Hollywood, FL

June 13-14, 2024

2024 TRANSPORTATION SYMPOSIUM

Emerging Technology Program

AI and UAS Policies

Raj Ponnaluri, PhD, P.E, PTOE, PMP
Emerging Technologies
Transportation Technology Office
Florida Department of Transportation

FDOT

Promote

Inspire

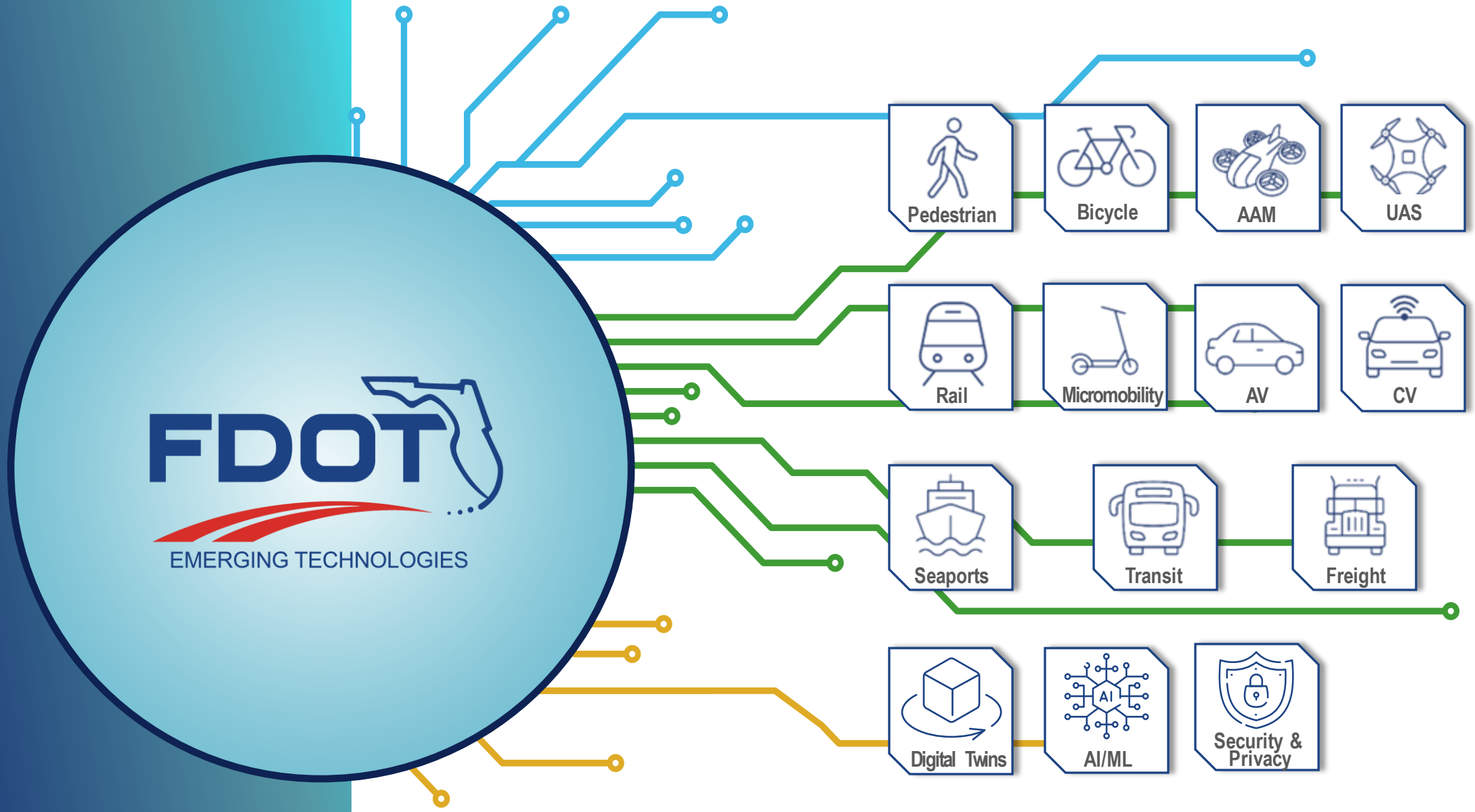
Attract

Test

Implement

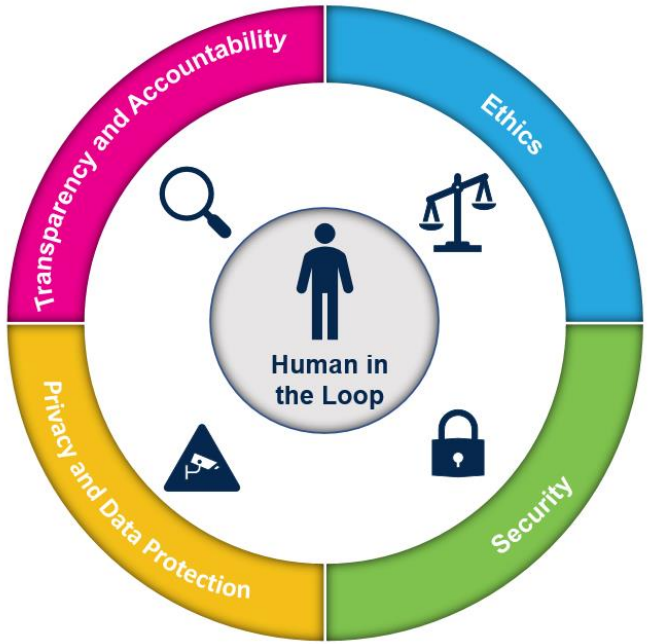
Framework & Roadmap

EMERGING TECHNOLOGIES


FDOT
EMERGING TECHNOLOGIES
Pedestrian
Bicycle
AAM
UAS
Rail
Micromobility
AV
CV
Seaports
Transit
Freight
Digital Twins
AI
AI/ML
Security &
Privacy

Artificial Intelligence (AI) Policy

AI Policy Themes



Florida Department of Transportation

RON DESANTIS
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JARED W. PERDUE, P.E.
SECRETARY

POLICY

Effective: May 21, 2024
Office: Transportation Technology
Topic No. 010-325-065-a

ARTIFICIAL INTELLIGENCE (AI) POLICY

To support the mission and vision of the Florida Department of Transportation (Department), it is the policy of the Department to responsibly, transparently, and ethically use artificial intelligence (AI) with human accountability.

This policy applies to all Department-related activities, employees, vendors, consultants, and contractors that use, acquire, collect, or develop AI solutions. This policy applies to Machine Learning, Generative Language Models, and covers all embedded and standalone AI technologies/tools.

The use of AI for Department-related purposes must occur within the following boundaries:

- AI must supplement or complement the work that is primarily accomplished by a human.
- AI usage must engage humans throughout the process, with human involvement in reviews and decisions. Humans are fully responsible for the work and products involving AI.
- AI systems and decision-making processes must be ethical and comply with all applicable laws, rules, regulations, and policies.
- AI systems and decision-making processes must be transparent and disclose if the products are generated partially or fully by an AI tool.
- AI systems must protect people's privacy and comply with all applicable data protection regulations.
- AI systems must protect information that is exempt from public disclosure pursuant to Florida's public records laws, and must comply with all applicable data protection laws, rules, regulations, and policies.
- AI data and the output from all AI-related models must be validated by humans to ensure AI data and its output are free of personally identifiable information and to prevent copyright infringement and other legal challenges.
- To ensure the quality and the security of the Department's data and IT systems, employees, vendors, consultants, and contractors are prohibited from attempting to gain access to AI applications not approved by the Department when using Department's systems, networks, computers, phones, or other communication devices, when conducting business under contract for the Department, or when using the Department's data.

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This AI Policy will be integrated into the Department's internal manuals, guidelines and related documents governing the Department's projects, including planning, designing, construction and operation of transportation facilities, as appropriate.

DocuSigned by:

Jared W. Perdue, P.E., Secretary

FDOT's AI Policy Highlights

Human in the loop

Must supplement or complement work accomplished by human

Must engage human throughout the process

Human are fully responsible for the work and product involving AI

Transparency and Accountability

Must be transparent and disclose if the products are generated partially or fully by an AI tool

Ethics

Must be ethical and comply with all applicable laws, rules, regulations, and policies

Privacy and Data Protection

Must protect people's privacy and comply with all applicable data protection regulations

Human validation of the AI data and output

Must protect information that is exempt from public disclosure per FL public records laws

Security

Employees, vendors, consultants, and contractors are prohibited from attempting to gain access to AI applications not approved by the Department

Human in the Loop

AI must supplement or complement the work that is primarily accomplished by a human.

AI usage must engage humans throughout the process, with human involvement in reviews and decisions.

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Security

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AI in FDOT – Non-Research Projects

- Near-miss identification safety system
- Wrong-way detection
- Intersection monitoring for safety hazards
- PedSafe phase II: Aim to improve ped safety
- Near-miss crash identification
- Bike-ped safety project
- Advanced video analytics (AI-driven) for incident detection
- Testing detection accuracy of AI cameras compared to road sensors
- Evaluating AI solutions for post-disaster assessment

AI in FDOT – Research Projects

AI in Safety and TSM&O Programs

Integrated management and decision support of arterial street operations

Research on AI for data integration with state highways – RADISH

Pedestrian upfront LIDAR-based safety on edge

Traffic unification system highlighting arterial roads – TUSHER

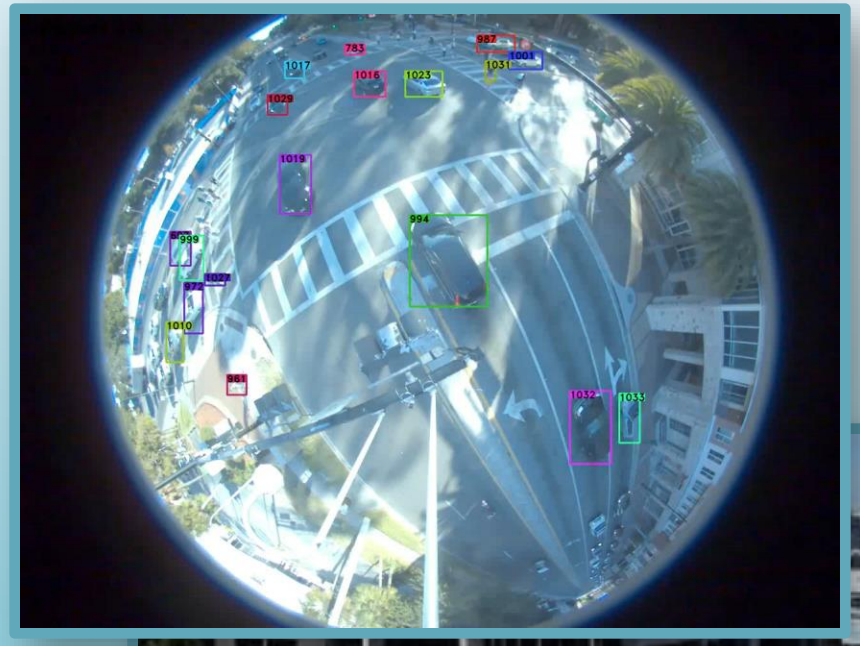
High-definition engineering intersection data via integrative modeling

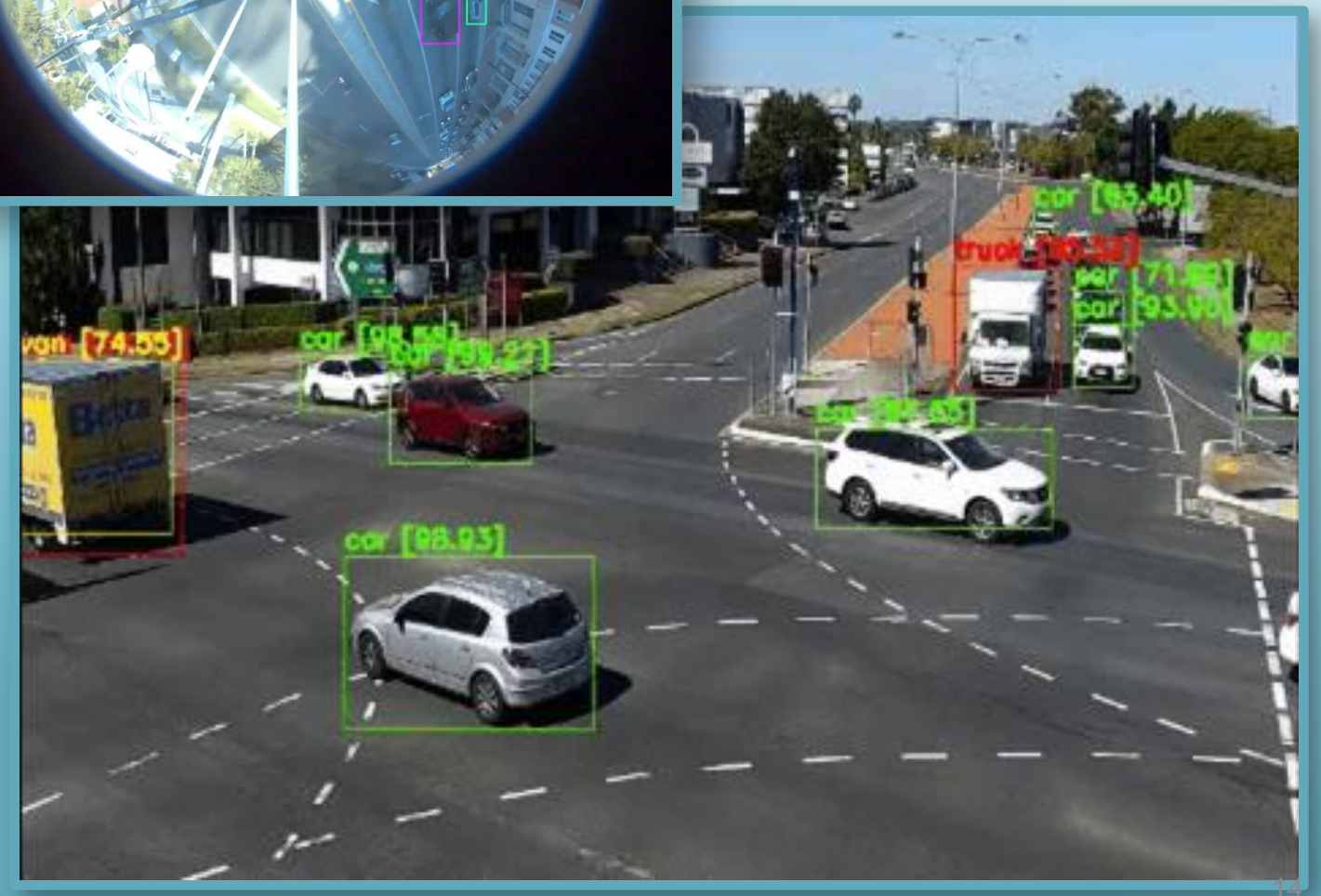
Phase III - ATTAIN: Intersection signal prediction and corridor traffic management based on big-data analytics and cutting-edge technologies

Pragmatic multi-objective planning approach for medium- and long-range projects

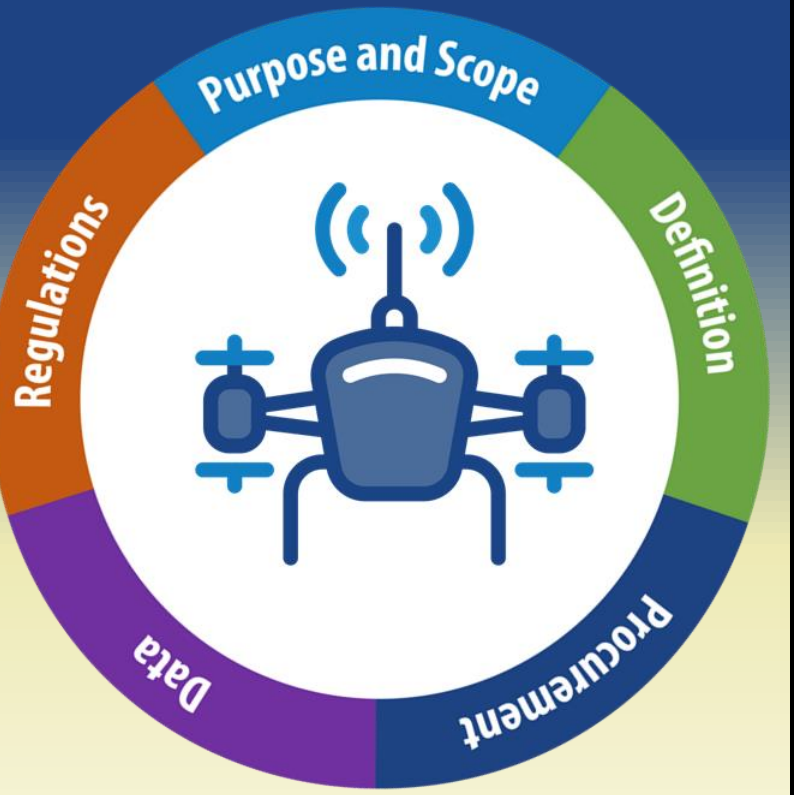
ML algorithms for improved network traffic signal policy optimization

Near Miss Identification Safety System





Unmanned Aircraft Systems (UAS) Policy



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POLICY

Effective: April 9, 2024
Office: Transportation Technology
Topic No.: 000-020-001-a

Unmanned Aircraft Systems (UAS) Operations Policy

The Florida Department of Transportation (FDOT) may use unmanned aircraft systems (UAS), also referred to as drones, productively and safely while meeting institutional, legal, public safety, and ethical responsibilities. This policy applies to all FDOT Districts and offices, and private contractors, consultants, and vendors authorized by the FDOT to perform UAS operations.

For this policy, UAS are defined as aircraft operated without the possibility of direct human intervention from within or on the aircraft, along with associated elements (including communication links and the components that control the aircraft) that are required for safe and efficient aircraft operation. For all FDOT business, UAS must always be piloted by a Federal Aviation Administration's (FAA) Certified Part 107 Pilot with an active and current Remote Pilot Certificate.

Pursuant to Section 934.50(7), Florida Statutes, governmental agencies may only use a UAS from a manufacturer that meets the minimum security standard requirements specified in Rule 60GG-2.0075, Florida Administrative Code. Procurement of UAS by or for FDOT must meet all applicable procurement requirements of FDOT and Florida Department of Management Services. An Information Resource Request (IRR) must be submitted for UAS purchases and other UAS hardware and software device purchases to ensure compliance with Florida Administrative Code and other applicable technology and security requirements. UAS procurement requests must be routed through the Civil Integrated Management Office and approved by the Assistant Secretary of Engineering & Operations of FDOT, or delegate.

UAS data must undergo human review prior to external disclosure to ensure it does not contain information that is exempt from public disclosure pursuant to Florida's public records laws, including personally identifiable information. UAS-generated data cannot be stored outside the United States of America.

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Utilization of UAS to conduct FDOT business is considered a commercial activity by the FAA. UAS Operations must meet all laws and rules of the FAA, State of Florida, and FDOT.

Docu Signed by:

Jared W. Perdue, P.E.
Secretary

www.fdot.gov

FDOT's UAS Policy Highlights

Scope

Applies to FDOT, Contractors, Vendors, and Consultants

Definition

Aircraft operated without the possibility of direct human intervention from within or on the aircraft

Procurement

Rule 60GG-2.0075, FAC Adherence

FDOT and FDMS Procurement

Asst. Secretary's (E&O) Approval

Data

No PII

Human validation of the data

Shall not contain information that is exempt from public disclosure, per FL public records laws

UAS-generated data cannot be stored outside USA

Regulations

Utilization of UAS - Commercial activity by the FAA

Comply with all laws and rules:

FAA, State of Florida, and FDOT

Purpose and Scope

Applies to FDOT, Contractors, Vendors, and Consultants

Definition

Aircraft operated without the possibility of direct human intervention from within or on the aircraft

Data

No Personally Identifiable Information

Human validation of data

Ensure it does not contain information that is exempt from public disclosure, per FL public records laws

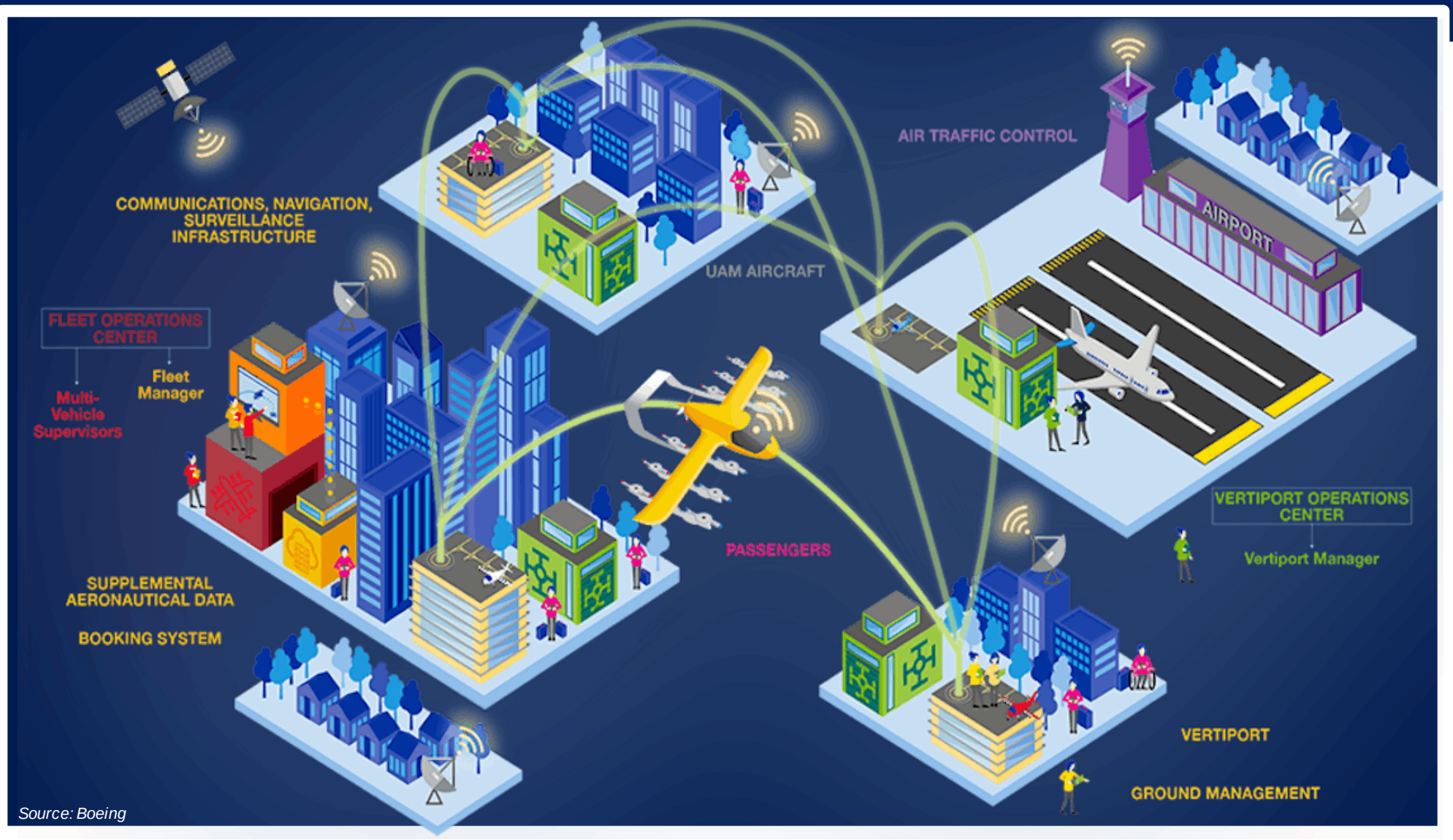
UAS-generated data cannot be stored outside USA

Regulations

Utilization of UAS - Commercial activity by the FAA

Comply with all laws and rules:
FAA, State of Florida, and FDOT

Advanced Air Mobility (AAM)



Source: Boeing

AAM Working Group

Focus Areas

- Public education and community engagement
- Infrastructure and zoning
- System planning and access
- Airspace and safety

Why Focus on Rail Safety?

Railroad Crossing Countermeasures Dashboard

FDOT

Train-Involved Crashes | Railroad Dynamic Envelope Pavement Markings | Advanced Countermeasures

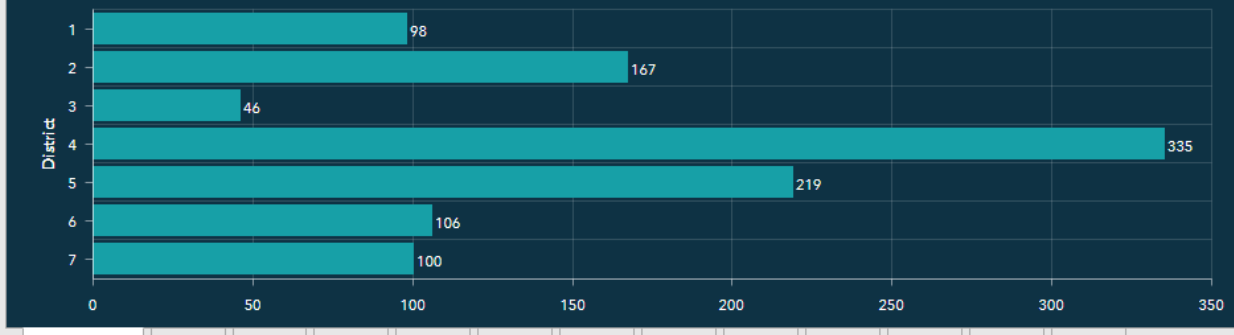
Train-Involved Crashes (2011-2022) Statewide (State and Local Roads)

1,071

Data as of December 2022. Note: Crashes include train-involved crashes at railroad crossings on both state and non-state roads.

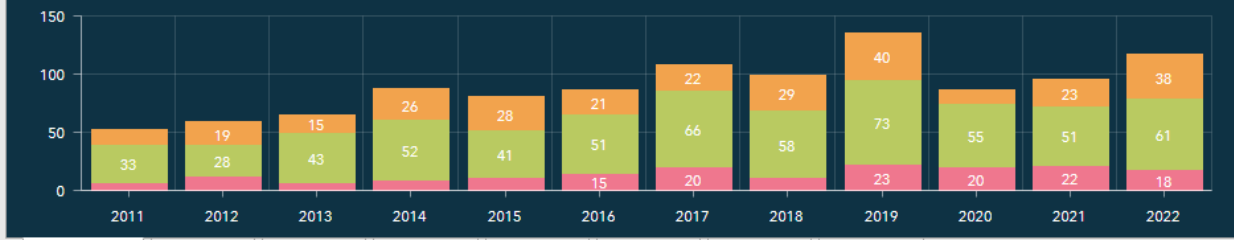
Fatal Crashes (2011-2022)	Injury Crashes (2011-2022	Other Crashes (2011-2022
175	284	612

Train-Involved Crash Summary by District (2011-2022)

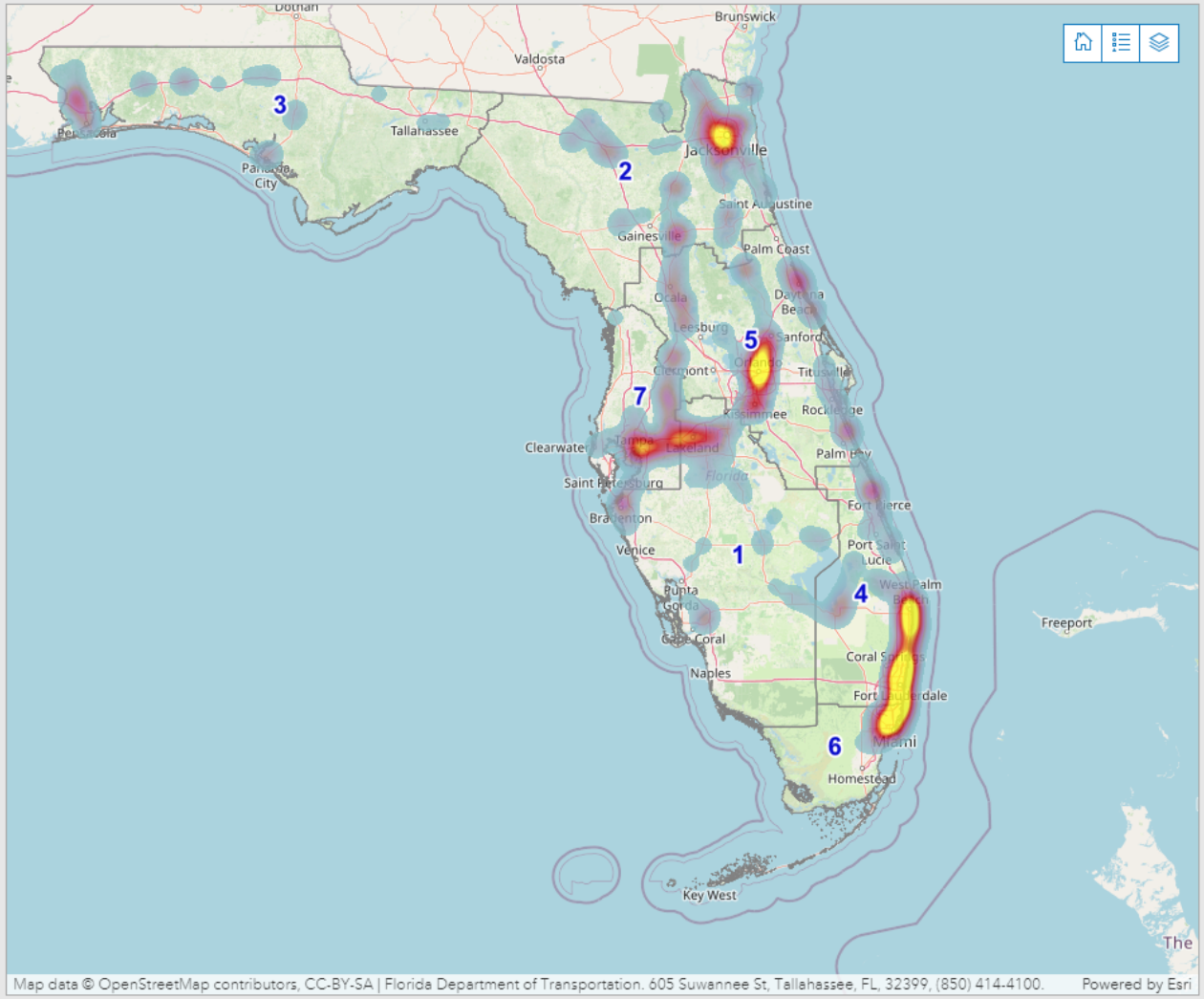


2011-2022 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022

Train-Involved Crash Severity by Year (2011-2022) - Statewide



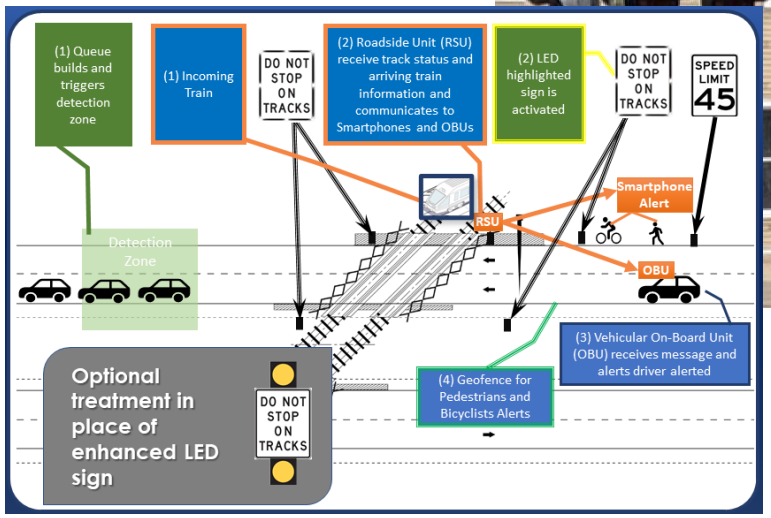
2011-2022 | District 1 | District 2 | District 3 | District 4 | District 5 | District 6 | District 7

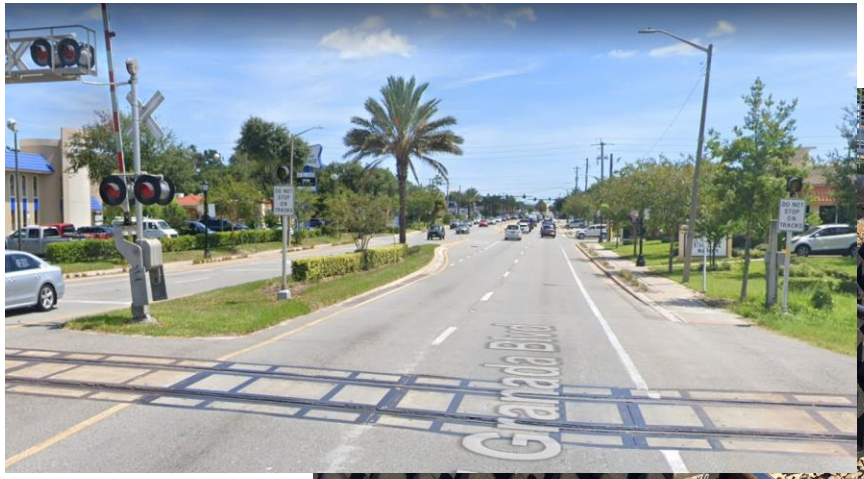


Source: Federal Railroad Administration Safety Data and Reporting

Current FDOT Countermeasures

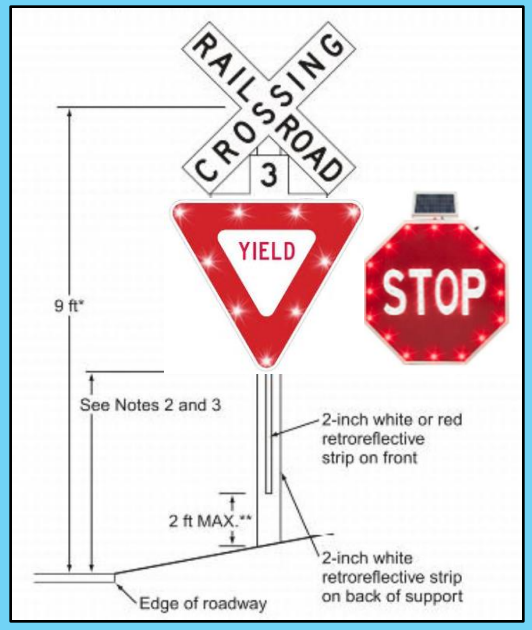
- FDOT has an active rail grade-crossing safety program.
- FDOT has implemented Railroad Dynamic Envelop at 520 crossings statewide to reduce vehicle stoppage in danger within the influence area of grade crossings
- FDOT has also implemented several advanced technology projects for enhanced safety at the grade crossings.
- Advanced technologies include always flashing or detection-triggered “DO NOT STAP ON TRACKS” signs.

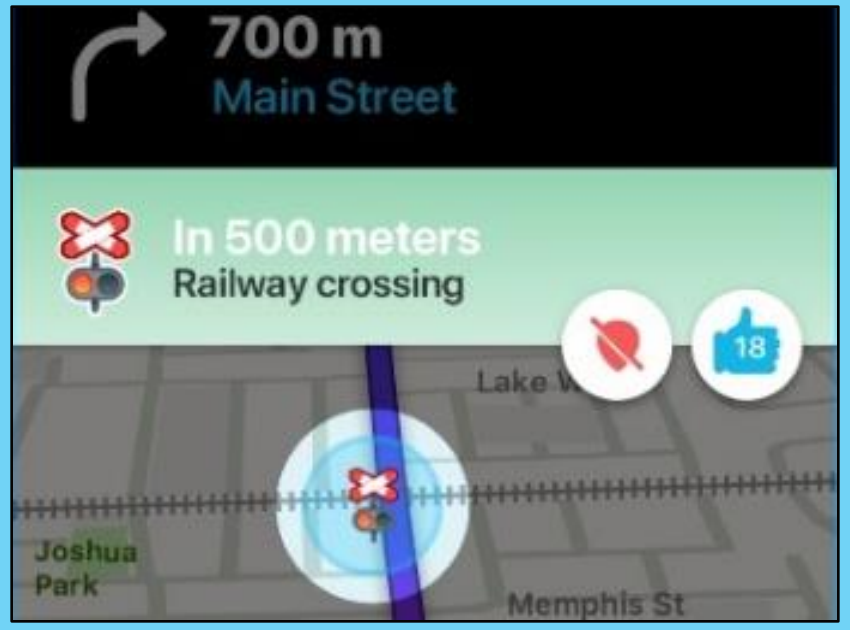




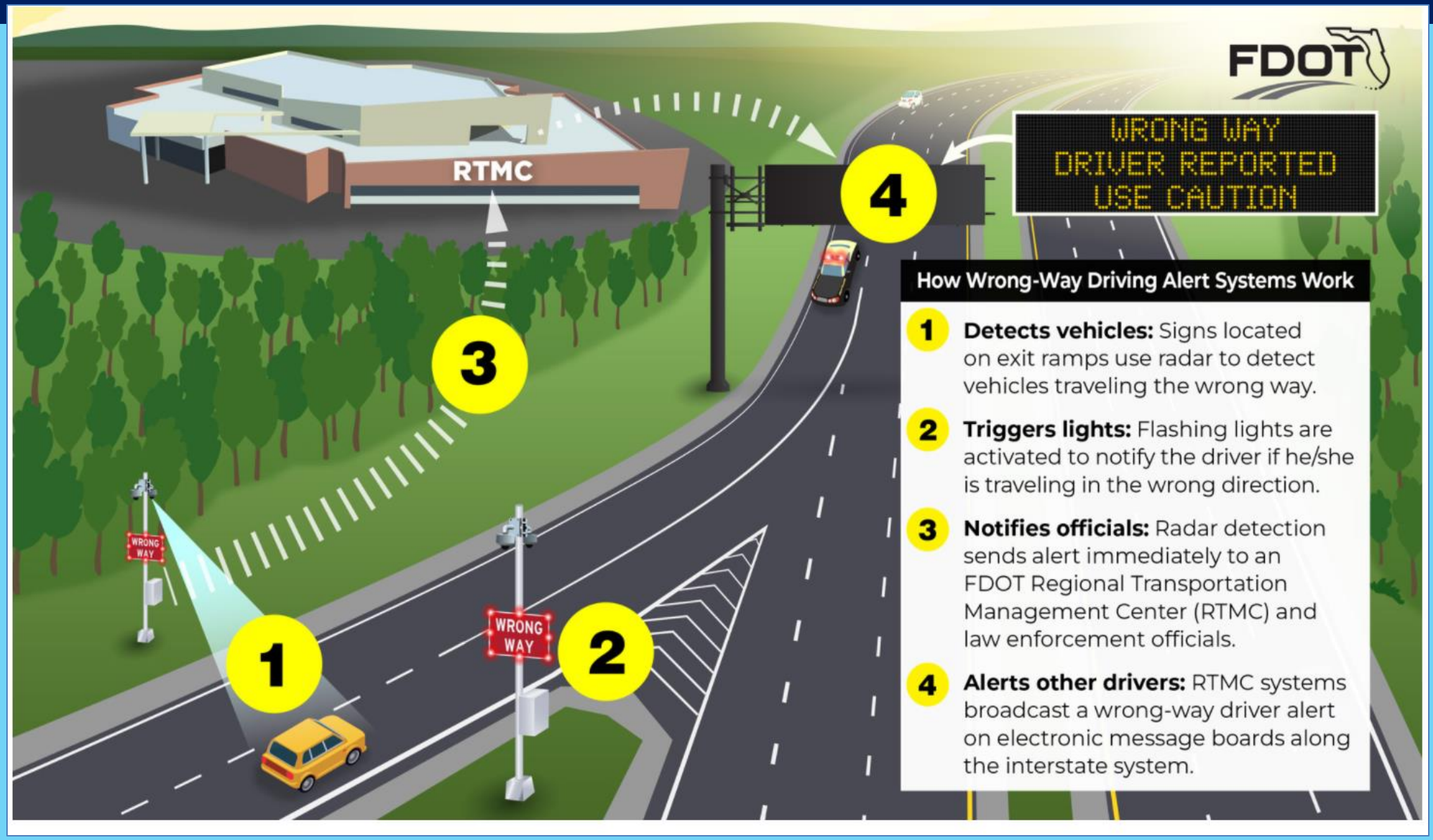
Rail Safety Technology

Enhanced Sign Assembly + **Vehicle Detection Sensors** = **Safer Passive Crossings!**



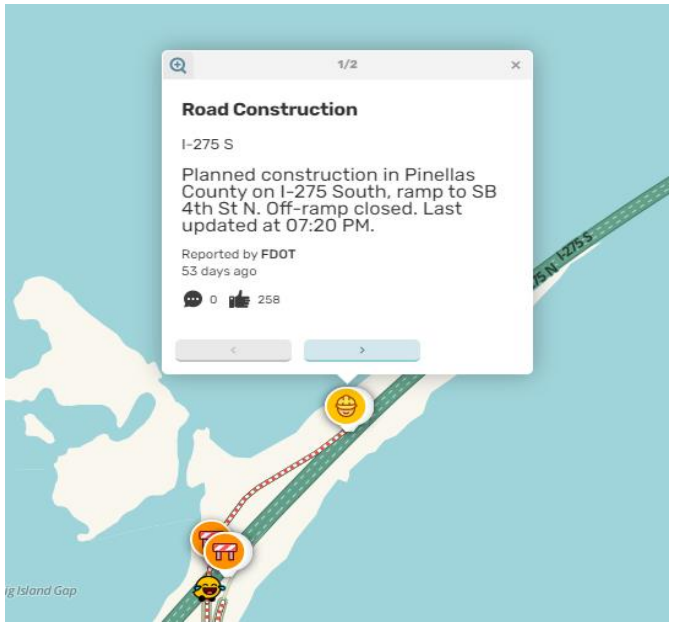


Wrong-Way Vehicle Technology

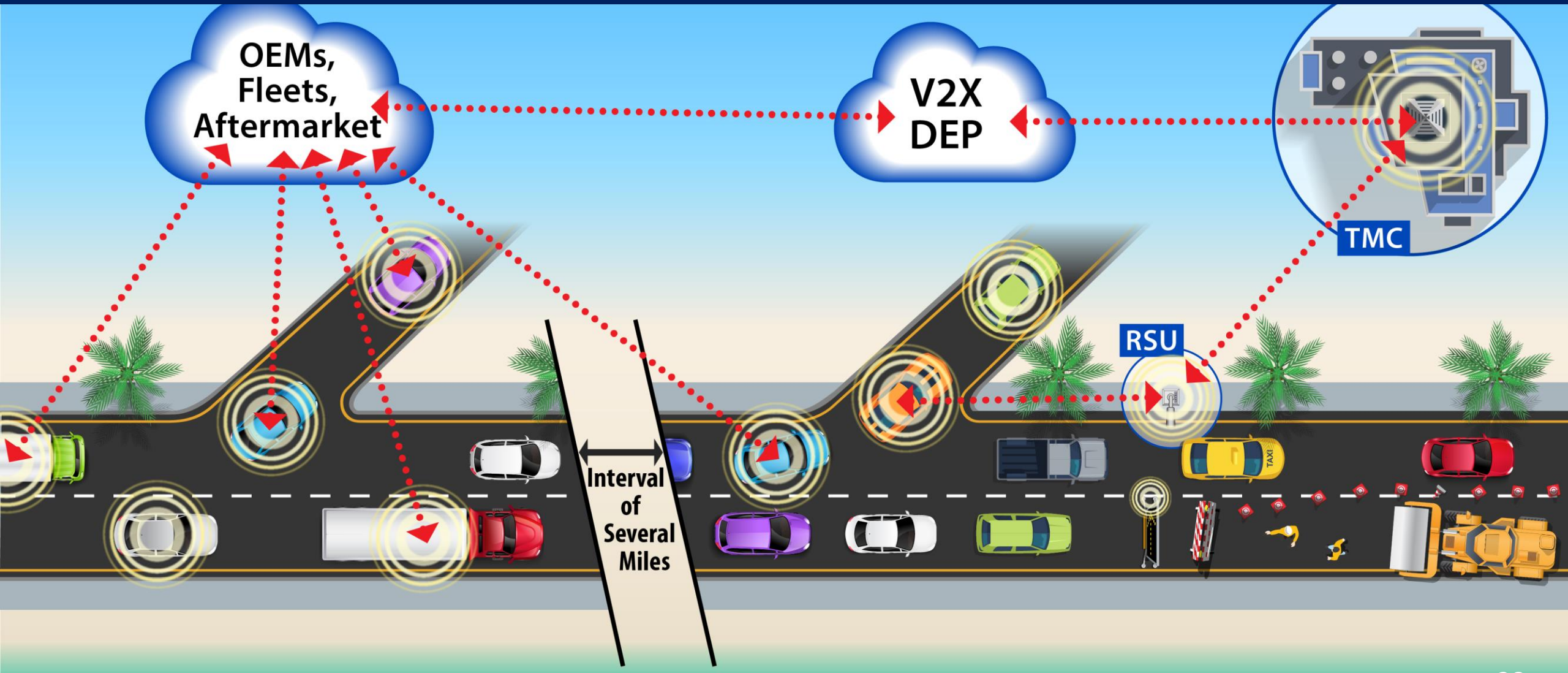


Lane Closure Notification System – LCNS

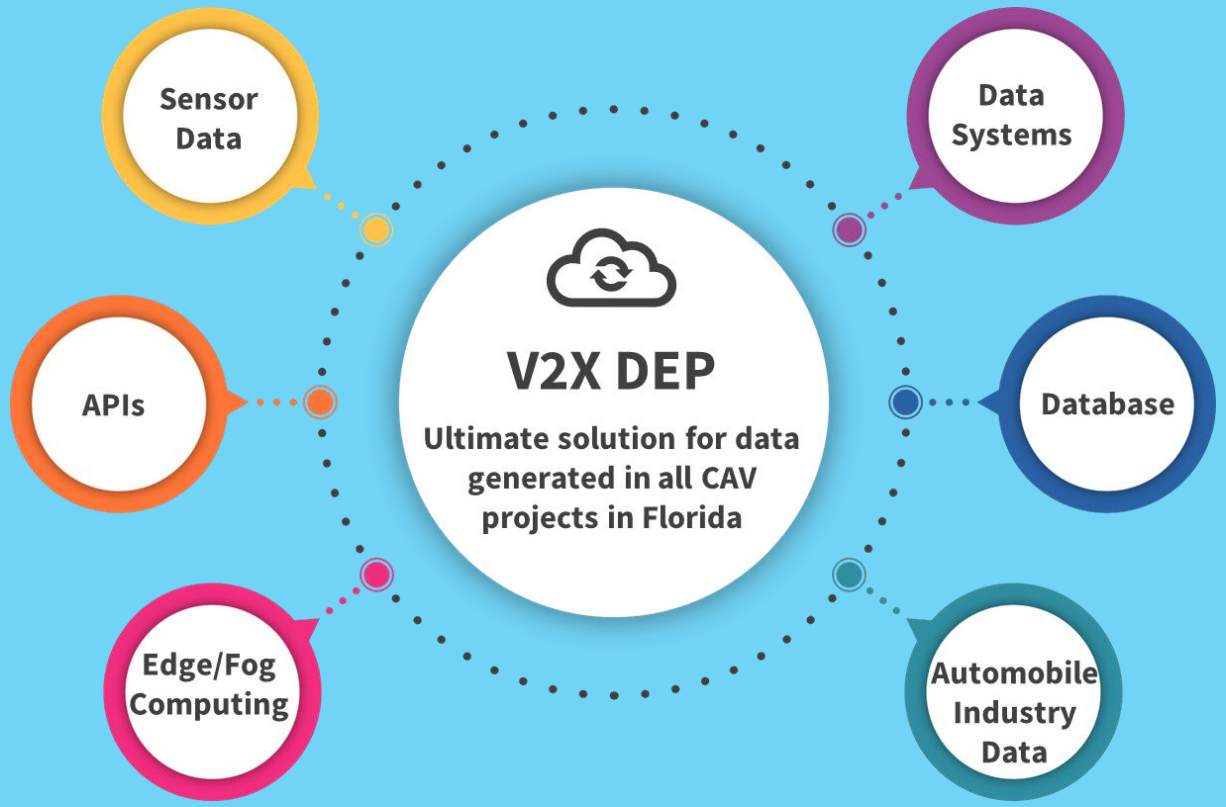
- Provides real-time lane closure information to motorists via navigation applications
- Improves worker safety in the work zone
- Improves mobility in and around work zones

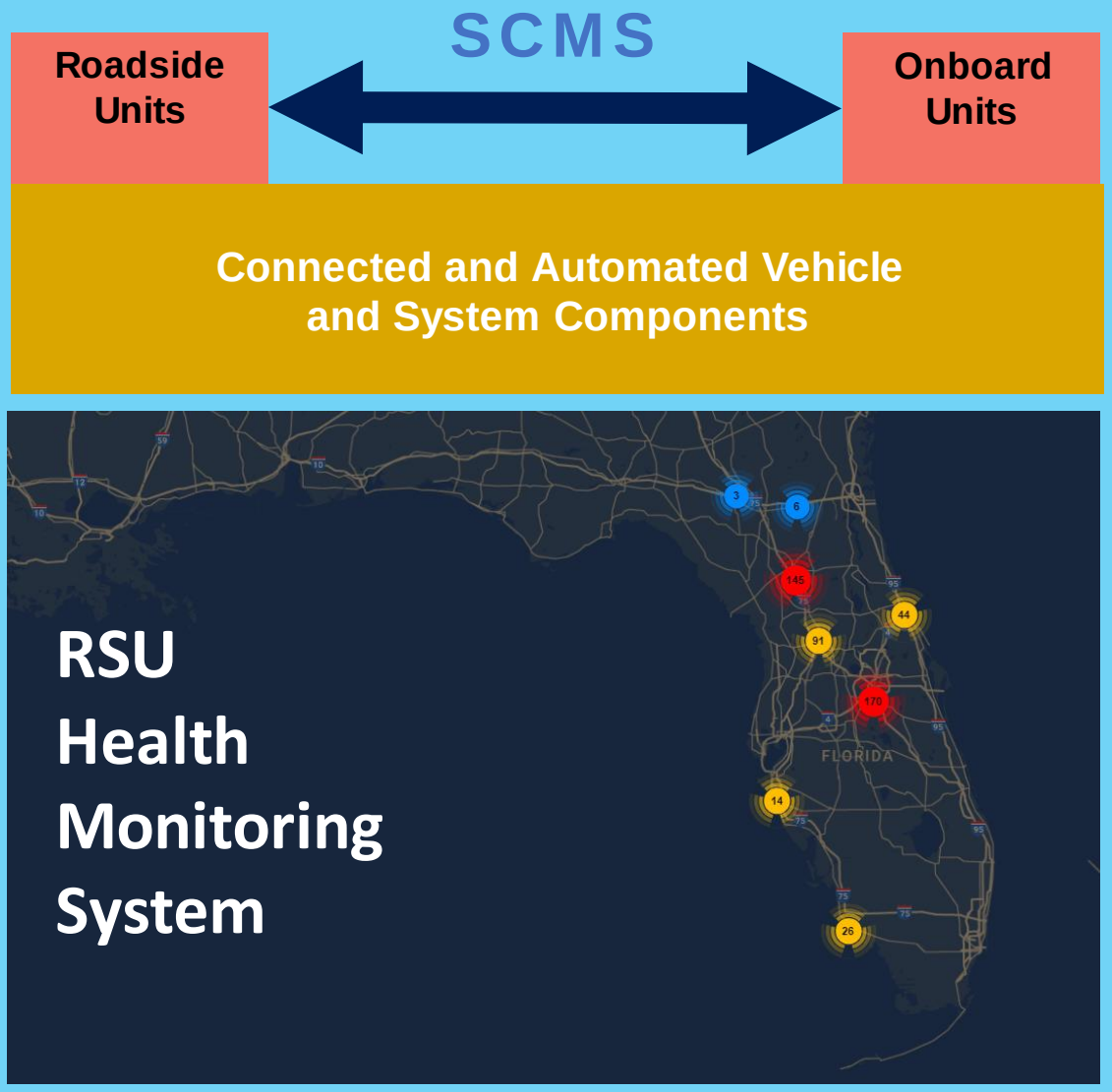


V2X Data Exchange Platform



Data Management





Transportation Technology Research Symposium at SunTrax (May 2-3, 2024)

- 30 attendees from 11 universities
- Over 30 attendees from FDOT
- Three panel sessions from the universities
  - Mobility
  - Safety
  - Resiliency
- FDOT panel session on overarching themes on future research
  - Safety
  - Resiliency
  - Supply chain

Adopting **TECHNOLOGIES** to improve **SAFETY** and advance **MOBILITY** to better serve the **COMMUNITIES**

Thank You!

Raj Ponnaluri, PhD, P.E, PTOE, PMP
Emerging Technologies
Transportation Technology Office
Florida Department of Transportation