I-4 FRAME
Florida's Regional Advanced Mobility Elements

ITS Wisconsin Transportation Conference - October 19, 2023
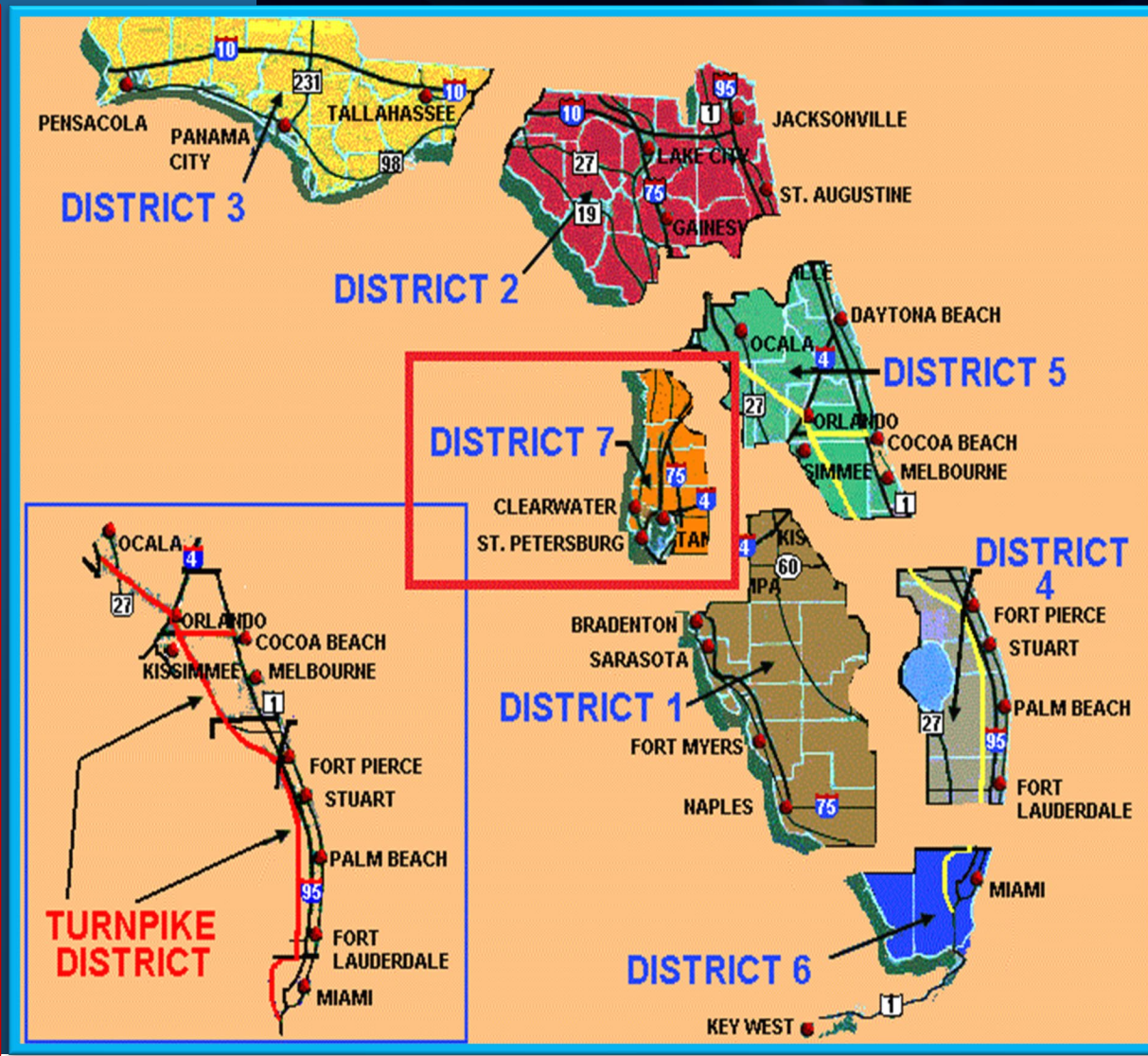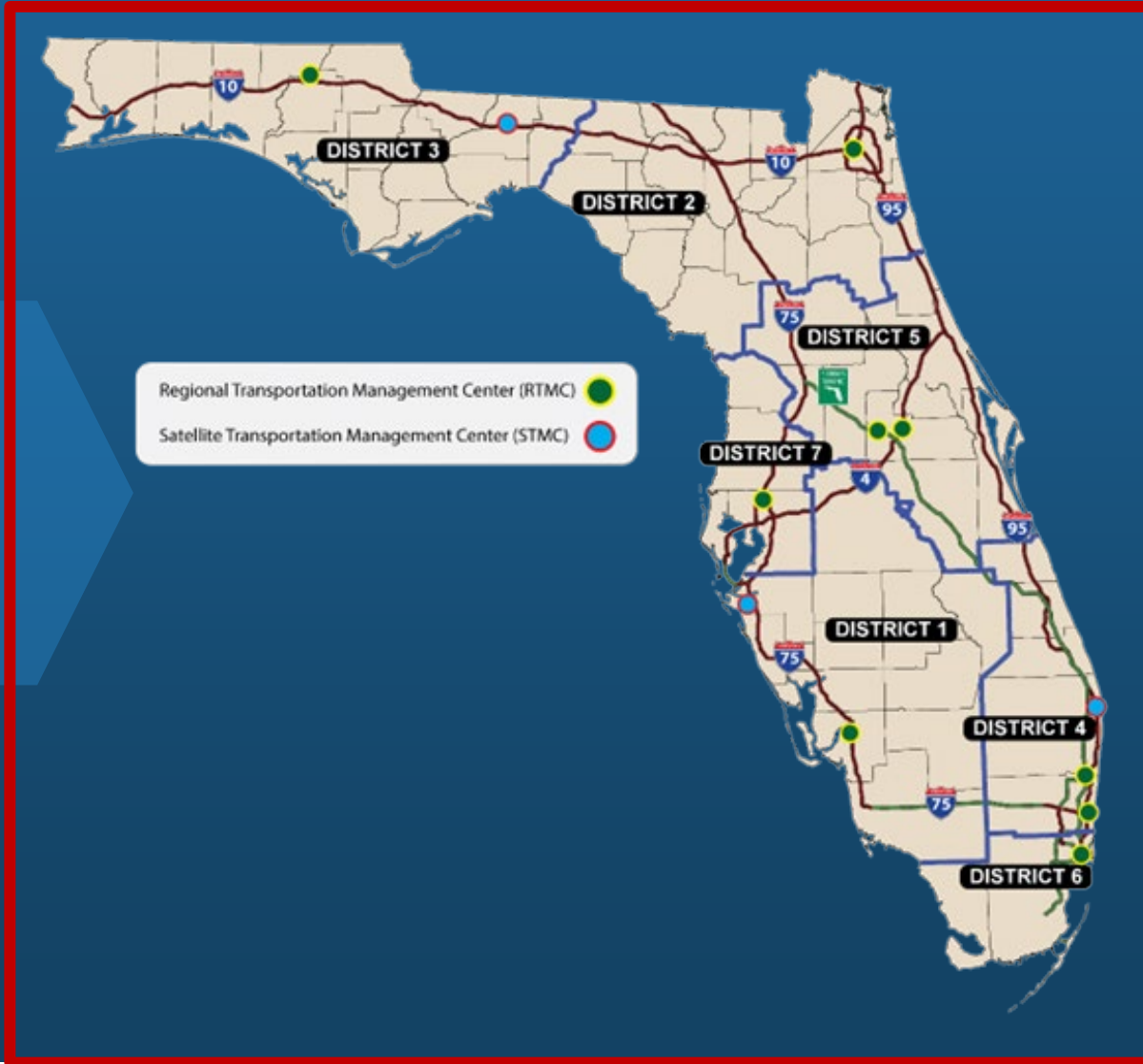
Presented by Megan Arasteh, PE
TSM&O Program Manager
Florida Department of Transportation
District 7 – Traffic Operations

Presentation Outline

FDOT TSM&O
Transportation Systems Management & Operations

Florida Department of Transportation Districts

Florida CAV Program

- FL CAV Program is gaining momentum and started a **roadmap** for its development

- Central Office published the **CAV Business Plan**

Identifies and develops an institutionalized framework and timeframes to *aggressively move the CAV Program from research and pilot projects into statewide deployment* using expedited planning and outcome centric sustainable **safety, mobility, and innovation goals.**

Florida's Connected and Automated Vehicles (CAV) Business Plan
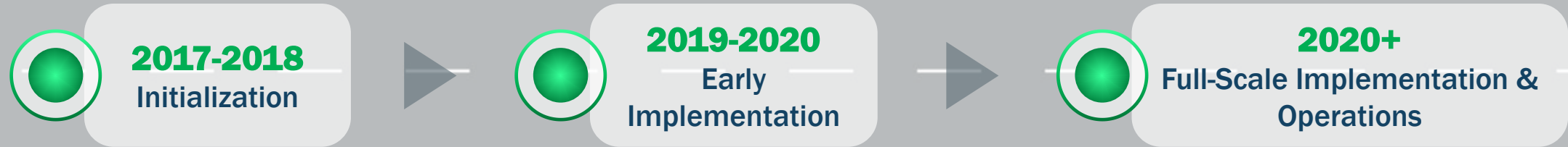January 2019

Florida CAV Program

Seven (7) Areas of Focus

1. Policies and Governance
2. Program Funding
3. Education & Outreach
4. Industry Outreach & Partnerships
5. Technical Requirements & Specifications Development
6. Implementation Readiness
7. Deployment & Implementation

Florida's Connected and Automated Vehicles (CAV) Business Plan

January 2019

Florida CAV Program

The CAV Program has a roadmap with three (3) major phases:

2017-2018
Initialization

➤

2019-2020
Early Implementation

➤

2020+
Full-Scale Implementation & Operations

- Each of the seven focus areas are broken into subareas and are assigned a status (Planned, Underway, Completed, Recurring)

- Overall, **all seven focus areas are at least underway in the initialization phase**

Florida CAV Program

Connected Vehicles

(CV) use vehicle-to-vehicle, vehicle-to-infrastructure, and infrastructure-to-vehicle communication to exchange information between vehicles, drivers, the roadside, bicyclists and pedestrians.

Projects/Initiatives

♦ Statewide Project/Initiative
♦ FDOT Led Projects
♦ Partner Agency Led Projects

Design/Implementation
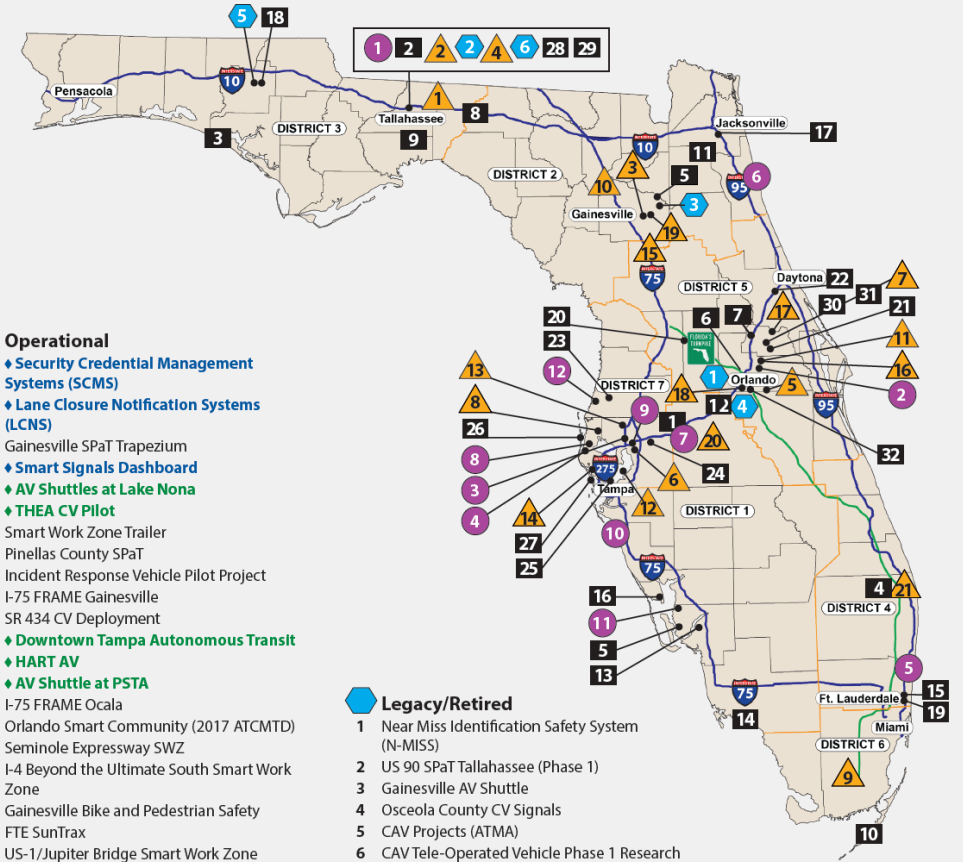
1. I-4 FRAME (2019 ATCMTD)
2. US 90 SPaT Tallahassee (Phase 2)
3. US 98 Smart Bay
4. SR-710/Beeline Hwy - CAV
5. US 41 FRAME
6. Florida's Turnpike Mainline and Beachline CV Deployment
7. Lake Mary Boulevard CV Project
8. I-10 Smart Road Ranger
9. ♦ V2X Data Platform
10. US 1 Keys COAST
11. Railroad Advanced Notification System
12. I-4 Active Work Zone
13. LeeTran Traffic Signal Priority
14. Collier Countywide Connected Traveler Information System (CTIS)
15. Train Vehicle Crash Avoidance Pilot Project
16. Wildlife Protection
17. AWZM - District 2
18. AWZM - District 3
19. AWZM - District 6
20. CV Smart Signal - Lake County
21. SR 436 PedSafe Project - City of Altamonte Springs
22. SR-40 ITS Safety Deployment
23. Pasco County SMART US-19
24. Hillsborough County Connected Vehicle Priority and Preemption System
25. AWZM - District 7
26. Pedestrian Warning System - I2V Deployment along Alt 19 (City of Clearwater)
27. Smart Signal Corridor (West St. Petersburg)
28. ♦ RSU Health Monitoring
29. Cybersecurity
30. First Responder
31. U.S. 17-92 Connected Vehicle Deployment
32. Ped/Safe II U.S. 441/State Road 50

Planning

1. CV Bike Safety Pilot Deployments
2. State Road 423 Freight Signal Priority
3. Downtown Interchange Smart Work Zone
4. ♦ Pinellas County Smart Community (2020 ATCMTD)
5. SR-869/SW 10th Street Connector TSM&O SWZ
6. Smart St. Augustine
7. Intersection Collision Avoidance Safety Program
8. SR 60 West Coast Smart Signal Corridor Project
9. Connected Vehicle Priority and Preemption System (CVPP)
10. Bee Ridge Corridor Smart Signals
11. City of Sarasota CAV Project
12. SMART US 19

Operational

1. ♦ Security Credential Management Systems (SCMS)
2. ♦ Lane Closure Notification Systems (LCNS)
3. Gainesville SPaT Trapezium
4. ♦ Smart Signals Dashboard
5. ♦ AV Shuttles at Lake Nona
6. ♦ THEA CV Pilot
7. Smart Work Zone Trailer
8. Pinellas County SPaT
9. Incident Response Vehicle Pilot Project
10. I-75 FRAME Gainesville
11. SR 434 CV Deployment
12. ♦ Downtown Tampa Autonomous Transit
13. ♦ HART AV
14. ♦ AV Shuttle at PSTA
15. I-75 FRAME Ocala
16. Orlando Smart Community (2017 ATCMTD)
17. Seminole Expressway SWZ
18. I-4 Beyond the Ultimate South Smart Work Zone
19. Gainesville Bike and Pedestrian Safety
20. FTE SunTrax
21. US-1/Jupiter Bridge Smart Work Zone

Legacy/Retired

1. Near Miss Identification Safety System (N-MISS)
2. US 90 SPaT Tallahassee (Phase 1)
3. Gainesville AV Shuttle
4. Osceola County CV Signals
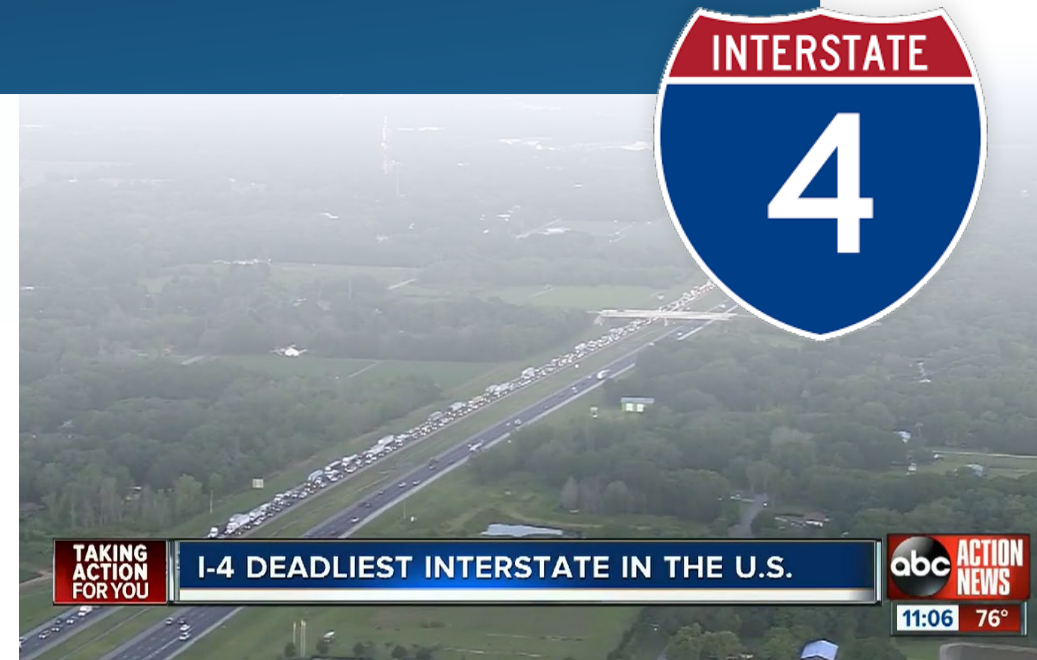5. CAV Projects (ATMA)
6. CAV Tele-Operated Vehicle Phase 1 Research

FLORIDA MOVES
Connecting People for Safer Transportation

Background

FDOT **TSM&O**
Transportation Systems Management & Operations

⚠️ **PROBLEM:** High crash frequency (injury and fatalities)
Hinders Florida's Vision Zero Initiative

*Orlando received **74 million annual visitors** in 2022 and is America's most visited destination.*

INTERSTATE 4

- More than **150,700** vehicles traveling daily
- I-4 experiences severe mobility issues due to frequent crashes and recurring congestion.
- Between 2018 and 2022, **104 fatal crashes** and **5,010 injury crashes**.
- For the Traffic Homicide investigation, the **average I-4 closure is 4 hours.**
- I-4 averaged **five lane-closure events per day with over 2,000 lane blocking events in 2022**
- One full directional closure every 10 days in 2022.

Background: Major Incidents

Background : Major Incidents

Location: I-4 Westbound beyond McIntosh Rd

Rapid Incident Scene Clearance (RISC) Event involving overturned tractor trailer with 4 feet of roadway damage. Even had drywall and wood panels spill across roadway.

Total event time: **3 hours 57 Minutes**

Background : Major Incidents
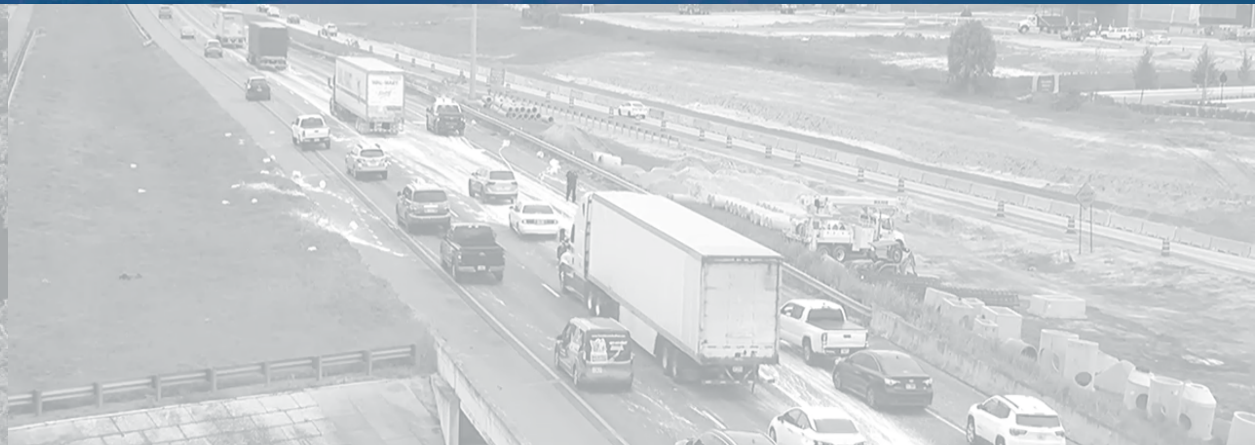
Location: I-4 Eastbound at Championsgate

Event involved 20-25 gallons of roof sealant that spilled onto I-4. FDOT District 5 asset maintenance handled the event with District 1's asset maintenance support for maintenance of transportation (MOT) assistance.

Total event time: **3 hours 51 Minutes**

I-4 10.8 EB

Background : Major Incidents

③

Location: I-4 Eastbound at Thonotosassa Rd
RISC event involving a jackknifed tractor trailer vs. vehicle crash.

Total event time: **1 hours 44 Minutes**

Background : Major Incidents

Location: I-4 Westbound before Mango Rd
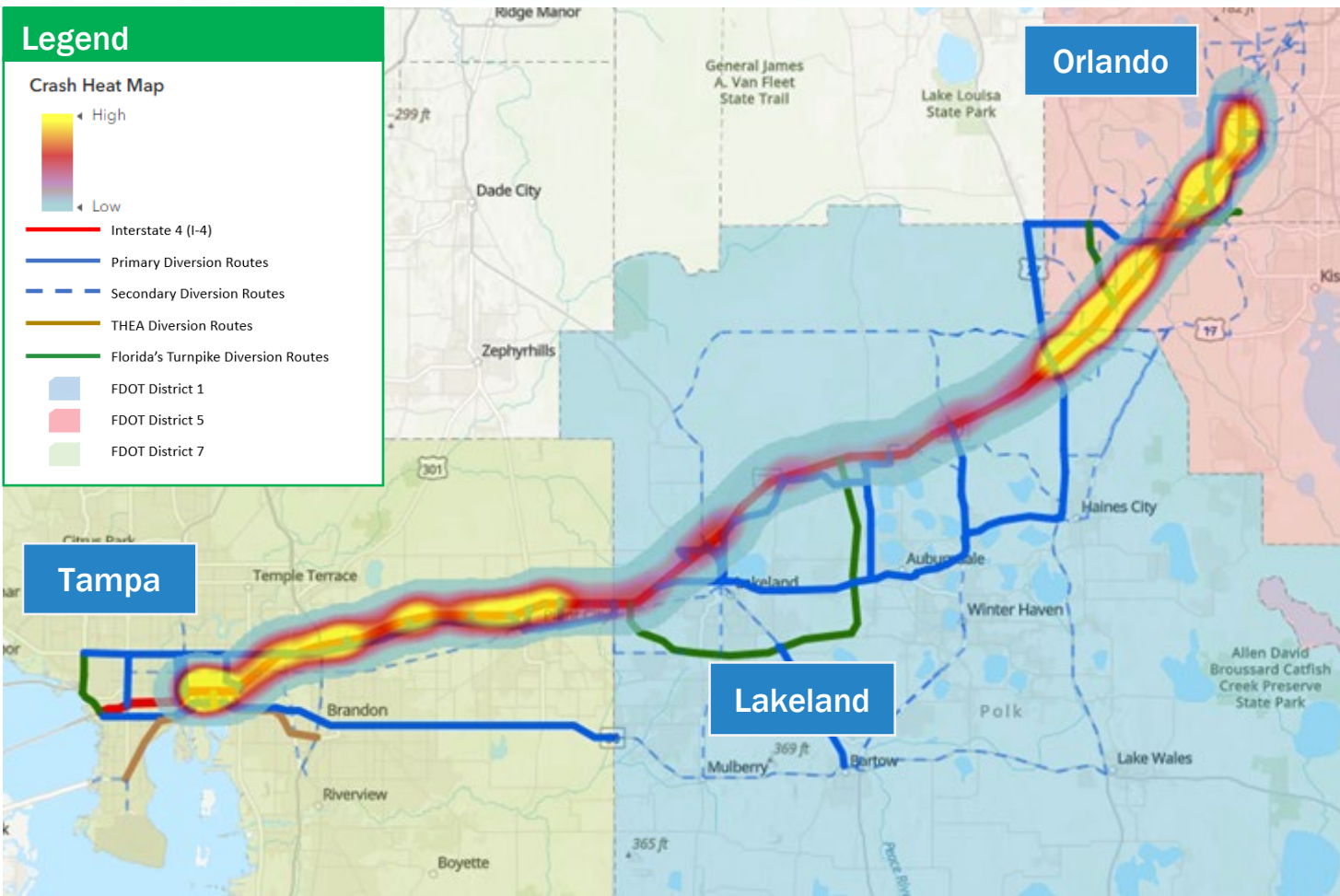RISC event involving a box truck fire on the shoulder.

Total event time: **2 hours 30 Minutes**

Background: Crashes on I-4 from 2018 - 2022

Legend

Crash Heat Map
- High
- Low

— Interstate 4 (I-4)
— Primary Diversion Routes
- - - Secondary Diversion Routes
— THEA Diversion Routes
— Florida's Turnpike Diversion Routes
- FDOT District 1
- FDOT District 5
- FDOT District 7

Orlando

Tampa

Lakeland

Crash Data

I-4 Crashes from 2018 – 2022 (All)						
Crash Severity	2018	2019	2020	2021	2022	Grand Total
Fatality	18	16	17	30	23	104
Injury	1,011	1,055	843	1,134	967	5,010
Property Damage Only (PDO)	2,564	2,726	1,964	2,826	2,870	12,950
Total	3,593	3,797	2,824	3,990	3,860	18,064

AADT = 157,000

Background: Injury Crashes on I-4 from 2018 - 2022

Legend

Crash Heat Map
- High
- Low

▬▬▬	Interstate 4 (I-4)
▬▬▬	Primary Diversion Routes
- - -	Secondary Diversion Routes
▬▬▬	THEA Diversion Routes
▬▬▬	Florida's Turnpike Diversion Routes
▮	FDOT District 1
▮	FDOT District 5
▮	FDOT District 7

Orlando

Tampa

Lakeland

5,010 Injury Crashes
Source: Signal 4 Analytics –
2018-2022 Crash Statistics
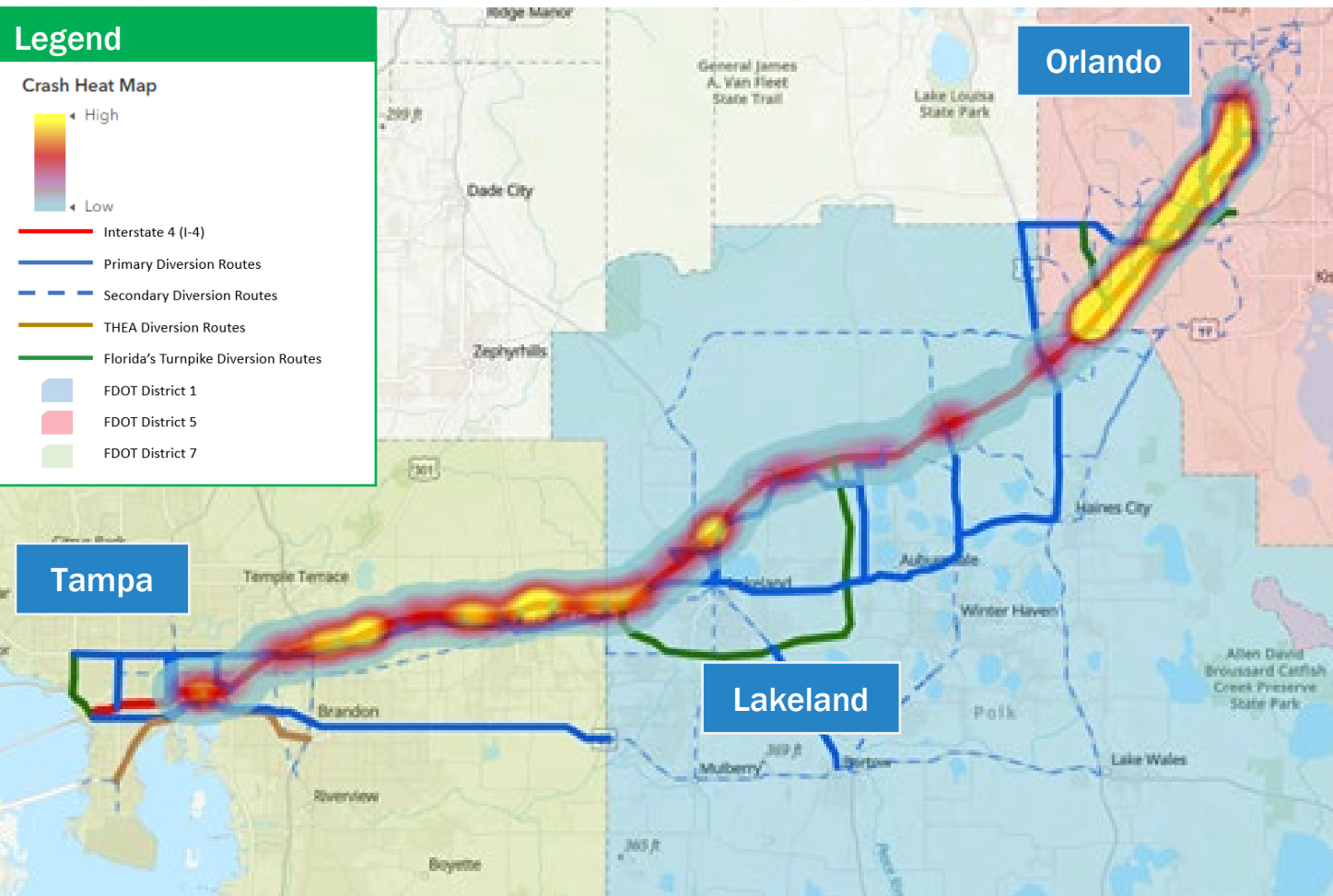
Background: Fatal Crashes on I-4 from 2018 - 2022

Legend

Crash Heat Map

◄ High

◄ Low

━━━ Interstate 4 (I-4)
━━━ Primary Diversion Routes
- - - Secondary Diversion Routes
━━━ THEA Diversion Routes
━━━ Florida's Turnpike Diversion Routes
▨ FDOT District 1
▨ FDOT District 5
▨ FDOT District 7

Orlando

Tampa

Lakeland
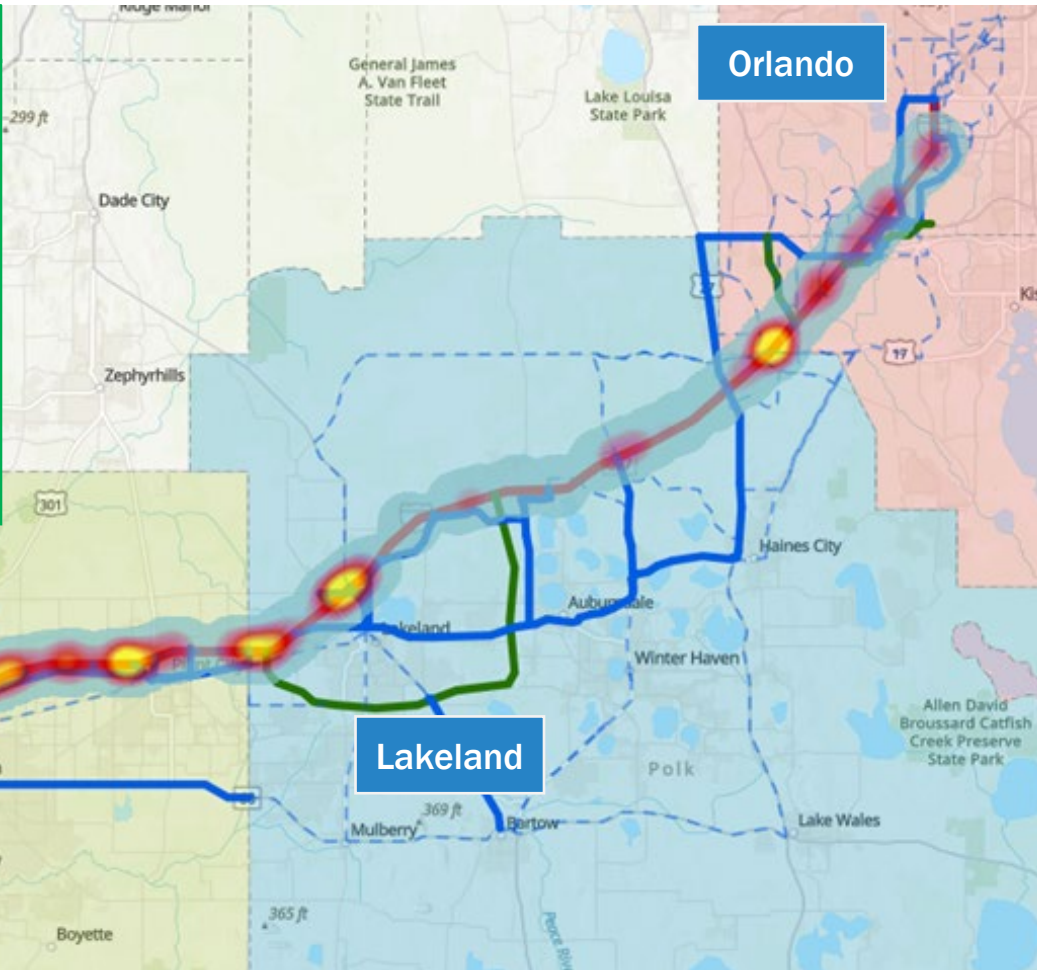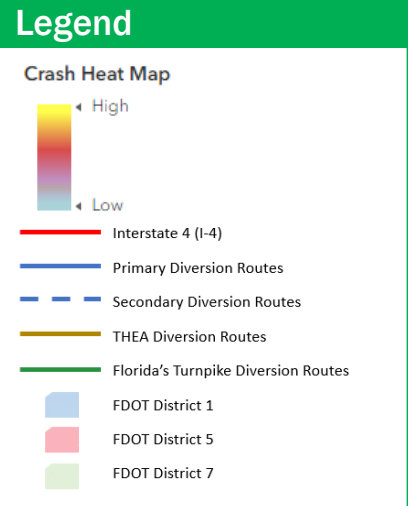
104 Fatal Crashes
Source: Signal 4 Analytics –
2018-2022 Crash Statistics

Understanding I-4 FRAME Need

Freight

- Rail to Road Facility near Winter Haven
- 12% heavy commercial vehicles

Port

- High volume of freight out of the Port of Tampa Bay to Central Florida Distribution Centers
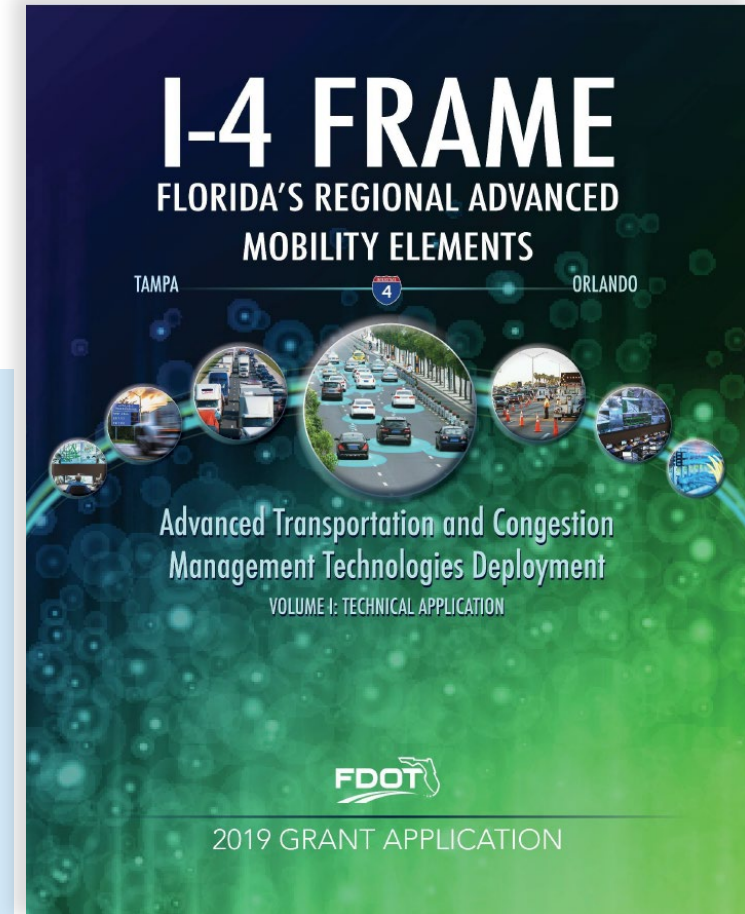
Construction/Work Zones

- Major reconstruction projects throughout project limits imminent (Tampa Bay Next, I-4 Beyond the Ultimate, etc.) with required detours onto the arterial network

Project Development and Funding

I-4's history of congestion, incidents (and subsequent delays) **drove the initial Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Grant response and current project's concept.**
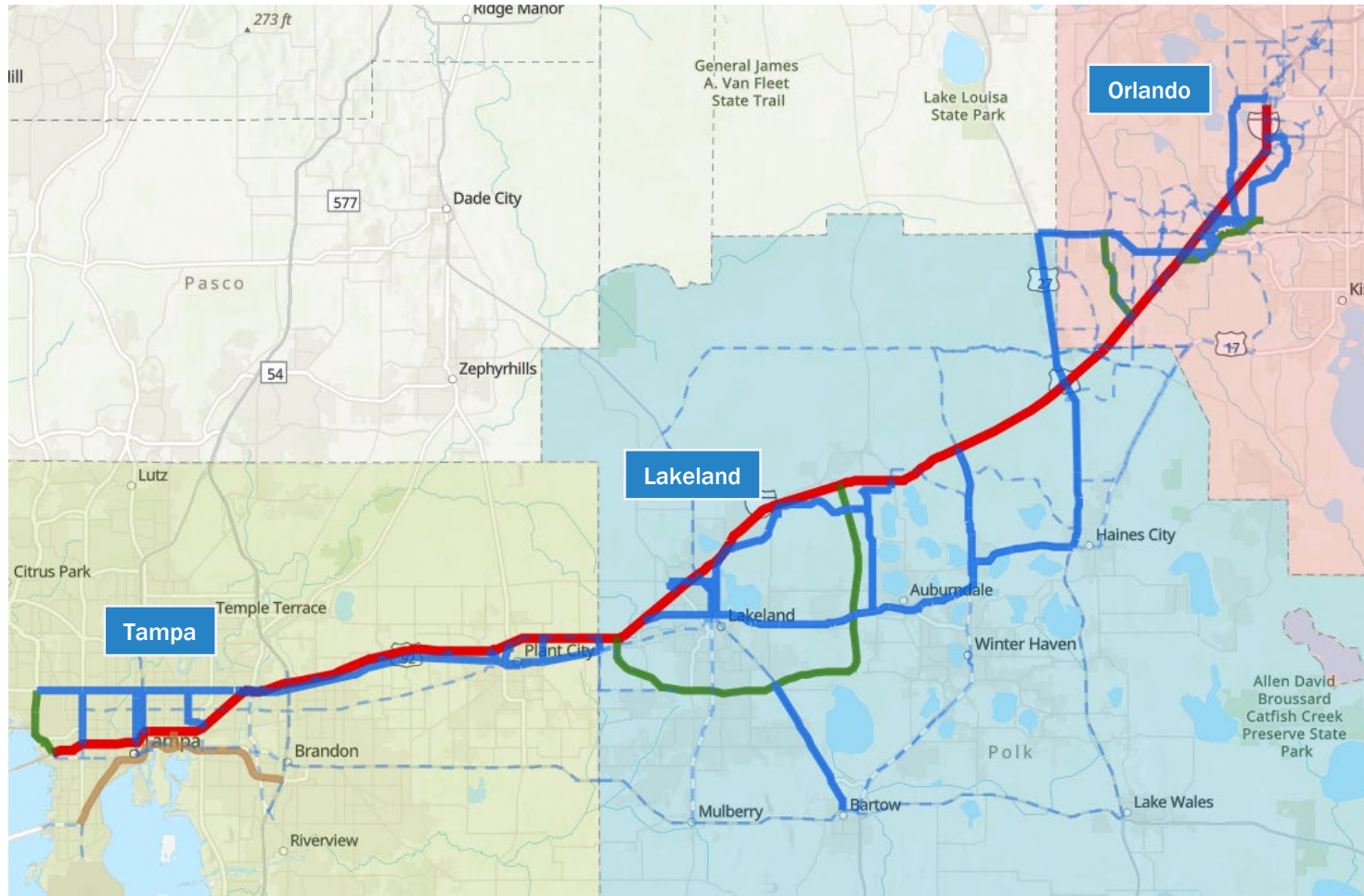
Project Goals

- Implement **CV technology and Advanced Traffic Signal Performance Metrics (ATSPM)** throughout the I-4 corridor and adjacent arterials

- Utilize multiple **TSM&O strategies** by **deploying strategic CV-related devices and applications for better ICM practices**

- **Supplementary systems to be used, as appropriate, for immediate benefit**

I-4 FRAME
FLORIDA'S REGIONAL ADVANCED MOBILITY ELEMENTS
TAMPA — 4 — ORLANDO
Advanced Transportation and Congestion Management Technologies Deployment
VOLUME I: TECHNICAL APPLICATION
FDOT
2019 GRANT APPLICATION

Project Development

Regional Integrated Corridor Management (ICM) project

Overall Limits

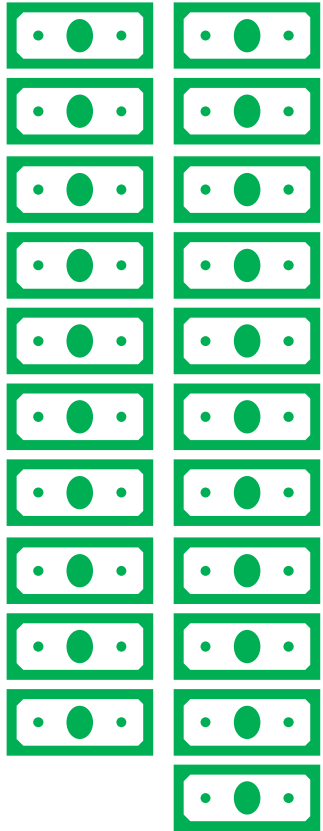*Central Business District in Tampa to southwest of Orlando at Sand Lake Rd*

- Includes **ICM routes** within four counties spanning three FDOT Districts, Florida's Turnpike Enterprise (FTE) with oversight by FDOT Central Office

ℹ Routes are for diversion when major incidents occur on I-4
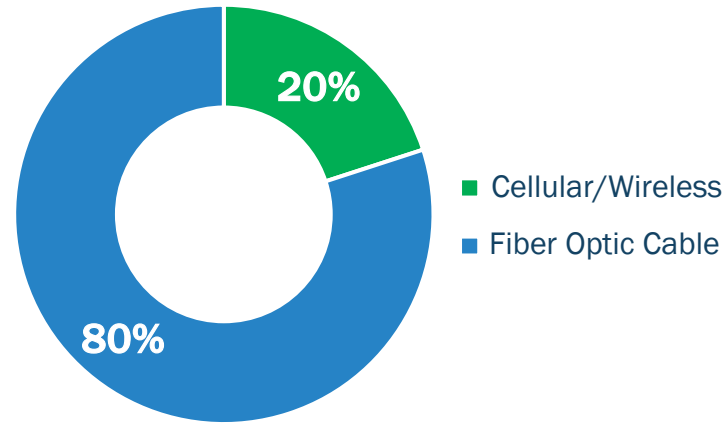
Project Development & Scope

Budget $21M

INTERSTATE 4 · · · · · ·

75 Miles on I-4

275+ Miles of other limited access and signalized arterial roadways

Communications

- 20% — Cellular/Wireless
- 80% — Fiber Optic Cable

Cloud-Based through Application*

4 1 1 Signals

CAV Technologies being Deployed

RSU
Roadside Unit

CV 541 RSUs
- Every Mile
- Dedicated Short-Range Communication (DSRC) and C-V2X capable

Roadside to Vehicle Messages for:
- Lane Closures
- Work Zones
- Delays, Congestion, & End of Queue
- Incidents
- Signal Phase and Timing (SPaT)
- Speeds
- Pedestrian-Bicyclist Safety
- Vehicle-to-Infrastructure (V2I)

OBU
Onboard Unit

CV 680 OBUs
- Public Vehicles
- Rental Cars
- Freight Companies (FedEx, UPS, DHL, etc.)

Advanced Traffic Signal Controllers
w/ATSPM

Replace approximately

220 controllers

💡 Detection is required to make ATSPM work

Blank-Out Signs
Fiber Optic Multi-Faced

For Route Diversion

Evaluated routes based on existing demographics and roadway use

2 Delivering I-4 FRAME

- Goals

- Key Stakeholders & Coordination

- Project Design

- CV Technologies & Applications

- Additional Technologies & Services

Goals

- **Deliver a project that supports Operations and overall CAV Business Plan**

- **Create a system design that is scalable and transferable that:**
  - Meets each Districts needs
  - Meets the goals of the CAV Program

- **Solve congestion problems using TSM&O strategies which includes:**
  - CV Technologies
  - Supplementary Systems

- **Identify performance measures**
  - Evaluation performance (Before/After) → University Research Partners to lead

Key Stakeholders

Government
- FDOT District 7
- FDOT District 1
- FDOT District 5
- Florida's Turnpike Enterprise
- FDOT Central Office

MPO/TPO
- Hillsborough County MPO
- Polk TPO
- METROPLAN Orlando

Local Toll Agencies
- Tampa-Hillsborough Expressway Authority (THEA)

First Responders
- Florida Highway Patrol
- City Police Departments
- County Sheriff's Office
- Local Fire Departments

Maintaining Agencies
Counties
- Hillsborough
- Polk
- Osceola
- Orange

Cities
- Lakeland
- Winter Haven
- Plant City
- Tampa

Rail/Freight Port
- Rail to Road Facility in Winter Haven
- Port Tampa Bay
- Florida Trucking Association
- Additional Freight:
  - FedEx, UPS, DHL

Private Parties
- Publix (Lakeland HQ)
- Rooms-To-Go
- Walmart
- Amazon
- Rental Car Fleets
- Rideshare Companies (Lynx / Uber)
- Theme Parks
- Strategic Property Partnerships

Universities
- University of South Florida / CUTR
- Florida Polytechnic University
- University of Central Florida
- University of Florida

Local Transit Agencies
- Hillsborough Area Regional Transit (HART)
- Lynx
- Citrus Connection

25+ Stakeholders

Stakeholder Coordination

- **Create an I-4 FRAME Consortium**
  - Will act as the central group for all workshops, review of project documentation for input and approval

- **Early Stakeholder Coordination**
  - Creates buy-in
  - Workshops to discuss identified diversion routes and/or alternatives. A workshop with stakeholders was held to ensure diversion routes made sense for each jurisdiction.
  - Learn more about existing infrastructure and CAV readiness in each jurisdiction

- **Worked with Maintaining Agency Stakeholders to draft licensing agreements and Memorandums of Agreements**
  - Utilized for operation and maintenance of newly installed devices
  - Licensing agreements used for data sharing

Additional Coordination

Future Projects

120 + Ongoing/Future Projects Within Project Limits

- Opportunity to leverage these projects for infrastructure installation

- **I-4 Beyond the Ultimate (BTU)**
  - The I-4 FRAME is a TSM&O strategy for the end of the I-4 BTU efforts

- **Citywide Tampa ATMS**
  - Major re-haul of signal controllers with ATSPM and CV-related preparations to their infrastructure

Project Coordination

- Coordination with railroads within the corridor
- Early Utility Coordination
- R/W identification for constrained intersections

5 Year Work Program Projects
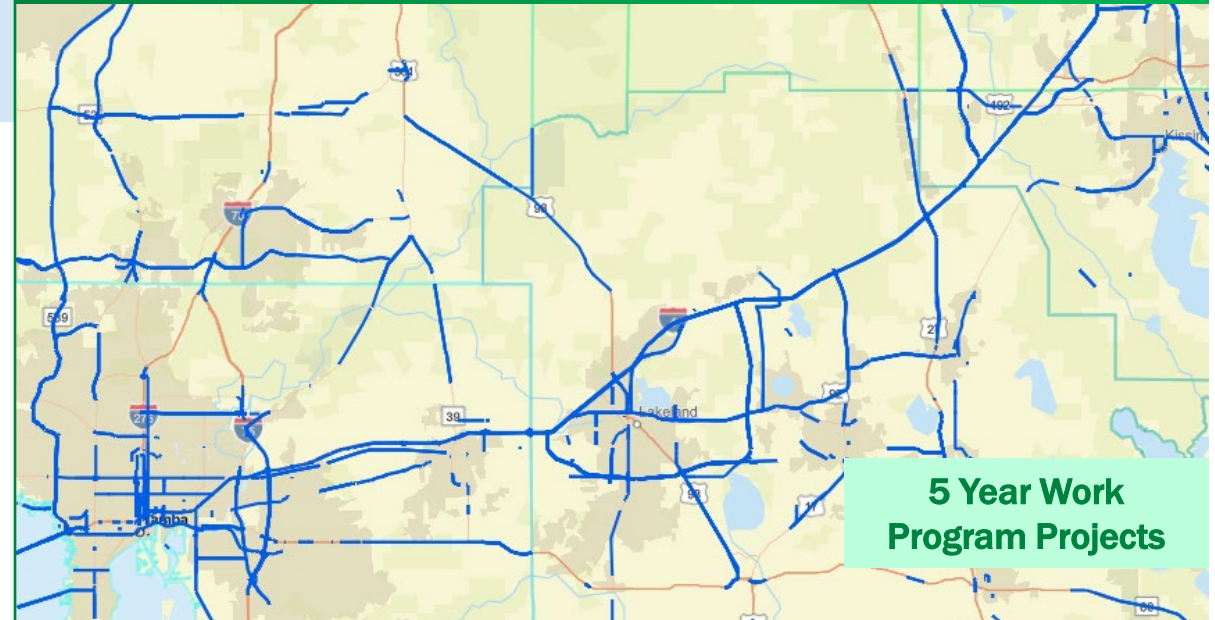
I-4 FRAME Project Overview

Legend
- Interstate 4 (I-4)
- Primary Diversion Routes
- Secondary Diversion Routes
- THEA Diversion Routes
- Florida's Turnpike Diversion Routes
- FDOT District 1
- FDOT District 5
- FDOT District 7

Orlando

District 1

I-4: 30 miles
Arterials: 100+ miles

Florida Turnpike Roadways: 24 miles

District 7

I-4: 25 miles
Arterials: 80 miles
SR 60 CAV: 30 Miles

Florida Turnpike Roadways: 3 miles

THEA Roadways: 16 miles

District 5

I-4: 17 miles
Arterials: 30 miles

Florida Turnpike Roadways: 10 miles

Florida Turnpike Enterprise

Total Mileage Across All Districts
37 miles

CV Technologies
Hardware
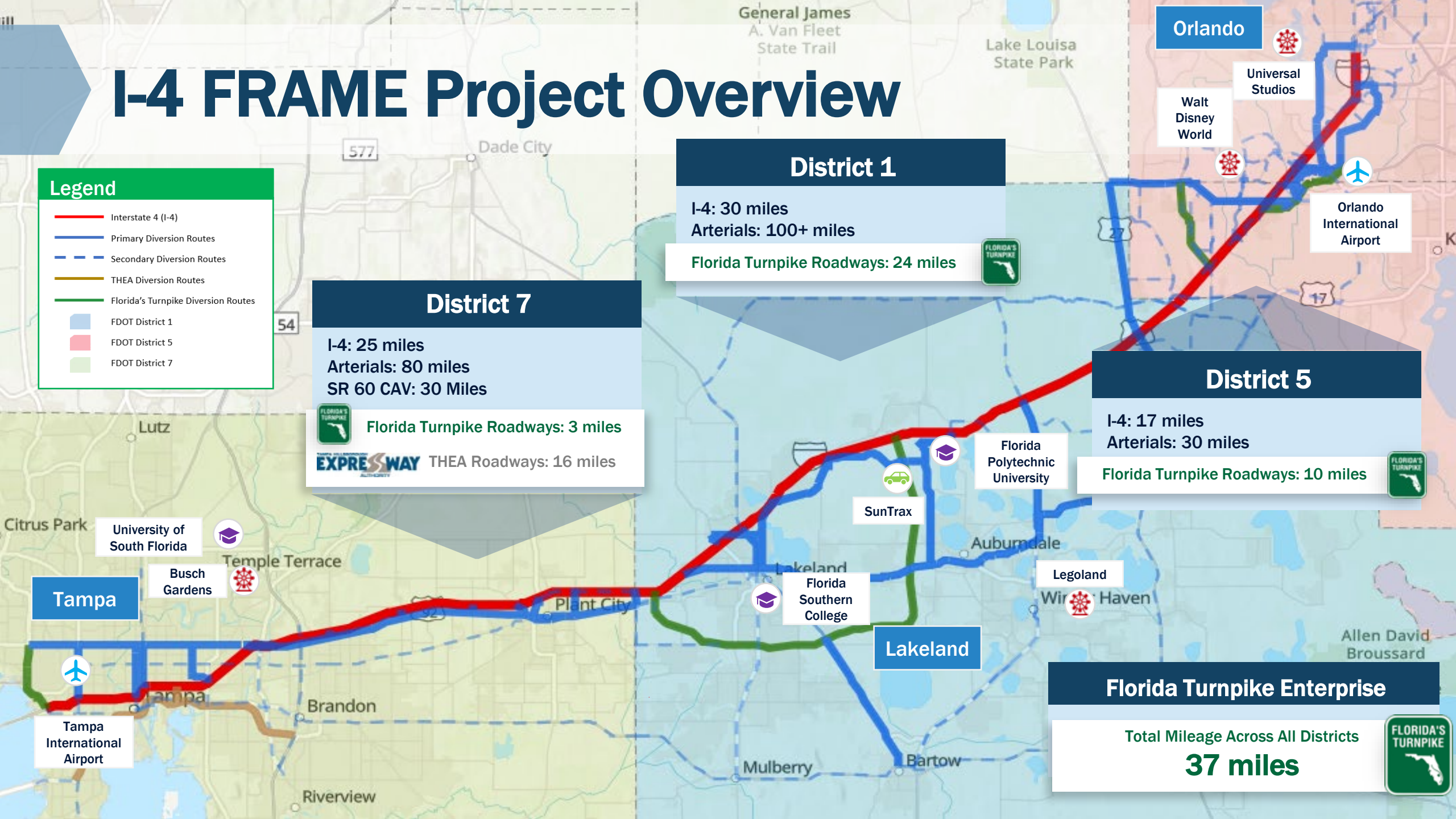
RSU

Roadside Units (RSU)

- Wireless communication between the roadway infrastructure and the vehicles that are equipped with OBUs
- Communicates on the 5.9 GHz DSRC band or C-V2X to transmit and receive CV messages

OBU

On-board Units (OBU)

- Device installed on the motor vehicle to allow communication (transmitting/receiving) with other OBUs or RSUs

IVP

Integrated V2I Prototype (IVP) Hub

- A small form-factor computer
- Handles the processing of CV applications
- Allows the RSU to perform "radio" functions only
- Only being installed at locations with Passive Pedestrian Detection (3 locations)

Data being Transmitted & Received

RSUs

- Receiving basic safety messages (BSMs) from OBUs
- Transmitting Traveler Information Messages (TIM) to OBUs
- Transmit Signal Phasing and Timing (SPaT) information to OBUs

OBUs

- Initially will transmit BSM with position, speed, heading, and location information
- In future, additional information such as brake status, acceleration status, windshield wiper status, etc. can be gathered as systems progress
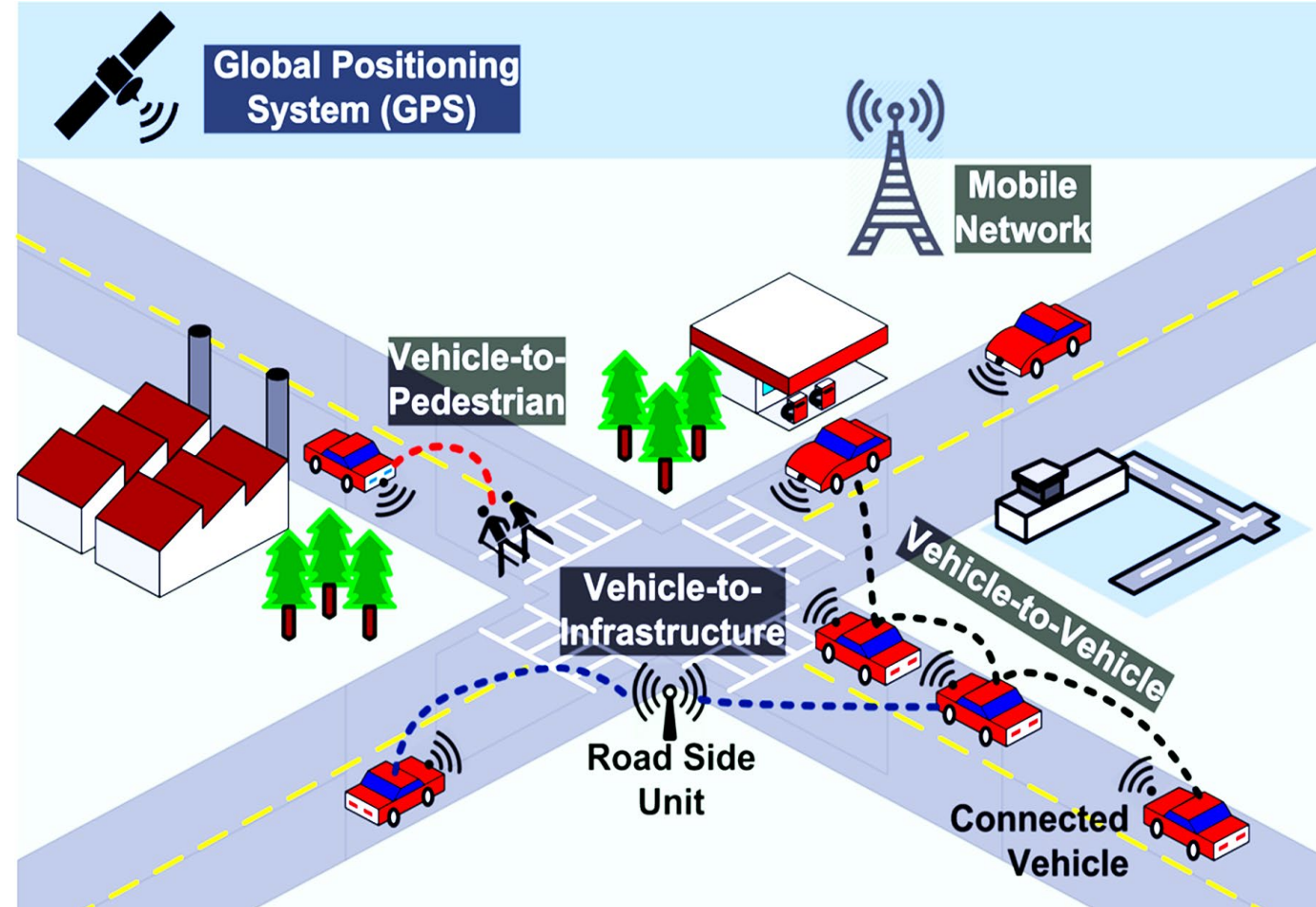
High-Level Architecture

1 Data will flow from field device to local agency TMC to FDOT District 7 RTMC.

2 CV Data will also be pushed to FDOT Central Office V2X Data Exchange Platform (V2X DEP).

- Data aggregation location and storage is currently still being determined based on the statewide V2X DEP Project development.

3 The local agencies can have a client of SunGuide® or some other CV application within their respective TMCs, to assist with viewing the CV data in order to make informed decisions on response plans.

Legend

- ((o)) Cellular Communication
- -- Fiber Optic Backbone
- Field Ethernet Switch (1 Gigabit)
- Signal Cabinet
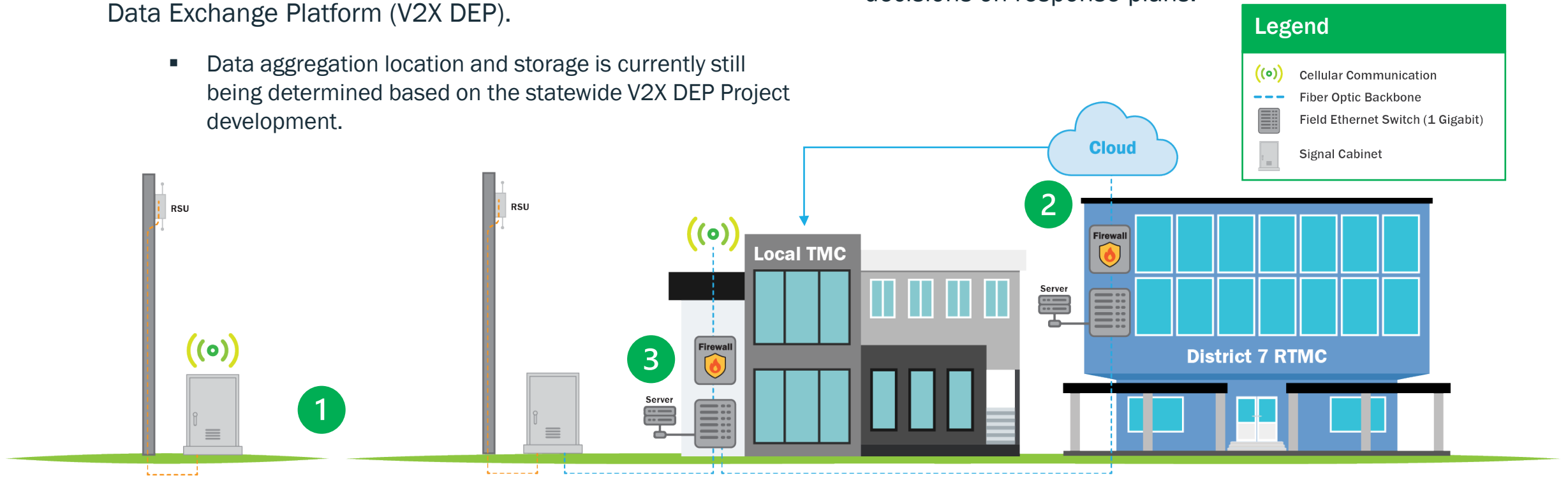
High-Level Architecture of Data Flows between the Local Agency TMC and FDOT.

TM08 – Traffic Incident Management System
- Broadcasts traffic incident management information from incident detection, maintenance and construction management, and emergency management centers via the RSUs.

- Existing FMS, TIM, RISC, 511, ICM, Service Patrol

TM12 – Dynamic Roadway Warning
- Broadcasts information on back-of-queues, roadway hazards, road weather conditions, road surface conditions, and obstacles or animals on the road.

- Existing DMS, Fog Warning

TM17 – Speed Warning and Enforcement
- Broadcasts information to warn drivers of reduced speed recommendations based on the roadway conditions ahead.

TM25 – Wrong Way Vehicle Detection and Warning
- Broadcasts TIM to oncoming drivers of a wrong way driver.

VS07 – Road Weather Motorist Alert and Warning
- The RTMC will receive data generated by the traffic detectors, CCTV cameras, road weather information systems (RWIS), and other weather

dissemination sources.

- Existing DMS, 511, RWIS, Fog Warning

VS08 – Queue Warning
- Broadcasts information to warn motorists of back-of-queue in order to minimize or prevent rear-end or other secondary collisions.

VS09 – Reduced Speed Zone Warning/Lane-Closure
- Broadcasts information on reduced speed zones that include (but are not be limited to) construction/work zones, school zones, and pedestrian crossing areas).

- Existing FMS, Work Zone VMS, Service Patrol

MC06 – Work Zone Management
- Broadcasts information to motorists in areas where maintenance, construction, and utility work are ongoing.

- Existing FMS, Work Zone VMS, Service Patrol

PS07 – Incident Scene Safety Monitoring
- Broadcasts information to alert drivers of incident zone operations.

Connected Vehicle Applications

TM17 – Speed Warning & Enforcement
- Curve Warning Application (Mainline or Ramps)

VS08 – Queue Warning
- Crash clusters at I-4 off-ramps – queue warning system(s) on I-4 to provide a ramp flush plan
- Special Events

SU01 – CV System Monitoring & Management
- SunGuide® monitors the status & uptime performance of RSUs
- SunGuide® operates the CV messaging system, consistent with other traveler messages (i.e. DMS)

TI07 – In-Vehicle Signage
- Potential to use PedSafe/THEA applications if desired for vehicles without OBU

Note: **XX99** - Designation from Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT) the National ITS Reference Architecture. The first two letters define the service package area, and the number refers to the specific service package in that category.

Connected Vehicle Applications

Wrong Way Driving

- **21 ramps** identified in the grant

  - 4 supplementary ramp systems were included in the I-4 FRAME deployment, the other 17 were installed in ongoing projects

- Hot spot analysis was performed

  - Proximity to Nightlife

  - Focus on partial cloverleaf interchanges
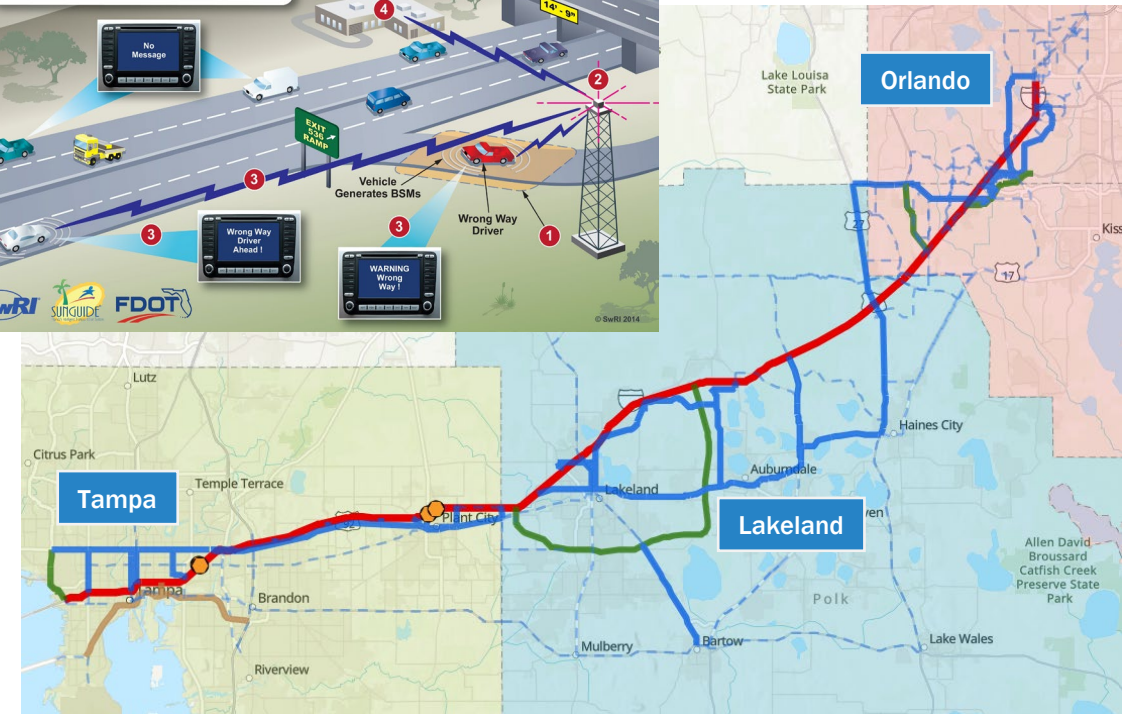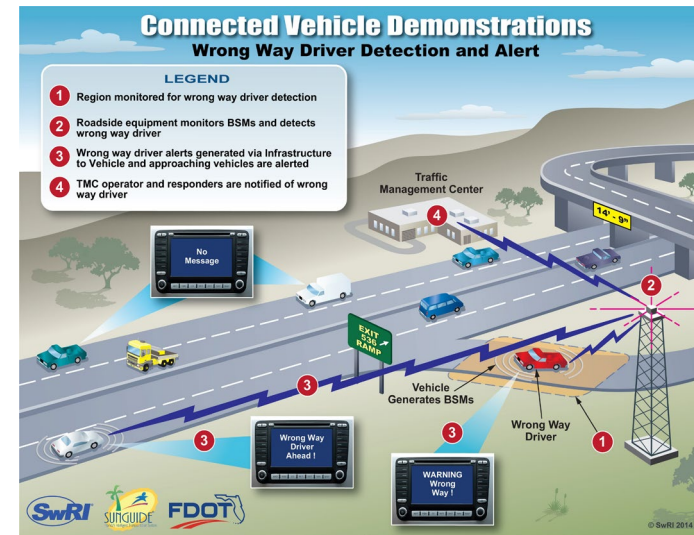
Connected Vehicle Applications

TM04 – Connected Vehicle Traffic Signal System
- Use CV data to determine whether signal timings for an intersection or group of intersections should be adjusted to improve traffic flow, including allowing platoon flow.

TM14 – Advanced Railroad Grade Crossing
- Broadcasts alerts to drivers approaching an at-grade railroad crossing if a train is approaching based on data collected from detection devices.
- Improving TT, TTR and Safety by accounting for railroad crossing delay is a key to the success of the I-4 FRAME project.
- Passing a railroad preemption call to the next downstream crossing using the ATMS Software

PT09 – Transit Signal Priority
- Use CV data to improve the operating performance of the transit vehicles by reducing the time spent stopped at a red light.
- This would be deployed along a couple strategic corridors after coordination with transit agency. OBU purchasing by Transit Authority would be required.
- Existing/Future TSP

PS03 – Emergency Vehicle Preemption
- Use CV data to improve the operating performance of the emergency vehicles by facilitating the movement of public safety vehicles through the intersection.

VS12 – Pedestrian and Cyclist Safety
- Integrates traffic, pedestrian, and cyclist information from roadside or intersection detectors and new forms of data from wirelessly connected, non-motorized traveler-carried mobile devices to request right-of-way or to inform non-motorized travelers when to cross and how to remain aligned with the crosswalk or pathway based on real-time Signal Phase and Timing (SPaT) and MAP information.

VS13 – Intersection Warning and Collision Avoidance
- If the vehicle determines that proceeding through the intersection is unsafe, a warning is provided to the driver and/or collision avoidance actions are taken, depending on the automation level of the vehicle.

CV006 – Freight Signal Priority
- Use CV data to reduce stops and delays for increased travel time reliability for freight traffic, and for enhancing safety at intersections.
- This would be deployed along select corridors, mainly SR 60.

Connected Vehicle Applications

CV006 – Freight Signal Priority

- **Key stakeholders for I-4 FRAME include Port of Tampa Bay & Logistics Companies**

- The I-4 connector provides a direct connection from I-4 to the entrance of the Port

- SR 60 is a freight corridor that runs parallel to I-4 and has 84 total signals to include CV technologies and configured for freight signal priority with this project

- Potential freight partners:
  - Florida Trucking Association
  - Publix
  - Rooms-To-Go
  - Walmart
  - Amazon
  - Rail to Road Facility – we are aware that truckers are driving any and all arterials, therefore, creating additional congestion and safety concerns to arterials including selected diversion routes

Connected Vehicle Applications

CV006 – Freight Signal Priority →

157,000
AADT Volume

15%
Truck Traffic

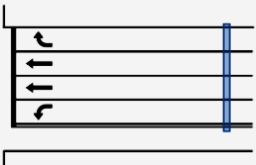OUR BACKYARD: MORE THAN 300 DISTRIBUTION CENTERS WITHIN 90 MINUTES OF PORT TAMPA BAY
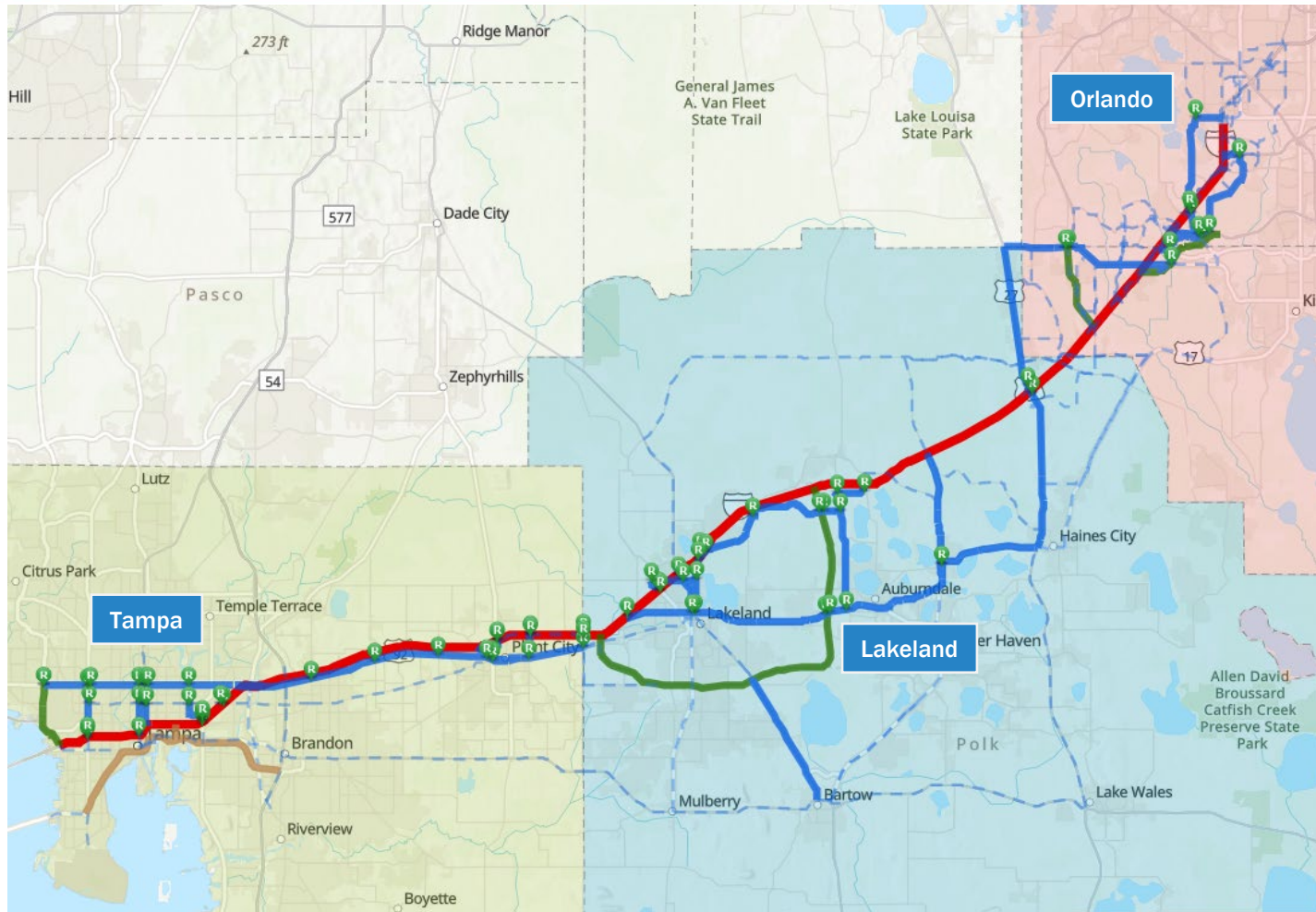
Additional Services
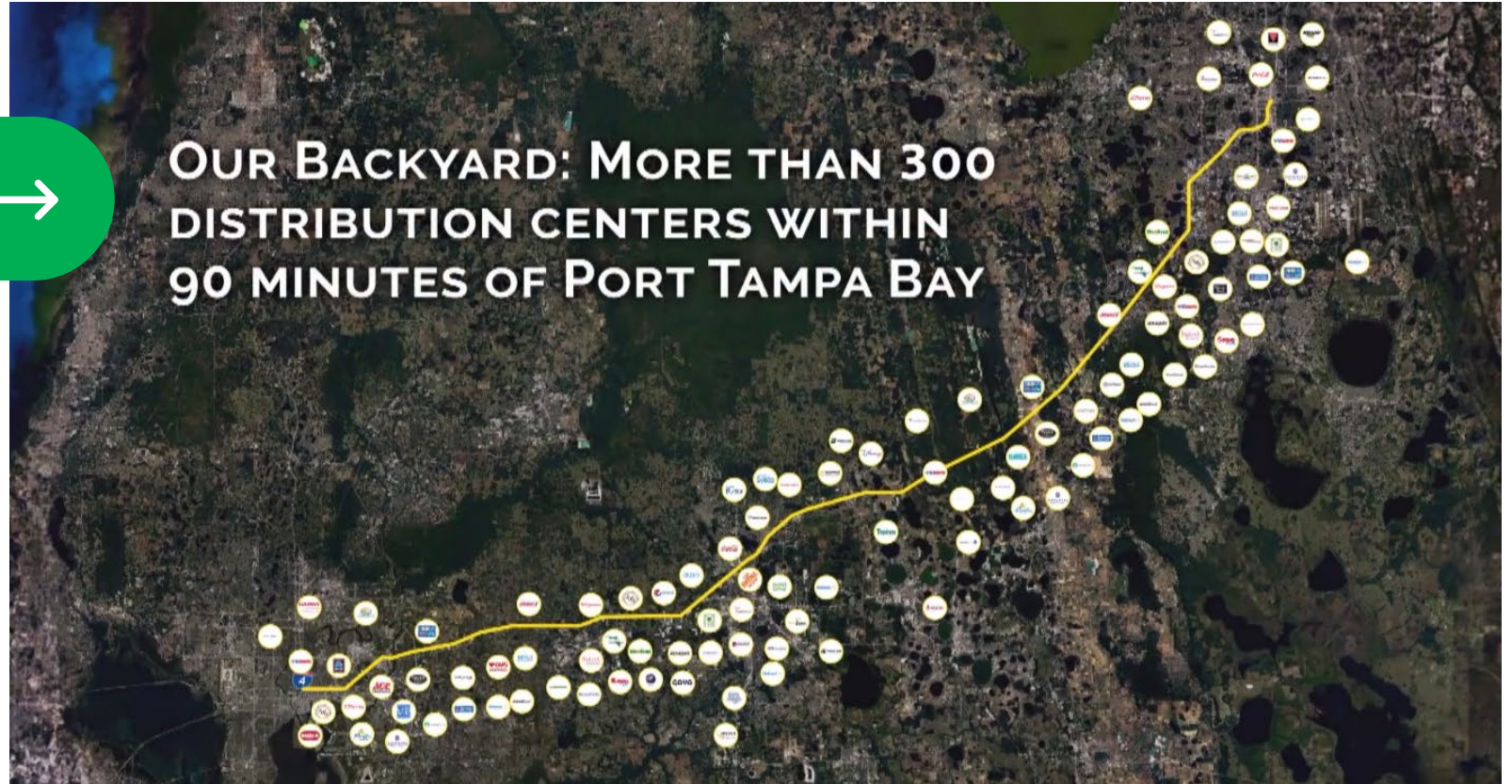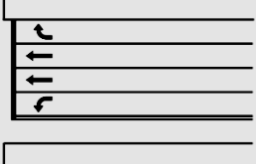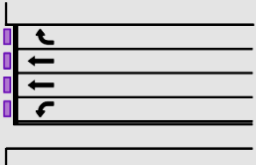
Automated Traffic Signal Performance Measures (ATSPM)

Detection

- Key component to maximize metrics
- Utilizing combination of video and radar for both presence and advanced detection
- Critical intersections upgraded
  - Crossing diversion routes
  - Major crossing arterials
- Full Upgrade with Detection
  - Stop bar and advance detection
  - 32 or 64 channel configurations
  - Consistent configurations

Detection		Metric
None		Phase Termination Chart Split Monitor Preemption Details Pedestrian Delay
Lane-by-lane or Lane Group Presence		Purdue Split Failure
Lane-by-lane Stop Bar Count		Turning Movement Counts
Advanced Count		Purdue Coordination Diagram Purdue Link Pivot Offset Optimization Approach Volume Approach Speed (requires detection with speed service)

Proposed Automated Traffic Signal Performance Measures Intersections

- ATSPM Intersections are at key decision points along diversion routes

- These intersections will include additional technologies such as upgraded detection systems, CCTVs, blank out signs, and Bluetooth devices for travel time

Legend

🚩 Intersection W/RSU and ATSPM

Systems Engineering

- **Key focus on transferability statewide**
- **Open-source concepts** and technical documentation prioritized to maximize compatibility

- **Update Systems Engineering Documentation throughout project life cycle:**
  - Project Systems Engineering Management Plan (PSEMP)
    - Includes Risk Matrix with Mitigation Strategies
  - Concept of Operations (ConOps)
  - RITSA
  - Requirements Traceability Verification Matrix (RTVM)
  - Systems Validation Plan
  - System Verification Plan
  - Performance Evaluation Plan (PEP)
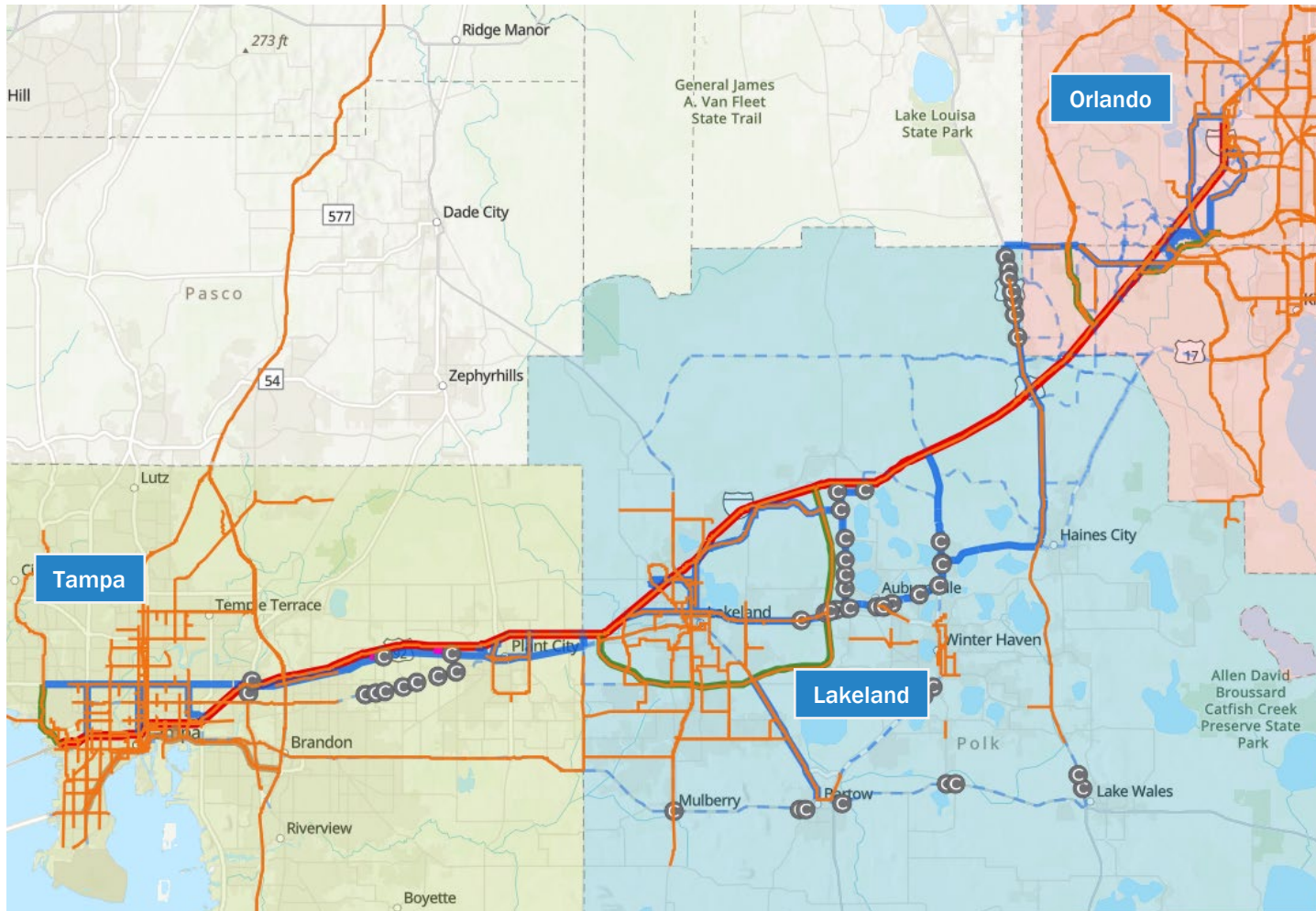
CV Data Architecture/Data Exchange (DEP)
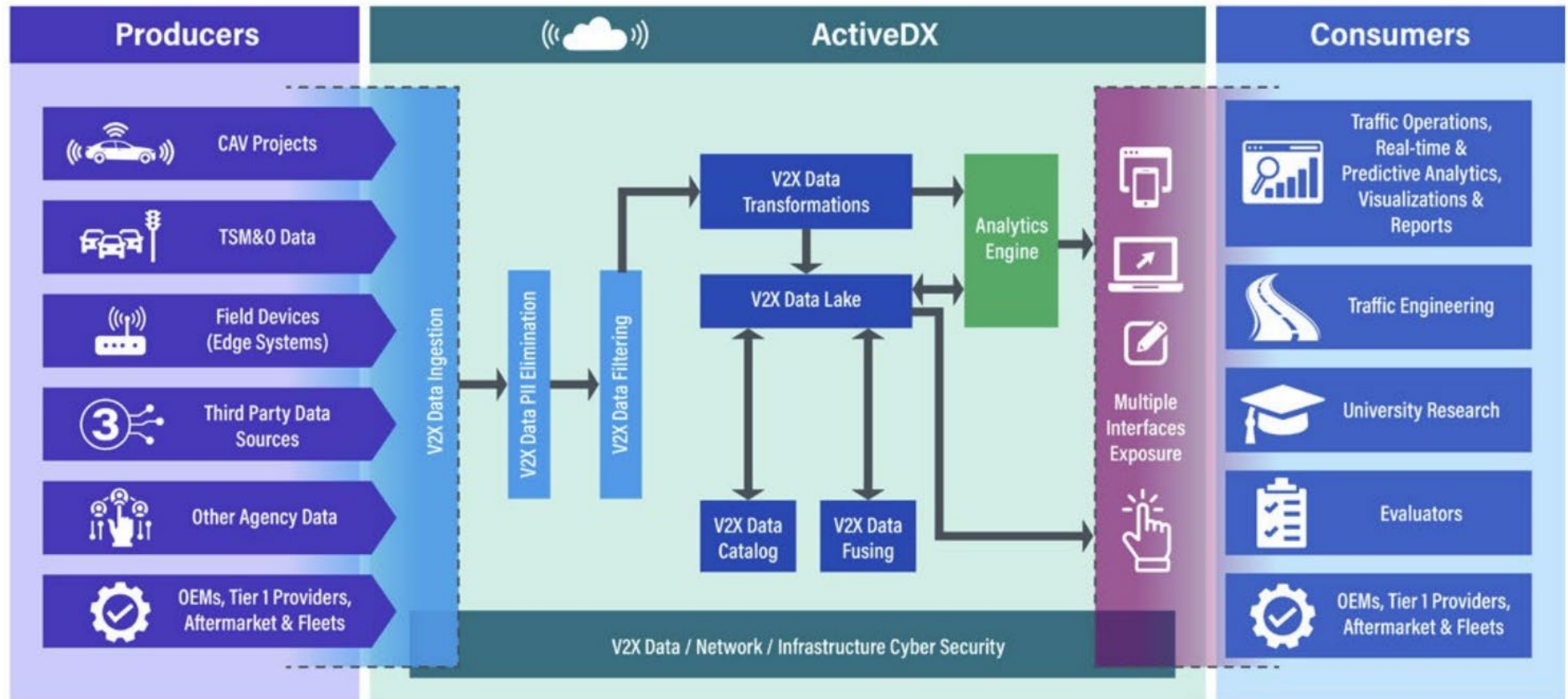
Communications
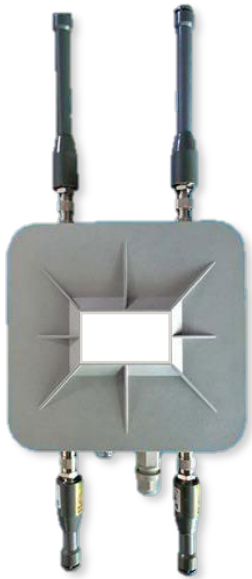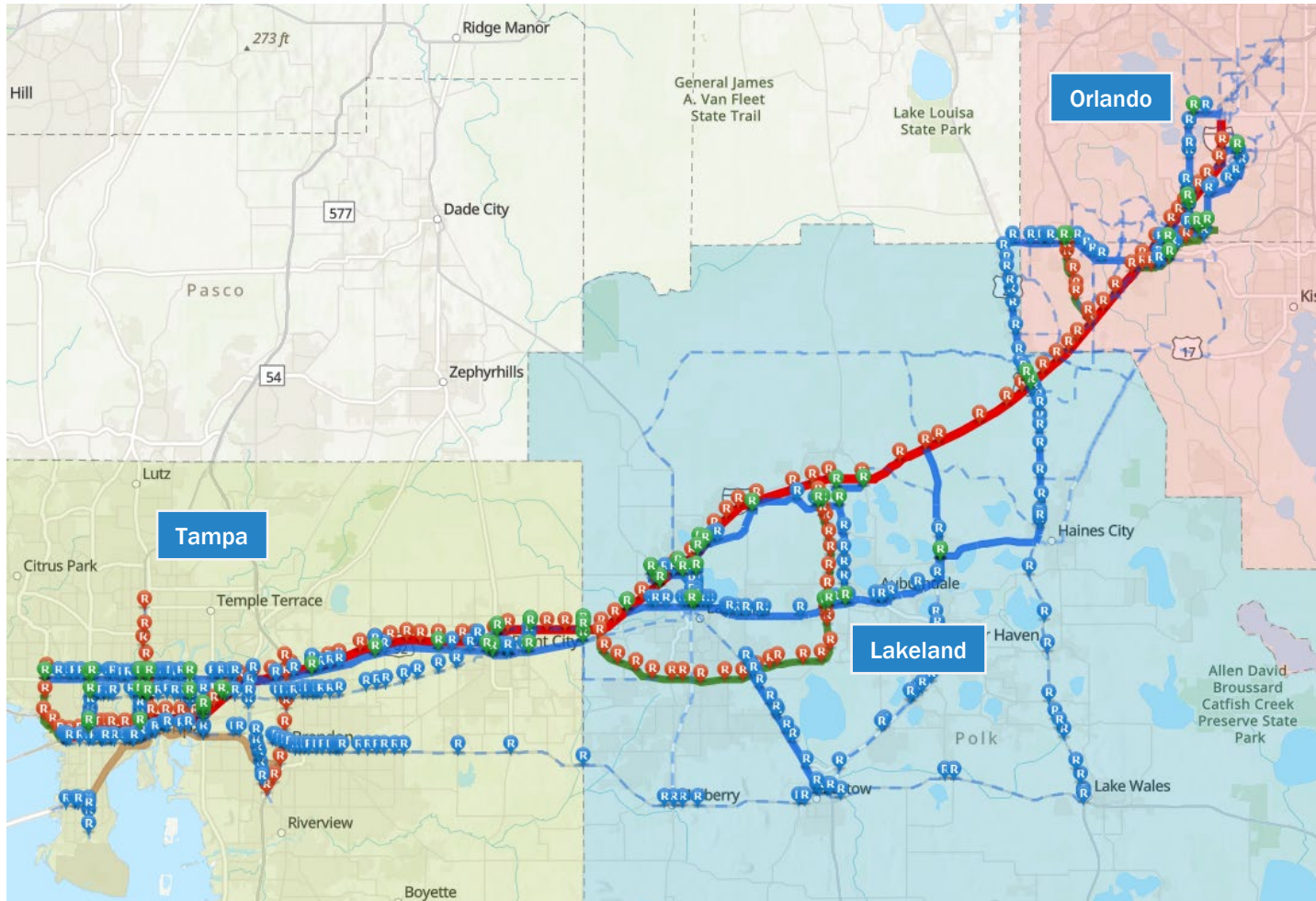

Legend

— Existing Fiber

Ⓒ Proposed Cellular Communication

— Proposed Fiber Drop

Proposed RSU Locations

RSU

- **Over 540 RSUs** will be installed

- Every signalized intersection on primary and secondary diversion routes

- Every mile on the Freeways – leveraging mainly CCTV Pole locations

Legend

- 🔵R Intersection W/RSU
- 🟢R Intersection W/RSU and ATSPM
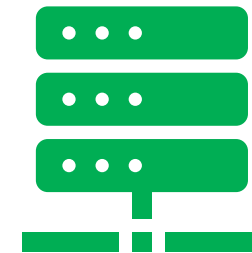- 🔴R Limited Access Facility RSUs

Automated Signal Performance Measures Data

ATSPM Data being gathered:

- Signal Phasing and Timing (SPaT)
- Traffic Volumes
- Queue Lengths
- Travel Times
- Delay (approach, pedestrian, preemption)
- Split Failures
- Yellow/Red Actuations

0.1 Sec

Data Frequency ~every 1/10th Second

Data Volume ~10MB per signal, per day

Additional Transportation Systems & Services

Testing / Integration

- **Ensures interoperability as a system**

- **Utilize existing testing facilities**
    - System Manager Testing Lab - MEI
    - Central Florida Testing Lab – Seminole County

- **Field Acceptance Test –** *to be done by Contractor*

- **Subsystem Acceptance Test –** *to be done by System Manager*

- **System Acceptance Test –** *to be done by System Manager*

- **Utilize a 120-day operational test period**
    - Starts with completion of the Field Acceptance Test
    - Completed prior to Final Acceptance of the Project

Project Evaluation Plan (PEP)

- **Describes project goals, evaluation methodology and design, performance measures, data collection procedures and risks.**

Evaluation Goals:

- Improve Safety
- Improve Mobility
- Reduce Costs and Increase Economic Benefits
- Share Institutional Benefits

ℹ️ Return on Investment will be developed using these performance measures.

Performance Measures

Incident Clearance Duration	TT Reliability
Open Roads Duration	TT Index
Roadway Clearance Duration	Planning Time Index
Incidents with RR Response	Average TT
Incident Duration	95th Percentile Average TT
Percentage of Event Types	Incidents by Roadway
Device Uptimes	Lane Blocking events by number
Alarms Managed	Event Durations
Dispatches of Signal Technicians	Signal Timing Changes
Events Managed Total	Origin/Destination
Events Managed by Type	Downloaded Real Time Controller Status
Through-put volumes	Incidents during Peak Times
Secondary Crashes	Incidents outside of Peak Times

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I-4 FRAME Project Schedule
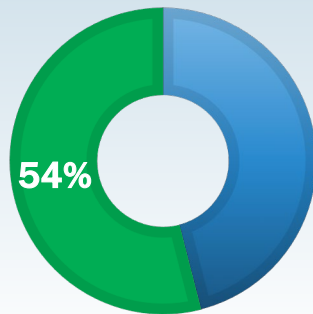
Contract 1 - T7483
445362-2, 447012-1 (District 7)

- Construction Letting Date: 02.23.2022

- Construction Begin Date: 11.02.2022

- Est. Construction Completion:
  Summer 2024

Construction Budget - $9 Million
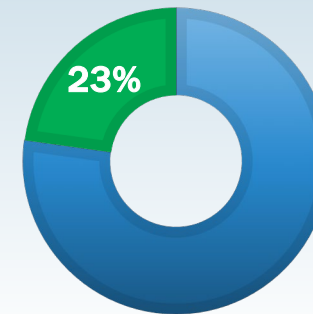
Percent Complete

54%

Contract 2 - E7P15
445362-3, -4, -5 (District 1, 5, Turnpike)

- Construction Letting Date: 07.13.2022

- Construction Begin Date: 03.15.2023

- Est. Construction Completion:
  Summer 2025
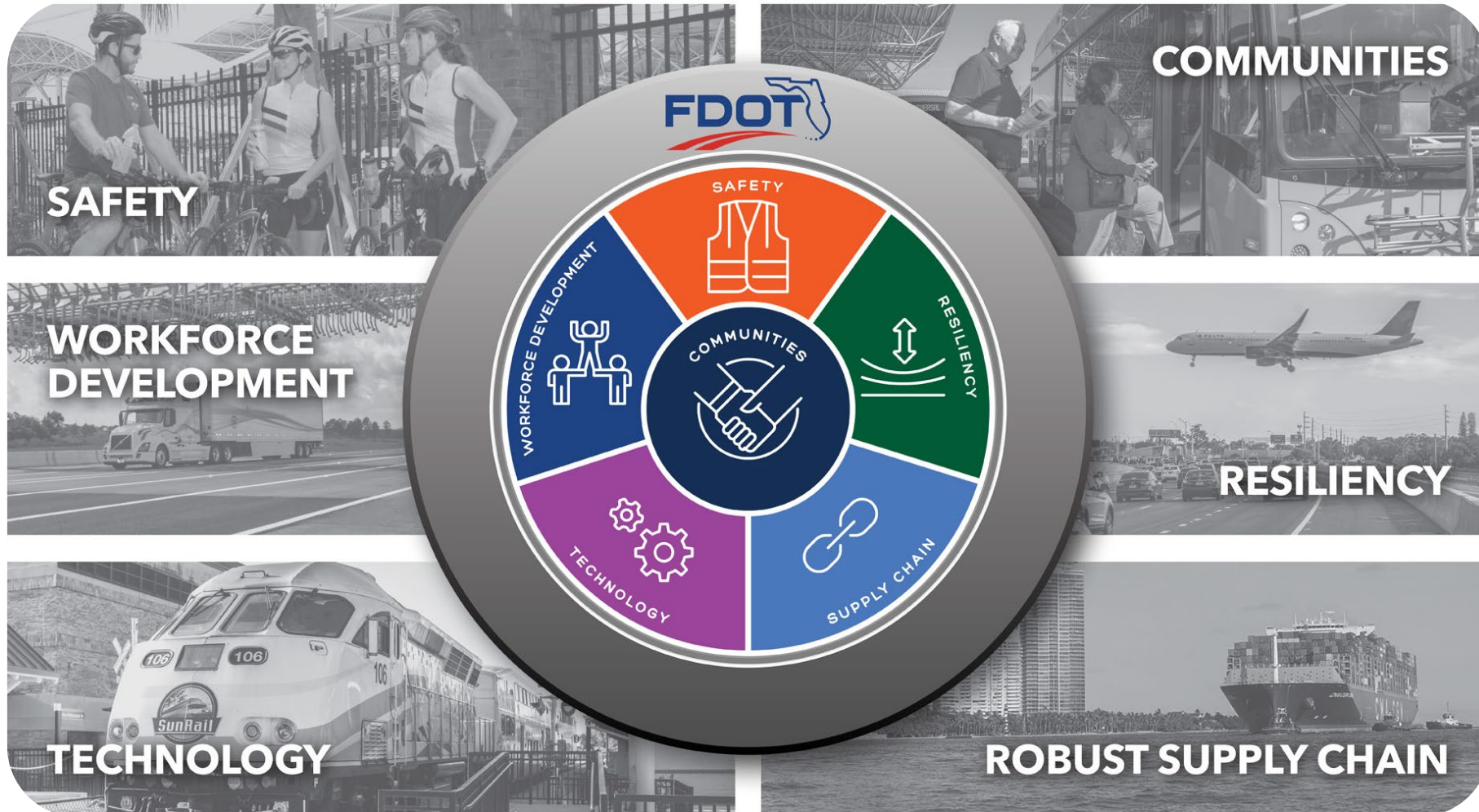
Construction Budget - $10.1 Million

Percent Complete

23%

Florida Department of Transportation Compass

Questions?

Contact Information:
Megan Arasteh, PE
TSM&O Program Manager | FDOT District 7 – Traffic Operations
Megan.Arasteh@dot.state.fl.us
Cell: 813.415.4623