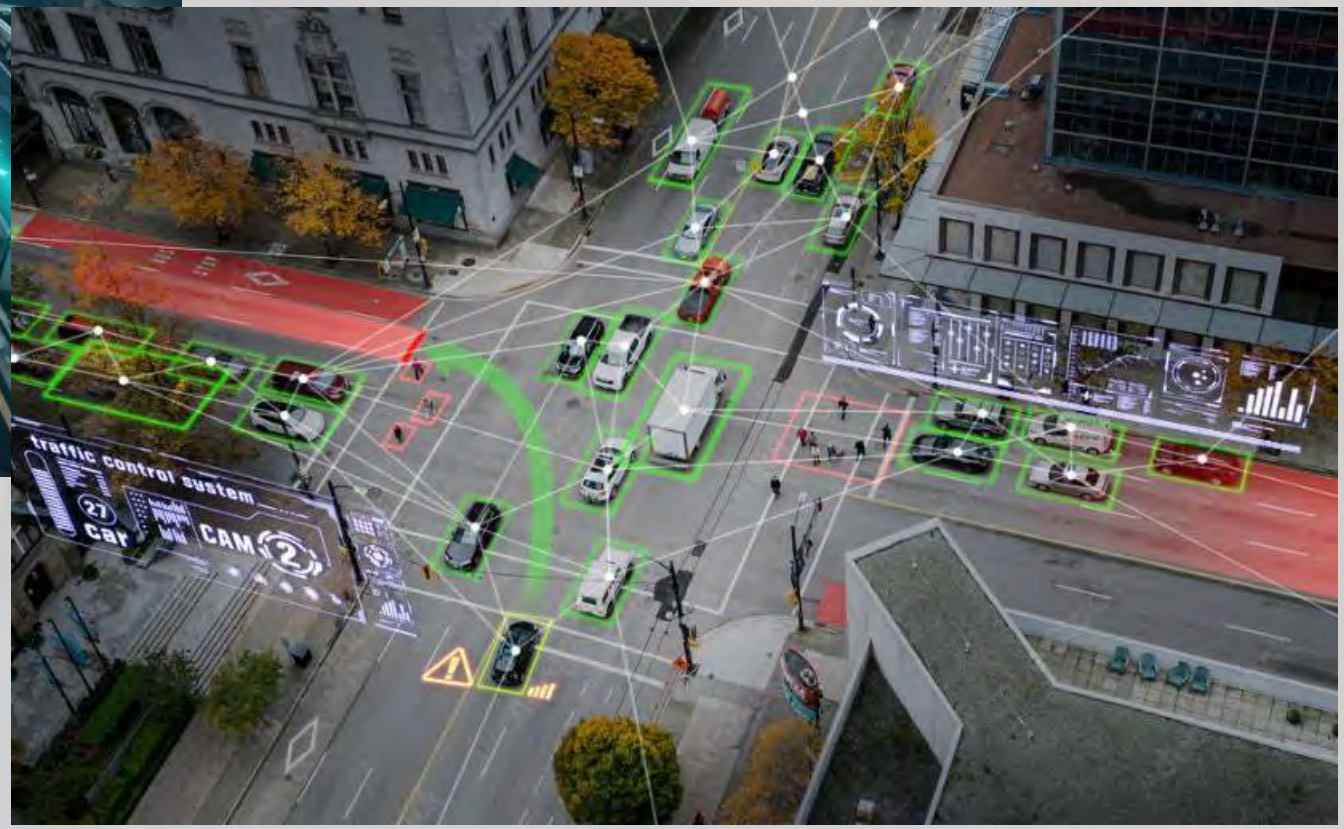
2024 FAV Summit: What's Next – CAV 2.0



2024 FAV Summit: What's Next – CAV 2.0

Moderator: Rudy Powell, Jr., P.E.

Chief Engineer of Operations, Florida Department of Transportation

Thursday, September 5

1:30 pm-3:00 pm

Our Presenters

Christine Shafik, PE, PMP®, CPM, FCCM, FCCN, CGB
State Connected Mobility & Technologies Engineer, Traffic Engineering & Operations, FDOT

Jeremy Dilmore, P.E.
TSM&O Engineer
Florida Department of Transportation, District 5

Dale Thompson
Sr Research Engineer, Enabling Technologies Team Leader, Office of Safety and Operations Research and Development, FHWA

John F. Kwant
Executive Director, Americas
5G Automative Association

Connected and Automated Vehicles Program 2.0

Christine Shafik, PE, PMP®, CPM, FCCM, FCCN, CGB
State Connected Mobility & Technologies Engineer,
Traffic Engineering & Operations, Florida Department of Transportation

Connected and Automated Vehicles Program 2.0

Christine Shafik, PE, PMP®, CPM, FCCM, FCCN, CGB

State Connected Mobility & Technologies Engineer
State Traffic Engineering & Operations Office
Florida Department of Transportation

FDOT

Agenda

- Brief Overview of FDOT's CAV Program
- CAV 1.0 to CAV 2.0
- Statewide Systems and Test Facilities

CAV Program Supports Target Zero

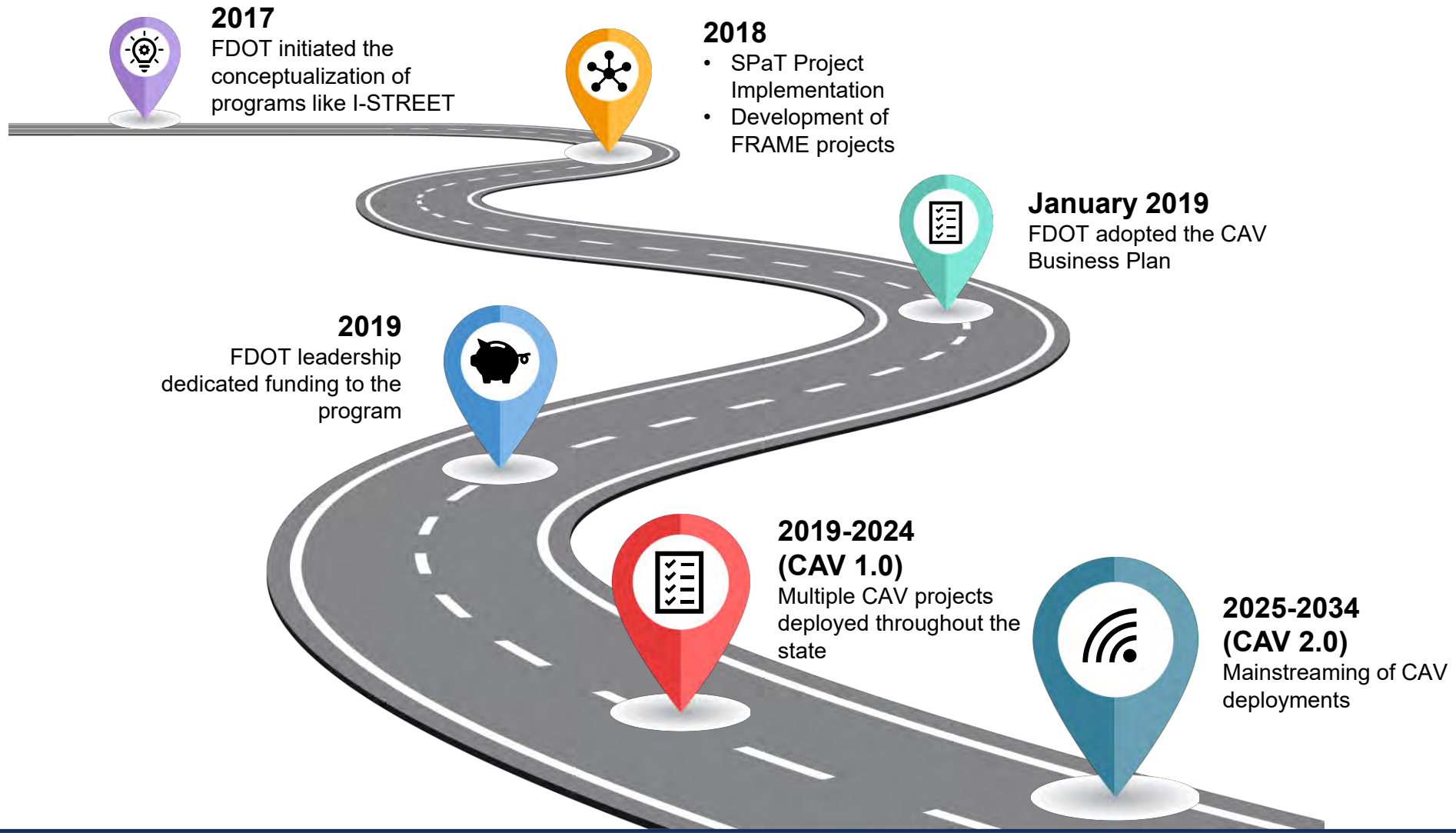
Target Zero focuses on influencing change in specific behaviors ***before a crash occurs.***

CAV Program is a tool in FDOT's toolbox to prevent crashes.

Influence driver awareness with situational alerts to avoid crashes.

TARGET ZERO
FATALITIES & SERIOUS INJURIES

CAV Implementation Roadmap



2017
FDOT initiated the conceptualization of programs like I-STREET

2018
- SPaT Project Implementation
- Development of FRAME projects

January 2019
FDOT adopted the CAV Business Plan

2019
FDOT leadership dedicated funding to the program

2019-2024 (CAV 1.0)
Multiple CAV projects deployed throughout the state

2025-2034 (CAV 2.0)
Mainstreaming of CAV deployments

CAV 1.0 (2019-2024) Overview

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

Roadside Units

- Operational: 580+
- Design/Construction: 760+
- Planning: 30+

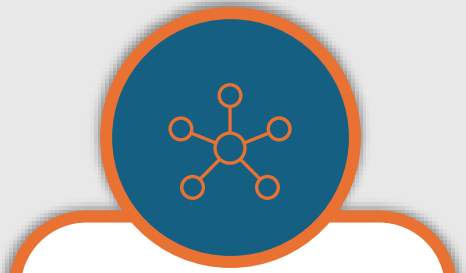
Roadway Coverage

Centerline Miles: 2,000+

Traffic Signals Coverage

- Operational: 450+
- Design/Construction: 550+
- Planning: 30+

CAV 1.0 (2019 - 2024) Overview- Accomplishments



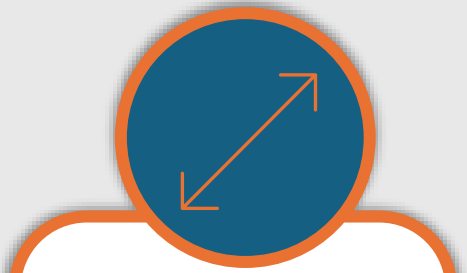
Regional Integrated CAV Projects

- *I-75 FRAME*
- *I-4 FRAME*
- *US 41 FRAME*

https://www.fdot.gov/traffic/its/cav-deployments

Signal Phase and Timing (SPaT)

- *Tallahassee SPaT*
- *Gainesville SPaT Trapezium*
- *Pinellas County SPaT*
- *Keys COAST*
- *Smart Bay*
- *SR 710 and SW10th Street*



Statewide Projects

- *V2X Data Exchange Platform*
- *Security Credential Management System*
- *RSU Health Monitoring System*

Local Agency Partnership Programs

- *Technology Application Partnership with Local Agencies (TAPs-LA)*

How Many CAV Projects in Florida?

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
3 US 98 Smart Bay
4 SR-710/Beeline Hwy- CAV Freight
5 US 41 FRAME
6 State Road 423 Freight Signal Priority
7 Lake Mary Boulevard CV Project
8 I-10 Smart Road Ranger
9 ♦ V2X Data Platform
10 Florida Keys Connecting Overseas to Advance Safe Travel (Florida Keys COAST) Pilot Project
11 ♦ Pinellas County Smart Community (2020 ATCMTD)
12 City of Sarasota CAV Project
13 LeeTran US 41 Transit Signal Priority
14 Collier Countywide Connected Traveler Information System (CTIS)
15 Train Vehicle Crash Avoidance Pilot Project
16 SR 29 Wildlife Detection
17 Lakeland Intersection Collision Avoidance Safety Program (iCASP) CV
18 Bee Ridge Corridor Smart Signals
19 Bluetooth to RSU Conversion in Orange and Osceola Counties
20 CV Smart Signal - Lake County
21 "Just on the Phone" Reference Application
22 SR-40 ITS Safety Deployment
23 Pasco County SMART US-19
24 Hillsborough County Connected Vehicle Priority and Preemption System
25 I-75 and I-95 Queue Warning System
26 City of Clearwater Pedestrian Warning System
27 City of St Petersburg Smart Signal Corridor Project
28 South I-75 FRAME
29 District 7 Integrated Corridor Management
30 SR-869/SW 10th Street Connector TSM&O SWZ
31 U.S. 17-92 Connected Vehicle Deployment
32 Ped/Safe II U.S. 441/State Road 50

Operational

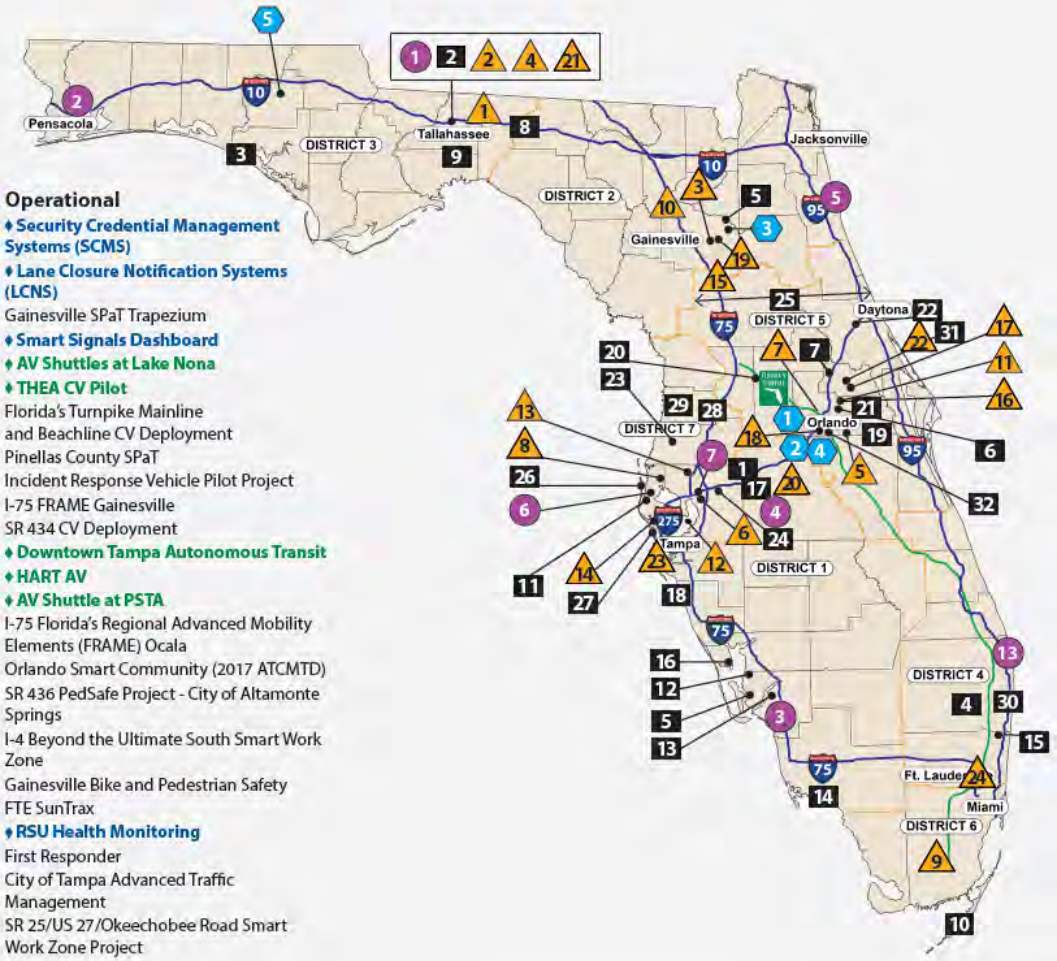
1 ♦ Security Credential Management Systems (SCMS)
2 ♦ Lane Closure Notification Systems (LCNS)
3 Gainesville SPaT Trapezium
4 ♦ Smart Signals Dashboard
5 ♦ AV Shuttles at Lake Nona
6 ♦ THEA CV Pilot
7 Florida's Turnpike Mainline and Beachline CV Deployment
8 Pinellas County SPaT
9 Incident Response Vehicle 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 Florida's Regional Advanced Mobility Elements (FRAME) Ocala
16 Orlando Smart Community (2017 ATCMTD)
17 SR 436 PedSafe Project - City of Altamonte Springs
18 I-4 Beyond the Ultimate South Smart Work Zone
19 Gainesville Bike and Pedestrian Safety
20 FTE SunTrax
21 ♦ RSU Health Monitoring
22 First Responder
23 City of Tampa Advanced Traffic Management
24 SR 25/US 27/Okeechobee Road Smart Work Zone Project

Legacy/Retired

1 Near Miss Identification Safety System (N-MISS)
2 I-4 Active Work Zone
3 Gainesville AV Shuttle
4 Osceola County CV Signals
5 CAV Projects (ATMA)

Planning

1 CV Bike Safety Pilot Deployments
2 Escambia and Santa Rosa County CAV
3 SW I-75 FRAME
4 District 1 CV Master Plan
5 Smart St. Augustine
6 Pinellas SR 60 West Coast Smart Signal Corridor Project
7 Connected Vehicle Priority and Preemption System (CVPP)



As of 8/26/2024

CAV Research Projects in Florida

- Evaluate and document
- Test most cutting-edge use cases
- Accompany new CAV use case pilot project.

https://www.fdot.gov/traffic/its/home/cav-research-projects

CAV 2.0 (2025-2034) Overview

- Mainstreaming
- CAV infrastructure readiness
- Funding

CAV 2.0 (2025-2034) Focus Areas

National CAV Program Alignment

Continued Evaluation, Testing, and Demonstration

Education, Outreach and Partnerships

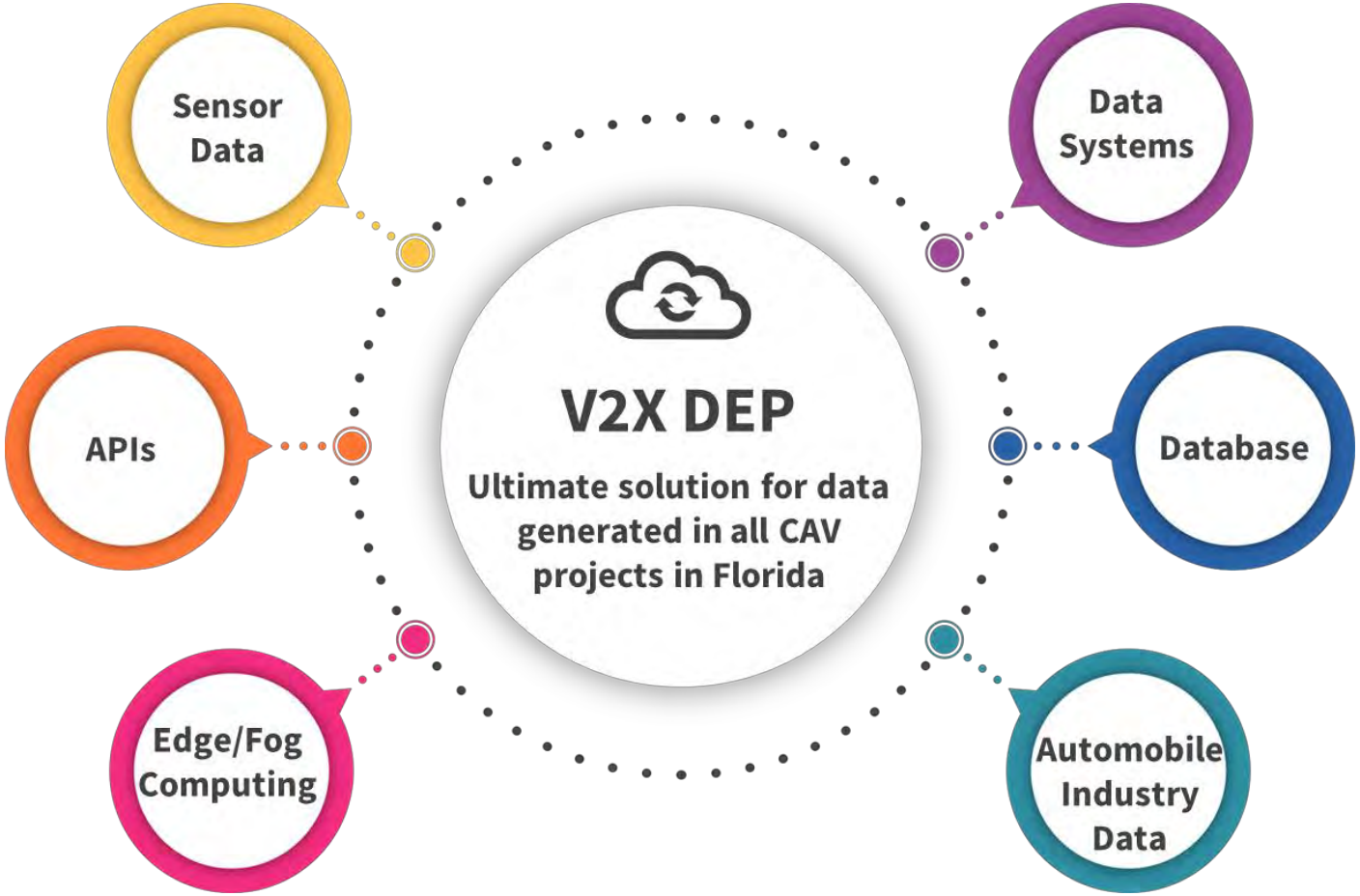
Communications Technology and Applications Implementation

Main-Streaming

Infrastructure Preparedness for ADS and AV

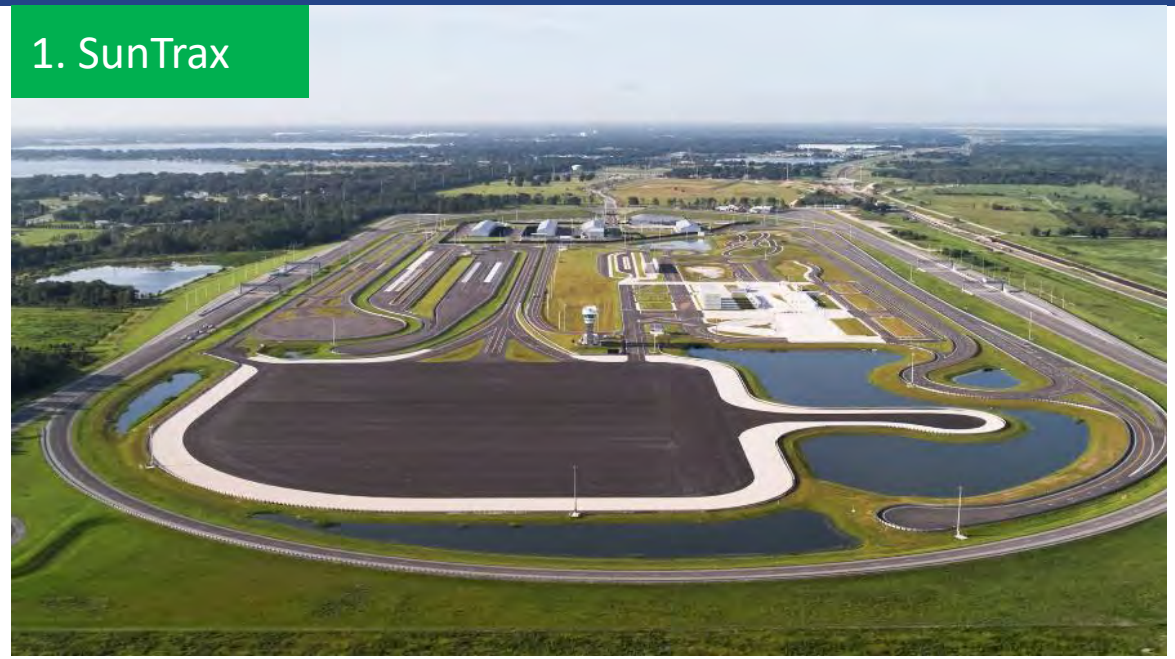
CAV Data Management and Sharing

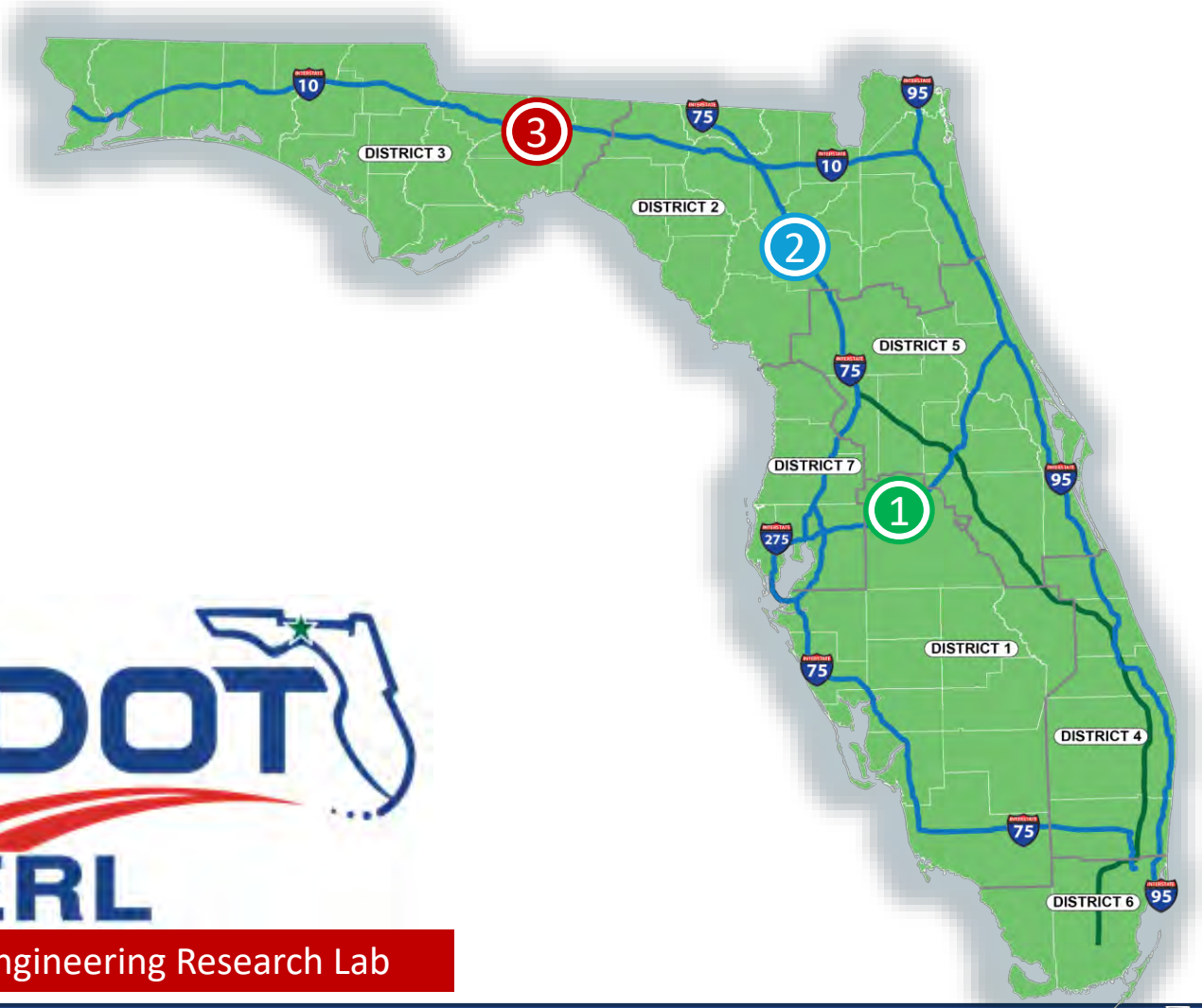
Vehicle-to-Everything Data Exchange Platform (V2X DEP)



Test Facilities: SunTrax, I-STREET, and TERL

1. SunTrax





I-STREET
TRANSPORTATION INSTITUTE
UNIVERSITY OF FLORIDA

2. I-STREET/UF

FDOT
TERL

3. Traffic Engineering Research Lab

Thank You!

FDOT Deployments and Lessons Learned

Jeremy Dilmore, P.E.
TSM&O Engineer
Florida Department of Transportation, District 5

FDOT Deployments and Lessons Learned

Jeremy Dilmore, P.E.

District 5, FDOT District 5 TSM&O Engineer
District 5 Traffic Engineering & Operations Office
Florida Department of Transportation

FDOT

Overview

- Best Practices by Phase
- Best Practices by Device
- FL 511 Smartphone Application Enhancement

CAV Planning Steps

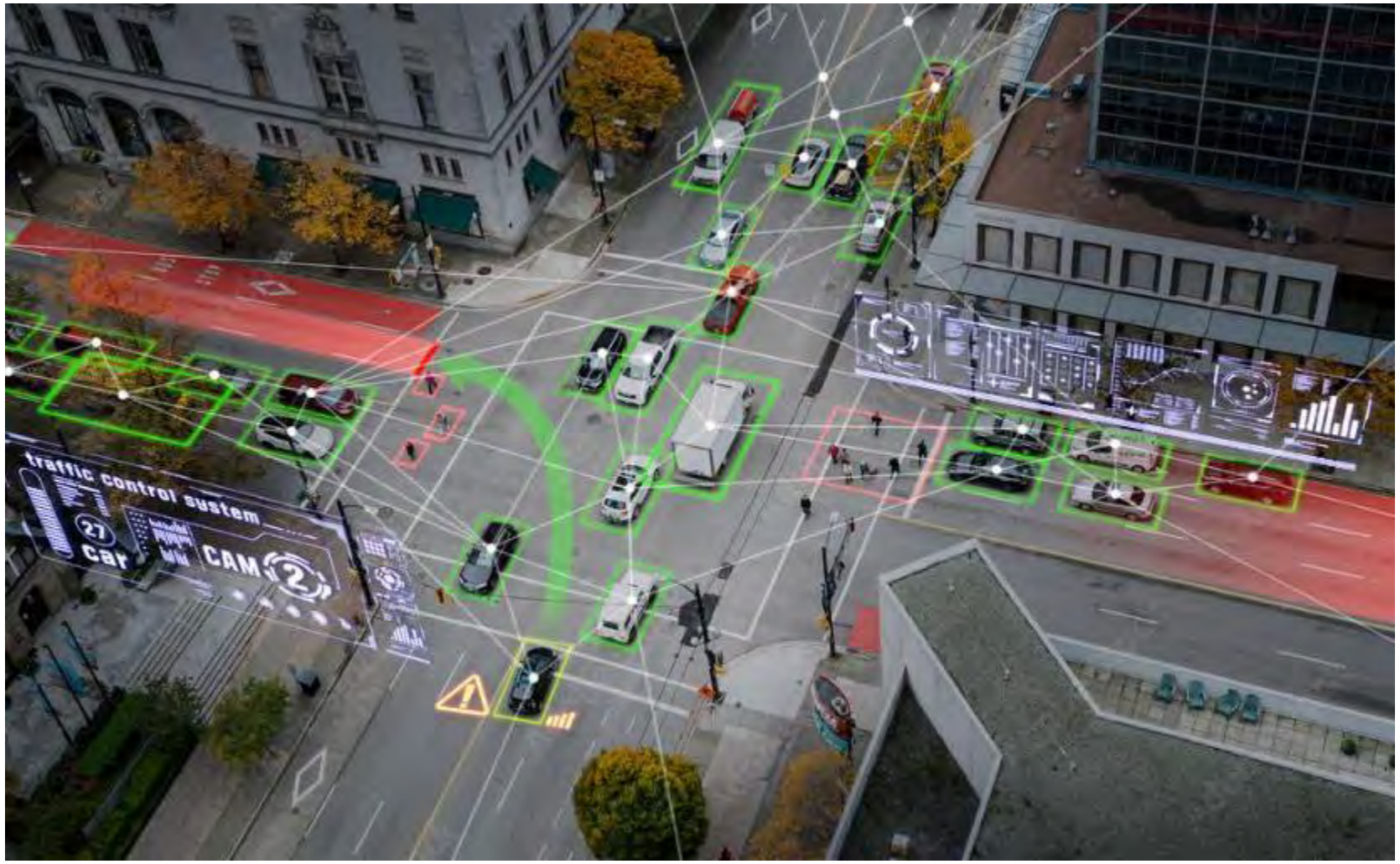
Planning

- Establish Goals and Objectives
  - Long Range Transportation Plans
  - ITS/TSMO Master Plans
  - Projects
- Tie outcomes to applications
- Obtain Stakeholder Buy-in
- FDOT or local agency maintenance agreement
- **Plan integration needs:**
  - FCC site registration
  - SCMS certificate support
  - V2X DEP integration
- **Local agency coordination for network access**

CAV Design Steps

Design

- Contracting Method
- Freeway systems:
  - Physical support infrastructure and connectivity should be already in place
- Arterial systems:
  - Controller type
  - Controller firmware version
  - Cabinet space
  - Connectivity to the TMC
- Network configuration specifics
- FCC site registration data collection



CAV Implementation Considerations in Various Phases?

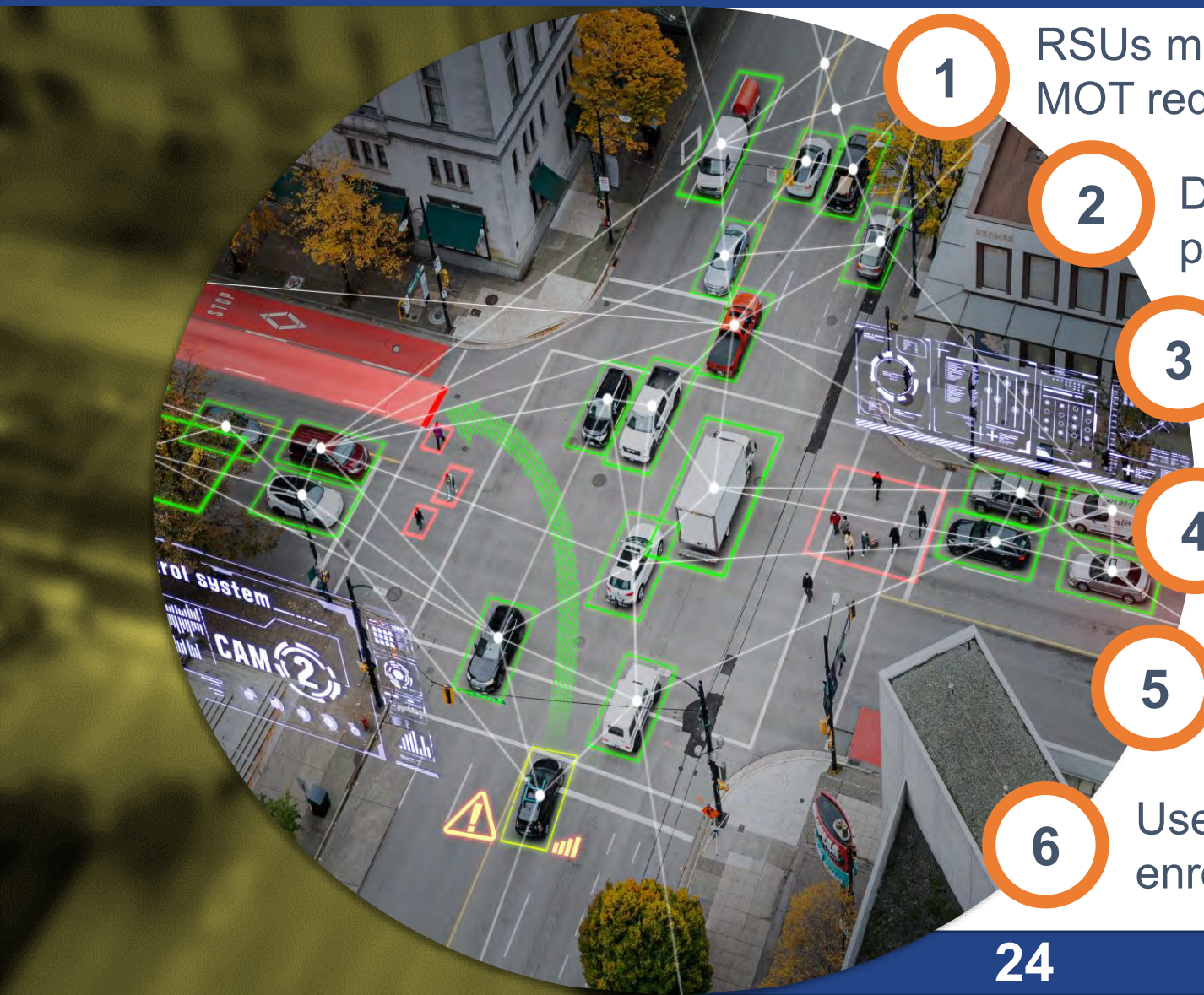
Construction

- Systems integration – **Who?**
- Project acceptance testing
- Burn-in period

Operation and Maintenance

- Hardware and software needs
- On-going maintenance of the accurate MAP
- Keep the FCC site registration up-to-date
- Network configuration and trouble-shooting
- Software licensing
- Monitor the status of the devices and data flow

Best Practices: RSUs



1. RSUs mounted on vertical support also works (i.e., less MOT required)
2. Data forwarding to multiple end points/multicast
3. Support NTCIP 1218, complementary technology and FDOT's SCMS PSID Profile
4. Ensuring proper grounding for lightning protection
5. If not on the FDOT's IPL, work with TERL for device permitting/certification
6. Use the serial ID on the device for enrolling into the SCMS and other places

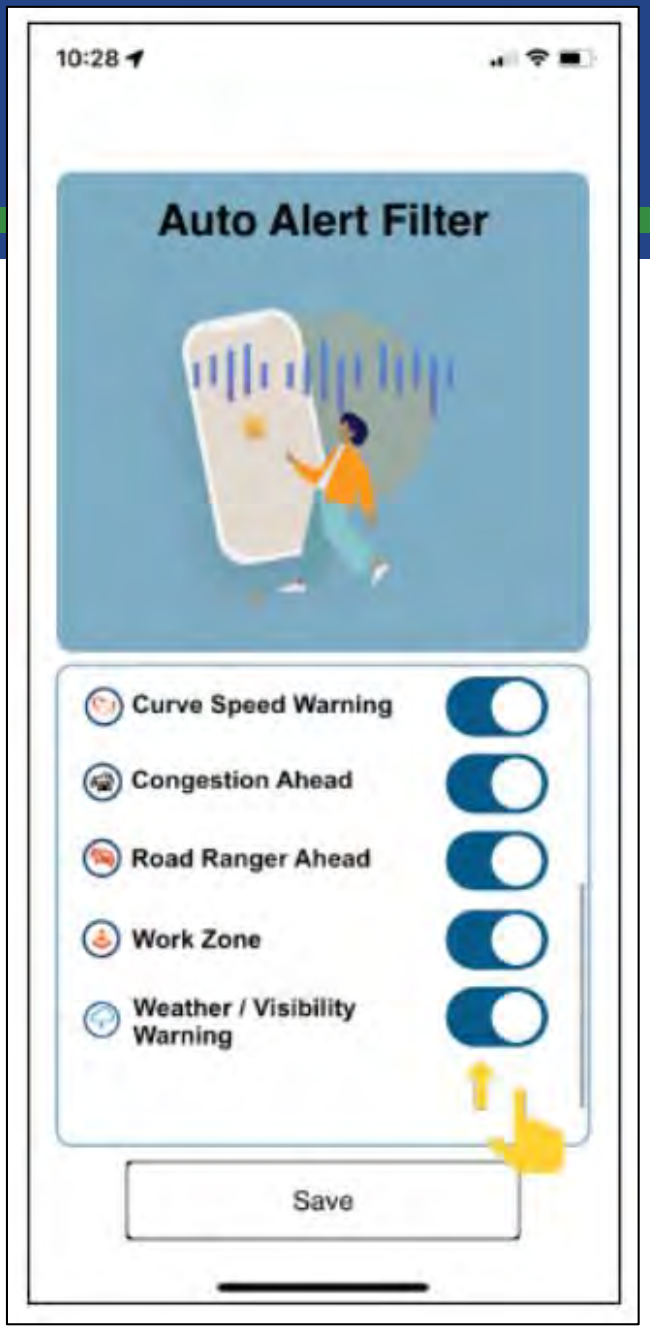
FDOT

OBU Requirements and Considerations

- Cellular Connection Required
- Applications with Requirements
- Installation Method Consideration
- Plan for Operations and Maintenance
- Early Engagement with Stakeholder
- Enrolled in Statewide SCMS System

FL511 Smartphone Application Enhancement

- Connected Vehicle Messages through FL511
  - Low Hanging Fruit to start leveraging CV technology benefits while OEMs work to increase penetration of equipped vehicles.
  - Allows safety related TIM messages to be provided to the public now using the FL511 Mobile Application in unequipped vehicles.



Thank You!


FLORIDA
ARRIVE ALIVE
BUCKLE UP
FLHSMV
HIGHWAY PATROL
FLORIDA

National Vehicle-to-Everything (V2X) Deployment Plan

Dale Thompson

Senior Research Engineer, Enabling Technologies Team Leader, Office of Safety and Operations Research and Development, Federal Highway Administration

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Except for the statutes and regulations cited, the contents of this presentation do not have the force and effect of law and are not meant to bind States or the public in any way. This presentation is intended only to provide information regarding existing requirements under the law or agency policies.

Agenda

1. National V2X Deployment Plan
2. Federal Grants
3. Technical Assistance and Resources
4. V2X Cohort meetings – ITS JPO

U.S. Department of Transportation

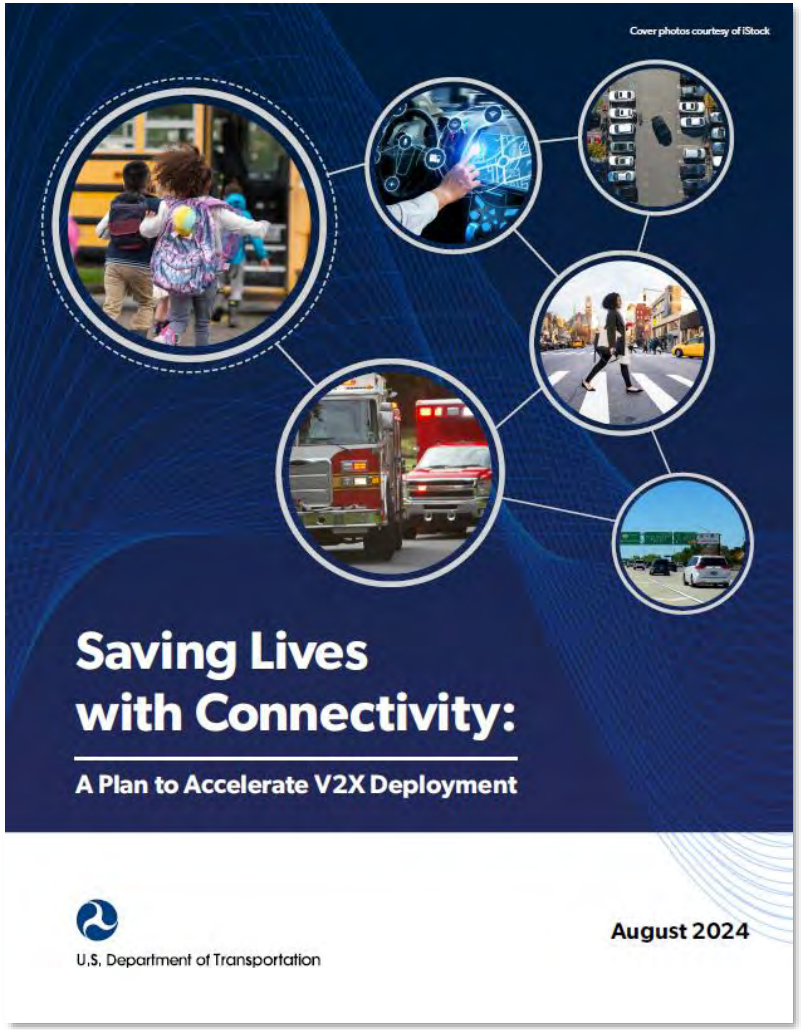
USDOT Leads Call to Action with Release of National V2X Deployment Plan

- The Plan provides a roadmap to nationwide deployment of interoperable, cybersecure V2X technologies.
- An official launch event was held at USDOT HQ on August 16 *(pictured right).*
  - Recordings from the press event and the panel are available at https://www.its.dot.gov/research_areas/emerging_tech/htm/ITS_V2X_CommunicationSummit.htm

Path to Developing a Plan

August 2022	1st V2X Summit held after FCC court ruling limited the use of certain V2X technologies. USDOT committed to taking action and shared research updates.
April 2023	2nd V2X Summit held to gather feedback to draft a national V2X deployment plan.
October 2023	3rd V2X Summit held to unveil the draft National V2X Deployment Plan.
August 2024	**National V2X Deployment Plan** published, incorporating public feedback received on the draft.

USDOT Leads Call to Action with Release of *National V2X Deployment Plan*



Source: FHWA

Available for download at:
https://www.its.dot.gov/research_areas/emerging_tech/htm/ITS_V2X_CommunicationSummit.htm

U.S. Department of Transportation

Plan Overview

Outlines USDOT's vision and mission for V2X deployment.

Identifies the V2X stakeholder community and their respective roles and responsibilities.

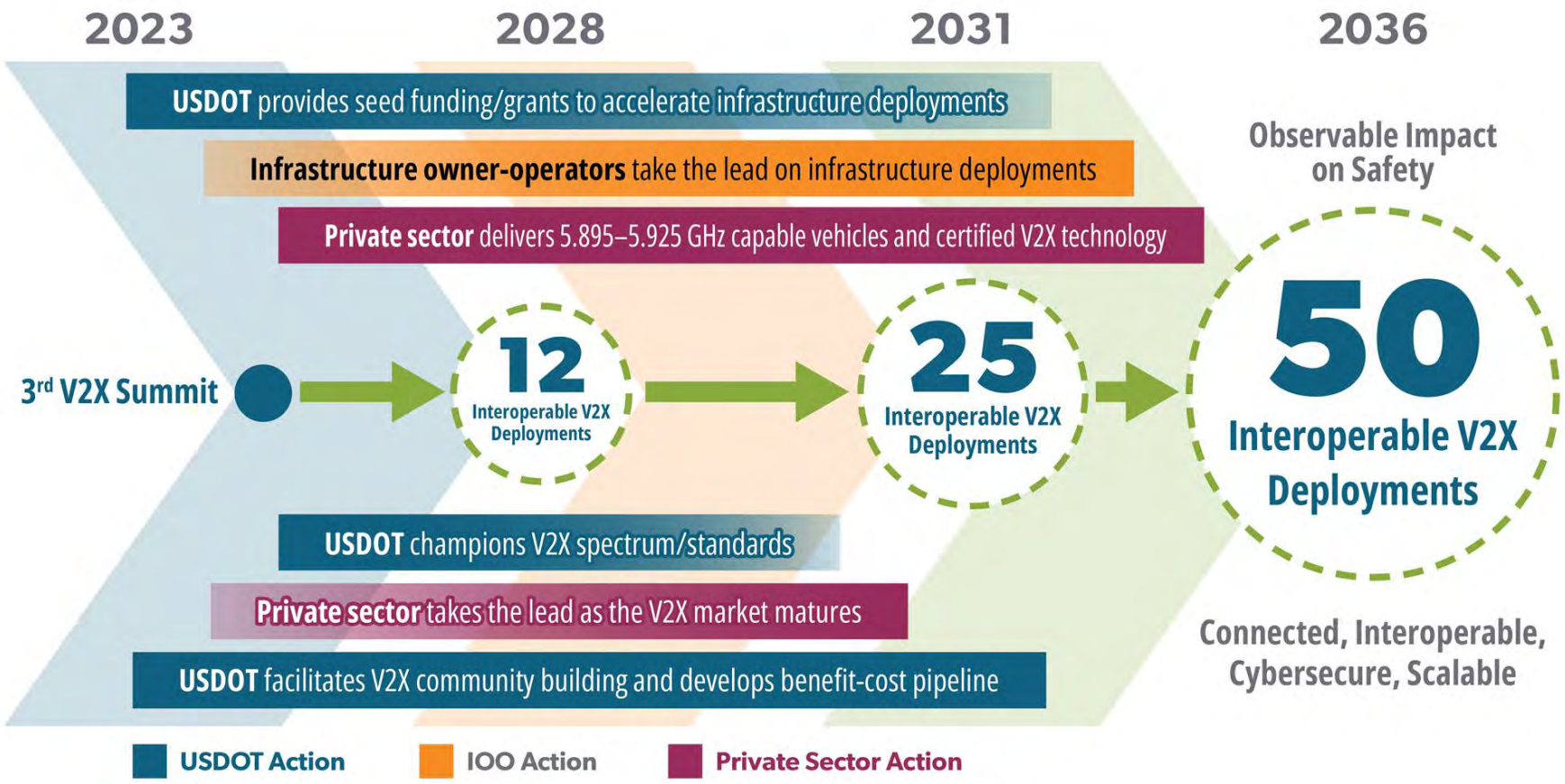
Sets short, medium and long-term milestones and targets for the private sector and public agencies.

Summarizes resources and technical assistance to support agencies on their deployment journey.

Identifies activities to evaluate system performance and establish a stream of benefit evidence.

U.S. Department of Transportation

Creating Momentum Through Coordinated Stakeholder Actions



Source: FHWA

Changes Made in Response to Stakeholder Feedback

Feedback on Draft Plan	Changes Reflected in Final Plan
Aggressive Goals/Targets May Require Mandate vs. Market Forces	Clarified language to show goals/targets are aspirational, community goals and do not imply a legislative/regulatory mandate or dedicated federal funding.
Safety Benefits can Occur with or Without V2X	Clarified language that V2X works in tandem and may amplify safety potential with other safety countermeasures.
Seek OEM Commitment	Alliance Letter indicates that once FCC Rulemaking is complete, the OEMs can start to put V2X in production.

Changes Made in Response to Stakeholder Feedback (cont.)

Feedback on Draft Plan	Changes Reflected in Final Plan
Funding Inconsistent with Goals/Targets	Clarified language to show goals/targets are aspirational, community goals and do not imply a legislative/regulatory mandate or dedicated federal funding.
Clarify Interoperability Definition	Incorporated high-level definition of interoperability from *Saving Lives With Connectivity: Accelerating V2X Deployment* NOFO.
Establish V2X Deployment Baseline	Added language about performing baselining activity and tracking deployments moving forward, as a separate effort.
Look Beyond 5.9 GHz	Emphasized commitment to LTE-V2X using the 5.9 GHz safety spectrum, complemented by a variety of communication technologies including Mobile Network Operators.

ITS Grants, Challenges, & Deployment Programs

INTERSECTION SAFETY CHALLENGE

SMART

ATTAIN

ITS4US

IT'S TRANSPORTATION FOR ALL OF US

S | S

4 | A

V2X Accelerator

Annual Federal ITS Grants

Grant	Description	Annual Funding
Strengthening Mobility and Revolutionizing Transportation (SMART)	Provides grants to eligible public sector agencies to conduct demonstration projects focused on advanced smart community technologies and systems in order to improve transportation efficiency and safety.	$100 million appropriated annually for fiscal years 2022-2026
Advanced Transportation Technology and Innovation (ATTAIN)	Provides funding to deploy, install, and operate advanced transportation technologies to improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment.	$60 million annually
Safe Streets for All (SS4A)	Focuses on comprehensive safety action planning and implementing those plans and is inclusive of all types of roadway safety interventions across the Safe System Approach (SSA).	$1 billion/year over 5 years

Interoperable Connectivity Accelerator Awardees

Utah DOT

Maricopa County

Texas A&M Transportation Institute

Source: USDOT (June 2024)

ITS Technical Assistance Resources

- DOT Navigator and Federal Grants for ITS
- Smart Community Resource Center (SCRC)
  - ITS and Safety
  - Interoperable Connectivity (V2X)
  - Systems Engineering
- ITS Deployment Evaluation Resources
- ITS Trainings and Other Technical Assistance Resources

DOT Navigator

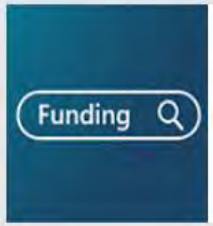
Focus on Helping to Develop Strong Discretionary Grant Applications

https://www.transportation.gov/dot-navigator

What Do You Want to Do?

PREPARE A SUCCESSFUL GRANT APPLICATION

Get planning tips, checklists, and information on applying for federal grants



FIND FUNDING OPPORTUNITIES

Search grant opportunities to meet your community's transportation needs

GET TECHNICAL ASSISTANCE RESOURCES

Find resources to get funding and build capacity to do transportation projects

LEARN ABOUT FUNDING AND MATCH

Learn about USDOT grant funding, including match requirements and flexibilities

ACCESS DATA AND MAPPING TOOLS

Access data and mapping tools to help write a strong grant application

LEARN ABOUT THE BIPARTISAN INFRASTRUCTURE LAW

Get information to help access BIL funding programs

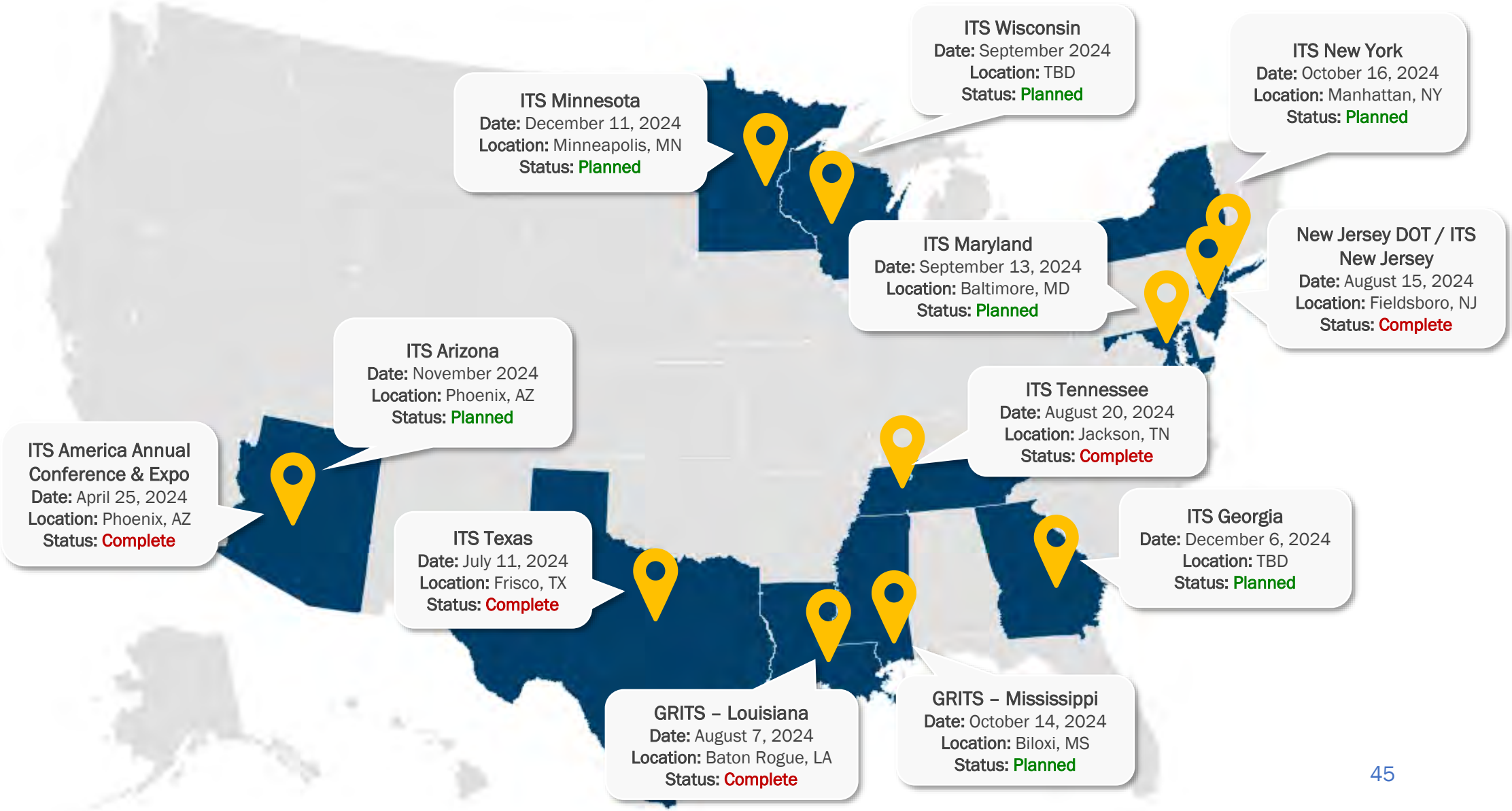
Smart Community Resource Center (SCRC)

- Online resource supporting information sharing and technical assistance related to ITS and Smart Community deployments.
- The site will evolve over time to continue being a source of current information, data and tools to support ITS investments.

www.its.dot.gov/scrc

Accelerating V2X Cohort Agencies (ITS PCB Program)

Foundational V2X Training



Thank You! Contact Information

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FHWA Office of Safety and Operations R&D
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For updates, please visit:
V2X Communications
https://www.its.dot.gov/research_areas/emerging_tech/htm/Next_landing.htm

V2XDeploymentPlan@dot.gov

Federal Regulatory Landscape for CV's

John F. Kwant
Executive Director, Americas
5G Automative Association

5GAA Automotive Association

Federal Regulatory Landscape for CV's

John F. Kwant
Executive Director, Americas

5GAA: A Global, Cross-Industry Association

11 of the top 15 OEMs

8 of the top 10 MNOs

2 top smartphone vendors

Today, 5GAA unites **115 members** from around the world working together on all aspects of C-V2X

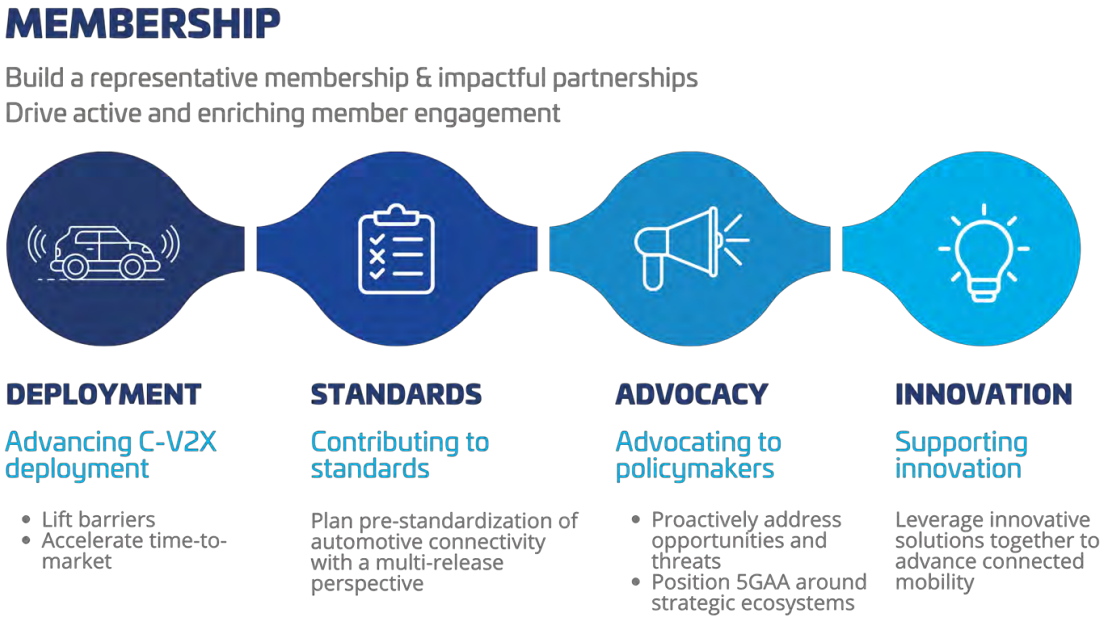
In September 2016, **8 companies** teamed to create the 5G Automotive Association (5GAA) to help develop, test, and promote 5G standards

SEPT 2016

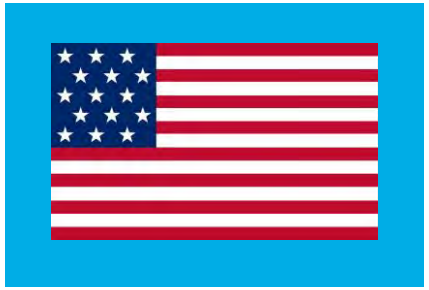
Q1 2024

5GAA – What We Do

- 5GAA's priority: execution and implementation of readily available connected infrastructure technology and services that lead to continued future development
- 5GAA's global ambition cascades into regional/national strategies (EU, US, APAC – now incl. India)
- Go-To-Market opportunities to identify roadblocks for proposed use cases



Recent 5GAAA Efforts in US



- Contributed to National Roadway Safety Strategy
- Pushed FCC Waivers for initial deployments of C-V2X Direct in 5.9 GHz
- Collaborate with DOT and other Industry Trade organizations for final rules
- Advocate with members of Congress for Smart Infrastructure funding
- Dialogue with FHWA on Digital Infrastructure
- Detroit Showcases on VRU protection and Day One Safety
- Contributed to USDOT National Draft V2X Deployment Plan
- Continue to highlight the risks of harmful interference in 5.9 and 6 GHz bands
- Filed comments on BIS ANPRM on Connected Vehicles

Federal Government Entities Involved in Connected Vehicle Regulations

- Department of Transportation
  - Federal Highway Administration
  - ITS - Joint Program Office
  - Volpe Center
- Federal Communications Commission
- Department of Commerce
  - National Telecommunications and Information Administration
  - Bureau of Industry and Security
- Department of Energy
  - Various National Labs
- NTSB
- U.S. Congress

DOT V2X Deployment Plan

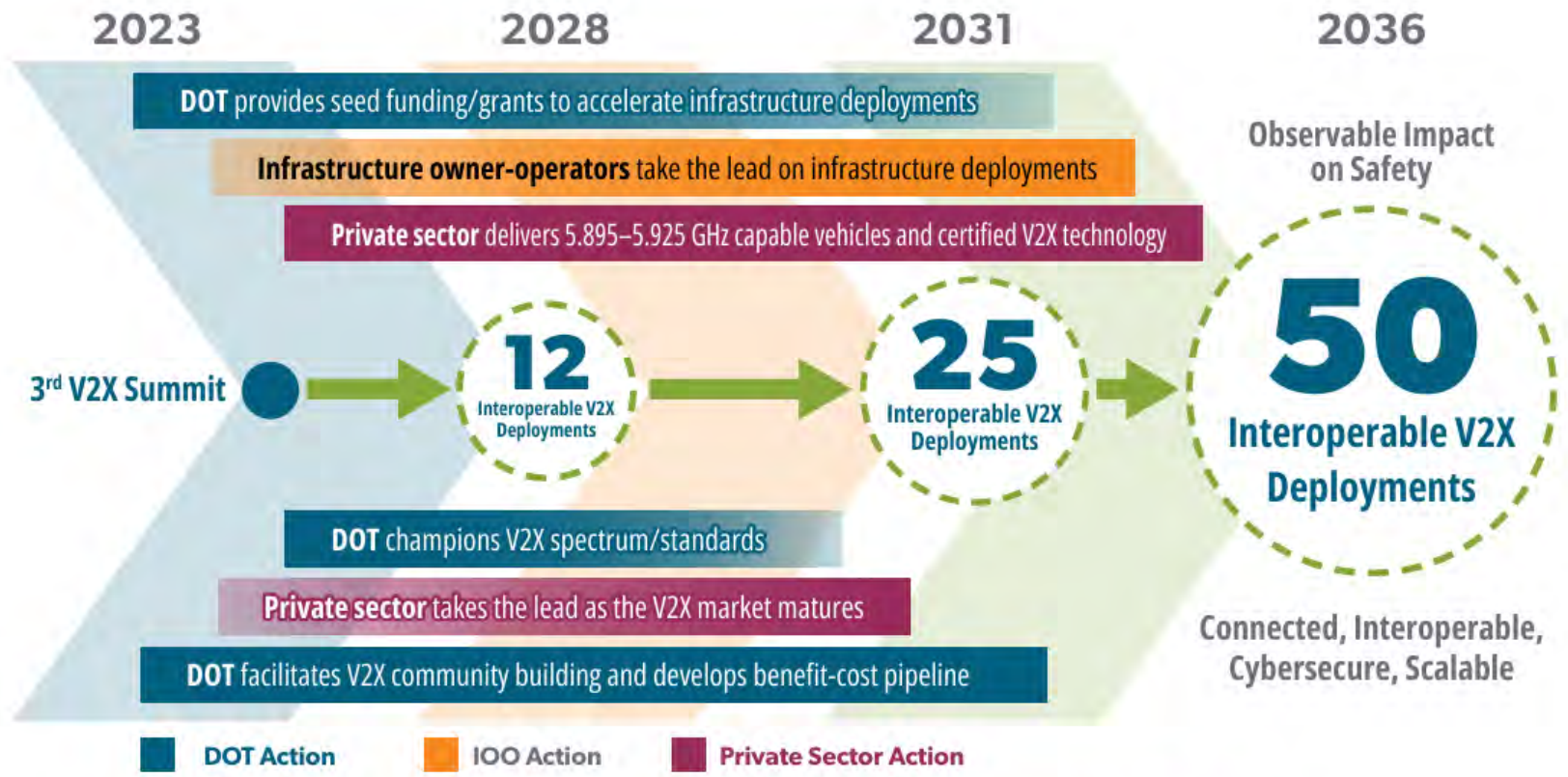


Figure 5. Strategic, Coordinated Actions of Key Stakeholders Create Momentum Towards Secure, Interoperable V2X Deployments

Source:DOT

FCC – 5.9 GHz Final Rules (Expected)

- Federal Communications Commission (FCC) Chairwoman has circulated the Final 5.9 GHz Band Report & Order for a vote
- It provides rules to enable C-V2X deployments in 5895-5925 MHz
- Approval expected within the upcoming weeks

DOC – CV Notice of Proposed Rulemaking (NPRM) (Expected)

- Earlier this year the Department of Commerce/Bureau of Industry and Security (DOC/BIS) issued an Advance Notice of Proposed Rulemaking (ANPRM) regarding CV Technologies seeking:
  - Definitions
  - Supply Chain Mapping re: software + hardware from 'hostile foreign nations'
  - Security Protocols
- The NPRM is due this month and is expected to provide:
  - Scope of bans on CV software (1 year) and hardware (3 years); ban on AV software (1 year) sourced from 'hostile foreign nations'
  - Anticipating OEMs and Suppliers will have to self-certify to conformity
  - Expected to take effect January 2025

DOE – CV's as an Enabler to More Efficient Transportation

- So how might the Department of Energy (DOE) encourage V2X deployment?
- DOE has long been interested in the potential of CV's to create more efficient traffic flows and thereby provide better fuel efficiency
  - Series of Advanced Research Projects Agency-Energy (ARPA-E) projects
  - Recent Vehicle Technologies Office solicitation featuring C-V2X
- Evidence of increased interest was in the workshop at the recent Automated Road Transportation Symposium (ARTS) in San Deigo

5GAA Automotive Association

Thank You!

2024 FAV Summit: What's Next – CAV 2.0

Questions?

Moderator: Rudy Powell, Jr., P.E.
Chief Engineer of Operations, Florida Department of Transportation

2024 FAV Summit: What's Next – CAV 2.0

Thank You!

Moderator: Rudy Powell, Jr., P.E.
Chief Engineer of Operations, Florida Department of Transportation

Potential Q&A Slides

CAV Data Security

Security Credential Management System

Roadside Units ⟷ **SCMS** ⟷ **Onboard Units**

Connected and Automated Vehicle and System Components

RSU Health Monitoring System

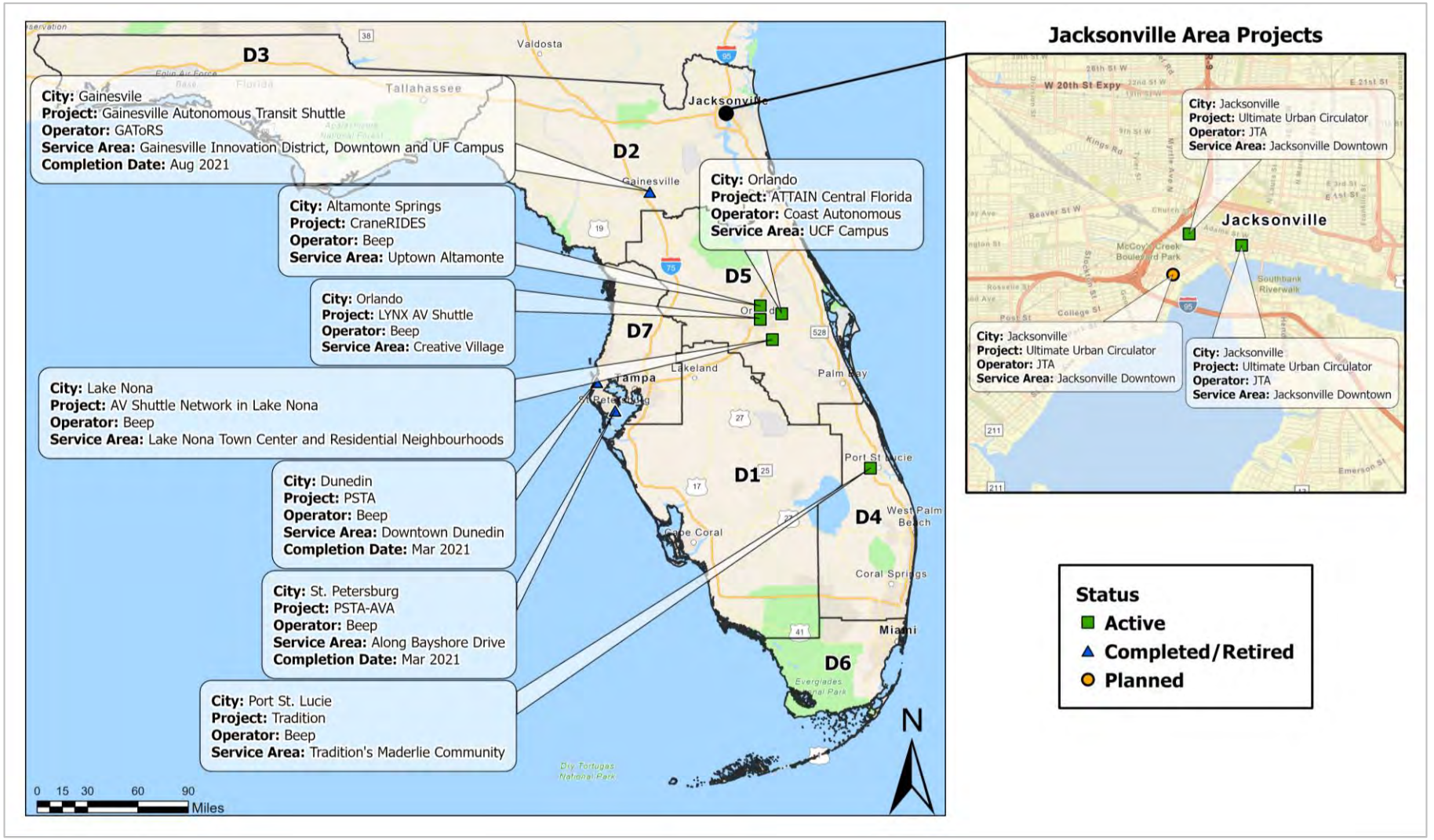
Project Objectives:

1. Provide holistic management of health monitoring and status of RSUs
2. Distribute alerts and other important information to district systems

Operational Status

- Healthy
- Unhealthy
- Communication Error

AV Shuttle Projects



FCC Site Registration Support

- ***Central Office supports District, regional and local agencies***
- ***Collect field information and provide to CO using a template***
- ***CO Submits in the FCC system***
- ***FDOT provides build-out dates within one year of registration approval***

VISION

Enable a safe, efficient, equitable, and sustainable transportation system through the national, widespread deployment of secure, interoperable V2X technologies.

MISSION

Accelerate deployment of secure, interoperable V2X connectivity using the dedicated 5.895-5.925 GHz spectrum and other available spectrum through collaboration and coordination across federal government, the public sector, and private industry.

Short-Term Goals (2024–2028)

Infrastructure Deployments

- V2X deployed on 20% of National Highway System
- Top 75 metro areas have 25% of signalized intersections V2X enabled
- 12 interoperable, cybersecure deployments
- 20 grants in at least 10 states utilizing the 5.895-5.925 GHz band

Vehicles

- 2 Original Equipment Manufacturers (OEMs) commit to 5.895-5.925 GHz capable vehicles by 2028 model year

Spectrum and Interoperability

- 2 Security Credential Management System (SCMS) providers demonstrate interoperable security credentials management following secure by design principles
- 3 device suppliers and 2+ OEMs demonstrate interoperability
- FCC completes 2nd Report and Order on 5.9 GHz band

Benefits and Technical Assistance

- 3 benefit/cost case studies, including at least one focused on vulnerable road user safety
- 25 active Accelerating V2X Cohort members
- 10 regional secure, interoperable connectivity hands-on training events

Medium-Term Goals (2029–2031)

Infrastructure Deployments

- V2X deployed on 50% of National Highway System
- Top 75 metro areas have 50% of signalized intersections V2X enabled
- 25 interoperable, cybersecure deployments
- V2X installed in 40% of the nation's intersections

Vehicles

- 5 vehicle models are 5.895-5.925 GHz capable
- 3 active deployments generate Infrastructure Owner-Operator (IOO) data used by 2 OEM production vehicles
- 4 suppliers, 3 OEMs demonstrate secure, interoperable connectivity

Spectrum and Interoperability

- 5 V2X use cases demonstrated in the 5.895-5.925 GHz band
- 5 V2X use cases demonstrated **beyond** the 5.895-5.925 GHz band (i.e., other communications technologies, including network-based communications technologies)
- 20 public agencies demonstrate interoperability
- 2 providers utilize interoperable SCMS credentials
- 10 certified devices on the market

Benefits and Technical Assistance

- 6 use cases (2 involving vulnerable road users) document V2X safety benefits/costs
- 50 active Accelerating V2X Cohort members author progress report

Long-Term Goals (2032–2036)

Infrastructure Deployments

- V2X fully deployed on National Highway System
- Top 75 metro areas have 85% of signalized intersections V2X enabled, a majority of which feature vulnerable road user safety applications
- 50 interoperable, cybersecure deployments
- Secure, interoperable 5.895-5.925 GHz operations across 50 states
- V2X installed in 75% of the nation's intersections

Vehicles

- 6 OEMs have 5.895-5.925 GHz capable production vehicles for safety use cases
- 20 vehicle models are V2X capable

Spectrum and Interoperability

- 5 V2X use cases operational in the 5.895-5.925 GHz band in all 50 states
- 5 V2X use cases operational beyond the 5.895-5.925 GHz band in 5 states
- 20 certified devices dominate deployed V2X technology base

Benefits and Technical Assistance

- 10 deployments in operation for 5 years streaming benefits/ cost data
- 75 active Accelerating V2X Cohort members sponsor pooled fund projects

Source: DOT