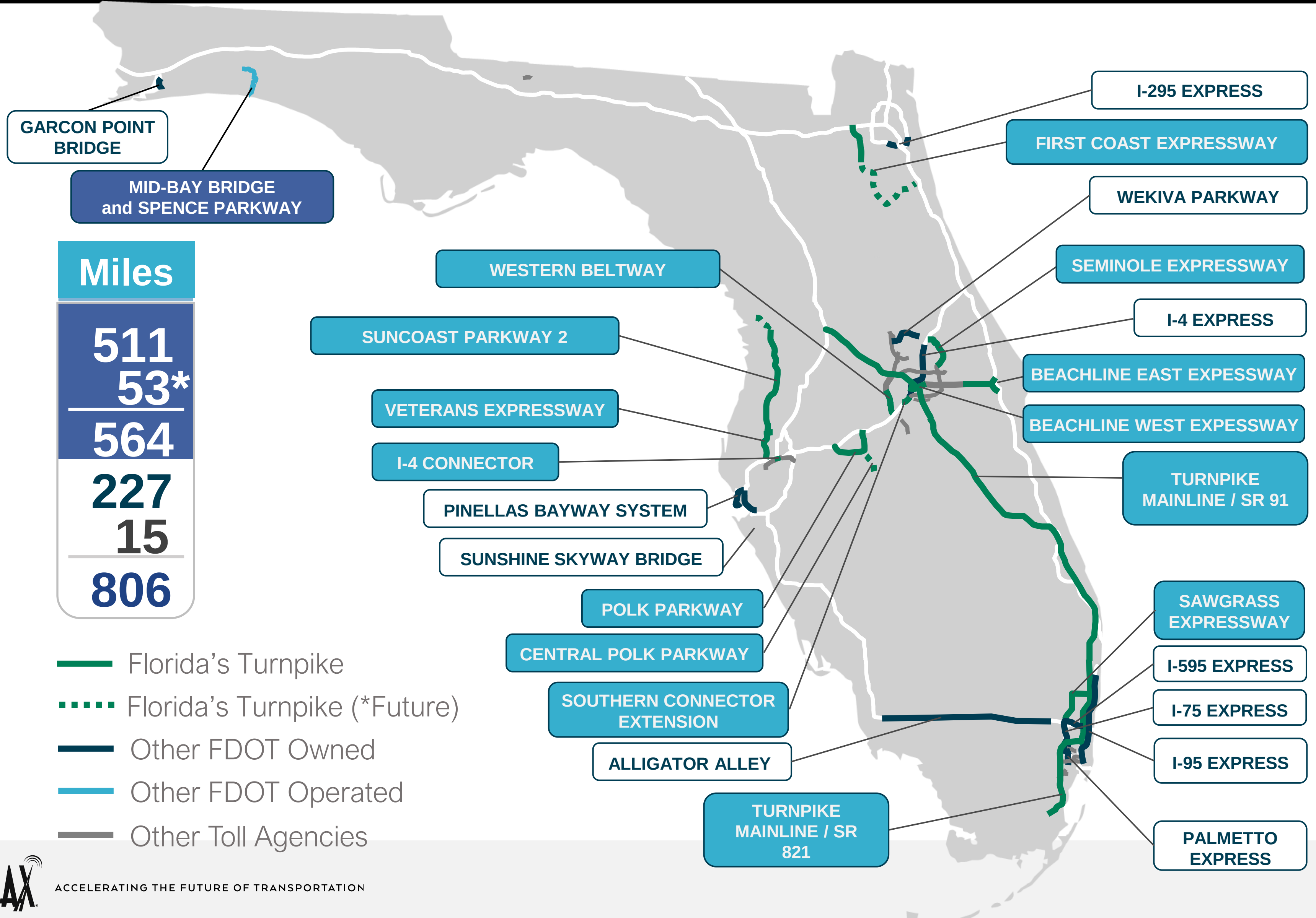
Tour of the SunTrax Test Facility

SUNTRAX®

FDOT

FLORIDA'S TURNPIKE

FLORIDA'S TURNPIKE ENTERPRISE



Miles

511
53*
564
227
15
806

FLORIDA'S TURNPIKE

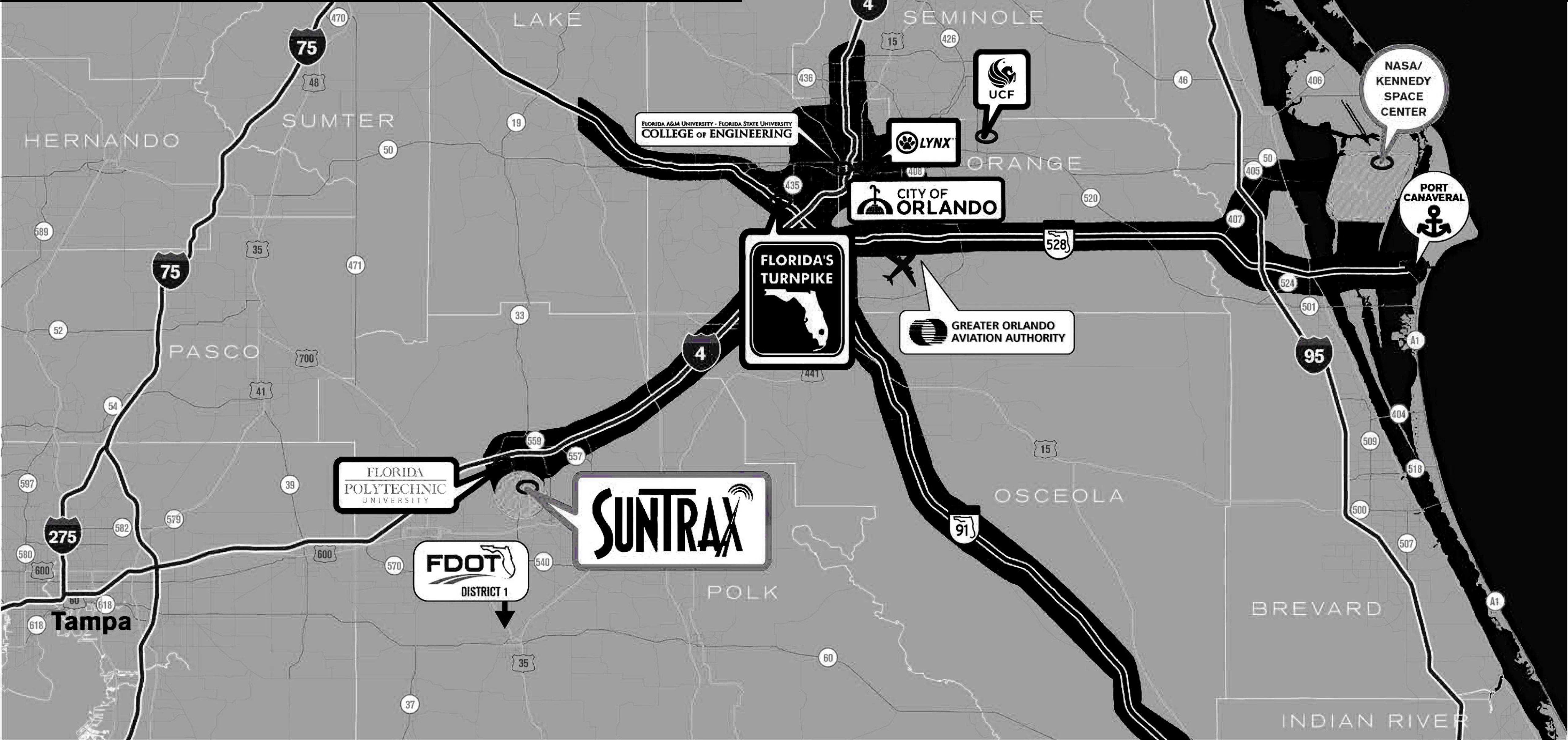
SERVING 29 COUNTIES

85%

OF FLORIDA'S POPULATION

SUNTRAX ACCELERATING THE FUTURE OF TRANSPORTATION

CENTRAL FLORIDA



OUR MISSION

To accelerate the future of transportation

OUR VISION

A continuously-evolving center for the development of innovative technologies that improve transportation safety, efficiency, and accessibility

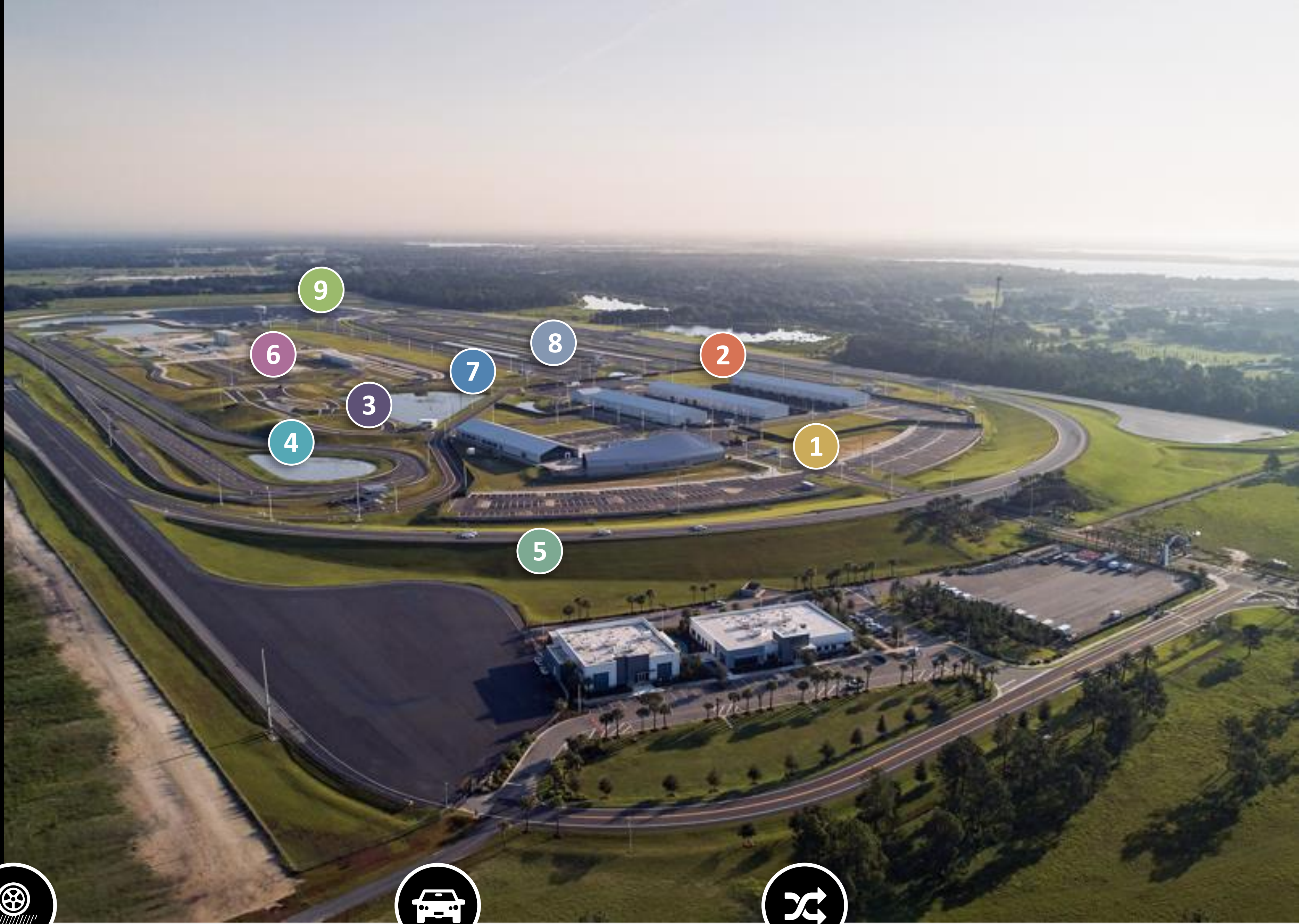
ABOUT SUNTRAX

Originally conceived for the development of toll technology to help meet long-standing goals for national interoperability, SunTrax has evolved into an innovative testing ground for the development of emerging transportation solutions with a focus on Autonomous, Connected, and Electric Vehicles (ACES).

SunTrax is LEED Certified.

INFIELD FEATURES

1. Main Entry Campus
2. Workshops / Warehouses
3. Roadway Geometry Track
4. Loop Tracks
5. Oval Track
6. Urban / Suburban
7. Pick-Up / Drop-Off
8. Noise, Vibration, & Harshness
9. Technology Pad



Varied Environments

Diverse Scenarios

Highly Reconfigurable

TOLLS TESTING AT SUNTRAX

SITE FEATURES

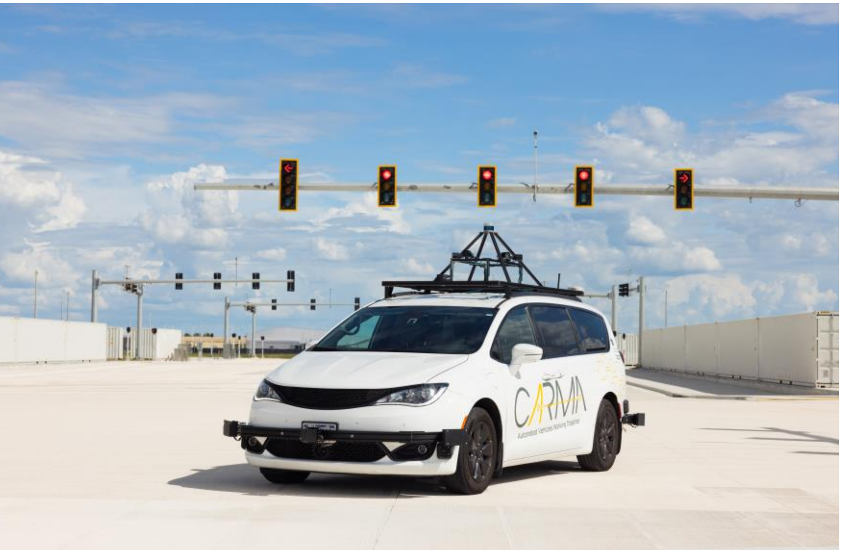
- *Multi-Lane, Reversible, Independent Straightaways*
- *4 Toll Sites / Gantries*
- *Single Location for All Scenarios*

TESTING TO DATE

- *FTE's 3 Current Toll Vendors*
- *Transponder Interoperability*
- *License Plate Recognition*
- *Wrong-Way Detection*

TECHNOLOGY TESTING

CARMA



BEEP / OXA

FLOCON

WELCOME TO SUNTRAX

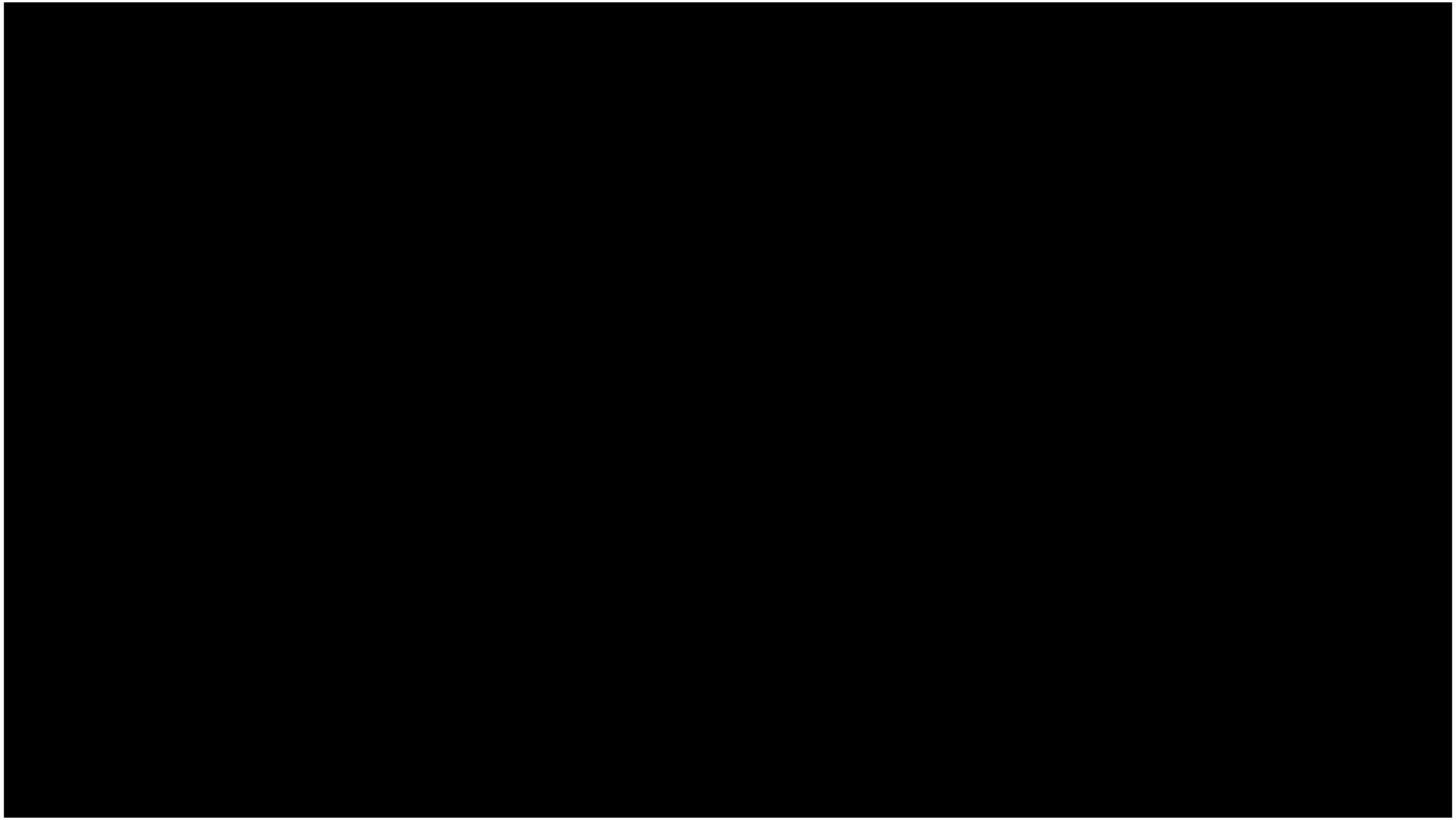
TRANSPORTATION ELECTRIFICATION

"THE WORLD IN 2030"

TRANSPORTATION ELECTRIFICATION

Inductive Wireless Charging Pavement Impacts

TRANSPORTATION ELECTRIFICATION



SunTrax®

Thank You

Contact: pamela.foster@dot.state.fl.us

Information: SunTraxFL.com

FDOT

FLORIDA'S TURNPIKE

Statewide ADA Data Collection Program

NMTM Statewide Meeting

02/07/2024

Agenda

1) Project Overview
2) Inventory Prioritization
3) Data Collection Webapp (Office/Field)

ADA Data Needs for State Business

- **Consistent, Statewide, ADA Data Reporting**
  - **Centralized resources + decentralized data collection**
- Compliments geospatially-oriented data management
- Proof of Concept for how RCI collects data for many other roadway features and characteristics in the future
- Office-first data collection - same webapp is used for field data collection (i.e., occlusions in imagery, need field validation, etc.)

ADA Data Needs for Federal Requirements

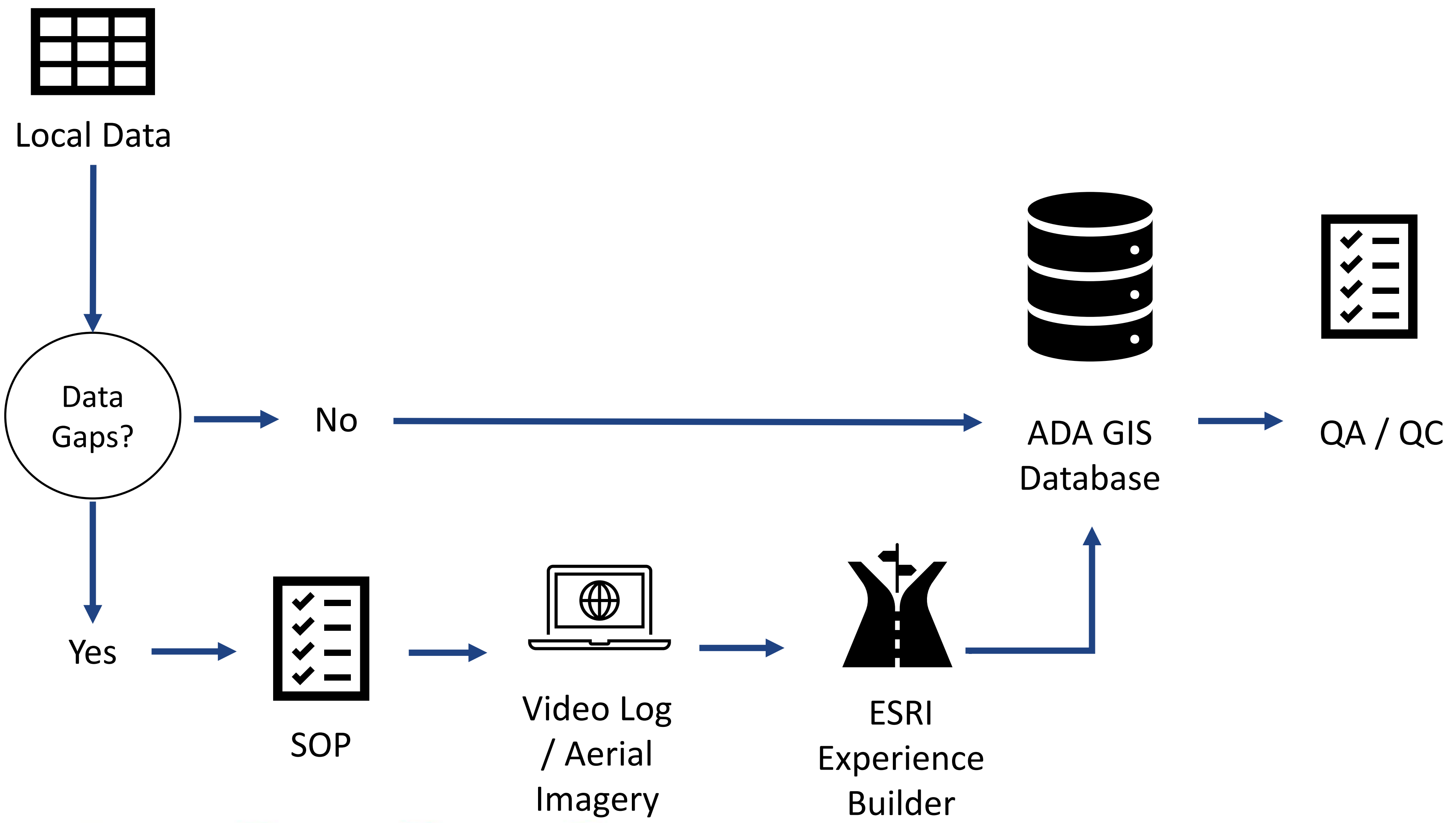
Fulfill Requirements of FHWA/FDOT ADA Transition Plan

- Support annual certification process – Monitor continual implementation of appropriate ADA design elements with every roadway (re)construction project.
- FHWA will no longer accept 2018 Video Log as means of office data collection beginning 2023
- TDA is working with the State Materials Office to utilize their imagery for FDOT Video Log purposes

ADA Pedestrian Rights of Way Features for Data Collection:

1. Sidewalks along SHS (import from RCI),
2. Curb ramps,
3. Detectable warnings,
4. Pedestrian signals, and
5. Other - marked crossings, mid-block crossings, etc.

Data Collection Conceptual Overview



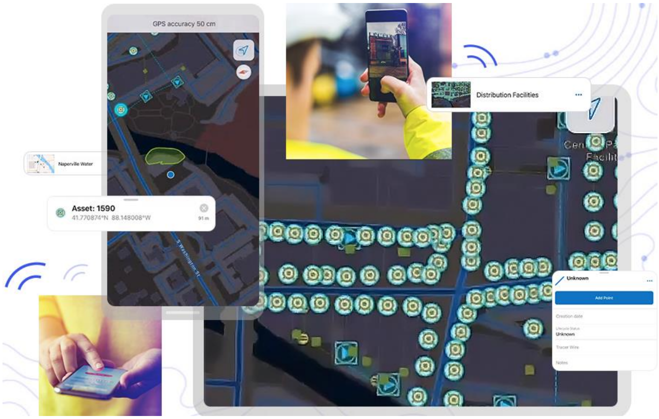
ADA Data Collection Webapp

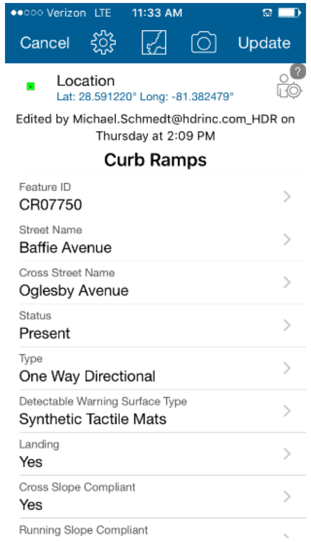
1) GIS Webapp for Office & Field (ESRI Experience Builder)

- Statewide webapp, Districts access only their District’s data
- State of Florida aerial imagery – known years for data collection, oldest imagery is from 2018
- SMO (Pavement) imagery to replace old Video Log imagery (pending)
- 3rd party imagery can be used, but must note year of image and hyperlink
- User friendly with diagrams for easy reference
- Online and offline capabilities

2) Prioritization Layer

3) Dashboard

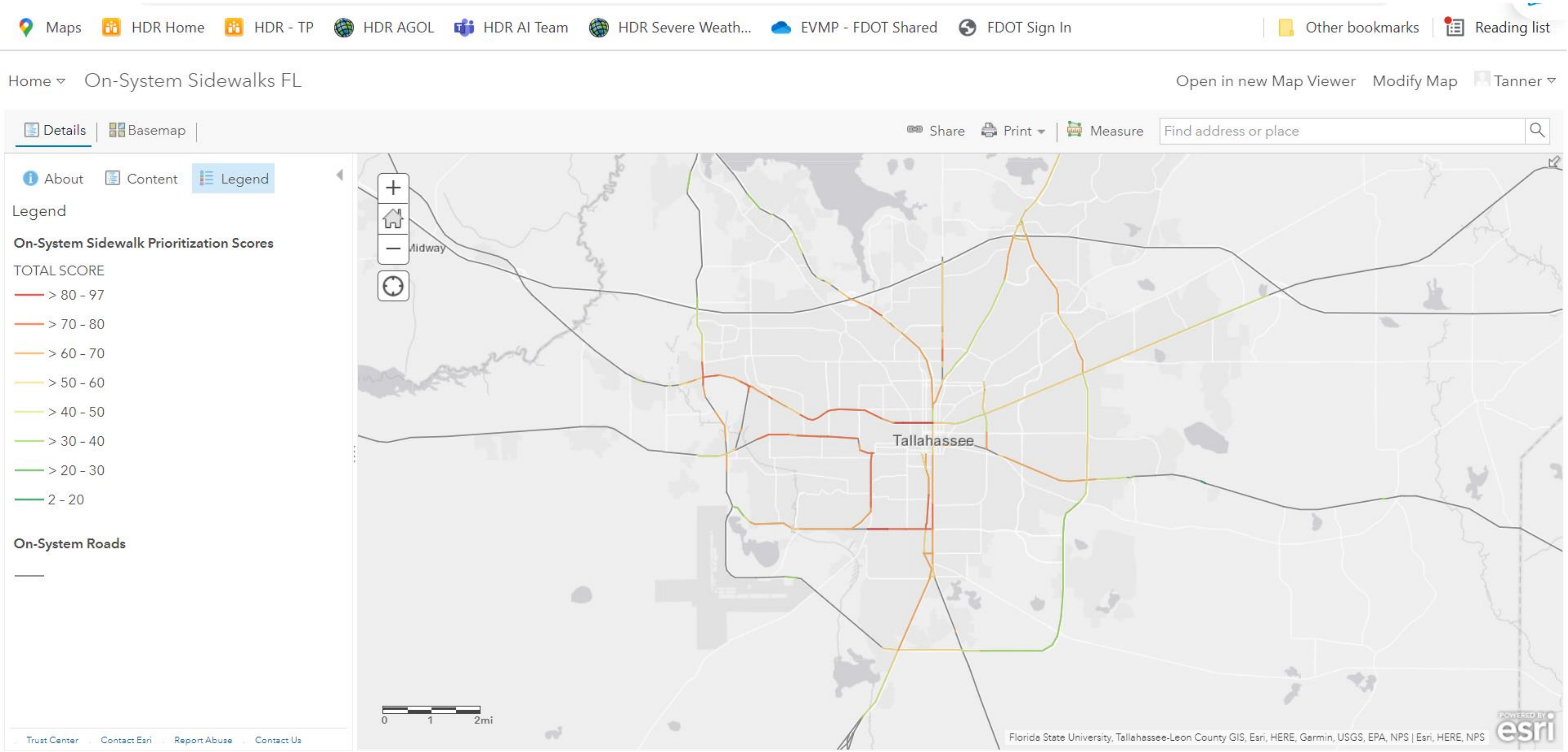




Data Collection Prioritization Schema

1) **GIS model results are displayed as a Layer in the Webapp**
2) **Determine where to focus initial, and subsequent, data collection efforts (3,700 miles of SHS w/ Sidewalks per RCI Data)**
3) **Identify where to focus deployment of Accessible Pedestrian Signals**
4) **GIS-Based Input / Criteria (weighting):**
   a) Population below poverty level (10%)
   b) Zero-car households (15%)
   c) Population below 18 or above 65 (10%)
   d) Population of persons with disabilities (15%)
   e) Residential population density (10%)
   f) Points of Interest - Health care facilities, hospitals, schools, parks (10%)
   g) Transit stops (10%)
   h) Context Classification (C4) (10%)
   i) Pedestrian crash rate (10%)

Aggregate Prioritization Scores



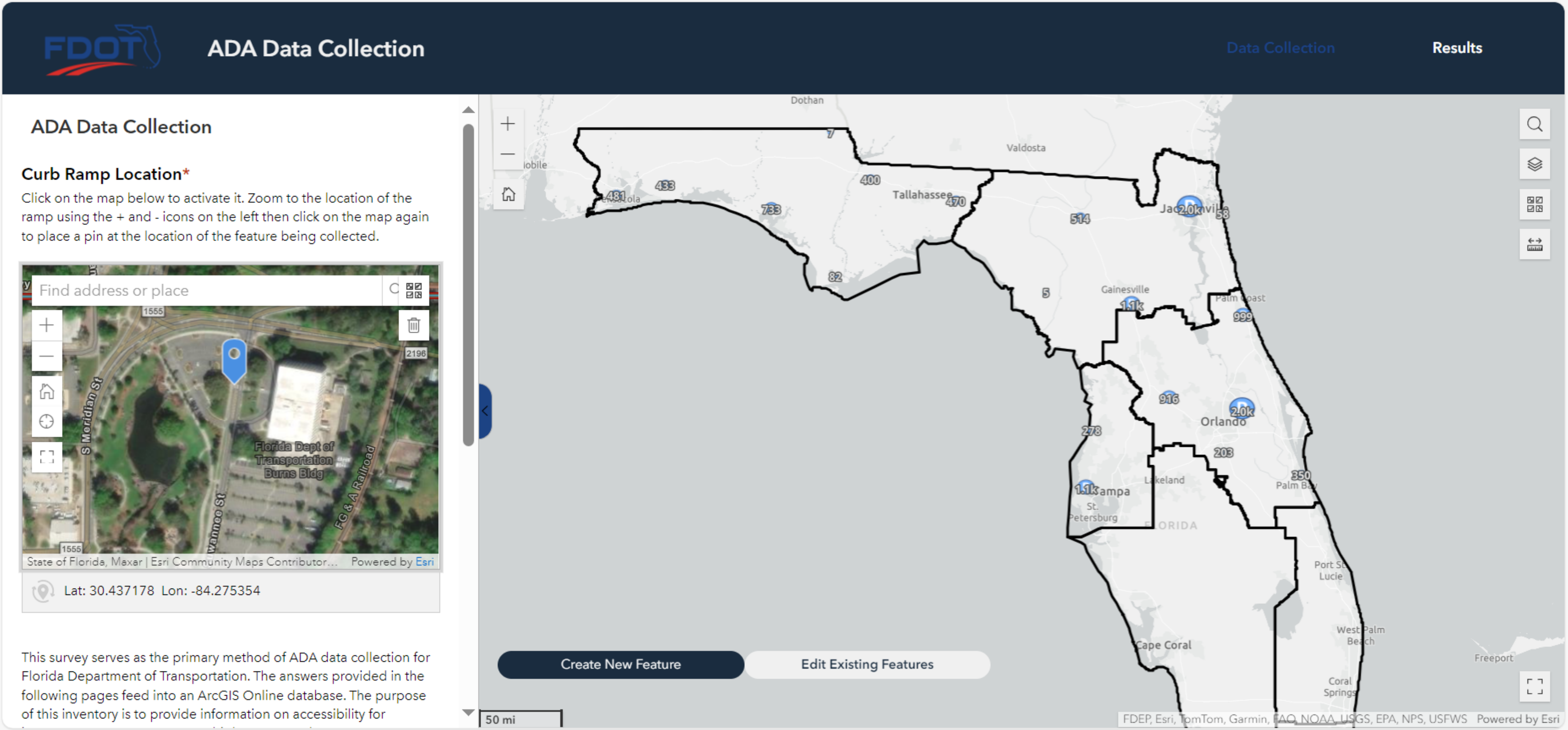
FDOT ADA Data Collection Webapp – ESRI Survey123 - Demo

ADA Data Collection Survey

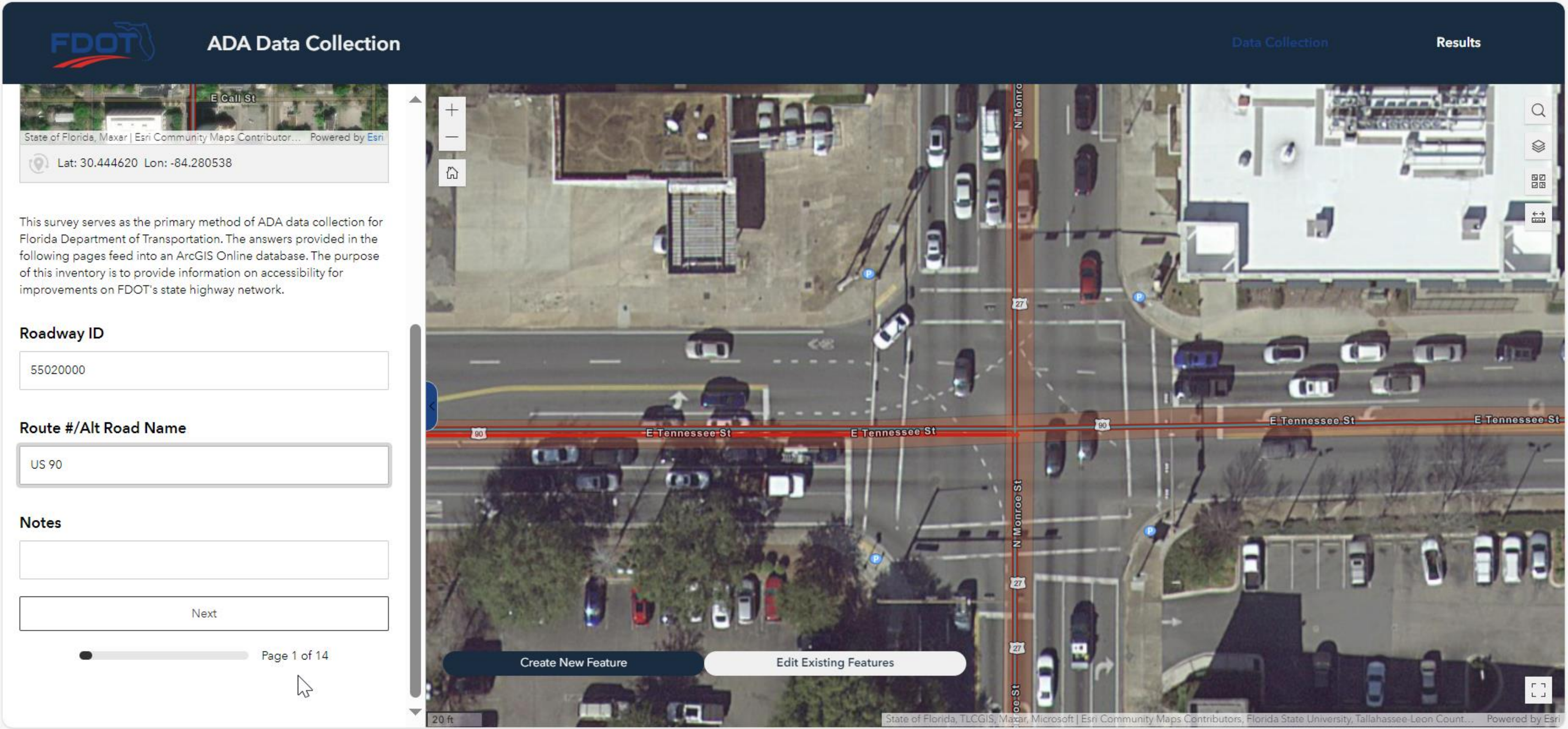
This survey serves as the primary method of ADA data collection for Florida Department of Transportation. The answers provided in the following pages feed into an ArcGIS Online database. The purpose of this inventory is to provide information on accessibility for improvements on FDOT's state highway network.

ADA Collection Experience V2 (arcgis.com)

ADA Data Collection Webapp



ADA Data Collection Webapp



ADA Data Collection Webapp

Page 1 – Location & Roadway ID

a) Route # / Local Name
b) Notes

Page 2 – Curb Ramp Status

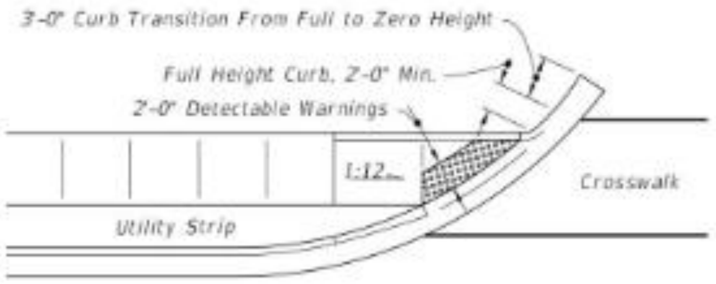
a) Present
b) Missing
c) Under Construction
d) Unknown
e) Obscured
f) Damaged
g) Notes

Missing - Sidewalk does not have a Curb Ramp at the time of inspection.

Page 3 – Curb Ramp Type

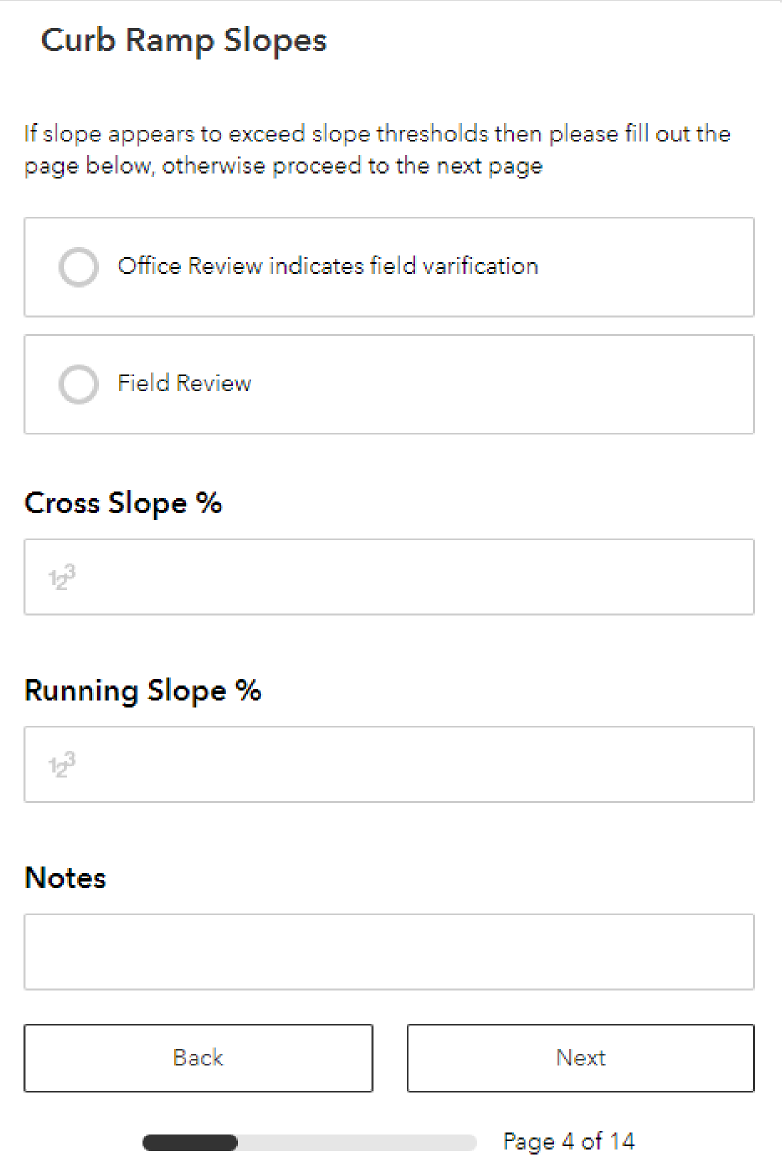
a) One Way Directional
b) Perpendicular
c) Parallel
d) Diagonal
e) Combined/Blended
f) Built Up
g) Unknown
h) Notes

One Way Directional - A directional ramp is used when there is only one pedestrian access route approaching the intersection and only one direction to cross the intersection.



Page 4 – Curb Ramp Slopes

- Slopes are not expected to be calculated in the office from imagery
- If the ramp appears to be non-compliant, user selects “Office Review Indicates Field Verification”
- Using the webapp and scale in the field, slopes can be input into the database



Page 5 – Detectable Warning Surface Type

a) None

b) Synthetic Tactile Mats

c) Missing / Damaged

d) Precast Brick / Pavers / Tile

e) Other / See Notes

f) Notes

Missing/Damaged - Indicates that the detectable warning surface shows clear signs of damage or in some cases is completely missing from the curb ramp.

Page 6 – Sides

a) Flared

b) Returned

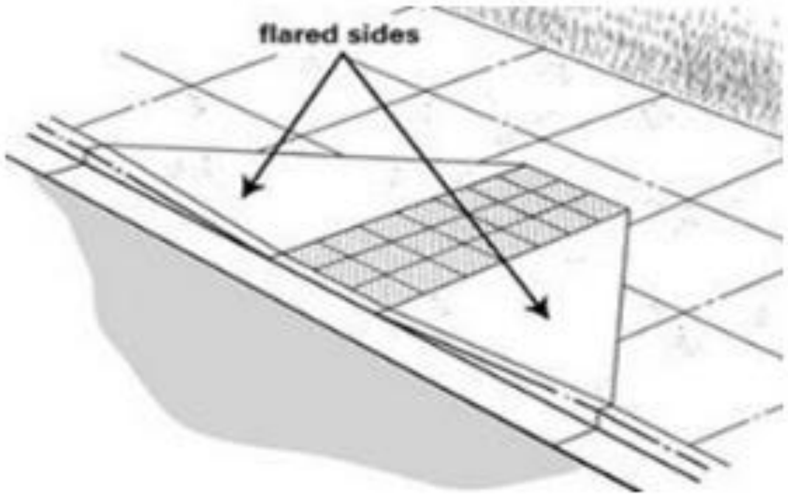
c) Flared and Returned

d) None

e) Other / See Notes

f) Notes

Flared - Flared sides provide a gradual incline from the edge of the center ramp to the sidewalk.

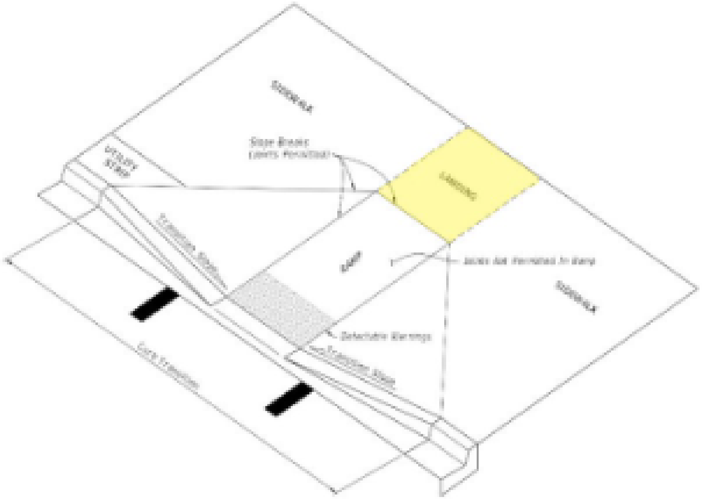


Page 7 – Landing

a) Yes

b) No

c) Notes



*

Curb ramp landings allow people with mobility impairments to move completely off the curb ramp and onto the sidewalk. Curb ramps without landings force wheelchair users entering the ramp from the street, as well as people turning the corner, to travel on the ramp flares.

Yes

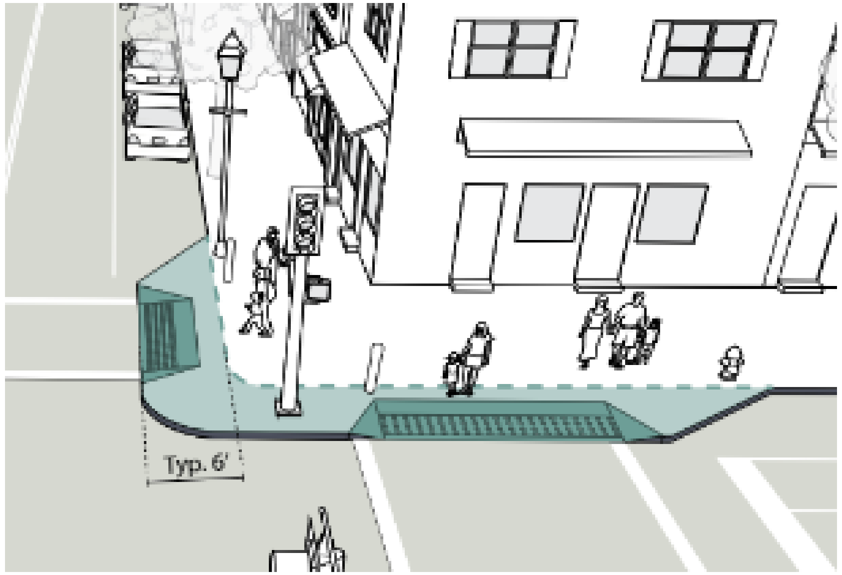
No

Page 8 – Curb Extensions

a) Yes

b) No

c) Notes



*

An extension or Bulb-Out of the curb line in a bulb-like rounding radius that incorporates the curb ramps. Its purpose is to shorten the crossing distance for pedestrians as they travel through an intersection, and to provide space to implement a curb ramp with all the necessary components and allowing pedestrians to see and be seen before entering a crosswalk.

Page 9 – Pavement Markings at Crosswalks

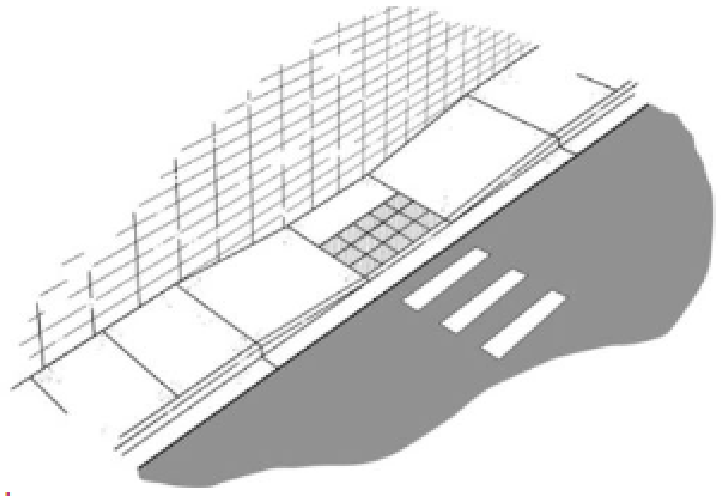
a) Yes

b) Faded (normal wear & tear)

c) Damaged (needs replacement)

d) No

e) Notes



*

Marked pedestrian crossings are often found at intersections, but may also be at other points on busy roads that would otherwise be too unsafe to cross without assistance due to vehicle numbers, speed or road widths. They are also commonly installed where large numbers of pedestrians are attempting to cross (such as in shopping areas) or where vulnerable road users (such as school children) regularly cross.

Page 10 – Midblock Crossing

a) Yes – No Control

b) Yes - Controlled

c) No

d) Notes

Yes - No Control - Not Controlled means the marked crossing does not have an accompanying pedestrian signal.

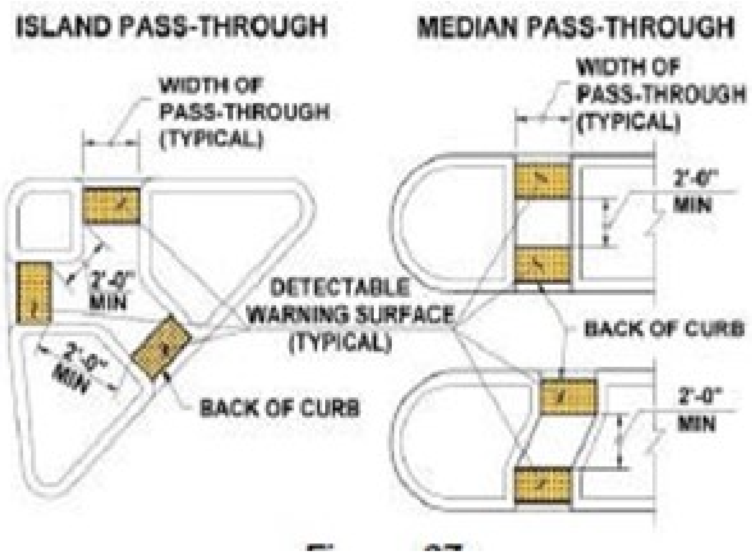
Yes - Controlled - Controlled indicates the presence of an accompanying pedestrian signal.

Page 11 – Island

a) Yes

b) No

c) Notes



*

Raised concrete refuge usually found between right turns and through-fare travel lanes. Typically, in the shape of a triangle or a "Pork Chop". Any raised islands in crossings shall be cut through level with the street or have curb ramps at both. Island must be 6 feet in length minimum. Provide a passing space at least 5 feet wide for a distance of at least 5 feet for each PAR in a raised median or on a traffic island.

ADA Data Collection Webapp

Page 12 – Pedestrian Signal / Push Button

a) Standard Pedestrian Signal
b) Accessible Pedestrian Signal (audible)
c) Damaged
d) None
e) Notes

Accessible Pedestrian Signal (audible) - An integrated device that communicates information about the WALK and DON'T WALK intervals at signalized intersections in non-visual formats (i.e., audible tones and vibrotactile surfaces) to pedestrians who are blind or have low vision.

FDOT

ADA Data Collection Webapp

Page 13 – Images

a) 3rd Party Image Link (field to copy/paste URL)

b) Image Year (select 2019, 2020, 2021, 2022, 2023, 2024)

c) Source (*select Field Location, State of Florida Aerial Imagery, State of Florida Video Log, Street Level Imagery (3rd Party))

d) Notes

State of Florida Aerial Imagery - An image or aerial photo that has a constant scale wherein features are represented in their 'true' positions. Orthorectification creates a final product whereby each pixel in the image is depicted as if it were collected from directly overhead or as close to this as possible.

* Select the Source Primarily Used

FDOT

ADA Data Collection Webapp

Page 14 – Additional Info

a) Comments (Field)

b) Attachments (Photos taken in field with mobile device w/ webapp installed)

c) Submit (data point)

ADA Data Collection Webapp – Results Dashboard

Total Curb Ramps Collected

12,027

ARE YOU ADA COMPLIANT?

Curb ramps are critical to providing access between the sidewalk and the street for people who use wheelchairs. Curb ramps are most commonly found at intersections, but they may also be used at other locations such as on-street parking, loading zones, bus stops, and midblock crossings. The implementing regulations under Title II of the ADA specifically identify curb ramps as requirements for existing facilities, as well as all new construction. Curb ramps for existing facilities must be included in Transition Plans. According to the Title II implementing regulations, priorities for the installation of curb ramps in existing facilities should include access to government facilities, transportation, public accommodations, and for employees to their place of employment (U.S. Department of Justice, 1991a).

Curb Ramp Status

Detectable Warning Surface Type

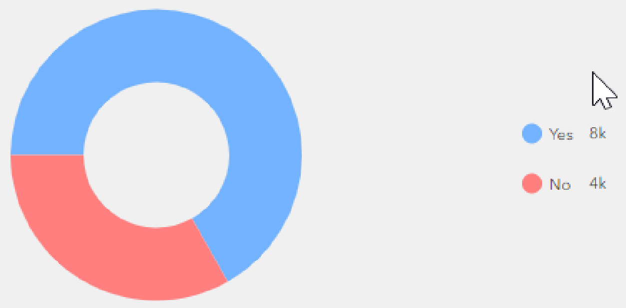
Curb Ramp Type

Sides

FDOT

ADA Data Collection Webapp – Results Dashboard

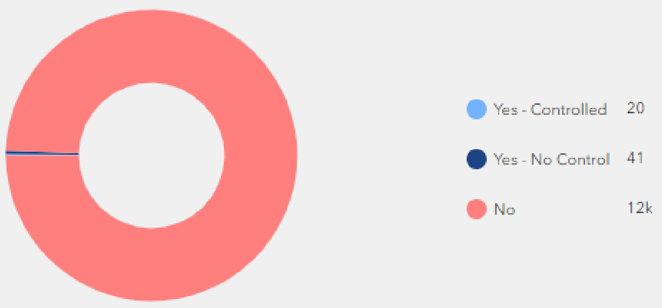
Landing



Curb Extensions

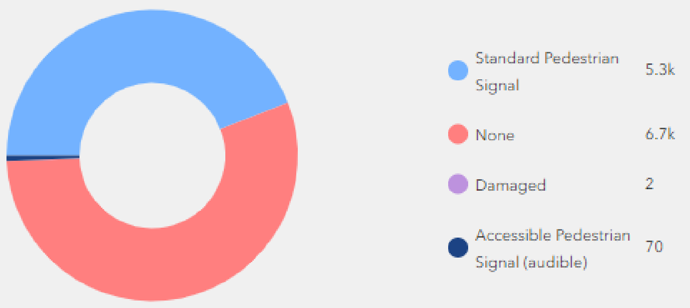
Marked Crossing

Midblock Crossing



Island

Pedestrian Signal



Thank You / Discussion

Shared-Use Nonmotorized (SUN) Trail Program

Statewide NMTM Auburndale

3:00 p.m., February 7, 2024

ROBIN BIRDSONG, Statewide Coordinator
SUN Trail and Transportation Alternatives Programs

FDOT

STRATEGIC DEVELOPMENT

SIO
SYSTEMS IMPLEMENTATION OFFICE

AGENDA

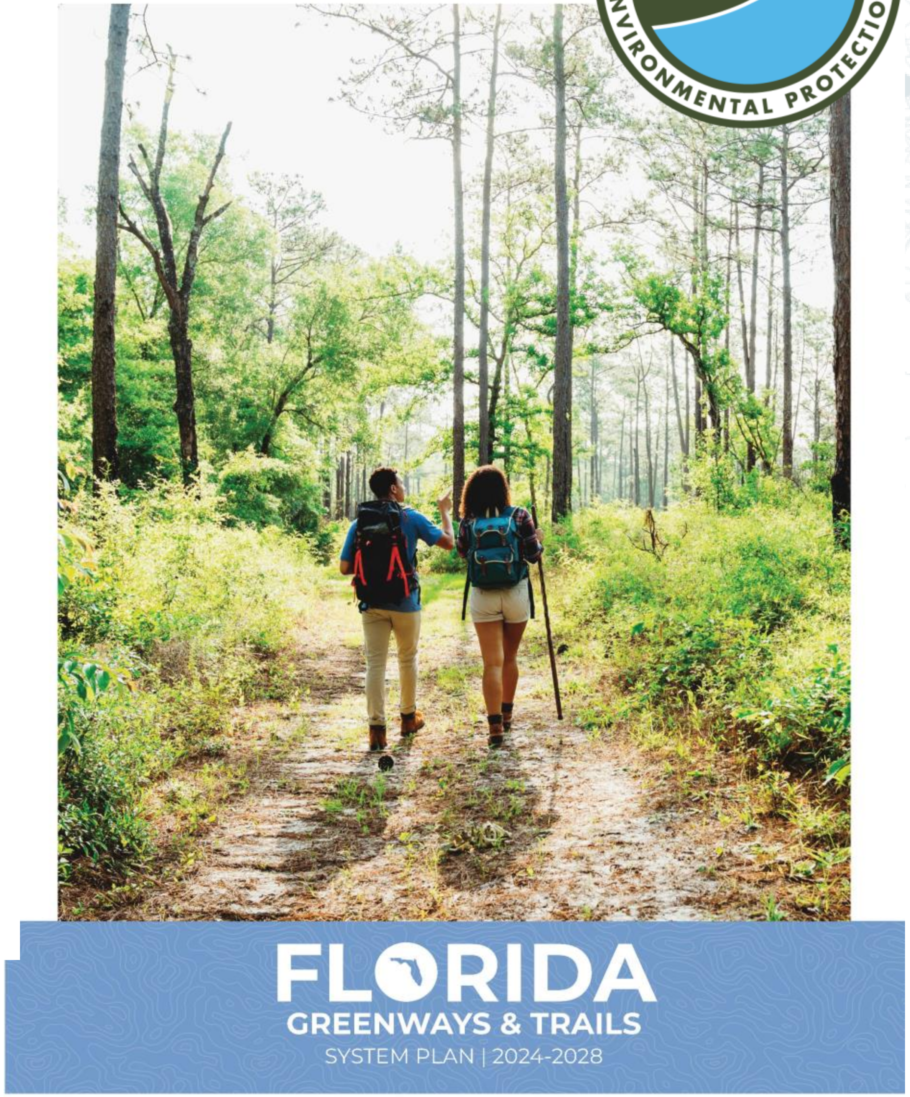
Background

Reporting

Collaboration

BACKGROUND

- 2015, Section 339.81, F.S., establishes the SUN Trail program to fund nonmotorized paved trails within the network
- SUN Trail network aligns with the Florida Greenways and Trails System (FGTS) Plan's Land Trail Priority Network overseen by the Department of Environmental Protection's Office of Greenways and Trail (Chapter 260, F.S.)
- 2023 enacted changes to Section 339.81, F.S., expended the network to include connections to and through lands of the Florida Wildlife Corridor Act (Section 259.1055, F.S.)



3

SUN Trail Network Status Reporting

JUNE 30
2026

Every 3rd year thereafter

Trail network mileage

Programming expenditures

Trail operational and performance measures

SUN Trail Network and Florida Wildlife Corridor

January 31, 2024

SUN Trail Network

- EXISTING
- PROGRAMMED/FUNDED
- PARTIALLY FUNDED FOR PRE-CONST
- UNFUNDED GAP
- FL Wildlife Corridor

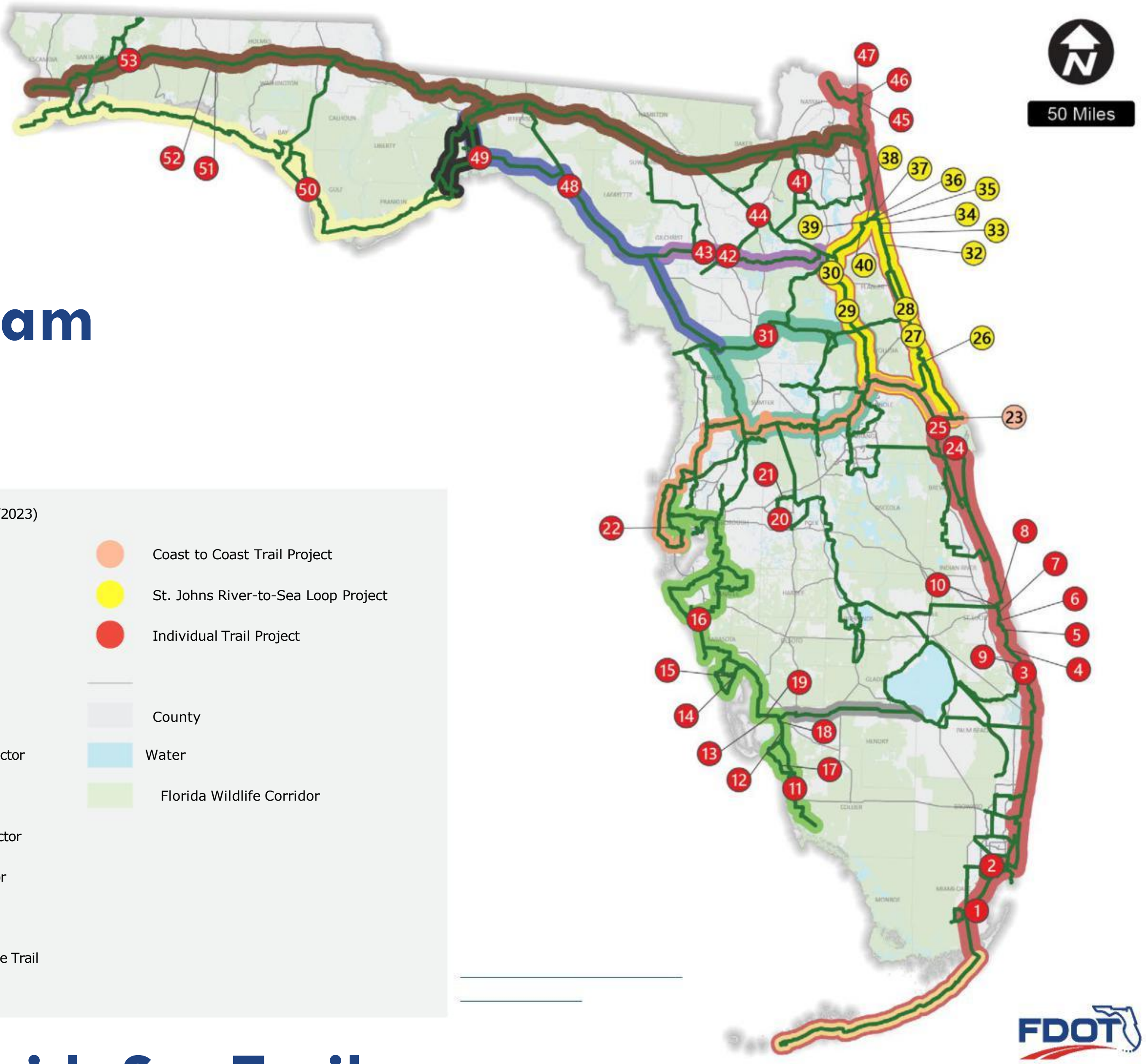
1:4,622,324

0 50 100 200 mi

0 80 160 320 km

Earthstar Geographics, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS

SUN Trail At-A-Glance
Amended Adopted Work Program
Fiscal Year 2024
as of November 2, 2023



- SUN Trail Network (As of 11/2/2023)
- Coast to Coast Trail
- St. Johns River-to-Sea-Loop
- Capital City to the Sea Trail
- East Coast Greenway
- Florida Gulf Coast Trail
- Great Northwest Coast Connector
- Heart of Florida Loop
- Nature Coast Regional Connector
- Old Florida Regional Connector
- US 90 Trail Corridor
- Florida Keys Oversees Heritage Trail
- Caloosahatchee-Sugar Trail
- Coast to Coast Trail Project
- St. Johns River-to-Sea Loop Project
- Individual Trail Project
- County
- Water
- Florida Wildlife Corridor

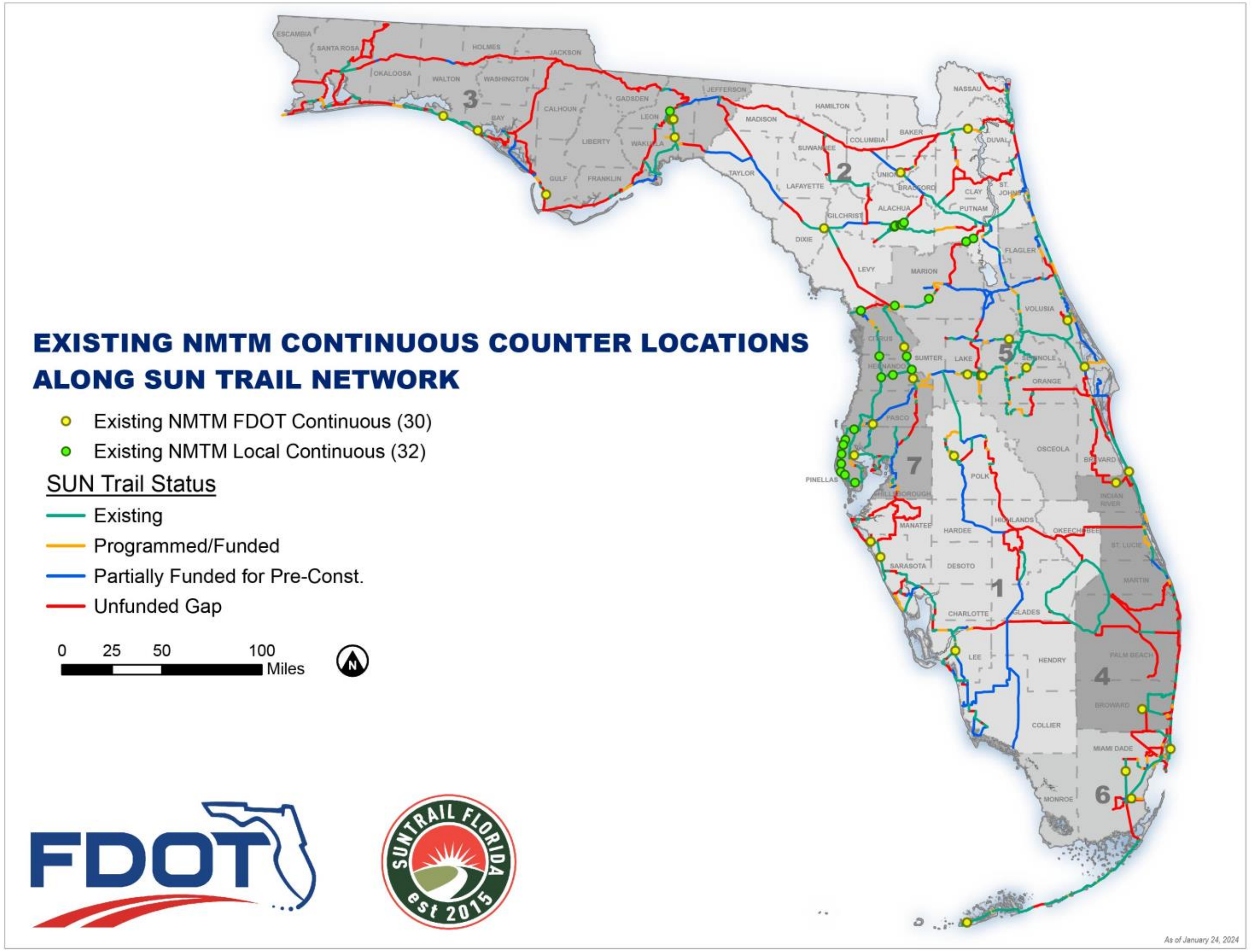
FDOT

Visit: FloridaSunTrail.com

FDOT

SUN Trail Tentative Work Program

Trail Operational and Performance Measures
Count Data



Trail Town Designation

The first Trail Town to be designated was Dunedin. Located along Florida's west coast, Dunedin has long been a mecca for non-motorized paved trail users. Bicyclists, joggers, in-line skaters and those enjoying a leisurely stroll can access the town by way of the Pinellas Trail, which runs through downtown on an abandoned CSX railroad corridor. The multi-use paved trail loop stretches from St. Petersburg to Tarpon Springs. Town officials credit the trail for a sharp rise in the business occupancy rate, from 30% to 100%. Bike shops, cafes, motels and other businesses cater to trail users.

Florida Greenways & Trails System Plan

FloridaGreenwaysAndTrails.com

11

Trail Operations and Performance Measures
Monetary Reporting

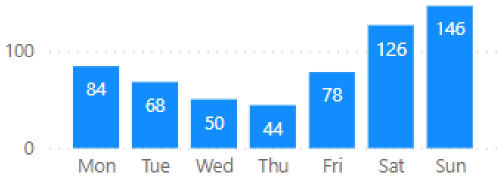
SunTrail User Survey

Total Responses* 596

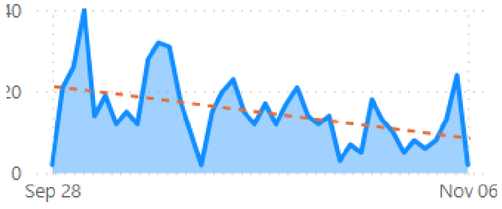
*as of 11/6/2023

Trailhead Name	Responses
Dunnellon-CR39	108
Spring-to-Spring	67
Palatka-Hawthorne	54
Santos	43
Inglis-Main-Dam	38
Suncoast	38
SW-49th-Ave	36
Felburn-Park	32
Baseline-Road	31

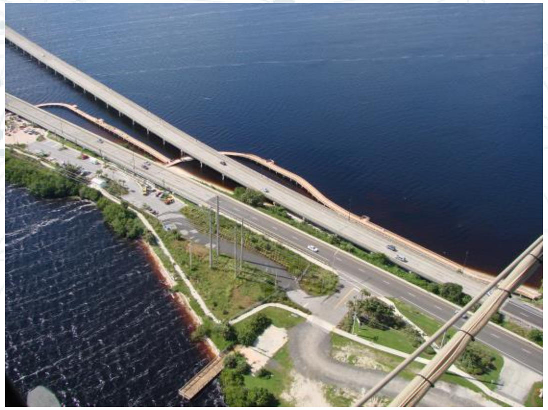
Responses by Day of Week



Response by Date



Collaboration



Port Charlotte – Gateway HarborWalk

Lynn Haven Rails-to-Trails

Edgewater Trail – Dale Avenue

Biscayne Everglades Greenway

Palatka to Lake Butler State Trail

Fort Pierce – Indian Hills

Withlacoochee-Dunnellon Trail Connector

SUN Trail Team Contact information:

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FDOT

FDOT Design Manual Updates & How Non-Motorized Counts Support

Tiffany Gehrke

State Complete Streets Coordinator, FDOT

Mission Statement

FDOT's continuing mission is to provide a safe transportation system that ensures the mobility of people and goods, enhances economic prosperity, and preserves the quality of our environment and communities.

Outline

I. Ch. 211 Limited Access Facilities
II. Ch. 213 Roundabouts
III. Ch. 222 Pedestrian Facilities
IV. Ch. 223 Bicycle Facilities
V. Ch. 224 Shared Use Path
VI. Ch. 266 Bicycle & Pedestrian Bridges

Chapter 211 Limited Access Facilities

FDM 211.18 Interchange Areas Bicycle and Pedestrian Facilities

- New Section for Bicycle and Pedestrian Facilities
- Shared Use Paths
  - Based on Research
  - New Interchanges
  - Not Required on RRR or Existing Interchanges

*Importance of Knowing Expected Non-Motorized Use (Volumes and Distribution)

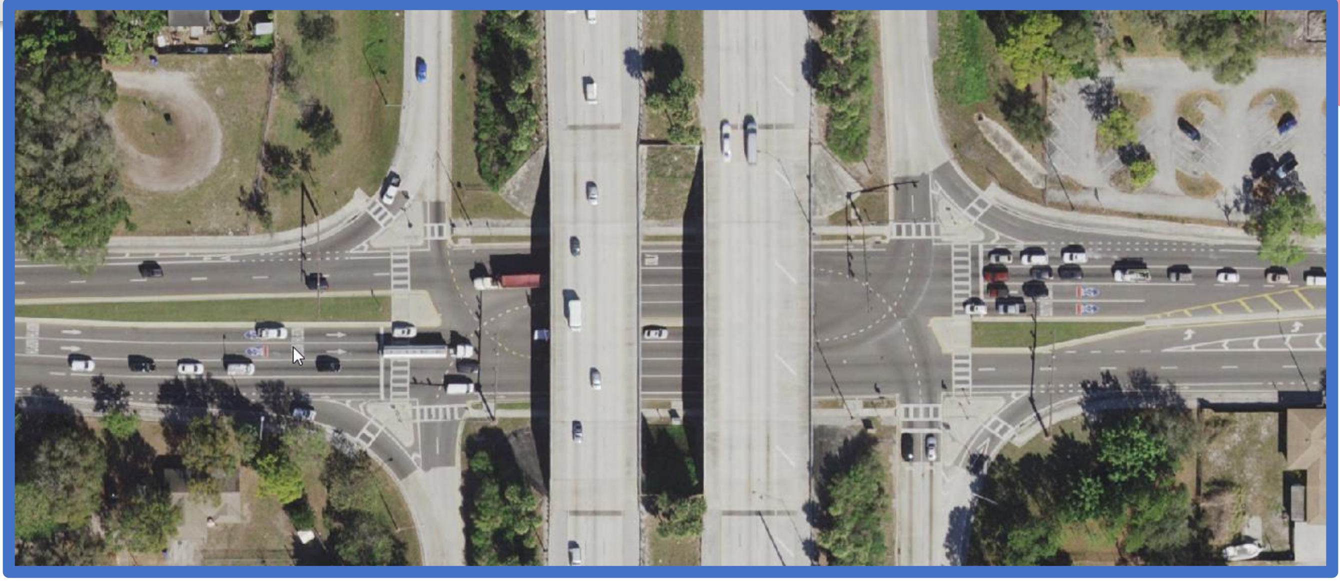
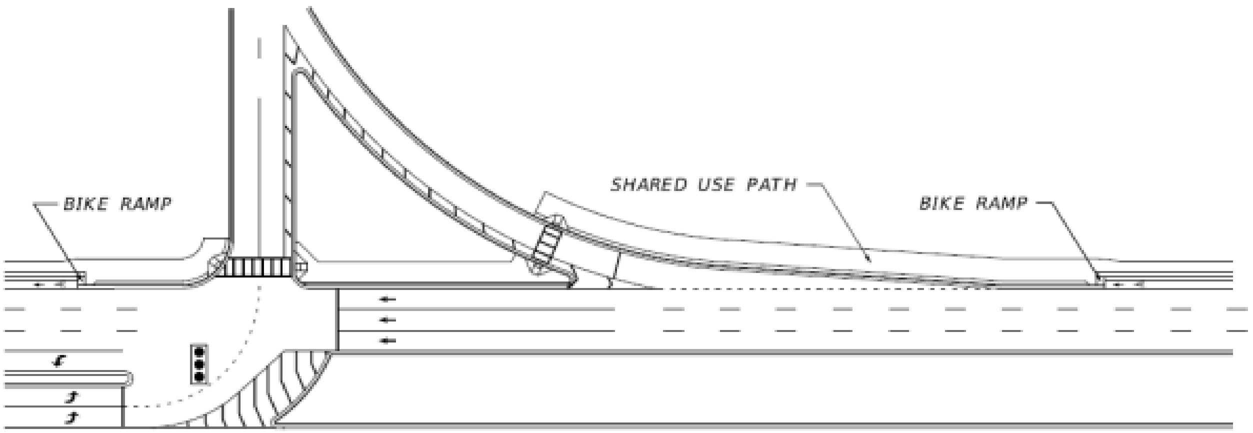


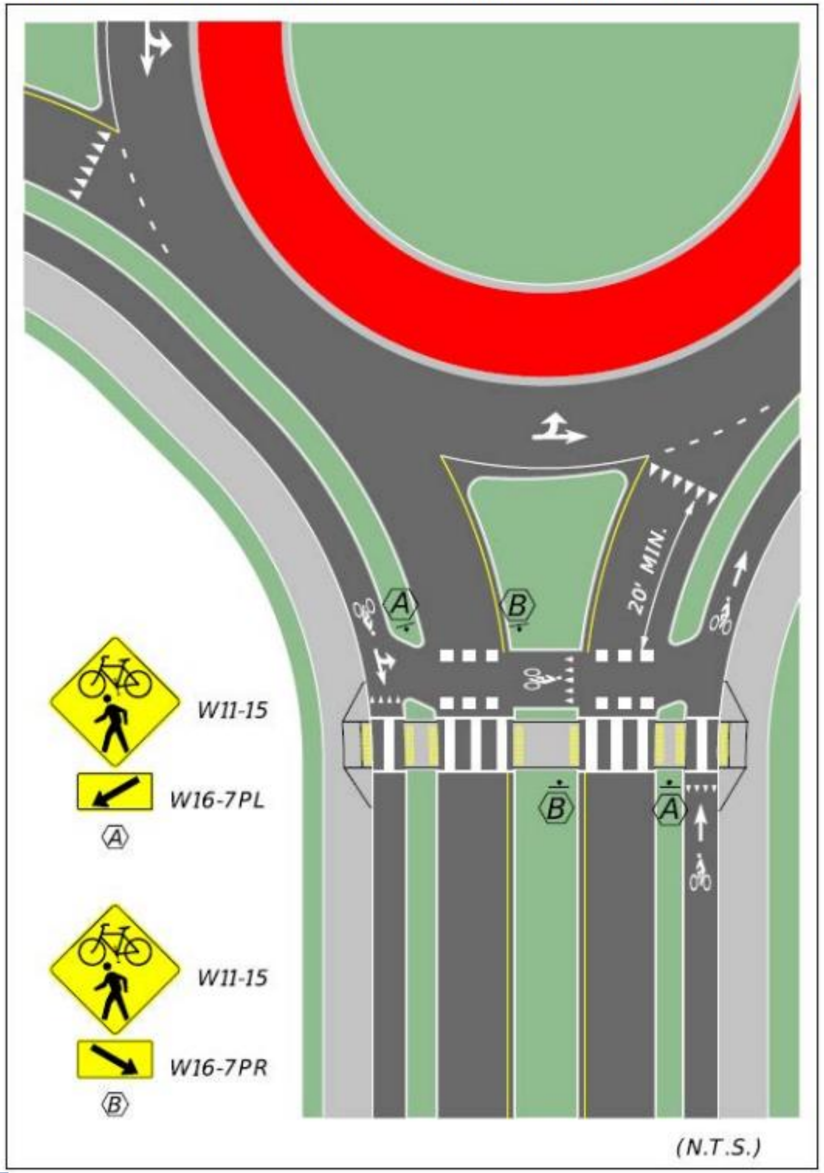
Figure 211.18.1 Conceptual Layout of Bicycle Ramps at Interchange Areas



Chapter 213 Roundabouts

FDM 213.8 Bicycle and Pedestrian Accommodation

Figure 213.10.1 Roundabout S&PM with Separated Bicycle Lane



- 21… gs
  - … ng
  -
  -

* Imp… Non-…

- 213.8.2 Bicycle Facilities
  - Termination of On-Road Bicycle Facilities Upstream
  - Provide Physically Separated Bicycle Facilities
  - Use Bike Ramps

* Importance of Knowing your Non-Motorized Use

Figure 213.8.1 Angled and Straight Crossings

This is not an FDOT facility and does not follow FDOT criteria

Chapter 222 Pedestrian Facilities

FDM 222.2.1 Sidewalk

Provide sidewalk on high speed curbed and flush shoulder roadways within C2T, C3C, C4, C5 or C6 context classification; and within C1, C2 or C3R where the demand for use is demonstrated.

*Importance of non-motorized counts in both sidewalk provision as well as width (FDM 222.2.1)

Chapter 223 Bicycle Facilities

FDM 223 Bicycle Facilities

- More to support Separated Bicycle Lanes (SBLs)

FDM 223.1 General

(4) Developing and maintaining a district bicycle facility plan to assign proposed bicycle facility types through a consistent and efficient process and ensure the following:

(a) Integration of FDOT bicycle facilities with local and regional bicycle transportation systems

(b) The direct use of more complex facility types in a cost-effective and efficient manner.

  - Widths of SBL (based on curb types)
  - Converting On-Street Parking to Micro mobility Parking

Figure 223.2.4 SBL Curb Types

Curb Types	Description

(NTS)

Chapter 224 Shared Use Paths

FDM 224 Shared Use Paths

- Importance of Non-Motorized Counts
  - Whether you Separate Bikes and Peds
  - Widths

Shared Use Paths on Vehicular

s

se a separated bike
ations C2T, C4, C5,

is elderly or people

224.4 Widths

The appropriate paved width for a two-directional shared use path is dependent upon context, volume and mix of users. Widths range from a minimum 10 feet to 14 feet, with a standard width of 12-feet. SUN Trail network facilities that are less than 12-feet require approval by the Chief Planner. For shared use paths not in the SUN Trail network:

(1) 10-feet wide may be used where there is limited R/W.

(2) Short 8-feet wide sections may be used in constrained conditions.

Consider the accommodation of emergency and maintenance vehicles or management of steep grades when selecting the width of the path.

FHWA's ***Shared Use Path Level of Service Calculator*** may be used as a guide in determining appropriate width.

Chapter 266 Bicycle & Pedestrian Bridges

FDM 266 Bicycle and Pedestrian Bridges

- No Updates
- Importance of Non-Motorized Counts
  - Need for Investment
  - Design Details such as width and features (ramp design, tire gutter, elevator, etc.)
  - Reflects Benefits within a Network on this Investment
    - Closing a gap
    - Creating a low-stress connection

Any Questions?

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Target ZERO

Strategic Investments Toward ZERO Fatalities and Serious Injuries

FDOT

February 7, 2024
FDOT Statewide Non-Motorist Traffic Monitoring Program Meeting

TARGET ZERO
FATALITIES & SERIOUS INJURIES

Agenda

- Motivation
- Methodology
- Challenges
- Questions

Motivation

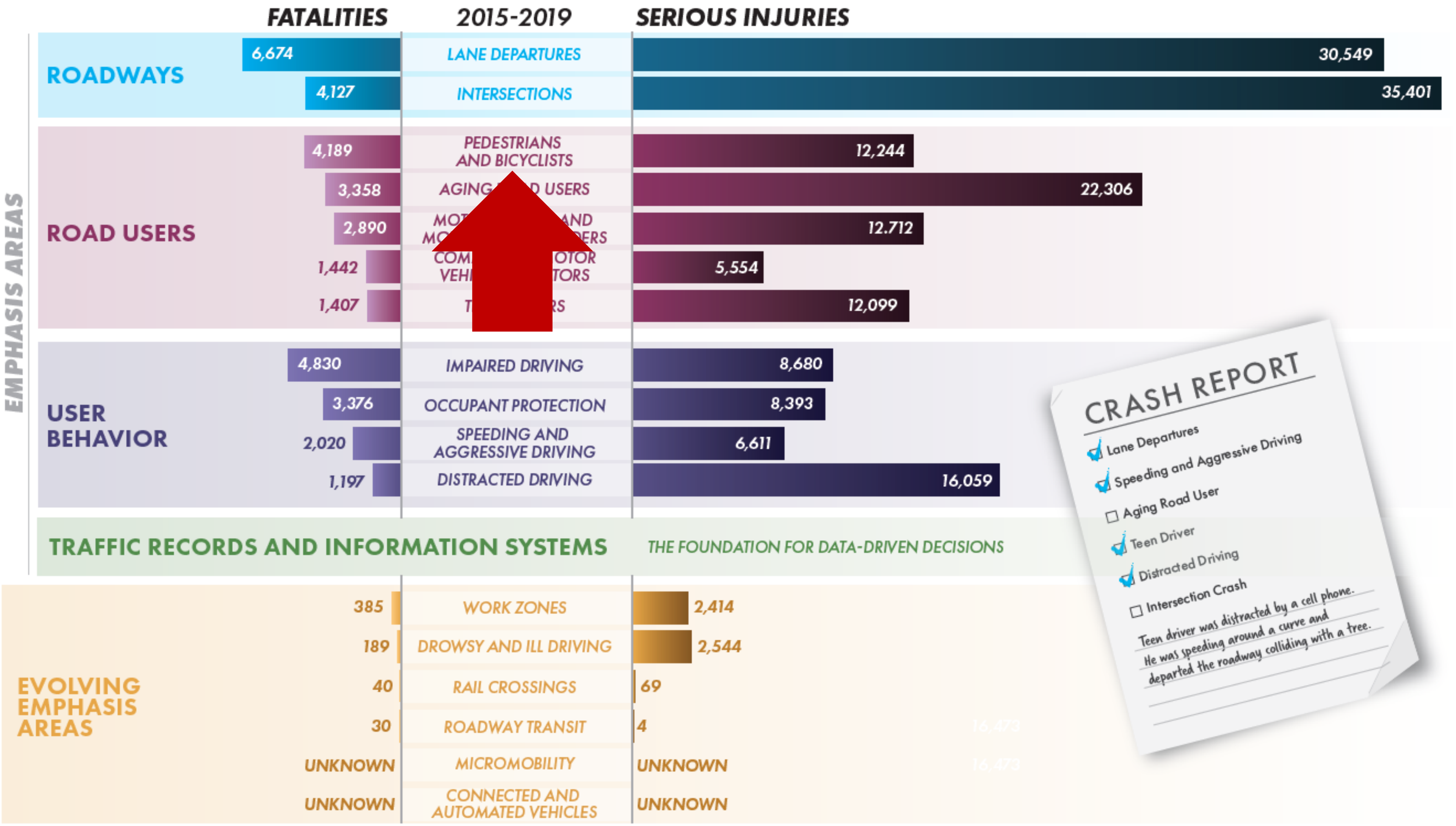
Prioritize Pedestrian and Bicyclist Traffic Safety

3% of crashes

…**BUT**…

30% of fatalities &

15% of serious injuries



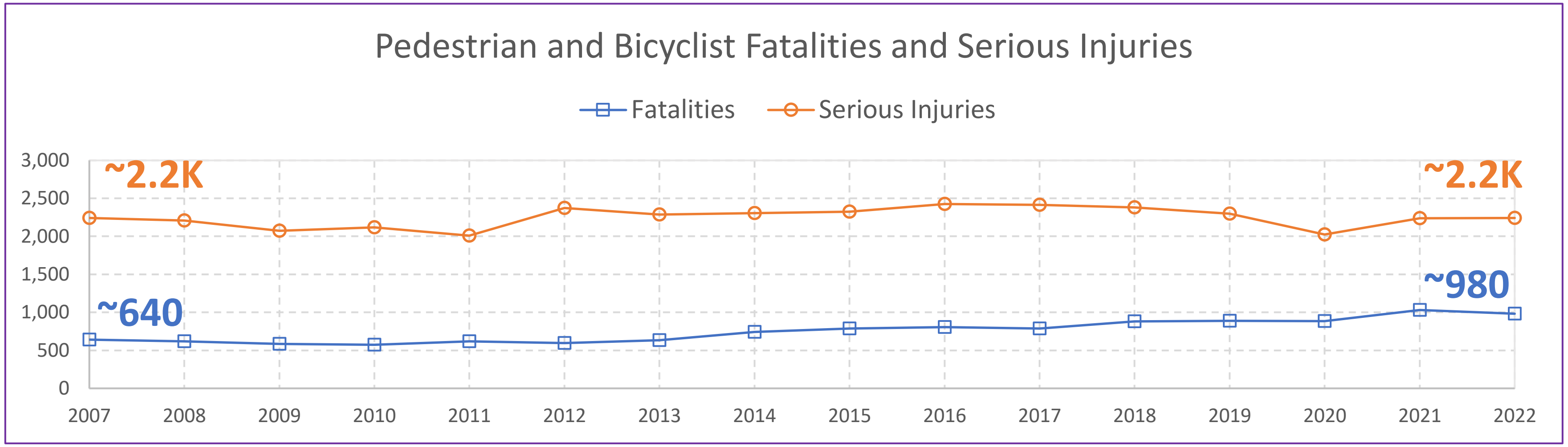
Long-Term Trends

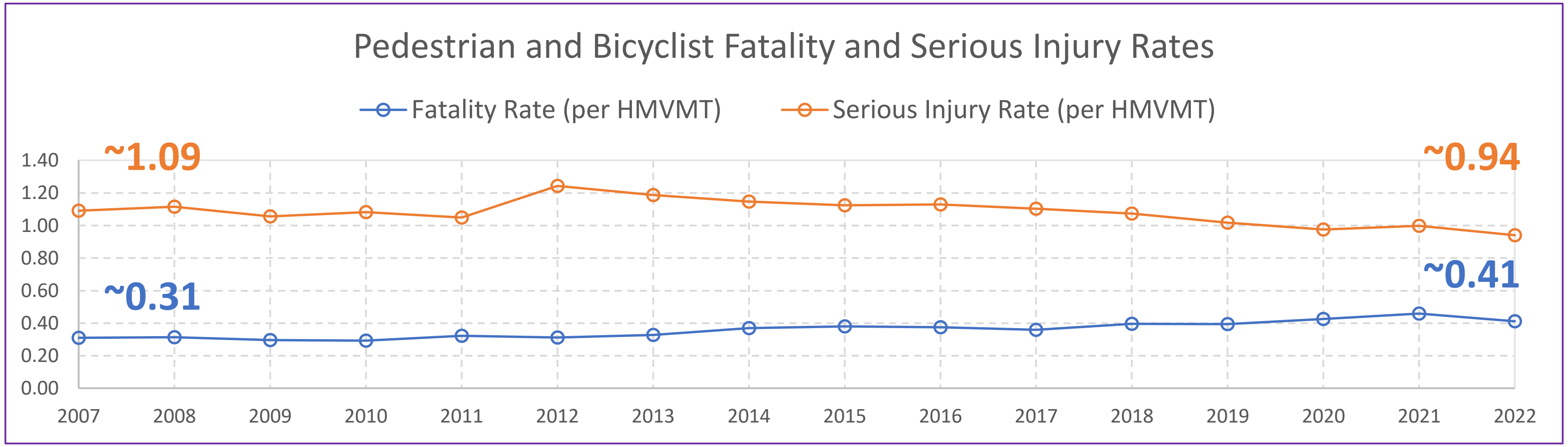
Fatalities gradually increase

Serious injuries remain flat

Fatality rates gradually increase

Serious injury rates gradually decrease





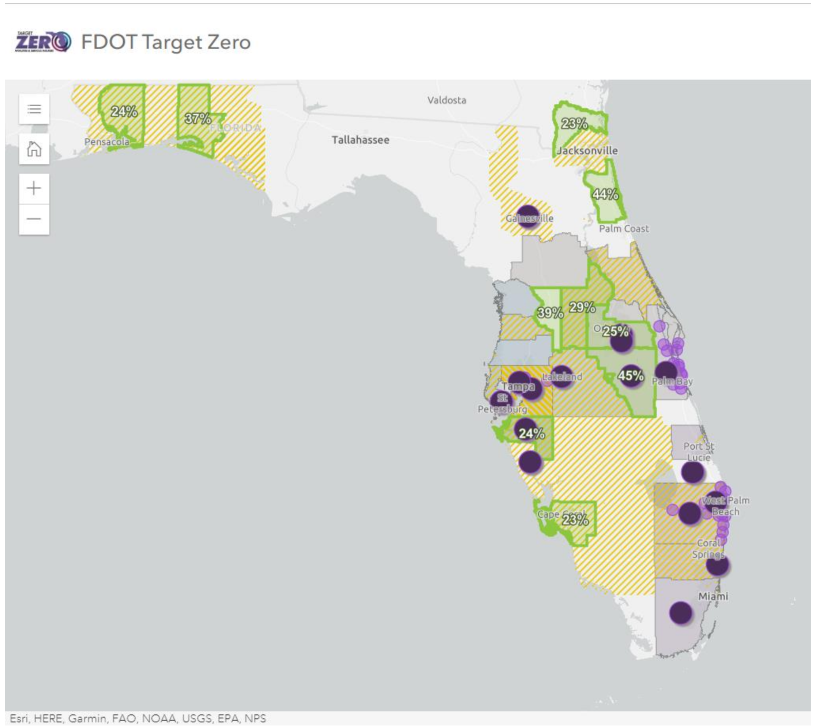
Our Target Is Zero!

TARGET
ZERO
FATALITIES & SERIOUS INJURIES

Methodology

Maximize Community Partnerships

Support Target Zero Communities and Safety Action Plans



Top Counties for Lane Departure, Intersection, Pedestrian and Bicyclist Fatalities and Serious Injuries

Top Counties for Population Growth

Partner Agencies with Vision Zero Resolution and/or Action Plan

Partners Awarded with 'Safe Streets for All' Federal Grants

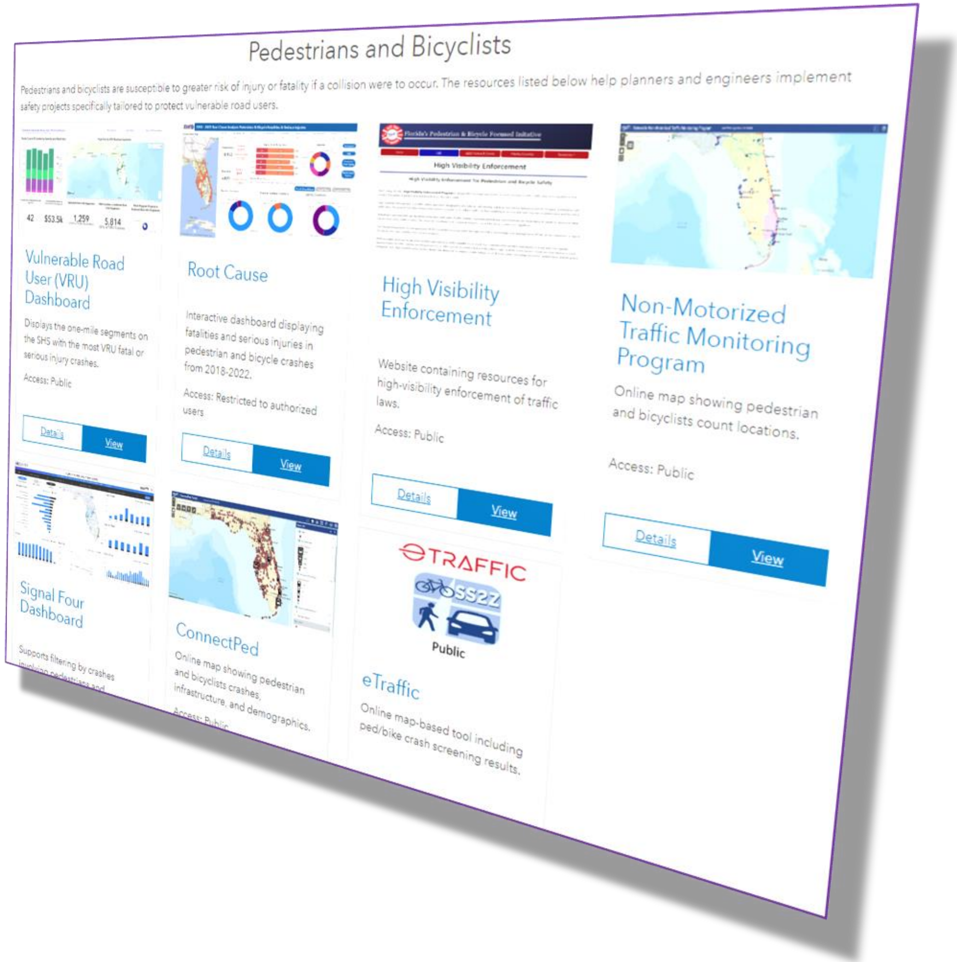
Maximize Resources

Safety Data Integration Space (SDIS)

SDIS Public

SDIS brings safety data and tools together in one space

SDIS Internal



Pedestrians and Bicyclists Section

Risk-Based Systemic Analyses

Identify significant risk factors and corresponding countermeasures

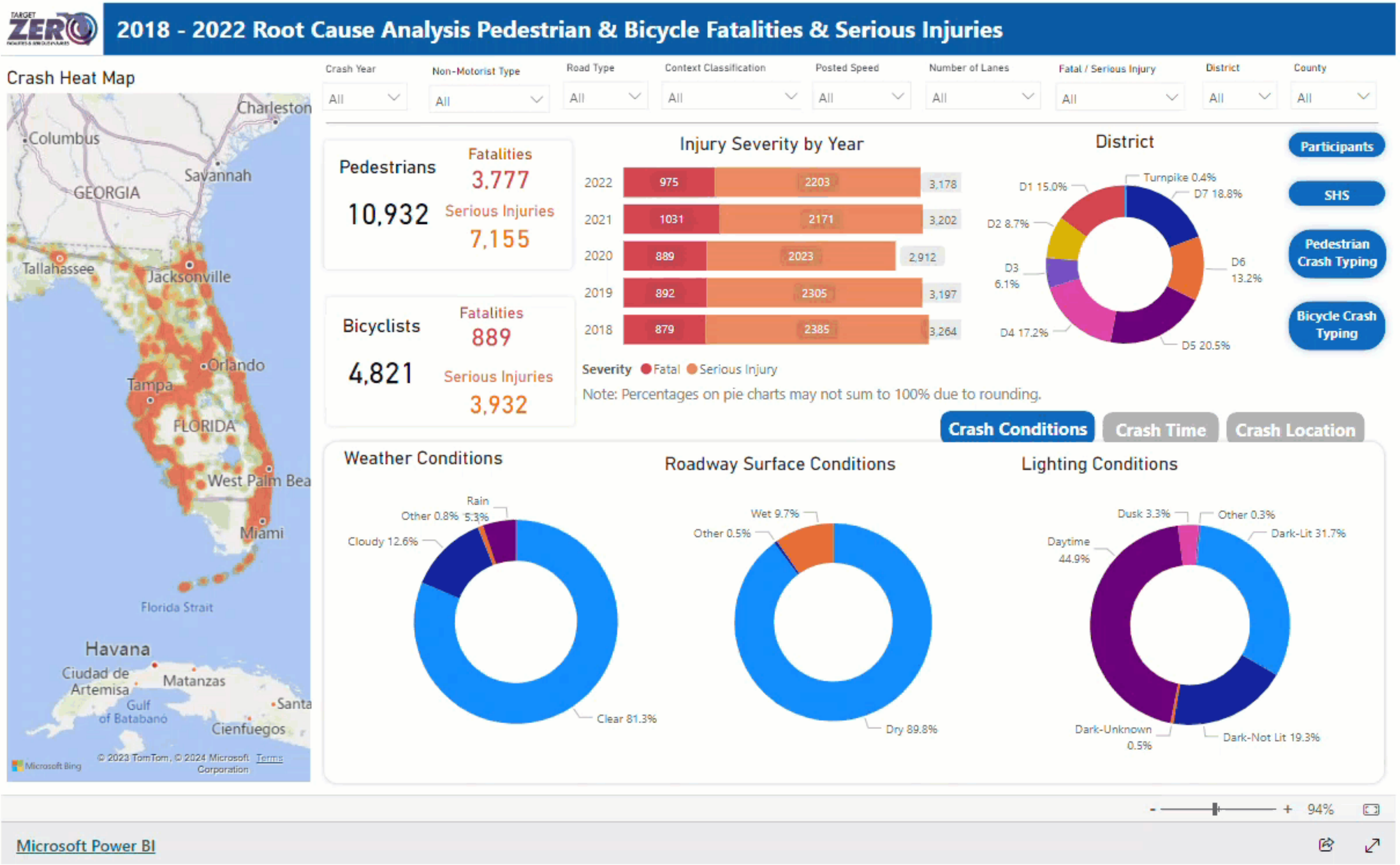
Bike/Ped
Crash Facts

Risk-Based Systemic Analyses

Screen roadways by significant risk factors

Select countermeasures

Recommend actions



Challenges

Estimates of Non-Motorized Traffic

- Comprehensive assessment of risk includes
  - Number of crashes
  - Number of fatal or serious injuries
  - Number of vehicles
  - Number of non-motorists
- Prioritizing resources effectively depends on know how many people (inside and outside vehicles) are at risk

Questions

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Safety Data Coordinator
FDOT State Safety Office

Rupert.Giroux@dot.state.fl.us

ROOT CAUSE ANALYSIS
PEDESTRIAN & BICYCLE

2024 STATEWIDE MEETING NON-MOTORIZED TRAFFIC MONITORING PROGRAM

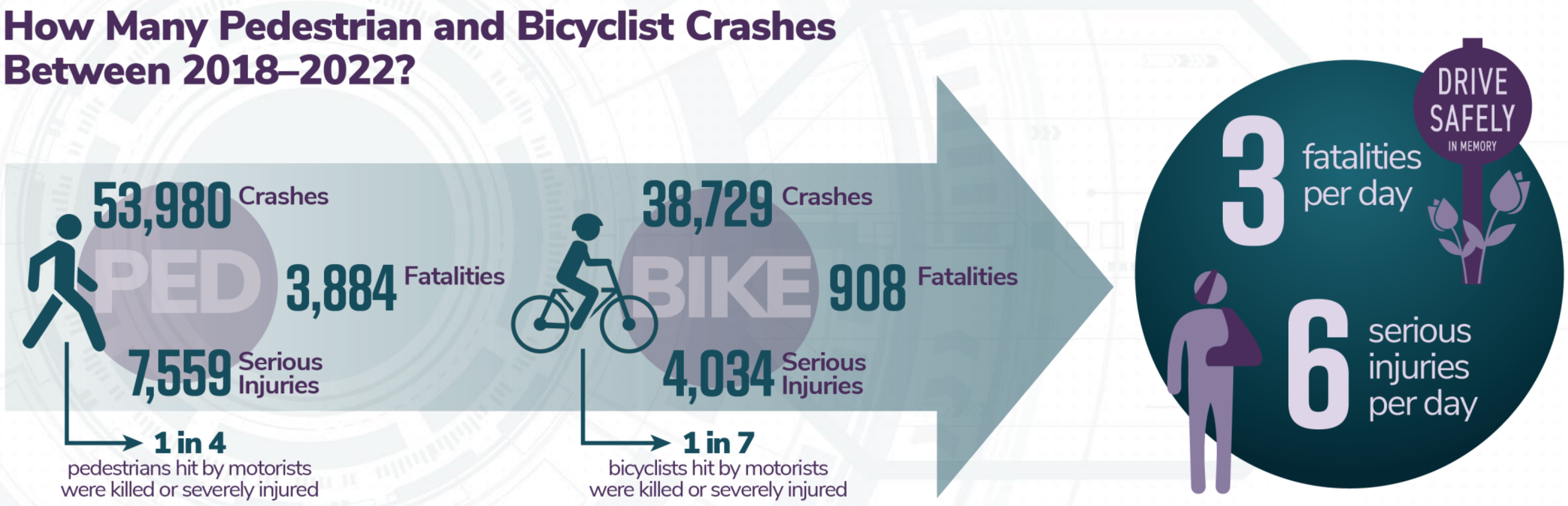
STATEWIDE RCA: PED/BIKE SAFETY

Methodology

- Evaluated statewide fatal/severe injury crashes
  - Trends, crash types, roadway & demographic characteristics
- Developed crash trees
  - Speed, number of lanes, context class & other roadway characteristics
- Identified risk factors
  - Overrepresentations & high occurrence
- Evaluated countermeasures
  - Applicability, benefit-cost analysis
- Systemic countermeasure and policy recommendations

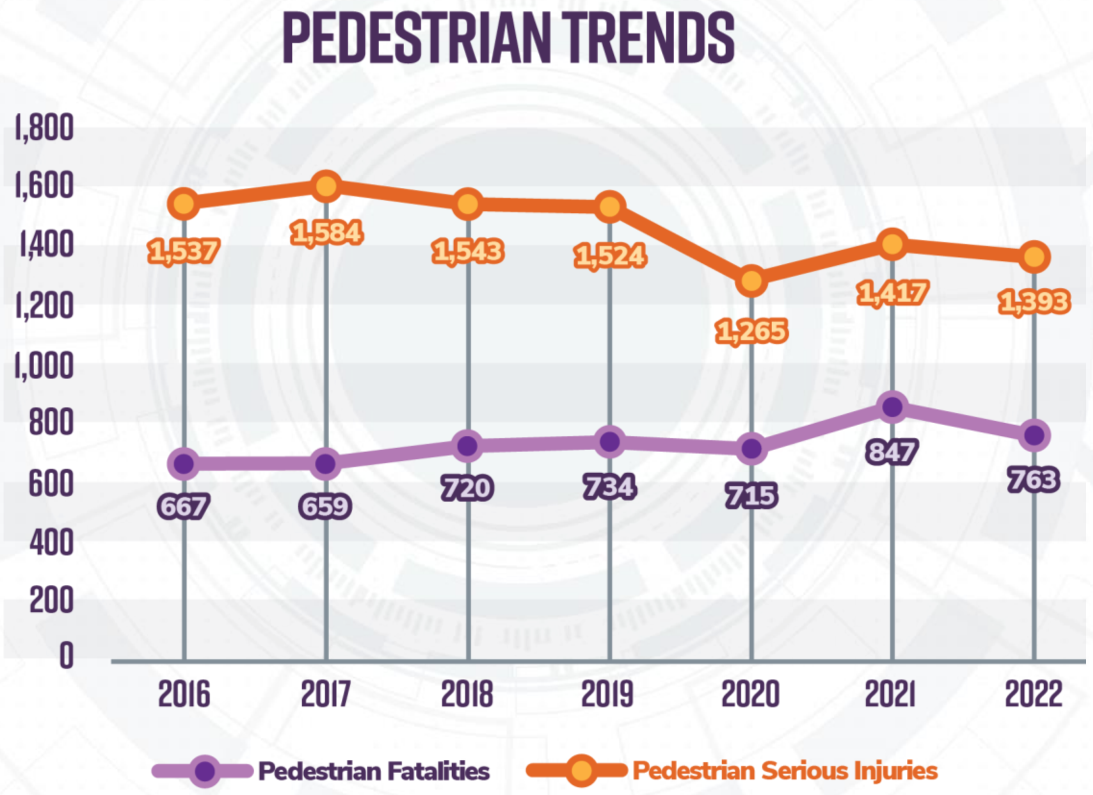
ROOT CAUSE ANALYSIS
PEDESTRIAN & BICYCLE

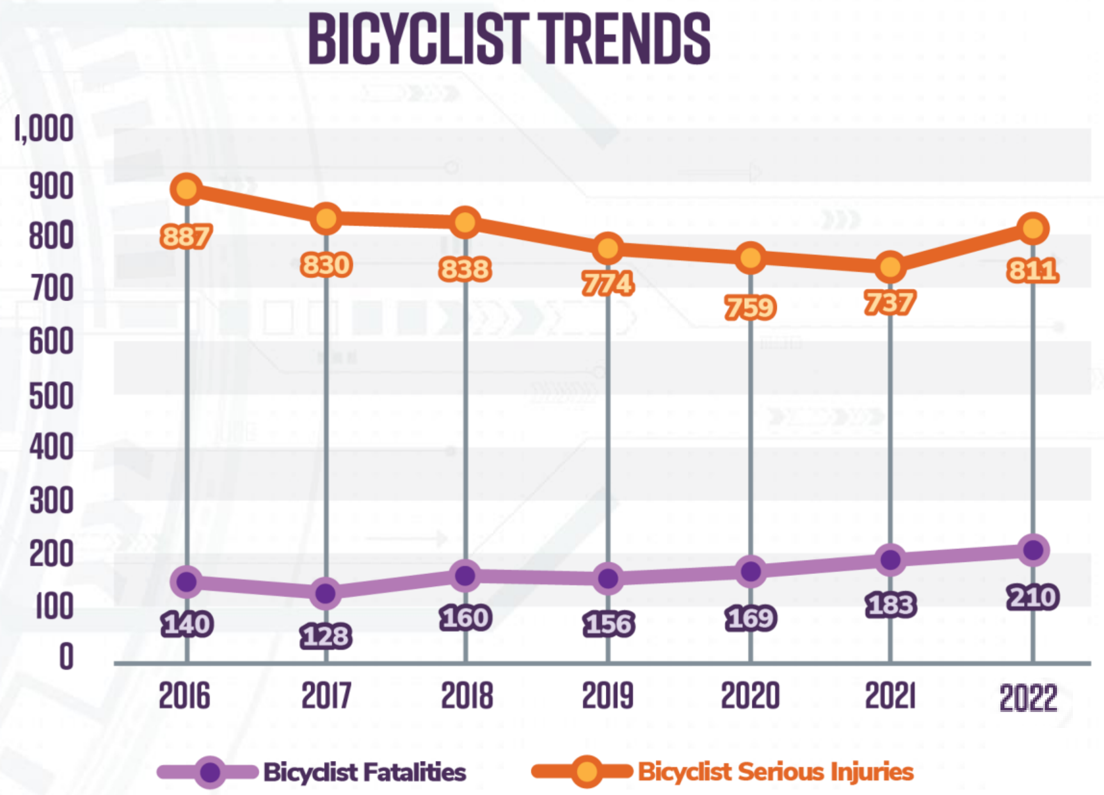
STATEWIDE TRENDS



Source: 2018-2022, Crash Analysis Reporting System. All Public Roads.

STATEWIDE TRENDS





FDOT TARGET ZERO FATALITIES & SERIOUS INJURIES ROOT CAUSE ANALYSIS PEDESTRIAN & BICYCLE

STATEWIDE TRENDS

Ped-Bike KSIs represent **4% of all crashes**, but…

- **27%** of all fatalities
- **14%** of all serious injuries

22.8%

Rate of pedestrian fatalities as a share of all transportation fatalities

2.4%

Rate of pedestrian crashes as a share of all vehicular crashes

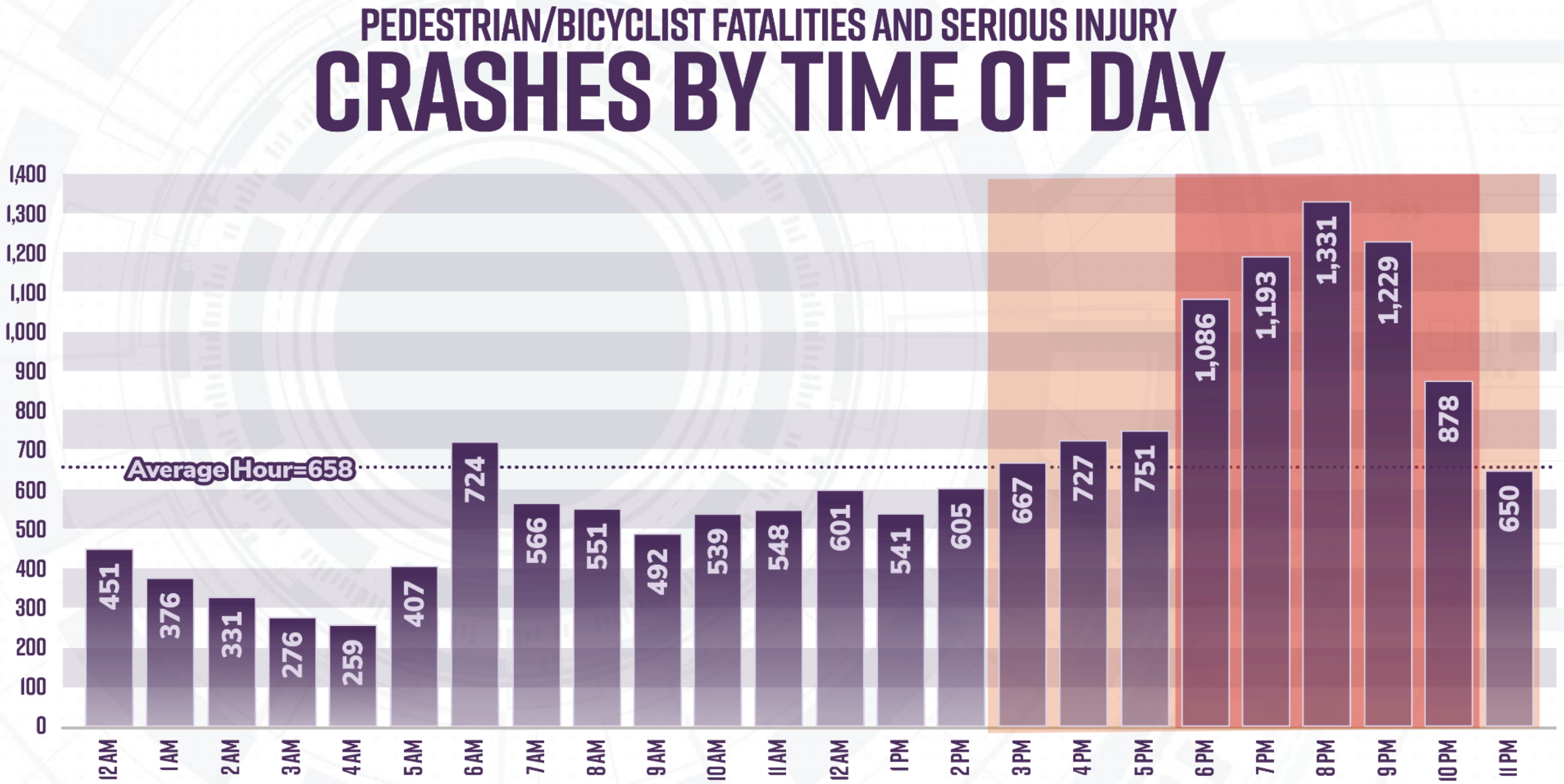
5.0%

Rate of bicyclist fatalities as a share of all transportation fatalities

1.7%

Rate of bicycle crashes as a share of all vehicular crashes

STATEWIDE TRENDS



Time of Day

54 percent between 3 PM and Midnight

Highest peak between **6 to 11 PM**

72% of fatalities occur from 6 PM–6 AM

PEDESTRIAN PROFILE

94% FL Residents

66% of males

34% of females

FATALITIES

Male age range:
50-64 YEARS

Percent male:
72%

Percent male that reside in Florida:
94%

Female age range:
45-64 YEARS

Percent female:
28%

Percent female that reside in Florida:
91%

SERIOUS INJURIES

Male age range:
20-39 YEARS
50-59 YEARS

Percent male:
62%

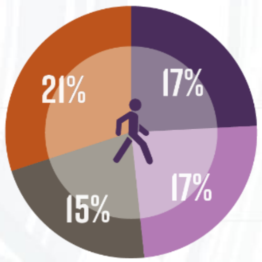
Percent male that reside in Florida:
94%

Female age range:
15-44 YEARS
55-69 YEARS

Percent female:
38%

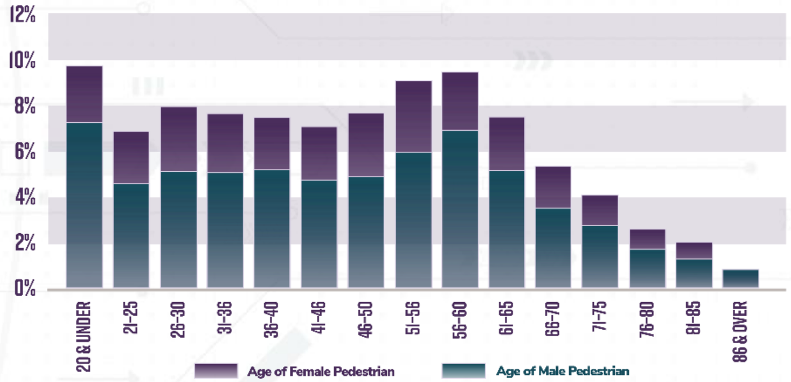
Percent female that reside in Florida:
94%

Pedestrian Action Contributes to 70% of Crashes



Dart/Dash
In Roadway Improperly
Failure to Yield ROW
Other Actions

AGE AND GENDER OF PEDESTRIAN



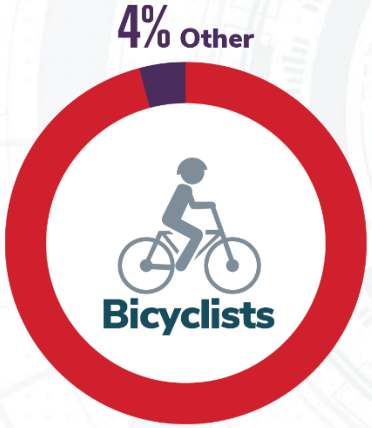
Age of Pedestrian

- 12 percent are 20 years and under*
- 19 percent are between 51 and 60 years

*6% account for 16 to 20 years old

FDOT TARGET ZERO FATALITIES & SERIOUS INJURIES ROOT CAUSE ANALYSIS PEDESTRIAN & BICYCLE

BICYCLIST PROFILE



95% FL Residents

83% of males

17% of females

FATALITIES

Male age range:
45-74 YEARS

Percent male:
88%

Percent male that reside in Florida:
96%

Female age range:
35-54 YEARS

Percent female:
12%

Percent female that reside in Florida:
94%

SERIOUS INJURIES

Male age range:
20-24YEARS
50-64 YEARS

Percent male:
81%

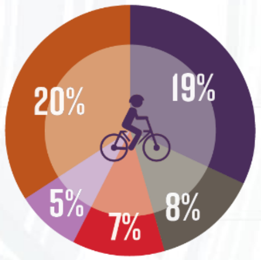
Percent male that reside in Florida:
96%

Female age range:
30-34 YEARS
45-59 YEARS

Percent female:
19%

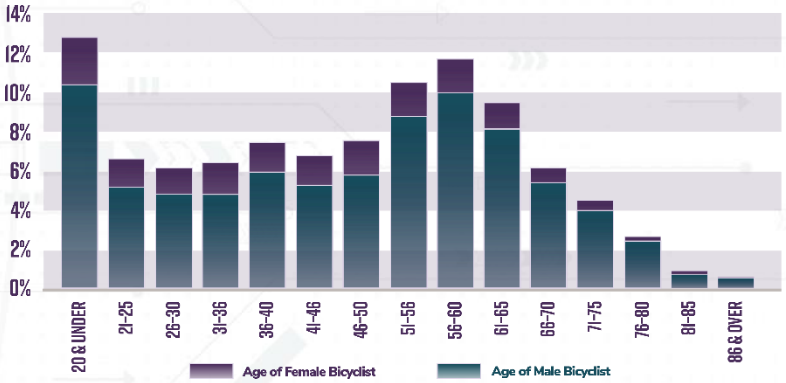
Percent female that reside in Florida:
93%

Bicyclist Action Contributes to 61% of Crashes



Failure to Yield ROW
Dart/Dash
Violate Traffic Control Device
Wrong Way Riding
Other Actions

AGE AND GENDER OF BICYCLIST



Age of Bicyclist

- 13 percent are 20 years old and under*
- 32 percent are between 51 and 65 years

*11% account for 11 to 20 years old

DRIVER PROFILE

DRIVER PROFILE

Male age range:
20-39 YEARS

Percent male:
66%

Percent male that reside in Florida:
96%

Female age range:
20-39 YEARS

Percent female:
34%

Percent female that reside in Florida:
97%

VEHICLE TYPE

Passenger Car in
50% of crashes

SUV/Pickup Truck in
35% of crashes

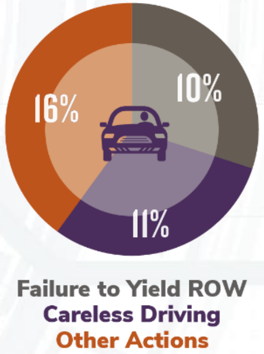
TRGT-0
FLORIDA

VEHICLE YEAR

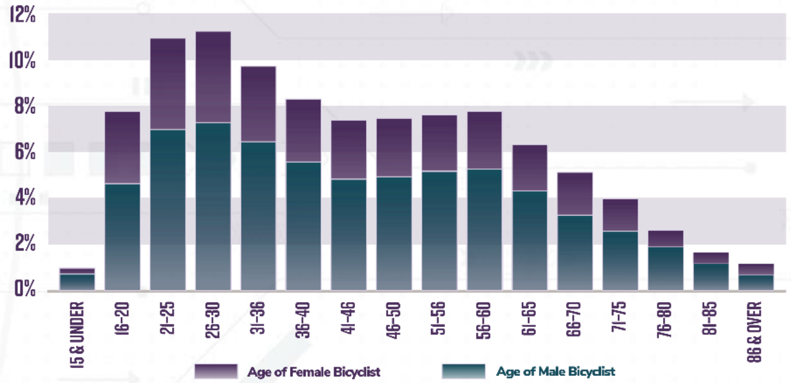
2012-2016 in
29% of fatalities

2017-2021 in
18% of fatalities

Driver Action Contributes to 37% of Crashes



AGE AND GENDER OF DRIVER



FDOT

TARGET ZERO FATALITIES & SERIOUS INJURIES

ROOT CAUSE ANALYSIS PEDESTRIAN & BICYCLE

ROADWAY LOCATION

Midblocks

74% Pedestrians

53% Cyclists

Intersections

26% Pedestrians

47% Cyclists

DEMOGRAPHIC CONSIDERATIONS

SOCIOECONOMIC FACTORS

% of population **above age 65**

% of households **below poverty level**

% of population **with disabilities**

% of **minority** population

% of population with **limited English proficiency**

% of households **with no vehicles**

Census Tracts with
4 OR MORE FACTORS*

8 Fatalities and Serious Injuries /10,000 population

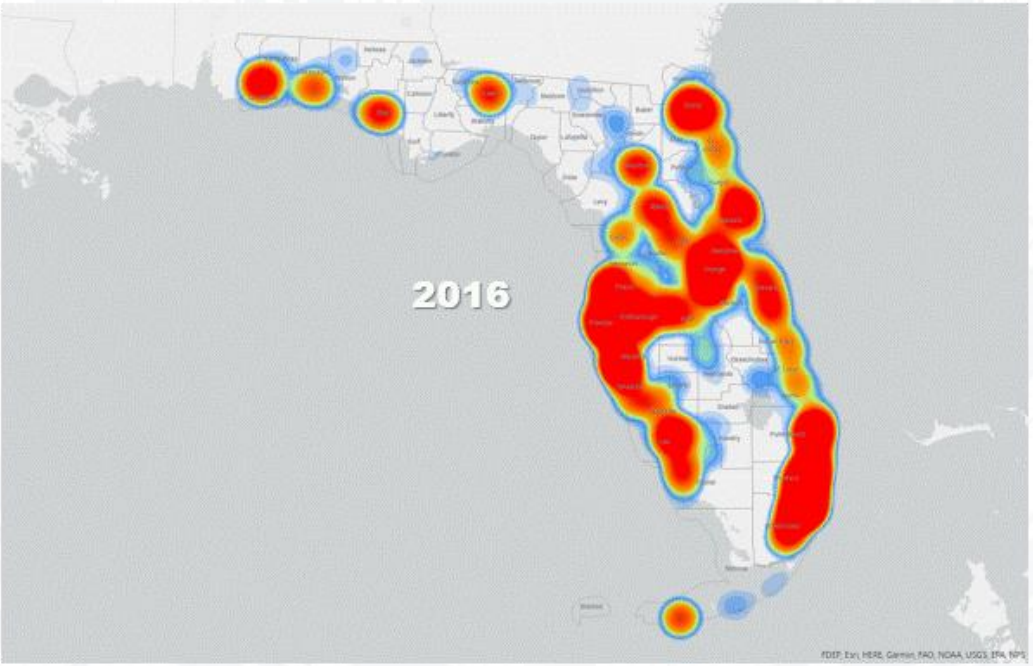
Census Tracts with
LESS THAN 4 FACTORS*

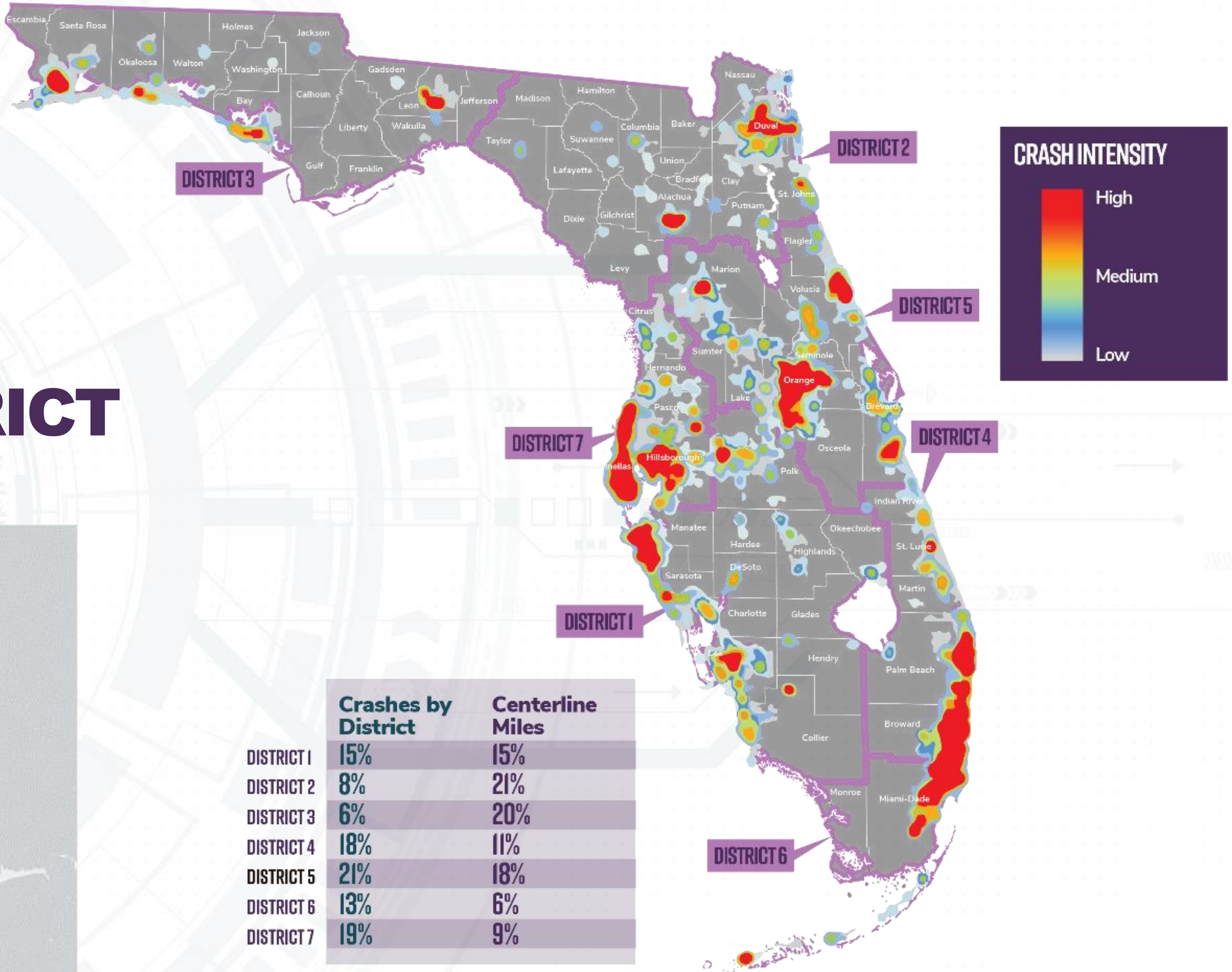
4 Fatalities and Serious Injuries /10,000 population

*Represents Census Tracts within a County where a factor falls below that County's Average.

FDOT | TARGET ZERO FATALITIES & SERIOUS INJURIES | ROOT CAUSE ANALYSIS PEDESTRIAN & BICYCLE

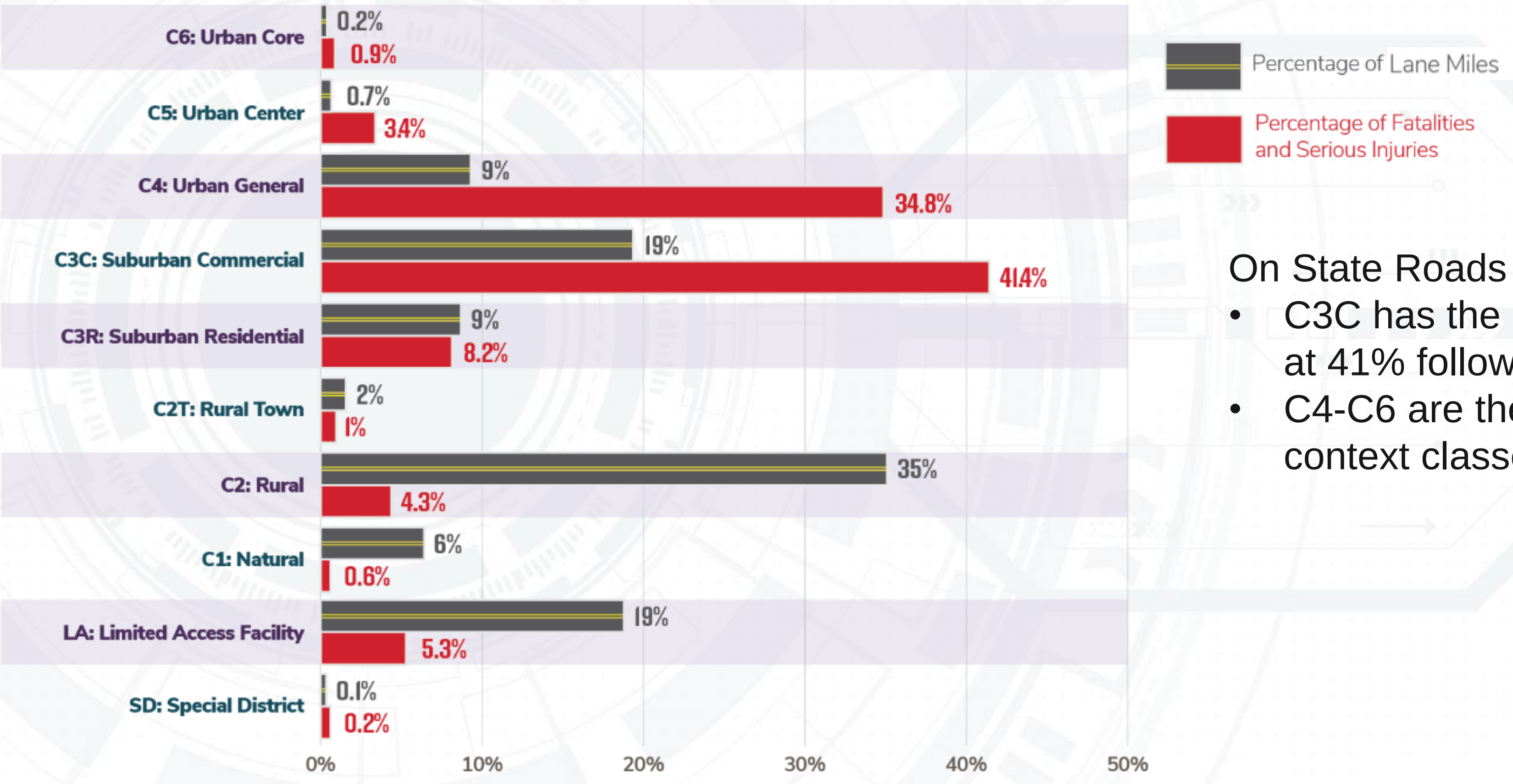
STATEWIDE CRASH INTENSITIES BY DISTRICT





	Crashes by District	Centerline Miles
DISTRICT 1	15%	15%
DISTRICT 2	8%	21%
DISTRICT 3	6%	20%
DISTRICT 4	18%	11%
DISTRICT 5	21%	18%
DISTRICT 6	13%	6%
DISTRICT 7	19%	9%

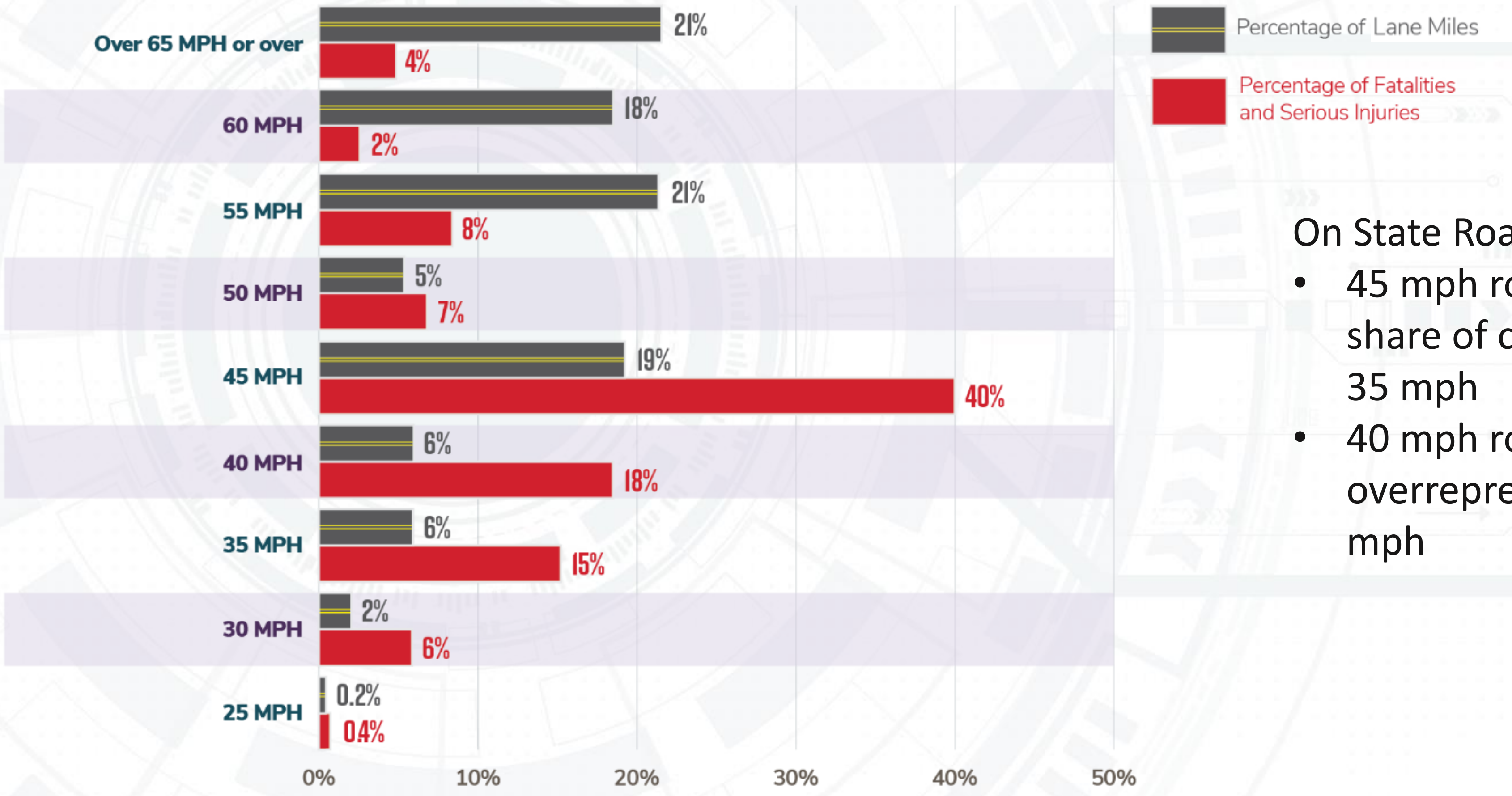
SHS – PED/BIKE CRASHES BY CONTEXT CLASS



On State Roads

- C3C has the highest share of crashes at 41% followed by C4 at 35%
- C4-C6 are the most overrepresented context classes

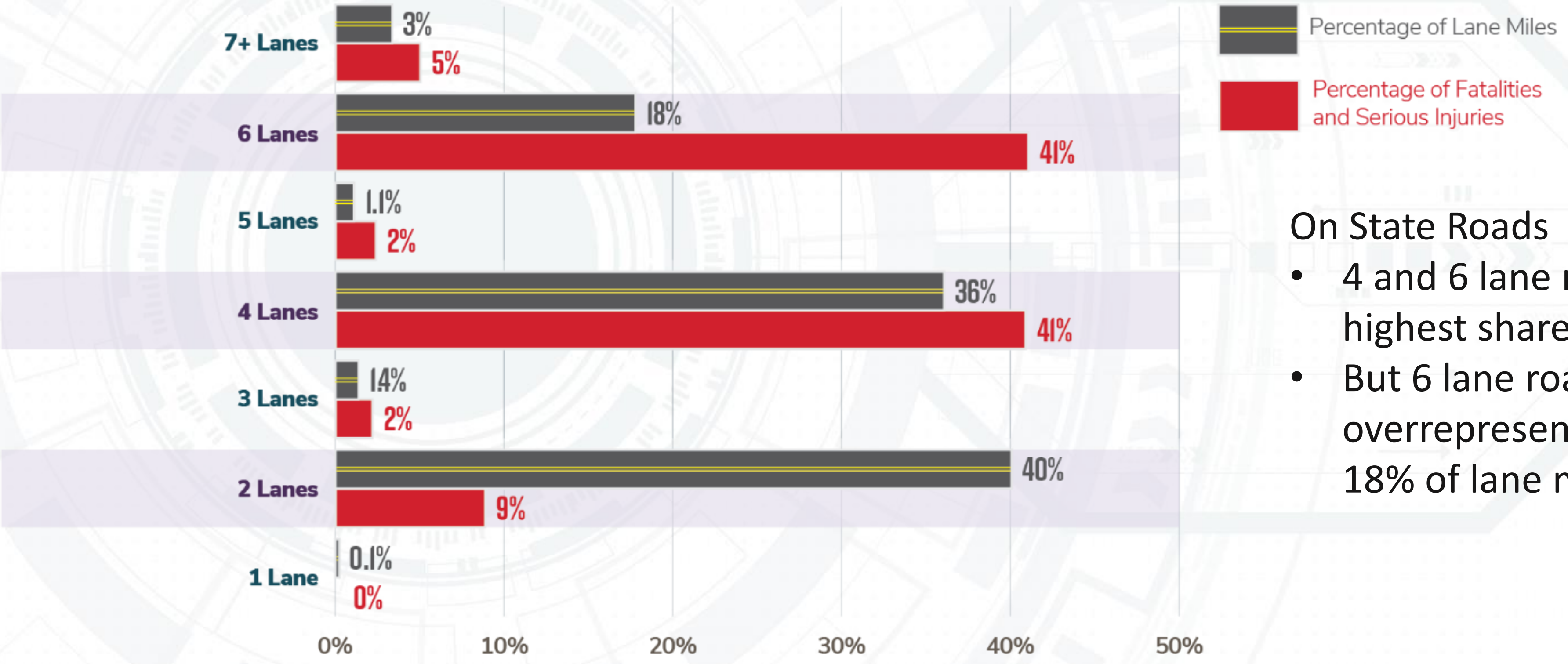
SHS - PED/BIKE CRASHES BY POSTED SPEED LIMIT



On State Roads

- 45 mph roadways have the highest share of crashes, followed by 40 and 35 mph
- 40 mph roadways have the highest overrepresentation followed by 35 mph

SHS - PED/BIKE CRASHES BY NUMBER OF LANES



On State Roads

- 4 and 6 lane roads make up the highest share of crashes (41% each)
- But 6 lane roads are the most overrepresented (41% crashes on 18% of lane miles)

STATEWIDE RCA: PED/BIKE SAFETY

Reviewed several factors:

- Maintaining Agency
- Context classification
- Number of lanes
- Posted speed limit
- Location
- Shoulder and median type
- Motorist/Non-motorist Interactions
- Demographic data

ROOT CAUSE ANALYSIS
PEDESTRIAN & BICYCLE

PEDESTRIAN & BICYCLE CRASH FACTS

Pedestrian and bicycle crashes are a top emphasis area of Florida's Strategic Highway Safety Plan. The Root Cause Analysis is a methodology to identify top contributing factors present in pedestrian and bicycle crashes to help inform strategic investments and decisions to improve our effectiveness toward Florida's target of ZERO roadway fatalities and serious injuries.

FDOT | TARGET ZERO FATALITIES & SERIOUS INJURIES

2017-2021 SIGNAL FOUR (S4) ANALYTICS

STATEWIDE (ALL PUBLIC ROADS)

OVERVIEW

PED
- 46,198 Crashes
- 3,673 Fatalities
- 7,350 Serious Injuries

1 in 4 pedestrians hit by motorists were killed or severely injured

BIKE
- 32,285 Crashes
- 804 Fatalities
- 3,952 Serious Injuries

1 in 7 bicyclists hit by motorists were killed or severely injured

DRIVE SAFELY

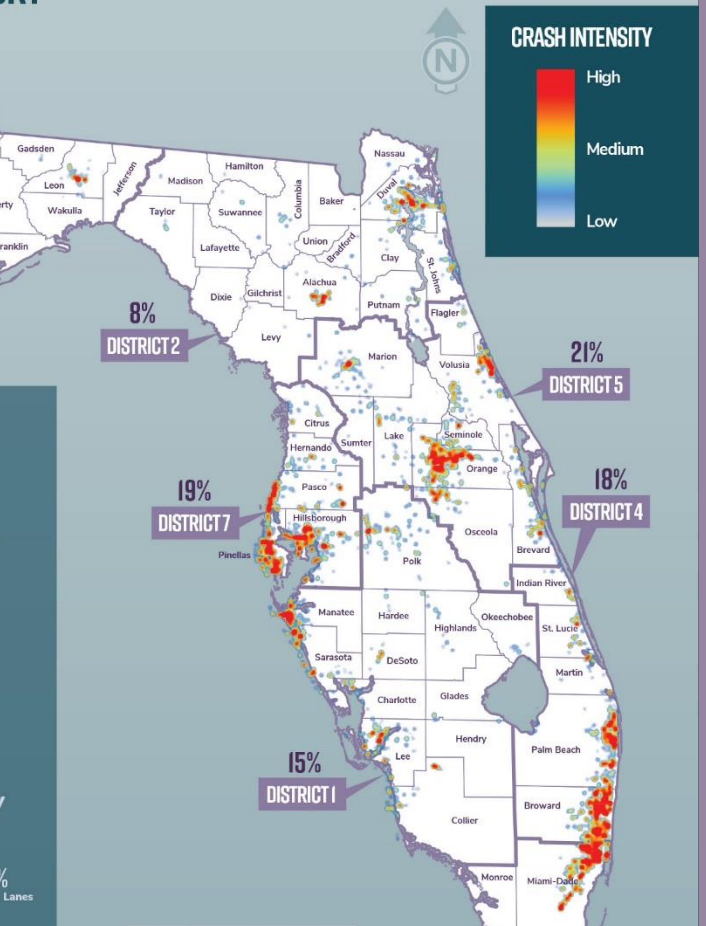
2 fatalities per day

6 serious injuries per day

Pedestrian and bicycle crashes are...

4% of all CRASHES but 27% of all FATALITIES

WHERE DID CRASHES OCCUR?



	Crashes by District	Centerline Miles
DISTRICT 1	15%	15%
DISTRICT 2	8%	21%
DISTRICT 3	6%	20%
DISTRICT 4	18%	11%
DISTRICT 5	21%	18%
DISTRICT 6	13%	6%
DISTRICT 7	19%	9%

DRAFT MAY 2023

WHEN DID CRASHES OCCUR?

Fatalities and Serious Injuries by Month

Fatalities and Serious Injuries by Year

Crashes commonly occur on **MON, WED & SAT**

Crashes commonly occur from **3 PM–12 AM**

72% of fatalities occur from **6 PM–6 AM**

Roadway Location

Midblocks
- 74% Pedestrians
- 54% Cyclists

Intersections
- 26% Pedestrians
- 46% Cyclists

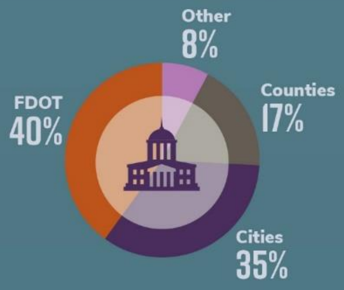
Environment

- 90% on dry roads
- 81% in clear weather
- 56% in non-daylight

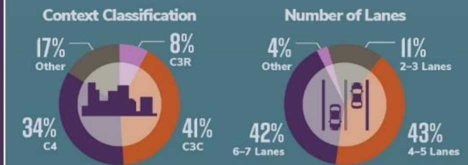
Lighting Conditions During Fatal Crashes

- 22% daylight
- 5% dusk/dawn
- 31% dark
- 41% dark but lighted

Road Maintaining Agency



Metrics for State Highway System Only



Posted Speed*: 57% 40-45 MPH; 22% 50+ MPH

*Driver speed, even if not 'speeding,' is a significant factor in the severity of injuries to vulnerable road users.

Source: Signal Four (S4) Analytics, 2017-2021 data, downloaded March 2022 & February 2023.

Roadway data for non SHS roadways is not as comprehensive as data for SHS roadways.

WHO WERE INVOLVED?

PEDESTRIAN PROFILE / BICYCLIST PROFILE / DRIVER PROFILE

FATALITIES

DRIVE SAFELY IN MEMORY

AGE/GENDER

	Pedestrian Profile	Bicyclist Profile	Driver Profile
Male age range:	50-64 YEARS	45-74 YEARS	20-39 YEARS
Percent male:	72%	88%	66%
Percent male that reside in Florida:	94%	96%	96%
Female age range:	45-64 YEARS	35-54 YEARS	20-39 YEARS
Percent female:	28%	12%	34%
Percent female that reside in Florida:	91%	94%	97%

SERIOUS INJURIES

	Pedestrian Profile	Bicyclist Profile
Male age range:	20-39 YEARS 50-59 YEARS	20-24 YEARS 50-64 YEARS
Percent male:	62%	81%
Percent male that reside in Florida:	94%	96%
Female age range:	15-44 YEARS 55-69 YEARS	30-34 YEARS 45-59 YEARS
Percent female:	38%	19%
Percent female that reside in Florida:	94%	93%

VEHICLE PROFILE

VEHICLE TYPE

Passenger Car in 50% of crashes

SUV/Pickup Truck in 35% of crashes

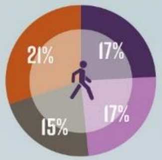
TRGT-0 FLORIDA

VEHICLE YEAR

2012-2016 in 29% of fatalities

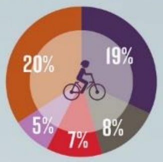
2017-2021 in 18% of fatalities

Pedestrian Action Contributes to 70% of Crashes*



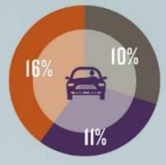
Dart/Dash
In Roadway Improperly
Failure to Yield ROW
Other Actions

Bicyclist Action Contributes to 61% of Crashes*



Failure to Yield ROW
Dart/Dash
Violate Traffic Control Device
Wrong Way Riding
Other Actions

Driver Action Contributes to 37% of Crashes*



Failure to Yield ROW
Careless Driving
Other Actions

*As reported by law enforcement in crash reports.

ROADWAY CHARACTERISTICS OF OVERREPRESENTED AND HIGHEST CRASHES (SHS)

CONTEXT CLASS

SUBURBAN COMMERCIAL (C3C) CONTEXT CLASS

41% of severe and fatal crashes occur on C3C roadways

which are 19% of the network

URBAN GENERAL (C4) CONTEXT CLASS

34% of severe and fatal crashes occur on C4 roadways

which are 9% of the network

POSTED SPEED

POSTED SPEEDS OF 45 - 50 MPH

47% of severe and fatal crashes occur on roadways with a posted speed of

SPEED LIMIT 45 TO SPEED LIMIT 50

which are 24% of the network

POSTED SPEEDS OF 35 - 40 MPH

32% of severe and fatal crashes occur on roadways with a posted speed of

SPEED LIMIT 35 TO SPEED LIMIT 40

which are 12% of the network

NUMBER OF LANES

ROADWAYS WITH 5 - 6 TRAVEL LANES

43% of severe and fatal crashes occur on 5 - 6 lane roadways

which are 19% of the network

ROADWAYS WITH 3 - 4 TRAVEL LANES

43% of severe and fatal crashes occur on 3 - 4 lane roadways

which are 37% of the network

TRANSIT FREQUENCY

TRANSIT IS AVAILABLE

72% of severe and fatal crashes occur on roadways with transit routes.

which are 51% of the network

DEMOGRAPHIC CONSIDERATIONS

SOCIOECONOMIC FACTORS

- % of population **above age 65**
- % of households **below poverty level**
- % of population **with disabilities**
- % of **minority** population
- % of population with **limited English proficiency**
- % of households **with no vehicles**

Census Tracts with **4 OR MORE FACTORS***: **8** Fatalities and Serious Injuries /10,000 population

DRIVE SAFELY IN MEMORY

Census Tracts with **LESS THAN 4 FACTORS***: **4** Fatalities and Serious Injuries /10,000 population

*Represents Census Tracts within a County where a factor falls below that County's Average.

Source: Signal Four (S4) Analytics, 2017-2021 data, downloaded March 2022 & February 2023.

PEDESTRIAN CRASH TYPE REVIEW

CRASH GROUPS BY PEDESTRIAN AGE (ALL ROADS)

Pedestrian Crash Group	5 or less	6-10	11-15	16-20	21-35	36-50	51-65	Over 65	Total
Crossing Roadway - Vehicle Not Turning	***34.2%***	***16.7%***	***31.6%***	***30.1%***	***32.2%***	***36.1%***	***44.8%***	***35.8%***	36.2%
Dash/Dart-Out	***16.0%***	***32.5%***	***22.6%***	***13.4%***	***11.2%***	***12.6%***	***9.7%***	5.1%	11.8%
Unusual Circumstances	***10.2%***	***16.7%***	***13.7%***	***18.3%***	***16.0%***	***10.8%***	8.7%	8.9%	11.5%
Crossing Roadway - Vehicle Turning	***7.6%***	4.4%	6.6%	5.1%	4.2%	6.5%	8.1%	***11.6%***	7.2%
Walking Along Roadway	3.6%	3.5%	***8.0%***	***11.6%***	***11.3%***	***9.2%***	5.1%	3.9%	7.0%
Off Roadway	***8.1%***	***11.4%***	2.4%	2.8%	4.7%	5.7%	5.5%	***12.6%***	6.7%
Pedestrian in Roadway - Circumstances Unknown	4.2%	1.8%	1.9%	6.9%	7.6%	6.6%	4.6%	3.4%	5.3%
Other/Unknown - Insufficient Details	5.5%	2.6%	3.8%	3.0%	5.0%	4.7%	4.6%	3.3%	4.5%
Backing Vehicle	5.4%	3.5%	1.9%	2.3%	2.0%	2.6%	3.4%	***10.3%***	4.2%
Working or Playing in Roadway	1.0%	2.6%	0.9%	0.9%	1.5%	1.9%	1.1%	0.3%	1.2%
Crossing Expressway	0.0%	0.0%	0.5%	1.4%	2.2%	1.3%	1.3%	0.9%	1.1%
Crossing Driveway or Alley	1.2%	0.0%	0.0%	1.2%	0.4%	0.6%	1.3%	1.9%	1.0%
Multiple Threat/Trapped	1.4%	0.9%	2.8%	0.9%	0.6%	0.5%	0.8%	0.8%	0.9%
Bus-Related	0.6%	2.6%	2.8%	1.2%	0.6%	0.2%	0.3%	0.5%	0.6%
Waiting to Cross	0.4%	0.0%	0.5%	0.5%	0.3%	0.3%	0.4%	0.2%	0.3%
Unique Midblock	0.4%	0.9%	0.0%	0.5%	0.3%	0.3%	0.2%	0.4%	0.3%
Grand Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

ROOT CAUSE ANALYSIS PEDESTRIAN & BICYCLE

STATE ROADS

Pedestrian Crash Type	Intersection	Intersection-Related	Non-Intersection	Total
Pedestrian Failed to Yield	306	182	1212	1,700
	18.0%	10.7%	71.3%	100.0%
Dash	78	41	291	410
	19.0%	10.0%	71.0%	100.0%
Dart-Out	32	13	113	158
	20.3%	8.2%	71.5%	100.0%
Motorist Left Turn - Parallel Paths	128	14	13	155
	82.6%	9.0%	8.4%	100.0%
Walking Along Roadway With Traffic - From Behind	3		135	138
	2.2%	0.0%	97.8%	100.0%
Motorist Failed to Yield	104	3	27	134
	77.6%	2.2%	20.1%	100.0%
Nonintersection - Other/Unknown			96	96
	0.0%	0.0%	100.0%	100.0%
Walking in Roadway	25	11	60	96
	26.0%	11.5%	62.5%	100.0%
Vehicle-Vehicle/Object	16	6	60	90
	17.8%	6.7%	66.7%	100.0%
Disabled Vehicle-Related	3	4	83	84
	3.6%	4.8%	98.8%	100.0%
Total	**946**	**333**	**2,578**	**3,857**
	24.5%	**8.6%**	**66.8%**	**100.0%**

LOCAL ROADS

Pedestrian Crash Type	Intersection	Intersection-Related	Non-Intersection	Total
Pedestrian Failed to Yield	154	114	523	791
	19.5%	14.4%	66.1%	100.0%
Dash	56	23	178	257
	21.8%	8.9%	69.3%	100.0%
Walking Along Roadway With Traffic - From Behind	5	6	238	249
	2.0%	2.4%	95.6%	100.0%
Motorist Failed to Yield	153	6	48	207
	73.9%	2.9%	23.2%	100.0%
Motorist Left Turn - Parallel Paths	162	8	19	189
	85.7%	4.2%	10.1%	100.0%
Nonintersection - Other/Unknown	0	0	107	107
	0.0%	0.0%	100.0%	100.0%
Walking in Roadway	18	9	64	91
	19.8%	9.9%	70.3%	100.0%
Dart-Out	18	2	62	82
	22.0%	2.4%	75.6%	100.0%
Vehicle-Vehicle/Object	21	7	49	77
	27.3%	9.1%	63.6%	100.0%
Motor Vehicle Loss of Control	5	7	64	76
	6.6%	9.2%	84.2%	100.0%
Grand Total	808	237	1867	2912
	27.7%	8.1%	64.1%	100.0%

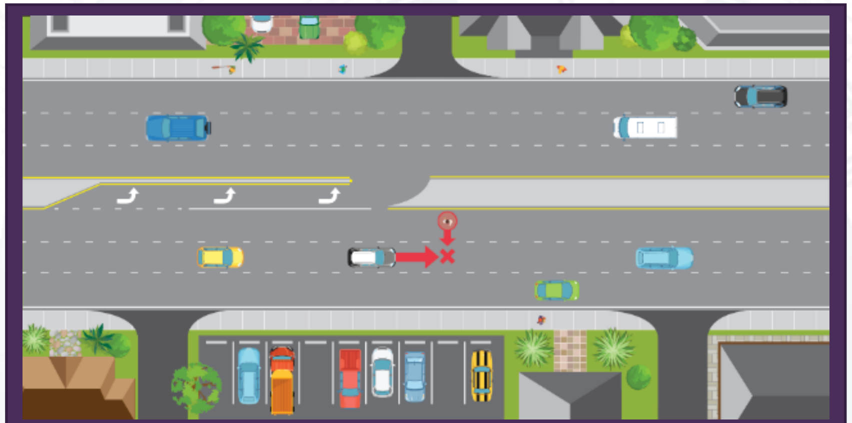
43 percent of all midblock crashes

CROSSING ROADWAY - VEHICLE NOT TURNING (1847/46%)

Pedestrian was struck while crossing roadway by a motorist that was traveling straight thru.

PEDESTRIAN FAILED TO YIELD (1710 / 43%)

Midblock (1210/71%)



Pedestrian Failed to Yield at Midblock

Possible Causes:

- Inadequate or insufficient crossing opportunities.
- Difficulty crossing multilane roads with higher speeds/volumes.
- Multiple lanes with longer crossing distances.
- Limited visibility due to nighttime conditions

C1	C2	C2T	C3R	C3C	C4	C5	C6
0%	3%	1%	7%	**51%**	**32%**	2%	1%

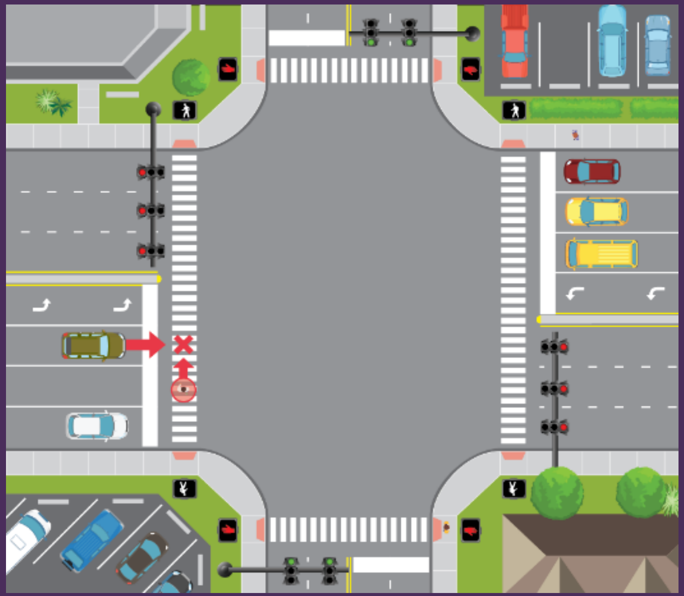
Risk Factors	C3C/Suburban Commercial (51%)	C4/Urban General (32%)
Lane	6-lane (48%) 4-lane (41%)	6-lane (47%) 4-lane (41%)
Posted Speed	45 mph (56%) 50-55 mph (23%)	40 mph (35%) 35-45 mph (92%)
Lighting from Crash Report	Nighttime (86%) Dark Lighted (50%)	Nighttime (80%) Dark Lighted (62%)
Transit Operating	Within ¼-mile (75%)	Within ¼-mile (93%)
Median Type	>15’ Curb & Vegetation (33%) >10’ Raised Traffic Separator (28%)	>10’ Raised Traffic Separator (34%) >10’ Curb & vegetation (29%)
Sidewalk	No sidewalk (13%) 5’ sidewalk (58%) 6’-10’ wide (28%)	5’ sidewalk (46%) 6’-10’ wide (50%)
Outside Shoulder	2’ Curb and gutter (44%) 2’-12’ Paved (33%) Lawn (20%)	2’ Curb and gutter (74%) 2’-12’ Paved (16%
Notes	Crash reports noted pedestrians being invisible due to dark environment or dark clothing.	Majority of the crashes appeared to have resulted from misjudgment of travel speeds and distance pedestrians must cross to get to the other side.

CROSSING ROADWAY - VEHICLE NOT TURNING (1845/46%)

Pedestrian was struck while crossing roadway by a motorist that was traveling straight thru.

MOTORIST FAILED TO YIELD (135 / 3%)

Intersection (107 / 80%)



Motorist Failed to Yield at Intersection

Possible Causes:

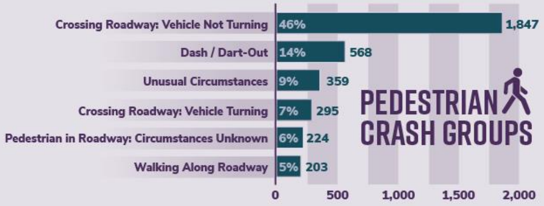
- Motorist ran through a red light at a signalized intersection.
- Failure to stop at signal or stop bar before proceeding - on red

C1	C2	C2T	C3R	C3C	C4	C5	C6
0%	0%	1%	6%	**46%**	**34%**	8%	5%

Risk Factors	C3C/Suburban Commercial (46%)	C4/Urban General (34%)
Lane	6-lane (61%) 4-lane (24%)	6-lane (44%) 4-lane (33%)
Posted Speed	45 mph (45%)	45 mph (39%) 35-45 mph (92%)
Lighting from Crash Report	Nighttime (61%) Dark Lighted (39%) *14% dark not lighted	Nighttime (47%) Dark Lighted (42%)
Location	Signalized (53%)	Signalized (50%)
Transit Operating	Within ¼-mile (94%)	Within ¼-mile (97%)
Median Type	>14’ Raised Traffic Separator (38%) >16’ Curb & vegetation (26%)	>10’ Raised Traffic Separator (39%) >9’ Paved, not TWLTL (36%)
Sidewalk	5’ sidewalk (67%) 6’-10’ wide (31%)	5’ sidewalk (53%) 6’-8’ wide (47%)
Outside Shoulder	2’ Curb and gutter (49%) 2’-12’ Paved (27%) 2’-12’ Lawn (24%)	2’ Curb and gutter (81%)

PEDESTRIAN & BICYCLE TOP PEDESTRIAN CRASH TYPES ON STATE ROADS

The top pedestrian crash groups and types on state roadways for the 2016–2019 time period were evaluated using the Pedestrian and Bicycle Crash Analysis Tool (PBCAT), a method for classifying crashes based on the operational dynamics of the parties leading to the crash. Together the top five crash groups account for over 82 percent of the pedestrian fatalities and serious injuries. **The crash groups were reorganized based on crash location, pedestrian location, and motorist action to identify pedestrian problem areas.** The top three pedestrian problems listed below account for 71 percent of all crashes. Countermeasures to address these problems are identified in the following sections.



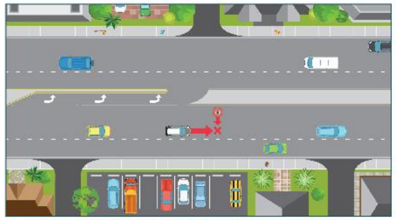
CRASH PROBLEM #1
Pedestrians getting struck by through motorist at midblock locations
(41%)

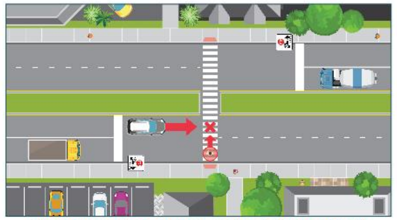
CRASH PROBLEM #2
Pedestrians getting struck by through motorist at intersections
(20%)

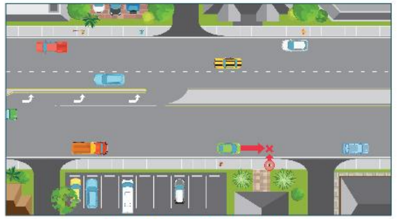
CRASH PROBLEM #3
Pedestrian getting struck by motorist conducting turning movements
(8%)

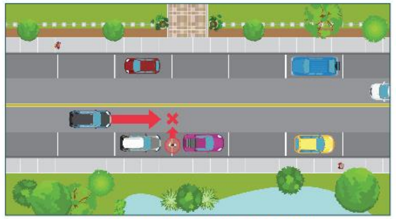
CRASH PROBLEM #1: PEDESTRIANS GETTING STRUCK BY A THROUGH MOTORIST AT MIDBLOCK LOCATIONS WHILE CROSSING A ROADWAY (41% OF CRASHES)

Pedestrians getting struck by a through motorist crossing a roadway at midblock locations constitute 41 percent of pedestrian fatalities and serious injuries on state roads. The crash types involved in midblock crashes are illustrated in the crash type images. The crash types "Pedestrian Failed to Yield", "Motorist Failed to Yield", "Dash" and "Dart-Out" **have similar contributing causes at midblocks and will respond to similar countermeasures**. The countermeasures should include provision of adequate crossing opportunities and roadway design elements that improve comfort and safety for all users.


PEDESTRIAN FAILED TO YIELD AT MIDBLOCK LOCATION


MOTORIST FAILED TO YIELD AT MIDBLOCK LOCATION


DASH AT MIDBLOCK LOCATION

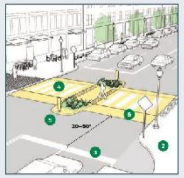

DART-OUT AT MIDBLOCK LOCATION

47% IN C3C
36% IN C4
62% ON 40 AND 45 MPH ROADS
87% ON 4 AND 6-LANE ROADS
80% IN DARK CONDITIONS

Engineering Countermeasure 1: Install midblock crossing opportunities for pedestrians at high volume multi-lane roads near activity centers in C3C, C4, C5 with crosswalk enhancement elements outlined below.


High-visibility crosswalks can help make pedestrians on the crosswalk more visible and reduce pedestrian injury crashes up to 40%. Data and Image Source: FHWA


Pedestrian refuge islands can reduce pedestrian crashes by 32%. Data and Image Source: FHWA


Raised crossings make the pedestrian more prominent in the driver's field of vision. Approach ramps may reduce vehicle speeds and improve motorist yielding and reduce pedestrian crashes by 45%. Data Source: FHWA; Image Source: NACTO


Advance stop or yield markings improve visibility of pedestrians; prevent multiple-threat crashes and reduce pedestrian crashes up to 25%. Data Source: FHWA; Image Source: SR A1A in Brevard County


Pedestrian Hybrid Beacons are ideal for multilane roadways and can reduce pedestrian crashes by 55%. Image Source: PHB on US 441 in Orange County


In-pavement flashing lights reinforced by well maintained retro reflective markings can enhance crosswalk visibility at night. Image Source: SR A1A in Brevard County


Pedestrian scale lighting increases visibility of pedestrians in the crosswalk and provides a feeling of safety and security to pedestrians crossing the road. Image Source: US 441 rendering in Orange County


Rapid Rectangular Flashing Beacons can reduce crashes up to 47% and increase motorist yielding rates up to 98%. Data Source: FHWA Image Source: RRFB on SR A1A in Brevard County

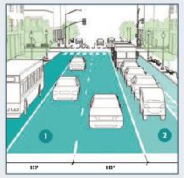

Curb extensions improve the ability of pedestrians and motorists to see each other and reduces crossing distance. Photo Source: NACTO Urban Street Design Guide

Engineering Countermeasure 2: Evaluate and redesign strategic high volume multi-lane roads near activity centers in C3C, C4, C5 based on appropriate speed limits for all road users and roadway reconfiguration with elements to reduce speeding, increase visibility of pedestrians and minimize conflicts.


Road Diet from four-lane undivided roadway to a three-lane roadway can reduce total crashes from 19–47%. Image Source: FDOT Lane Repurposing Guidebook, 2020

Speed control is the most important method for reducing fatalities and serious injuries. Establishing appropriate target speeds increases safety and comfort for pedestrians and other road users.


Wide sidewalks or shared use paths separated by landscaping can create a buffer from traffic and establish priority areas for pedestrians. Image of Lake Nona Blvd., Orlando, FL


Narrower travel lanes can help with reduced speeds and allows room for landscaping and pedestrian amenities. Source: NACTO Urban Street Design Guide


Vertical speed control elements are applied where the target speed of the roadway cannot be achieved through the use of conventional traffic calming elements. Source: NACTO Urban Street Design Guide


Raised Median with refuge islands reduce the exposure time experienced by a pedestrian while crossing a road. Image Source: The Greenway Collaborative

Education Countermeasure 1:
Targeted education for drivers to reinforce that pedestrians have right of way in a crosswalk, whether marked or unmarked; not passing vehicles stopped at a crosswalk; dangers of not stopping at signal or stop bar and dangers of speeding and aggression.

Education Countermeasure 2:
Provide safety education to pedestrians about nighttime visibility limitations; watching for motorists even if pedestrian has right-of-way, yielding to motorists at non-crosswalk locations; and using designated crossings.

Enforcement Countermeasure 1:
Implement progressive ticketing at midblock crossing locations regarding motorist yielding compliance including education, warnings and then citation.

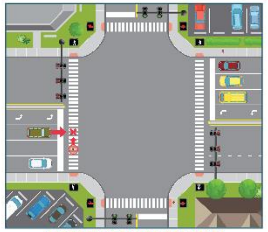
CRASH PROBLEM #2: PEDESTRIANS GETTING STRUCK BY A THROUGH MOTORIST AT STOP CONTROLLED OR SIGNALIZED INTERSECTIONS (20% OF CRASHES)

The same four crash types have similar contributing causes at intersections and account for 20 percent of all crashes on state roads. The countermeasures for addressing this crash problem should include implementing pedestrian friendly accommodations at traffic signals to reduce excessive delay to pedestrians, which will improve yielding behavior and reduce opportunities for violations.

44% IN C4
39% IN C3C
60% ON 40 AND 45 MPH ROADS
85% ON 4 AND 6-LANE ROADS
76% IN DARK CONDITIONS


DASH AT INTERSECTION


PEDESTRIAN FAILED TO YIELD


MOTORIST FAILED TO YIELD

Engineering Countermeasure 1: Design or retrofit intersections to improve visibility of pedestrians, lower speeds on intersection approaches and reduce pedestrian crossing distances.

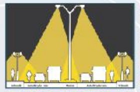

Compact intersections maximize activity within the sight triangle, giving all users a better view of potential conflicts. Source: NACTO


Roundabouts substantially reduce pedestrian crashes by reducing speeds and conflicts. Converting a 2-way two way stop controlled intersection and signalized intersection to a roundabout reduces crashes by 82% and 78% respectively. Source: FHWA


Raised intersections create a safe, slow-speed crossing and public space at minor intersections. May be applicable in C5 and C6 roads. Source: NACTO


Curb extensions improve ability of motorists and pedestrians to see each other and reduce the pedestrian crossing distances. Source: PEDSAFE


Raised pedestrian crossings make the pedestrian more prominent in the driver's field of vision. Image of Tavistock Lakes Blvd., Orlando, FL

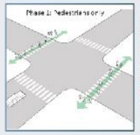

Lighting is crucial to the visibility of pedestrians and approaching vehicles. Lighting can reduce crashes up to 42% for nighttime injury pedestrian crashes at intersections. Source: FHWA


Pedestrian refuge islands can reduce pedestrian crashes by 56%. Medians with marked crosswalks reduce pedestrian crashes by 46%. Source: FHWA


High-visibility crosswalks can help make pedestrians on the crosswalk more visible and reduce pedestrian injury crashes up to 40%. Source: FHWA

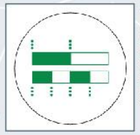

Far side bus stops allow pedestrians to cross behind the bus and also increase the visibility of crossing pedestrians for drivers waiting at the signal. Image Source: NACTO

Engineering Countermeasure 2: Modify signal timing and phasing on C3C, C4 and C5 roads with elements that are more responsive to pedestrian movement including:



Leading Pedestrian Intervals increase visibility of pedestrians, minimizes conflicts between pedestrians and vehicles and increases motorist yield rates. FHWA reports 13% reduction in pedestrian-vehicle crashes at intersections. Image Source: NACTO


Automated pedestrian detection or passive detection identifies pedestrians and prompts a walk signal without needing to press a button. Can be applied at both signalized intersections and midblock crossings equipped with RRFB, PHB and MPS. Source: FDOTResearch.com

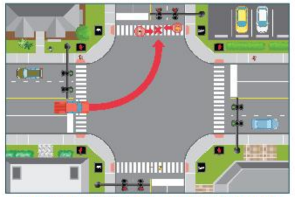

Shorter signal cycles are more appropriate along C4, C5 and C6 roadways to help streets function as a complete network rather than a series of major corridors and improves pedestrian compliance. Source: NACTO

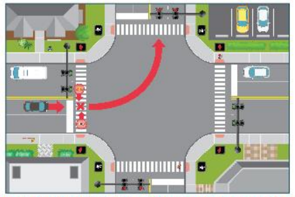
Education Countermeasure 1: Provide safety education for motorists to reinforce the dangers of not stopping at a red signal or stop bar before proceeding. Image Source: alerttodayflorida.com

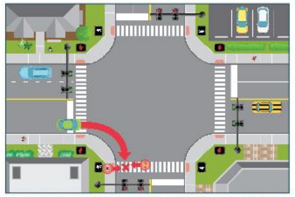

Enforcement Countermeasure 1: Implement progressive ticketing at midblock crossing locations regarding motorist yielding compliance including education, warnings and then citation through high visibility enforcement programs. Image Source: Bike/Walk Central Florida

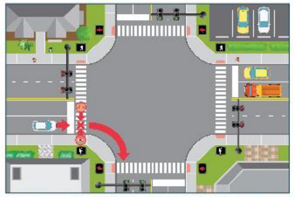
CRASH PROBLEM #3: PEDESTRIAN GETTING STRUCK BY A MOTORIST CONDUCTING TURNING MOVEMENT AT INTERSECTIONS OR DRIVEWAYS (8% OF CRASHES)

These crashes include where a pedestrian is struck while crossing a road by a turning motorist. The most common crash type is where the motorist is turning left while initially traveling on a parallel path with the pedestrian before making a left turn and striking the person. Countermeasures to address the problem should include strategies to reduce conflicts between pedestrians and left turning motorists and right turning motorists.


MOTORIST LEFT TURN – PARALLEL PATHS


MOTORIST LEFT TURN – PERPENDICULAR PATHS


MOTORIST RIGHT TURN – PARALLEL PATHS


MOTORIST RIGHT TURN – PERPENDICULAR PATHS

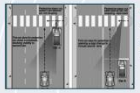
42% IN C4
32% IN C3C
54% ON 40 AND 45 MPH ROADS
81% ON 4 AND 6-LANE ROADS
34% IN DARK CONDITIONS

Engineering Countermeasure 1: Redesign high pedestrian crash intersections in C3C and C4 with countermeasures that reduce pedestrian crossing distances and reduce turning speeds for left turning vehicles.


Curb extensions at an intersection shortens the crossing distance for pedestrians and improves ability of motorists and pedestrians to see each other. Source: PEDSAFE


High-visibility crosswalks can help make pedestrians on the crosswalk more visible and reduce pedestrian injury crashes up to 40%. Source: FHWA


Tighter corner radii will reduce vehicle turning speeds and pedestrian crossing distances. The smallest practical curb radii should be chosen based on effective curb radius for design vehicle. Source: PEDSAFE


Advance stop or yield markings improve visibility of pedestrians; prevent multiple-threat crashes and reduce pedestrian crashes up to 25%. Source: FHWA


Engineering Countermeasure 2: Tighten and calm left turns by implementing a permanent plastic curb delineator on receiving centerline and/or by marking guiding radius and turn path. Source: NACTO

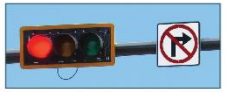

Engineering Countermeasure 3: Provide fully protected left turn phase separate from the pedestrian walk phase signal at high priority intersections. Source: FHWA STEP Countermeasure


Engineering Countermeasure 4: Install Leading Pedestrian Interval (LPI) in conjunction with "Right Turn on Red" restrictions at high pedestrian crash intersections. Source: NACTO


Engineering Countermeasure 5: Redesign high pedestrian crash intersections with reduced radii or right turn slip lanes, high visibility marked crosswalks, advanced stop lines and reduced curb radii. Source: NACTO

Education Countermeasure 1: Provide safety education to pedestrian on using LPI and other signal modifications as well as emphasize the importance of looking back for a motorist turning left or right before crossing.

Education Countermeasure 2: Provide safety education to motorists to stop prior to entering crosswalk and look for pedestrians before making a left or right turn. Image Source: alerttodayflorida.com



BICYCLIST CRASH TYPE REVIEW

CRASH GROUP BY BICYCLE AGE GROUPS

Bicylist Crash Group	5 or less	6-10	11-15	16-20	21-35	36-50	51-65	Over 65	Total
Motorist Overtaking Bicyclist	***8.3%***	3.6%	6.8%	7.6%	***13.9%***	***16.6%***	***15.5%***	***14.8%***	13.1%
Bicyclist Failed to Yield - Midblock	***14.6%***	***16.4%***	***20.9%***	9.3%	***10.6%***	***10.9%***	***11.1%***	8.7%	11.7%
Motorist Failed to Yield - Sign-Controlled Intersection	***8.1%***	7.3%	8.5%	8.1%	***11.0%***	8.6%	8.5%	***12.5%***	9.3%
Motorist Failed to Yield - Midblock	***8.5%***	5.5%	6.8%	***15.3%***	8.9%	9.2%	7.4%	8.9%	8.7%
Bicyclist Failed to Yield - Signalized Intersection	***9.3%***	3.6%	8.5%	8.9%	8.9%	9.2%	8.0%	5.1%	8.3%
Motorist Left Turn/Merge	5.6%	1.8%	4.0%	5.9%	7.1%	6.7%	7.8%	8.9%	6.9%
Bicyclist Failed to Yield - Sign-Controlled Intersection	6.1%	***21.8%***	***10.7%***	***10.6%***	4.2%	4.8%	6.2%	5.6%	6.2%
Bicyclist Left Turn/Merge	***8.0%***	7.3%	5.6%	4.7%	6.2%	5.2%	4.8%	4.6%	5.7%
Crossing Paths - Other Circumstances	4.6%	***9.1%***	7.9%	3.8%	4.1%	4.7%	5.3%	8.9%	5.3%
Motorist Right Turn/Merge	5.3%	3.6%	2.8%	6.8%	5.0%	6.5%	4.4%	2.3%	4.9%
Motorist Failed to Yield - Signalized Intersection	5.0%	0.0%	2.3%	5.5%	4.2%	4.7%	4.2%	4.6%	4.4%
Parallel Paths - Other Circumstances	4.0%	3.6%	5.1%	3.0%	3.5%	2.8%	4.1%	4.3%	3.7%
Loss of Control/Turning Error	4.0%	3.6%	2.8%	3.4%	2.9%	3.3%	2.9%	4.8%	3.4%
Head-On	1.2%	1.8%	4.0%	1.7%	3.8%	1.6%	2.6%	0.8%	2.2%
Nonroadway	2.0%	3.6%	2.3%	2.1%	1.5%	1.2%	1.9%	0.5%	1.6%
Other/Unknown - Insufficient Details	2.5%	1.8%	1.1%	1.3%	1.5%	1.5%	1.4%	0.8%	1.5%
Bicyclist Right Turn/Merge	0.3%	0.0%	0.0%	0.8%	1.8%	0.9%	1.2%	0.8%	1.0%
Bicyclist Overtaking Motorist	0.8%	0.0%	0.0%	0.8%	0.3%	0.4%	1.1%	1.8%	0.8%
Other/Unusual Circumstances	1.2%	3.6%	0.0%	0.0%	0.0%	1.2%	1.0%	0.3%	0.7%
Backing Vehicle	0.7%	1.8%	0.0%	0.4%	0.3%	0.3%	0.6%	1.3%	0.6%
Parking/Bus-Related	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

BICYCLIST FAILED TO YIELD MIDBLOCK (249 / 15%)

Bicyclist Ride-out – Midblock location

Group: Bicyclist rode into the street from a midblock location without yielding to a motorist.

Possible Causes:

- *Bicyclist rides out from a residential or commercial driveway, sidewalk, or other midblock without stopping or yielding.*
- *Common in children who fail to stop/scan before crossing.*
- *Motorist speed increases the risk.*

C1	C2	C2T	C3R	C3C	C4	C5	C6
0%	2%	1%	9%	**44%**	**40%**	3%	1%

Risk Factors	C3C/Suburban Commercial (44%)	C4/Urban General (40%)
Lane	6-lane (49%) 4-lane (43%)	6-lane (45%) 4-lane (40%)
Posted Speed	45 mph (53%) 40 mph (18%)	40 mph (37%) 35-45 mph (90%)
Lighting from Crash Report	Nighttime (51%)	Nighttime (55%)
Transit Operating	Within ¼-mile (80%)	Within ¼-mile (89%)
Median Type	>15’ Curb & vegetation (40%) >15’ Raised Traffic Separator (23%)	>15’ Raised Traffic Separator (38%) >15’ Curb & vegetation (21%)
Sidewalk	5’ sidewalk (57%) 6’-10’ wide (31%)	5’ sidewalk (51%) 6’-10’ wide (44%)
Bike Facility		
Outside Shoulder	2’ Curb and gutter (51%) 2’-12’ Lawn (21%) 2’-12’ Paved (25%)	2’ Curb and gutter (79%) 2’-12’ Paved (17%)
Bicyclist Position	On roadway (63%)	On roadway (63%)
Bicyclist Direction	85% of crashes listed as not applicable or unknown	95% of crashes listed as not applicable or unknown

MOTORIST FAILED TO YIELD – MIDBLOCK (187/11%)

Motorist Drive-out Commercial Driveway

Group: Motorist drove across the sidewalk or into the street from a midblock location without yielding to the bicyclist.

Possible Causes:

- Motorist visibility may be obstructed due to site or street elements.
- Motorist may fail to look right before pulling out or fail to detect high speed bicyclists or bicyclists riding the wrong way on the roadway or sidewalk.

C1	C2	C2T	C3R	C3C	C4	C5	C6
0%	1%	0%	9%	**57%**	**31%**	2%	1%

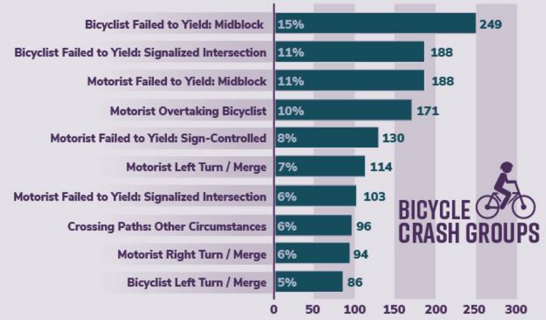
Risk Factors	C3C/Suburban Commercial (57%)	C4/Urban General (31%)
Lane	6-lane (57%) 4-lane (27%)	6-lane (59%) 4-lane (38%)
Posted Speed	45 mph (58%) 45-55 mph (79%)	45 mph (50%) 35-45 mph (98%)
Lighting from Crash Report	Nighttime (11%)	Nighttime (12%)
Transit Operating	Within ¼-mile (84%)	Within ¼-mile (90%)
Median Type	>14' Curb & vegetation (43%) >15' Raised Traffic Separator (28%) 10'-25' Paved not TWLT (21%)	>15' Curb & vegetation (35%) >15' Raised Traffic Separator (40%)
Sidewalk	5' sidewalk (64%) 6'-10' wide (29%)	5' sidewalk (43%) 6'-10' wide (55%)
Outside Shoulder	2'-12' Paved (42%) 2' Curb and gutter (38%)	2' Curb and gutter (74%) 2' Paved (22%)
Bicyclist Position	On a sidewalk, crosswalk, or driveway crossing (84%)	On a sidewalk, crosswalk, or driveway crossing (81%)
Bicyclist Direction	With Traffic (82%)	With Traffic (81%)

PEDESTRIAN & BICYCLE TOP BICYCLE CRASH TYPES ON STATE ROADS

FDOT TARGET ZERO FATALITIES & SERIOUS INJURIES

The top bicycle crash types for state roadways from 2016-2019 was also evaluated using the Pedestrian and Bicycle Crash Analysis Tool (PBCAT). Together the top ten crash types contribute to 83% of the crashes. These crash types have been grouped into crash problems and presented below with recommended countermeasures. The eighth crash type, Crossing Paths: Other Circumstances, has not been detailed below as some of the other countermeasures will address this crash type as well.

1. Bicyclist Failed to Yield: Midblock **(15%)**
2. Bicyclist Failed to Yield: Signalized Intersection **(11%)**
3. Motorist Failed to Yield: Midblock **(11%)**
4. Motorist Overtaking Bicyclist **(10%)**
5. Motorist Failed to Yield: Sign-Controlled Intersection **(8%)**
   Motorist Failed to Yield: Signalized Intersection **(6%)**
6. Motorist Left Turn/Merge **(7%)**
   Motorist Right Turn/Merge **(6%)**
7. Bicyclist Left Turn/Merge **(5%)**



CRASH PROBLEM #1: BICYCLIST RIDES OUT FROM A MIDBLOCK LOCATION INTO THE ROAD AND IS STRUCK BY A MOTORIST (15%)

This is the highest crash group on state roads and constitutes 15% of fatalities and serious injuries. The bicyclist rides out from a midblock location without stopping/yielding or after stopping/slowing. 40% of this crash type involves children under 15 who may fail to stop and scan for motorists before crossing. Motorist speeding could increase the severity of these crashes. The following countermeasures can be effective at addressing this crash type.

BICYCLIST RIDE OUT AT MIDBLOCK

44% IN C3C
40% IN C4
39% ON 45 MPH ROADS
25% ON 40 MPH ROADS
41% ON 4-LANE ROADS
44% ON 6-LANE ROADS
53% IN DARK CONDITIONS
55% OF BICYCLISTS RODE FACING TRAFFIC

Adequate roadway lighting helps motorists see bicyclists and allows bicyclists to judge motorist speeds. Source: BikeSAFE

Median refuge islands provides protected spaces for bicyclists to cross one direction of traffic at a time. Source: NACTO

Improve **sight distance** through landscaping maintenance, parking limitation and proper sign placement. Source: FHWA BIKESAFE

Enhanced crossings use flashing beacons, signing, striping and pavement markings to alert motorists to crossing bicyclists. Source: FHWA

Active warning beacons can be placed to alert motorists that bicyclists may be crossing the road. Source: NACTO

Optimize **signal timings** to create gaps midblock and provide crossing opportunities for bicyclists along the corridor. Source: NACTO

Provide **safety education** to bicyclists to slow down and yield to motorists at midblock locations and nighttime visibility.

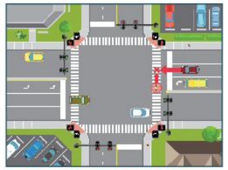
Educate motorists to anticipate bicyclists or pedestrians and midblock locations and the dangers of speeding.

Implement **positive enforcement campaign** directed at bicyclists about yielding before entering roadway and not making improper turns. Distribute bicycle lights as part of enforcement.

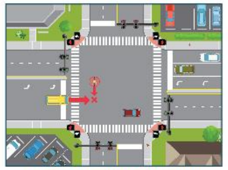
CRASH PROBLEM #2: BICYCLIST RIDES INTO A SIGNALIZED INTERSECTION AND IS STRUCK BY A MOTORIST (11%)

The bicyclist violated the signal and rode into the intersection and collided with the motorist or first stopped and then rode in. This crash type has the third highest fatalities of all crash types.

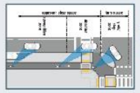
47% IN C3C
38% IN C4
40% ON 45 MPH ROADS
20% ON 40 MPH ROADS
48% ON 6-LANE ROADS
37% ON 4-LANE ROADS
44% IN DARK CONDITIONS
46% OF BICYCLISTS RODE FACING TRAFFIC



BICYCLIST RIDE THROUGH AT SIGNAL



BICYCLIST RIDE OUT AT SIGNAL



Improve sight lines and sight distances at intersections. Source: Separated Bike Lane Design Guide, MDOT

Cycle tracks provide exclusive space for bicyclists and may be one- or two-way. Source: Urban Bikeway Design Guide, NACTO. (Photo from Chicago, IL)

Optimize **signal timings** and add bicycle activation to the traffic signal with Bicycle Detector Pavement Marking. Source: NACTO Bikeway Design Guide

Bicycle signals make crossing intersections safer for bicyclists by clarifying when to enter and by restricting conflicting vehicle movements. Source: NACTO

Buffered bike lanes provide buffer space separating bicyclists from motorists. Source: Urban Bikeway Design Guide, NACTO. (Photo from Chicago, IL)

Bike boxes provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase. Source: NACTO Bikeway Design Guide

Roundabouts substantially reduce bicycle crashes by reducing speeds and conflicts. Source: FHWA

Median refuge islands provide protected spaces for bicyclists. Source: Urban Bikeway Design Guide, NACTO. (Photo from San Luis Obispo, CA)

Educational materials reminding bicyclists that they have the same rights and responsibilities as a motorist on the roadway.

CRASH PROBLEM #3: MOTORIST RIDES OUT FROM A MIDBLOCK LOCATION AND STRIKES THE BICYCLIST (11%)

This crash type group occurs when a motorist pulls out of a midblock location and fails to yield to a bicyclist riding along a roadway or a sidewalk. Motorist visibility may be obstructed due to street elements or motorist might fail to look right before pulling out or fail to detect bicyclists riding the wrong way on the roadway or sidewalk.

MOTORIST DRIVE-OUT

57% IN C3C
31% IN C4
56% ON 45 MPH ROADS
16% ON 40 MPH ROADS
57% ON 6-LANE ROADS
30% ON 4-LANE ROADS
88% IN DAYLIGHT CONDITIONS
82% OF BICYCLISTS RODE FACING TRAFFIC

Access management through consolidating driveways and adding medians can help reduce conflict between motorists and bicyclists.

Driveway improvements with narrow driveways, tighter radii and improved driveway definition can increase sight distance and manage speeds.

Educational materials reminding bicyclists about nighttime visibility limitations and dangers of wrong way riding.

Roadway lighting can improve crosswalk visibility and help motorists see bicyclists and bicyclists better judge motorist speeds at night.

Improve **sight distance** through landscape maintenance, parking limitation and proper sign placement.

Educational materials reminding motorists to look both ways and stop and yield before pulling out of the driveway.

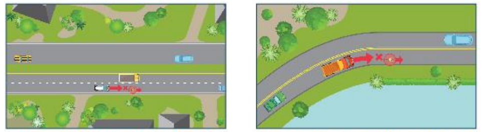
Signage reminding motorists to look for cross traffic can be implemented at commercial driveways.

Improve **crosswalk visibility** through pavement markings, green paint at conflict points, enhanced bike lane markings and surface materials.

Sidewalk stencils reminding bicyclists to be aware of motorists who may not expect to see them on their right before pulling out at a midblock location.

CRASH PROBLEM #4: MOTORIST OVERTAKES A BICYCLIST (10%)

This crash type group involves motorists overtaking but misjudging the space to safely pass the bicyclist, bicyclist suddenly swerving onto the path of the motorist or motorist failing to detect bicyclists and striking from behind. This crash type has the second highest fatalities of all crash types.



MOTORIST OVERTAKING - MISJUDGED SPACE

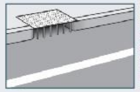
MOTORIST OVERTAKING - UNDETECTED BICYCLIST

39% IN C3C
22% IN C2
37% ON 45 MPH ROADS

18% ON 55 MPH ROADS
53% ON 4-LANE ROADS

25% ON 2-LANE ROADS
42% BICYCLIST IN SHARED TRAVEL LANE

57% BICYCLISTS IN PAVED SHOULDER



Roadway surface hazard improvements to prevent poor drainage, slippery surface, pavement gaps and debris accumulation. Include bike safe grates, curb inlets, narrow rumble strips. Source: BikeSafe

Implement **pavement markings** to provide separation for bicyclists via colored bike lanes and markings for merging and weaving. Source: NACTO

Bicyclist safety education to reinforce bicyclists have same rights and responsibilities; wearing high visibility clothing; wearing a properly fitted helmet; and taking over the travel lane if the bicycle lane or shoulder is too narrow.

Exclusive bike facilities like buffered bike lanes, cycle tracks or wide curb lanes increased bicyclist comfort and safety. Source: Urban Bikeway Design Guide, NACTO.

Lighting is crucial to the visibility of bicyclists and approaching vehicles; especially in over and underpasses. Photo: Seattle, WA. Source: BikeSafe

Driver safety education about Florida's 3-ft safe passing law, bicyclists having same rights and dangers of distracted driving.

Provide **safe, accessible spaces on bridges and overpasses** for bicyclists to navigate ascents and descents with smooth riding surfaces. Source: Bike Safe

Sign improvements such as "Bicycles may use full lane", "3-ft minimum passing", and "share the road" signs can make motorists more aware of bicyclists on roads.

Enforcement of safe passing law via automatic sensor-based or video-based enforcement.

CRASH PROBLEM #5: MOTORIST FAILED TO YIELD AT INTERSECTIONS - SIGN-CONTROLLED (8%) AND SIGNALIZED (6%)

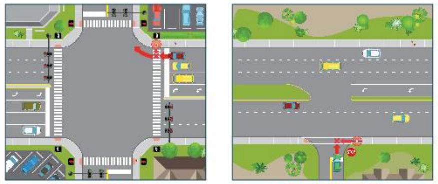
This crash type group involves crashes where the motorist drove into the crosswalk area or intersection and collided with the bicyclist. The motorist either violated the signal or the sign or did not properly yield right-of-way to the bicyclist.

54% IN C3C
30% IN C4
53% ON 45 MPH ROADS

29% ON 35-40 MPH ROADS
49% ON 6-LANE ROADS

37% ON 4-LANE ROADS
56% BICYCLISTS FACING TRAFFIC

84% DAYLIGHT CONDITIONS



MOTORIST DRIVE-OUT SIGNALIZED INTERSECTION

MOTORIST DRIVE-THRU STOP-CONTROLLED INTERSECTION

High-visibility crosswalks can help make bicyclists on the crosswalk more visible and reduce injury crashes up to 40%. Source: FHWA

Protected Intersections can reduce crossing distances and exposure, keeps bicyclists physically separate, making bicycling at intersections more comfortable. Source: NACTO

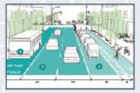
Speed control is the most important method for reducing fatalities and serious injuries. Establishing appropriate target speeds increases safety and comfort for pedestrians.

Roundabouts substantially reduce bicycle crashes by reducing speeds and conflicts. Source: FHWA Image Source: NACTO

High visibility pavement markings to improve awareness and visibility of bicyclists via bike boxes, colored bike lanes, bike lane striping thru the intersection and left of right turn lanes. Source: NACTO

Bicyclist safety education about the importance of conspicuity through use of bike lights and reflective clothing and the dangers of wrong way riding.

Tighter corner radii will reduce vehicle turning speeds and bicyclist crossing distances. The smallest practical curb radii should be chosen based on effective curb radius for design vehicle. Source: BikeSafe

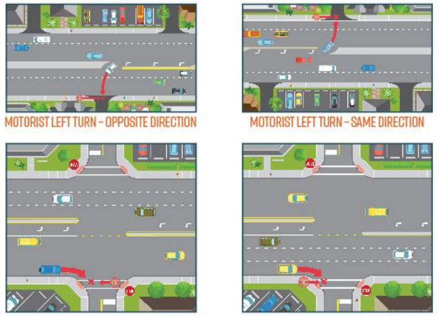


Narrower travel lanes can help with reduced speeds and allows room for landscaping and pedestrian amenities. Source: NACTO

Enforcement of yielding violations and positive reinforcement through distribution of bike lights and discussion about wrong way riding.

CRASH PROBLEM #6: LEFT TURN MERGE (7%)/RIGHT TURN MERGE (6%)

This problem consists of two crash groups associated with motorist left turning and right turning crashes. In the left turn crashes, the motorist could be looking for gap in traffic and fail to look for bicyclist on multilane roads. In right turning crashes, the motorist may be making a right turn (on red) and fail to look to the right for approaching bicyclist. Bicyclist could be riding against traffic on the road or sidewalk.



MOTORIST LEFT TURN - OPPOSITE DIRECTION

MOTORIST LEFT TURN - SAME DIRECTION

MOTORIST RIGHT TURN - OPPOSITE DIRECTION

MOTORIST RIGHT TURN - SAME DIRECTION

MOTORIST LEFT TURN

39% IN C4
38% IN C3C

44% ON 45 MPH ROADS

35% ON 35-40 MPH ROADS

40% ON 4-LANE ROAD

33% ON 6-LANE ROADS

53% BICYCLISTS RIDING WITH TRAFFIC

75% DAYLIGHT CONDITIONS

MOTORIST RIGHT TURN

46% IN C3C
32% IN C4

47% ON 45 MPH ROADS

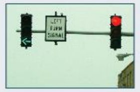
33% ON 35-40 MPH ROADS

43% ON 4-LANE ROAD

42% ON 6-LANE ROADS

71% BICYCLISTS RIDING WITH TRAFFIC

78% DAYLIGHT CONDITIONS



Provide **protected-only left-turn phasing** at high priority intersections in urban areas and near activity centers. Image Source: BIKESAFE

Through Bike Lanes can allow bicyclists to position themselves to the left of right turn lanes and signage for right turn motorists to yield to bicyclists increase yielding behavior by motorists. Image Source: NACTO

Implement **intersection pavement markings and design** such as colored bike lanes combined with advanced stop bar at intersections to allow bicyclists to proceed to the front of the queue at signalized locations.

Restrict left turns at midblock locations or side streets to reduce left turn conflicts at high bicycle usage corridors or near activity centers. Image Source: NACTO

Combined bike/turn lane with a bike lane delineation in the inside portion of a dedicated right turn lane can minimize conflicts with right turning vehicles. Image Source: NACTO

Educate bicyclists to take over the travel lane if designated bicycle lane does not continue through to the far end of the intersection.

MUTCD-approved regulatory or warnings signs (such as Yield when Turning or Watch for Bikes types of signs) can reduce motorist violations at intersections. Source: NACTO

Implement right-turn-on-red (RTOR) restrictions at intersections with high bicycle volumes and high right turning vehicles and crashes

Enforce motorist requirement to fully stop behind stop bar before turning.

CRASH PROBLEM #7: BICYCLIST LEFT TURN MERGE (5%)

This crash type group involves crashes where a bicyclist turns or merges left in front of a motorist going in the same direction or opposite direction. In the former, the rider could fail to yield to a motorist coming from behind or motorist may not suspect the bicyclist will turn (speed could be a factor). In the latter, the bicyclist may turn left into the motorist's path at an intersection or midblock.

43% IN C3C
23% IN C4
35% ON 45 MPH ROADS

29% ON 35-40 MPH ROADS
44% ON 4-LANE ROADS

30% ON 6-LANE ROADS
89% BICYCLISTS RIDING WITH TRAFFIC

54% DAYLIGHT CONDITIONS

BICYCLIST LEFT TURN - OPPOSITE DIRECTION

BICYCLIST LEFT TURN - SAME DIRECTION

Bike boxes extending across the intersection can facilitate bicyclist left turn positioning at intersections and provide a safe way to get ahead of queuing. Image Source: NACTO Urban Bikeway Design Guide

Leading Bicycle Intervals can provide priority and lead time to bicyclists at intersections, especially school intersections along priority corridors. Image Source: NACTO Bikeway Guide

Medians and crossing islands can help manage left turn movements, provide a refuge for bicyclists and break the crossing in two stages. Image Source: NACTO Urban Street Design Guide

Two-stage turn queue boxes allows bicyclists to safely make left turns on multi lane roadways with higher traffic speeds. Image Source: NACTO Urban Bikeway Design Guide

Bicycle detection and activation improves efficiency and reduces delay for bicycle travel. Image Source: NACTO Bikeway Guide

Bicycle lanes buffered by pavement markings can provide exclusive space for bicyclists and create a buffer between the bike and motor vehicle lanes. Image Source: NACTO Bikeway Guide

DISTRICT LEVEL SUMMARIES

PED BIKE FACTORS BY DISTRICT

Risk Factors	State	D1	D2	D3	D4	D5	D6	D7
Ped Bike Share of All Fatalities	27%	23%	23%	24%	29%	27%	**33%**	**32%**
Fatalities during Dark Hours (6 p.m. - 6 a.m.)	72%	70%	74%	75%	71%	**77%**	68%	72%
Lighting Condition during Crash (dark not lighted)	31%	**39%**	33%	**53%**	19%	**38%**	17%	27%
State Road Share of Crashes	40%	34%	**55%**	**51%**	**44%**	42%	30%	33%
District Share of Crashes		15%	8%	6%	18%	21%	13%	19%
Midblock Crashes								
Pedestrians	74%	76%	77%	80%	75%	75%	65%	74%
Bicyclists	54%	52%	62%	63%	52%	52%	46%	56%

More significant than statewide values

PED BIKE CRASH FACTORS BY DISTRICT

Risk Factors	State	D1	D2	D3	D4	D5	D6	D7
Context Class								
Most Overrepresented	C3C/C4	C3C/C3R/C4	C3C/C4	C3C/C4	C4/C3C	C3C/C4	C4/C5	C3C/C4
Highest Share	C3C	C3C	C3C	C3C	C4	C3C	C4	C3C
Highest and Overrepresented	**C3C**	**C3C**	**C3C**	**C3C**	**C4**	**C3C**	**C4**	**C3C**
Number of Lanes								
Most Overrepresented	5-6	5-6	5-6	5-6	**5-6**	5-6	5-6	**5-6**
Highest Share	3-4	3-4	3-4	3-4	**5-6**	3-4	3-4	**5-6**
Posted Speeds								
Highest Share	45-50 mph	45-55 mph	**45 mph**	**45/35-40 mph**	**45/35-40 mph**	45-50 mph	40-45 mph	45-50 mph
Most Overrepresented	35-40 mph	35-40 mph	**45 mph**	**35-40 mph**	**35-40 mph**	35-40 mph	30-35 mph	35-40 mph
On roadways with transit service	72%	70%	60%	58%	**87%**	**75%**	**86%**	53%

Priority Areas

TOP PEDESTRIAN CRASH TYPES BY DISTRICT

Midblock Crash Types	State	D1	D2	D3	D4	D5	D6	D7
Crossing Roadway - Vehicle Not Turning	**48%**	**50%**	**43%**	**46%**	**44%**	**50%**	**45%**	**54%**
Pedestrian Failed to Yield	47%	49%	42%	45%	44%	49%	43%	53%
Motorist Failed to Yield	1%	1%	1%	1%	0%	1%	2%	1%
Dash/Dart-Out	**16%**	**16%**	**11%**	**11%**	**25%**	**13%**	**20%**	**14%**
Dash	11%	11%	8%	5%	19%	10%	14%	10%
Dart-Out	4%	5%	3%	5%	6%	3%	5%	4%
Walking Along Roadway	**8%**	**10%**	**11%**	**19%**	**4%**	**6%**	**2%**	**7%**
Walking Along Roadway - Traffic from Behind	5%	6%	8%	14%	3%	4%	1%	4%

#1

#2

#3

Higher than statewide values

TOP PEDESTRIAN CRASH TYPES BY DISTRICT

Intersection Crash Types	State	D1	D2	D3	D4	D5	D6	D7
Crossing Roadway - Vehicle Not Turning	**47%**	**41%**	**43%**	**47%**	**32%**	**60%**	**43%**	**51%**
Pedestrian Failed to Yield	38%	35%	37%	44%	27%	43%	36%	44%
Motorist Failed to Yield	8%	6%	6%	3%	5%	17%	8%	7%
Dash/Dart-Out	**13%**	**11%**	**16%**	**12%**	**18%**	**9%**	**13%**	**10%**
Dash	9%	8%	13%	9%	11%	6%	12%	6%
Dart-Out	4%	3%	3%	3%	7%	3%	1%	4%
Crossing Roadway - Vehicle Turning	**21%**	**31%**	**15%**	**20%**	**26%**	**12%**	**24%**	**24%**
Motorist Left Turn - Parallel Paths	11%	16%	9%	11%	12%	6%	15%	11%
Motorist Right Turn - Parallel Paths	4%	6%	3%	4%	6%	3%	3%	5%

#1

#2

#3

Higher than statewide values

TOP BICYCLIST CRASH TYPES BY DISTRICT

Midblock Crash Group	State	D1	D2	D3	D4	D5	D6	D7
Bicyclist Failed to Yield - Midblock	28%	27%	29%	19%	28%	24%	36%	32%
Motorist Failed to Yield - Midblock	21%	24%	6%	8%	23%	28%	14%	27%
Motorist Overtaking Bicyclist	18%	14%	31%	28%	14%	24%	18%	10%
Bicyclist Left Turn/Merge	7%	9%	7%	12%	6%	5%	2%	8%

Ranking #1

Ranking #2

Ranking #3

Higher than statewide values

TOP BICYCLIST CRASH TYPES BY DISTRICT

Crash Group (Intersection)	State	D1	D2	D3	D4	D5	D6	D7
Bicyclist Failed to Yield - Signalized Intersection	23%	21%	25%	26%	29%	20%	23%	23%
Motorist Failed to Yield - Sign Controlled Intersection	16%	14%	8%	13%	10%	21%	15%	23%
Motorist Failed to Yield - Signalized Intersection	13%	17%	14%	17%	12%	13%	6%	13%
Motorist Left Turn/Merge	11%	11%	12%	17%	13%	9%	10%	9%
Crossing Paths - Other Circumstances	10%	12%	9%	3%	15%	6%	8%	11%

Ranking #1

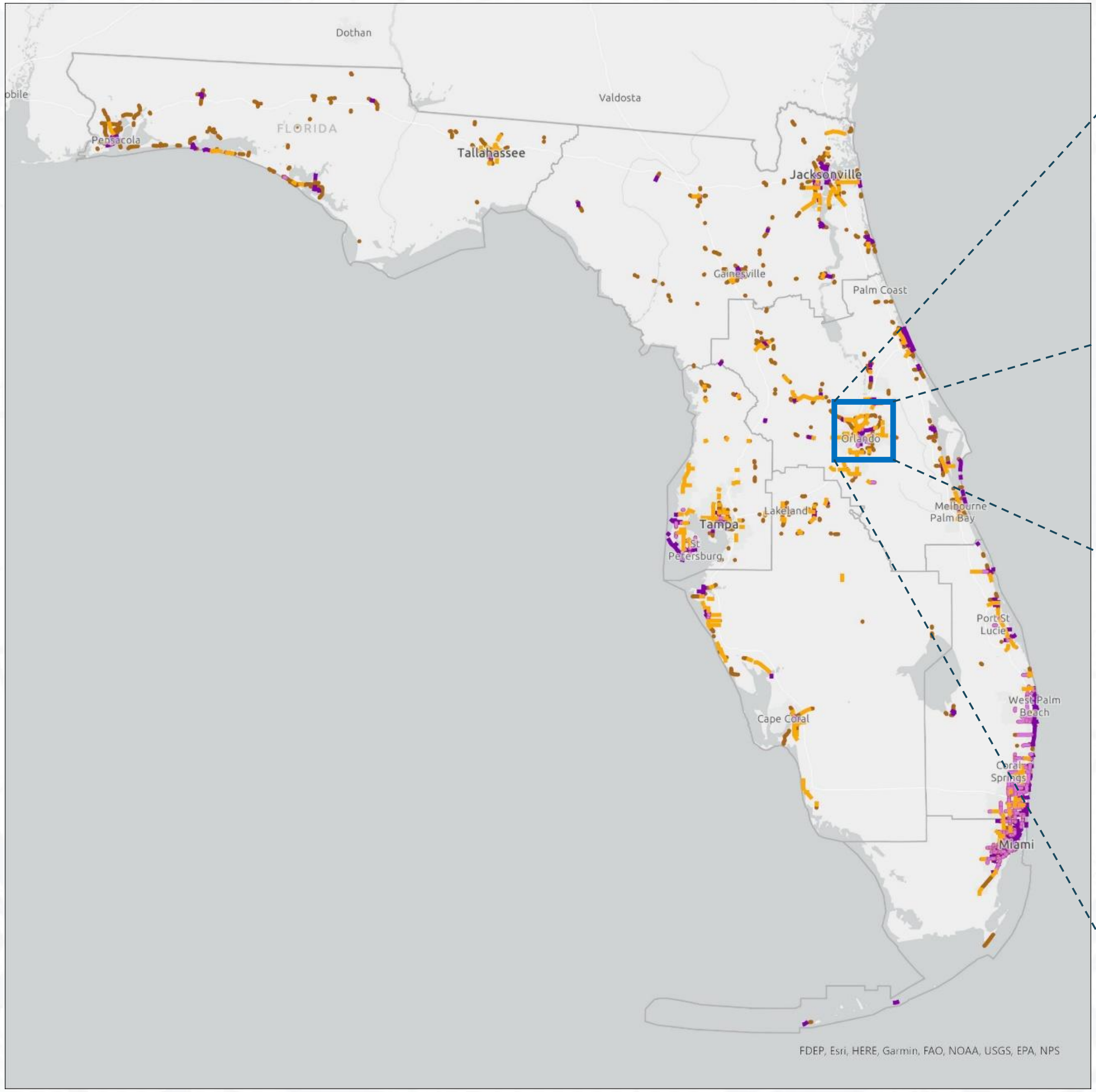
Ranking #2

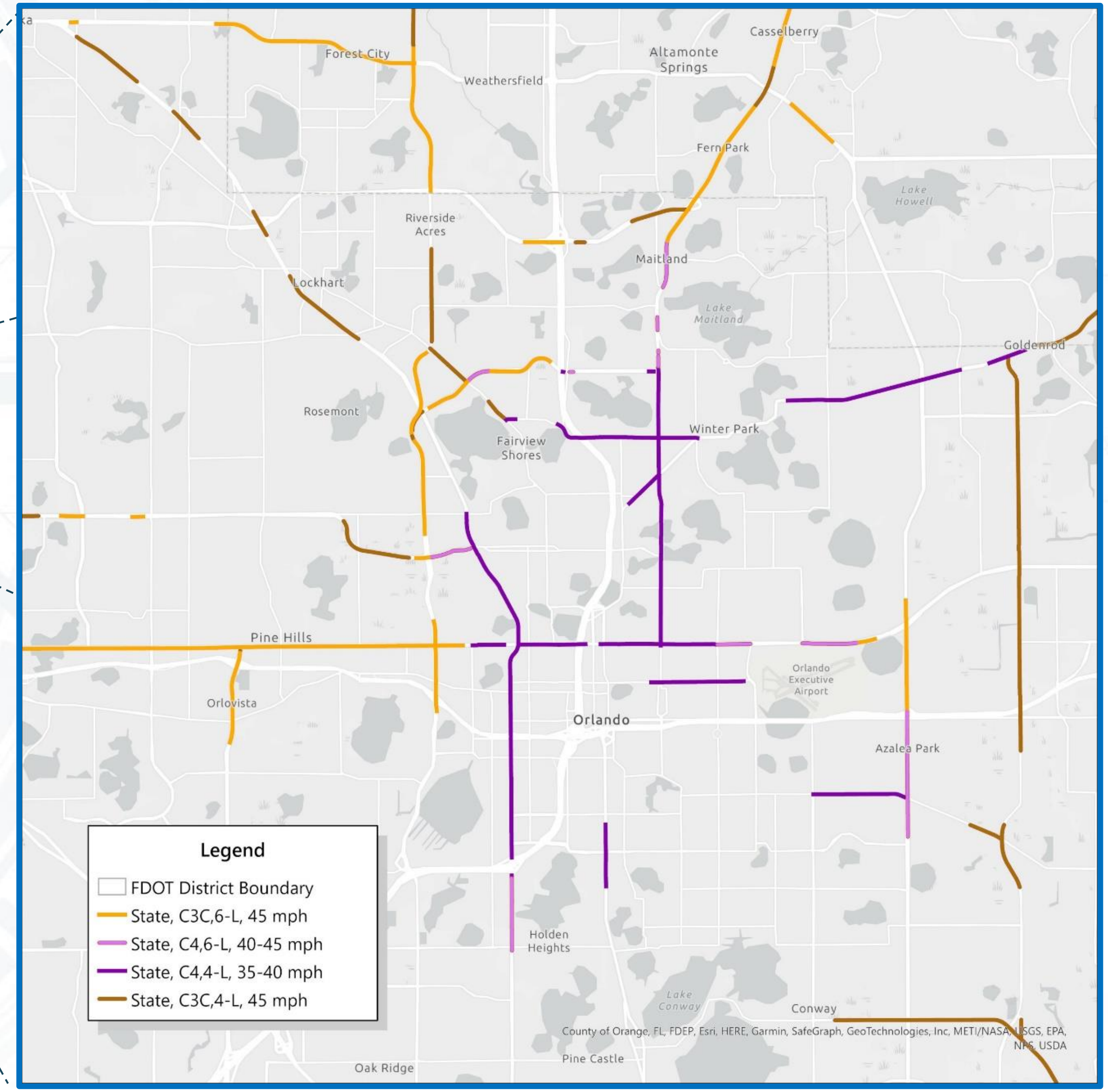
Ranking #3

Higher than statewide values

PEDESTRIAN B/C ANALYSIS

RISK FACTORS FOR PEDESTRIAN CRASHES





COUNTERMEASURES FOR PED. MIDBLOCK ANALYSIS

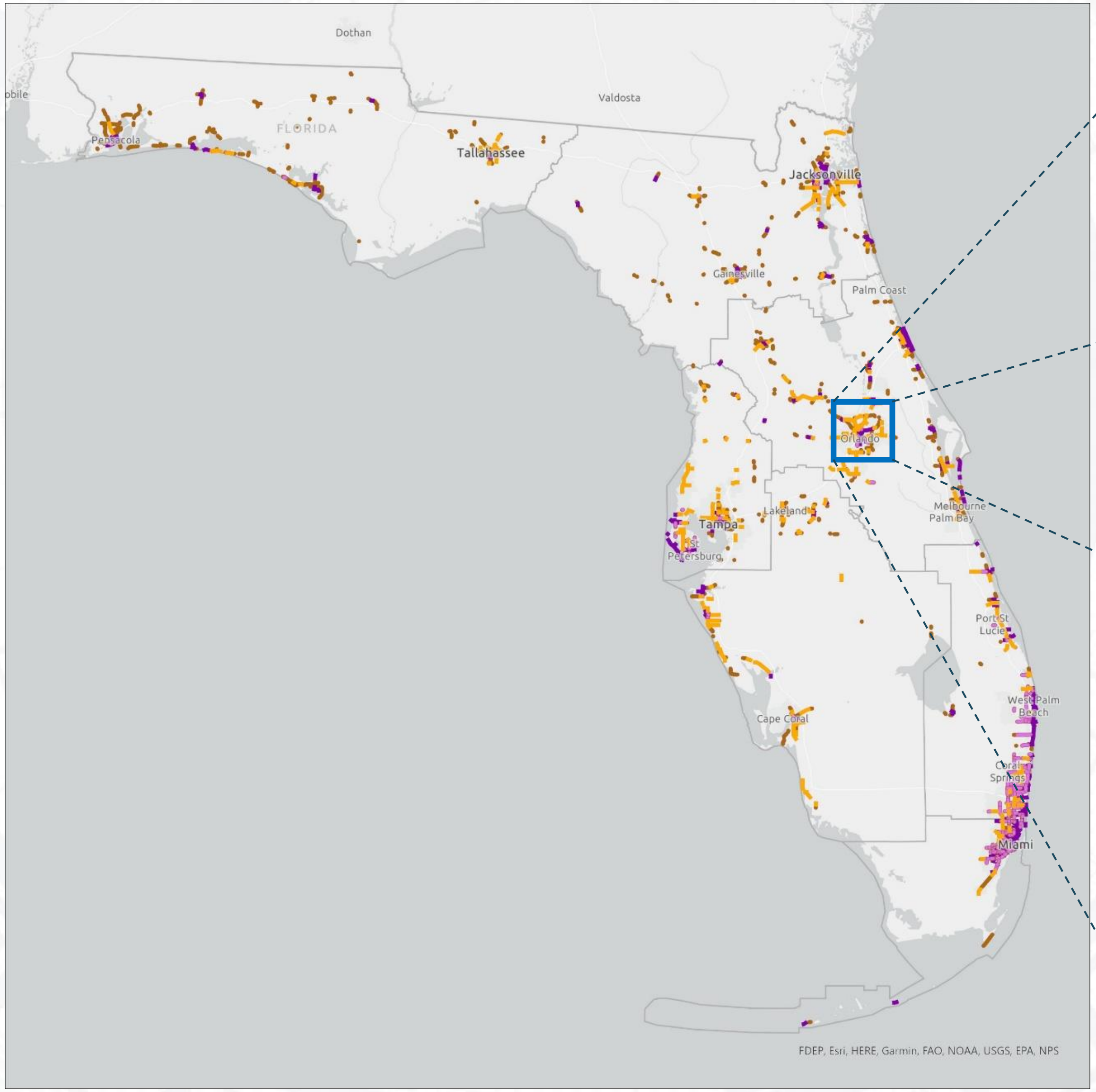
Group 1	Group 2	Group 3
C3C, 6 lane, 45 mph C4, 6 lane, 40-45 mph	C4, 4 lane, 35-40 mph C3C, 4 lane, 45 mph	C4, 4 lane, 35-40 mph C3C, 4 lane, 45 mph
Countermeasure	*Countermeasure*	*Countermeasure*
▪ Install Midblock Crosswalk ▪ Add High Visibility crosswalks ▪ Add Advanced Stop/Yield Lines ▪ Add Crosswalk Lighting ▪ Add Ped Refuge Island ▪ Install PHB	▪ Install Midblock Crosswalk ▪ Add High Visibility crosswalks ▪ Add Advanced Stop/Yield Lines ▪ Add Crosswalk Lighting ▪ Add Ped Refuge Island ▪ Install RRFB	▪ Install Midblock Crosswalk ▪ Add High Visibility crosswalks ▪ Add Advanced Stop/Yield Lines ▪ Add Crosswalk Lighting ▪ Add Ped Refuge Island ▪ Install Median ▪ Install PHB

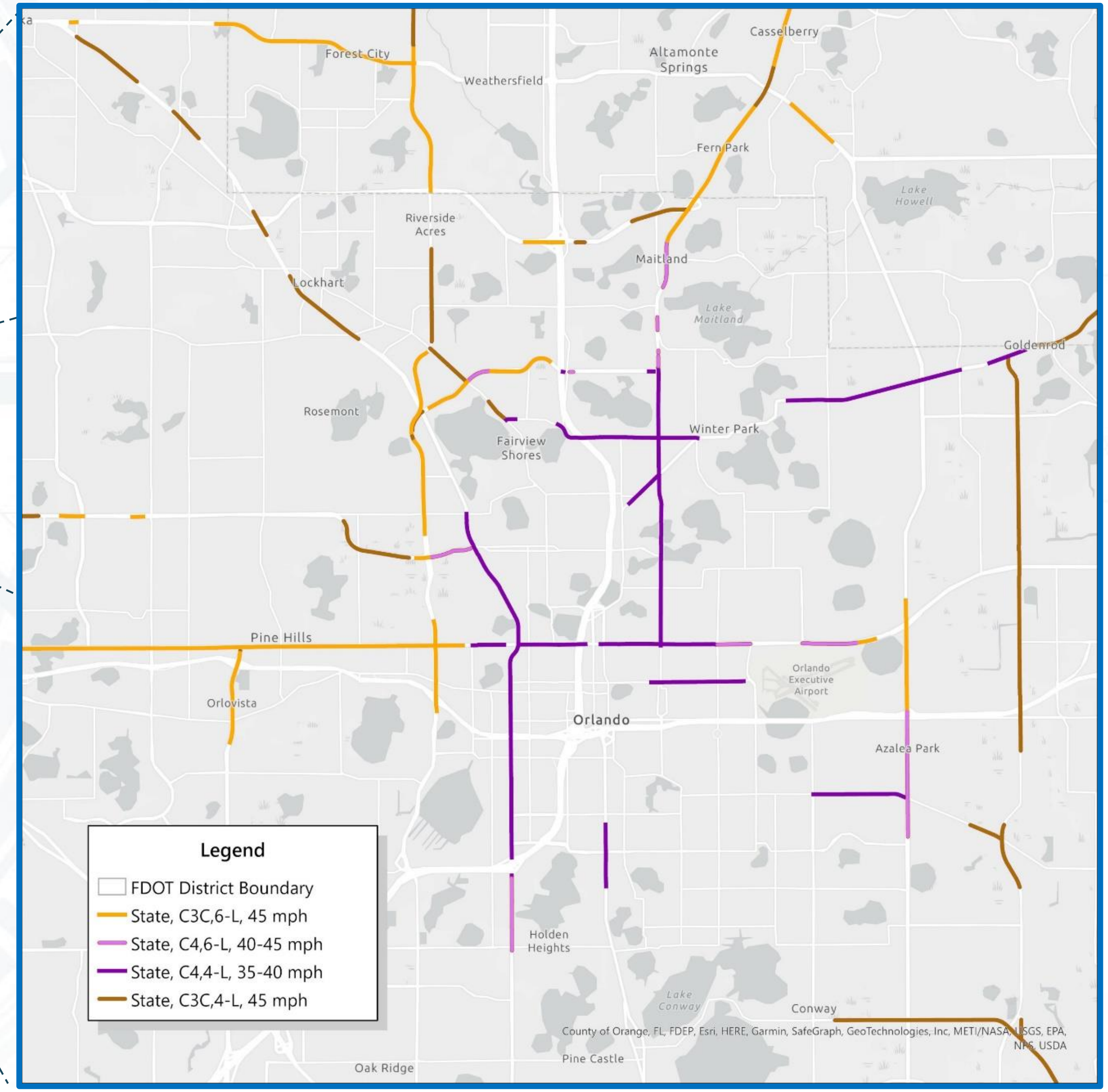
Other FHWA proven countermeasures like Road Diet or speed management countermeasures did not have readily available CMF for specific risk factors for C3C/6-lane state roadways

Risk Factor	Countermeasure	CMF	Annualized Benefit	Annualized Cost	B/C	Lives Saved	Cost per Centerline Mile	Cost per life saved	Rank
C4, 4 lane, 35-40 mph C3C, 4 lane, 45 mph (Group 3 – TWLTL)	Midblock Crossing	0.82	$37,734.90	$6,359.70	**5.9**	5	$70,709.60	$3,747,387.90	**1**
	Lighting	0.48	$109,934.35	$26,079.94	**4.2**	15	$289,966.92	$5,274,830.66	**2**
	Ped refuge Island	0.36	$134,000.83	$34,625.84	**3.9**	18	$384,983.54	$5,745,504.32	**3**
C3C, 6 lane, 45 mph C4, 6 lane, 40-45 mph (Group 1 – Divided)	Midblock Crosswalk with Lighting	0.48	$124,397.69	$36,025.14	**3.5**	38	$400,541.48	$6,439,151.56	**4**
	Midblock Crosswalk	0.82	$42,699.44	$13,531.16	**3.2**	13	$150,444.73	$7,046,092.08	**5**
C4, 4 lane, 35-40 mph C3C, 4 lane, 45 mph (Group 2 – Divided)	Ped refuge Island and Lighting	0.21	$165,768.58	$57,119.82	2.9	22	$635,080.29	$7,661,607.19	6
C3C, 6 lane, 45 mph C4, 6 lane, 40-45 mph (Group 1 – Divided)	Midblock Crosswalk with PHB and Lighting	0.22	$2,032,373.23	$182,793.89	1	57	$2,032,373.23	$21,838,605.15	7
C4, 4 lane, 35-40 mph C3C, 4 lane, 45 mph (Group 3 – TWLTL)	PHB & Lighting	0.26	$154,557.96	$158,177.31	1	21	$1,758,676.61	$22,755,588.51	8
	PHB & Ped Refuge Island	0.2	$167,853.23	$179,465.38	0.9	23	$1,995,365.67	$23,773,124.87	9
C3C, 6 lane, 45 mph C4, 6 lane, 40-45 mph (Group 1 – Divided)	Midblock Crosswalk with PHB	0.37	$149,101.69	$160,299.91	0.9	46	$1,782,276.48	$23,904,847.82	10

BICYCLE

RISK FACTORS FOR BICYCLE CRASHES





COUNTERMEASURES FOR BIKE MIDBLOCK ANALYSIS

Group 1	Group 2
C3C, 6 lane, 45 mph	C3C, 6 lane, 45 mph
C4, 6 lane, 40-45 mph	C4, 6 lane, 40-45 mph
Divided Median	TWLTL
Countermeasure	*Countermeasure*
▪ Separated Bike Lane	▪ Separated Bike Lane
▪ Cycle Tracks	▪ Cycle Tracks
▪ Highway Lighting	▪ Highway lighting
▪ Raised bicycle crossing on side roads	▪ Raised bicycle crossing on side roads
▪ Shared Use Path	▪ Add High Visibility crosswalks
	▪ Add Advanced Stop/Yield Lines
	▪ Add Crosswalk Lighting
	▪ Add Ped Refuge Island

COMBINED BCA FOR BIKE/PED MIDBLOCK – TWLTL

C3C, 6 LANE, 45 MPH, C4, 4 LANE, 35-40 MPH

Countermeasure to Implement		CMF	Annualized Benefit	Annualized Cost	B/C	Lives Saved	Cost per Centerline Mile	Cost per life saved	Rank
High Visibility Crosswalk - Ped Benefit	Only	0.6	$121,349	$6,360	**19.1**	21	$70,710	$1,165,290	1
High Visibility Crosswalk - Ped Benefit	With Ped Refuge Island	0.48	$159,089	$26,080	**6.1**	28	$289,967	$3,645,032	2
High Visibility Crosswalk - Ped Benefit	With Crosswalk Lighting	0.36	$193,916	$34,626	**5.6**	34	$384,984	$3,970,279	3
High Visibility Crosswalk - Ped Benefit	With Ped Refuge Island and Crosswalk Lighting	0.21	$239,888	$57,120	**4.2**	42	$635,080	$5,294,351	4
High Visibility Midblock Crossing - Bike & Ped Combined Benefit	Only	0.6	$184,662	$6,360	**29**	33	$70,710	$765,762	1
High Visibility Midblock Crossing - Bike & Ped Combined Benefit	With Ped Refuge Island	0.48	$242,092	$26,080	**9.28**	43	$289,967	$2,395,307	2
High Visibility Midblock Crossing - Bike & Ped Combined Benefit	With Crosswalk Lighting	0.36	$295,090	$34,626	**8.52**	52	$384,984	$2,609,040	3
High Visibility Midblock Crossing - Bike & Ped Combined Benefit	With Ped Refuge Island and Crosswalk Lighting	0.21	$365,048	$57,120	**6.39**	64	$635,080	$3,479,145	4
High Visibility Midblock Crossing - Bike & Ped Combined Benefit	With Crosswalk Lighting & Cycle Track	0.31	$312,376	$103,785	**3.01**	60	$1,410,474	$8,327,720	5
High Visibility Midblock Crossing - Bike & Ped Combined Benefit	With Ped Refuge Island and Crosswalk Lighting & Cycle Track	0.18	$381,111	$128,322	**2.97**	73	$1,743,937	$8,454,562	6
High Visibility Midblock Crossing - Bike & Ped Combined Benefit	With Cycle Track	0.52	$203,879	$72,952	**2.79**	39	$991,443	$8,922,008	7
High Visibility Midblock Crossing - Bike & Ped Combined Benefit	With Ped Refuge Island & Cycle Track	0.41	$260,305	$94,463	**2.76**	50	$1,283,786	$9,078,080	8
High Visibility Midblock Crossing - Bike & Ped Combined Benefit	With Ped Refuge Island and Crosswalk Lighting & Separate Bike Lane	0.18	$382,195	$156,946	**2.44**	73	$2,132,949	$10,307,378	9
High Visibility Midblock Crossing - Bike & Ped Combined Benefit	With Crosswalk Lighting & Separate Bike Lane	0.3	$314,245	$132,409	**2.37**	60	$1,799,487	$10,553,352	10
High Visibility Midblock Crossing - Bike & Ped Combined Benefit	With Ped Refuge Island & Separate Bike Lane	0.4	$262,768	$123,087	**2.13**	50	$1,672,798	$11,704,296	11
High Visibility Midblock Crossing - Bike & Ped Combined Benefit	With Separate Bike Lane	0.5	$206,987	$101,576	**2.04**	40	$1,380,455	$12,213,951	12

CHALLENGES & LIMITATIONS

- **Exposure Data** — lack of exposure data limits risk-based evaluation, comparison across roadway types/characteristics and crash rate calcs
- **Crash Typing Data** — time lag in crash typing
- **Local Road Data** — information on local roads is not as robust as state data
- **Traffic Control Data** — presence of medians, double yellow line, other traffic controls, etc., may not be comprehensive
- **CMF Availability** — some innovative countermeasures don't have CMFs yet
- **Cost Benefit Limitations** — due to lower occurrence compared to lane departure crashes

ROOT CAUSE ANALYSIS
PEDESTRIAN & BICYCLE

QUESTIONS?

Poorna Bhattacharya, AICP
poorna@ashaplanning.com

U.S. Department of Transportation
Federal Highway Administration

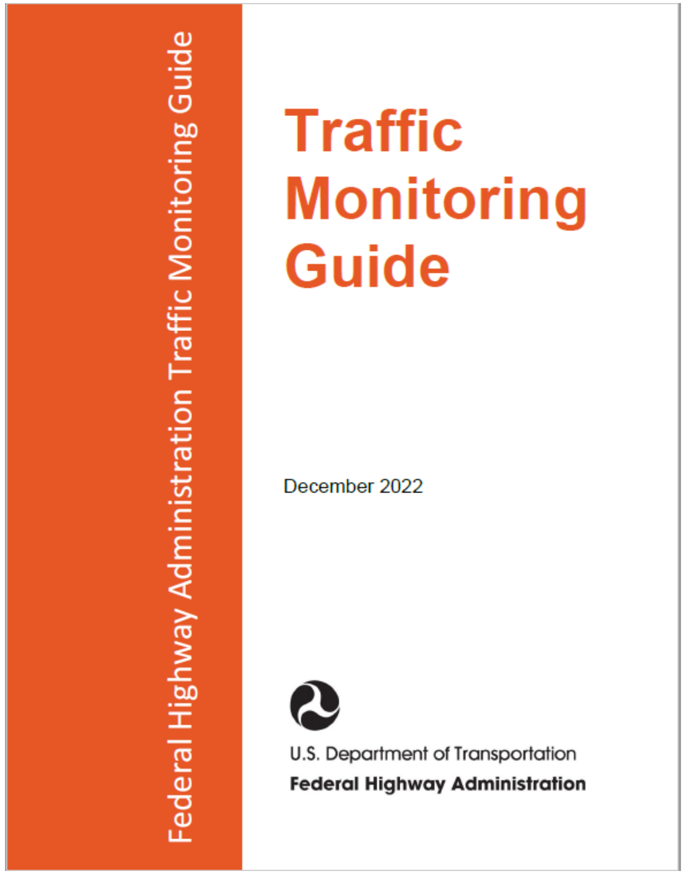
NaTMEC
NATIONAL TRAVEL MONITORING EXPOSITION AND CONFERENCE
June 2-5, 2024 • Boise, Idaho

nhi national highway institute

TRB

NATIONAL ACADEMIES
Sciences
Engineering
Medicine

FHWA’s Traffic Monitoring Guide (TMG)



- TMG updates
  - Micromobility Integrated with Motorized Guidance
  - https://www.fhwa.dot.gov/policyinformation/tmguide/
  - Callouts for Micromobility Traffic Monitoring Practices that differ from Motorized

The distribution of where to locate continuous counters should include a site selection methodology that is established to determine where an investment in continuous counting equipment is best utilized. Noteworthy practices for selecting sites have been documented and are provided in Appendix H for Nonmotorized Site Selection Methods for Continuous and Short-Term Volume Counting. Agencies should follow these guidelines when determining how many and where to install continuous counting sites.

> As stated in these guidelines, it is recommended that agencies preform a short-term count for at least 2 weeks prior to installing continuous counting equipment to ensure travelers are present on the facility being considered for continuous counting instrumentation.

The reason for collecting a 2-week short-term count prior to installing continuous counting equipment is to ensure travelers are using the facility. It then provides a baseline dataset in which traffic patterns can be evaluated. Evaluating traffic patterns can help to determine if a continuous counter is needed for representation of a traffic volume group such as high, medium, or low volume.

NaTMEC
NATIONAL TRAVEL MONITORING EXPOSITION AND CONFERENCE
June 2-5, 2024 • Boise, Idaho

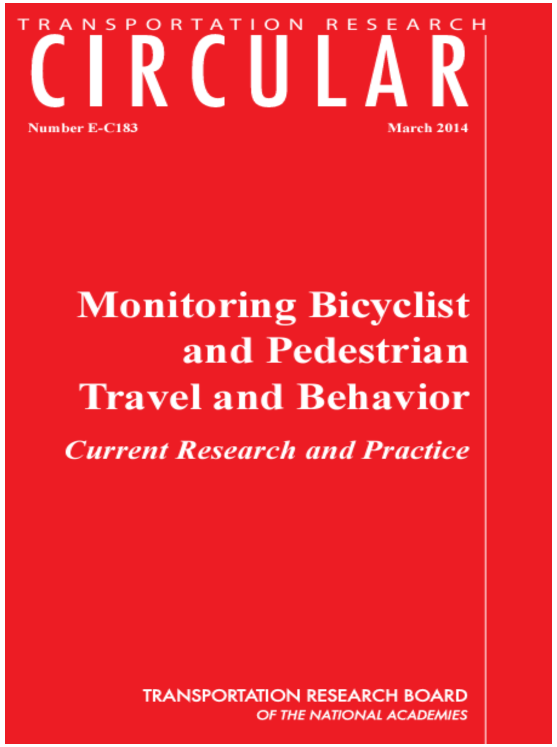
- National Traffic Monitoring Exposition and Conference
- https://www.natmec.org/
- "We travel together."
- Our theme for NaTMEC 2024 complements the motto. We travel together as we connect communities through travel monitoring. It's time we travel to Boise, Idaho to meet in person for our next NaTMEC. We hope to see you there.
- Dates: June 2-5, 2024
  - June 2 - Ride to NaTMEC along the Boise river and end your evening at a welcome reception.
  - June 3-5 - Enjoy a conference of informative sessions, workshops, and vendors.
- Location: Boise Center on the Grove in the heart of Idaho's capitol city.

Transportation Research Board

- Transportation Research Board – TRB
  - As part of the National Academies of Sciences, Engineering, and Medicine, the Transportation Research Board (TRB) mobilizes expertise, experience, and knowledge to anticipate and solve complex transportation-related challenges. For example, committees, researchers, and staff are currently focused on advancing resilient infrastructure, exploring transformational technology, and caring for the public's health and safety.
- ACP70 – Highway Traffic Monitoring Committee (Parent)
  - https://sites.google.com/site/highwaytrafficmonitoring/home?authuser=0
- ACP70(2) – Bicycle and Pedestrian Data Subcommittee
  - https://sites.google.com/site/bikepeddata/
- Annual Meeting – January 3-5, 2025 – Washington DC

TRB e-Circular

- March 2014
- Update currently being developed for 2024/2025 publication
- List of “hot topics” that drive research funding in Micromobility travel and behavior



Bike/Walk Central Florida

FDOT NMTM Statewide Meeting

February 8, 2024

Best Foot Forward
for pedestrian safety

BIKE 5
5 Miles | 5 Parks | 5 Cities

Bike/Walk Central Florida
WHEEL OF
ACHIEVEMENT
AWARDS

Bike/Walk
KIDS

HEALTHY
WEST ORANGE
TRAILS CONNECTION

Bike/Walk
Central
Florida
Active Transportation Studies

Bike/Walk Central Florida Programs

Best Foot Forward Program

Best Foot Forward
for pedestrian safety

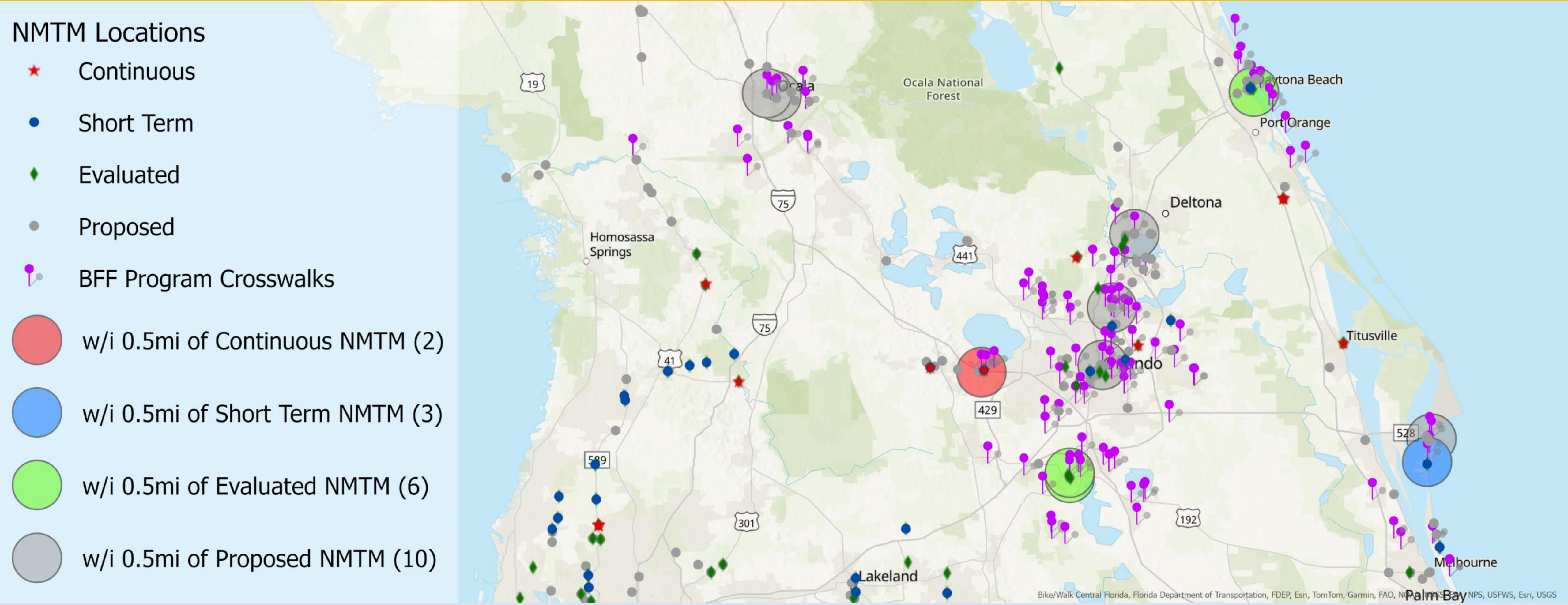
EDUCATE residents living and working in close proximity to program crosswalks.

ENGINEER low-cost engineering solutions at crosswalks.

ENFORCE Florida's laws at crosswalks.

EVALUATE drivers' compliance to yield and stop for pedestrians at observed crosswalks.

Best Foot Forward + FDOT NMTM



Best Foot Forward + FDOT NMTM

Data Use Cases

EDUCATE

ENGINEER

ENFORCE

EVALUATE

Targeting campaigns

- …in specific geographies
- …to specific audiences (e.g. bike/ped)

Before/After evaluation

- Trail crosswalk improvements

Program crosswalk selection process

- Identification of high-priority areas

Data Collection scheduling

- Peak-use periods

Healthy West Orange Trails Connection Program

Supporting Healthy Communities

Formation of a coalition with nearby municipalities that share a common goal to:

Promote, activate and enhance the trail system throughout West Orange.

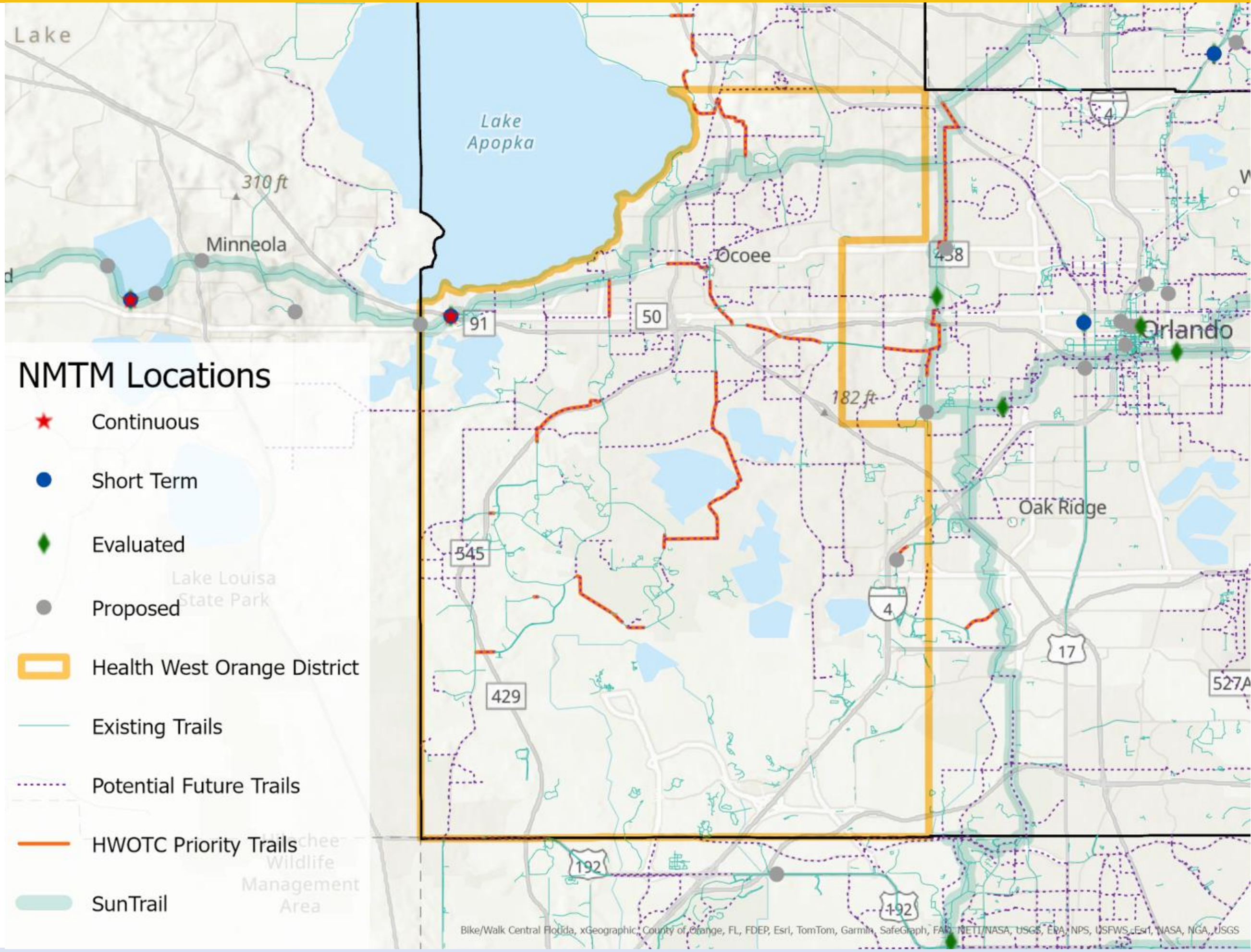
Entrusted with a $5.5 million grant from the West Orange Healthcare District to support this mission to:

Determine the use of funds to accelerate the implementation of projects that support walking, biking and wellness activities within the community.

HWOTC + FDOT NMTM

Data Use Cases

- Promote
  - Tailor program outreach activities to promote trails and active lifestyles in West Orange County
- Activate
  - Prioritize activation programming and infrastructure improvements
- Enhance
  - HWOTC Trail Project Grants
    - Evaluating and prioritizing local and regional connections and enhancements



Bike/Walk Central Florida

Bike/Walk Central Florida

Patrick Panza, AICP

Programs Director

m. 407.538.3843

p. 407.542.6074 x.705

e. Patrick@bikewalkcf.org

w. BikeWalkCentralFlorida.org

100 E. Pine St. Suite 110-74 Orlando, FL 32801

Non-motorized Traffic Monitoring Program

February 8, 2024

Rails-to-Trails Conservancy

Rails-to-Trails Conservancy (RTC) is the nation's largest trails organization—with a grassroots community more than 1 million strong—dedicated to connecting people and communities by creating a nationwide network of public trails, many from former rail lines.

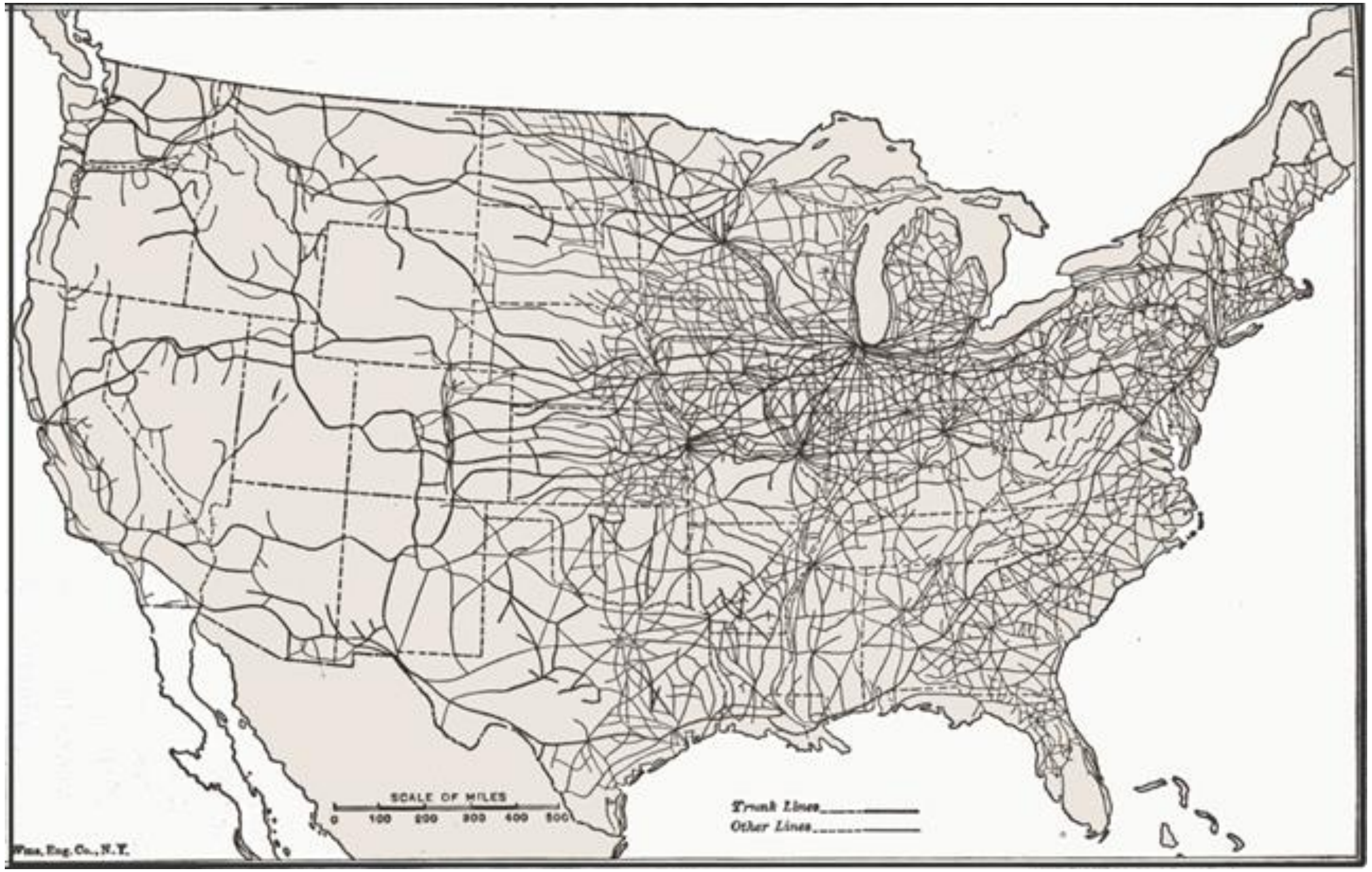
Connect with RTC at railstotrails.org and @railstotrails on Facebook, Twitter and Instagram.

railstotrails.org

rails·to·trails
conservancy

America's Rail System

Earlier in the 20th century



rails·to·trails conservancy

America's Rail System

2010

Rail Trail Stats

United States

Rail-Trail Stats

~~2,289~~ total rail-trails
2,414

~~24,889~~ miles of rail-trails
25,910

874 current projects

9,257 miles of potential rail-trail

railstotrails.org

rails-to-trails conservancy

Railbanked Stats

To date, at least **393 corridors have been railbanked** - representing **nearly 6,000 miles** of corridor that have been **preserved for future rail use** and interim use as trails.

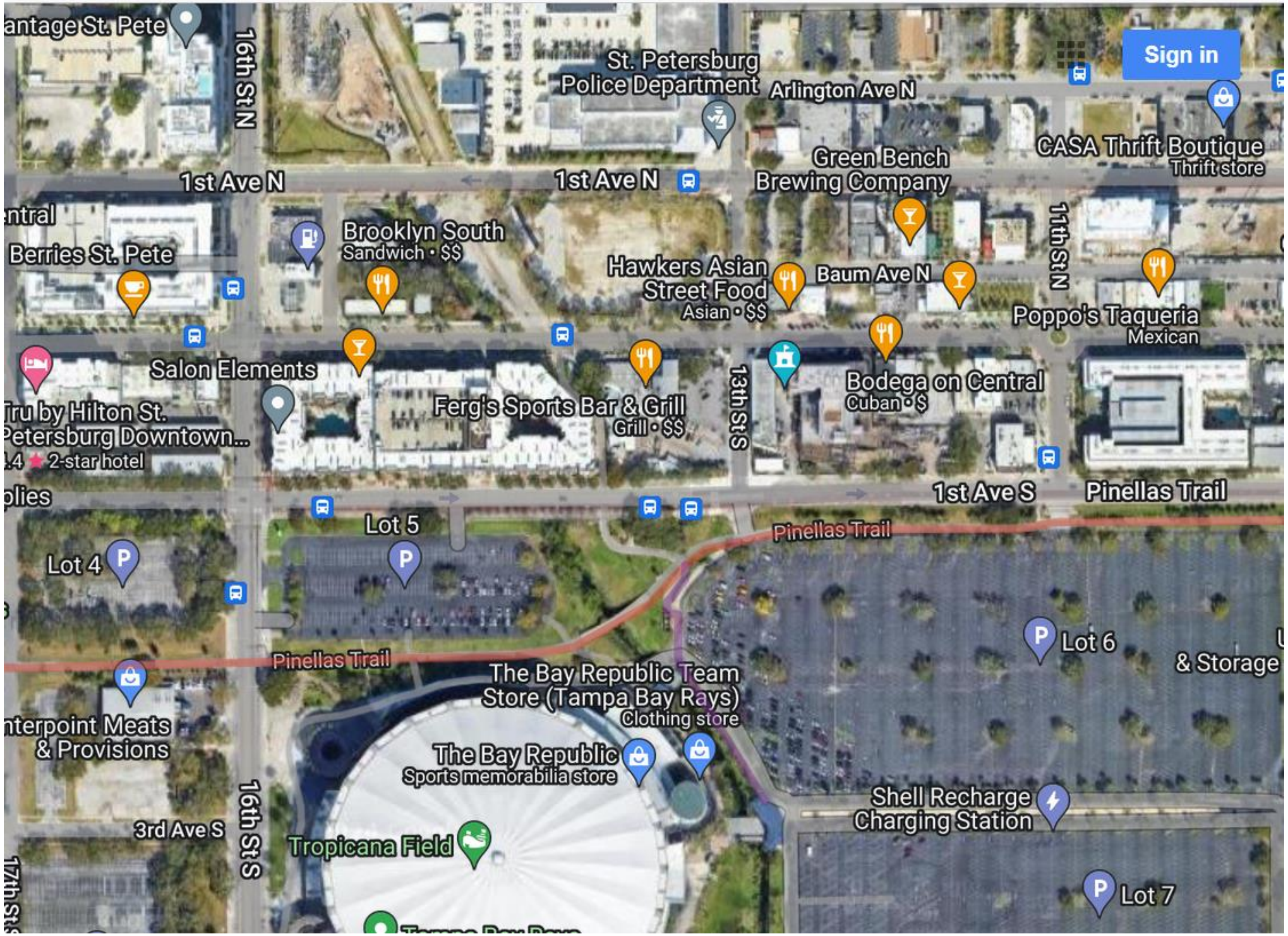
Estimated 175 Rail-Trails Made Possible by Railbanking Since 1983 + 60+ Legal Cases to Date

20,000+ Advocacy ACTIONS TAKEN to Protect Railbanking in FY 2019

What is Railbanking?

- Established as an amendment to Section 8(d) of the National Trails System Act in 1983
- Pre-abandonment strategy
- Voluntary agreement between the railroad and trail manager
- Surface Transportation Board (STB) jurisdiction over the corridor is retained
    - Line can be reactivated for future rail use
    - Corridor is available for interim trail use
- Preempts state law with regards to reversionary rights
- Successfully defended at the Supreme Court


Cowboy Recreation and Nature Trail (Nebraska)
Photo by: mbcallawa, TrailLink.com



rails·to·trails
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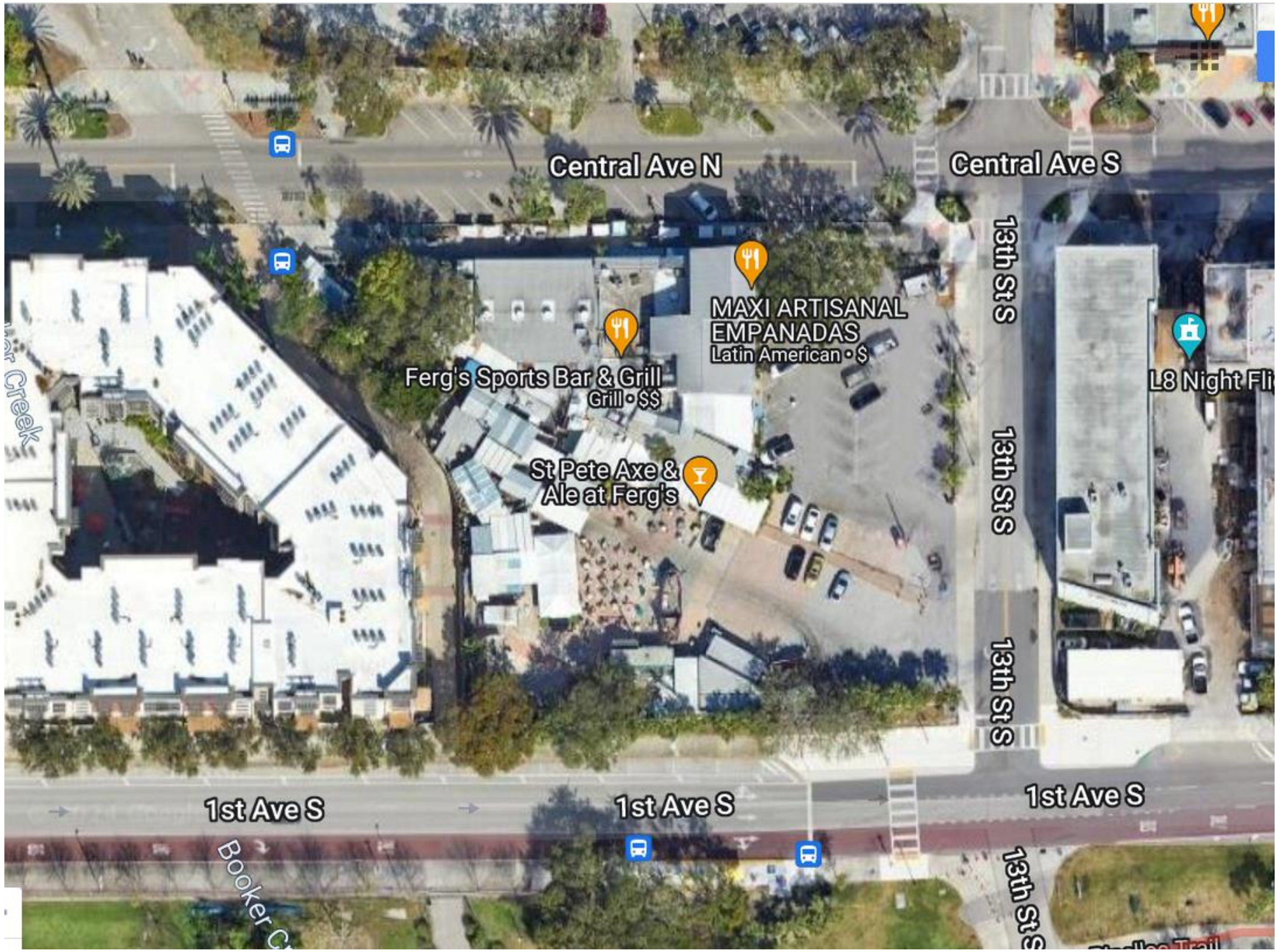


rails·to·trails conservancy

U.S. Department of Justice

Environment and Natural Resources Division

Natural Resources Section
P.O. Box 7611
Washington, DC 20044

Telephone (202) 305-1461
james.gette@usdoj.gov

October 12, 2022

306057

ENTERED
Office of Proceedings
December 14, 2022
Part of
Public Record

By Electronic Mail

Craig M. Keats
General Counsel
Surface Transportation Board
Office of the General Counsel
395 E. Street SW, Suite 1260
Washington, DC 20423-0001

Re: *Collective Edge, LLC v. United States*, No. 20-34 (Fed. Cl.), DJ# 90-1-23-15950

Mr. Keats:

In February 2020, the above-captioned case was filed in the United States Court of Federal Claims. It was thereafter consolidated with two related matters: *Ferg's Sports Bar & Grill, Inc. v. United States*, No. 20-84 (Fed. Cl.); and *Lopez v. United States*, No. 20-159 (Fed. Cl.). Plaintiffs in the consolidated cases allege takings resulting from the Surface Transportation Board's issuance of a Notice of Interim Trail Use or Abandonment ("NITU") on January 13, 2020 in Docket No. AB-55 (Sub-No. 794X), *CSX Transportation, Inc. – Abandonment Exemption – in Pinellas County, Fla.* The NITU pertains to an approximately 0.86-mile portion of right-of-way between milepost ARE 897.57 and milepost ARE 898.43 (the "ROW") in St. Petersburg, Pinellas County, Florida.

We wish to bring to your attention the following factual information ascertained in the course of litigating the consolidated case:

- CSX Transportation, Inc. ("CSXT") and the City of St. Petersburg, Florida (the "City") negotiated for the sale and purchase of the right-of-way for years, but never reached an agreement. According to CSXT, the main reason for the failure of negotiations was that CSXT "never received an offer of sufficient consideration from the City to incentivize CSXT to enter an agreement." *See Collective Edge LLC v. United States*, Case Nos. 20-34, 20-48, and 20-159, United States' Response in Opposition to Plaintiffs' Motion for Partial Summary Judgment on Liability, ECF No. 27, Exhibit 1, Declaration of G. Payne at ¶ 6 (Feb. 12, 2021) (noting that the "gap was significant").

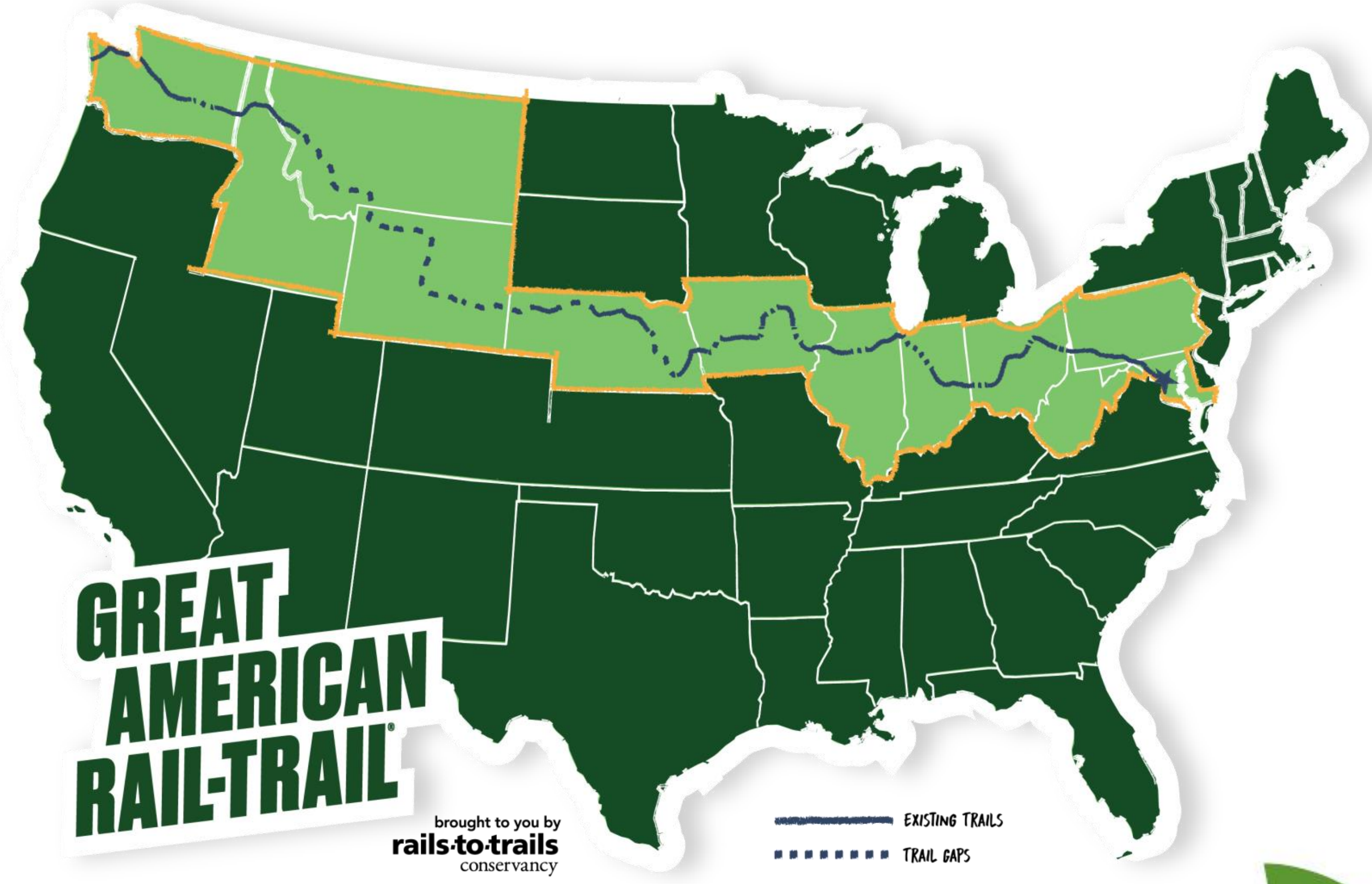
Where Are We At Now?

- STB decision issued in Pinellas County/City of St. Petersburg proceeding: NITU issued to GHL vacated, with a reopened opportunity for City to railbank.

- The Board reopens the proceeding and issues a notice of interim trail use or abandonment to CSX Transportation, Inc., and the City of St. Petersburg. The City is again pursuing negotiations with Railroad.

- CSX has filed a petition in the 11th Circuit seeking review of the STB's decision revoking the NITU issued to GHL, CSX's subsidiary

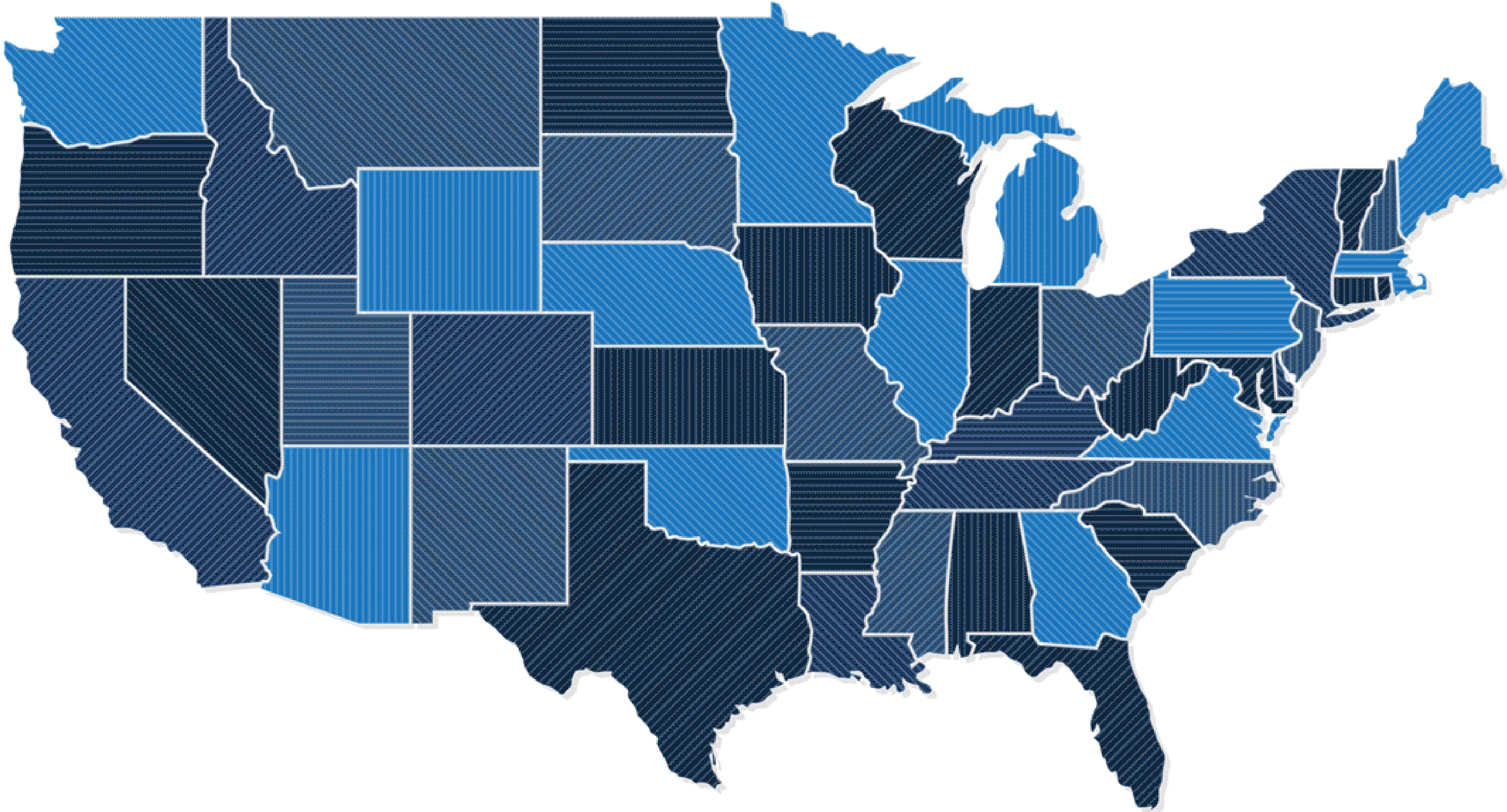
- Since launch in 2019, the route is now 55% complete by adding 74 miles in three years.
- In 2022, Rails-to-Trails released a comprehensive economic impact study of the GRT.
- RTC has hosted three multi-day ride events, in Indiana and Idaho, to engage influential audiences in elevating and developing the route.



railstotrails.org

rails·to·trails conservancy

TRAIL NATION
rails·to·trails conservancy



railstotrails.org

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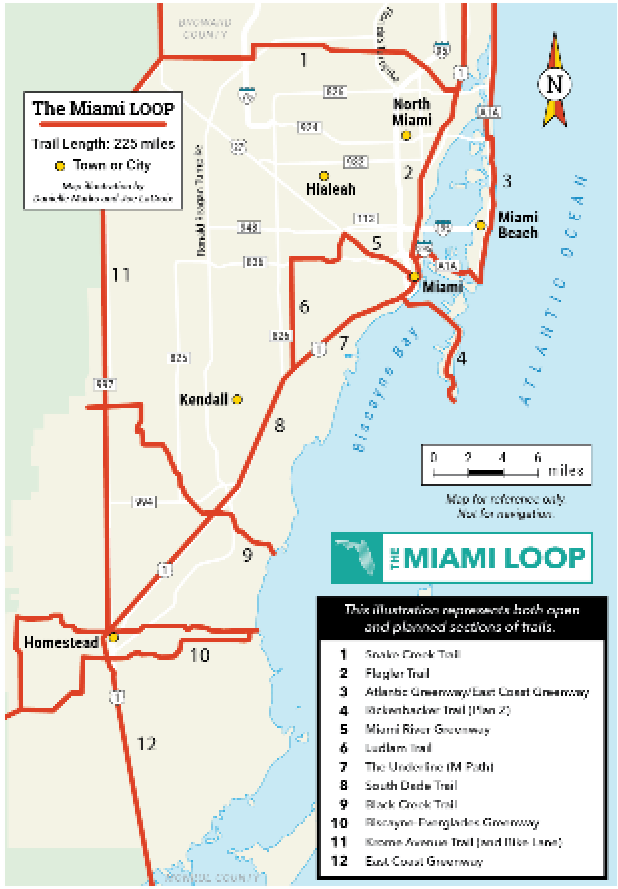
Miami-Dade Trail Alliance

Miami LOOP

The Miami LOOP is a 232-mile trail vision to expand transportation options, make biking and walking safer and more equitable, strengthen the regional economy, reduce the area's carbon footprint, and improve health and wellness across Miami-Dade County. Currently, 56.3% of the Network is completed with many more miles in public ownership.

The Miami-Dade Trail Alliance has organized to turn vision into reality by serving as a collective voice for the project and its diverse network of trails—with a goal of enriching the quality of life for all people in the region through equitable access to active transportation and outdoor recreation.



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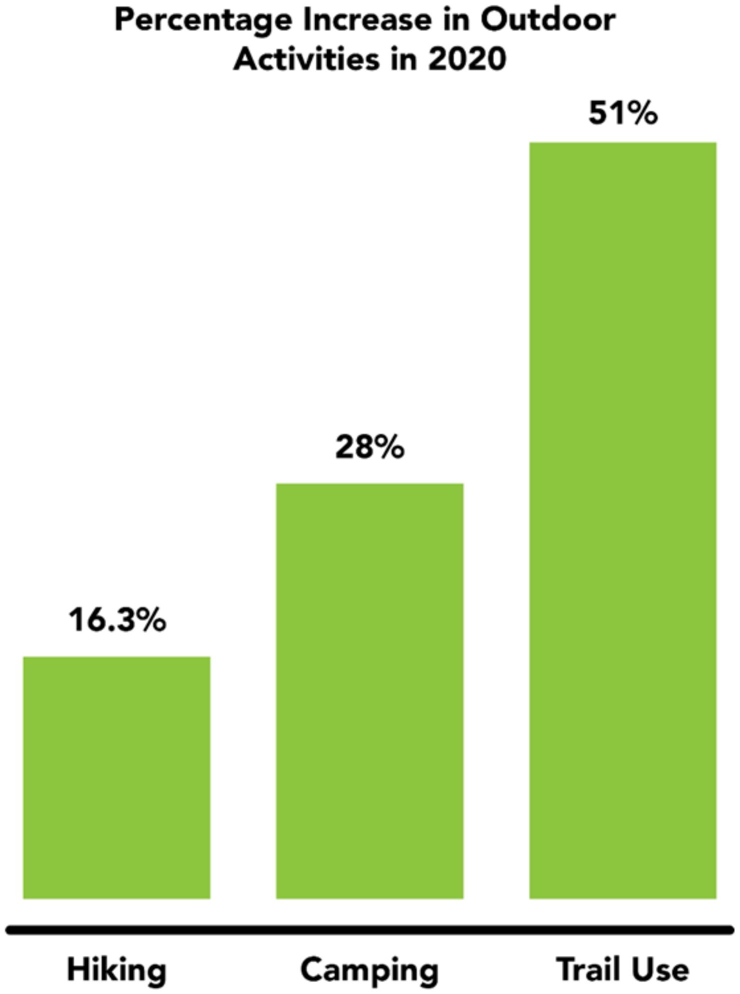
* - pictures provided by TrailLink.com

rails-to-trails conservancy

Unprecedented Trail Use



Source: Outdoor Industry Association, Rails-to-Trails Conservancy

rails·to·trails conservancy

You have trail counts, now what?

rails·to·trails conservancy

Access Membership Info | DONATE | RENEW

About Us | What We Do | Experience Trails | Find Trails | Resources | Store | Support Us

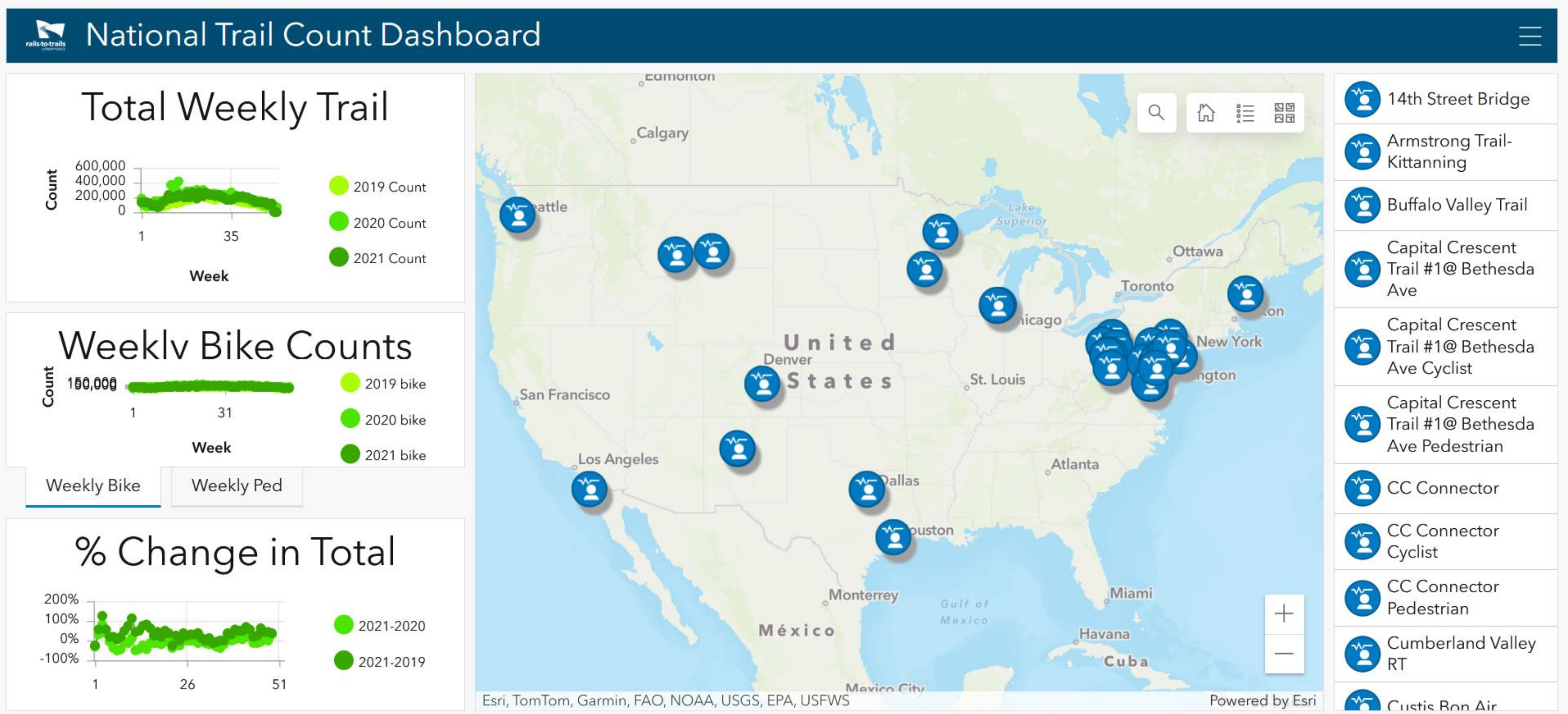
Home > Build Trails > Trail-Building Toolbox > Management and Maintenance > Trail User Surveys and Counting

Trail User Surveys and Counting

Related Resources

- **Data** - *RTC's National Trail Count Data Dashboard*
- **Webinar** - *Trail Use Counts: Leveraging Data to Make the Case for Trails*

Tell The Story



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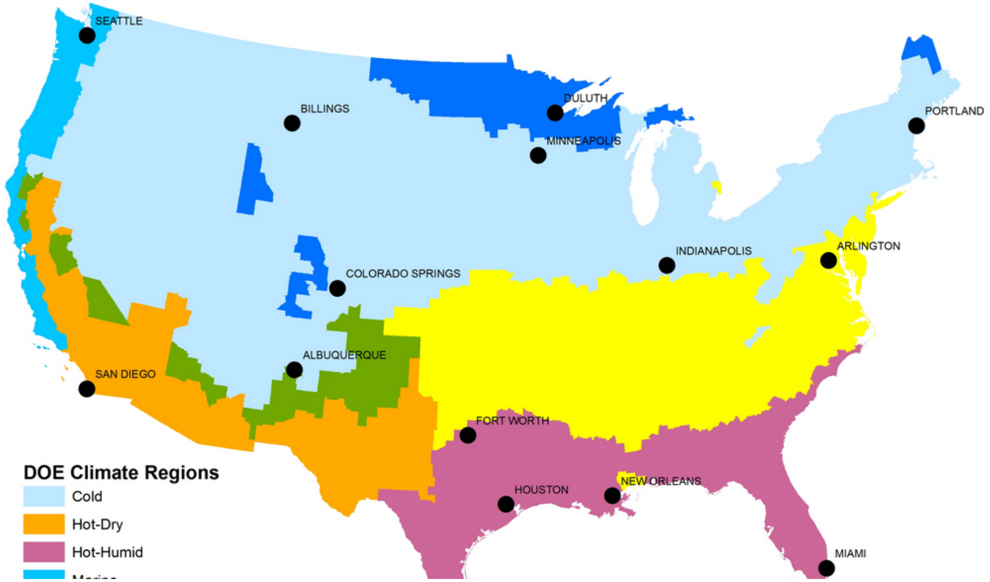
Alternative Methodology

Trail Traffic Calculator



Resources

- T-MAP Fact Sheet
- T-MAP FAQ
- T-MAP Webinar (register to view)

Tools

- GoCounter Trail Counting App
- Trail Traffic Calculator

Published Research

Explore RTC's most recent research published with our academic partners.

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conservancy

railstotrails.org

East Coast Greenway

Visit Data & the Economic Impact of Long-Distance Trails

East Coast Greenway

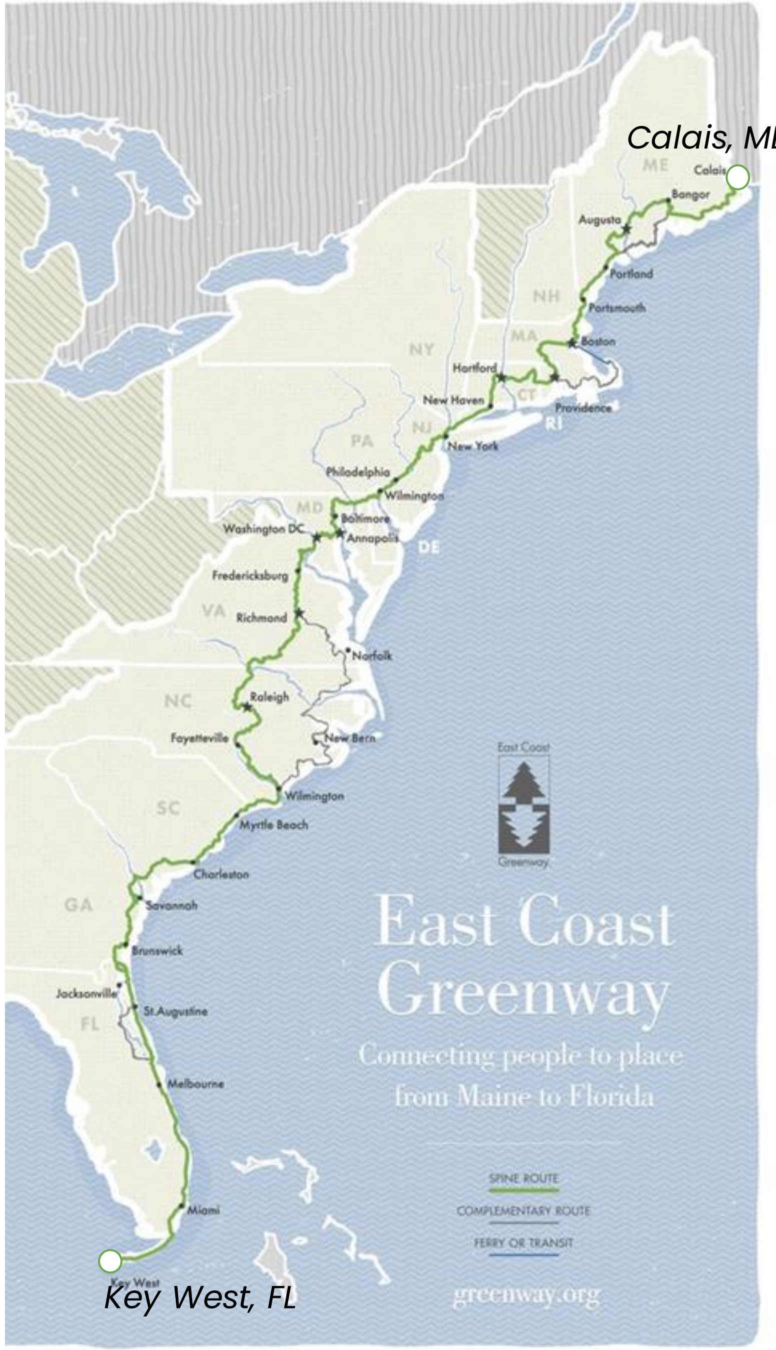
Connecting People to Place

3,000-mile biking & walking trail in development from Maine to Florida

Create safe, equitable access to an improved quality of life for all

Bring people together around open space and community engagement

Greenway design criteria: greenway.org/design-guide



Connecting local and regional trails together.

The East Coast Greenway is more than **1/3 complete** with more than **1,000 miles** of shared-use biking and walking paths, being linked together up and down the coast.

East Coast Greenway

Maine to Florida:

3,000 miles

15 states + Washington, DC

450 communities

50 million annual rides, runs + walks


East Coast Greenway® ALLIANCE
2023
YEAR IN REVIEW
7
Federal RAISE grants
2X
Greenway rides, runs + walks planned with mapping tool
20
New miles designated
$200+ MILLION
Invested in East Coast Greenway projects
4 BILLION
News media reach
GREENWAY TRAIL
BIKE ROUTE

East Coast Greenway ALLIANCE

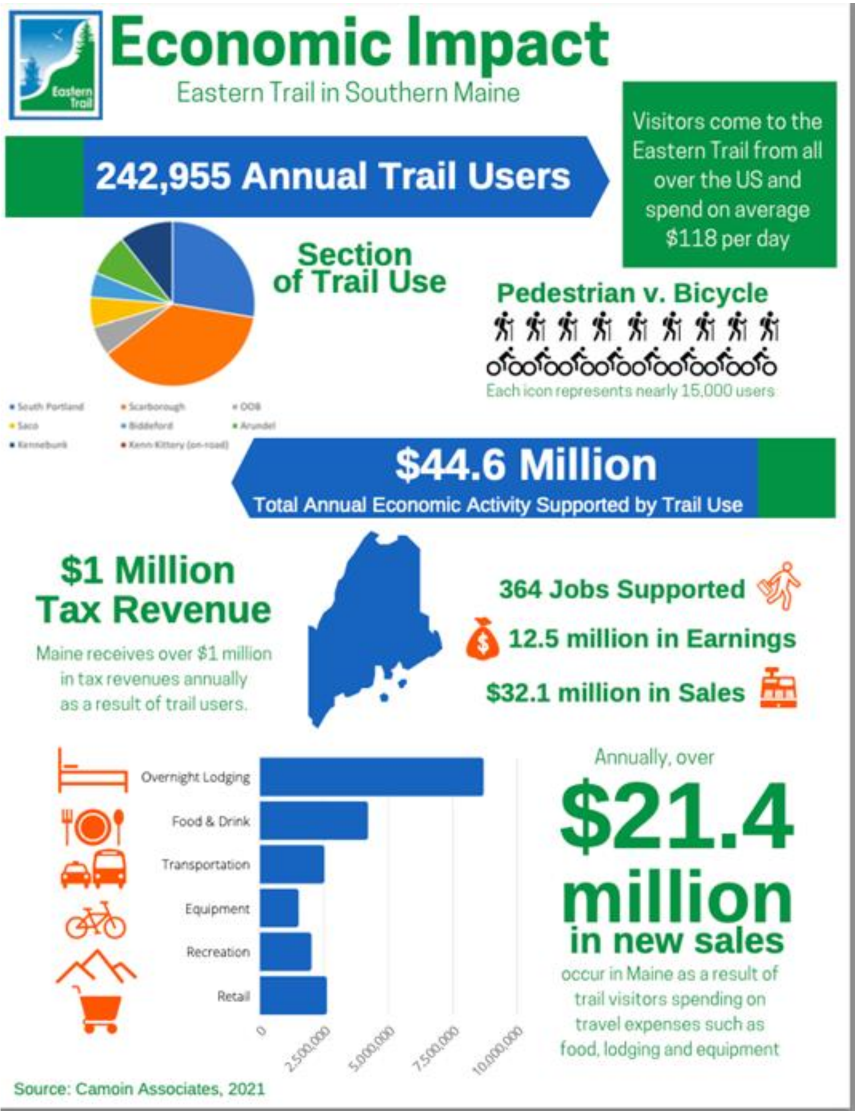
2023 Designations

1. New Hampshire Seacoast Greenway, NH
2. Upper Charles Rail Trail, MA
3. Holliston Rail Trail, MA
4. Upper Charles Trail, MA
5. Southern New England Trunkline Trail, MA
6. Mattapoisett Rail Trail, MA
7. Tariffville Greenway Hughes Connector, CT
8. K&T Trail, PA
9. Metropolitan Branch Trail,

   8th Street NE Cycle Track & Sidewalk, DC
10. Maine Avenue SW Cycle Track

    & Sidewalk, DC
11. Jarboe Park, FL
12. Cape Canaveral Trail, FL
13. Boca Raton A1A Sidepath, FL

Maine Trails Coalition



1865 THE UNIVERSITY OF MAINE

Key findings - (2) Trends in trail use 2020 & 2021

Pedestrian activity on trails in our sample **doubled** during the first two years of the pandemic. For the 89 trail sites monitored across Maine, the pedestrian index increased by 64% from 2019 to 2020 and a further 15% in 2021.

The cycling index across the 89 monitored sites **increased by 18% in 2020** compared to 2019, and then **returned to the 2019 baseline** in 2021.

THE UNIVERSITY OF MAINE 1865

Insights and guidance for future work

Build on experience and findings to inform broader research on outdoor recreation, including economic impact, recreation demand, and community development and planning studies

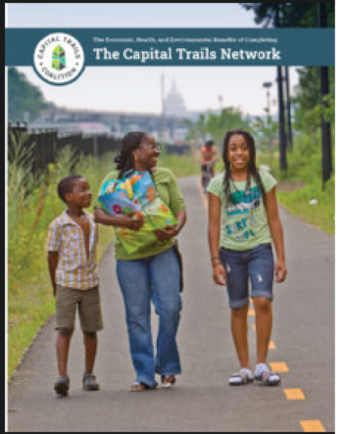
- Use StreetLight data in conjunction with other visitor data to assess trail recreation demand as well as the economic contributions and impacts of trails and their users
- Use StreetLight data in conjunction with other visitor data to support engagement with businesses, community leaders, and other decision makers

Capitol Trails Coalition – Regional Trail Count Program

The Economic, Health, and Environmental Benefits of Completing the Capital Trails Network

Trails provide places for people to exercise, provide reliable transportation routes, and support local business and tourism. Until now, those benefits to the Washington region have not been quantified.

The Capital Trails Coalition, in partnership with a team of experts, spent two years developing this impact report to quantify the economic, health, and environmental benefits of our region's 881 mile multi-use trail network. The Washington DC region is uniquely positioned to have the best trails system in the nation.



The impact of a completed trail network:

19,580 metric tons of CO2 emissions prevented every year

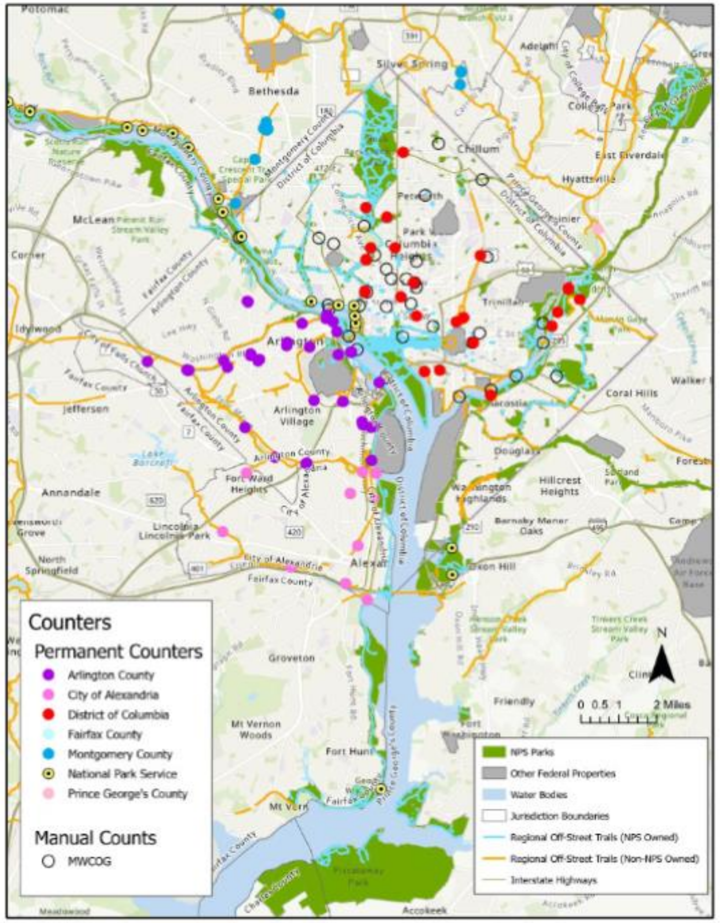
$517 million in public health savings every year

16,100 jobs supported over 25 years

$1 billion in total economic impact every year.

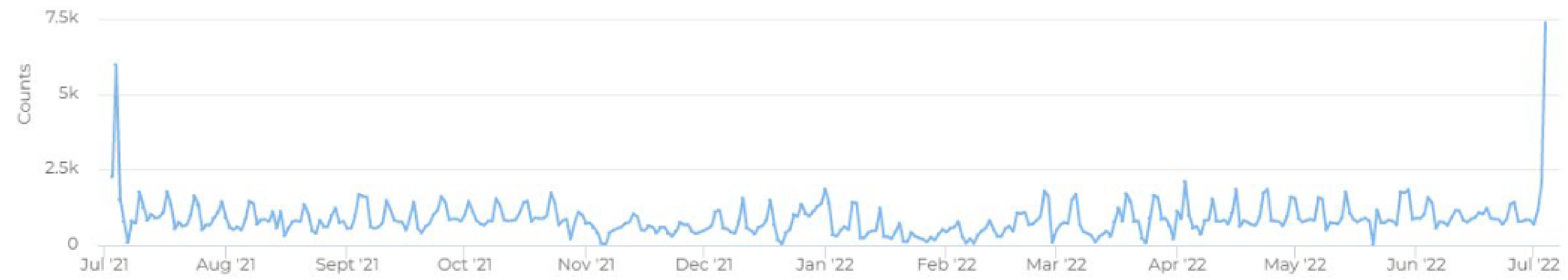
3.9 million residents served every year

Scoping a Regional Trail Count Program in the National Capital Area: *Summary Report*



FL Case Study:

Building the East Coast Greenway in Neptune Beach



Key Figures Summary

07/03/2021 → 07/04/2022

First St - Neptune Beach   Total IN OUT

Site	Total	Daily Average	Peak Day	Peak Count
First St - Neptune Beach Cyclist	316,835	863	Mon Jul 4, 2022	7,353

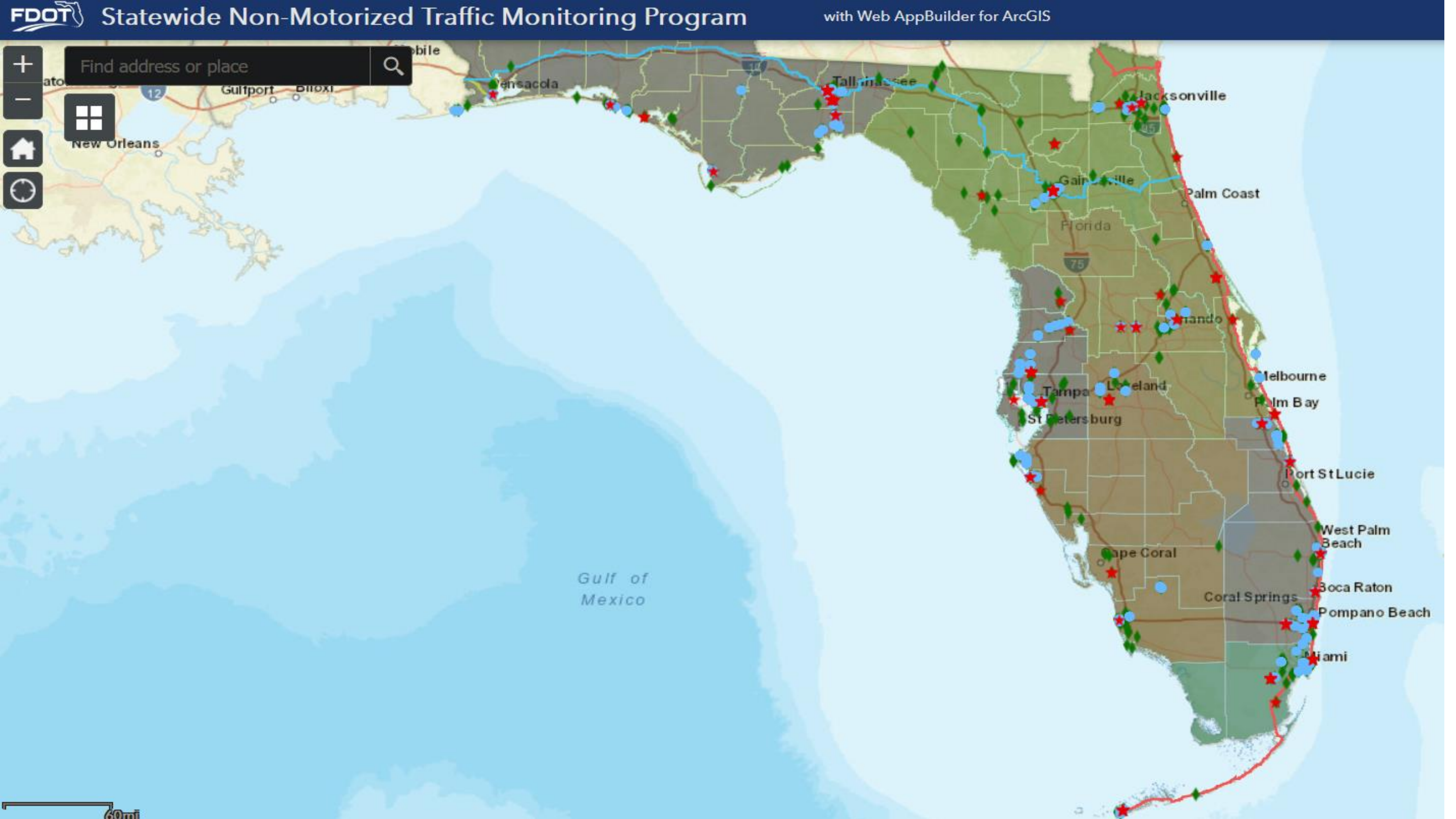
From July/21 to July/22 collected a year's worth of cyclist data from City of Jacksonville's Eco-Counter


Sea Gate
TRAFx Dock G4

WELCOME TO BEAUTIFUL
NEPTUNE
1931 BEACH FLA

NO PARKING THIS SIDE OF STREET

Peak Counts:
7/4/21 - 5,970
7/4/22 - 7,353


FDOT
Statewide Non-Motorized Traffic Monitoring Program
with Web AppBuilder for ArcGIS
Find address or place
Gulfport
Biloxi
New Orleans
Jacksonville
Palm Coast
Florida
Tampa
Port St Lucie
West Palm Beach
Cape Coral
Boca Raton
Coral Springs
Pompano Beach
Gulf of Mexico
60mi

To explore the route, visit:
map.greenway.org

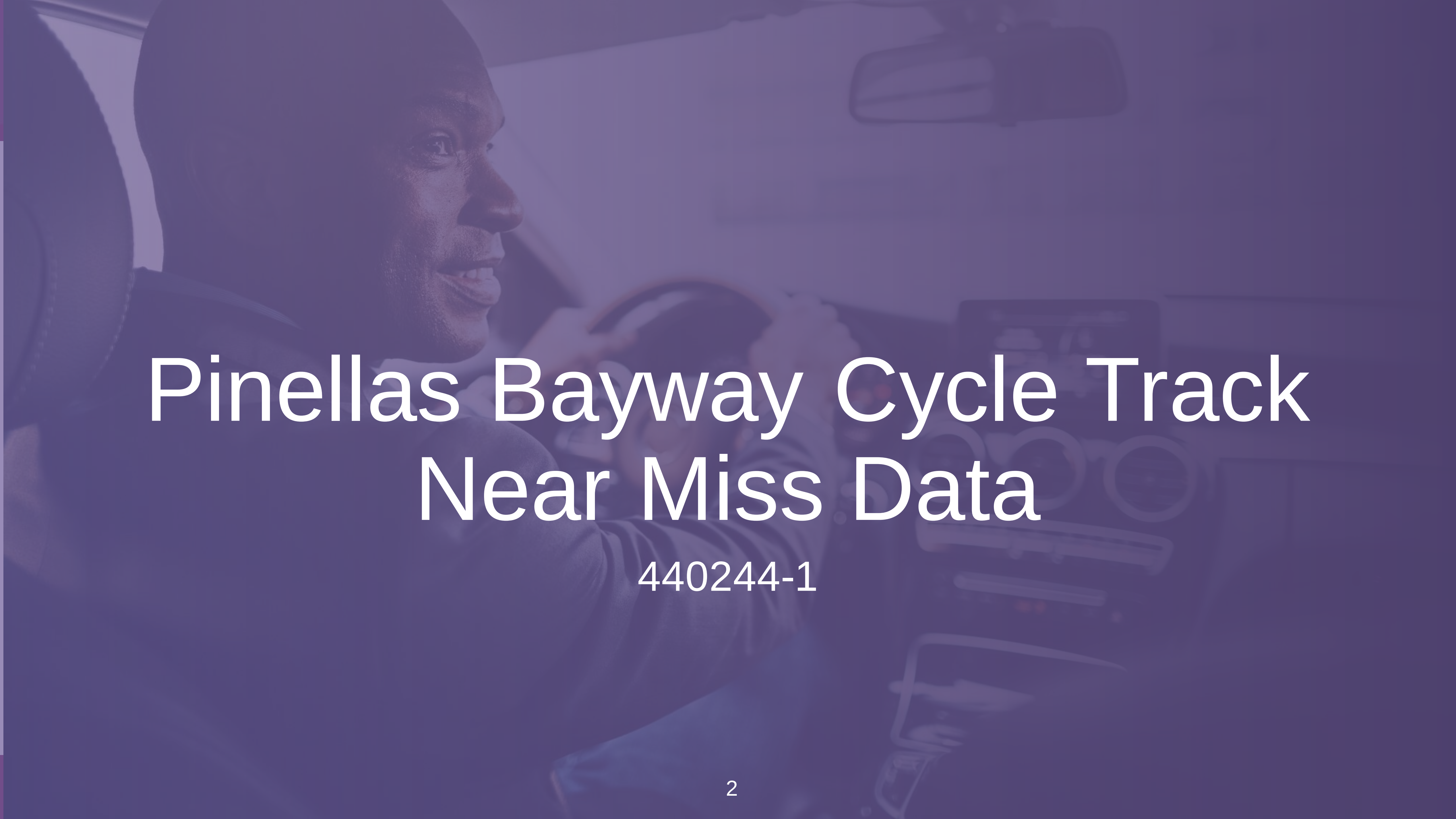
For more info & to support our work- become a member at:
greenway.org

Feel free to reach out:

Robert Barto
FL Manager
robert@greenway.org

FDOT District 7

Andrew Gray, EI, RSP1, Interim Bicycle and Pedestrian Safety Program Manager



Pinellas Bayway Cycle Track Near Miss Data

440244-1

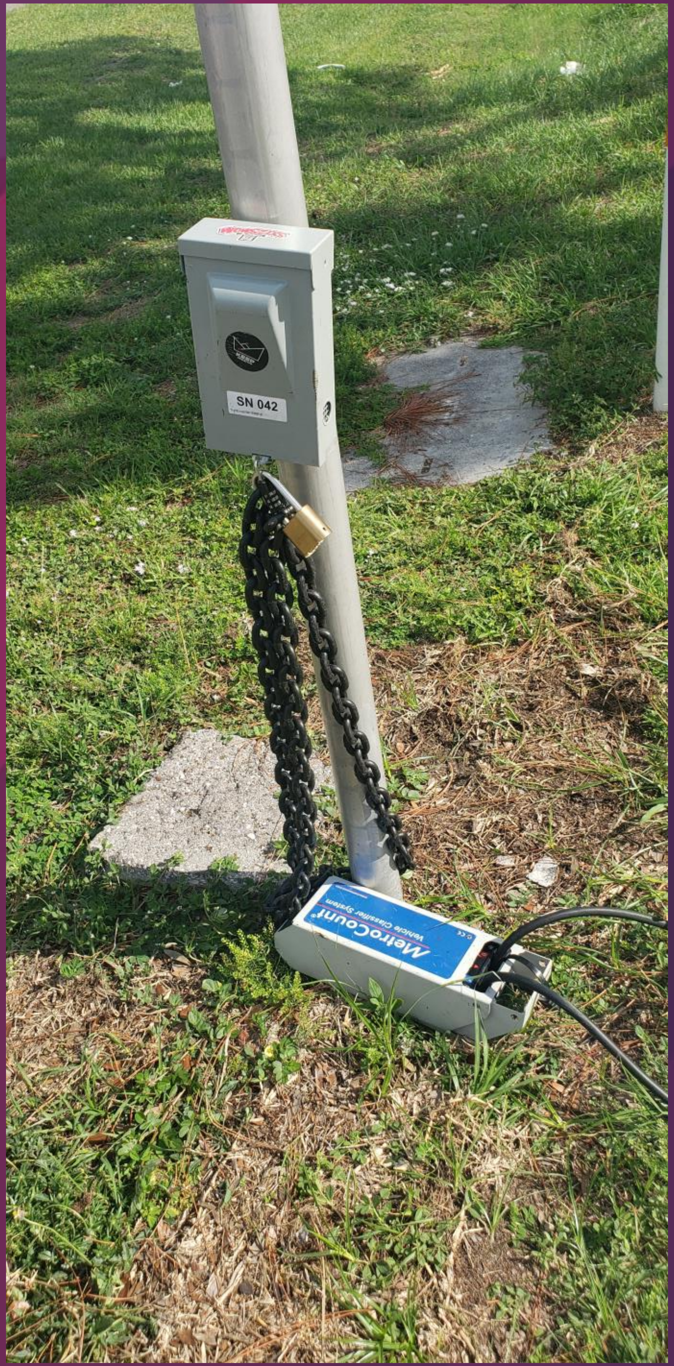
Pinellas Bayway Cycle Track

- Public Safety Concerns
- Collected Near Miss Data


200638 2023/07/20 10:35:29
QC
PC 730
QualityCounts.net


200638 2023/07/20 06:41:19

Non-Motorized Counter Equipment Loaner Pilot


SN 042


KEEP
CREATIVE
SN 042
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Vehicle Classifier System
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Always be alert
for pedestrians.
Safer Drivers
Save Lives
NHTSA

Andrew Gray, EI, RSP1
D7 Safety Consultant
Interim Bicycle and Pedestrian Program Manager
Andrew.Gray@dot.state.fl.us

2024 FDOT STATEWIDE NON-MOTORIZED TRAFFIC MONITORING MEETING

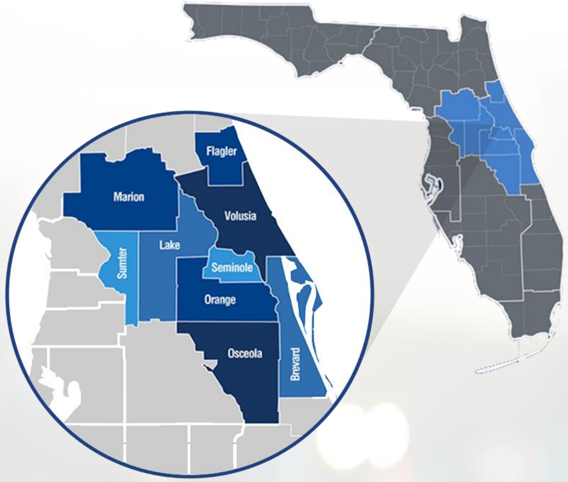
CENTRAL FLORIDA PERSPECTIVES

FDOT

Stephanie Moss, CPM, PMP, RSP1
Bicycle & Pedestrian Coordinator
Florida Department of Transportation
District Five, Office of Safety

February 2024

DISTRICT 5


Flagler
Marion
Volusia
Lake
Sumter
Seminole
Orange
Osceola
Brevard


FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 5
BRINGING CENTRAL FLORIDA TOGETHER
SAFETY STRATEGIC PLAN


LET'S GET EVERYONE HOME.
Early. On time. A little late.
JUST GET THERE SAFELY
TARGETZEROFL.COM

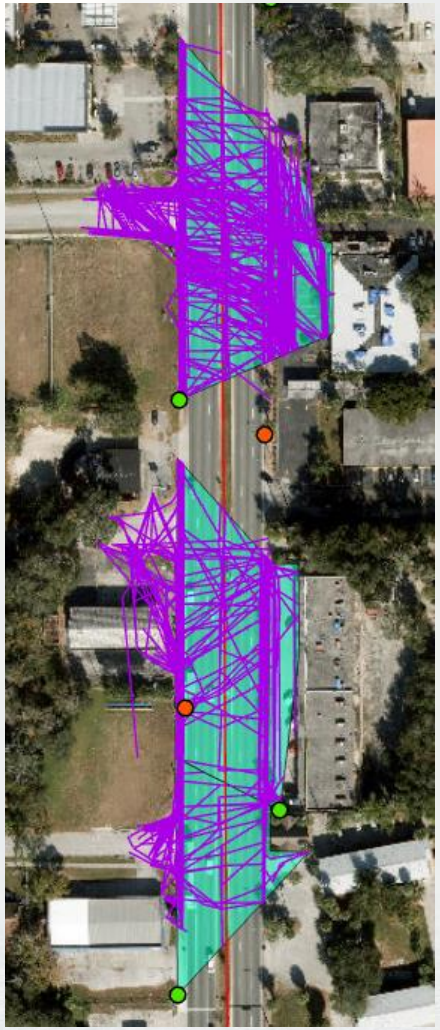

TARGETZEROFL.COM


Mobility Week
What moves you?
www.MobilityWeekFL.com

BEST PRACTICES/LESSONS LEARNED

- **Sharing data** with the public, local businesses and partners helps build support for the program and justify reinvestment
- **Plan for unforeseen costs** resulting from technology upgrades
- **Partner with other agencies** that are interested in collecting similar information and can help with funding
- **Short term counts are labor intensive**; agencies don't have the resources to organize and collect short term counts
- **Permanent counters** with remote wireless data access technology is preferable

ORANGE BLOSSOM TRAIL



- Number of people crossing OBT
- Number of people using crosswalks
- Number of people activating crossings
- Motorist yield rates to people walking or biking
- Walking School Bus

BREVARD COUNTY

- Short term count location on SR A1A south of Eau Gallie Blvd.
- High usage location with two recent pedestrian fatalities prompted the count location
- Data provided the TPO and City insights into facility usage and communicate to public
- The first count location prompted the TPO to start collecting routine non-motorist counts along trails

The counts from this location opened our eyes to the use that the path was getting and promoted the discussion on starting a local non-motorized count program.

— Kim Smith, Retired SCTPO Staff Member

CITY OF ORLANDO

Since its start in 2015, Orlando's permanent bike/ped count program has been a useful tool in tracking a trend line for biking and walking as a growing transportation mode being used by our residents. More recently, before and after counts have helped us measure the success of project installations, and provides much needed bicycle and pedestrian quantitative data in evaluation metrics when determining the appropriate types of transportation investments and trade-offs. The Quick-build Corrine Drive pilot path project is just one example of that.

— Jenn Rhodes, Bicycle and Micromobility Program Manager

LAKE COUNTY COUNT PROGRAM

Our count program is our best way to justify continued investments in parks, both active and passive, trails and other facilities such as trailheads and boat ramps. Counters provide a concrete set of data showing where residents and visitors are recreating. For trails this may also tie into transportation, such as low-income residents commuting to jobs to children walking or biking safely to school.

— Gallus Quigley, Recreation Coordinator-Trails, Lake County

METROPLAN ORLANDO

What drives me is really getting a full and clear understanding of what's really happening out there from a mobility and safety standpoint with regard to non-motorists.

— Mighk Wilson, Senior Transportation Planner, MetroPlan Orlando

VOLUSIA COUNTY

- East Central Regional Rail Trail in Edgewater
- Coming Up!

  Gemini Springs

  City of Daytona Beach

Count data is critical to policy makers that are confronted with decisions about expending funds on infrastructure such as new trailheads, parking, or connecting the trails system.

— Time Baylie, Volusia County Director of Parks and Recreation

CONNECT WITH US!

EVENTBRITE

SAFE DRIVING TIPS TO

SHOW LOVE BEHIND THE WHEEL

Set phone on "Do not Disturb".

Show compassion to yourself and others.

Leave earlier to avoid being late.

Preset your romantic playlist.

Give fellow drivers the benefit of the doubt.

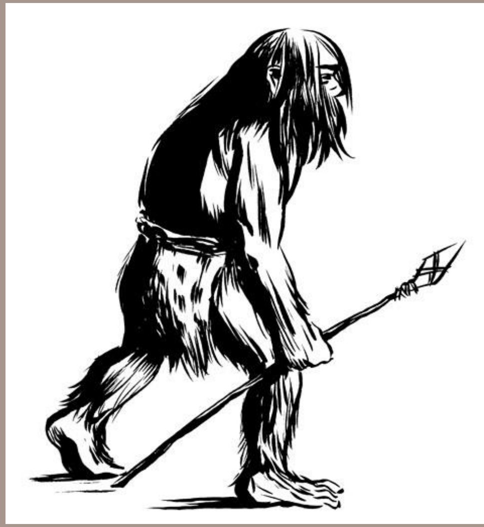
Focus on getting to the ones you love.

TargetZeroFL.com

THE "KISS" METHOD
BLUETOOTH READER TECHNOLOGY

Peter Vega, P.E. – District Two TSM&O Program Manager
Florida Department of Transportation

THE PAST

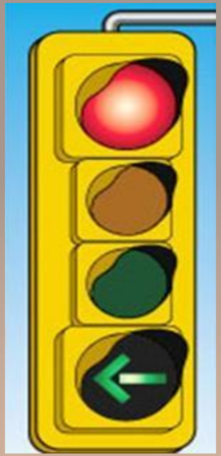


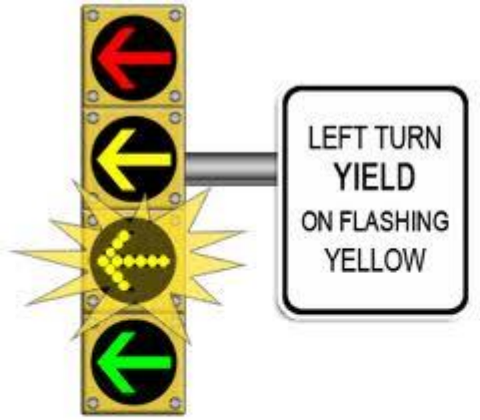
THE PRESENT


YIELD


STOP


Boss ST
Mean ST NW




LEFT TURN
YIELD
ON FLASHING
YELLOW

THE FUTURE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Arterial Management

Emergency / Incident Management

Freeway Management

Special Event Management

Freight Management

Transit Operations & Management

Traveler Information

Travel Demand Management

Work Zone Management

Travel Weather Management

Planning & Development ***Operations*** ***Construction*** ***Maintenance***

THE CHALLENGE

- Ed Hutchinson's Call
- Funding for Trails
- Bike/Ped User Counts
- Bike/Ped Dwell Time
- Bike/Ped Trail Route

FDOT

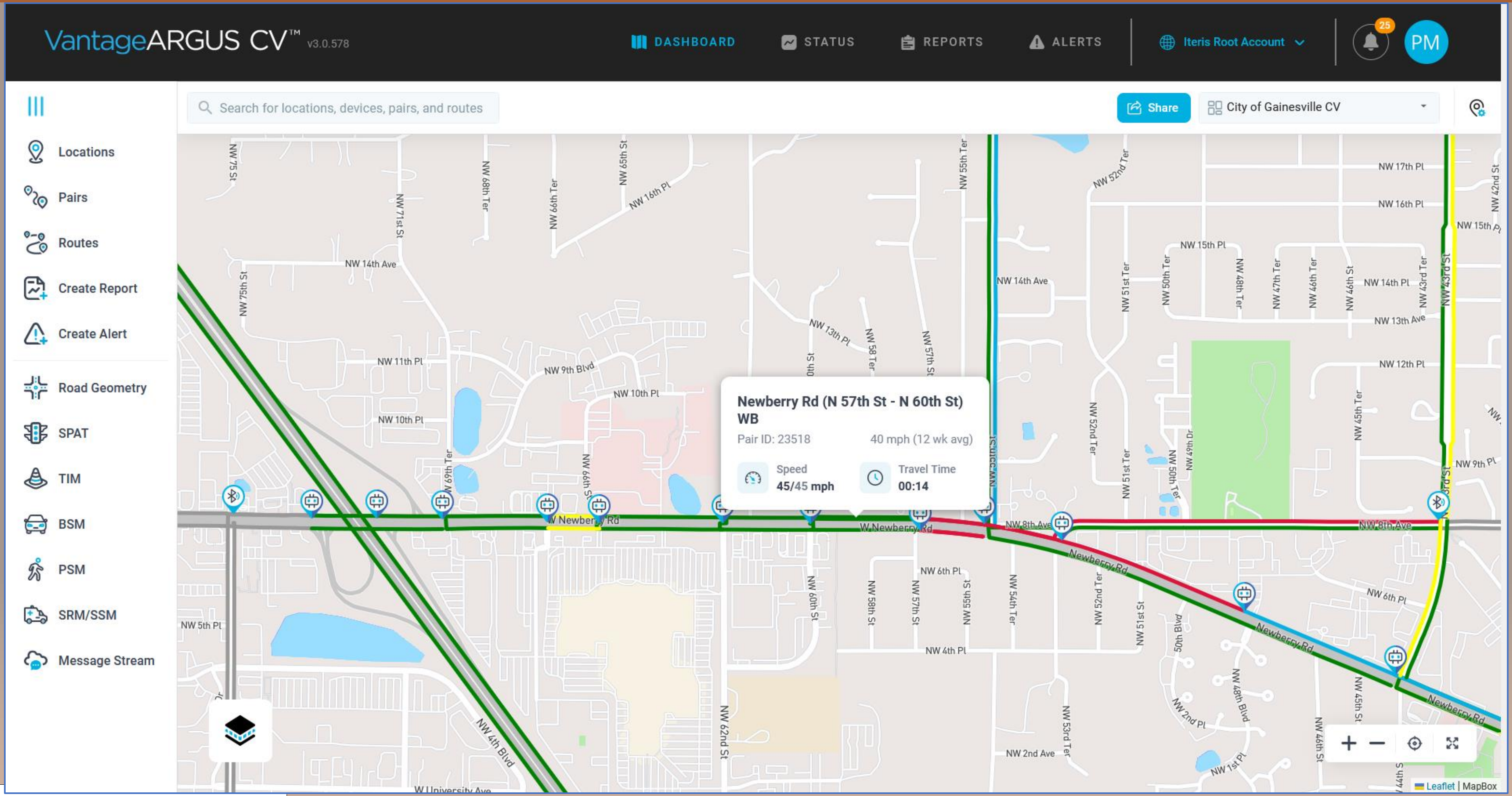
POSSIBLE SOLUTIONS

- Video technology
  - TraffiSense, Miovision, Modii, Bosch Analytics
  - Counts Only
  - AI and Machine Learning for other data
  - Cost prohibitive
- Loop technology
  - Limited data
- Bluetooth technology (BLE)
  - Counts
  - O/D
  - Dwell time

INSTALLATION

- The BlueTOAD devices are compact and easy to mount.
- Mounted on a mast arm or other structure between 12 and 15 feet above the roadway.
- Banding straps to secure BlueTOAD to structure.

FDOT: O/D REPORT EXAMPLE



INTERSTATE BT DEPLOYMENT

Tall-Jax-Tampa-Orlando-Ft. Lauderdale OD

OD Study

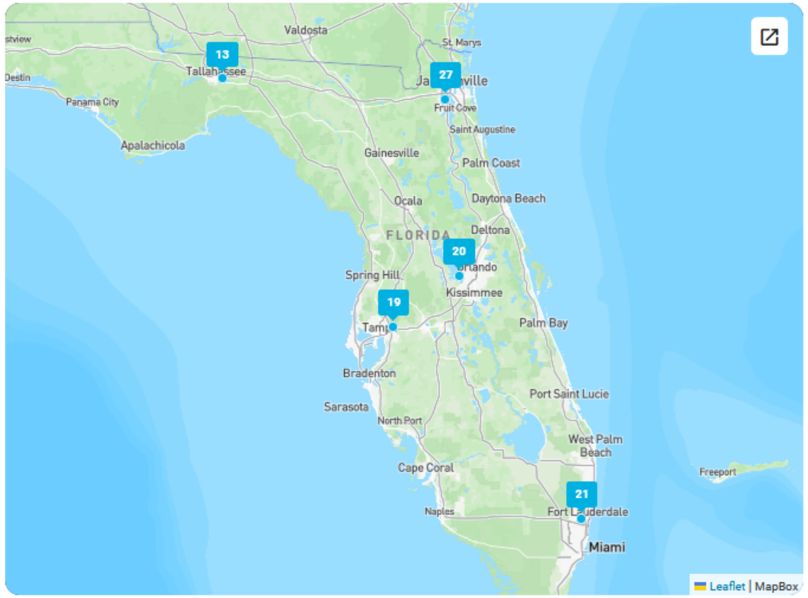
Created: 01/31/2024 10:54 AM
Finished: 01/31/2024 10:56 AM

Download

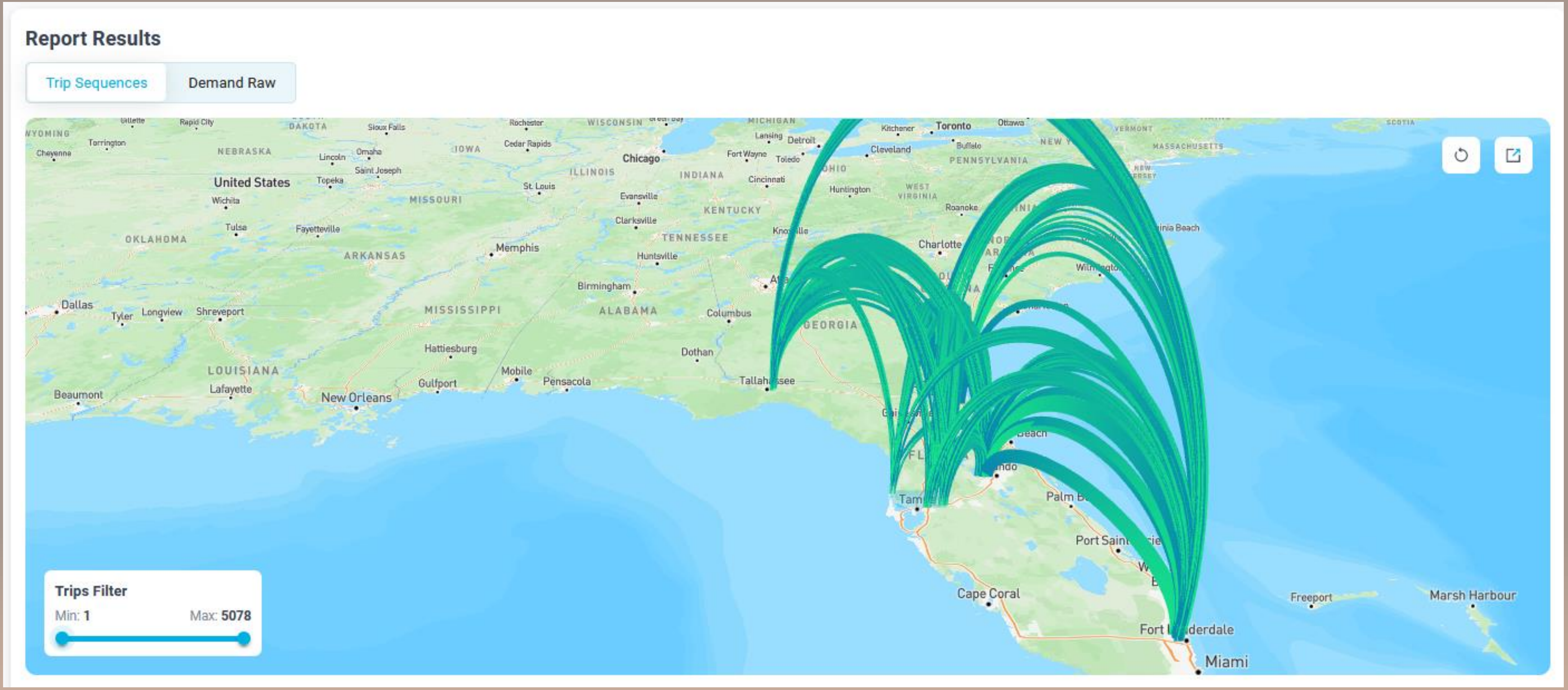
Report Details

Report Parameters

Status	Finished
Creator	Iteris Root Account
Recipients	Paul & Frank Tests (2)
Time zone	(GMT-05:00) Eastern Time
Zones	Tallahassee Area Locations (13) Jacksonville Area Locations (27) Tampa Area Locations (19) Orlando Area Locations (20) Ft. Lauderdale Locations (21)
Time Slices	Time Slice 1 Date Range: 12/1/2023 - 12/31/2023 Time Range: 00:00 - 23:59 Days of Week: Mon, Tues, Wed, Thur, Fri
Output Options	Include Trip Sequences: Yes Include Trips By OD: Yes Include Raw Trips: No Demand Travel Time: No



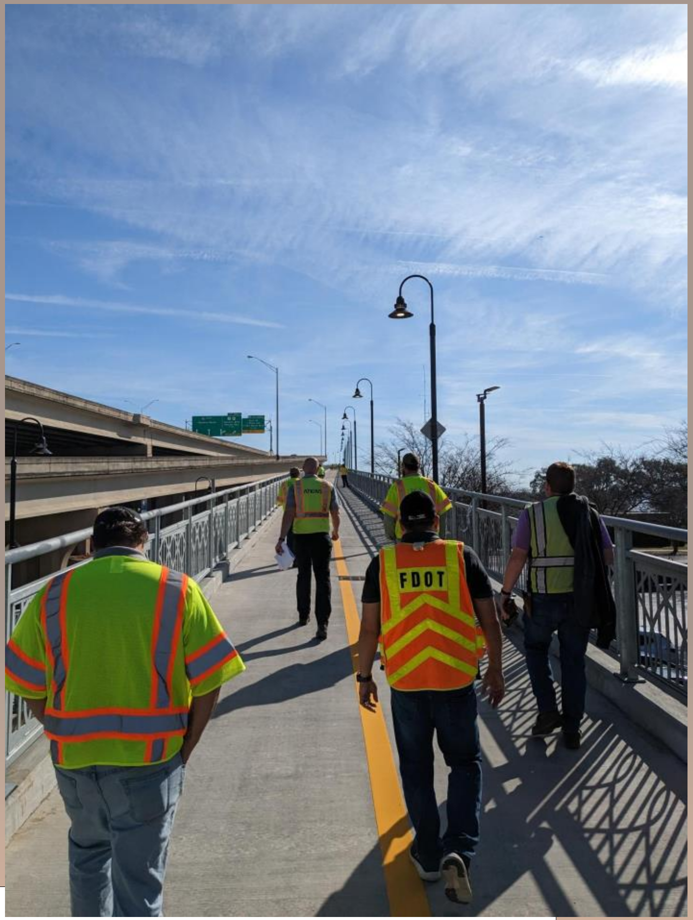
INTERSTATE BT DEPLOYMENT



INTERSTATE BT DEPLOYMENT

Sequence	Start Location	End Location	Count	Avg Travel Time (mins)
091-063_3-NB → 091-265_2-NB	091-063_3-NB	091-265_2-NB	5078	03:52:27
091-265_2-NB → 091-063_3-NB	091-265_2-NB	091-063_3-NB	3243	03:57:14
091-063_3-NB → 091-265_5-SB	091-063_3-NB	091-265_5-SB	2997	03:52:53
091-063_3-NB → I-95 & S of Race Track Rd (was u1175)	091-063_3-NB	I-95 & S of Race Track Rd (was u1175)	2721	05:30:46
091-265_2-NB → 091-060_3-SB	091-265_2-NB	091-060_3-SB	2358	04:02:28
091-265_5-SB → 091-060_3-SB	091-265_5-SB	091-060_3-SB	2058	03:50:45
091-265_5-SB → 091-063_3-NB	091-265_5-SB	091-063_3-NB	1875	04:00:39
091-063_3-NB → 091-266_1-SB	091-063_3-NB	091-266_1-SB	1611	03:54:44
091-060_3-SB → 091-265_2-NB	091-060_3-SB	091-265_2-NB	1527	04:25:23
I-95 & S of Race Track Rd (was u1175) → 091-063_3-NB	I-95 & S of Race Track Rd (was u1175)	091-063_3-NB	1348	05:33:23
Mahan Dr @ Walden Rd → RSU-10-344.9	Mahan Dr @ Walden Rd	RSU-10-344.9	1289	02:29:53
091-266_1-SB → 091-063_3-NB	091-266_1-SB	091-063_3-NB	1128	04:04:33

FULLER WARREN BRIDGE SHARED USE PATH



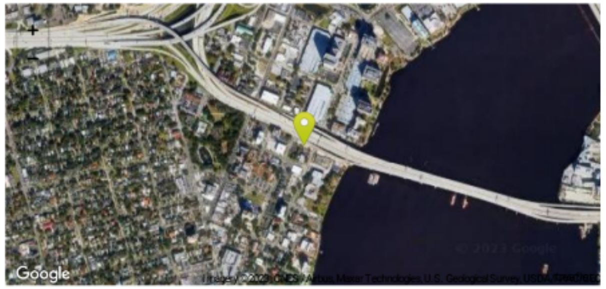
FULLER WARREN: ECO-COUNTER

Fuller Warren SUP - West

City of Jacksonville - Transportation

April 5th, 2023 12:00 am → April 30th, 2023 12:44 pm

Location



Total Bikes-Peds
04/05/2023 → 04/30/2023

Total

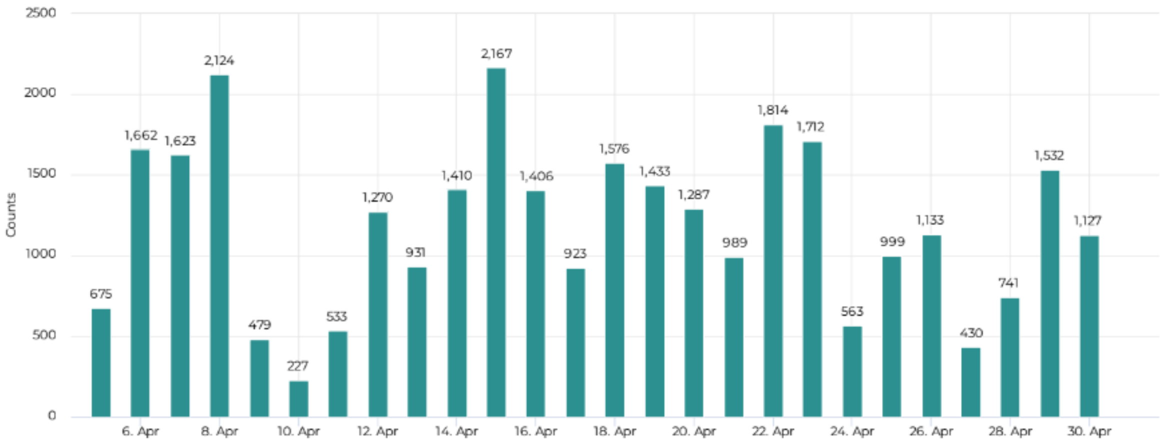
30,156

Daily Average
04/05/2023 → 04/30/2023

Daily Average

1,160

Fuller Warren SUP: Total Counts
04/05/2023 → 04/30/2023



Fuller Warren SUP - East

City of Jacksonville - Transportation

April 5th, 2023 12:00 am → April 30th, 2023 12:44 pm

Location

Total Bikes-Peds
04/05/2023 → 04/30/2023

Total

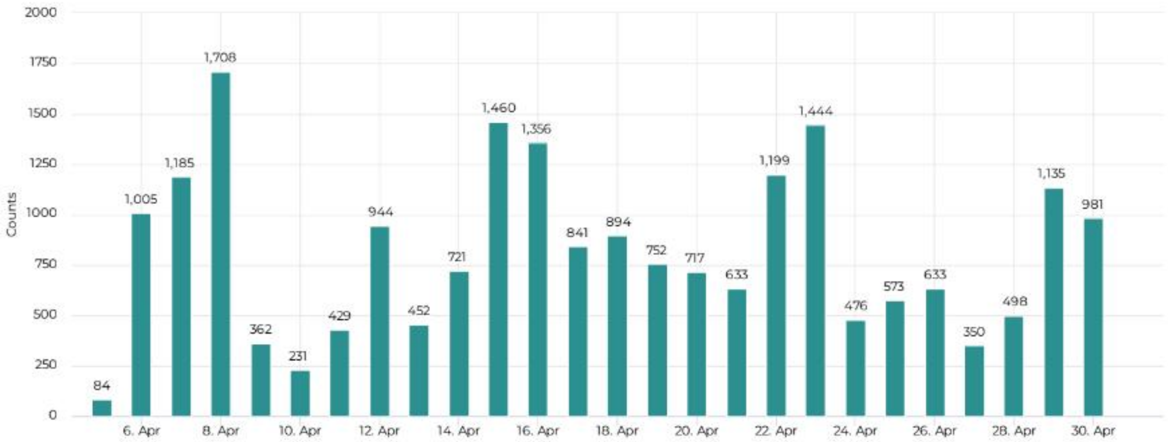
21,006

Daily Average
04/05/2023 → 04/30/2023

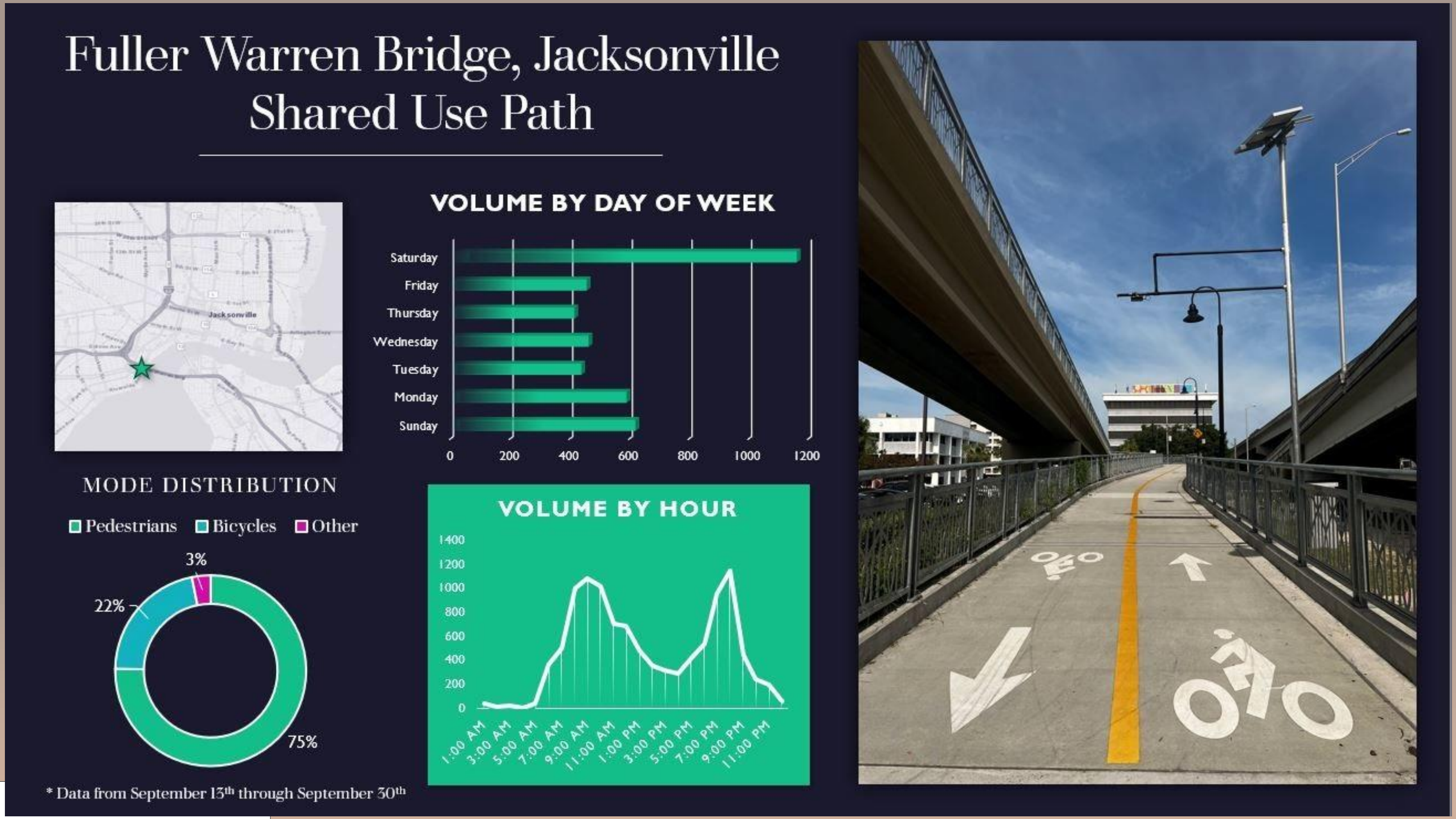
Daily Average

808

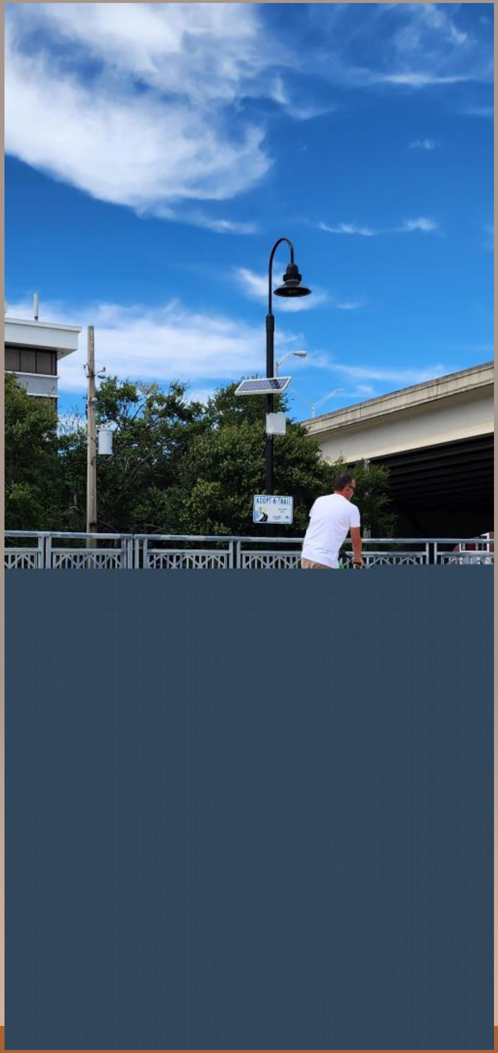
Fuller Warren SUP: Total Counts
04/05/2023 → 04/30/2023



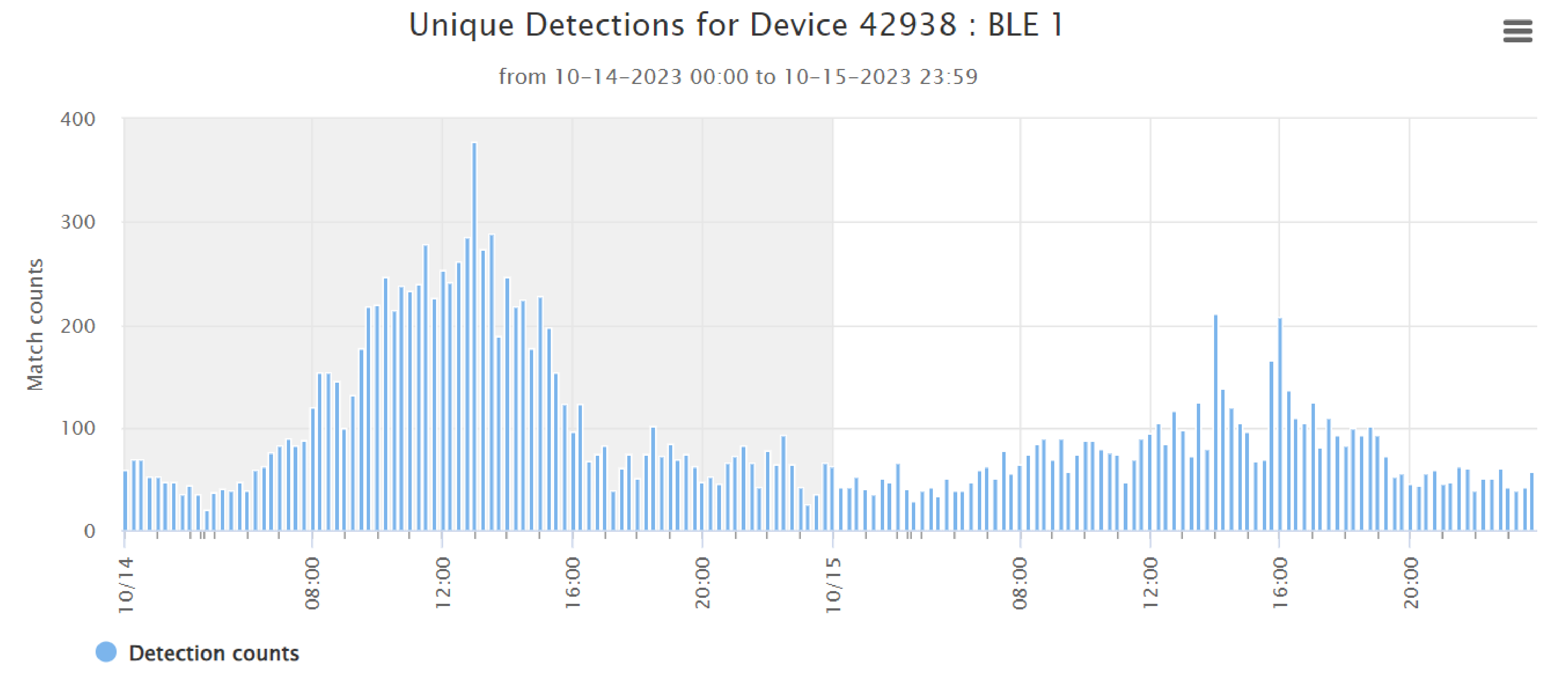
FULLER WARREN: OVERHEAD



FULLER WARREN: BLUETOAD



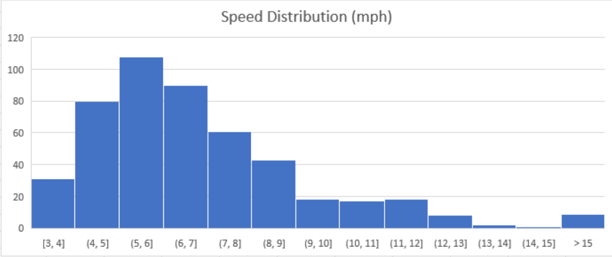
FULLER WARREN: BLUETOAD

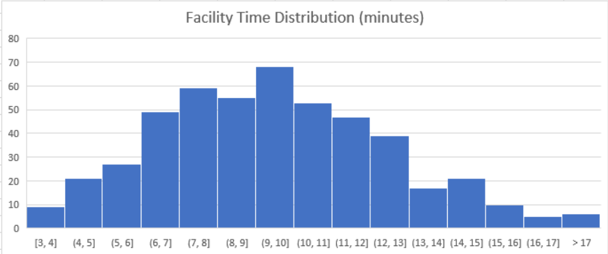


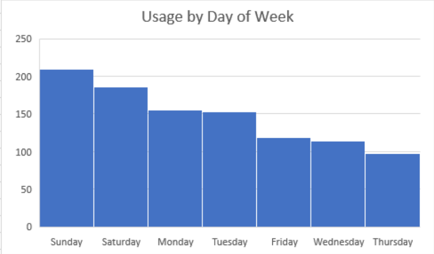
FULLER WARREN: BLUETOAD

Pair	FDOTFW-381603: (BLE EB)
Start Date	10/10/2023 0:00
End Date	10/26/2023 23:59
Days	All days
Period	0:00 to 24:00
Type	Individual Speeds (Filtered): 15 min aggregate

Day of week	Date	Time	Number matches	Travel time (s)	Time (m)	Speed (mph)
Tuesday	10/10/2023	5:30	1	391	6.52	9.21
Tuesday	10/10/2023	5:45	1	988	16.47	3.64
Tuesday	10/10/2023	6:15	1	533	8.88	6.75
Tuesday	10/10/2023	7:30	2	374.5	6.24	9.61
Tuesday	10/10/2023	7:45	1	672	11.20	5.36
Tuesday	10/10/2023	8:15	3	769	12.82	4.68
Tuesday	10/10/2023	9:00	1	791	13.18	4.55
Tuesday	10/10/2023	10:15	1	486	8.10	7.41
Tuesday	10/10/2023	11:15	1	623	10.38	5.78
Tuesday	10/10/2023	11:30	2	754.5	12.58	4.77
Tuesday	10/10/2023	11:45	1	461	7.68	7.81
Tuesday	10/10/2023	12:00	1	603	10.05	5.97
Tuesday	10/10/2023	13:00	1	258	4.30	13.95
Tuesday	10/10/2023	13:15	2	349.5	5.83	10.30
Tuesday	10/10/2023	13:30	2	324.5	5.41	11.09
Tuesday	10/10/2023	13:45	2	530	8.83	6.79
Tuesday	10/10/2023	15:00	3	341.7	5.70	10.54
Tuesday	10/10/2023	15:30	4	407.5	6.79	8.83
Tuesday	10/10/2023	16:00	3	196	3.27	18.37
Tuesday	10/10/2023	16:15	2	417.5	6.96	8.62
Tuesday	10/10/2023	17:00	3	683.3	11.39	5.27
Tuesday	10/10/2023	18:15	1	652	10.87	5.52
Tuesday	10/10/2023	18:30	2	490.5	8.18	7.34
Tuesday	10/10/2023	18:45	10	454.5	7.58	7.92
Tuesday	10/10/2023	19:00	1	369	6.15	9.76
Tuesday	10/10/2023	19:30	4	560.8	9.35	6.42
Tuesday	10/10/2023	19:45	1	729	12.15	4.94
Tuesday	10/10/2023	20:45	2	799.5	13.33	4.50
Tuesday	10/10/2023	22:00	6	583.5	9.73	6.17
Wednesday	10/11/2023	5:15	1	569	9.48	6.33
Wednesday	10/11/2023	6:15	1	686	11.43	5.25
Wednesday	10/11/2023	6:30	1	500	8.33	7.20
Wednesday	10/11/2023	7:30	1	619	10.32	5.82
Wednesday	10/11/2023	8:15	7	498.9	8.32	7.22
Wednesday	10/11/2023	8:30	1	369	6.15	9.76
Wednesday	10/11/2023	8:45	3	597.7	9.96	6.02
Wednesday	10/11/2023	9:15	2	633	10.55	5.69
Wednesday	10/11/2023	9:30	1	863	14.38	4.17
Wednesday	10/11/2023	9:45	1	431	7.18	8.35
Wednesday	10/11/2023	10:15	2	655.5	10.93	5.49
Wednesday	10/11/2023	12:00	1	862	14.37	4.18
Wednesday	10/11/2023	12:30	2	563.5	9.39	6.39
Wednesday	10/11/2023	12:45	3	754	12.57	4.77
Wednesday	10/11/2023	13:15	1	424	7.07	8.49
Wednesday	10/11/2023	13:30	1	654	10.90	5.50
Wednesday	10/11/2023	14:30	1	422	7.03	8.53
Wednesday	10/11/2023	16:30	3	477.3	7.96	7.54
Wednesday	10/11/2023	17:15	2	585.5	9.76	6.15
Wednesday	10/11/2023	18:00	1	326	5.43	11.04
Wednesday	10/11/2023	18:15	3	631.3	10.52	5.70

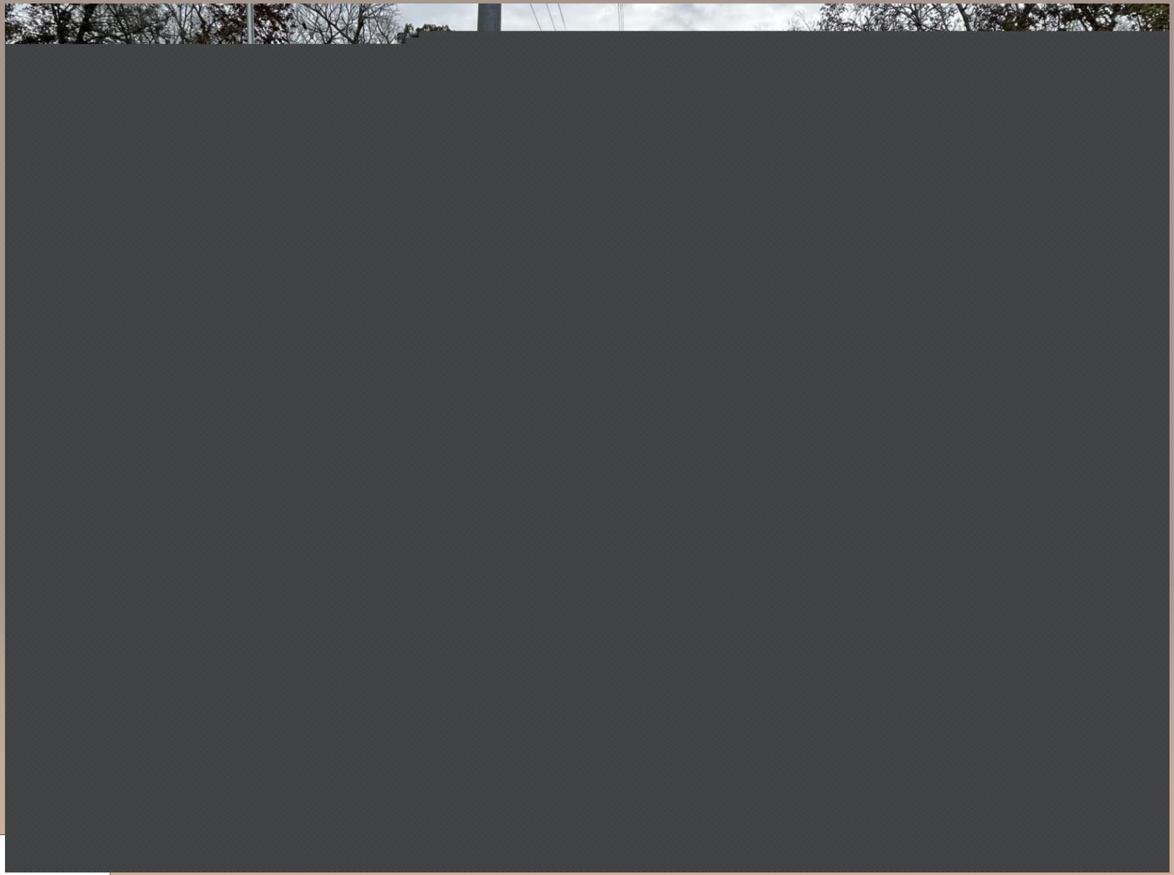






JACKSONVILLE-BALDWIN RAIL TRAIL

BALDWIN TRAIL: IN-GROUND



BALDWIN TRAIL: BLUETOAD

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SMART ST AUGUSTINE

ST AUGUSTINE: MIOVISION CORE DCM

ST AUGUSTINE: MIOVISION CORE DCM

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HOW BLUETOOTH (BLE) TECHNOLOGY WORKS

- **MAC Addresses for:**
  - Earbuds
  - Cell Phones
  - Vehicles
  - Smart Bikes
- **Captures time, device presence and location**
- **Software provides counts, dwell times and routes**

BLUETOOTH (BLE) TECHNOLOGY CHALLENGES

- **Count accuracy due to multiple user devices (being addressed)**
- **Enabled/Disabled**
- **Interference by vehicle data (must be kept away from thoroughfares)**
- **Power and communication (Some sunlight and nearby cell tower)**
- **Children and non-Bluetooth users**

BLUETOOTH (BLE) TECHNOLOGY BENEFITS

- **Easy and Low-Cost Installation**
- **Flexibility (i.e. solar/cellular/wireless)**
- **Full Picture of activities (counts, stay duration and path taken)**
- **Existing Statewide Software**

NEEDS

- **Further calibration**
- **Video capability (Ubiquiti Camera – iTPAS)**
- **Equipment "fine-tuning"**

The

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PETER.VEGA@DOT.STATE.FL.US
(904) 360-5463

Questions?

COUNTERS

Placement, Data, & Uses

Gallus Quigley, Recreation Coordinator - Trails

Lake County Parks & Water Resources

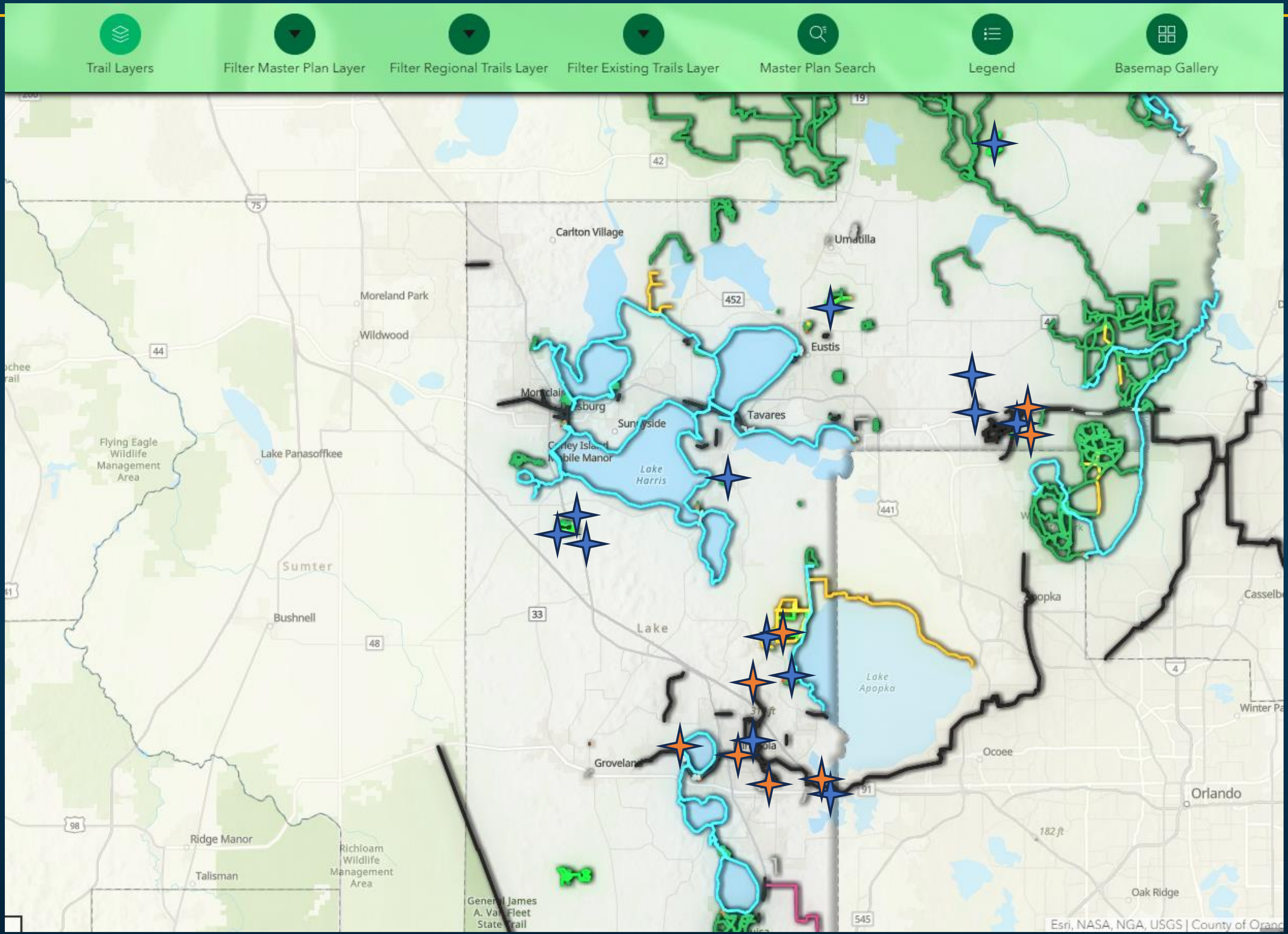
Office of Parks & Trails

COUNTERS

- Chambers Electronics – Scotland UK
  - Vehicle
    - Vehicle Only
    - RadioBeam – Single Band
    - Maximum road width ~45’
      - We’ve had accuracy issues on road widths beyond ~35’
      - Most park and trailhead entrances are only up to 24’
  - Bicycle – Pedestrian
    - Separates Cyclists and Pedestrians
    - RadioBeam - Dual Band
    - Maximum path width ~14’

Directional counting	Can be supplied as a directional counter (DRBBP), if this option is chosen it incorporates two X band beams.
Position	Positioned on both sides of path
Maximum path width	4 metres
Battery:	Battery life: 2 years Transmitter: 4 D cells lithium Receiver: 2 D cells lithium
Housing Dimensions (cm) (H x W x D)	Protective Housing: 39 x 19 x 14 Bollards: 110 x 15 x 15 (above ground) Metal Posts: 110 x 15 x 15 (above ground)
Housing Construction	Protective Housing: Polycarbonate Bollard: Recycled plastic Metal Posts: Galvanised or painted steel (bike antennae exterior to posts for metal posts)
Housing options:	Protective housing and posts can be painted Waymark signs to customers specifications can be affixed as required
Waterproofing	Counter IP68 with additional external protection from housing or posts
Operating temperature	-20° to + 60°C
Indicators and controls	Transmitter: Battery check flashing LED Receiver LED indicators (activate by magnet): •Bike VLF antenna tuned •People beam strength •Bike detect •Battery check Bike detect sensitivity control: Rotary dial
	Satellite and GSM: Remote access via web portal

COUNTERS



VEHICLE

BIKE/PED

COUNTERS

- Vehicle Counters
  - Single Traffic Direction
    - Multiply by 2.5 = Total estimated users
  - Two-way Traffic Direction
    - Divide total by 2
    - Multiply by 2.5 – Total estimated users
  - Set to hourly counts
  - Data pulled monthly

COUNTERS

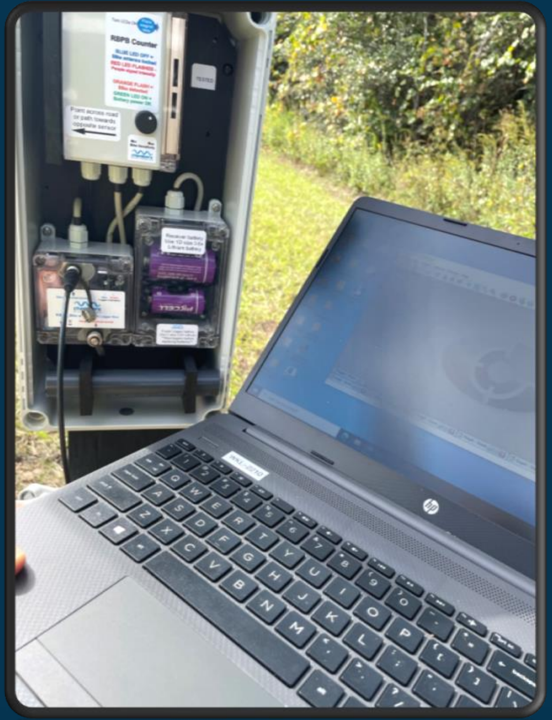
- Trail Counters (Cyclists/Pedestrian)
  - Typical trail installation site
    - Divide total by 2
  - Set to hourly counts
  - Data pulled monthly

COUNTERS

- Counter Deployed
  - Vehicle – 16
    - Three (3) more awaiting installation
  - Bicycle-Pedestrian – 6
- Other Agencies
  - FDOT – 2 Bicycle-Pedestrian
  - SJRWMD – 3 Bicycle-Pedestrian

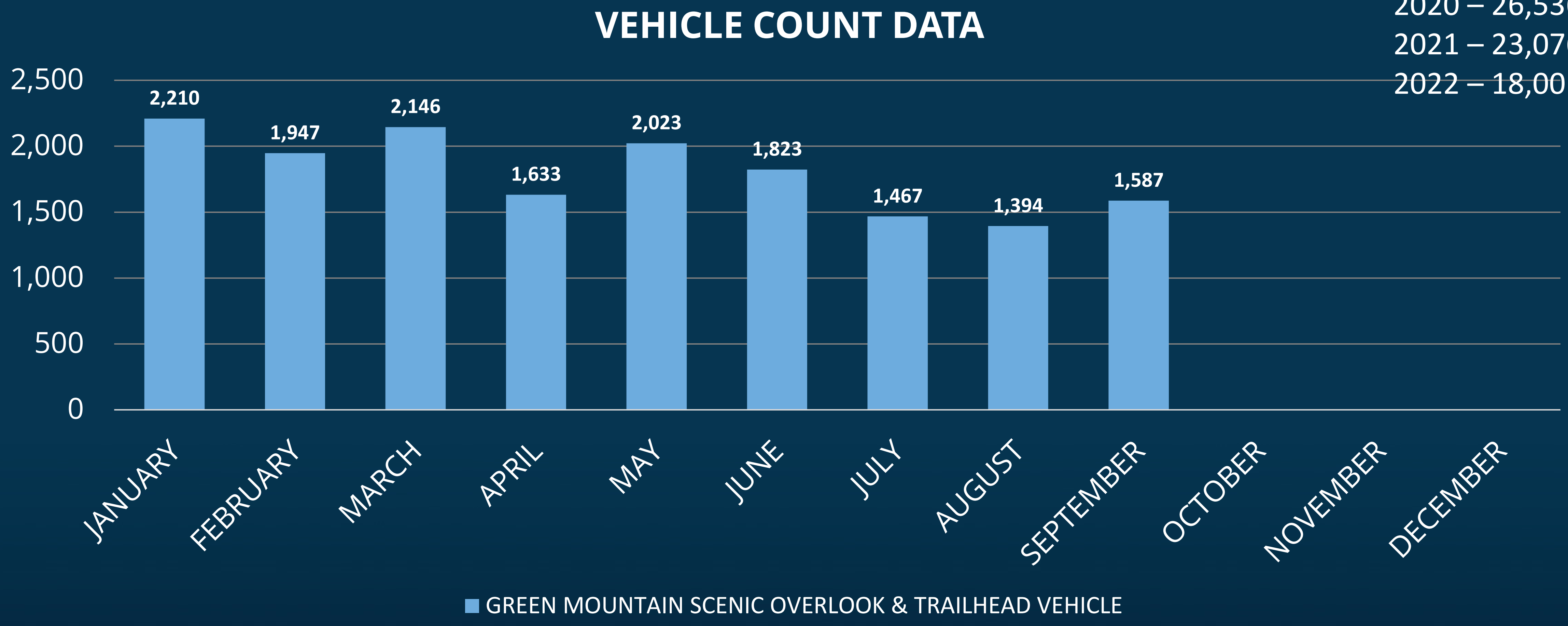
COUNTERS

- Trail Deployment Sites
  - South Lake Trail (C2C)
    - Lake Blvd.
    - Mohawk Rd.
    - County Road 565A
  - Hancock Trail (Lake Apopka Loop)
    - South Tunnel (Cooper Memorial Library)
    - County Road 561A
  - Green Mountain Scenic Overlook & Trailhead (Lake Apopka Loop)
    - Upper Trail



GREEN MOUNTIAN SCENIC OVERLOOK & TRAILHEAD

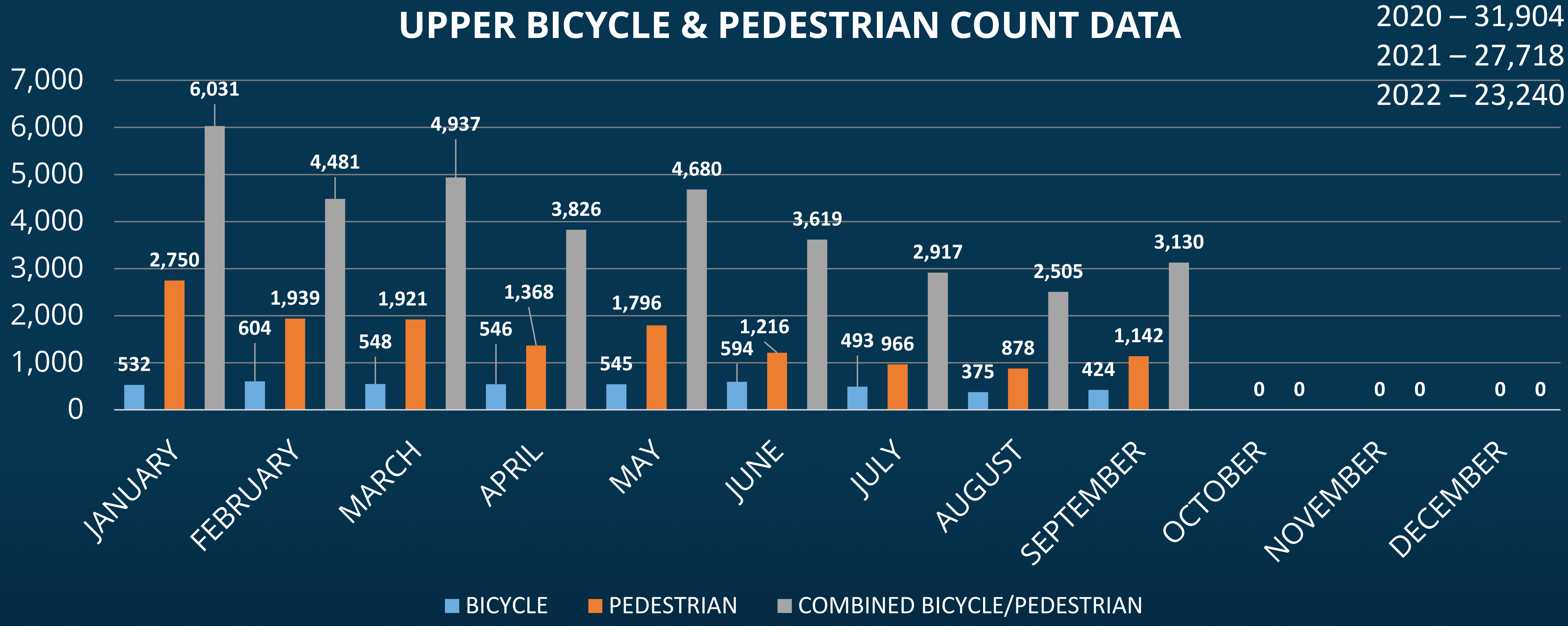
2019 – 17,245
2020 – 26,536
2021 – 23,076
2022 – 18,001



2023

GREEN MOUNTIAN SCENIC OVERLOOK & TRAILHEAD

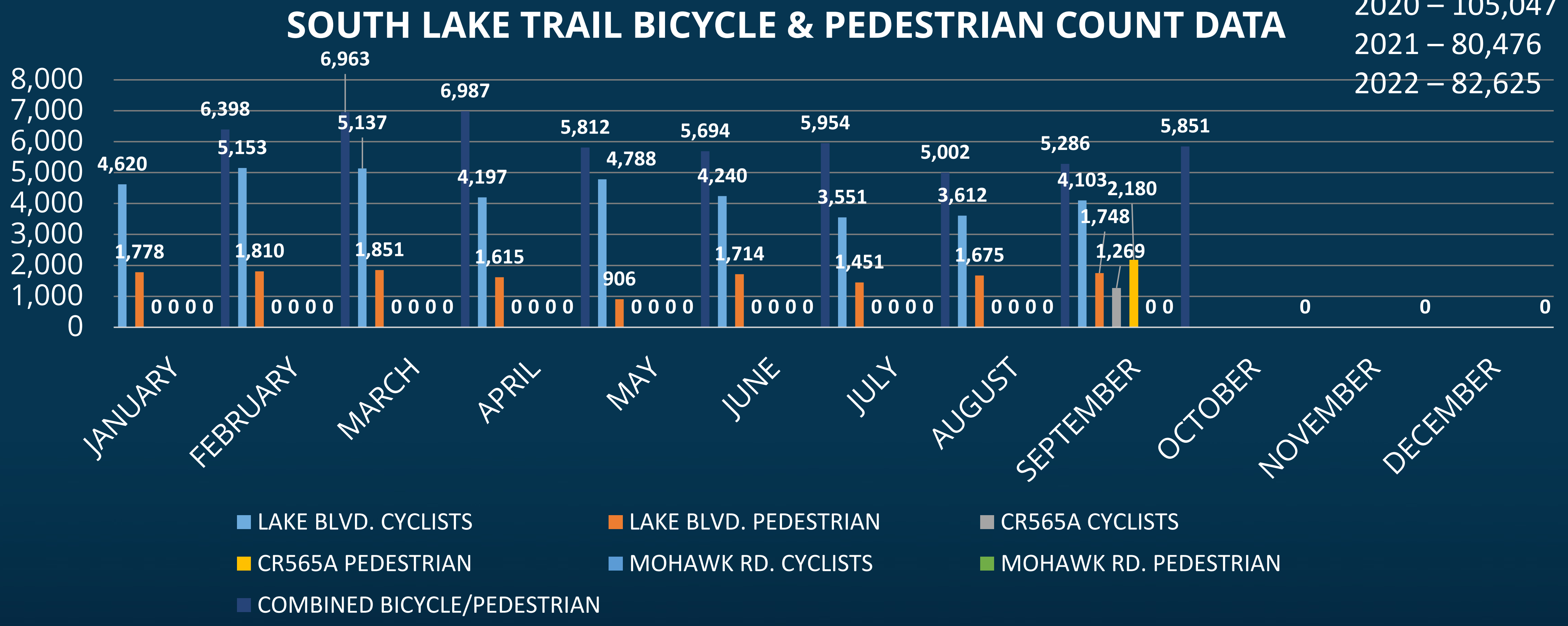
2019 – 19,509
2020 – 31,904
2021 – 27,718
2022 – 23,240



2023

SOUTH LAKE TRAIL

2019 – 62,199
2020 – 105,047
2021 – 80,476
2022 – 82,625

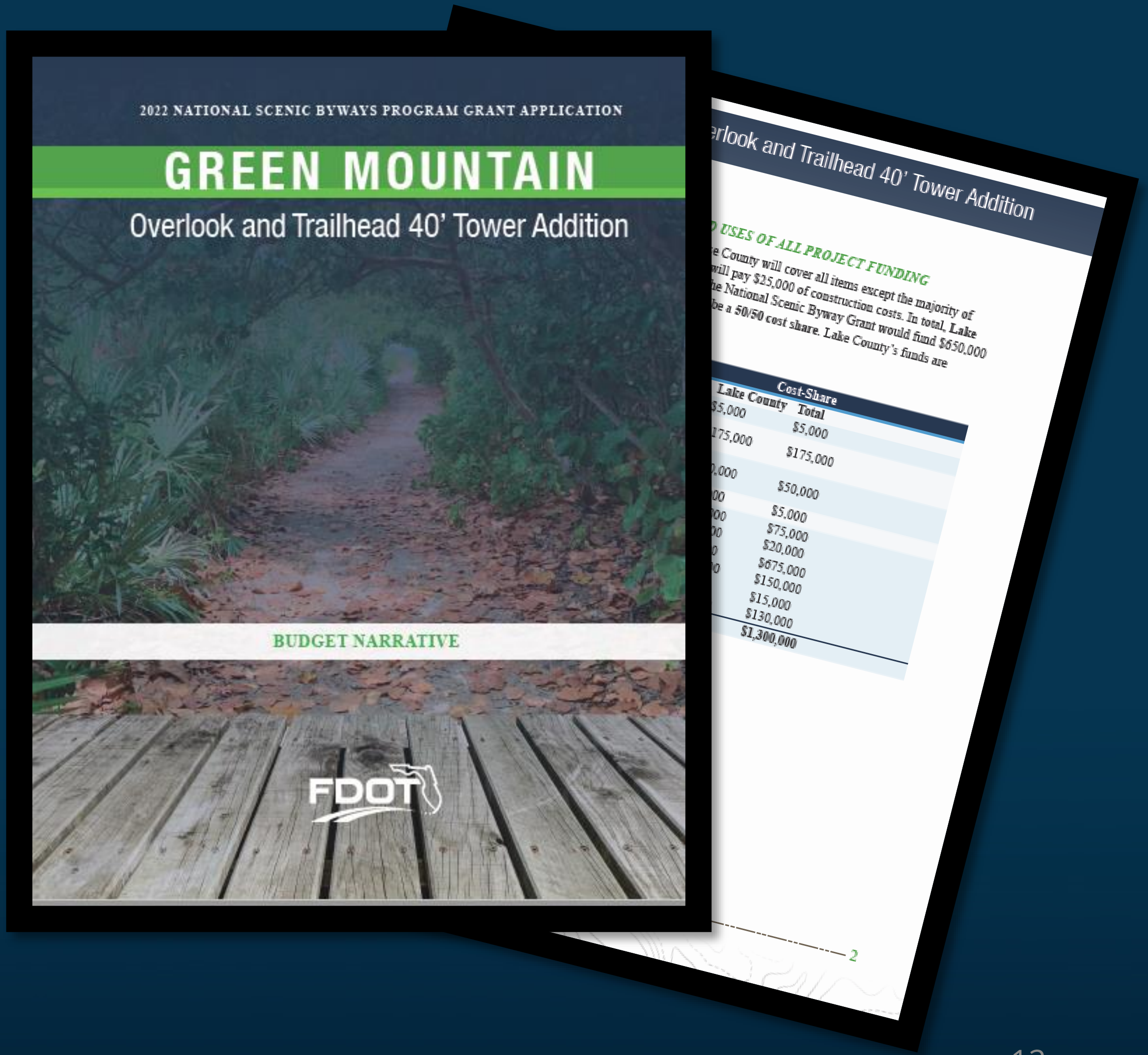


DATA USAGE

- Green Mountain Scenic Byway Committee with assistance from Lake County received a matching federal highway grant for $650,000.
- Construction of a new observation tower that is 40’ higher than the existing tower at Green Mountain Scenic Overlook and Trailhead.
- Lake Apopka Loop Trail and along the OGT designated priority River to the Hills Regional Trail.

DATA USAGE

- Submitted with application
  - Vehicle count data
  - Bicyclist count data
  - Pedestrian count data



DATA USAGE

COUNTERS

- Year over year count data and user estimates

Monthly Data

Year Totals

Monthly Cumulative

Yearly Cumulative

SOUTH LAKE TRAIL (COUNTY LINE)

YEAR/MONTH														
[illegible]	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	YEAR TOTAL	ESTIMATED ATTENDENCE
[illegible]	3384	3883	5682	3856	4306	4564	3150	3592	4427	5024	2714	3491	48069	48069
[illegible]	971	1051	1146	1067	1381	1372	928	1192	1428	1473	881	1242	14131	14131
COMBI[illegible]	4355	4933	6828	4923	5687	5936	4078	4784	5855	6496	3594	4733	62199	62199
2020	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	YEAR TOTAL	ESTIMATED ATTENDENCE
CYCLISTS	4523	4094	5707	9498	12245	7874	6730	7117	[illegible]	[illegible]	[illegible]	[illegible]	83043	83043
PEDESTRIANS	1492	1381	1993	2959	2207	1927	1585	1735	[illegible]	[illegible]	[illegible]	[illegible]	22004	22004
COMBINED	6015	5475	7700	12457	14452	9801	8315	8852	[illegible]	[illegible]	[illegible]	[illegible]	105047	105047
2021	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	YEAR TOTAL	ESTIMATED ATTENDENCE
CYCLISTS	4266	6276	6260	5097	6524	4307	4718	4563	4635	5629	3152	5209	60634	60634
PEDESTRIANS	1464	1827	1699	1596	1921	1318	1556	1604	1709	2178	1207	1765	19842	19842
COMBINED	5729	8103	7959	6693	8445	5625	6274	6167	6343	7807	4359	6974	80476	80476
2022	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	YEAR TOTAL	ESTIMATED ATTENDENCE
CYCLISTS	3389	4392	4952	5020	4135	3905	4580	11343	8710	3500	2992	3265	60180	60180
PEDESTRIANS	1379	1486	1738	1884	1468	1521	1723	3879	3219	1426	1316	1408	22445	22445
COMBINED	4767	5878	6690	6904	5602	5426	6302	15222	11929	4926	4308	4673	82625	82625
2023	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	YEAR TOTAL	ESTIMATED ATTENDENCE
CYCLISTS	4620	5153	5137	4197	4788	4240	3551	3612	4103				39400	39400
PEDESTRIANS	1778	1810	1851	1615	1811	1714	1451	1675	1748				15453	15453
COMBINED	6398	6963	6987	5812	6599	5954	5002	5287	5851	0	0	0	54853	54853
CUMULATIVE	20865	24388	29176	30976	34185	26788	24968	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	330346	330346

*ESTIMATED BICYCLE/PEDESTRIAN ATTENDANCE IS NUMBER OF TRIPS DIVIDED BY 2

2

HANCOCK TRAIL (SOUTH TUNNEL) | SOUTH LAKE TRAIL (COUNTY LINE) | SOUTH LAKE TRAIL (CR5 ...

Ready | Accessibility: Good to go | Display

COUNTERS

- Year over year percent change

Monthly Changes

TRAIL COUNTER DATA PERCENT CHANGE COMPARISION DATA

SOUTH LAKE TRAIL (COUNTY LINE) BICYCLE & PEDESTRIAN COMBINED TOTALS

YEAR	JANUARY	% CHANGE	FEBRUARY	% CHANGE	MARCH	% CHANGE	APRIL	% CHANGE	MAY	% CHANGE	JUNE	% CHANGE
2019	4355	N/A	4933	N/A	6828	N/A	4923	N/A	5687	N/A	5936	N/A
2020	6015	38.12%	5475	10.98%	7700	12.76%	12457	153.03%	14452	154.14%	9801	65.13%
2021	5729	-4.75%	8103	48.00%	7959	3.37%	6693	-46.27%	8445	-41.57%	5625	-42.61%
2022	4767	-16.79%	5878	-27.46%	6690	-15.95%	6904	3.15%	5602	-33.66%	5426	-3.54%
2023	6398	34.21%	6963	18.46%	6987	4.45%	5812	-15.81%	6599	17.80%	5954	9.73%
2024												

YEAR	JULY	% CHANGE	AUGUST	% CHANGE	SEPTEMBER	% CHANGE	OCTOBER	% CHANGE	NOVEMBER	% CHANGE	DECEMBER	% CHANGE
2019	4078	N/A	4784	N/A	5855	N/A	6496	N/A	3594	N/A	4733	N/A
2020	8315	103.91%	8852	85.04%	9136	56.04%	7587	16.79%	7390	105.61%	7871	66.30%
2021	6274	-24.54%	6167	-30.33%	6343	-30.57%	7807	2.90%	4359	-41.02%	6974	-11.40%
2022	6302	0.45%	15222	146.82%	11929	88.07%	4926	-36.90%	4308	-1.16%	4673	-33.00%
2023	5002	-20.63%	5287	-65.27%								
2024												

Yearly Changes

YEAR	YEAR TOTAL	% CHANGE
2019	41160.5	N/A
2020	105046.5	155.21%
2021	80476	-23.39%
2022	82624.5	2.67%
2023	49001.5	-40.69%
2024		

... MCDONALD CANAL BOAT RAMP | GMSO VEHICLE | GMSO BIKE-PED | SOUTH LAKE TRAIL

Ready | Accessibility: Good to go | Display Settings

COUNTERS

- Collecting Data
  - Data is pulled on the last workday of each month
  - Downloaded to a laptop
  - Transfer to a PC
  - Checked for abnormalities
  - Entered into Excel Sheets and Power Point Presentation
  - Shared with others

ANY QUESTIONS

Gallus Quigley

Lake County Office of Parks & Trails

Gallus.Quigley@lakecountyfl.gov

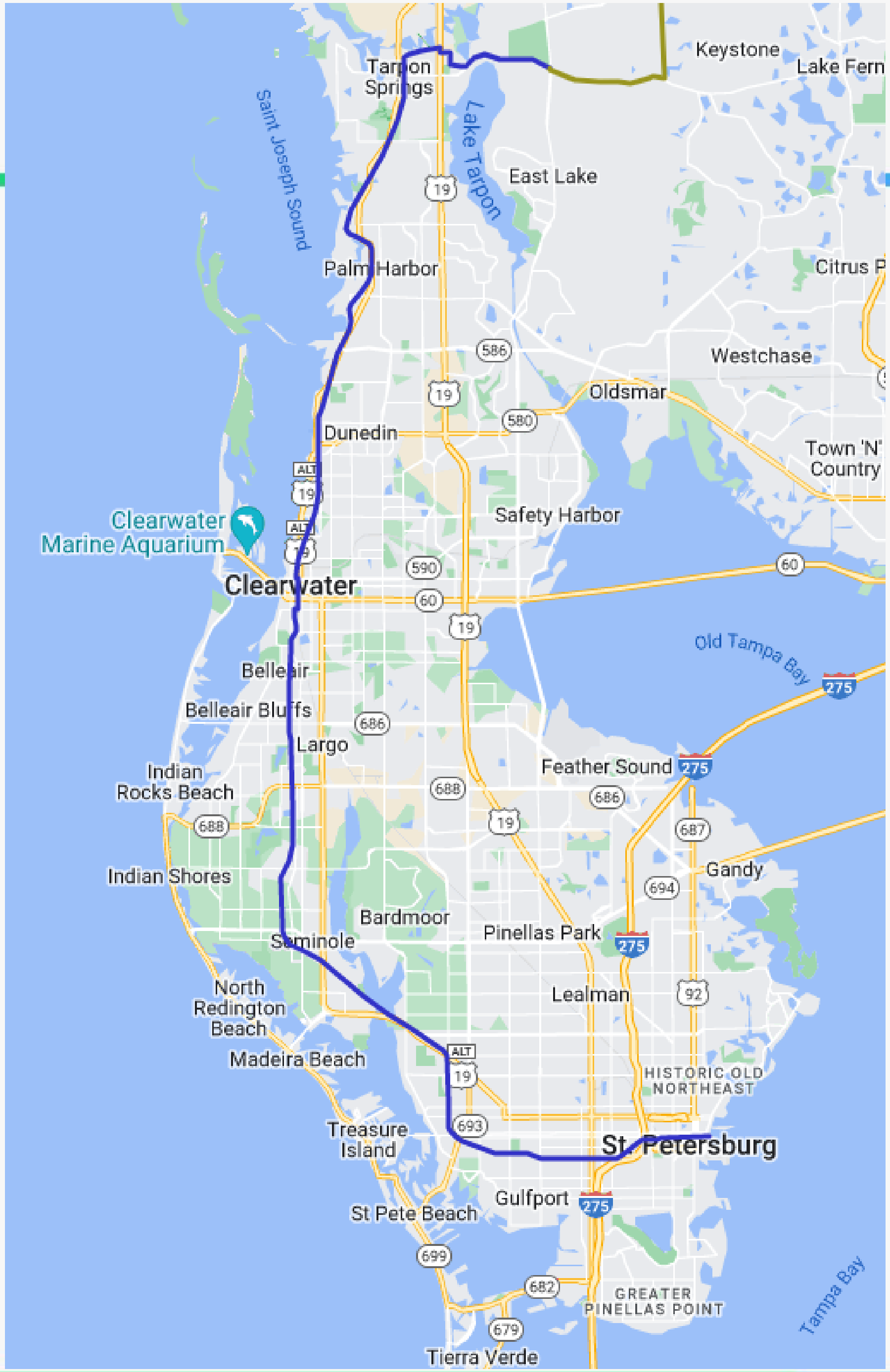
LAKE
COUNTY, FL

REAL FLORIDA · REAL CLOSE

FORWARD PINELLAS
Integrating Land Use & Transportation

Pinellas Trail Counter Program

The Pinellas Trail

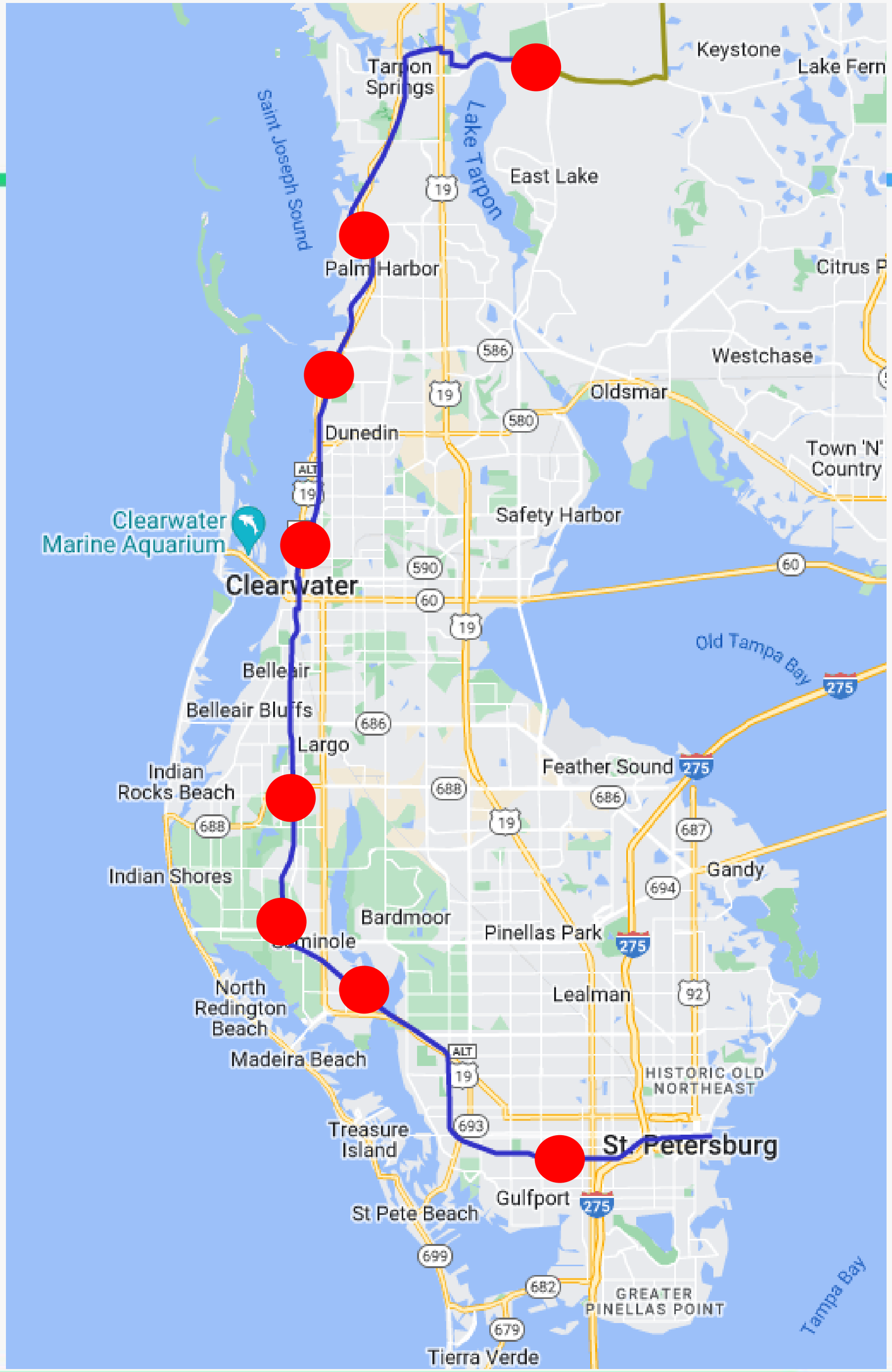


Trail Counters

- Purchased through Partnership in Community Health (PICH) funds received from the Florida Department of Health
- Installed in late 2016, data collection began in January 2017
- Eight locations along the Pinellas Trail system

The Pinellas Trail

- Counter Location



Pinellas Trail Count Data Summary

Automated Trail Counter Data Collection Period:
March 1st-31st (31 days)

FORWARD PINELLAS
Integrating Land Use & Transportation

March 2023

31-Day Count Total: 246,838
Daily Average Counts: 7,963

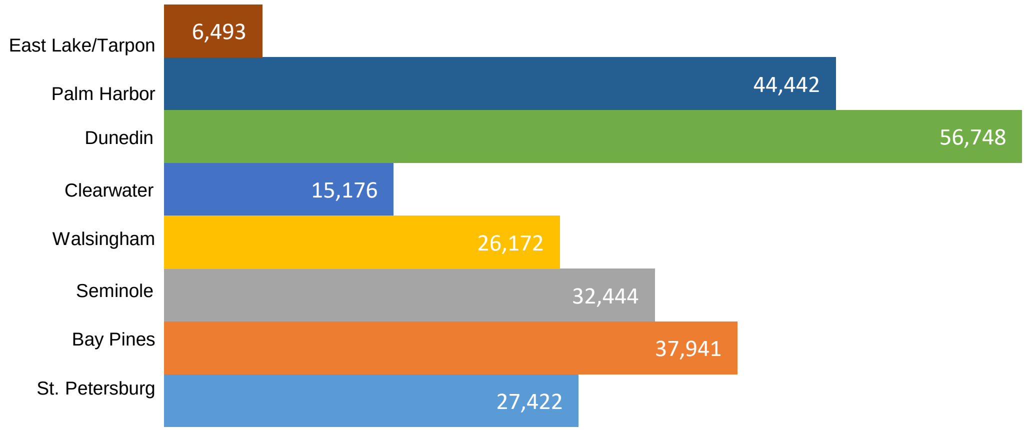
Highest Daily Totals:

#1 – Saturday, March 11th (Dunedin – 3,127)

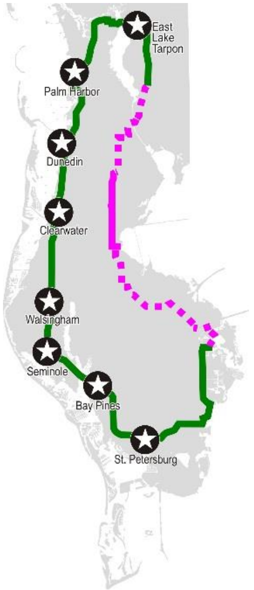
#2 – Saturday, March 11th (Palm Harbor – 2,184)

#3 – Saturday, March 4th (Bay Pines – 1,504)

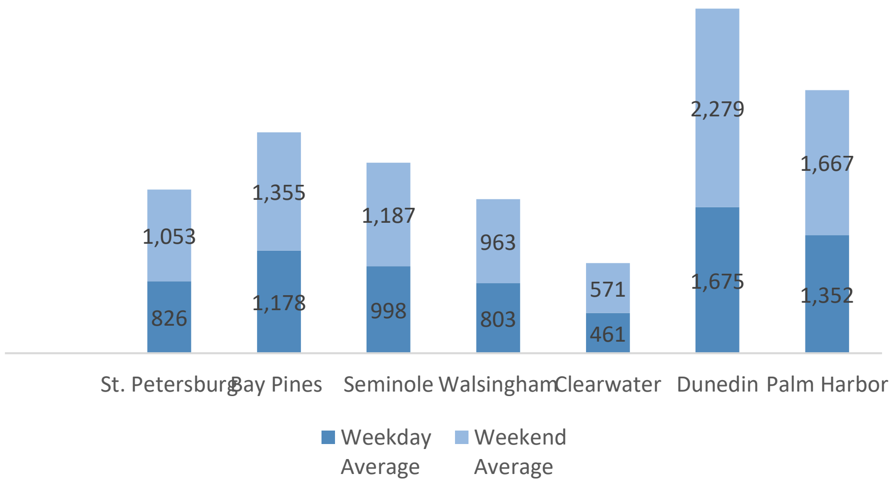
March Totals by Counter Location



Counter Locations



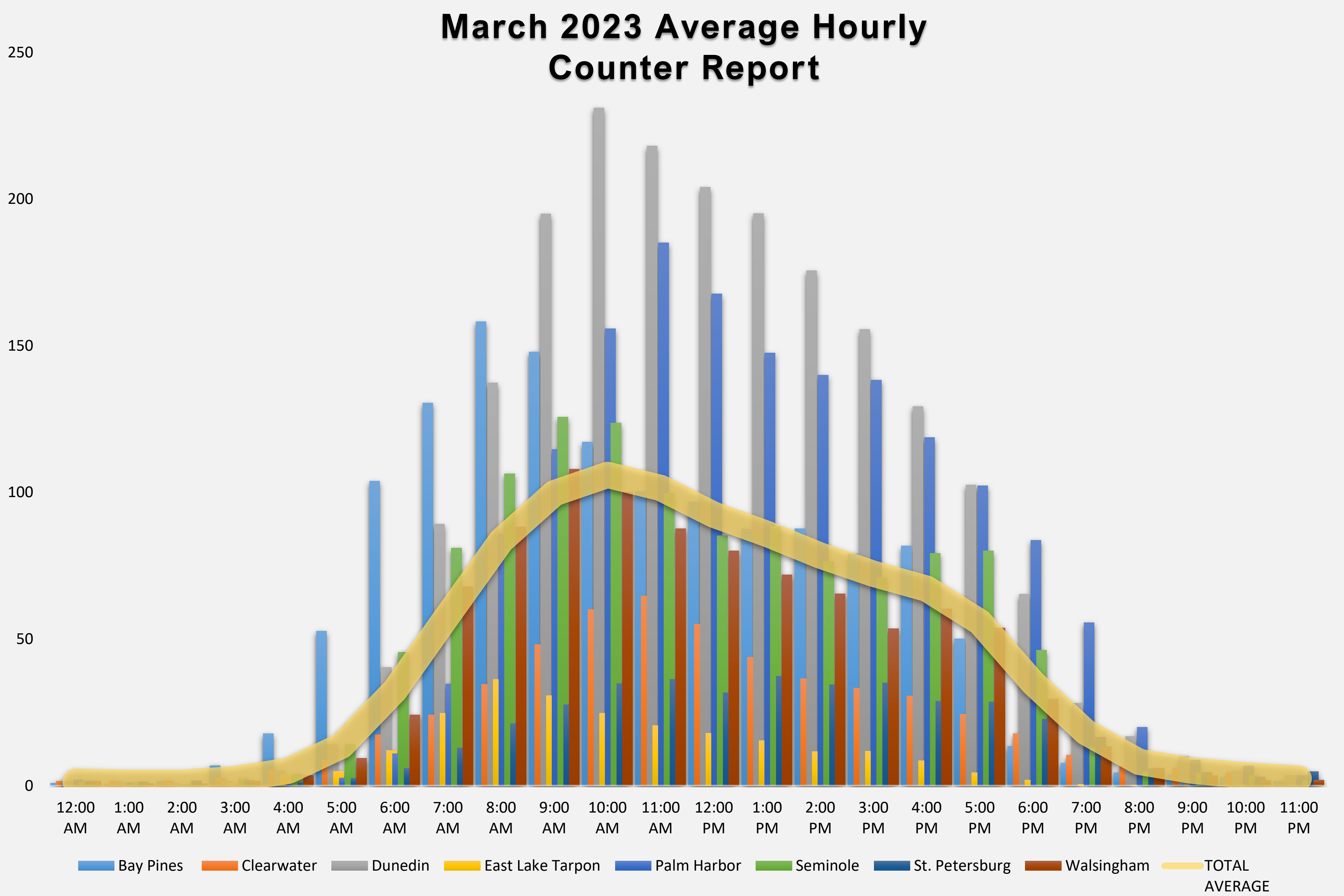
Weekday & Weekend Profile



Trail User Mode Split

	Pedestrian	Bicycle
Palm Harbor	18%	82%
Dunedin	13%	87%
Clearwater	38%	62%
Walsingham	18%	82%
Seminole	28%	72%
Bay Pines	21%	79%
St. Petersburg	33%	67%
East Lake/Tarpon	11%	89%

Source: Forward Pinellas March 2023

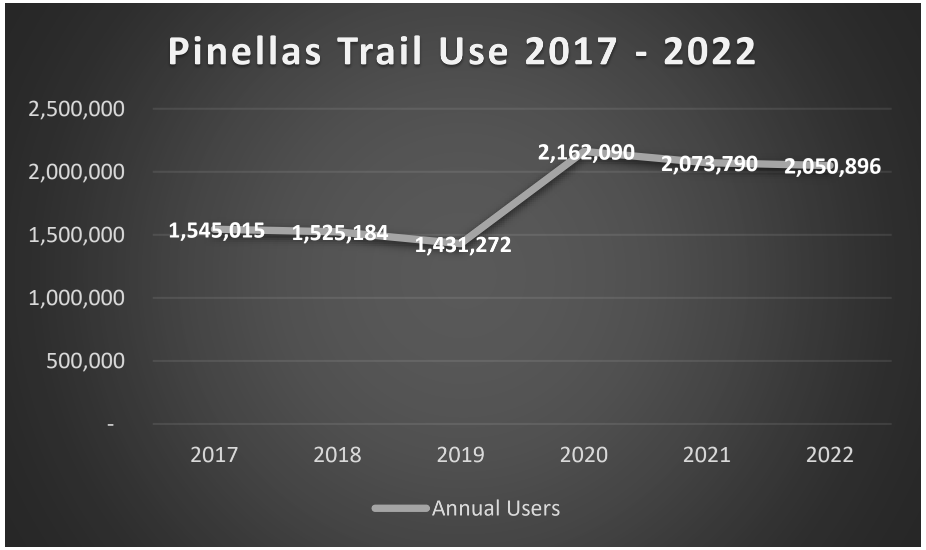

March 2023 Average Hourly Counter Report
250
200
150
100
50
0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Bay Pines
Clearwater
Dunedin
East Lake Tarpon
Palm Harbor
Seminole
St. Petersburg
Walsingham
TOTAL AVERAGE

Pinellas Trail Count Data Summary

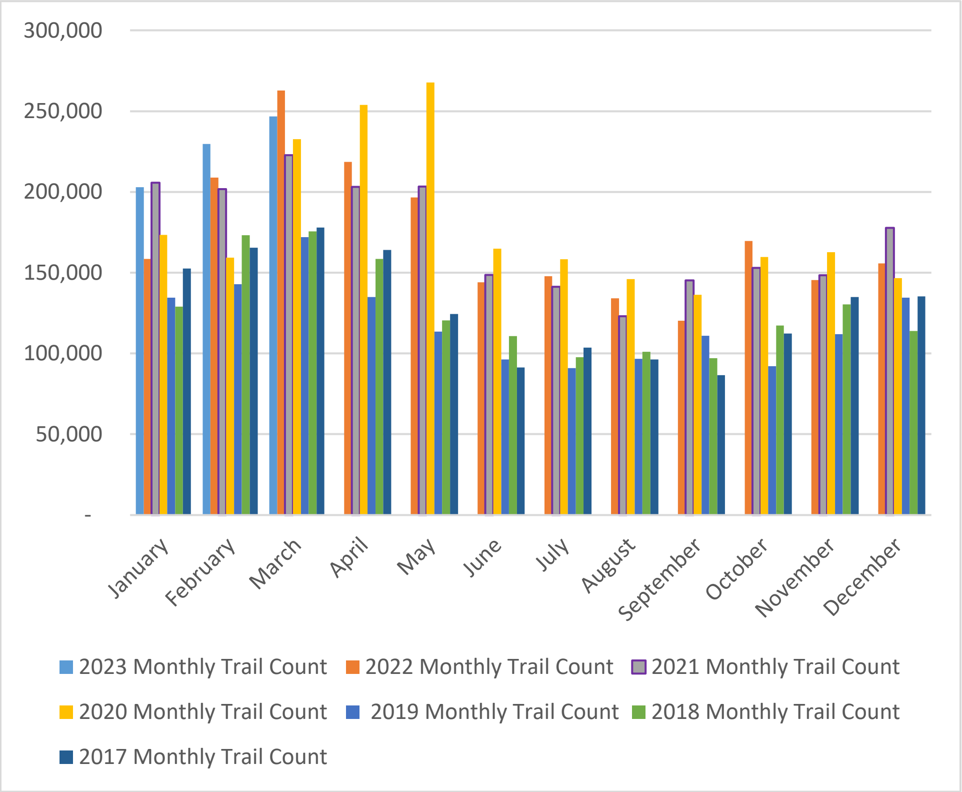
Automated Trail Counter Data Collection

Period: March 2017 - March 2023 Data

2023 Total Count: 634,509



Monthly Trail Counts 2017 - 2023



Counter Program Opportunities

- Long-term data analysis
  - Track use and speed over time
  - Goal to develop seasonal adjustment factors
- Partner uses
  - Pinellas Trail Ranger staffing
  - FDEP reporting
  - SUN Trail studies

Counter Program Challenges

- Operations and maintenance
  - Counters are the only field asset the MPO operates and maintains
- Limited vendors
- Life cycle of equipment
- Limited standards on data irregularity

Pinellas Trail Counter Data Gaps (highlighted cells)

Month	2017 Monthly Trail Count	2018 Monthly Trail Count	2019 Monthly Trail Count	2020 Monthly Trail Count	2021 Monthly Trail Count	2022 Monthly Trail Count	2023 Monthly Trail Count
January	152,595	128,902	134,506	173,457	205,716	158,627	203,010
February	165,425	173,279	142,822	159,261	201,834	208,918	229,781
March	178,057	175,679	172,043	232,778	222,672	262,734	246,838
April	164,168	158,547	134,872	253,959	203,090	218,584	194,941
May	124,495	120,473	113,574	267,869	203,333	196,619	176,341
June	91,299	110,783	96,279	164,938	148,594	144,095	132,054
July	103,694	97,742	90,881	158,430	141,211	147,919	125,104
August	96,197	101,107	96,666	146,131	122,996	134,071	128,016
September	86,499	97,080	110,899	136,282	145,206	120,258	143,351
October	112,352	117,318	92,076	159,735	153,051	169,603	170,021
November	134,923	130,417	112,048	162,633	148,337	145,396	162,718
December	135,311	113,857	134,606	146,617	177,750	155,719	150,421
Total:	**1,545,015**	**1,525,184**	**1,431,272**	**2,162,090**	**2,073,790**	**2,062,543**	**2,062,596**

FORWARD PINELLAS
Integrating Land Use & Transportation

Pinellas Trail Counter Program

Kyle Simpson, AICP
Active Transportation Planner
ksimpson@forwardpinellas.org

CITY of JACKSONVILLE NON-MOTORIZED USER COUNT EFFORTS

Matt Fall, Bicycle-Pedestrian Coordinator, City of Jacksonville

STATEWIDE NON-MOTORIZED TRAFFIC MONITORING PROGRAM MEETING
February 8, 2024 - SunTrax, Auburndale, FL

User Counts Show Demand

Higher Demand = Higher Investment

Higher Investment = Safer / More Comfortable Facilities

Safer / More Comfortable Facilities = Higher Mode Share

Higher Mode Share = More User Counts

AT A GLANCE:
CITY of JACKSONVILLE

2020 Population:

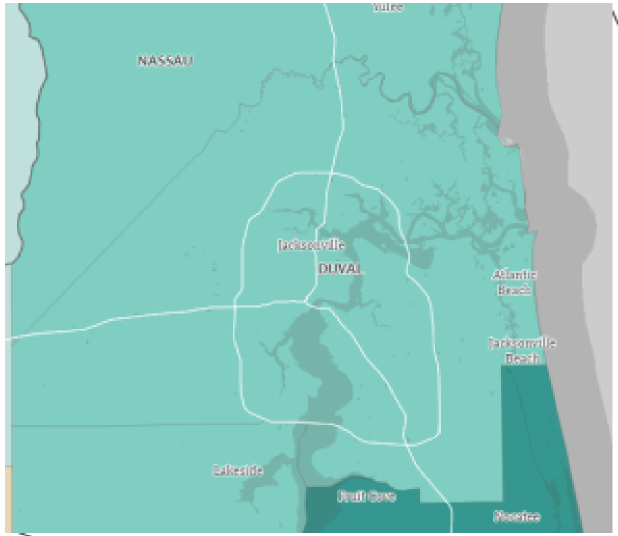
949,611

15.5% Growth Rate (2010-2020)

Projected **2030** Population:

1,096,801

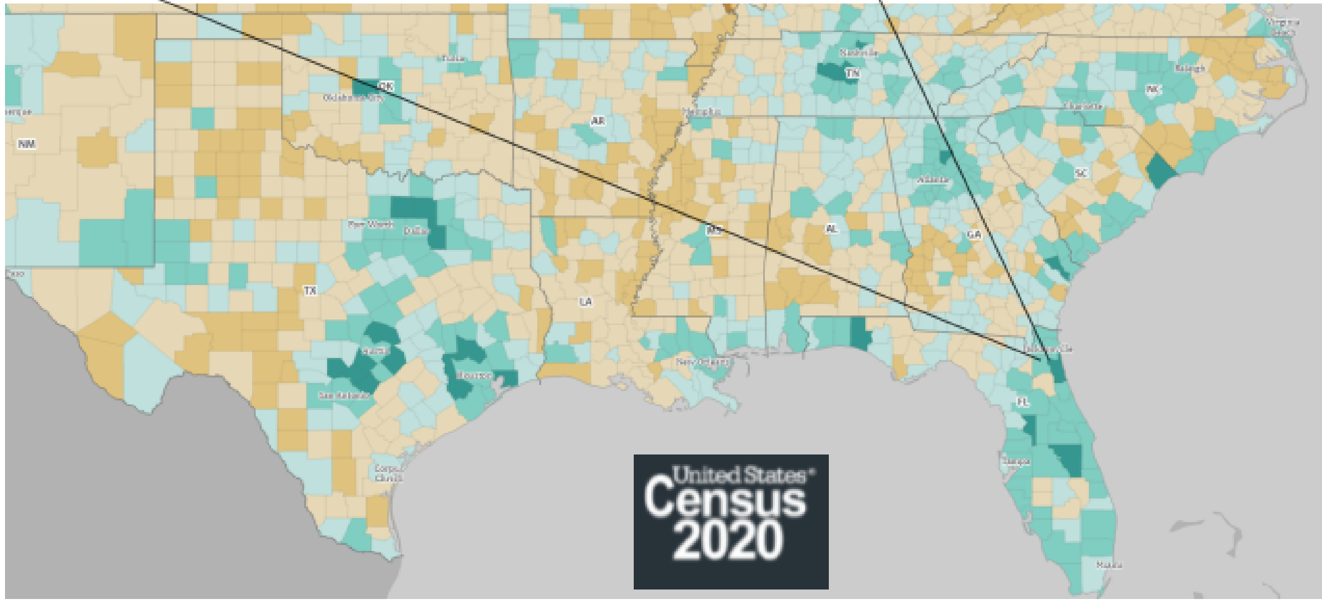
Source: US Census Data



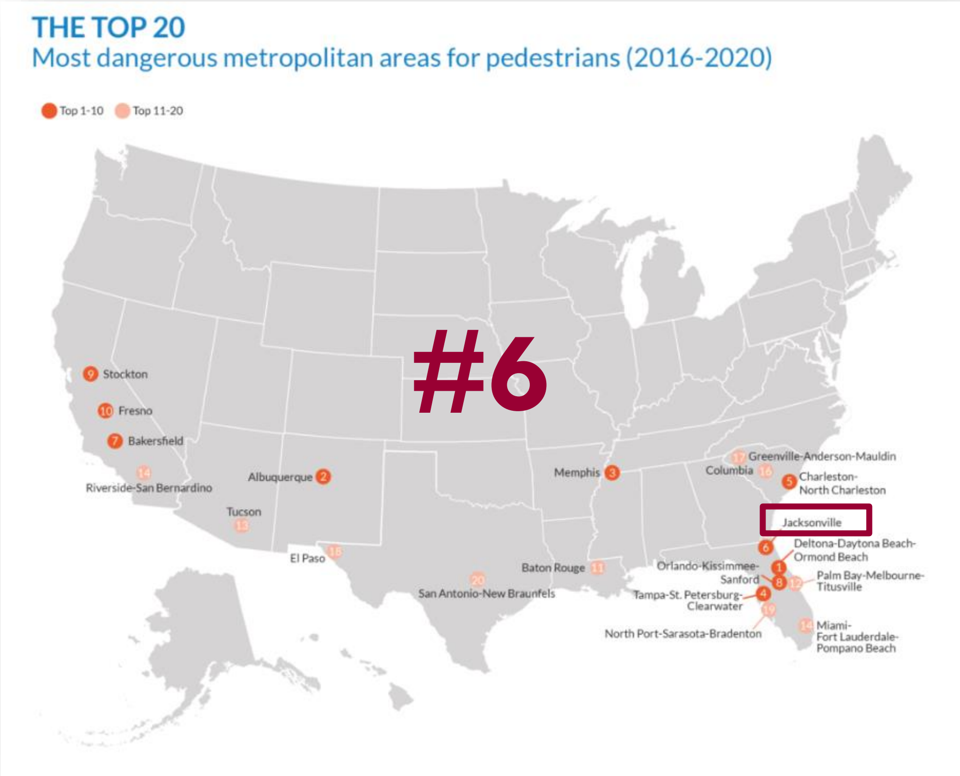
Percentage COJ population change between 2010 and 2020: Source census.gov

	60.0 or more
	30.0 to 59.9
	10.0 to 29.9
	0.0 to 9.9
	-9.9 to -0.1
	-29.9 to -10.0
	-30.0 or less

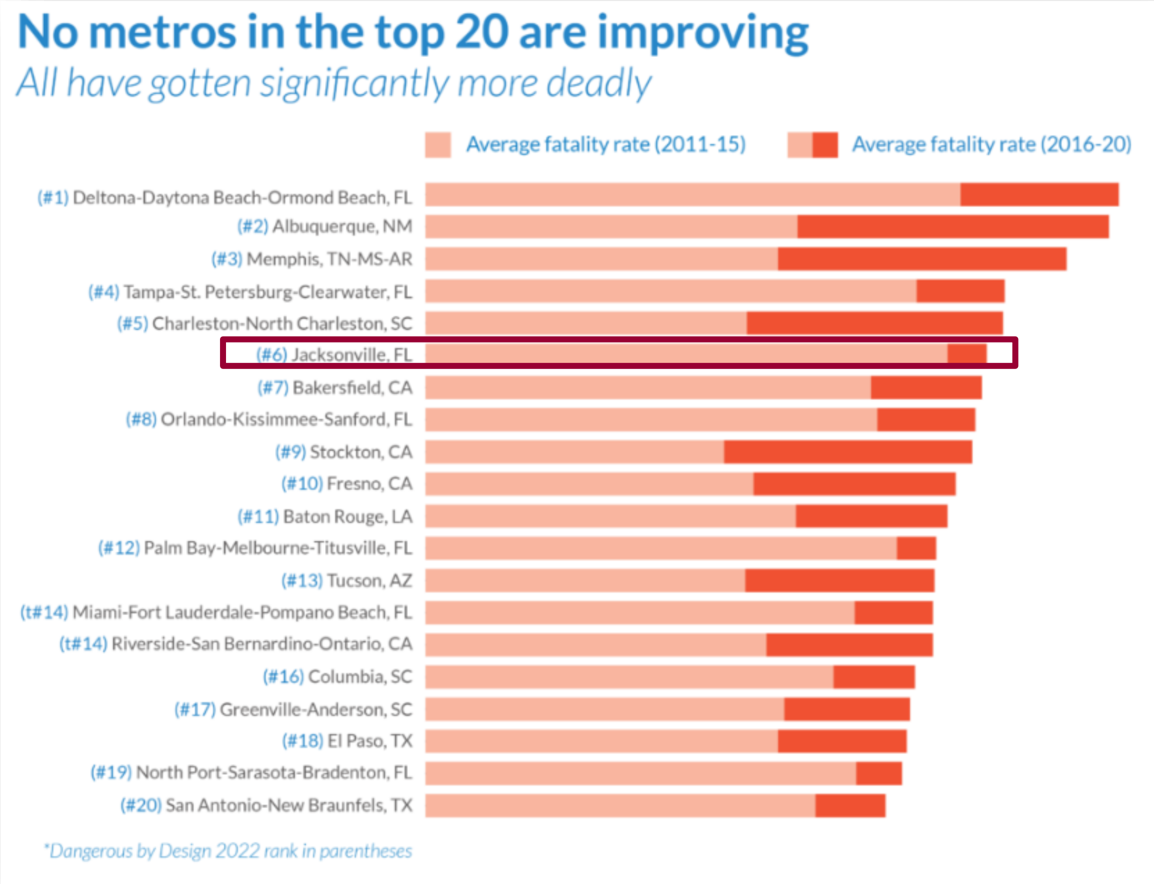
U.S. percent = 7.4



Smart Growth America
Improving lives by improving communities
National Complete Streets Coalition



SOURCE: SMART GROWTH AMERICA, DANGEROUS BY DESIGN 2022



#3

Table 7. Total and Pedalcyclist Fatalities in Traffic Crashes in Cities With Populations of 500,000 or Greater, and Fatality Rates, 2021

City	Total Fatalities	Pedalcyclist Fatalities		Population	Fatality Rate per 100,000 Population	
		Number	Percentage of Total Fatalities		Total	Pedalcyclist
New York, NY	252	8	3.2%	8,467,513	2.98	0.09
Los Angeles, CA	332	12	3.6%	3,849,297	8.62	0.31
Chicago, IL	233	11	4.7%	2,696,555	8.64	0.41
Houston, TX	337	12	3.6%	2,288,250	14.73	0.52
Phoenix, AZ	291	10	3.4%	1,624,569	17.91	0.62
Philadelphia, PA	133	7	5.3%	1,576,251	8.44	0.44
San Antonio, TX	200	6	3.0%	1,451,853	13.78	0.41
San Diego, CA	118	5	4.2%	1,381,611	8.54	0.36
Dallas, TX	228	3	1.3%	1,288,457	17.70	0.23
San Jose, CA	76	5	6.6%	983,489	7.73	0.51
Austin, TX	118	4	3.4%	964,177	12.24	0.41
Jacksonville, FL	180	6	3.3%	954,614	18.86	0.63
Fort Worth, TX	128	2	1.6%	935,508	13.68	0.21
Columbus, OH	97	3	3.1%	906,528	10.70	0.33
Indianapolis, IN	144	6	4.2%	882,039	16.33	0.68
Charlotte, NC	109	2	1.8%	879,709	12.39	0.23
San Francisco, CA	31	0	0.0%	815,201	3.80	0.00
Seattle, WA	45	3	6.7%	733,919	6.13	0.41
Denver, CO	68	1	1.5%	711,463	9.56	0.14

18.86

Pedalcyclist Fatality Rate per 100k Population

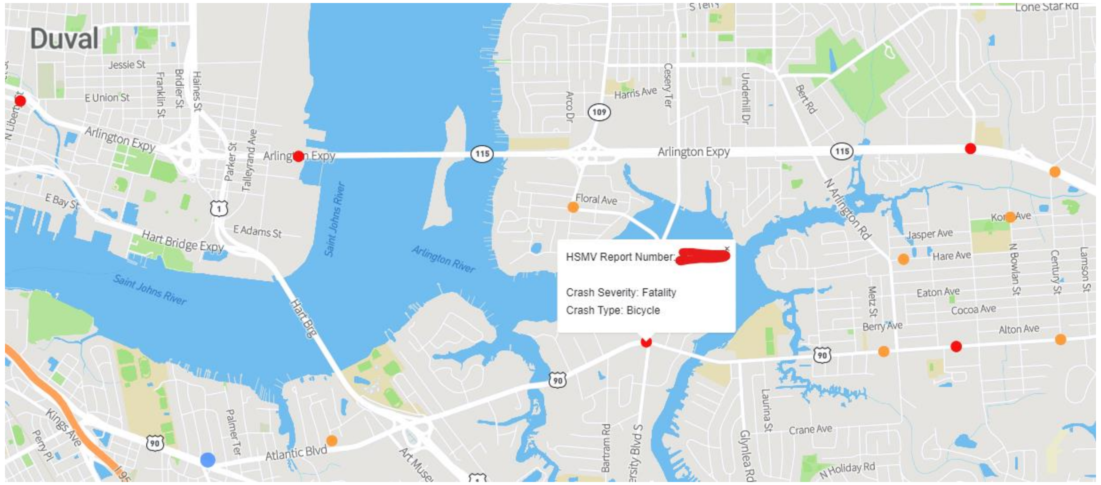
462

Pedestrian Fatalities Between 2010 - 2019

SIGNAL FOUR ANALYTICS

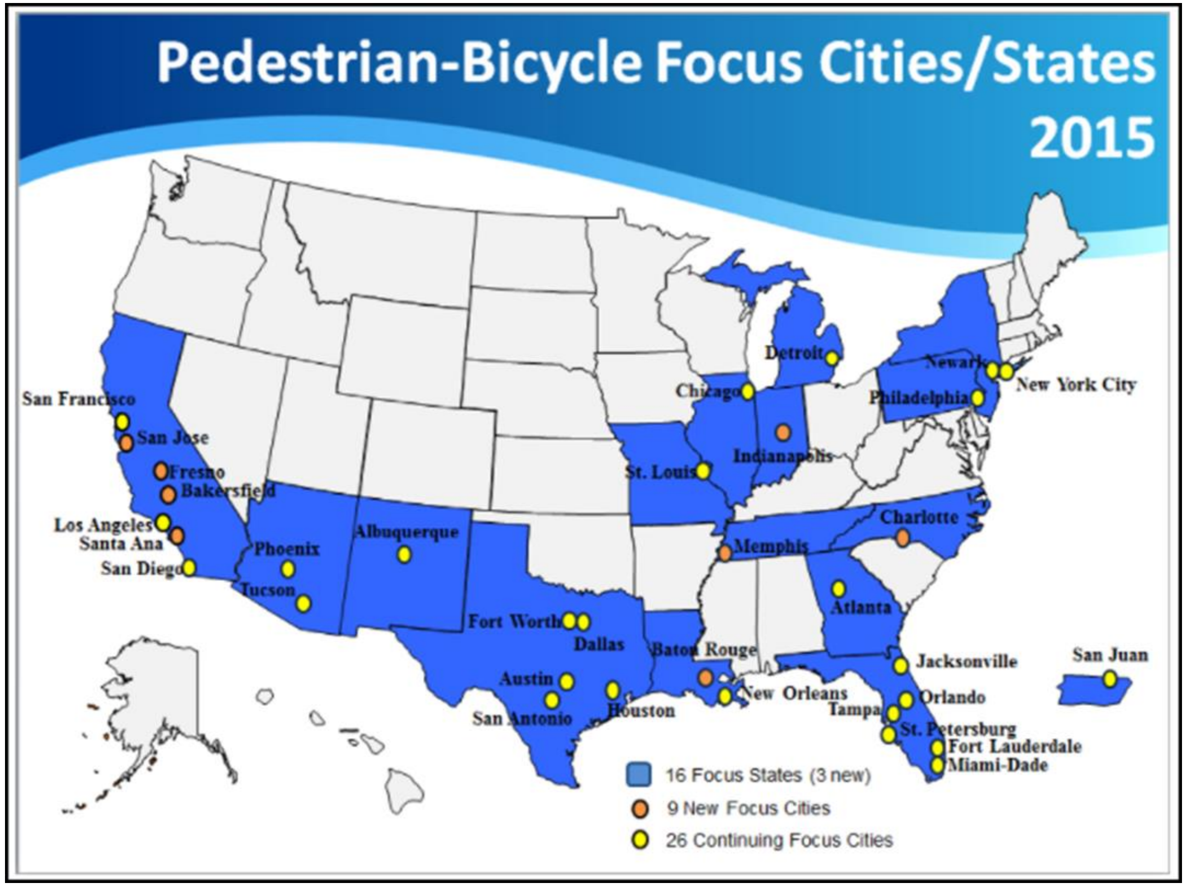
291

Bicyclist Fatalities & Serious Injuries Between 7/2011 – 7/2022

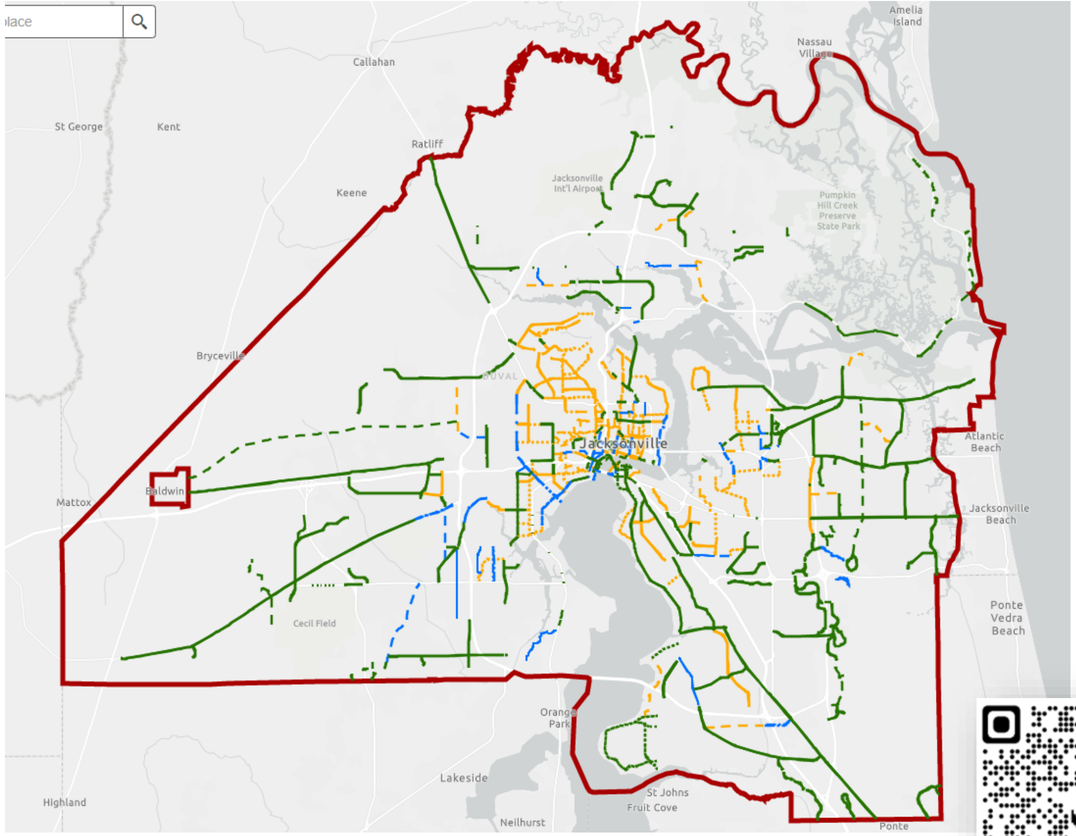


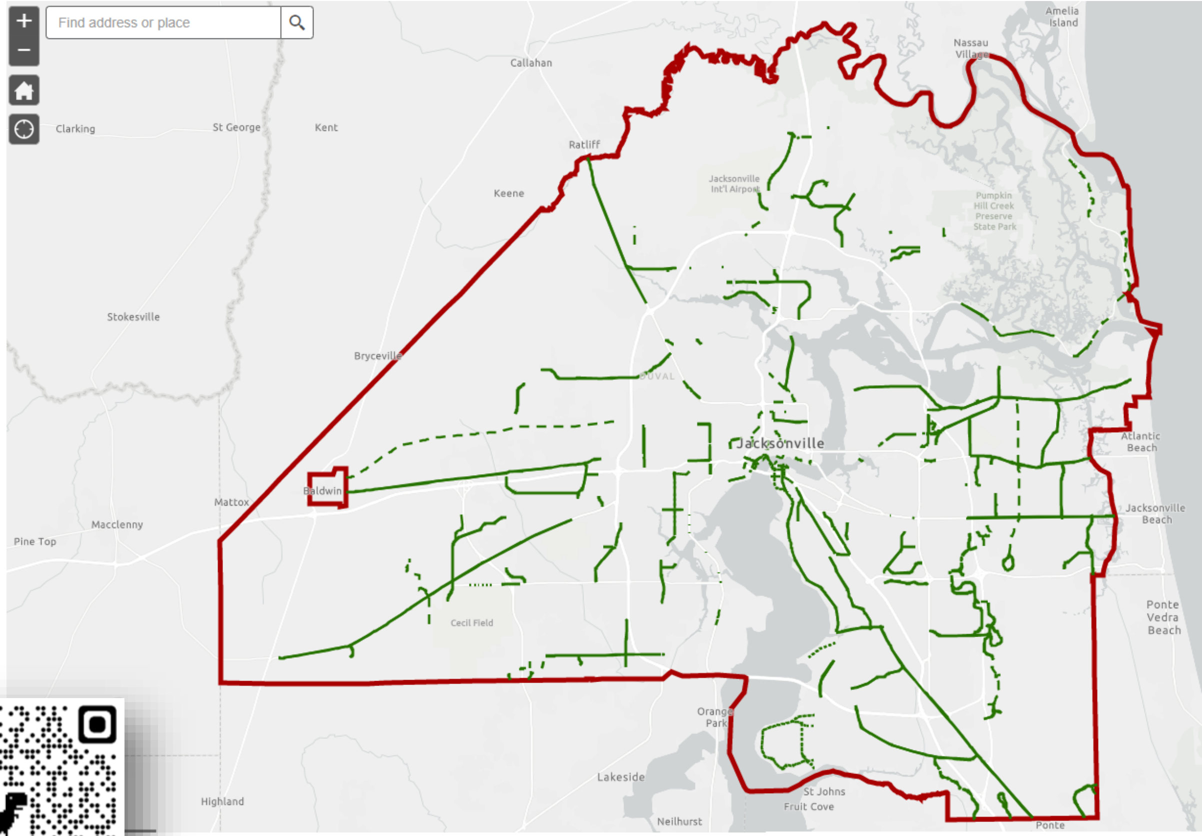
FHWA-Designated Focus States & Focus MPO Areas:

- Designated when bike-ped fatalities are consistently higher than the national average
- Florida (*Focus State*) & Jacksonville (*Focus MPO Area*)

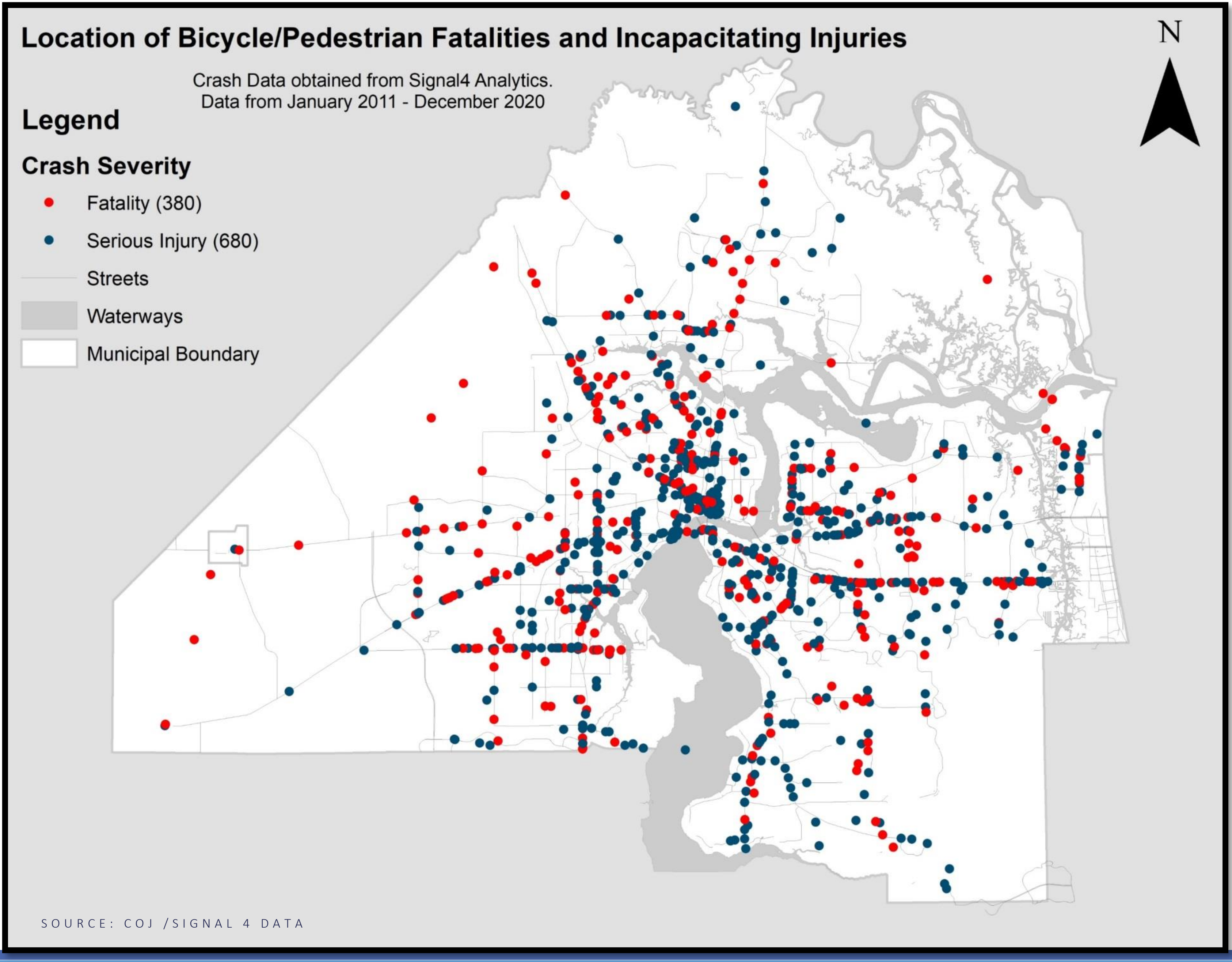


Bikeways and Trails Network Inventory: Holistic Perspective



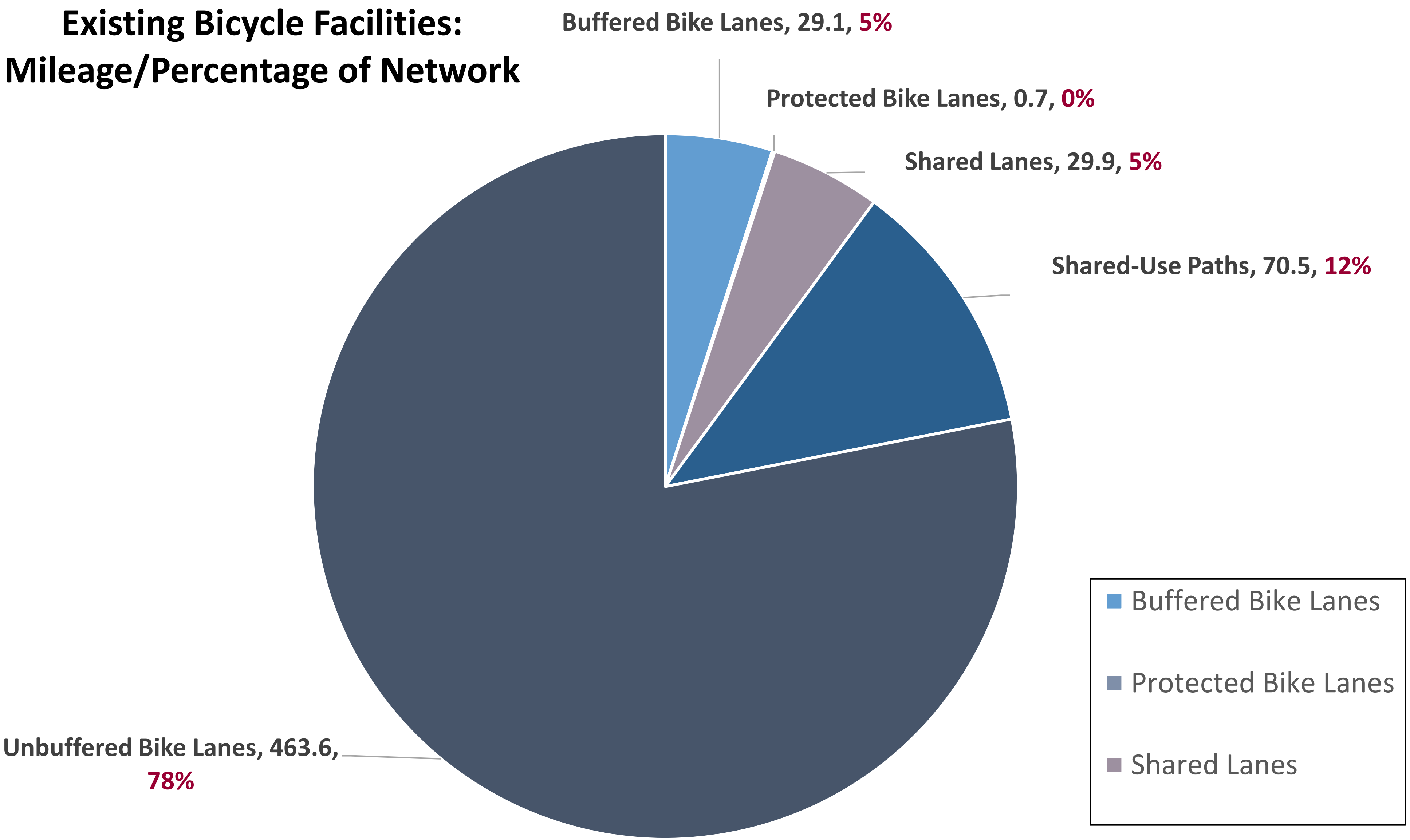


https://tinyurl.com/COJbikeMAP

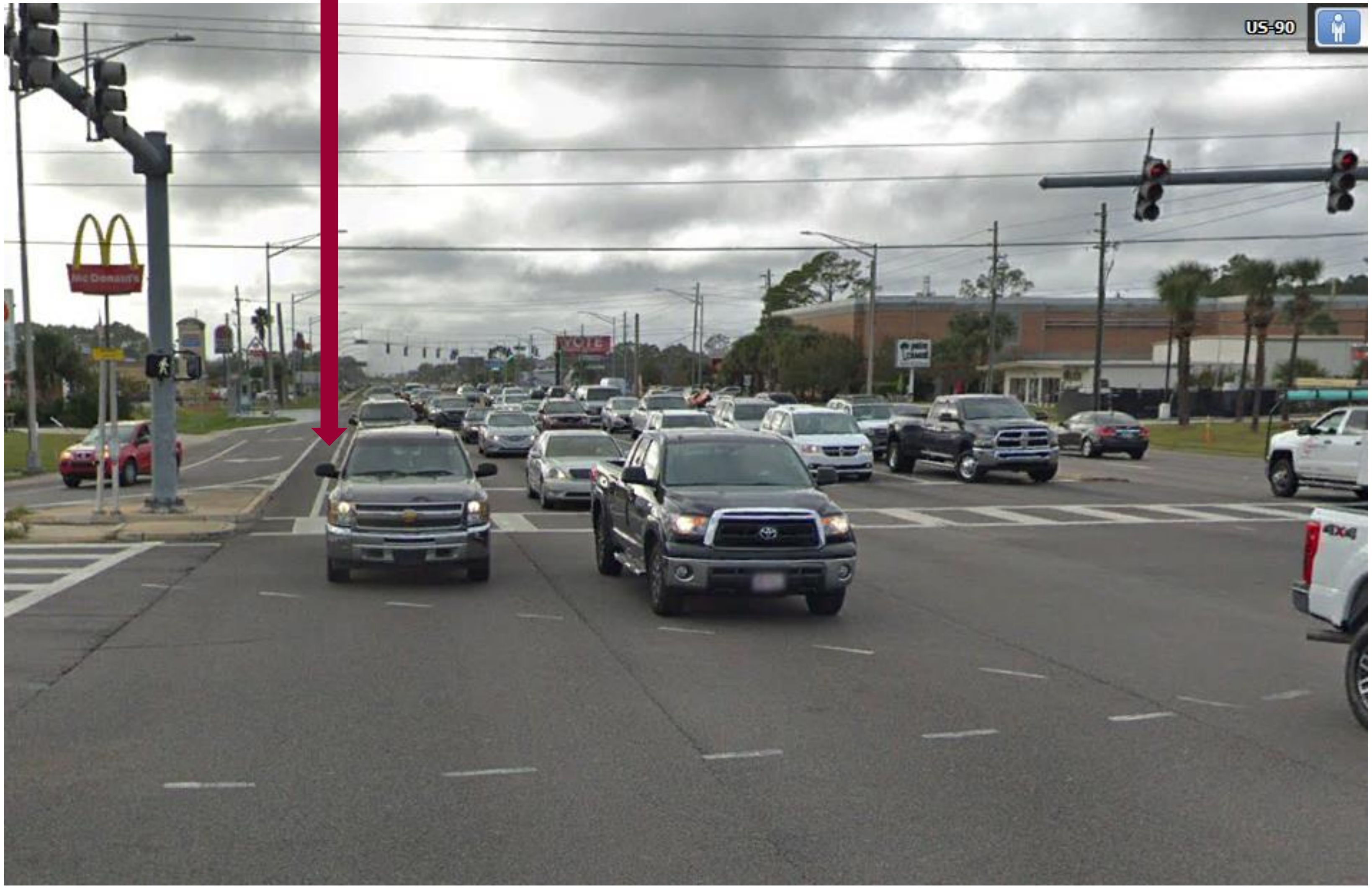


SOURCE: COJ /SIGNAL 4 DATA

Existing Bicycle Facilities: Mileage/Percentage of Network



Bike lane on St Johns and Beach Blvd

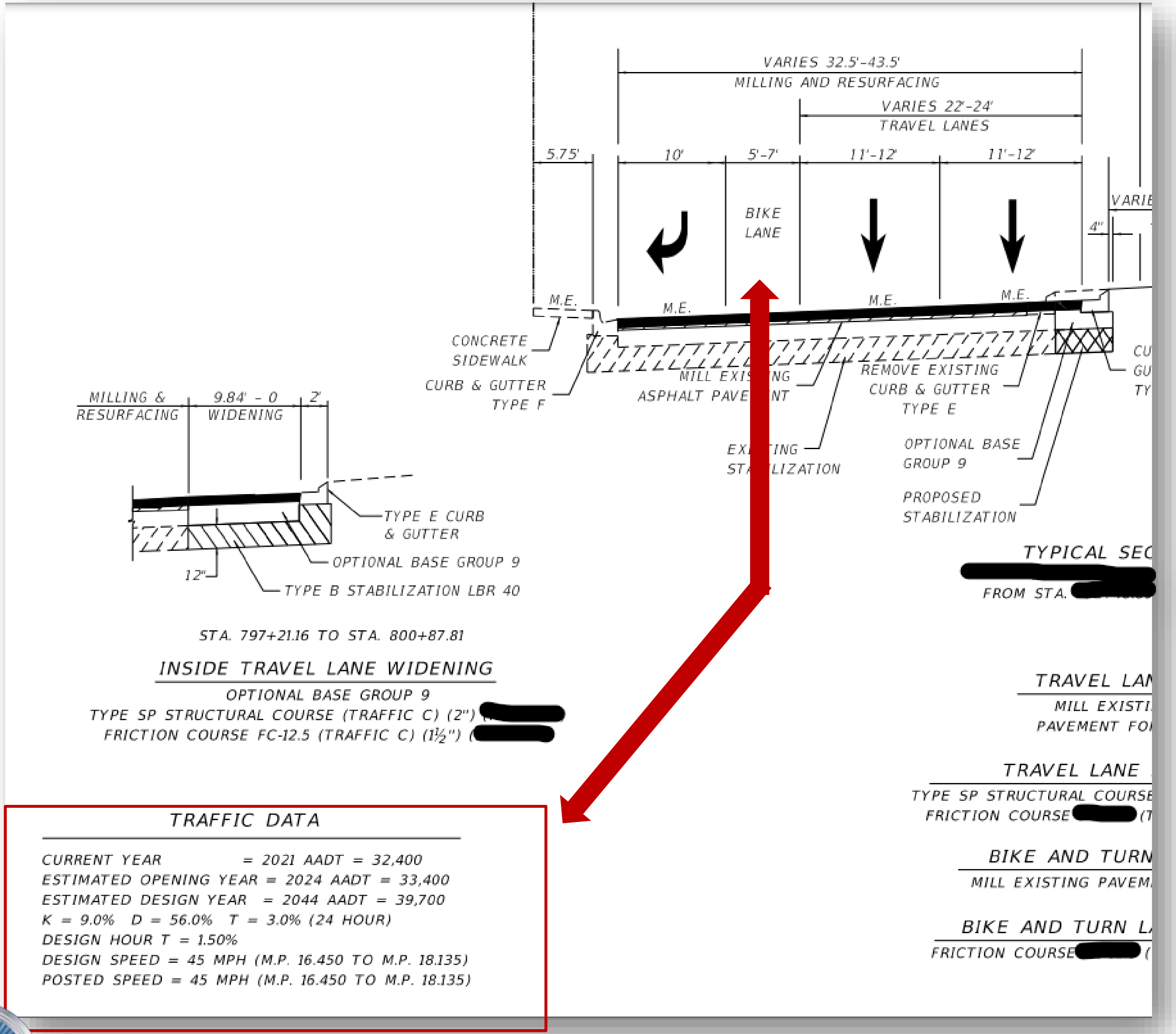


SOURCE: COJ

Checking a Box

SOURCE: FHWA

John Forester Approach



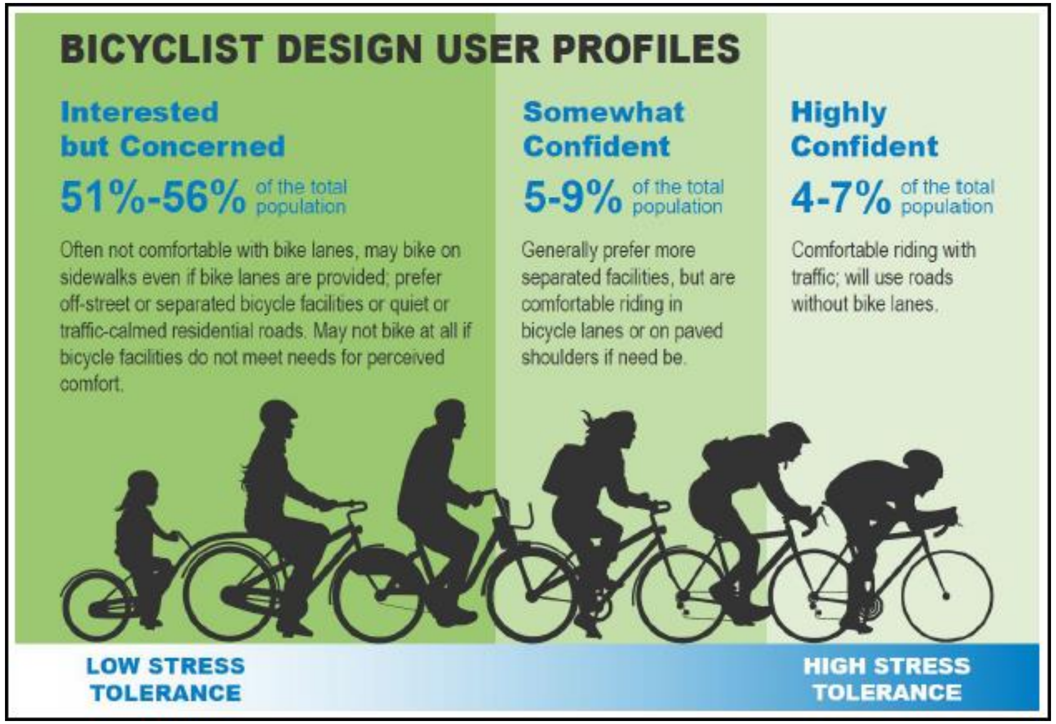
COMMON DESIGNS:

DESIGN USER IS "HIGHLY CONFIDENT" 4-7% (AT BEST)

- **COJ's PRIORITY**: Provide safe and connected sidewalks and bikeway facilities for residents of **ALL AGES AND ABILITIES**

- **Hierarchy of Infrastructure**: Shared-use paths are MOST comfortable/safe for ALL

SOURCE: FLORIDAHIKES.COM

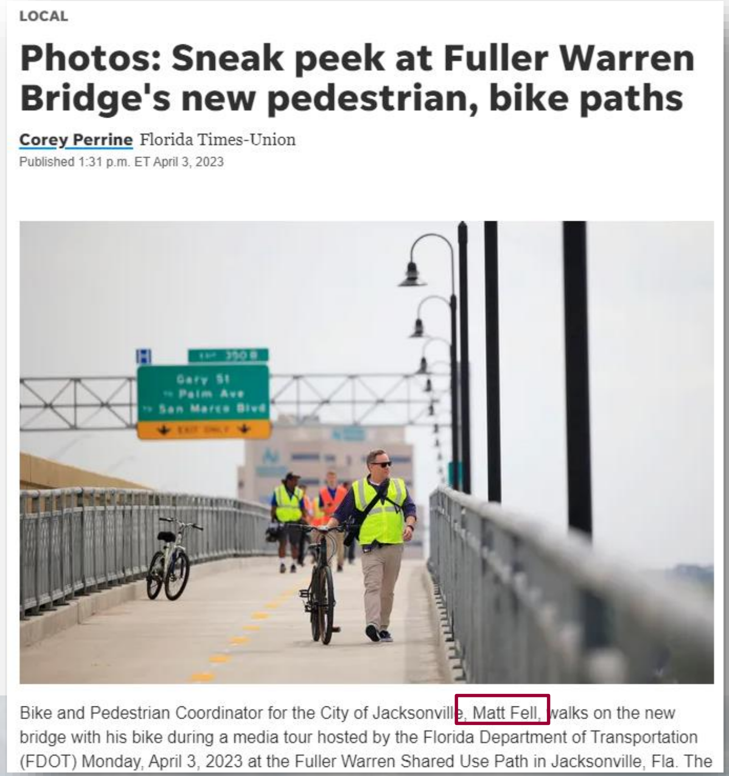


SOURCE: FHWA BIKEWAY SELECTION GUIDE

SOURCE: DANGEROUS BY DESIGN

COMMON RESPONSES:

- NOT IN THE BUDGET
- NOT IN THE SCOPE
- ALREADY APPROVED
- ALREADY INCLUDES BIKE LANES / SIDEWALKS



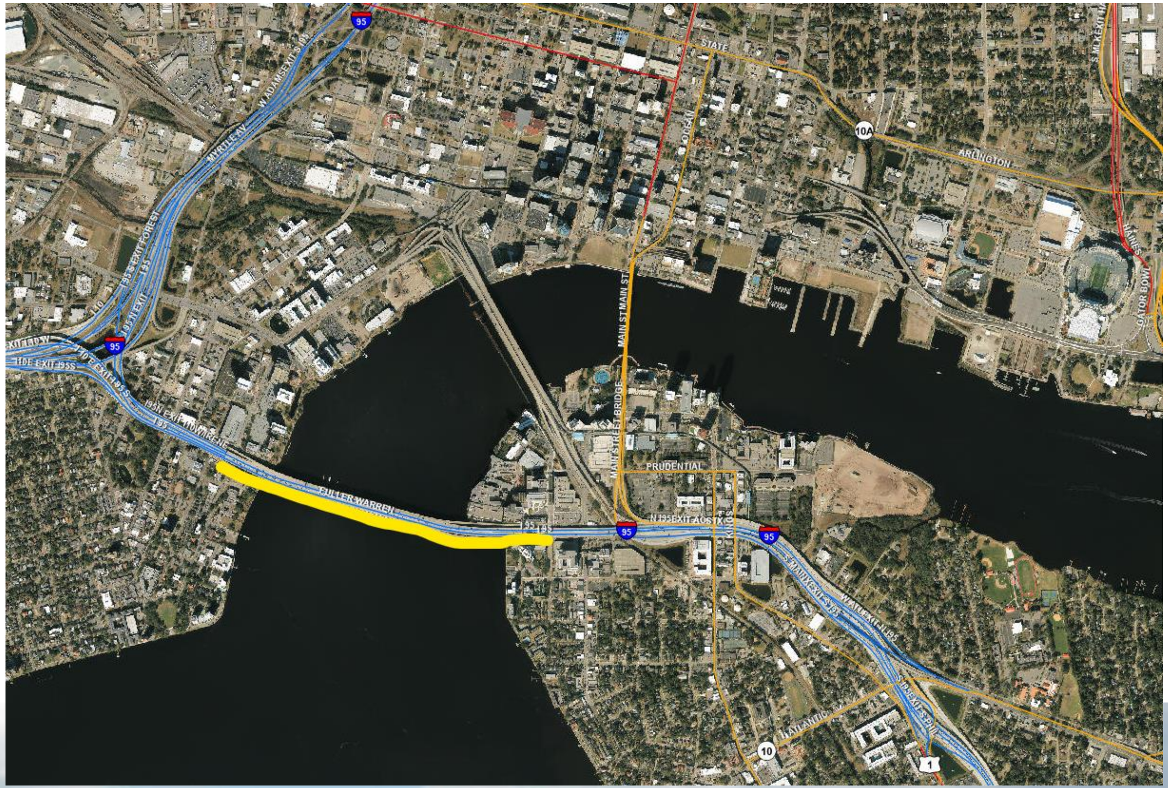
LOCAL

Photos: Sneak peek at Fuller Warren Bridge's new pedestrian, bike paths

Corey Perrine Florida Times-Union

Published 1:31 p.m. ET April 3, 2023

Bike and Pedestrian Coordinator for the City of Jacksonville, Matt Fell, walks on the new bridge with his bike during a media tour hosted by the Florida Department of Transportation (FDOT) Monday, April 3, 2023 at the Fuller Warren Shared Use Path in Jacksonville, Fla. The



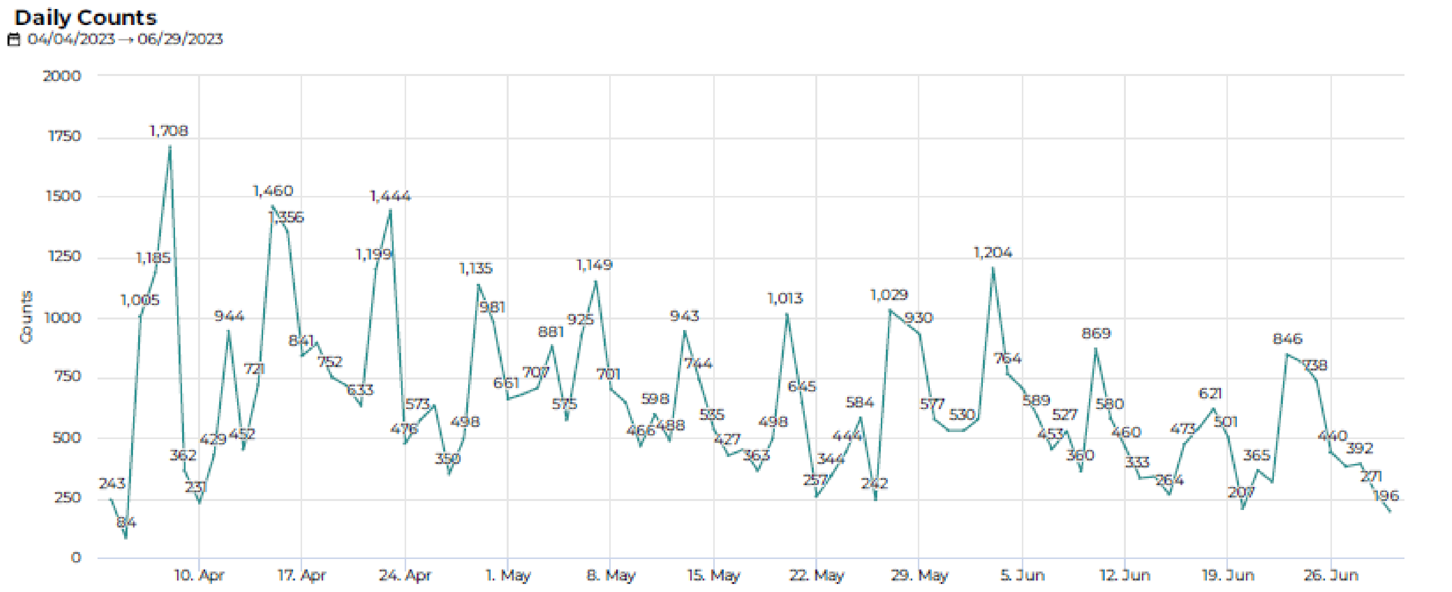

ROSSELLE ST
MAY ST
I95 N OFF RAMP
I95 EXPY S
COMPUTER POWER PL
I95 EXPY N
I95 S ON RAMP
RIVERSIDE PARK PL
RIVERSIDE AVE
FULLER WARREN BRG S
OAK ST
BISHOP GATE LN
LOMAX ST
LANCASTER ST
MEMORIAL PARK DR
PRUDENTIAL DR
PALM AVE
SAN MARCO BLVD
ACOSTA EXPY
MAIN ST S
I95 N ON RAMP
I95 EXPY S
I95 EXPY N
GARY ST
CHILDRENS WAY
LE BARON AVE
PHILLIPS ST
LARUE AVE
CEDAR ST

56,982 total users

648 daily average

APRIL 4, 2023 – JUNE 30, 2023

eco VISIO

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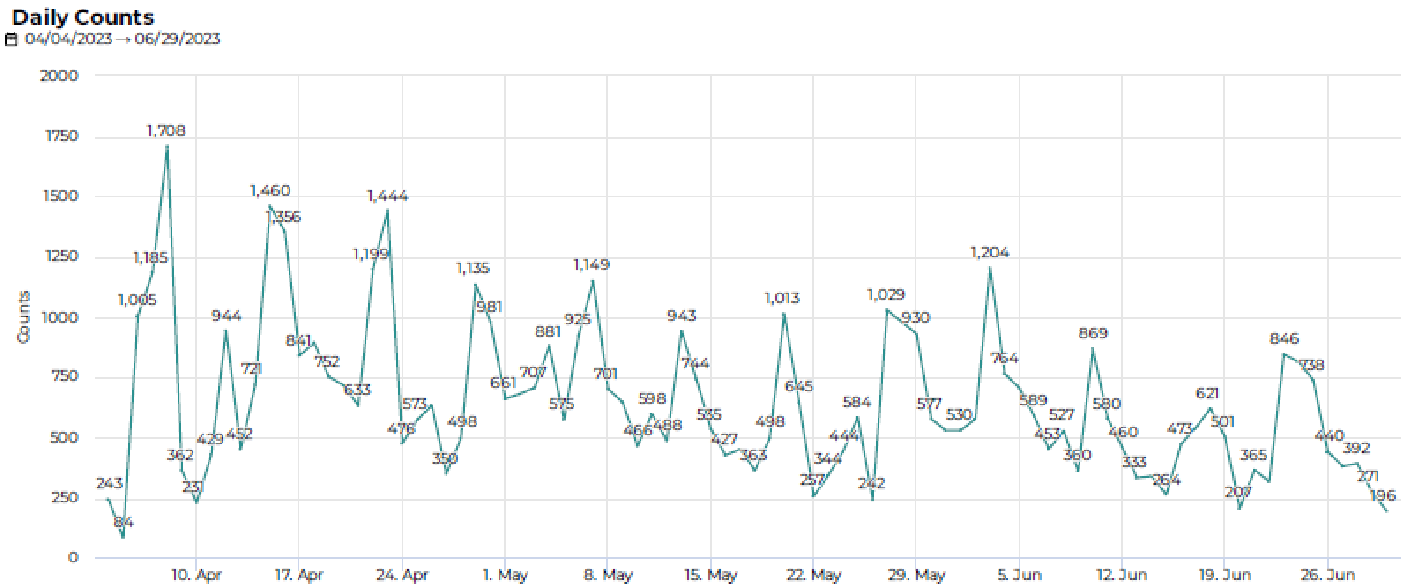
ACOSTA EXPY
PALM AVE
BISHOP GATE LN
LOMAX ST
LANCASTER ST
CHILDRENS WAY
PHILLIPS ST
LE BARON AVE
LARUE AVE
CEDAR ST


SIDEWALK CLOSED

83,614 total users

950 daily average

APRIL 4, 2023 – JUNE 30, 2023



Fuller Warren Bridge: West Ramp

Permanent Counter

JANUARY 1, 2023 – MAY 1, 2023

99,442 total users

842 daily average

MAY 9, 2022 – MAY 8, 2023

52,008 total users

160 daily average

2023: Permanent Counter

MATT FALL

BIKE-PED COORDINATOR
CITY of JACKSONVILLE, FLORIDA
MFALL@COJ.NET

FDOT TDA Statewide Meeting

Tampa's Advocacy Group
Efforts February, 2024

Karen Kress, AICP
Director, Transportation & Planning

TAMPA
DOWNTOWN PARTNE

Christine Acosta, TDM-CP
Founder

PEDAL POWER
Promoters

Introduction to Non-Motorized Counts Program

Strategic Plan

Form Data Committee

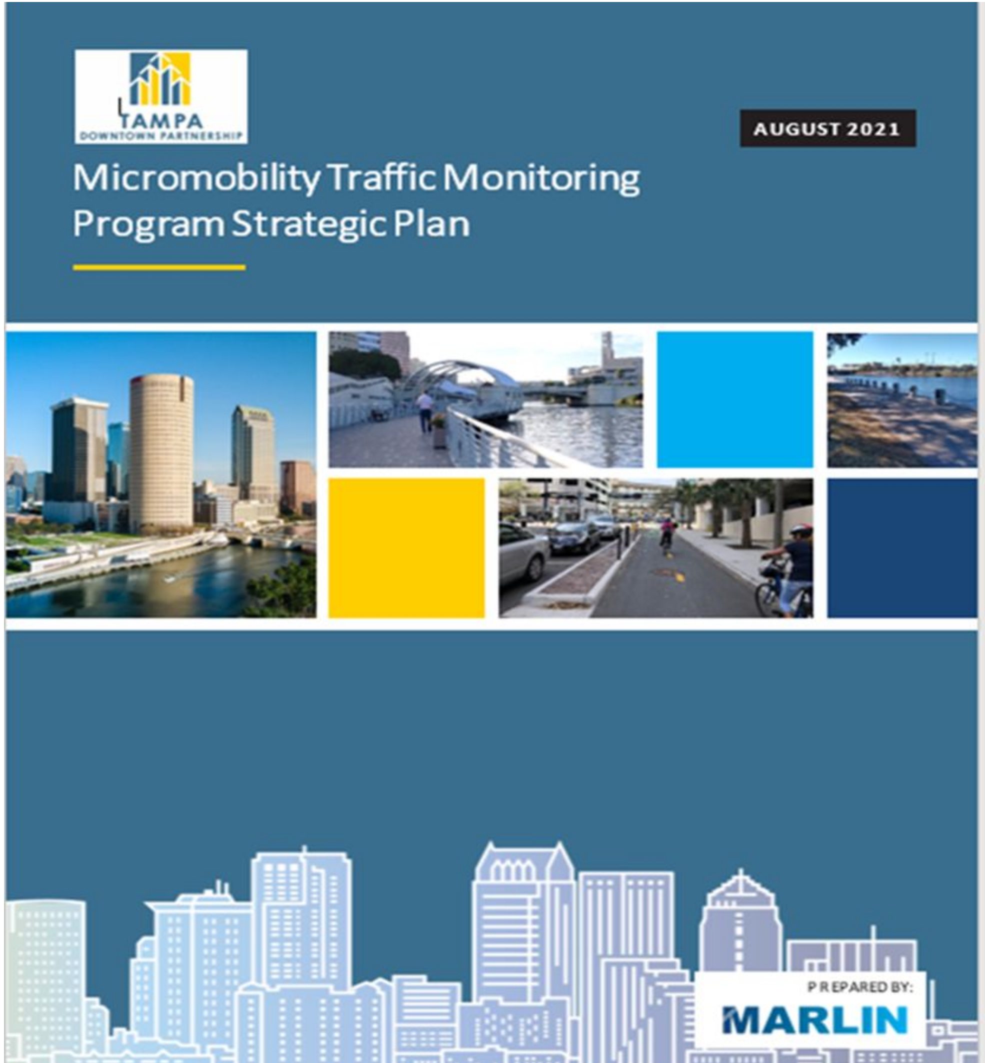
Test Equipment

Site Selection

Data Collection

Analysis

Repository/Database



Tampa Data Committee

FDOT

Hillsborough TPO
Transportation
Planning Organization

Hillsborough
County

PEDAL POWER
Promoters

WESTSHORE
ALLIANCE

CITY OF TAMPA, FLORIDA
MASCOTTE
ORGANIZED JULY 15, 1887
City of
Tampa
Florida

TAMPA
DOWNTOWN PARTNE

Why we counted….

Advocate to include bike/ped with vehicular counts:

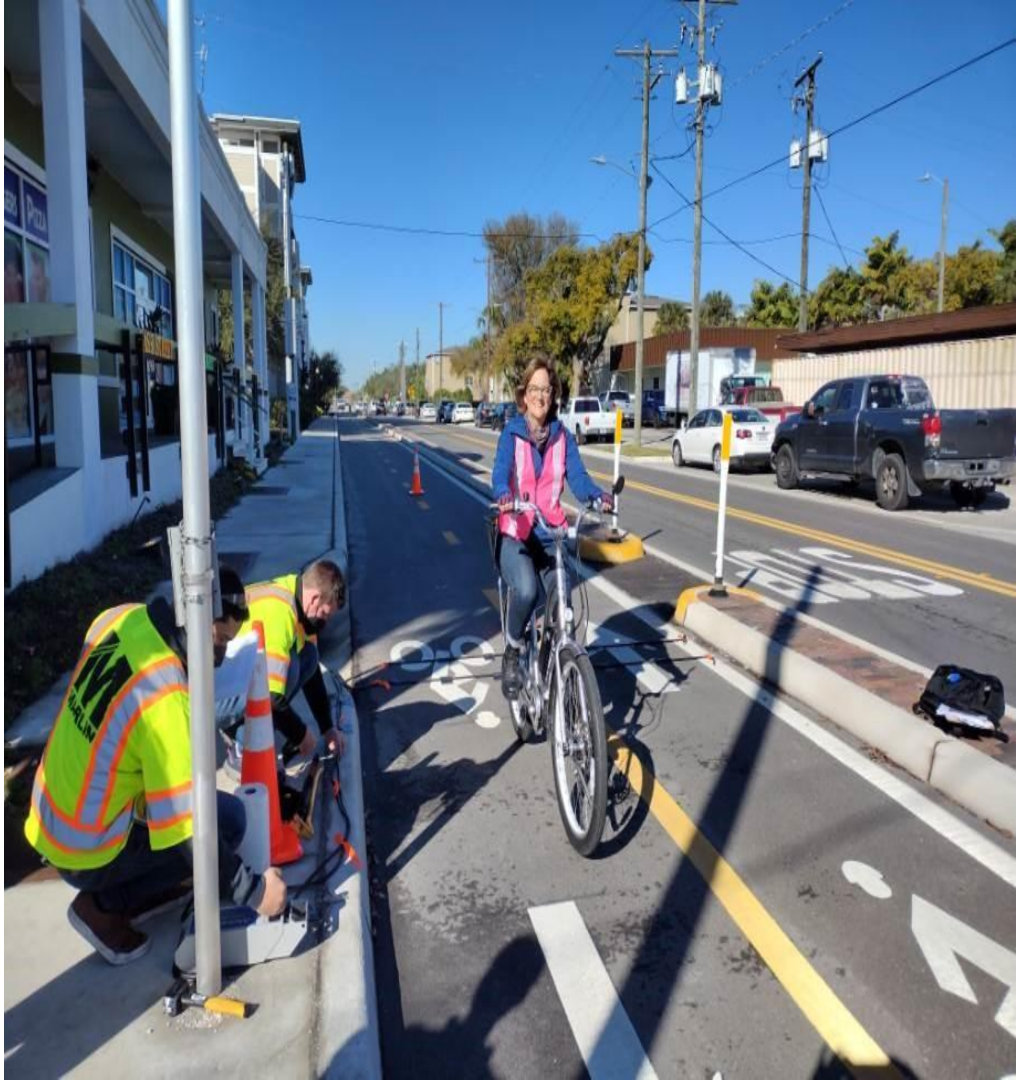
Improve bike/ped conditions

Replace outdated traffic signal with all way stop condition

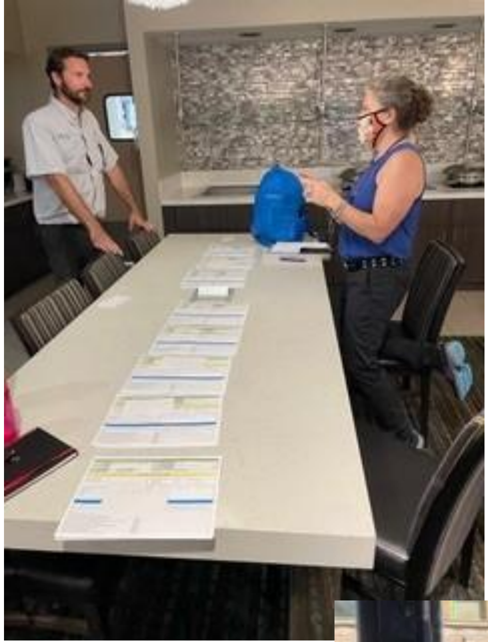
Gather before use and behavior to advocate for an east/west bicycle boulevard

Trail vs. on-street bike lane usage

Better wayfinding and facility improvements

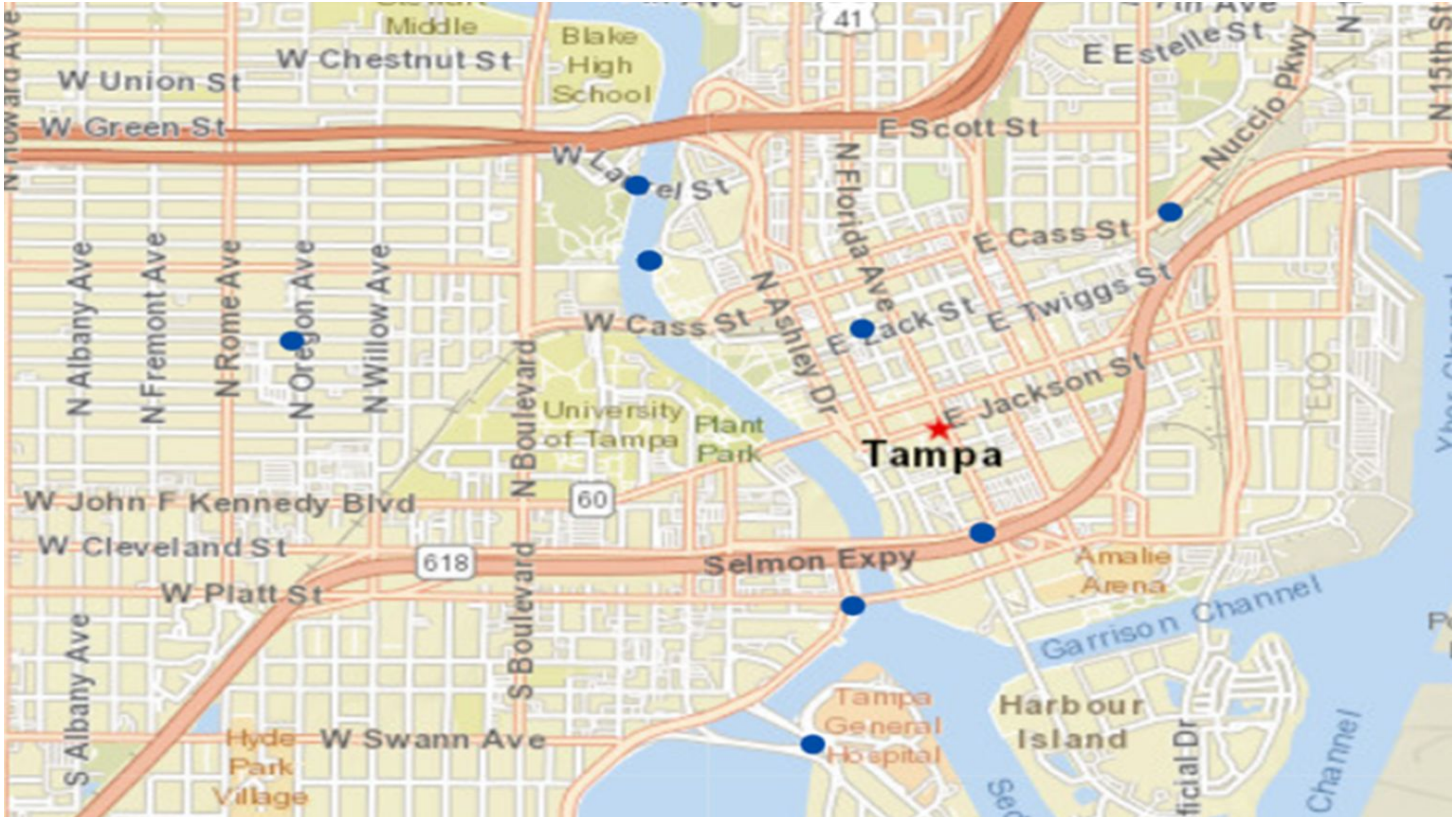


Site Selection



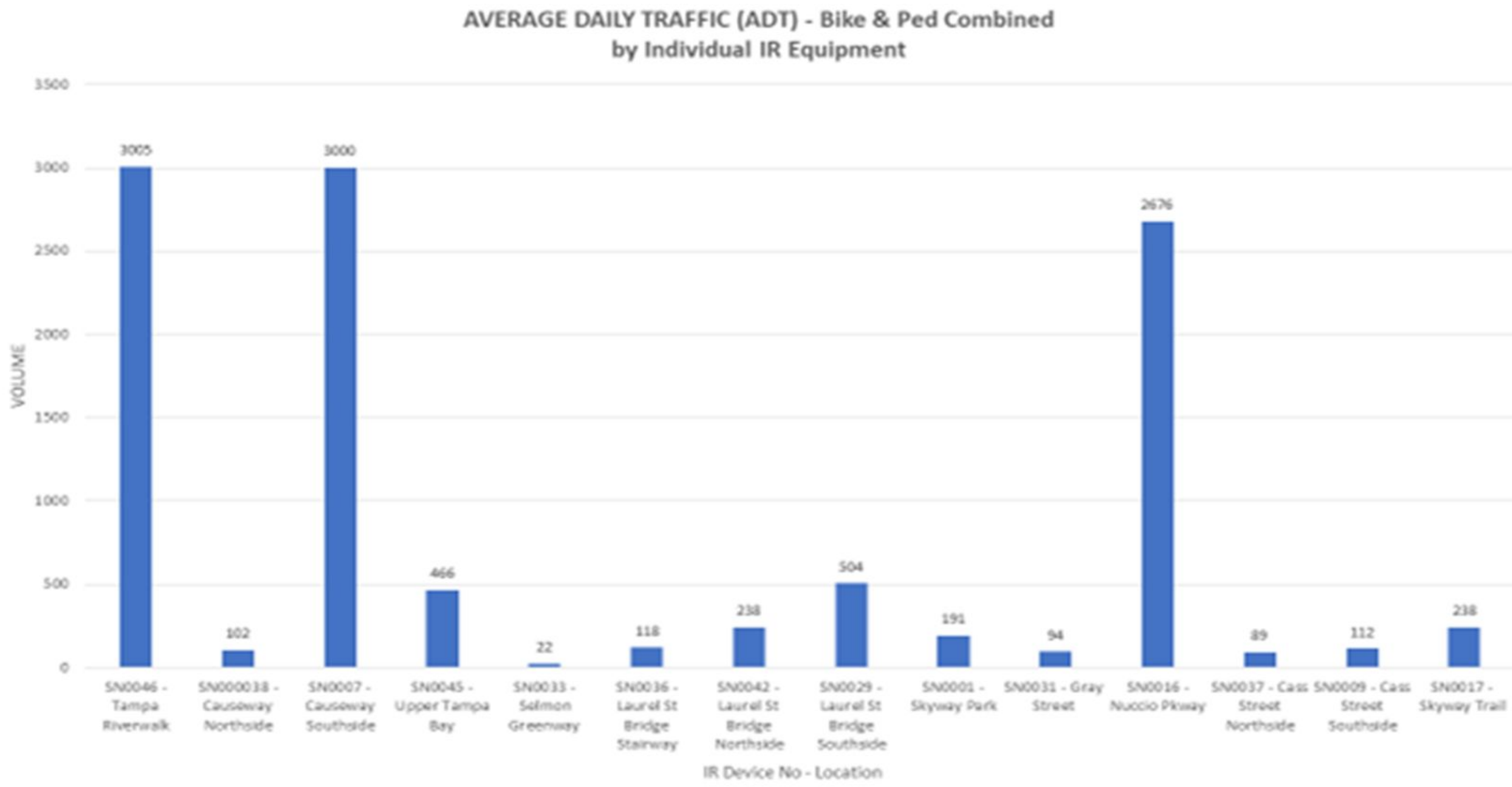
Site Selection

Site Selection

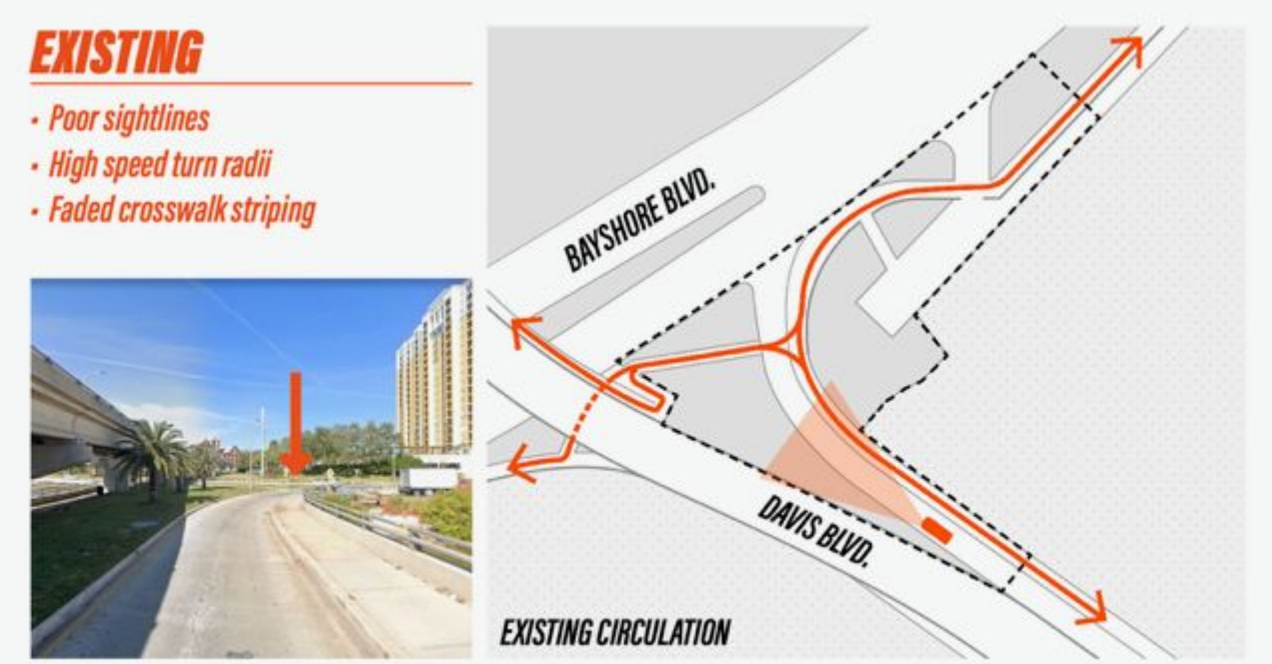


Database Formation

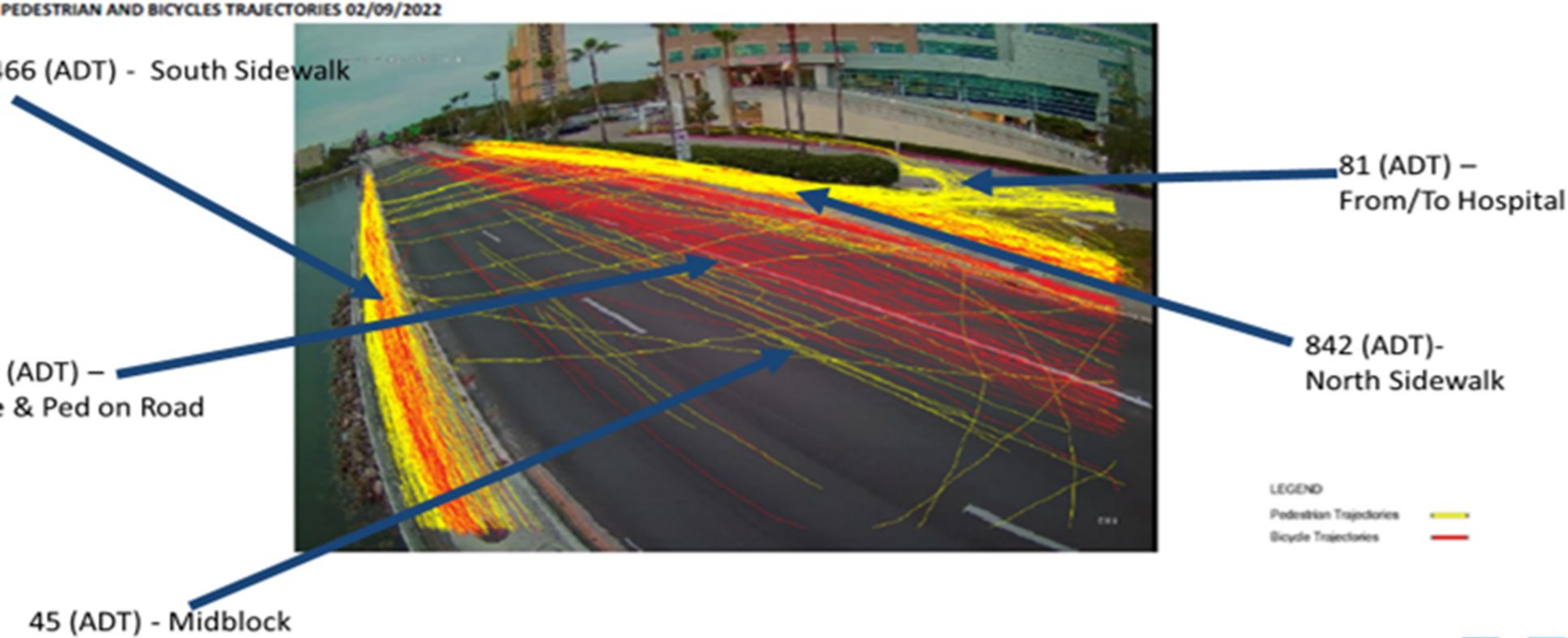
#	SITE ID	LOCATION	FACILITY TYPE	DIRECTION	AVERAGE DAILY TRAFFIC (ADT)	TOTAL FOR SITE	SITE
1	10N001	Tampa Riverwalk @ Fortune St.	Trail	East Side NB-SB	3005	3005	Tampa Riverwalk @ Fortune St.
2	10N002	Courtney Campbell Causeway - Northside	Sidewalk	North Side EB-WB	102		
3	10N002	Courtney Campbell Causeway - Southside	Sidewalk	South Side EB-WB	6851	6953	Courtney Campbell Causeway
4	10N003	Upper Tampa Bay Trail	Trail	East Side NB-SB	466	466	Upper Tampa Bay Trail
5	10N004	Selmon Greenway Trail	Trail	North Side EB-WB	22	22	Selmon Greenway Trail
6	10N007	Laurel St Bridge - Stairway	Stairway	North Side EB-WB	118	118	Laurel St Bridge - Stairway
7	10N007	Laurel St Bridge - Northside	Sidewalk	North Side EB-WB	238		
8	10N007	Laurel St Bridge - Southside	Sidewalk	South Side EB-WB	504	742	Laurel St Bridge
9	10N008	Skyway Park Trail @ Bayport Drive	Trail	North Side EB-WB	191	191	Skyway Park Trail @ Bayport Drive
10	10N009	Gray Street Between Trask & Westshore	Sidewalk	North Side EB-WB	94	94	Gray Street Between Trask & Westsho
11	10N010	Nuccio Pkway East of Nebraska - Green spine Cycle Track	Cycle Track	North Side EB-WB	2676	2676	Nuccio Pkway East of Nebraska - Gree Cycle Track
12	10N011	Cass Street Cycle Track @ Rome - Northside	Sidewalk	North Side EB-WB	89		
13	10N011	Cass Street Cycle Track @ Rome - Southside	Sidewalk	South Side EB-WB	112	201	Cass Street Cycle Track @ Rome
		Skyway Trail - U Path @ West					


AVERAGE DAILY TRAFFIC (ADT) - Bike & Ped Combined
by Individual IR Equipment
VOLUME
3500
3000
2500
2000
1500
1000
500
0
3005
102
3000
466
22
118
238
504
191
94
2676
89
112
238
SN0046 - Tampa Riverwalk
SN000038 - Causeway Northside
SN0007 - Causeway Southside
SN0045 - Upper Tampa Bay
SN0033 - Selmon Greenway
SN0036 - Laurel St Bridge Stairway
SN0042 - Laurel St Bridge Northside
SN0029 - Laurel St Bridge Southside
SN0001 - Skyway Park
SN0031 - Gray Street
SN0016 - Nuccio Pkway
SN0037 - Cass Street Northside
SN0009 - Cass Street Southside
SN0017 - Skyway Trail
IR Device No - Location

Davis Islands - Access Tampa Gen Hospital



Davis Islands/Hospital Access



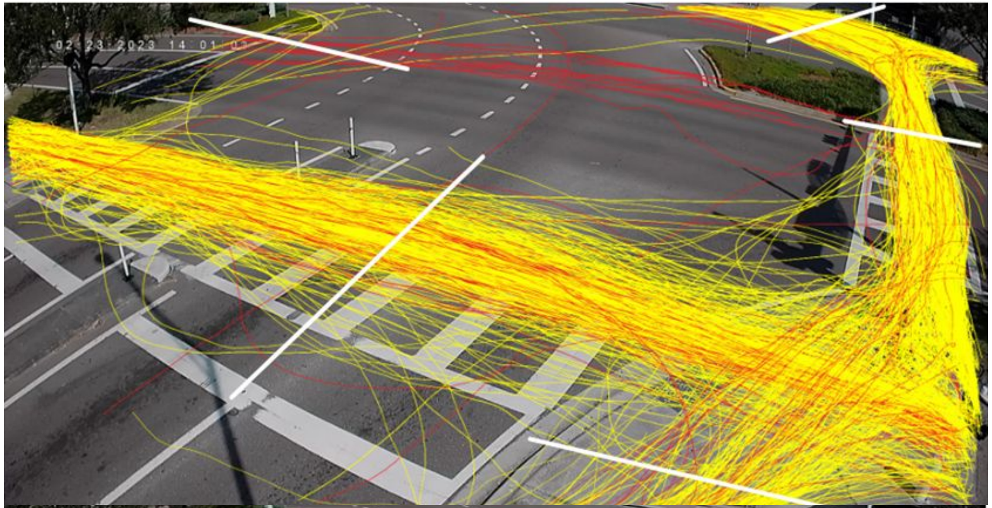
Selmon Greenway

Weekday Volumes are higher than weekend (>2,200 on weekday versus >1600 on the weekend) indicating a commuter traffic pattern

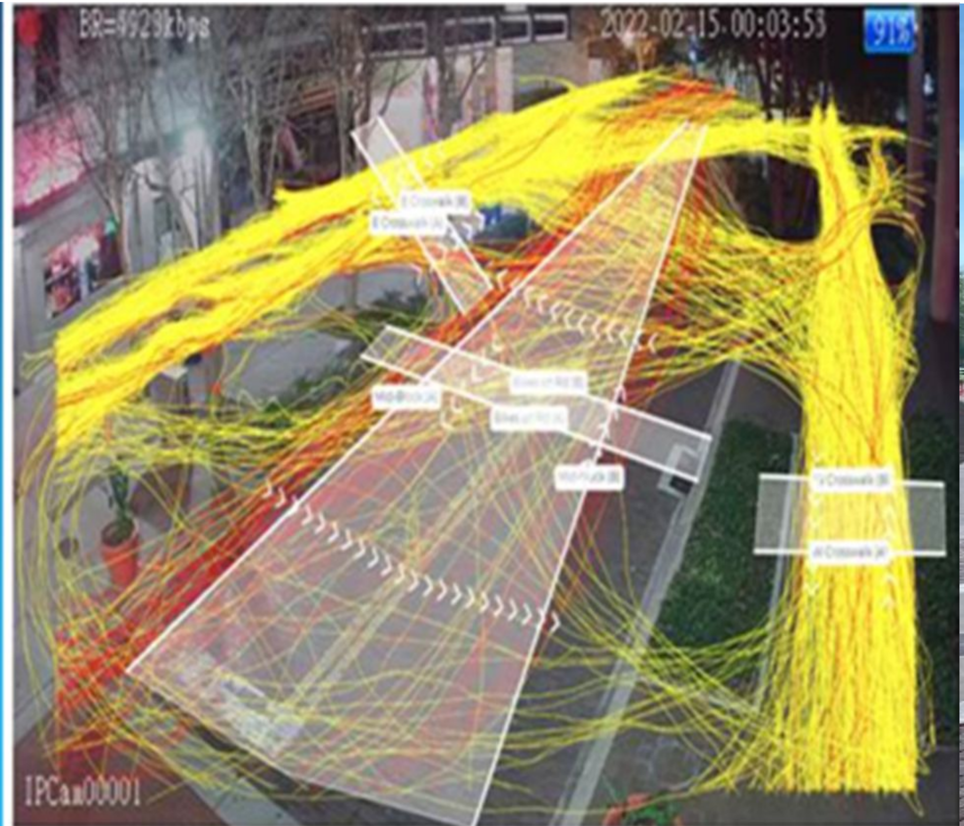
More Pedestrians (>1,400) than Cyclists (>200) 14% cyclists

Safety Concerns for cyclists using all 3 lanes and pedestrians not using the cross walks

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY



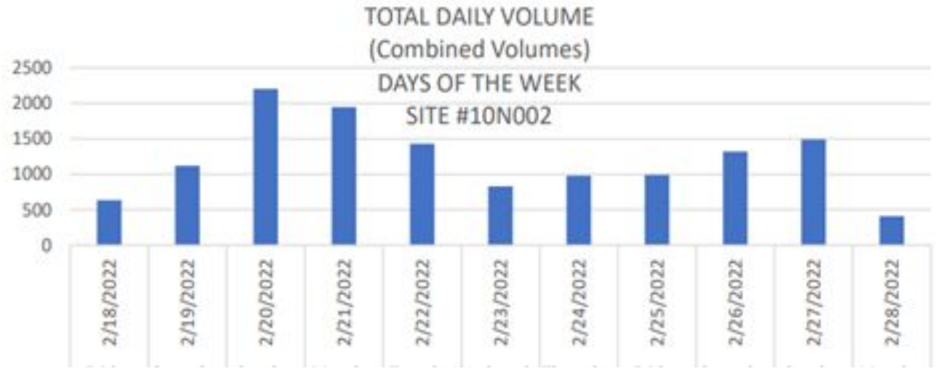
Signal Replacement (Franklin)



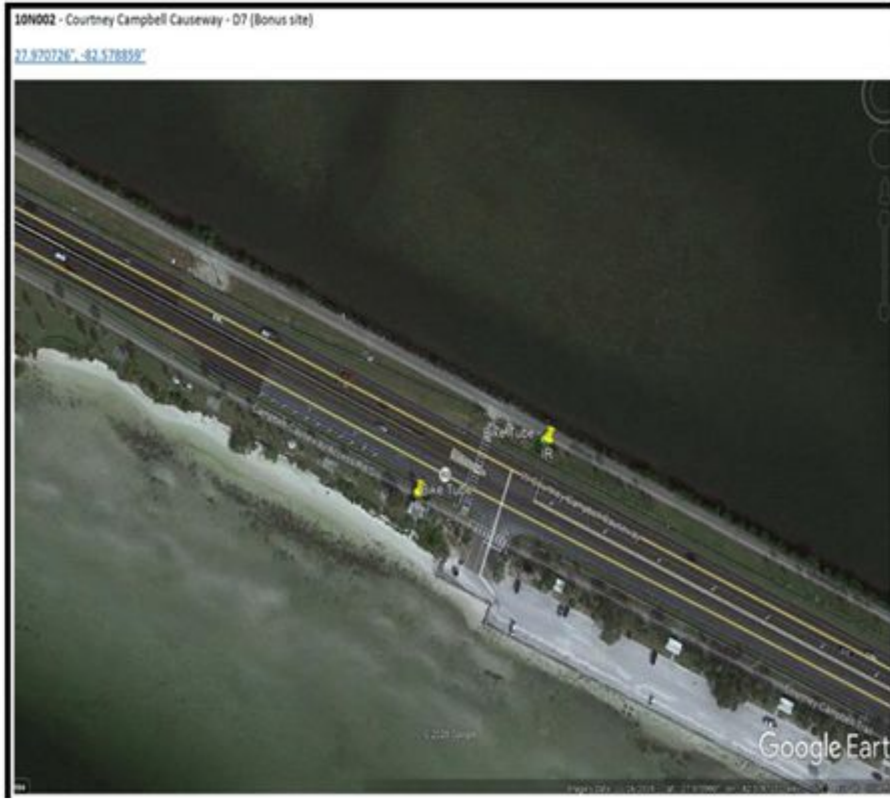
Gray Street (Proposed) Bicycle Boulevard

Courtney Campbell Trail (SR 60) vs. Bike Lane

DOW	DATE	TOTAL DAILY VOLUME
Friday	2/18/2022	635
Saturday	2/19/2022	1120
Sunday	2/20/2022	2203
Monday	2/21/2022	1945
Tuesday	2/22/2022	1430
Wednesday	2/23/2022	829
Thursday	2/24/2022	980
Friday	2/25/2022	992
Saturday	2/26/2022	1320
Sunday	2/27/2022	1490
Monday	2/28/2022	411
AVERAGE DAILY TRAFFIC (ADT)		1214



66,000 Motorized AADT



Safety to large event venue (RJ Stadium)

Findings

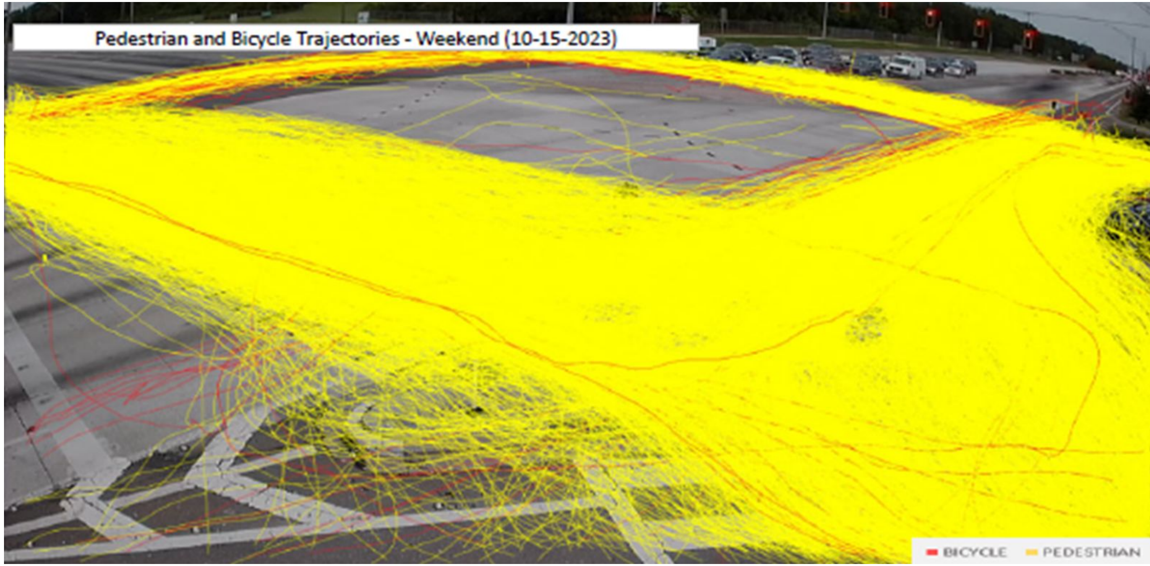
- Low Volume site until events happen (123 Total Volume)
- High Volume Site when events happen (22,176 Total Volume)
- Huge increase from weekday to weekend with event

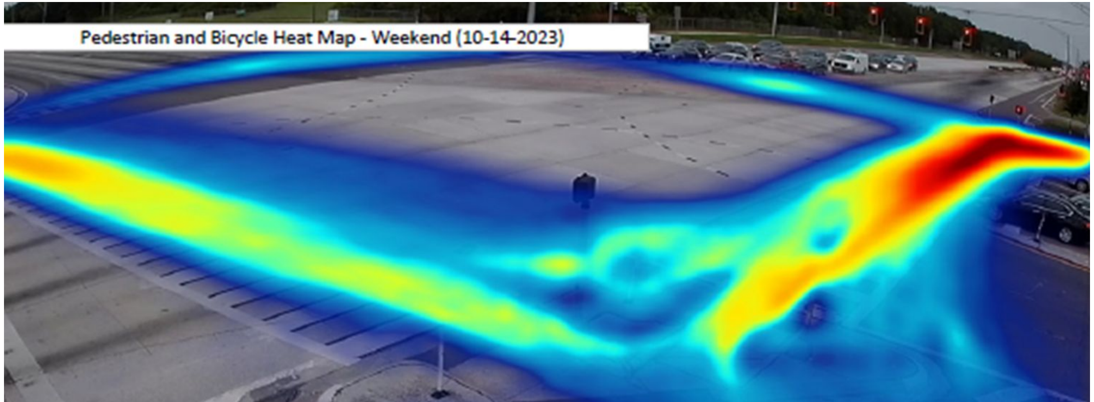
  (**17,929% Increase**)

Safety to large event venue (RJ Stadium)

Traffic Operation and Safety Improvement Opportunities

- Signal timing improvement opportunity (green time increases for pedestrians, etc.)
- pedestrian milling in the roadway (crossing guards, etc.)
- right turn slip lane (close during the game, etc.)
- More Crossing guards, etc.





Next Steps

Continue coordination of Tampa Data Committee

Work with District 7 to borrow count equipment

Focus on shared camera equipment

Identify key places/reasons for counts

Advocate for “count parity” with vehicular data collection!

THANK YOU FDOT TDA PROGRAM!!