# CENTRAL FLORIDA TSM&O CONSORTIUM MEETING SUMMARY

**Meeting Date**: May 19, 2022 (Thursday) **Time**: 10:00 AM – 12:00 PM

**Subject:** TSM&O Consortium Meeting

**Meeting Location:** Teleconference
FDOT RTMC 4975 Wilson Rd. Sanford, FL 32771

## I. OVERVIEW

The purpose of this recurring meeting is to provide an opportunity for District Five FDOT staff and local/regional agency partners to collaborate on the state of the TSM&O Program and ongoing efforts in Central Florida. Jeremy Dilmore gave a short introduction and outlined the meeting agenda.

## I. FDOT STAFFING CHANGES

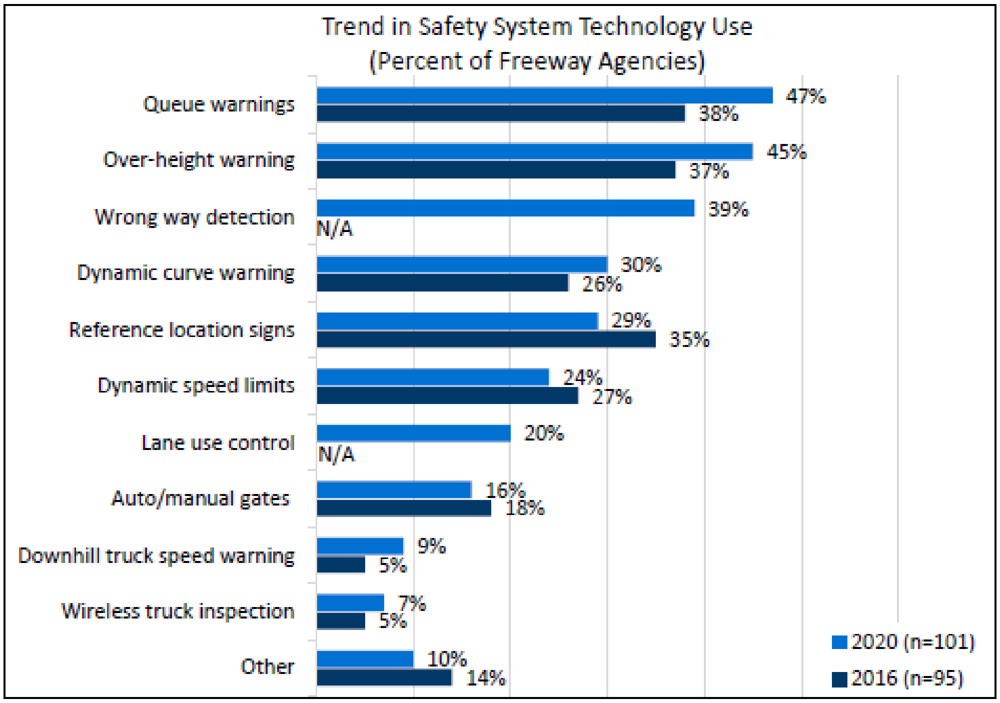
Jeremy Dilmore gave a brief explanation of changes in the District Five Traffic Operations personnel.

- Patrick White – handling retiming work (filling Tricia's previous role)
  - patrick.white@dot.state.fl.us
- Lorena Cucek – handling maintenance contracts (filling Patrick's previous role)
  - lorena.cucek@dot.state.fl.us
- John Lilly – working with Maintaining Agencies
  - john.lilly@dot.state.fl.us
- David is coordinating an update of the D5 Traffic Operations org chart.

## II. ITS DEPLOYMENT TRACKING SURVEY

David Williams presented on the findings of the ITS-JPO's ITS Deployment Tracking Survey, carried out from December 2020 through March 2021.

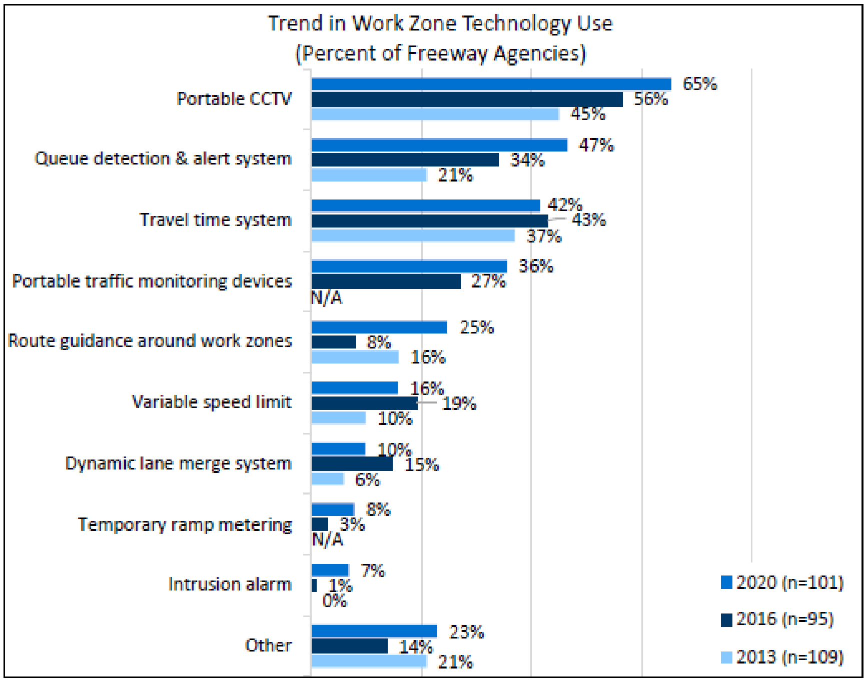
- Survey population – 108 large- and medium-sized metro areas (>50,000 residents)
- Survey results – 578 completed surveys; 68% response rate
- Freeway / Arterial Key Findings
  - Increased ITS safety system usage across all agencies



*2020 Q12* *Source: USDOT*

**Figure 3. Trend in Safety System Technology Use – Freeway Agencies**

- ○ Increased Work Zone technology adoption among freeway agencies

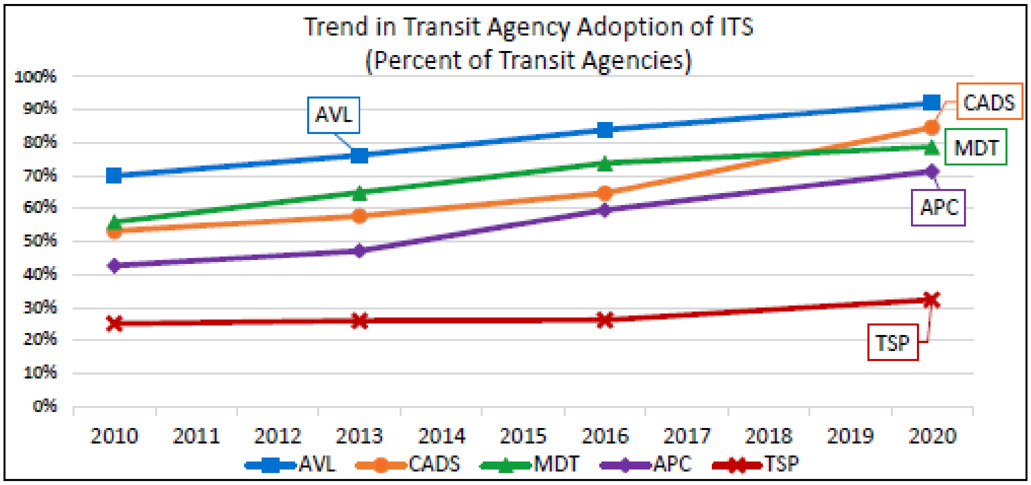


*2020 Q18* *Source: USDOT*

**Figure 4. Trend in Work Zone Technology Use – Freeway Agencies**

- ○ increased pedestrian safety technologies among arterial agencies
- ○ adoption of some technologies is widespread, reflecting their maturity in the market

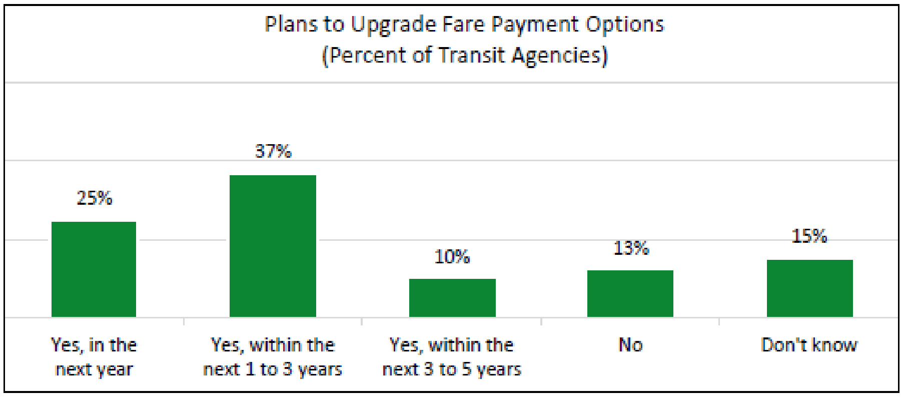
        - inductive loop, video imaging, radar/microwave
    - steady growth in roadside devices (BT, RSU) by arterial agencies
        - 40% have deployed RSUs; 25% have deployed BT probe devices
    - external data sources are widely used (INRIX, HERE, Waze)
- Transit Agency Key Findings
    - increased adoption rates across ITS technologies



*2020 Q2* *Source: USDOT*

**Figure 21. Trend in Transit Agency Adoption of ITS**

    - increased use of DMS
    - mobile app adoption increased substantially
    - partnerships have increased with ride-hailing, taxi, and other private transportation providers since 2016
    - 72% of transit agencies have plans to upgrade fare payment options within 5 years

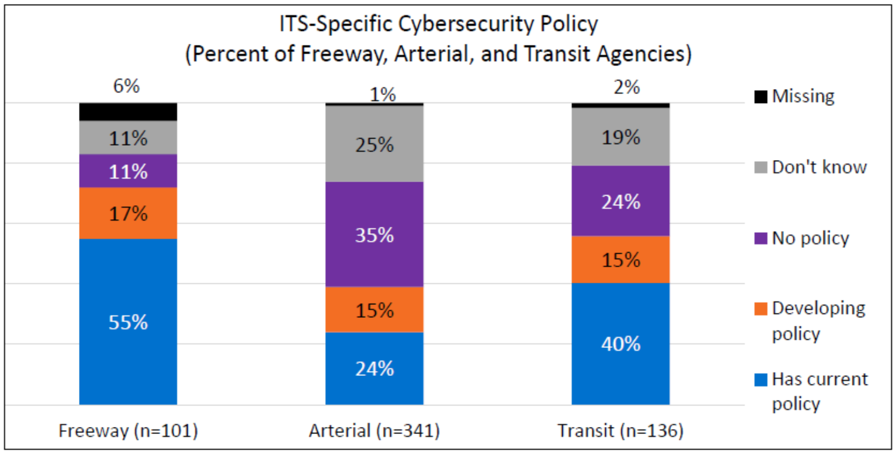


*2020 Q10; (n=136)* *Source: USDOT*

**Figure 27. Plans to Upgrade Fare Payment Options – Transit Agencies**

    - 54% report using real-time standards (e.g., GTFS-RT)

- Other Key Findings
  - ICM adoption has increased; 21% of freeway agencies have ICM deployments, and 46% have plans to deploy ICM strategies and technologies
    - due to the length of the survey, the did not include follow-up questions inquiring about the ICM strategies/technologies used
  - Approximately 72% of freeway agencies have an ITS-specific cybersecurity policy or are developing a policy; only 39% of arterial agencies have a policy or are developing one



*2020 Freeway Q29, Arterial Q33, Transit Q23* *Source: USDOT*

**Figure 30. ITS-Specific Cybersecurity Policy – Freeway, Arterial and Transit Agencies**

  - Approximately 18% of freeway agencies, 18% of transit agencies, and 10% of arterial agencies <u>have experienced a cybersecurity event within the last 3 years</u> that affected their IT systems and/or transportation operations

Discussion:

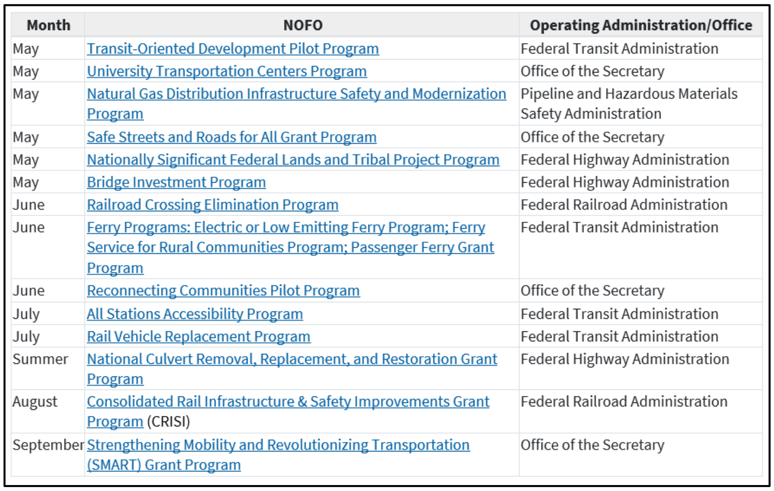
- **Q**: Eric Hill – This only shows deployment usage; did it show effectiveness at all?
  - **A**: this specific survey only focuses on usage; it does not discuss effectiveness
  - Jeremy – there is a repository where USDOT allows agencies to provide reviews

## III. FDOT GRANT PROCESS – UPDATE

Jeremy Dilmore and David Williams discussed the updated FDOT process for pursuing federal grant programs.

- The *Bipartisan Infrastructure Law* established a variety of new federal grant programs for local and state agencies to pursue
- there are 34 anticipated grant opportunities
- Requires a match – grants will cover 50% to 80% of project cost
  - RRR is a good mechanism to match using FDOT funds
- This is a five-year program with an option to extend five more years
- Focus on Resiliency, Safety, Equity, Innovation

- FDOT Central Office has established a process to pursue these grant programs if FDOT is submitting (if non-FDOT agencies are submitting for a grant, they do not have to follow this process)
    - FDOT CO receives NOFO; has 2 weeks to prepare a benefit-cost analysis and application
        - Goal to have projects identified before NOFO is released
        - FDOT priority = construction-ready projects that avoid right-of-way and environmental concerns
        - FDOT CO focusing on currently funded projects
            - if grant gets awarded, FDOT can reallocated the programmed funds for another project within the same jurisdiction
    - FDOT submits project BCA/application to Governor's Office for review and approval (takes between 2 to 6 weeks)
    - FDOT can typically only submit 3 total applications per grant opportunity across the entire state
- If Local Agencies are submitting:
    - have the entire NOFO schedule to prepare and submit application
    - can submit for any phase (Planning, R/W, etc.)
    - BCA/Application has a cost average of $40,000 per application, due to BCA work effort
    - can coordinate with FDOT regarding lessons learned, letter of support, and other support
- FDOT District 5 contact – Todd Davis (todd.davis@dot.state.fl.us)
- who leads the project is based on likelihood of award
- District 5 is preparing 2-pagers of identified projects
- FDOT Internal Coordination = Jeremy Dilmore → Todd Davis → Alison Stettner
- District 5 Queued Projects
    - Altamonte Springs – Gateway AV Shuttle
    - LYNX Downtown Circulator
    - LYNX EV Infrastructure Project
    - Smart Space Coast Project
    - Volusia Beach Management
    - Smart I-75
- Please let us know if you have any upcoming projects in mind



| Month | NOFO | Operating Administration/Office |
|---|---|---|
| May | Transit-Oriented Development Pilot Program | Federal Transit Administration |
| May | University Transportation Centers Program | Office of the Secretary |
| May | Natural Gas Distribution Infrastructure Safety and Modernization Program | Pipeline and Hazardous Materials Safety Administration |
| May | Safe Streets and Roads for All Grant Program | Office of the Secretary |
| May | Nationally Significant Federal Lands and Tribal Project Program | Federal Highway Administration |
| May | Bridge Investment Program | Federal Highway Administration |
| June | Railroad Crossing Elimination Program | Federal Railroad Administration |
| June | Ferry Programs: Electric or Low Emitting Ferry Program; Ferry Service for Rural Communities Program; Passenger Ferry Grant Program | Federal Transit Administration |
| June | Reconnecting Communities Pilot Program | Office of the Secretary |
| July | All Stations Accessibility Program | Federal Transit Administration |
| July | Rail Vehicle Replacement Program | Federal Transit Administration |
| Summer | National Culvert Removal, Replacement, and Restoration Grant Program | Federal Highway Administration |
| August | Consolidated Rail Infrastructure & Safety Improvements Grant Program (CRISI) | Federal Railroad Administration |
| September | Strengthening Mobility and Revolutionizing Transportation (SMART) Grant Program | Office of the Secretary |

Discussion:

- **Q**: Jon Cheney – Up to the local agency to make entire match?
    - **A**: depends on each project
- **Q**: Jon – what is the timeline for the letter of support?
    - A: depends on Governor's Office; Alison meets with leadership often
    - Jeremy – plan on it taking at least one month

- **Q**: Jon – Do we draft the letter of support for FDOT?
    - Jeremy – it will make things go much quicker

## IV. TAKING TIME TO FLEX

David Williams briefly discussed the TSMO eLearning platform FLEX.

- What's new?
    - Updated design
    - New courses available
        - Computer Security Awareness
        - I-4 Express Gate
        - Drones and Traffic Management (workshop)
    - Active Users – 330
    - Courses completed – 248
    - Most popular course – Traffic Signal Training (A)
- Upcoming courses
    - Adaptive Signal Control Technology (ASCT) Training
    - ITS CEI Dynamic Message Sign
    - ITS CEI Road Weather Information System
    - Manual on Uniform Traffic Studies (MUTS)
- If you have a training from a vendor upcoming, and are okay with it, we'd like to record it and post it on the FLEX Portal

Discussion:

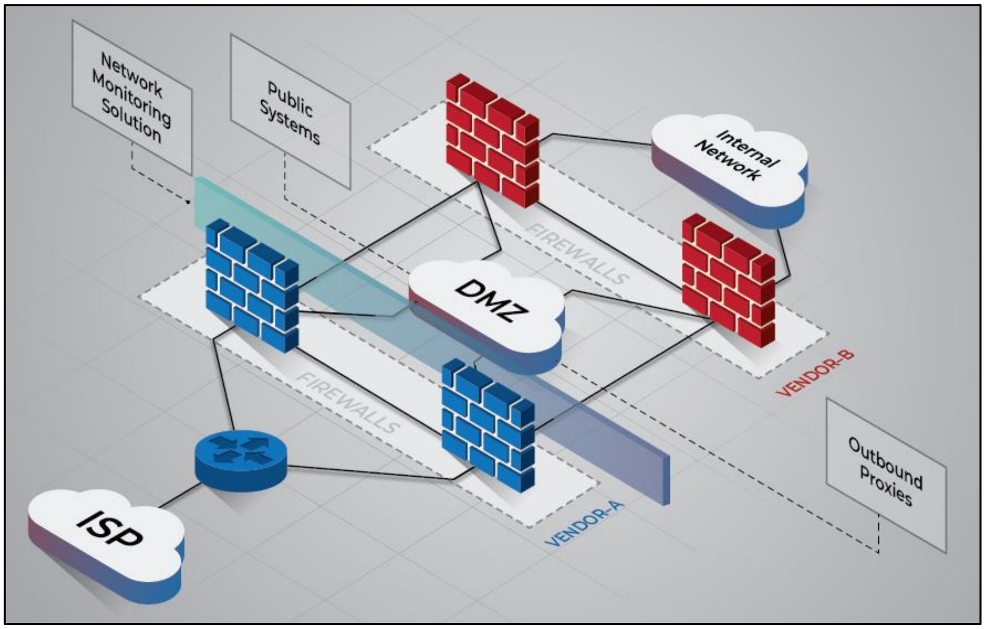
- **Q**: Are certificates provided upon completing a course?
    - **A**: There is a notice of completion. Certificates may be part of future enhancements.

## V. NETWORK INFRASTRUCTURE SECURITY GUIDANCE – NSA REPORT

Jeremy Dilmore discussed the National Security Agency's report, *Network Infrastructure Security Guidance*, published March 2022.

- The guidance document provides best practices for overall network security and protection of individual network devices
- the guidance provided is typically generic and can be applied to many types of network devices
    - however, it includes sample commands for Cisco Internetwork Operating System (IOS) devices to implement recommendations
- NSA fully supports the **Zero Trust** security model
    - assumes threats may exist inside/outside traditional network boundaries
    - set of system design principles
    - coordinated cybersecurity and system management strategy
- However, this report is focused on mitigating common vulnerabilities and weaknesses on existing networks

- Best Practices and Guiding Principles (more detail provided in the report and PowerPoint slides)
  - Network Design
    - Implement multiple defensive layers
      - each layer should use different vendors to protect from an attack exploiting the same unpatched vulnerability



    - Group similar network systems
    - Remove all backdoor connections
    - Utilize strict perimeter access controls
    - Implement a network access control (NAC) solution
    - Limit and encrypt virtual private networks (VPN)
    - Verify software and configuration integrity
  - Security Maintenance
    - Maintain proper file system and boot management
    - Maintain up-to-date software and operating systems
    - Stay current with vendor-supported hardware
  - Authentication, Authorization, Accounting (AAA)
    - Implement centralized servers
    - Configure authentication
    - Configure accounting
    - Apply principle of *least* privilege
      - users given lowest privilege level necessary to perform tasks
    - Limit authentication attempts
  - Local Administrator Accounts & Passwords
    - Use unique usernames and account settings (no defaults)
    - Change default passwords
    - Remove unnecessary accounts

        - Employ individual accounts (disable all shared or group admin accounts)
        - Store passwords with secure algorithms
            - NSA recommends to never store passwords as clear text
        - Create strong passwords
        - Utilize unique passwords
        - Change passwords as needed
    - Remote logging and monitoring
        - Enable logging
        - Establish centralized remote log servers
        - Capture necessary log information
        - Synchronize clocks
    - Remote Administration and Network Services
        - Disable clear text administration services
        - Ensure adequate encryption strength for encrypted connections
        - Utilize secure protocols
        - Limit access to services
        - Set acceptable timeout period
        - Enable Transmission Control Protocol (TCP) keep-alive messages
        - Disable outbound connections
        - Remove SNMP read-write community strings
        - Disable unnecessary network services
        - Disable discovery protocols on specific interfaces
        - Proper remote networks administration service configuration
    - Routing
        - Disable IP source routing
        - Enable unicast reverse-path forward (uRPF)
        - Enable routing authentication
    - Interface Ports
        - Disable dynamic trunking
        - Enable port security
        - Disable default VLAN
        - Disable unused ports
        - Disable port monitoring
        - Disable proxy Address Resolution Protocol (ARP)
- District 5 staff will try to hold a basic meeting/call to go over cybersecurity in more detail

## VI. CURRENT INITIATIVES

Jeremy Dilmore briefly provided an update on the current work efforts throughout District Five.

- I4 Ultimate – Express Lanes
    - high growth rates with demand
    - Q: When will congestion pricing be implemented?
        - A: when the congestion warrants increased pricing

    - Lessons Learned – simulated for 1 year; allowed us to fix a lot of issues before they were on the ground
    - PIO successes; emergency response successes
    - Jon – only issue I saw was speed enforcement concerns in school zones
        - SB 410 speed enforcement in school zones (died in Senate)
        - Jeremy – FDOT is not currently looking at this
- PedSafe
    - Working through challenges with transit kiosk visibility
    - LiDAR being integrated with single processor
    - many lessons learned
    - Jeremy – advise reaching out to use before pursuing LiDAR
        - currently have 65% accuracy
- AV Shuttle – working through power/permitting issues
- Kiosks at UCF – to conform to ADA, having issues for visibility of screen for non-ADA people
- Smart Work Zone
    - next step is deployment at a construction project
    - writing up spec for this
    - potentially adding LiDAR (study underway)
- STROZ – operational and ready for training
    - reach out to Jeremy or Tricia for access
- I4 FRAME – NTP expected in August for first set; D5 to follow a few months later
- ATC Controller Changeouts
    - City of Orlando – ~50 intersections remaining
    - Cities of Orange County – all intersections are complete
    - Orange County – ~100 intersections remaining
    - Cubic is deploying their Cubic ATMS
- Siemens – 6 units in Seminole have issues; 113 units in County overall
- TAPs-LA Osceola – DERQ selected for computer vision

## VII. NEXT MEETING

- July 28, 2022

## VIII. ATTACHMENTS

- A – Presentation Slides
- B – Meeting agenda

END OF SUMMARY

*This summary was prepared by David Williams and is provided as a summary (not verbatim) for use by the Consortium Members. The comments do not reflect FDOT's concurrence. Please review and send comments via e-mail to dwilliams@vhb.com so the meeting summary can be finalized.*

# Welcome to the TSM&O Consortium Meeting

May 19, 2022

FDOT TSM&O

Transportation Systems Management & Operations

Transportation Systems Management & Operations

CENTRAL FLORIDA TSM&O CONSORTIUM

# Meeting Agenda

1. Welcome
2. ITS Deployment Tracking Survey – ITS-JPO Report
3. FDOT Grant Process – Update
4. What’s New in the FLEX Training Portal
5. Network Infrastructure Security Guidance – NSA Report
6. Current Initiatives

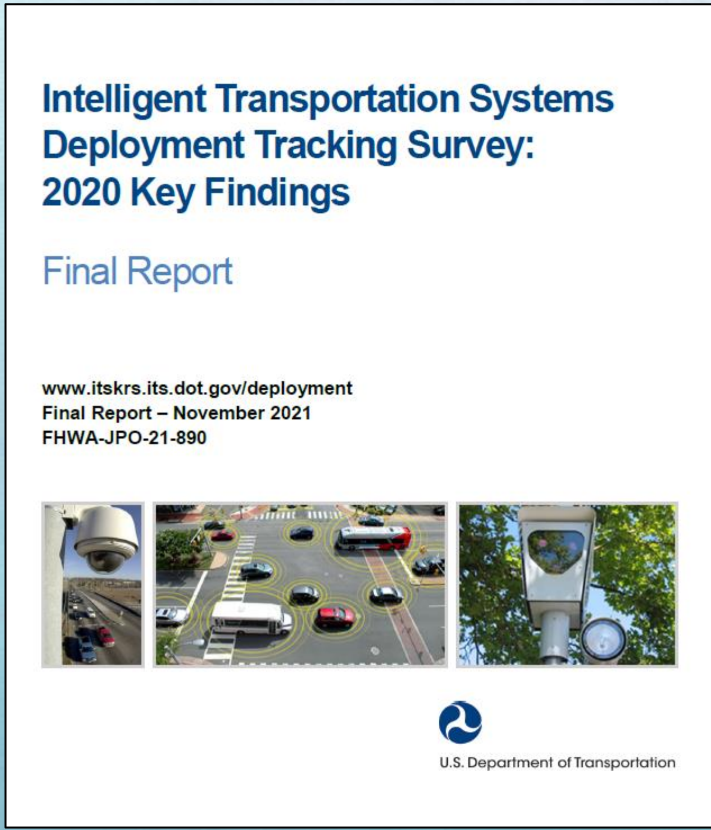
# ITS Deployment Tracking Survey
# ITS-JPO Report

David Williams, VHB

Transportation Systems Management & Operations

# ITS Deployment Tracking Survey

- Since 1997, the Deployment Tracking Survey has been used to collect information on ITS deployments in metro areas
- Survey results enable ITS-JPO to make informed strategic planning decisions
  - ITS deployment gaps
  - ITS deployment planning and execution



Intelligent Transportation Systems Deployment Tracking Survey: 2020 Key Findings

Final Report

www.itskrs.its.dot.gov/deployment
Final Report – November 2021
FHWA-JPO-21-890

U.S. Department of Transportation

# ITS Deployment Tracking Survey

- 2020 DTS: December 2020 through March 2021
- Survey Population:
  - 108 large- and medium-sized metro areas*
- Survey Results
  - 578 completed surveys
  - 68% response rate

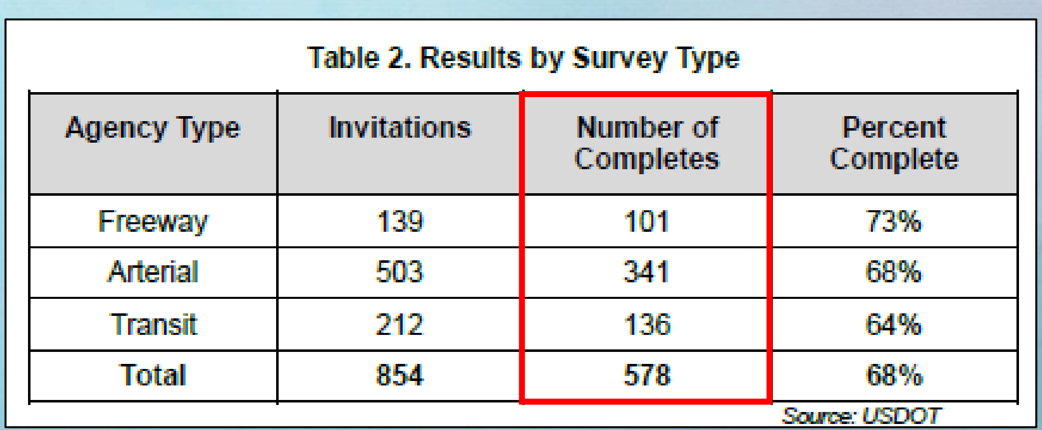


Table 2. Results by Survey Type

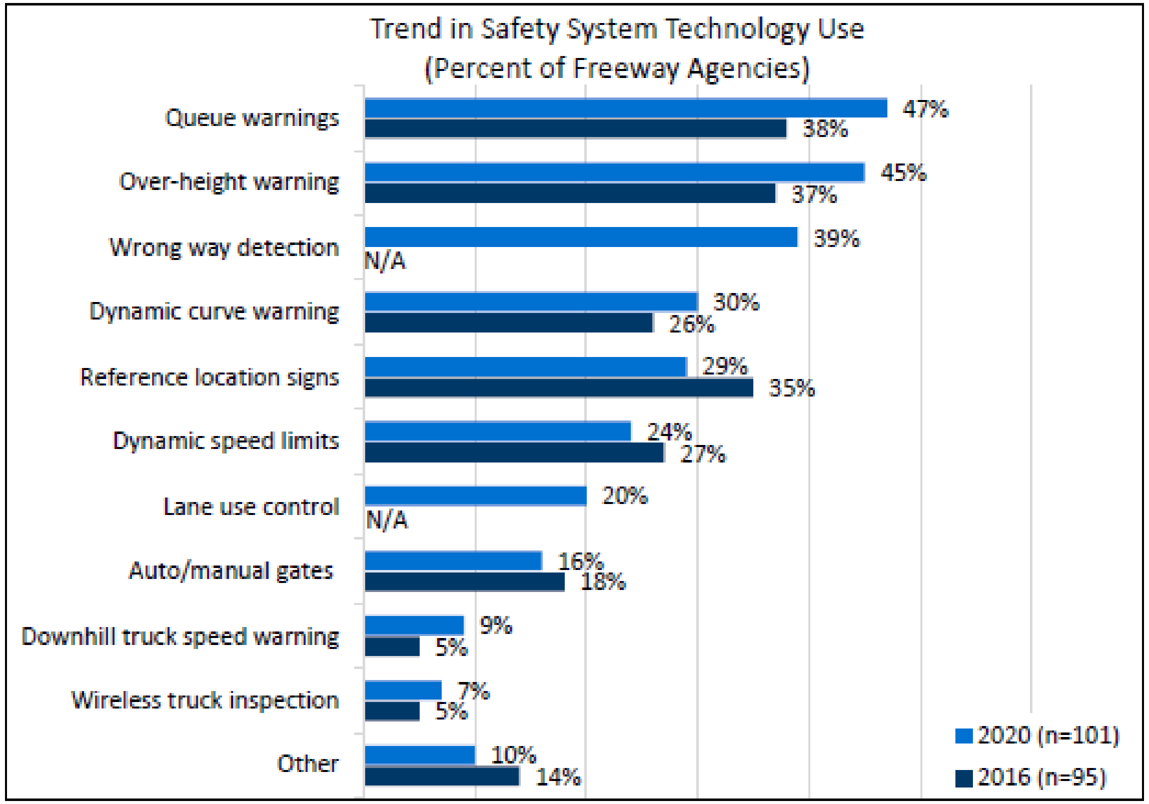
| Agency Type | Invitations | Number of Completes | Percent Complete |
|---|---|---|---|
| Freeway | 139 | 101 | 73% |
| Arterial | 503 | 341 | 68% |
| Transit | 212 | 136 | 64% |
| Total | 854 | 578 | 68% |

*Source: USDOT*

*Metro Areas - > 50,000 residents

# ITS-JPO DTS 2020 – Freeway/Arterial Key Findings

- Increased **ITS safety system** usage across all agencies
  - 85% of freeway agencies use at least one system
  - 50% of all agencies have adopted Queue Warning Systems and Over-height Warning Systems



*2020 Q12* *Source: USDOT*

**Figure 3. Trend in Safety System Technology Use – Freeway Agencies**

# ITS-JPO DTS 2020 – Freeway/Arterial Key Findings

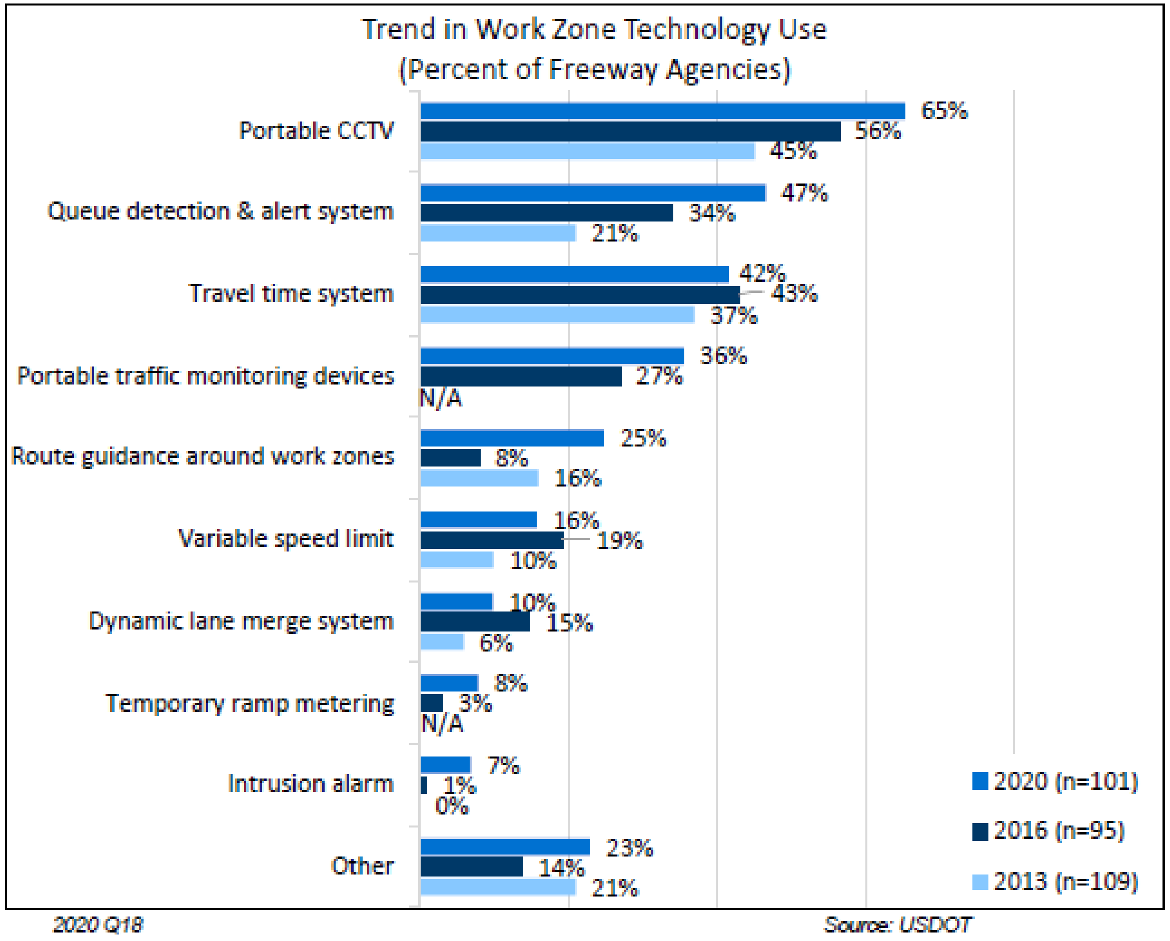
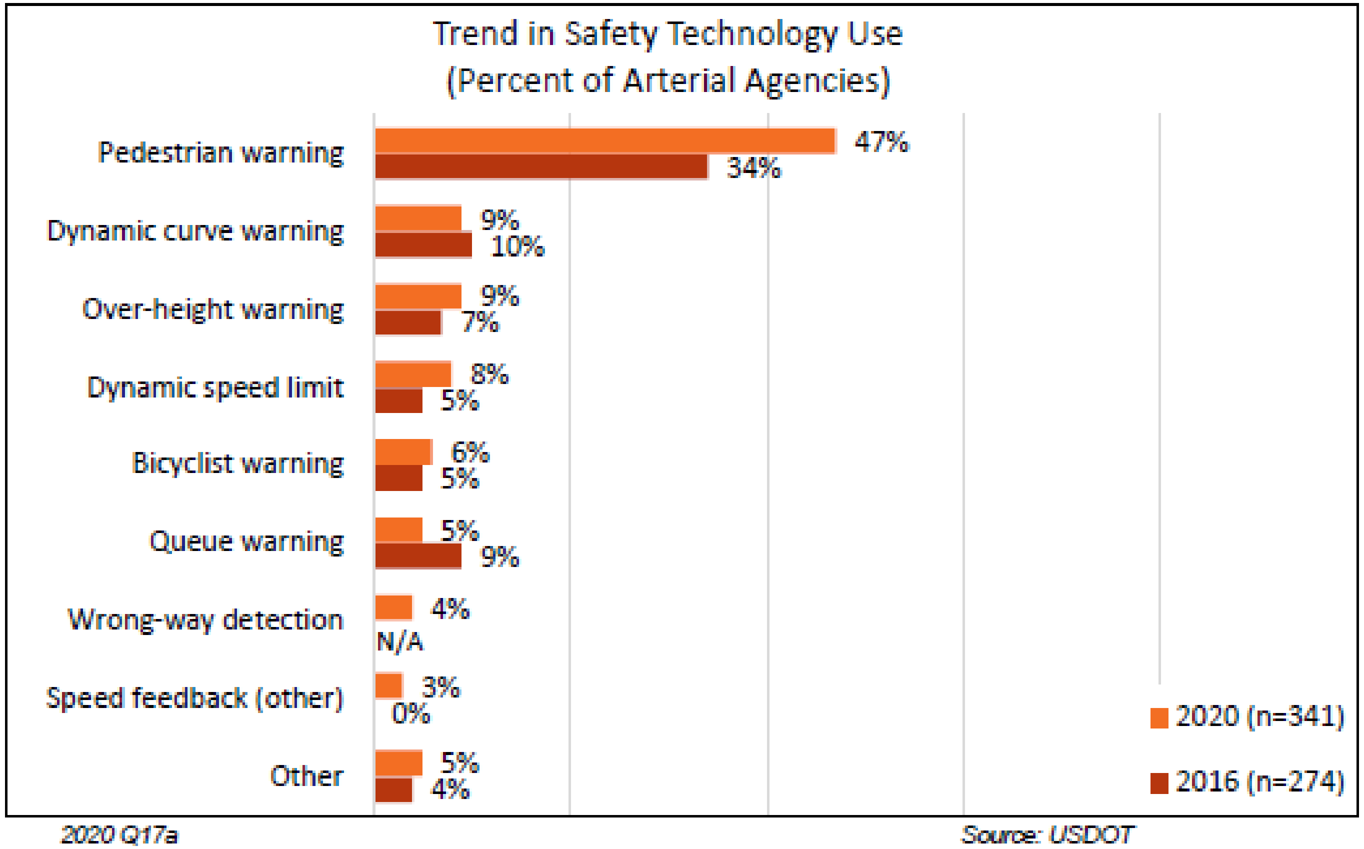


Figure 4. Trend in Work Zone Technology Use – Freeway Agencies

- Increased **Work Zone technology** adoption among freeway agencies
  - 82% of freeway agencies use WZ technologies
  - Key technologies include CCTV, queue detection and alert systems

# ITS-JPO DTS 2020 – Freeway/Arterial Key Findings

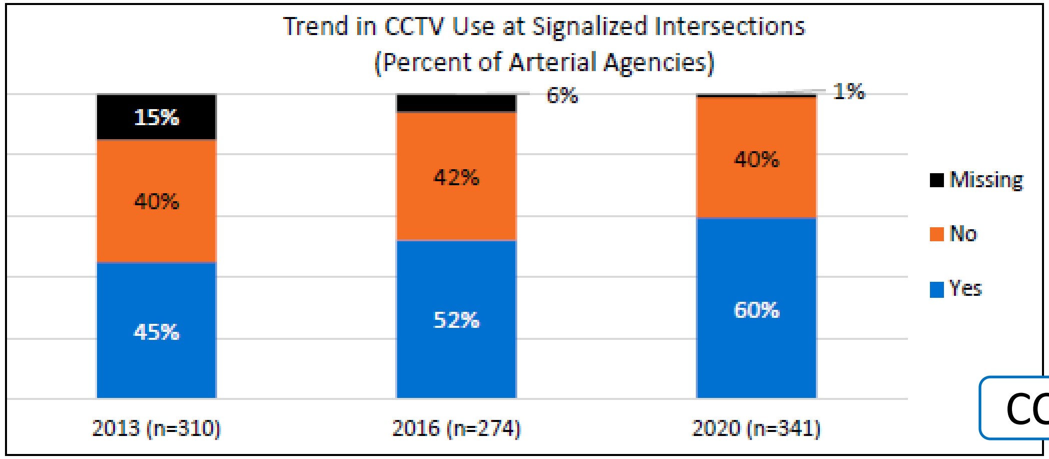
- Increased **pedestrian safety technologies** among arterial agencies
  - 47% of arterial agencies now use pedestrian warning systems



Source: USDOT

Figure 6. Trend in Safety System Technology Use – Arterial Agencies

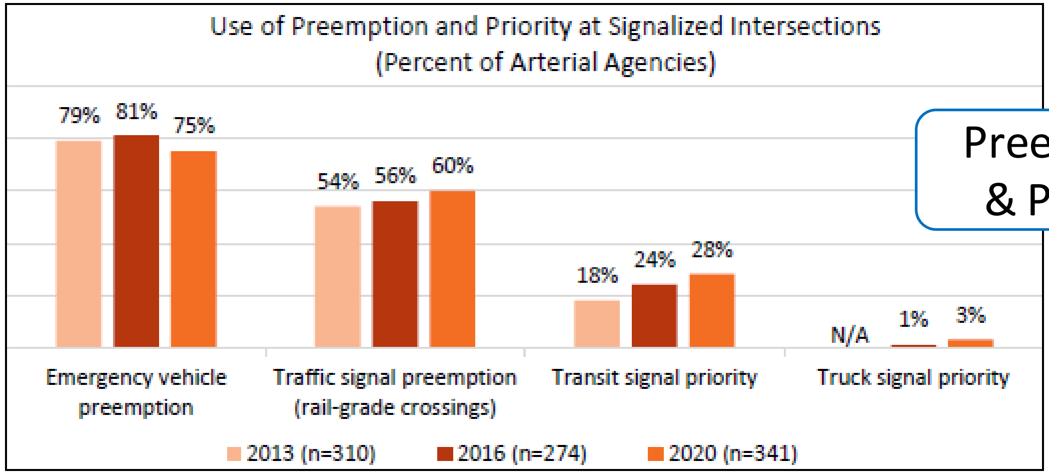
# ITS-JPO DTS 2020 – Freeway/Arterial Key Findings



CCTV

*2020 Q8* *Source: USDOT*

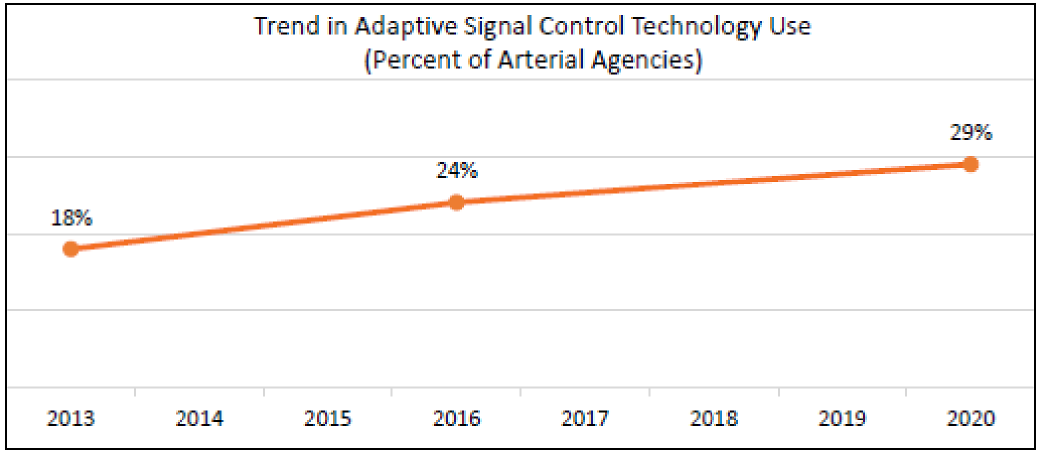
**Figure 9. Trend in CCTV Use at Signalized Intersections – Arterial Agencies**



Preemption & Priority

*2020 Q11* *Source: USDOT*

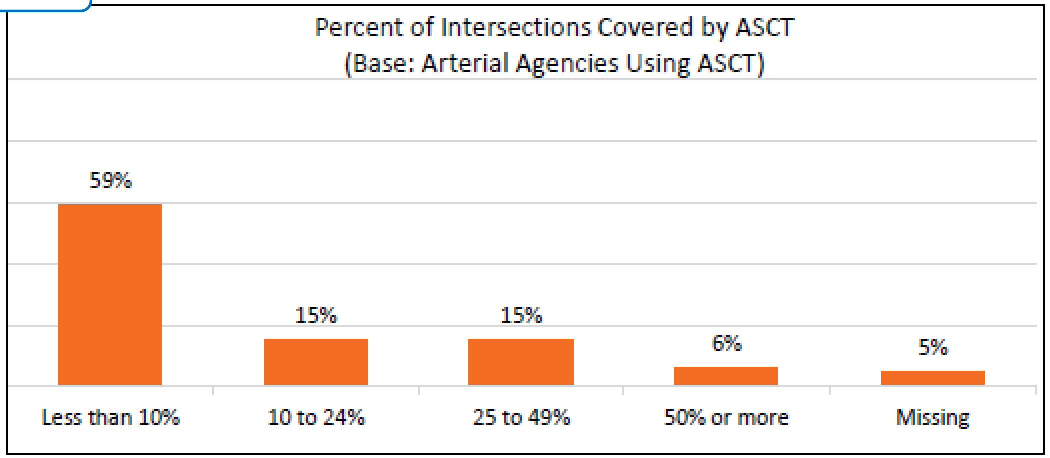
**Figure 10. Use of Preemption and Priority at Signalized Intersections – Arterial Agencies**



*2020 Q9* *Source: USDOT*

**Figure 7. Trend in Adaptive Signal Control Technology Use – Arterial Agencies**

ASCT

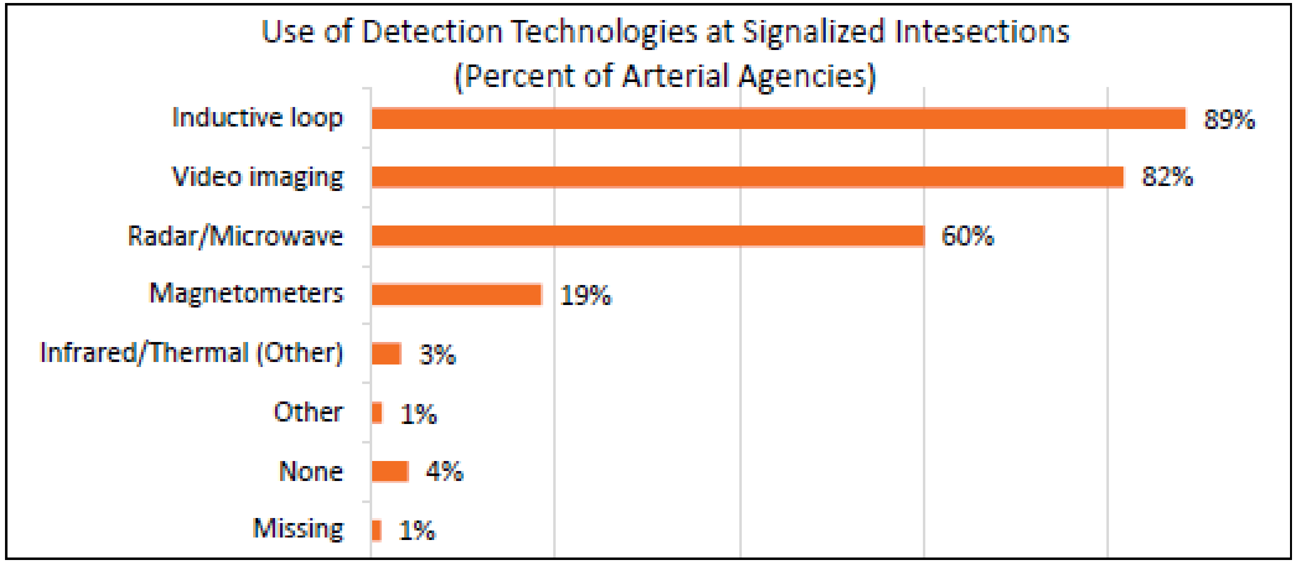


*2020 Q9a; (n=100)* *Source: USDOT*

**Figure 8. Percent of Intersections Covered by ASCT – Arterial Agencies**

# ITS-JPO DTS 2020 – Freeway/Arterial Key Findings

- Adoption of some technologies is widespread, reflecting their maturity in the market
  - 74% of freeway agencies have adopted radar/microwave detection
  - Majority of arterial agencies have adopted inductive loops (89%) and video imaging (82%) to detect traffic at intersections

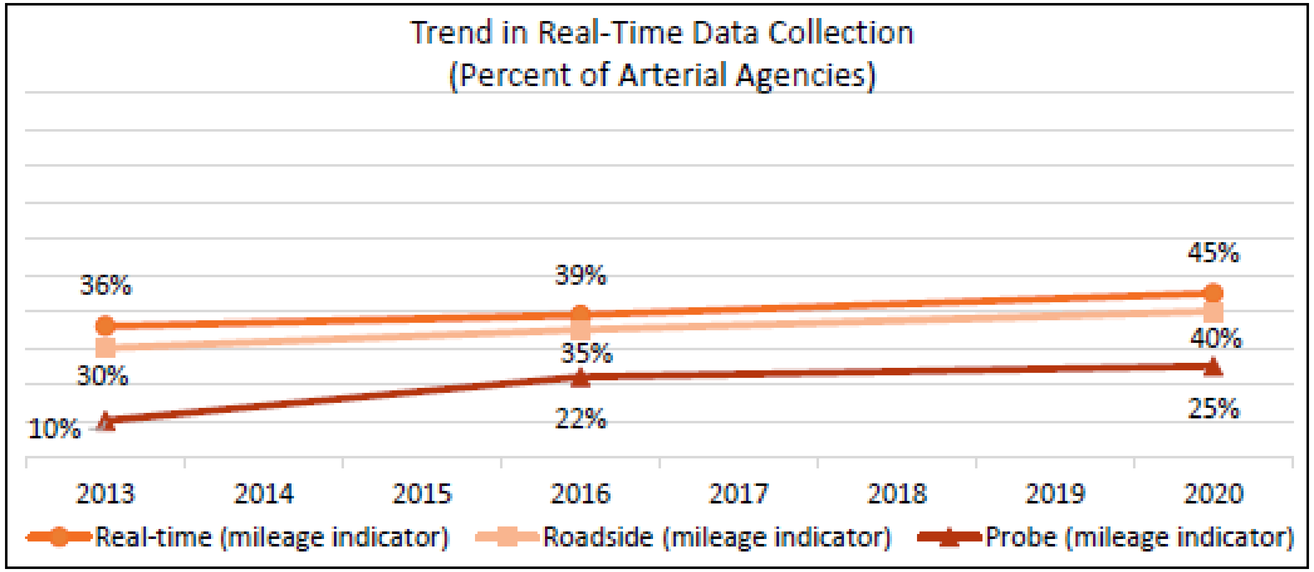


*2020 Q7; (n=341)* *Source: USDOT*

**Figure 13. Use of Detection Technologies at Signalized Intersections – Arterial Agencies**

# ITS-JPO DTS 2020 – Freeway/Arterial Key Findings

- Steady growth in roadside devices (BT, RSU) by arterial agencies
  - 40% have deployed RSUs (30% in 2013)
  - 25% have deployed probe readers (13% in 2013)

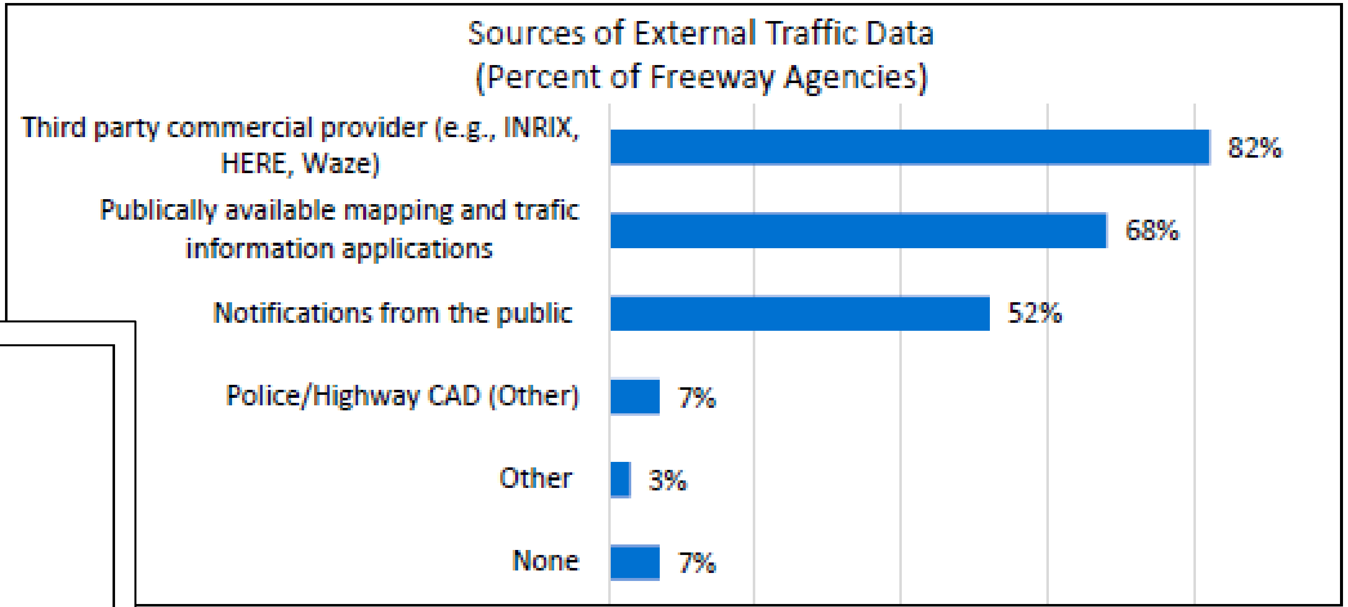


*2020 Q3, Q4, Q5a* *Source: USDOT*

Figure 11. Trend in Real-Time Data Collection – Arterial Agencies

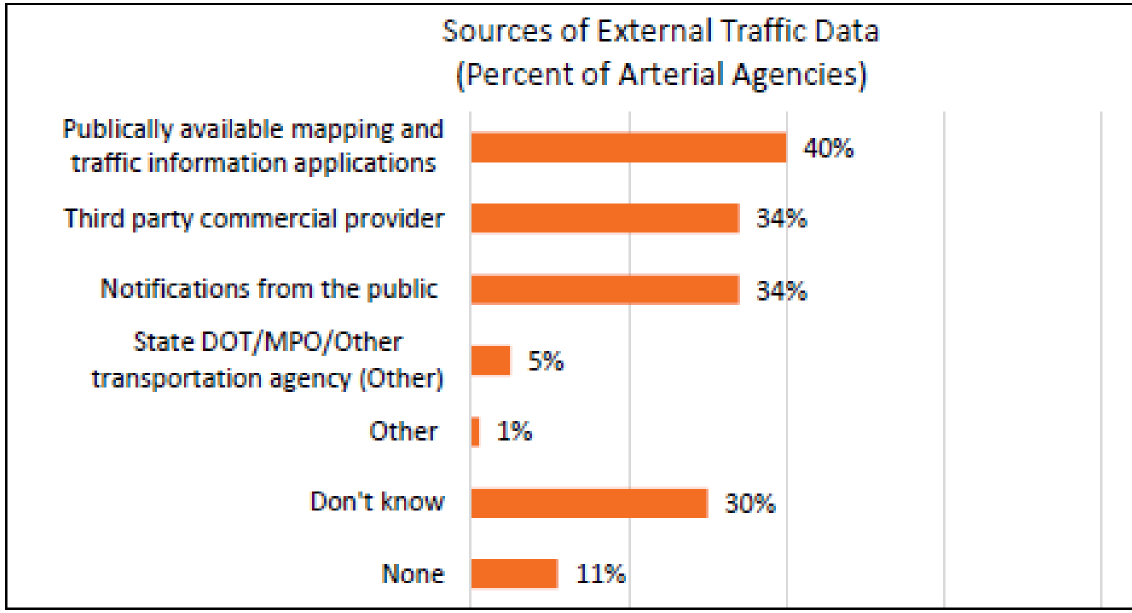
# ITS-JPO DTS 2020 – Freeway/Arterial Key Findings

- External data sources are widely used
  - 93% of freeway agencies
  - 59% of arterial agencies



5; (n=101) Source: USDOT

Figure 17. Sources of External Traffic Data – Freeway Agencies

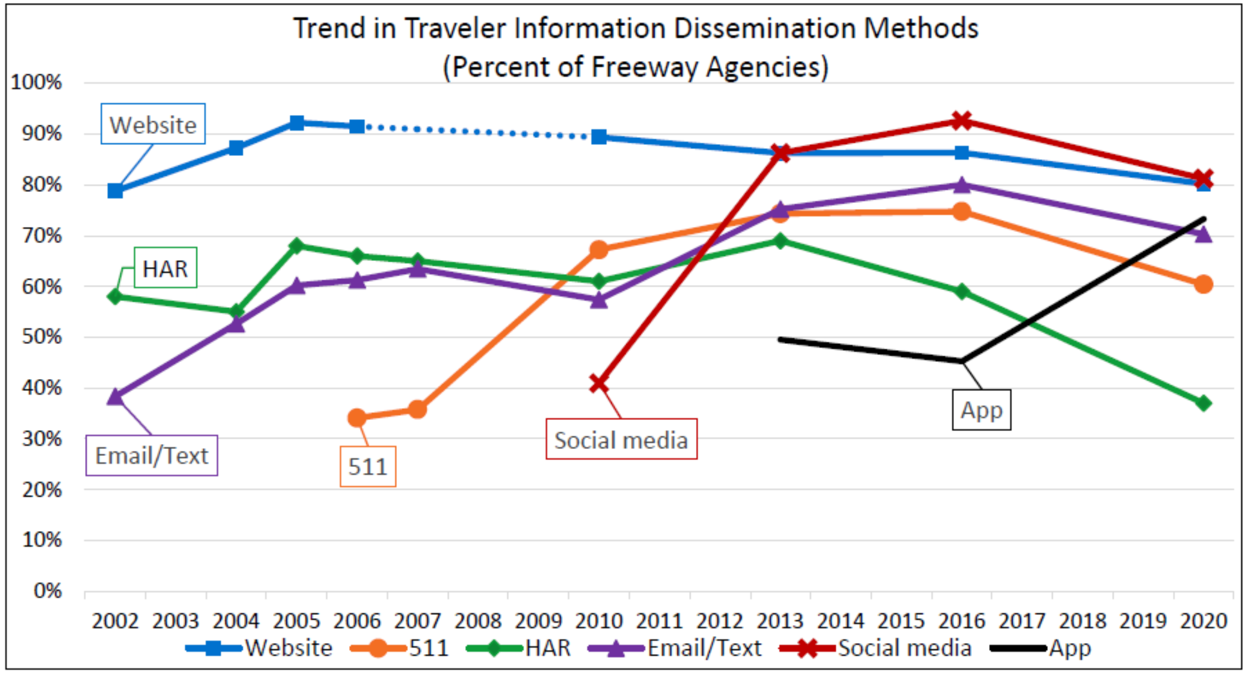


2020 Q6; (n=341) Source: USDOT

Figure 18. Sources of External Traffic Data – Arterial Agencies

# ITS-JPO DTS 2020 – Freeway/Arterial Key Findings

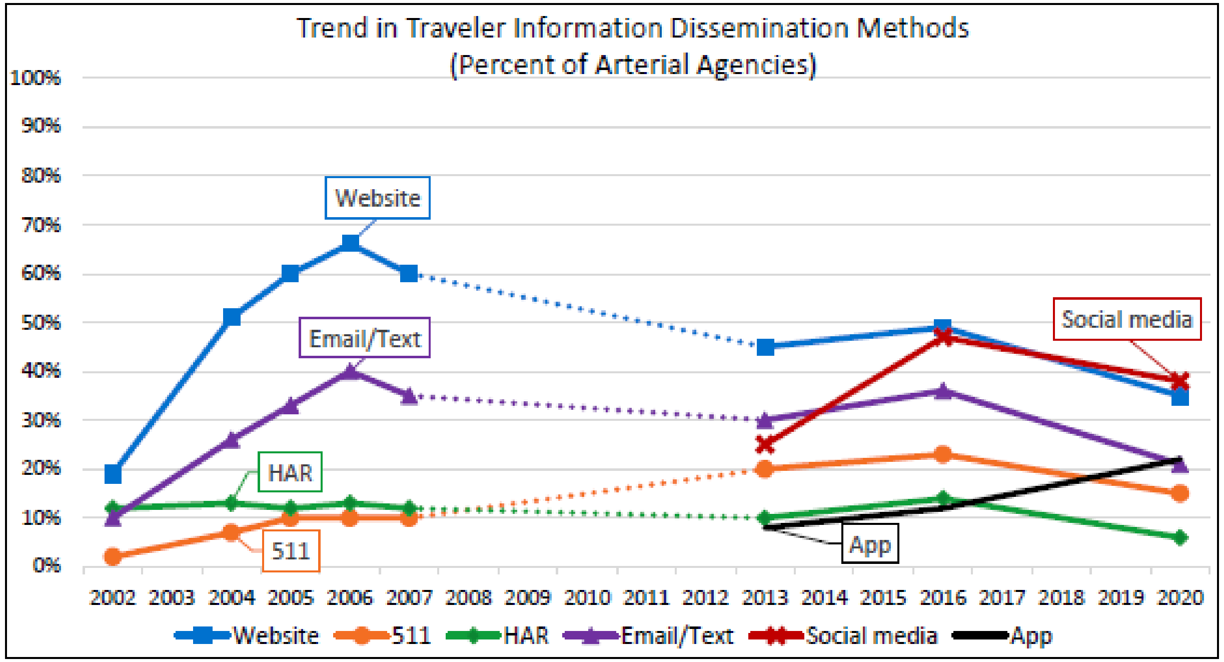
- Traveler Information methods are shifting



*2020 Q20* *Source: USDOT*

*NOTE: In 2007 "websites" was not a response option, so data for that survey year were imputed, as represented by the dashed lines for websites between 2006 and 2010.*

**Figure 19. Trend in Traveler Information Dissemination Methods – Freeway Agencies**



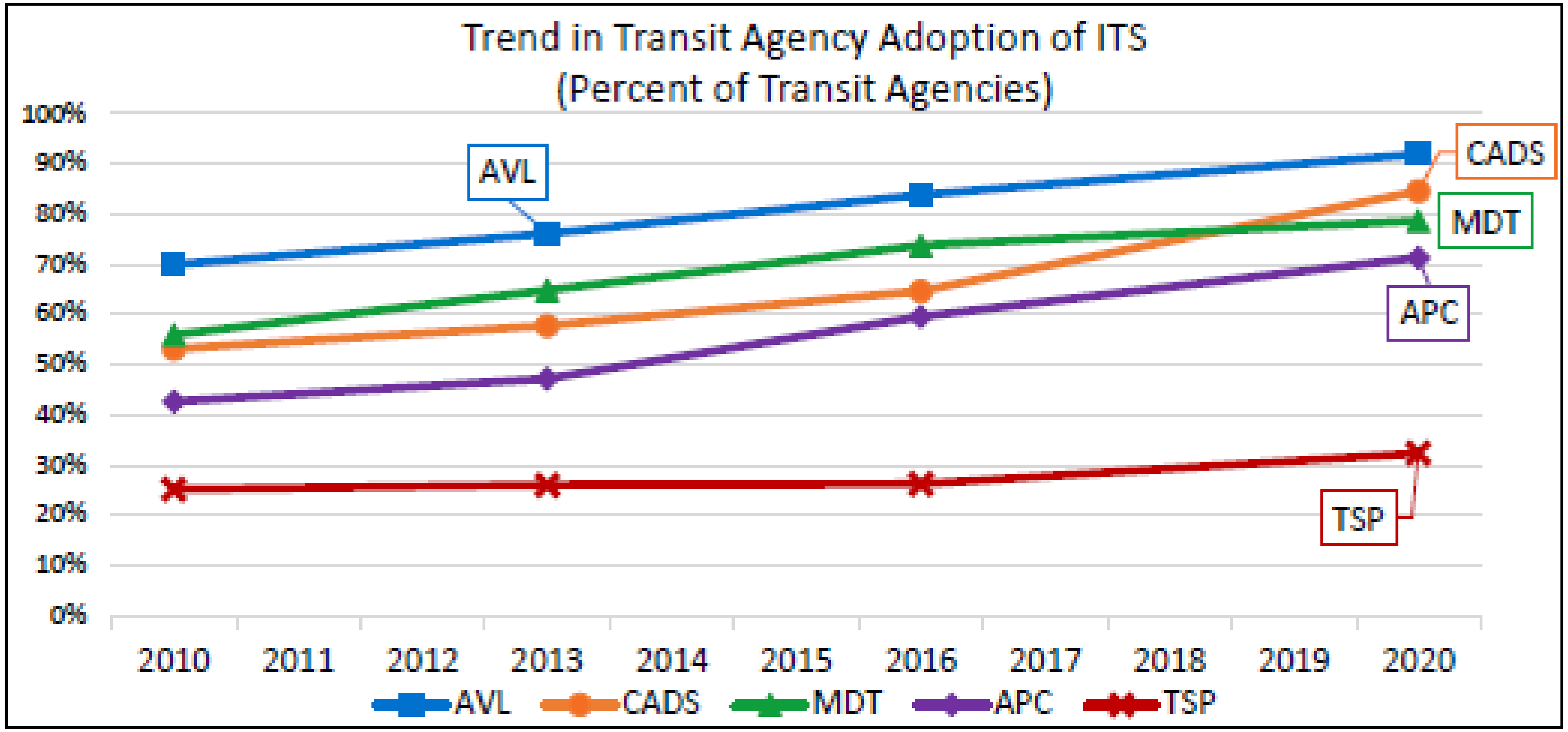
*2020 Q25* *Source: USDOT*

*NOTE: Dashed lines indicate data are not available or are not comparable*

**Figure 20. Trend in Traveler Information Dissemination Methods – Arterial Agencies**

# ITS-JPO DTS 2020 – Transit Agency Key Findings

- Increased adoption rates across ITS technologies



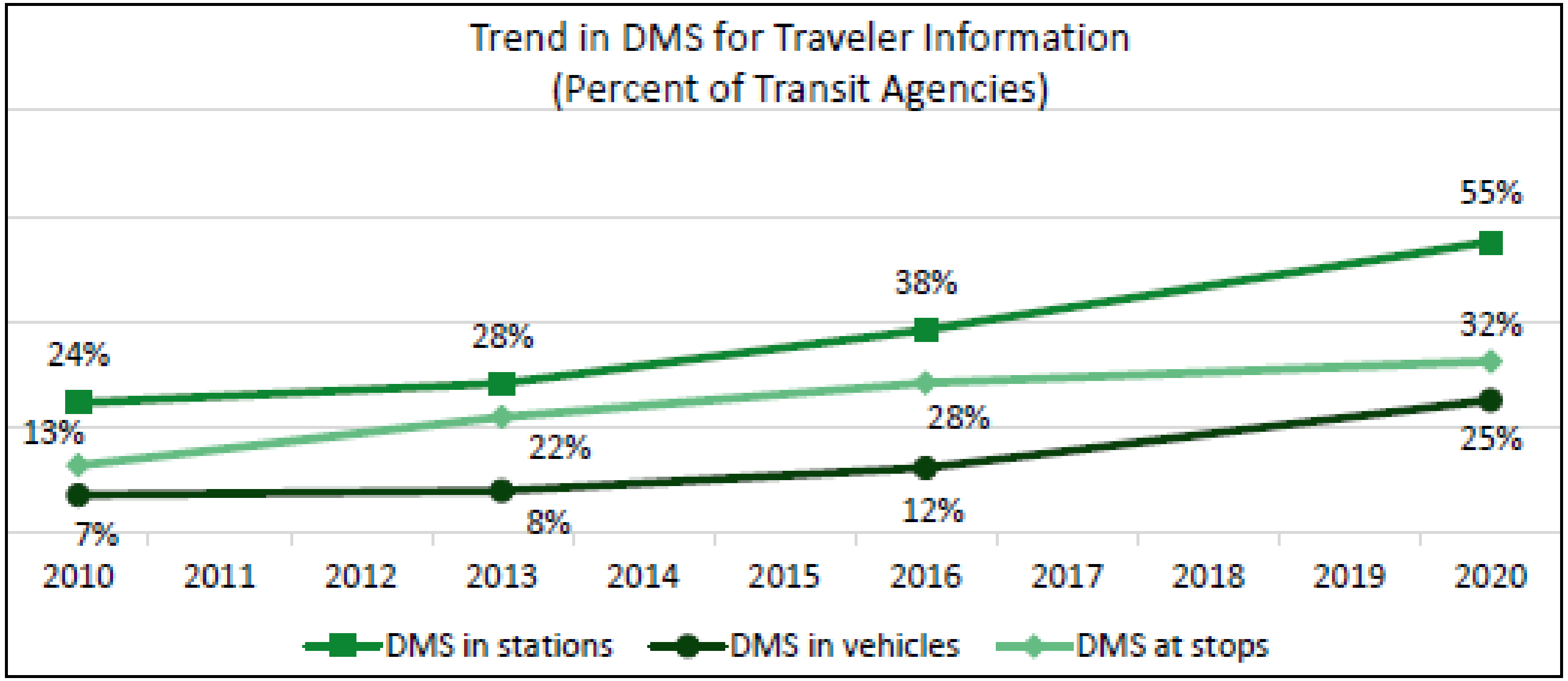
*2020 Q2*

*Source: USDOT*

**Figure 21. Trend in Transit Agency Adoption of ITS**

# ITS-JPO DTS 2020 – Transit Agency Key Findings

- Increased use of Dynamic Message Signs

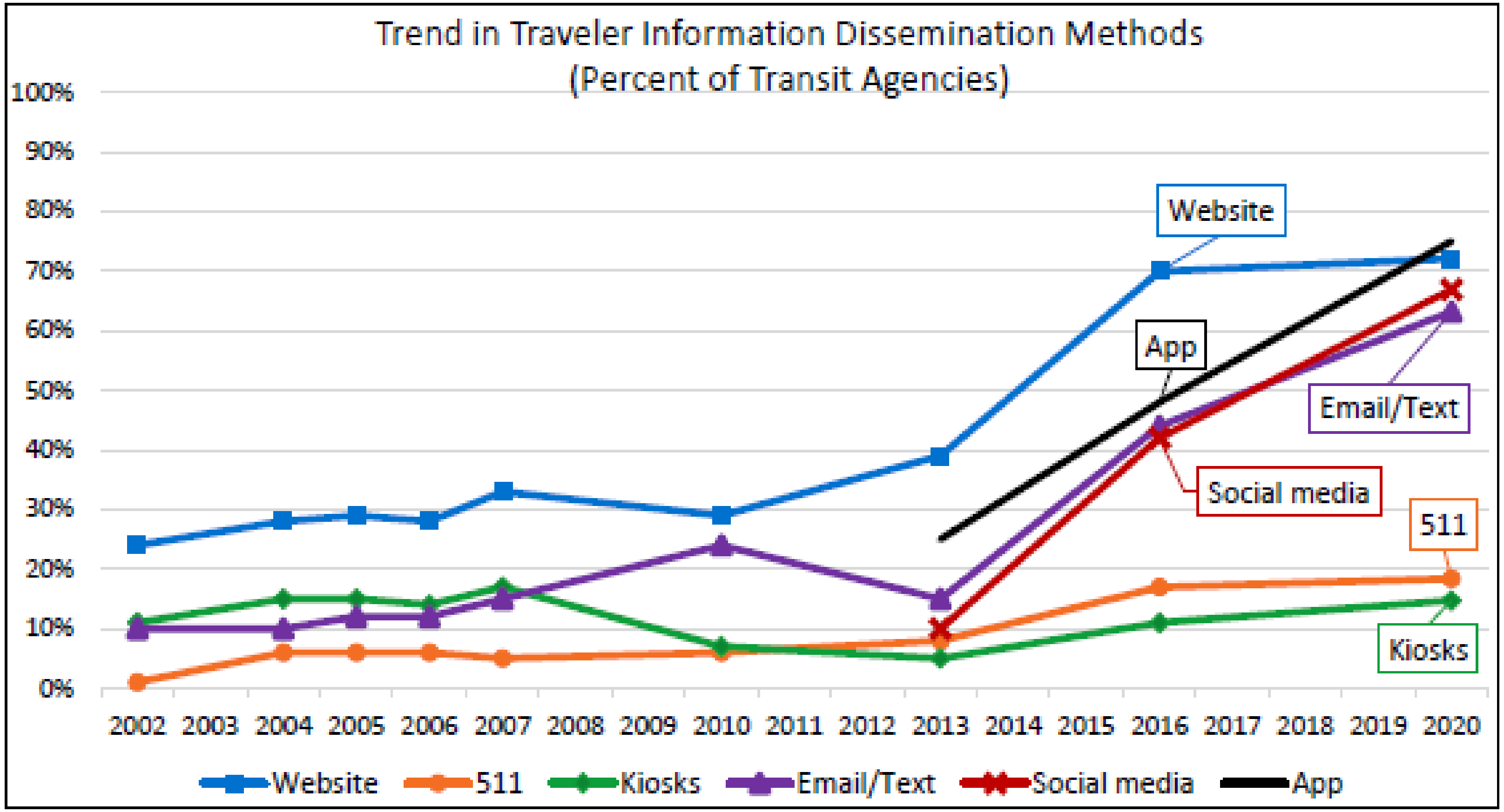


*2020 Q6* *Source: USDOT*

**Figure 25. Trend in DMS for Traveler Information – Transit Agencies**

# ITS-JPO DTS 2020 – Transit Agency Key Findings

- Mobile app adoption increased substantially



*2020 Q6*

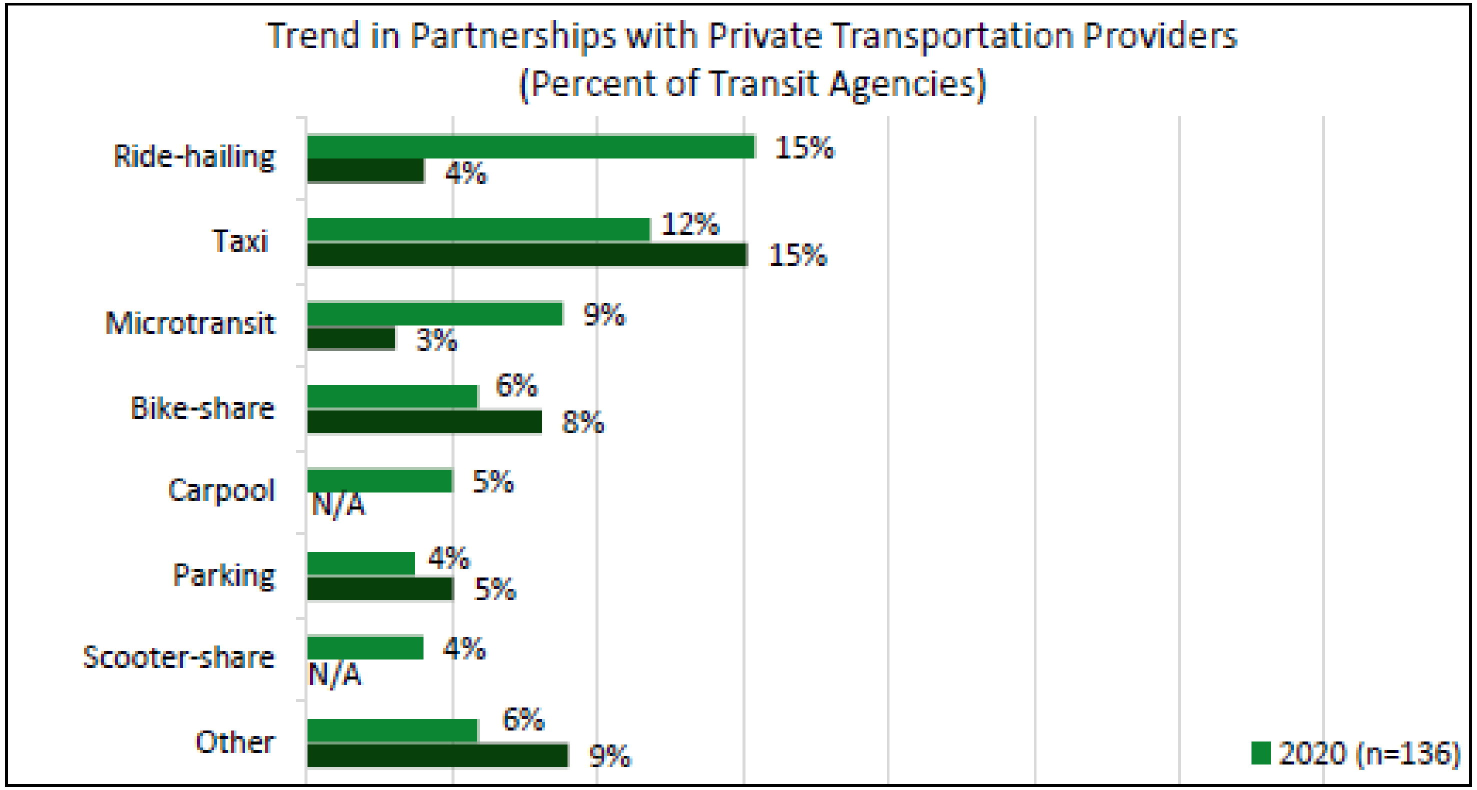
*Source: UDSOT*

**Figure 24. Trend in Traveler Information Dissemination Methods – Transit Agencies**

Transportation Systems Management & Operations

# ITS-JPO DTS 2020 – Transit Agency Key Findings

- Partnerships have increased since 2016



Trend in Partnerships with Private Transportation Providers
(Percent of Transit Agencies)

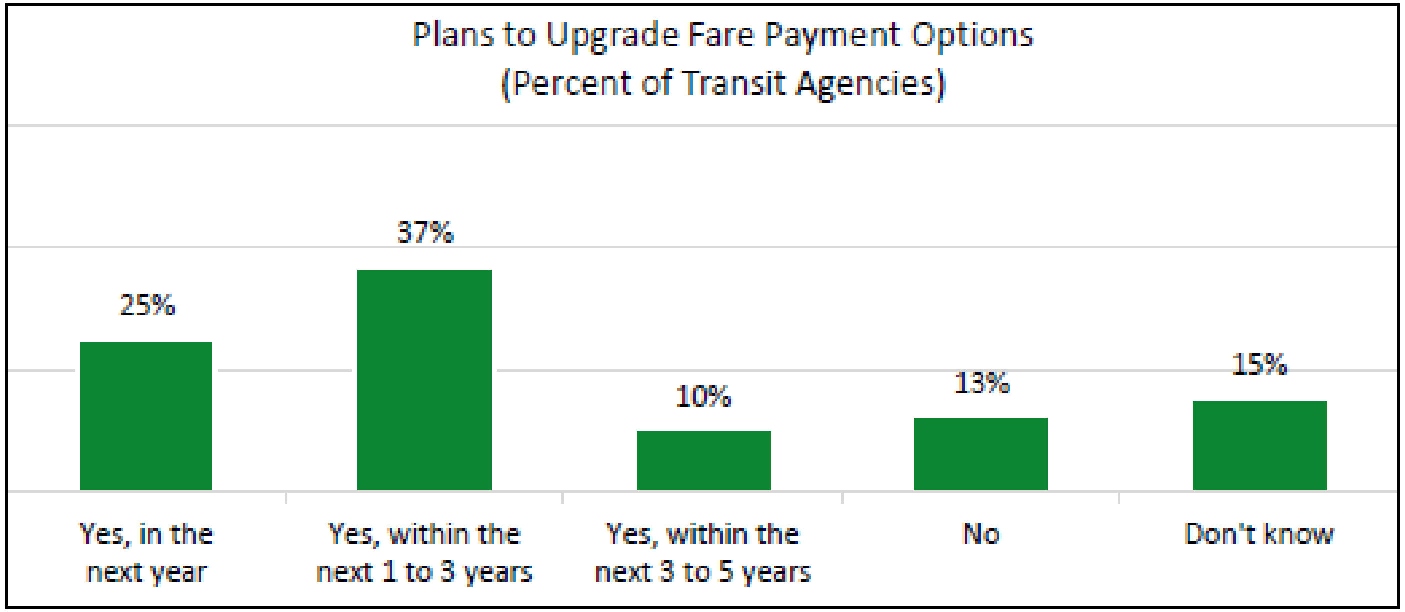
*2020 Q12*

*Source: USDOT*

**Figure 26. Trend in Partnerships with Private Transportation Providers – Transit Agencies**

# ITS-JPO DTS 2020 – Transit Agency Key Findings

- 72% of transit agencies have plans to upgrade fare payment options within 5 years

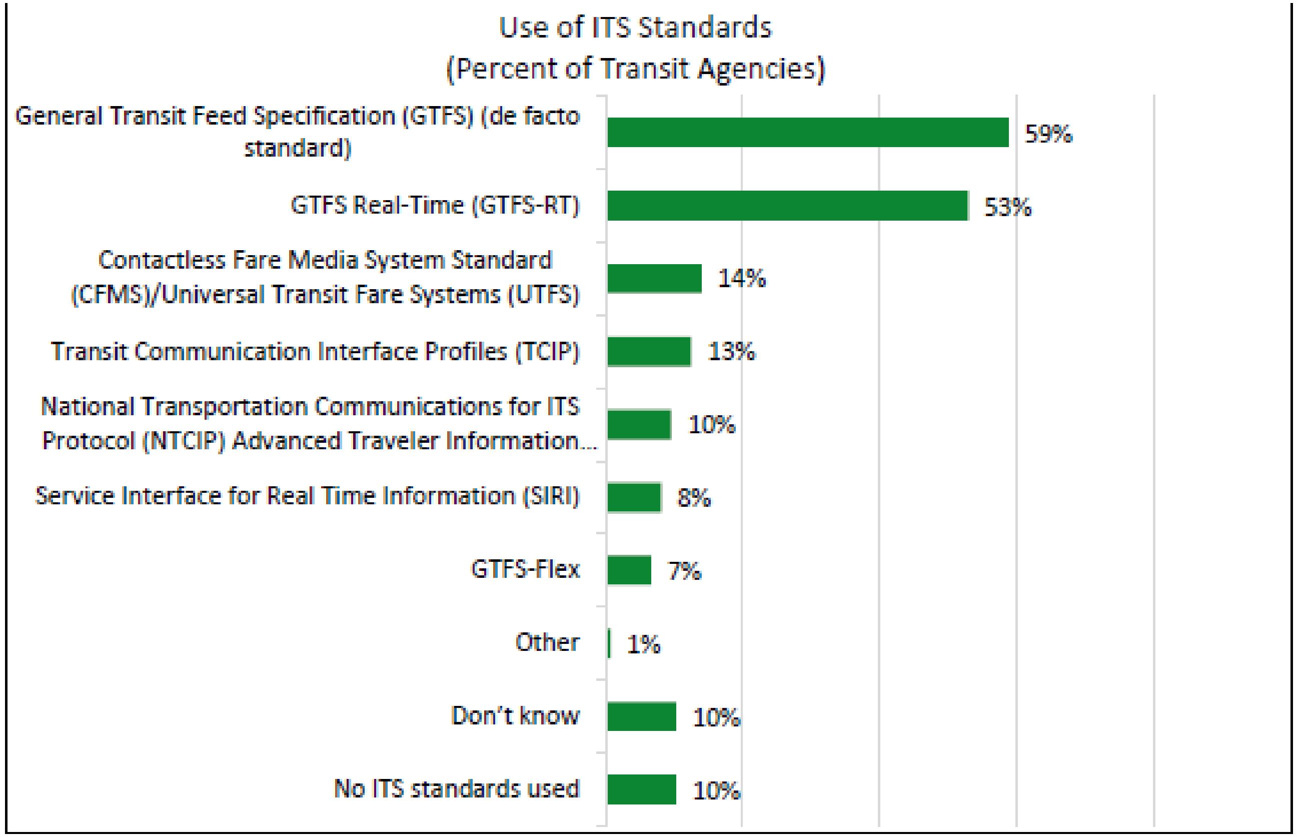


*2020 Q10; (n=136)* *Source: USDOT*

**Figure 27. Plans to Upgrade Fare Payment Options – Transit Agencies**

# ITS-JPO DTS 2020 – Transit Agency Key Findings

- 54% report using real-time standards
  - Jumps to 70% for agencies reporting real-time data to mobile apps

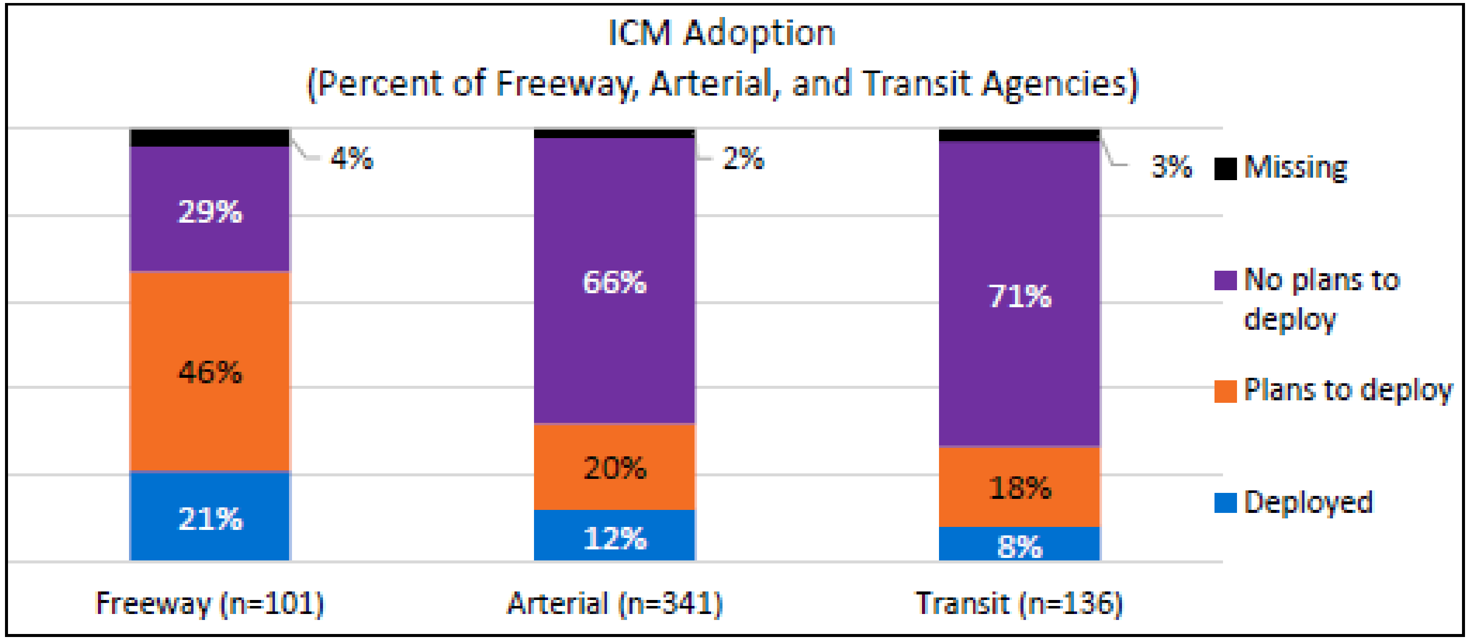


*2020 Q33; (n=136)* *Source: USDOT*

**Figure 28. Use of ITS Standards – Transit Agencies**

# ITS-JPO DTS 2020 – Other Takeaways

- Integrated Corridor Management adoption



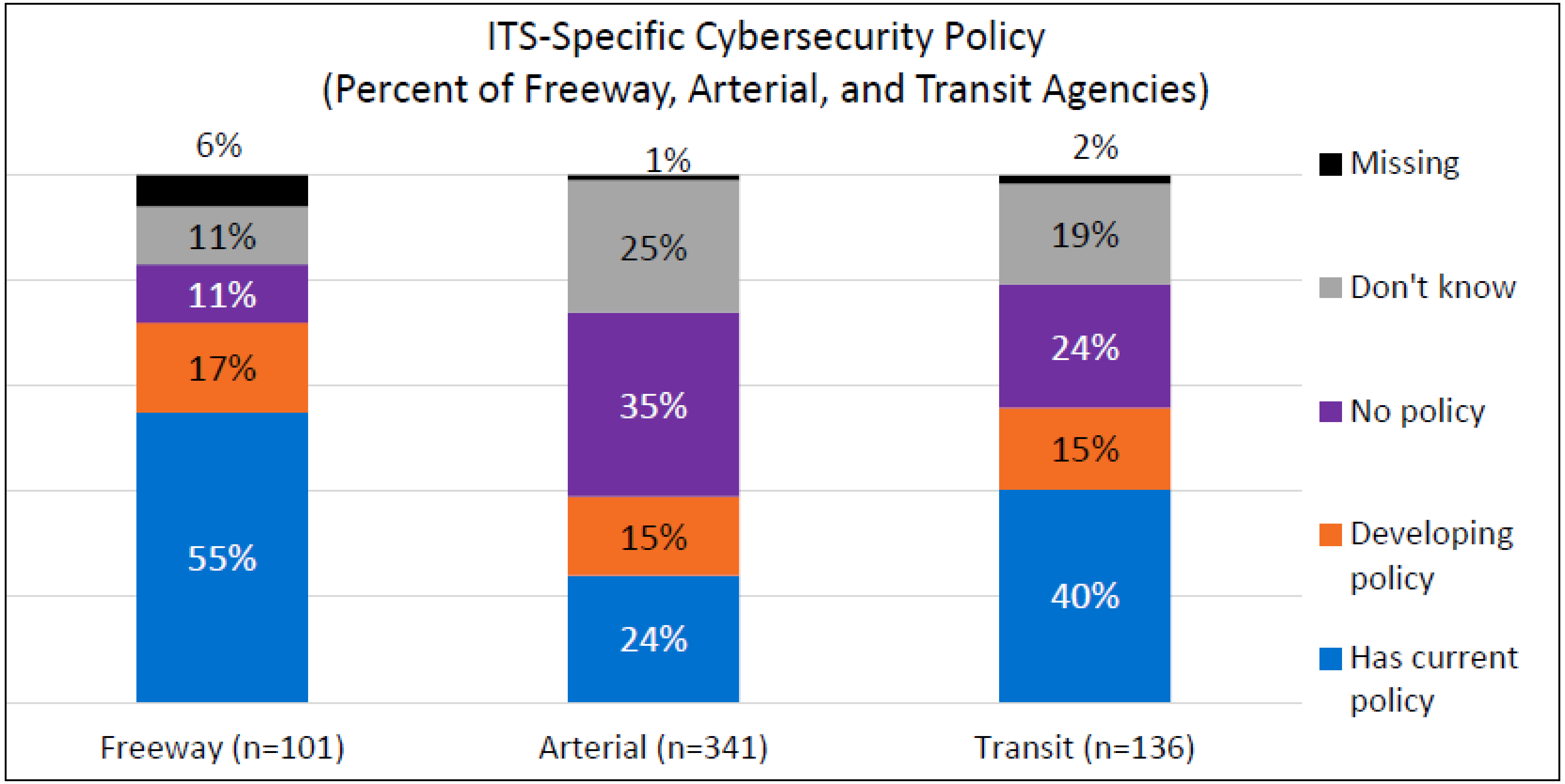
*2020 Freeway Q23, Arterial Q28, Transit Q15* *Source: USDOT*

**Figure 29. ICM Adoption – Freeway, Arterial, and Transit Agencies**

- Due to the length of the survey, they did not include follow-up questions relating to the ICM strategies/technologies deployed

# ITS-JPO DTS 2020 – Other Takeaways

- Cybersecurity Policy

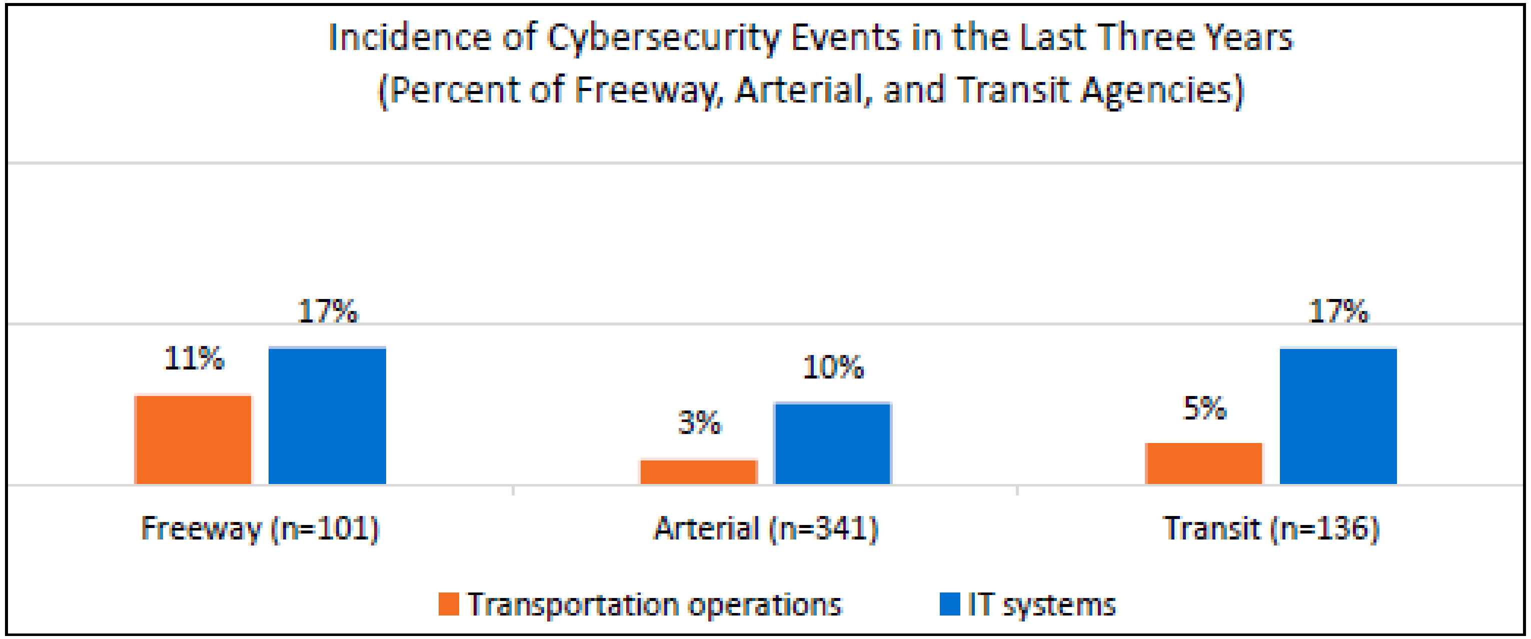


*2020 Freeway Q29, Arterial Q33, Transit Q23* *Source: USDOT*

**Figure 30. ITS-Specific Cybersecurity Policy – Freeway, Arterial and Transit Agencies**

# ITS-JPO DTS 2020 – Other Takeaways

- Agencies that experienced cybersecurity event in last 3 years
  - 18% of freeway and transit agencies
  - 10% of arterial agencies

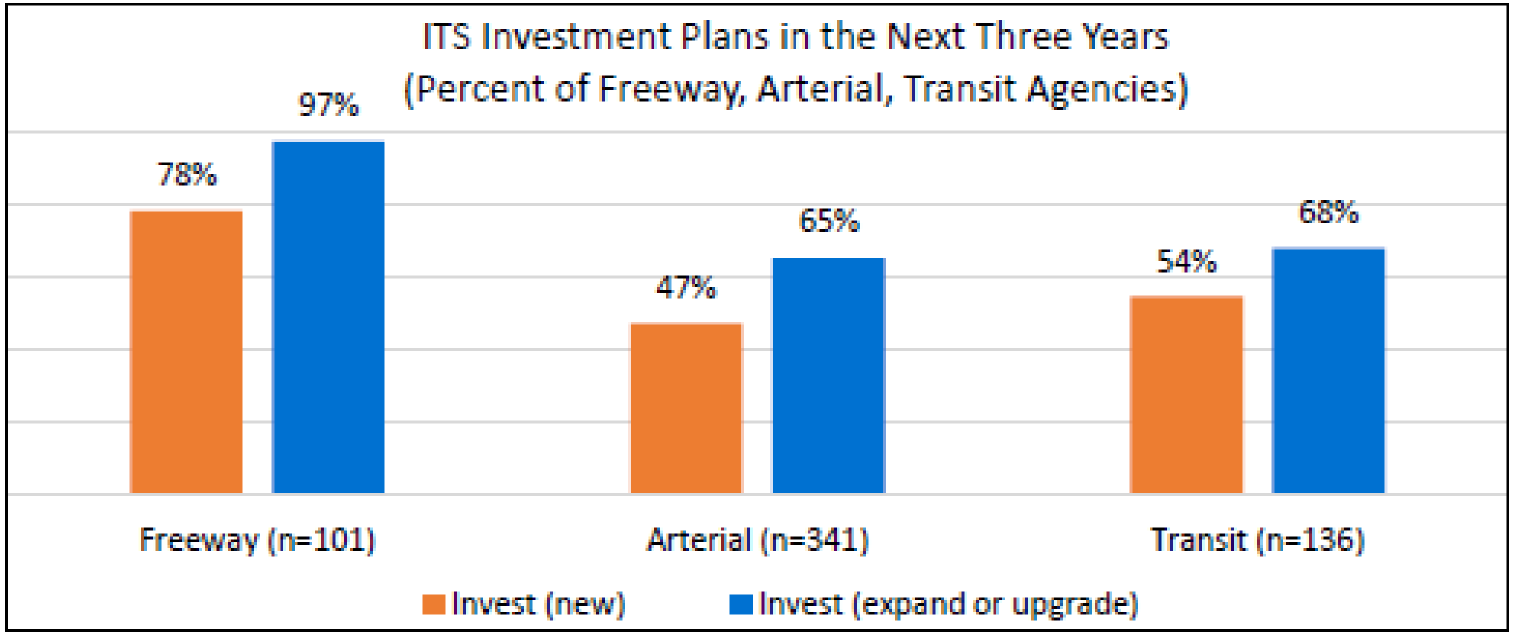


*2020 Freeway Q30, Q31, Arterial Q34, Q35, Transit Q24a, Q24b* *Source: USDOT*

**Figure 31. Incidence of Cybersecurity Events in the Last Three Years – Freeway, Arterial and Transit Agencies**

# ITS-JPO DTS 2020 – Other Takeaways

- Planned cybersecurity investments

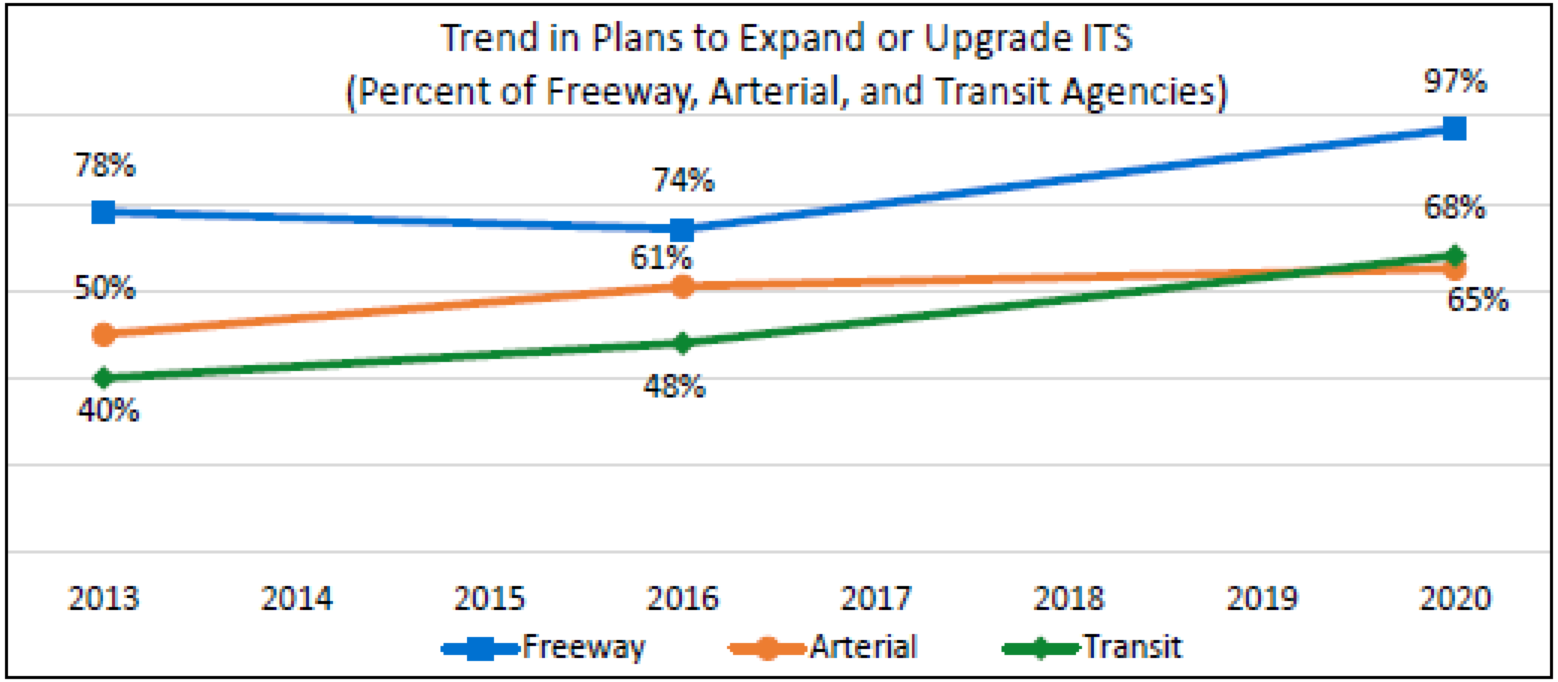


*2020 Freeway Q36, Q37, Arterial Q39, Q40, Transit Q34, Q35* *Source: USDOT*

**Figure 32. ITS Investment Plans in the Next Three Years – Freeway, Arterial and Transit Agencies**

# ITS-JPO DTS 2020 – Other Takeaways

- Planned cybersecurity investments



*2020 Freeway Q36, Arterial Q39, Transit Q34* *Source: USDOT*

Figure 33. Trend in Plans to Expand or Upgrade ITS – Freeway, Arterial and Transit Agencies

# Questions

# FDOT Grant Process – Update

David Williams, VHB

# Bipartisan Infrastructure Law – Grants

- The **Bipartisan Infrastructure Law** established a variety of new federal grant programs for local and state agencies to pursue
- There are 34 grant opportunities anticipated, so far
- USDOT is interested in seeing a variety of agencies submit (State, MPO, Local, Academic)
- **Requires match** – grants will cover 50% to 80% of project cost
  - RRR is a good way to match using FDOT funds
- Five-Year Program with an option to extend five more years
- Projects should address **Resiliency, Safety, Equity, Innovation**

# FDOT Grant Process

- FDOT Central Office has established a process to pursue these grant programs **if FDOT is submitting**
- FDOT CO receives NOFO; has 2 weeks to prepare a BCA and application
  - **Goal is to have project(s) identified <u>before</u> NOFO is released**
  - FDOT priority = construction-ready projects that avoid R/W and environmental concerns
  - FDOT CO also looking at current funded projects
    - if grant gets awarded, FDOT could reallocate the programmed funds to another project within same jurisdiction/region

# FDOT Grant Process

- FDOT submits project application/BCA to Governor’s Office for review and approval (takes between 2 to 6 weeks)
- **FDOT can typically only submit 3 total applications per grant opportunity, for the entire state**

# Grant Process for Local Agency Submittals

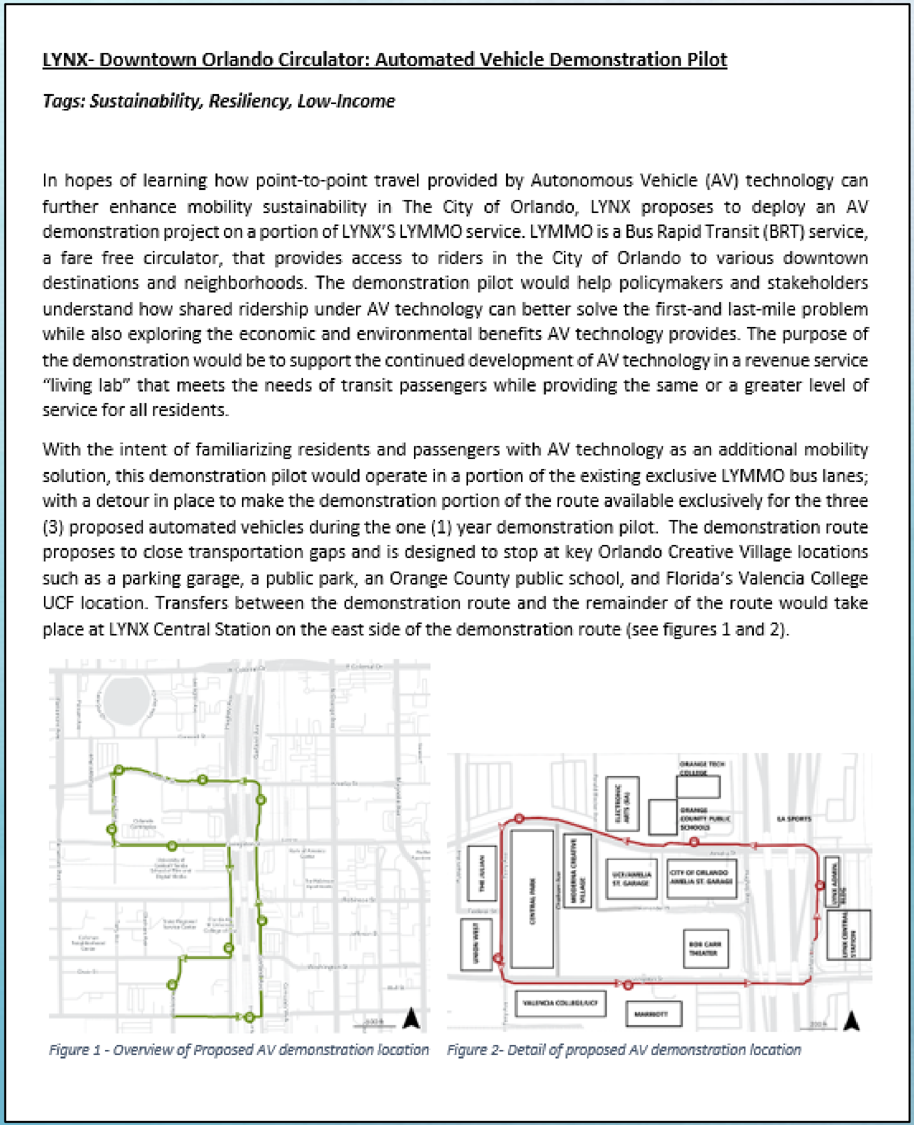
- Local agencies have the entire NOFO schedule to prepare and submit application
- Locals can submit for any phase (Planning, R/W, etc.)
- BCA/Application has a cost average of $40,000 per application
  - Due to work effort needed to prepare BCA
- Local agency can coordinate with FDOT regarding lessons learned, letter of support, and other support

# Key Points for District Five

- District Contact – Todd Davis ([todd.davis@dot.state.fl.us](mailto:todd.davis@dot.state.fl.us))
- Who leads the project is based on likelihood of award
- Writing the grant via CO in a lot of cases; they are willing to support
- District is preparing 2-pagers of identified projects
- FDOT Internal Coordination
  - Jeremy Dilmore → Todd Davis → Alison Stettner

# District Five – Queued Projects

- Altamonte Springs – Gateway AV Shuttle
- LYNX Downtown Circulator
- LYNX EV Infrastructure Project
- Smart Space Coast Project
- Volusia Beach Management
- Smart I-75



**LYNX- Downtown Orlando Circulator: Automated Vehicle Demonstration Pilot**

***Tags: Sustainability, Resiliency, Low-Income***

In hopes of learning how point-to-point travel provided by Autonomous Vehicle (AV) technology can further enhance mobility sustainability in The City of Orlando, LYNX proposes to deploy an AV demonstration project on a portion of LYNX'S LYMMO service. LYMMO is a Bus Rapid Transit (BRT) service, a fare free circulator, that provides access to riders in the City of Orlando to various downtown destinations and neighborhoods. The demonstration pilot would help policymakers and stakeholders understand how shared ridership under AV technology can better solve the first-and last-mile problem while also exploring the economic and environmental benefits AV technology provides. The purpose of the demonstration would be to support the continued development of AV technology in a revenue service "living lab" that meets the needs of transit passengers while providing the same or a greater level of service for all residents.

With the intent of familiarizing residents and passengers with AV technology as an additional mobility solution, this demonstration pilot would operate in a portion of the existing exclusive LYMMO bus lanes; with a detour in place to make the demonstration portion of the route available exclusively for the three (3) proposed automated vehicles during the one (1) year demonstration pilot. The demonstration route proposes to close transportation gaps and is designed to stop at key Orlando Creative Village locations such as a parking garage, a public park, an Orange County public school, and Florida's Valencia College UCF location. Transfers between the demonstration route and the remainder of the route would take place at LYNX Central Station on the east side of the demonstration route (see figures 1 and 2).

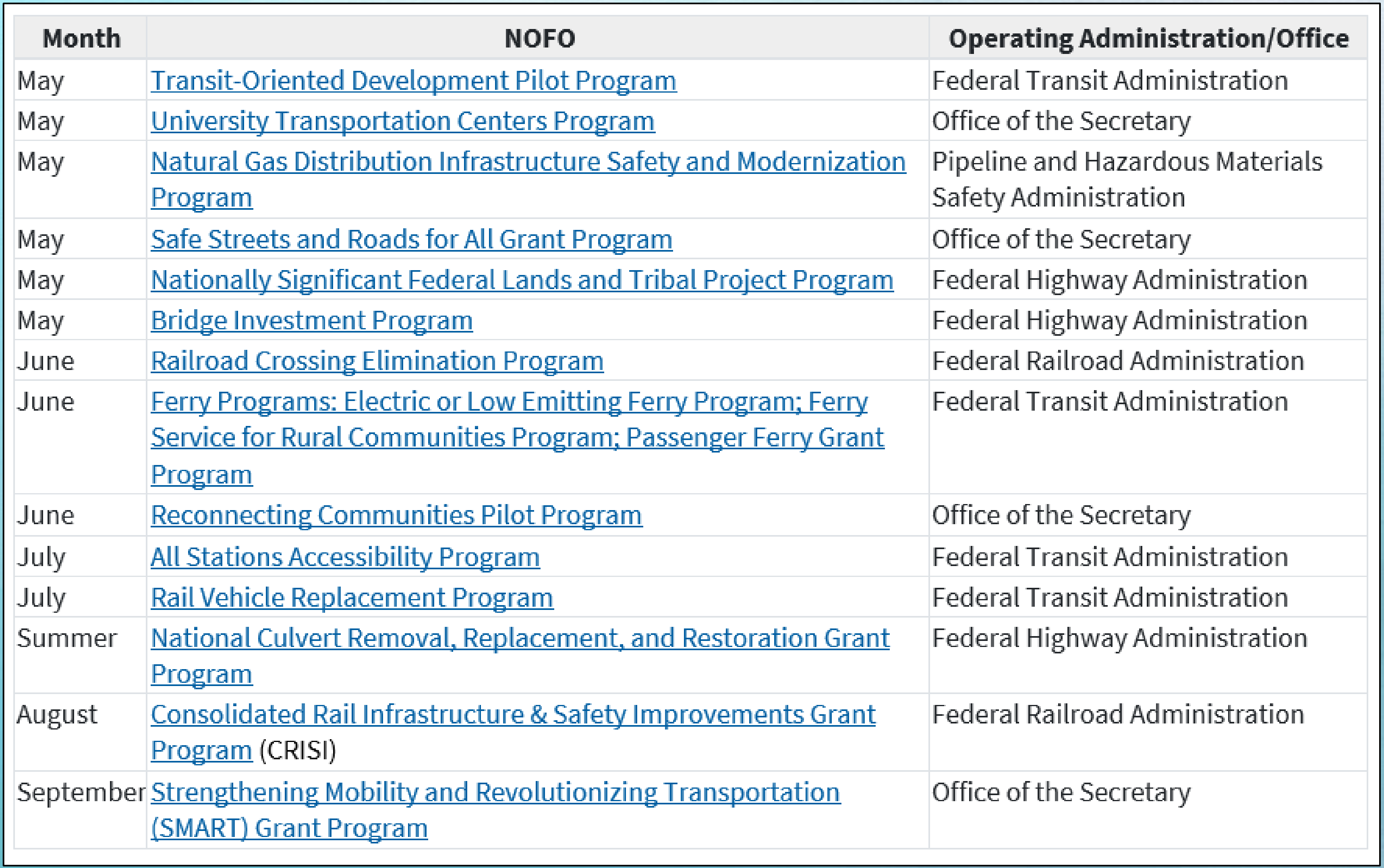
*Figure 1 - Overview of Proposed AV demonstration location*

*Figure 2- Detail of proposed AV demonstration location*

# District Five – Potential Projects?

**Please let us know if you have any potential projects in mind**

upcoming NOFOs →



| Month | NOFO | Operating Administration/Office |
|---|---|---|
| May | Transit-Oriented Development Pilot Program | Federal Transit Administration |
| May | University Transportation Centers Program | Office of the Secretary |
| May | Natural Gas Distribution Infrastructure Safety and Modernization Program | Pipeline and Hazardous Materials Safety Administration |
| May | Safe Streets and Roads for All Grant Program | Office of the Secretary |
| May | Nationally Significant Federal Lands and Tribal Project Program | Federal Highway Administration |
| May | Bridge Investment Program | Federal Highway Administration |
| June | Railroad Crossing Elimination Program | Federal Railroad Administration |
| June | Ferry Programs: Electric or Low Emitting Ferry Program; Ferry Service for Rural Communities Program; Passenger Ferry Grant Program | Federal Transit Administration |
| June | Reconnecting Communities Pilot Program | Office of the Secretary |
| July | All Stations Accessibility Program | Federal Transit Administration |
| July | Rail Vehicle Replacement Program | Federal Transit Administration |
| Summer | National Culvert Removal, Replacement, and Restoration Grant Program | Federal Highway Administration |
| August | Consolidated Rail Infrastructure & Safety Improvements Grant Program (CRISI) | Federal Railroad Administration |
| September | Strengthening Mobility and Revolutionizing Transportation (SMART) Grant Program | Office of the Secretary |

# Questions

# Taking Time to FLEX – What's new in Training

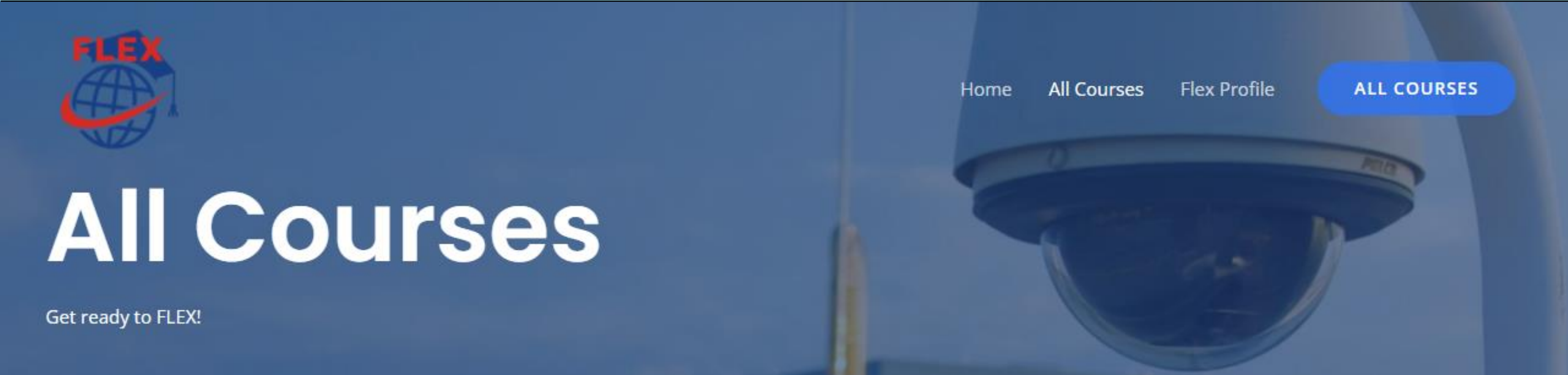
David Williams, VHB

# TSM&O Focused Learning Education and Experiences (FLEX)

- Types of training in FLEX Portal
  - TSM&O concepts
  - TSM&O applications
  - Field equipment
  - How-to training videos
- FLEX Portal is available with a **free** account

# What’s New?

- New courses available
  - Computer Security Awareness
  - I-4 Express Gate
  - Drones and Traffic Management (workshop



All Courses

Get ready to FLEX!

# TSM&O Focused Learning Education and Experiences (FLEX)

- Active Users – 330
- Courses Completed – 248
- Most Popular Course – *Traffic Signal Training (A)*

- Troubleshooting – *Request Support* button
- For more information, visit: https://elearning.cflsmartroads.com/
  - Google: "FDOT FLEX Portal"

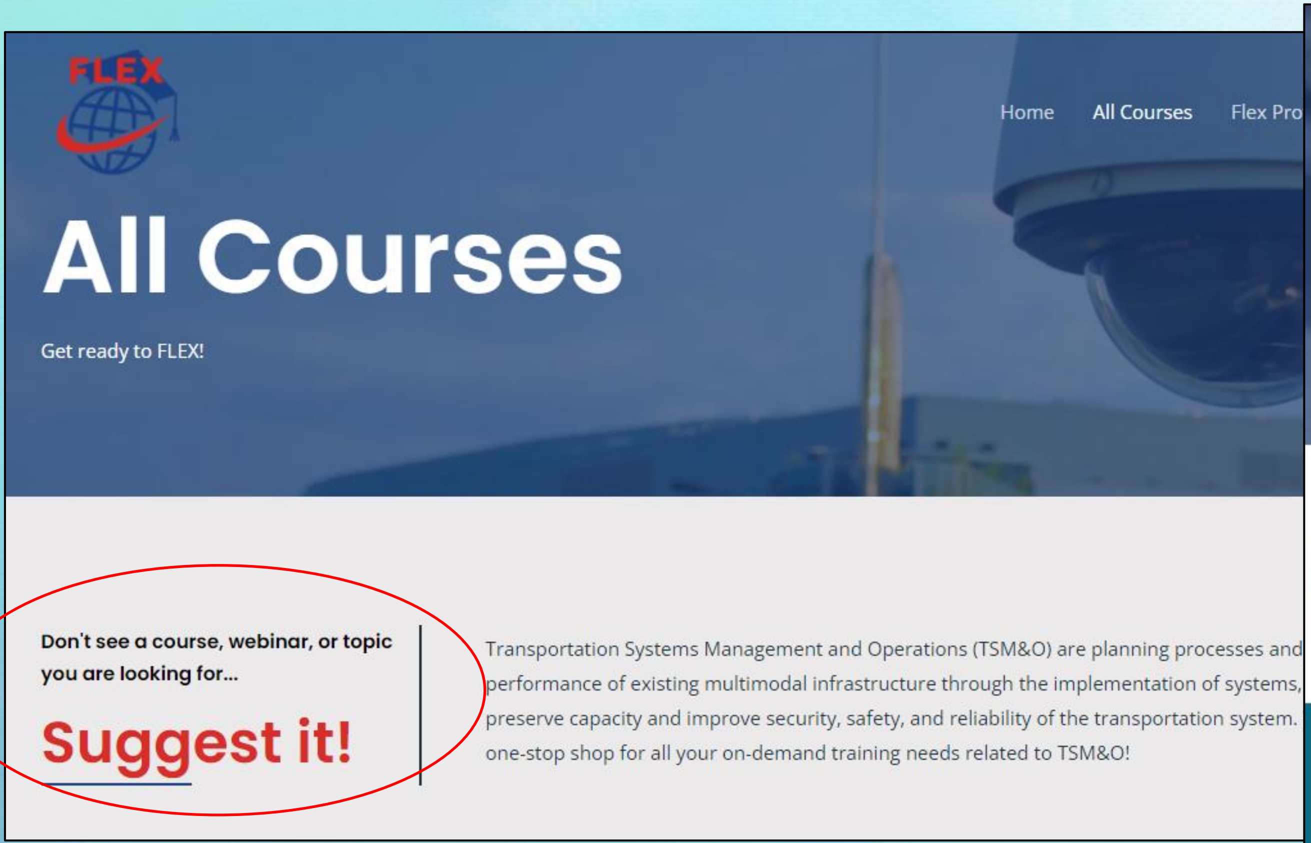
# Courses Coming Soon to FLEX Portal

- Adaptive Signal Control Technology (ASCT) Training
- ITS CEI Dynamic Message Signs
- ITS CEI Road Weather Information System CBT
- Manual on Uniform Traffic Studies (MUTS)

All Courses

Get ready to FLEX!

# Have a Suggested Training?



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## All Courses

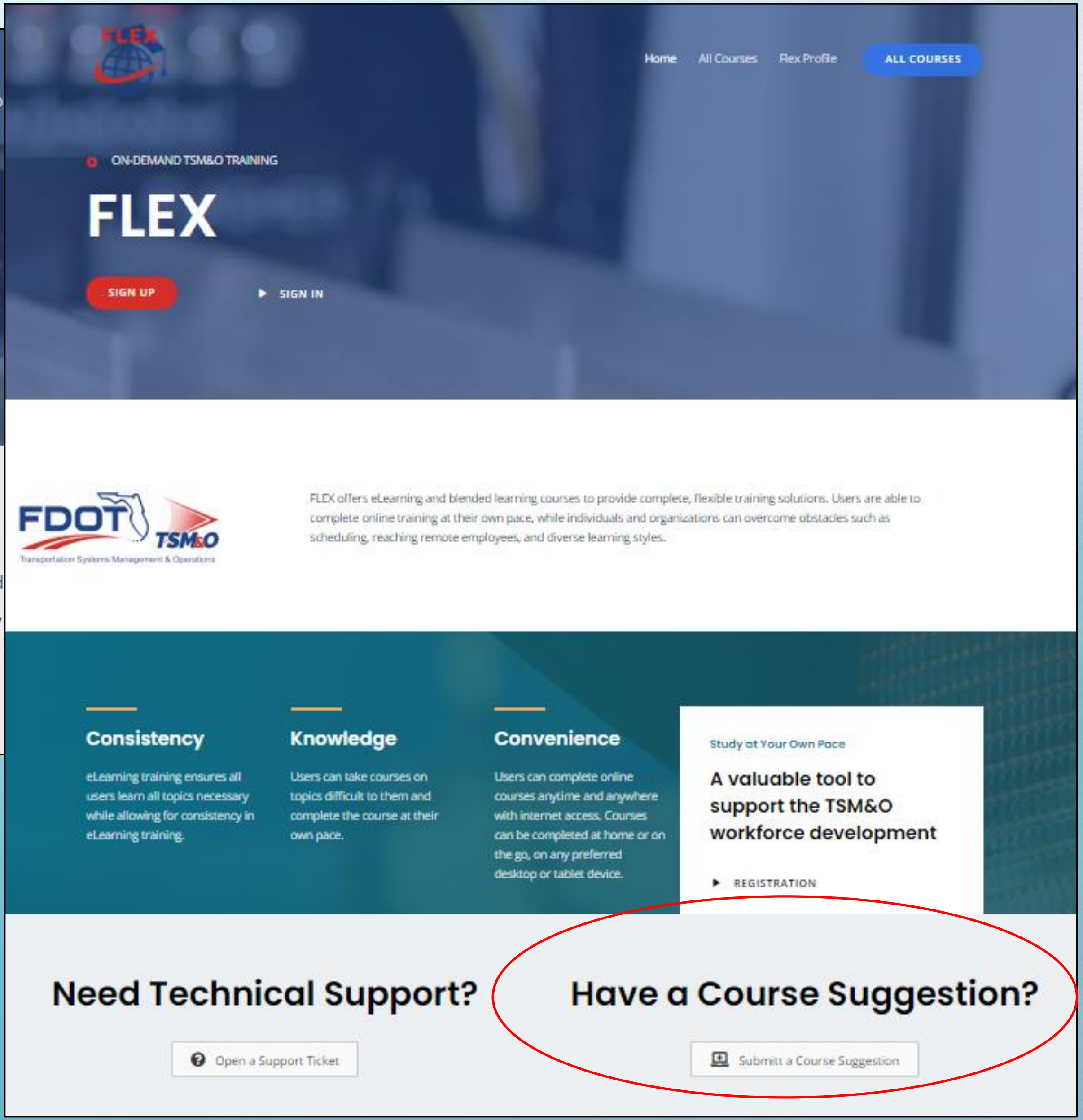
Get ready to FLEX!

Don't see a course, webinar, or topic you are looking for...

**Suggest it!**

Transportation Systems Management and Operations (TSM&O) are planning processes and performance of existing multimodal infrastructure through the implementation of systems, preserve capacity and improve security, safety, and reliability of the transportation system. one-stop shop for all your on-demand training needs related to TSM&O!

https://elearning.cflsmartroads.com/flex-suggestions/



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ON-DEMAND TSM&O TRAINING

## FLEX

SIGN UP ▶ SIGN IN

FDOT TSM&O Transportation Systems Management & Operations

FLEX offers eLearning and blended learning courses to provide complete, flexible training solutions. Users are able to complete online training at their own pace, while individuals and organizations can overcome obstacles such as scheduling, reaching remote employees, and diverse learning styles.

**Consistency**

eLearning training ensures all users learn all topics necessary while allowing for consistency in eLearning training.

**Knowledge**

Users can take courses on topics difficult to them and complete the course at their own pace.

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Study at Your Own Pace

**A valuable tool to support the TSM&O workforce development**

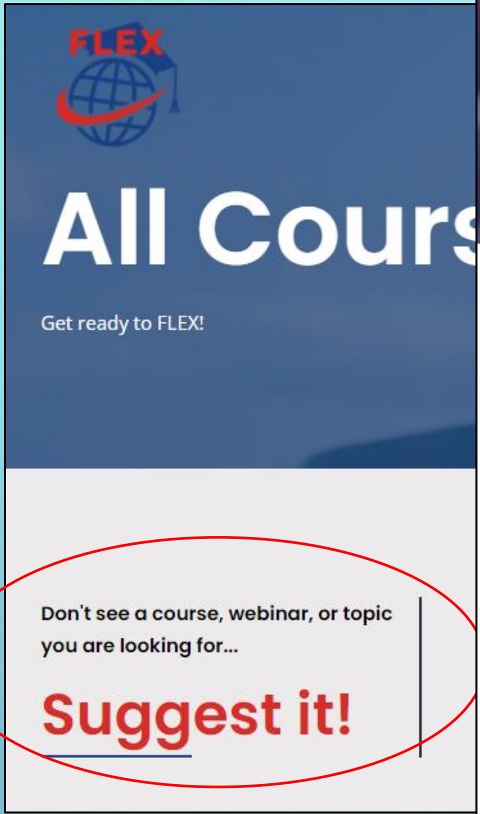
▶ REGISTRATION

**Need Technical Support?**

Open a Support Ticket

**Have a Course Suggestion?**

Submit a Course Suggestion



# All Cours

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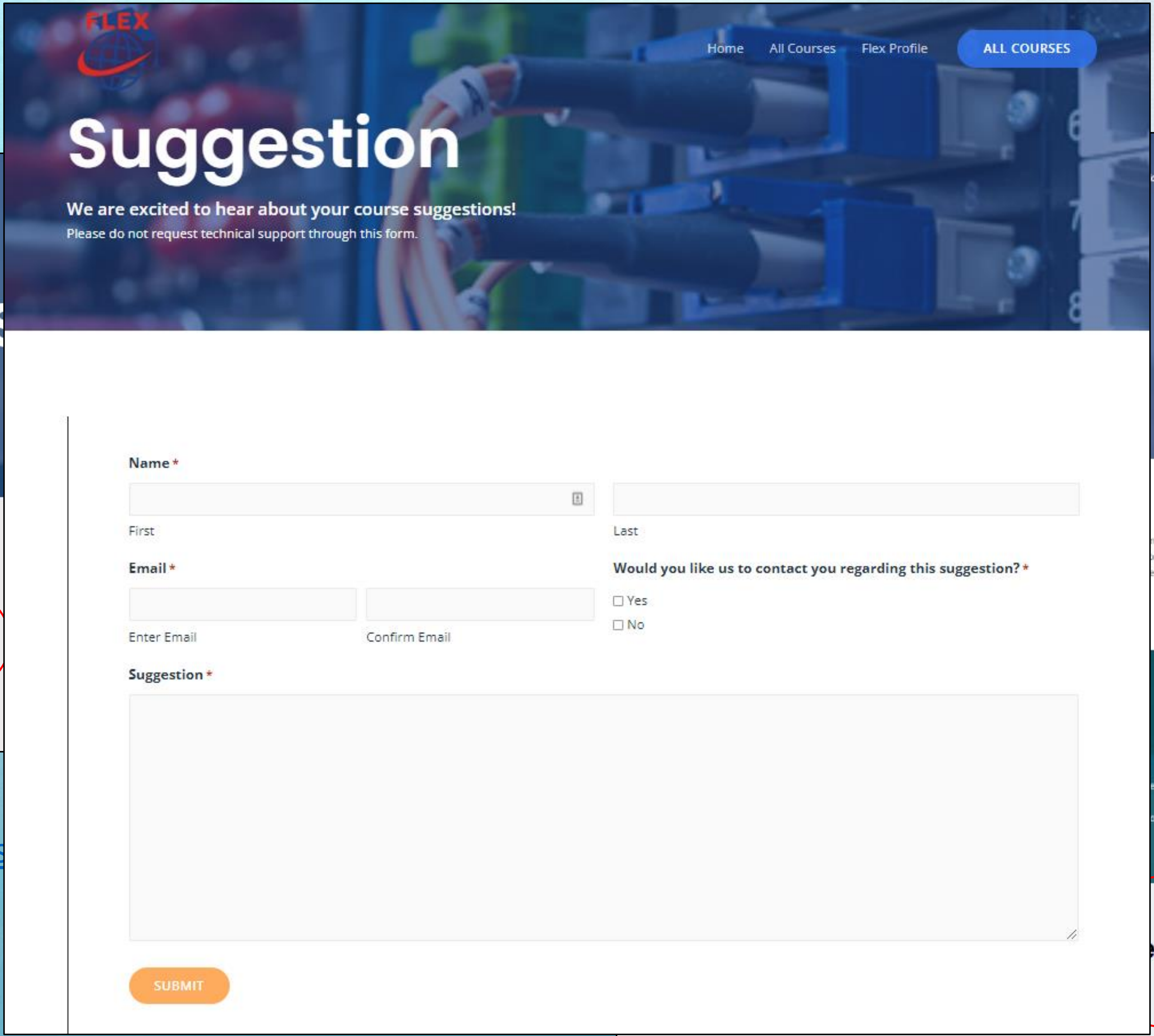
**Suggest it!**

https://elearning.cfls



# Suggestion

**We are excited to hear about your course suggestions!**

Please do not request technical support through this form.

**Name** *

First

Last

**Email** *

Enter Email

Confirm Email

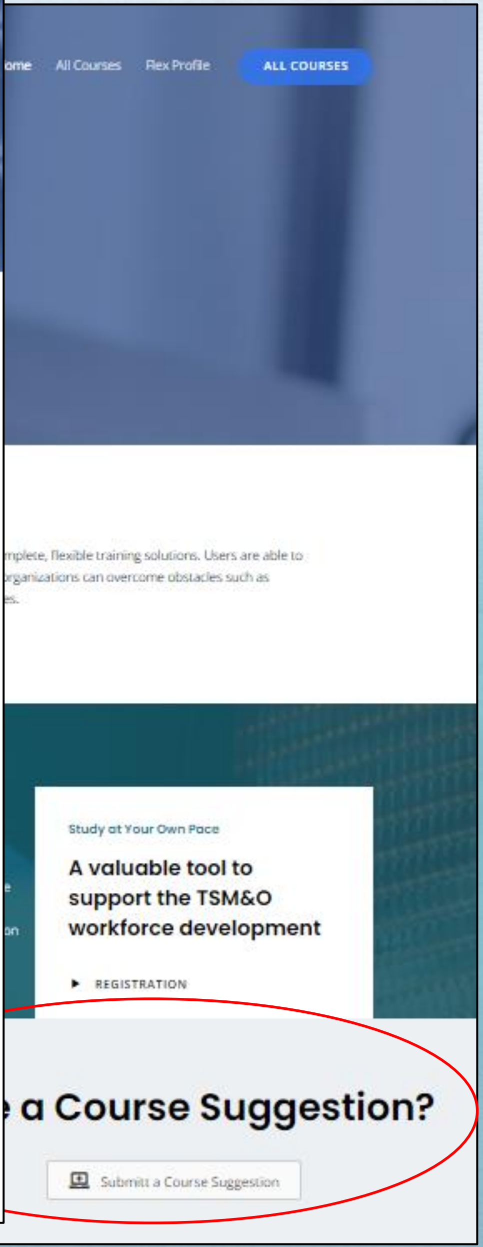
**Would you like us to contact you regarding this suggestion?** *

□ Yes

□ No

**Suggestion** *

SUBMIT



...mplete, flexible training solutions. Users are able to ...rganizations can overcome obstacles such as ...es.

Study at Your Own Pace

**A valuable tool to support the TSM&O workforce development**

▶ REGISTRATION

## a Course Suggestion?

Submit a Course Suggestion

# Network Infrastructure Security Guidance
# *NSA Cybersecurity Technical Report*

David Williams, VHB

Transportation Systems Management & Operations

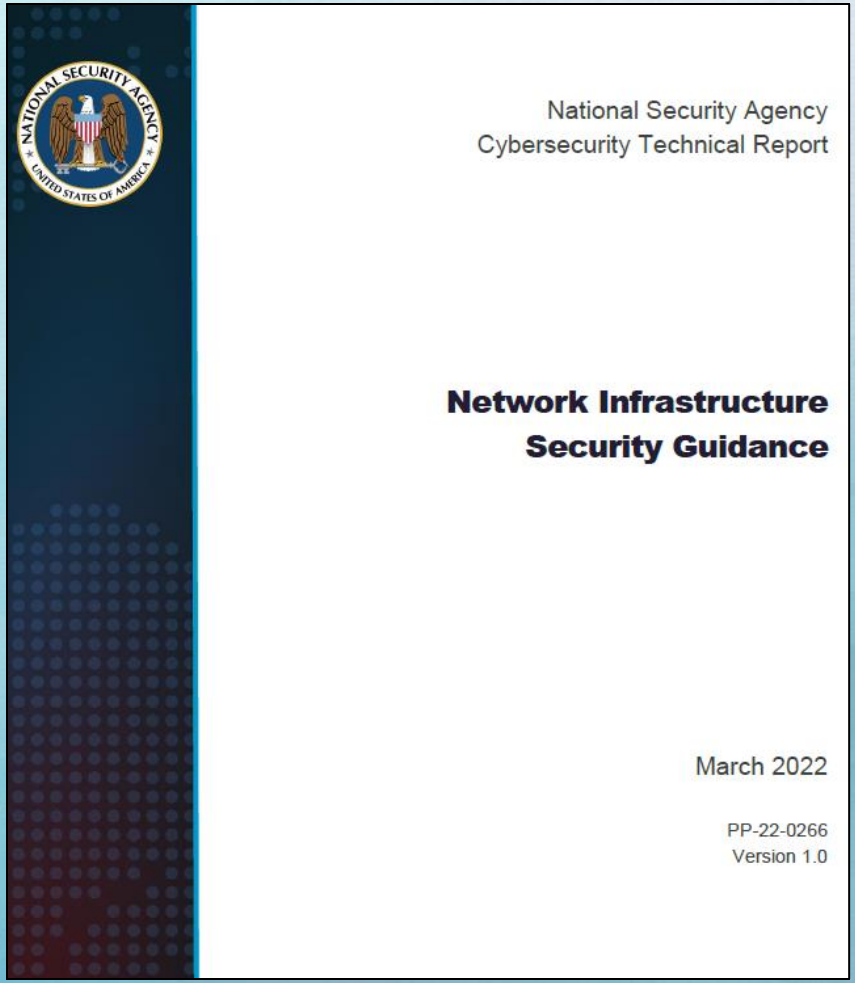
# Table of Contents

1. **Introduction**
2. **Network architecture and design**
3. **Security maintenance**
4. **Authentication, authorization and accounting (AAA)**
5. **Administrator accounts and passwords**
6. **Remote logging and monitoring**
7. **Remote administration and network services**
8. **Routing**
9. **Interface Ports**
10. **Notification Banners**

# Network Infrastructure Security Guidance

- Best practices for overall network security and protection of individual network devices

- Guidance provided is generic and can be applied to many types of network devices
  - However, includes sample commands for Cisco Internetwork Operating System (IOS) devices to implement recommendations



National Security Agency
Cybersecurity Technical Report

**Network Infrastructure Security Guidance**

March 2022

PP-22-0266
Version 1.0

# Zero Trust Security Model

- **NSA fully supports the Zero Trust security model**
  - Assumes threats can exist inside/outside traditional network boundaries
  - Set of system design principles
  - Coordinated cybersecurity & system management strategy
- **However, this report is focused on mitigating common vulnerabilities and weaknesses on existing networks**

# Network Architecture and Design

Network Diagram

- **Network Design – implement multiple defensive layers**

A. Install border router to facilitate connection to external network (e.g., ISP)

B. Implement multiple layers of next-gen firewalls throughout network

  - **Each layer should use different vendors** to protect against an attack exploiting the same unpatched vulnerability to access the internal network

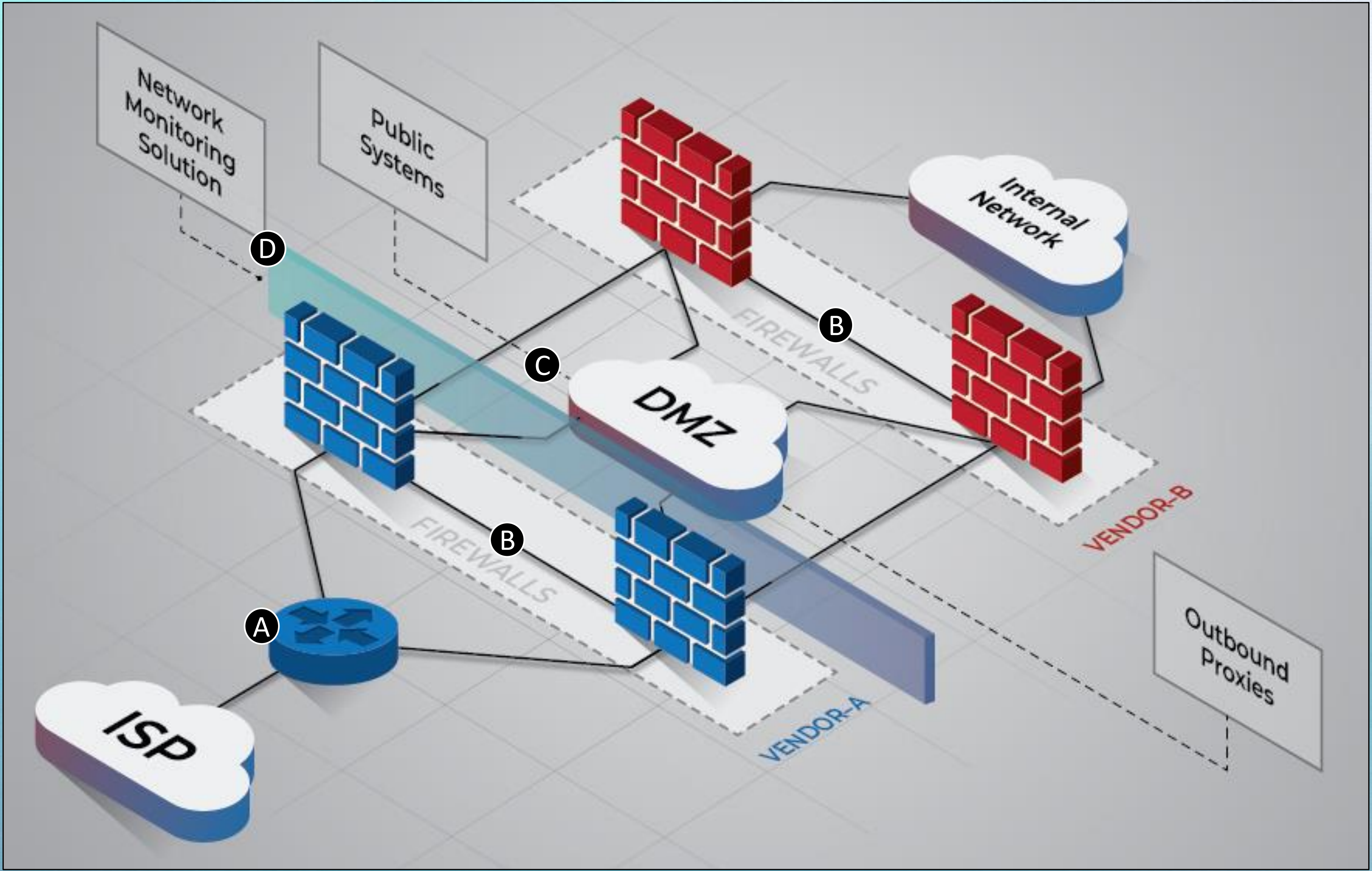
C. Place publicly accessible systems and outbound proxies in between firewall layers in 1 or more demilitarized zone (DMZ) subnets

  - Access can be controlled

D. Implement network monitoring solution to log/track inbound & outbound traffic

E. Deploy multiple dedicated remote log servers to enable activity correlation among devices and lateral movement detection

F. Implement redundant devices in core areas to ensure availability; these can be load-balanced to increase network throughput and decrease latency


Network Monitoring Solution
Public Systems
Internal Network
D
B
C
DMZ
FIREWALLS
VENDOR-B
FIREWALLS
B
A
Outbound Proxies
ISP
VENDOR-A

# Network Architecture and Design

- **Group similar network systems**
  - Adversaries will target systems that are more easily exploitable (e.g., printers) and use that initial access to further propagate to other systems
  - **Proper network segmentation** significantly reduces ability for adversary to reach and exploit these other systems
  - NSA recommends **isolating similar systems into different subnets or VLANs**, or physically separating the different subnets via firewalls or filtering routes
  - Workstations, servers, printers, telecommunications systems, and other network peripherals should be separate from each other
  - Operational technology (industrial control systems) needs to be isolated from other IT and high-risk networks like the internet

# Network Architecture and Design

- **Remove all backdoor connections**
  - Backdoor network connection is between 2 or more devices located in different network areas, typically with different data types and security requirements
  - If one device is compromised, adversary can use connection to bypass access restrictions
  - Example: external border router connected to an ISP that is also directly connected to the internal or management networks
- **Utilize strict perimeter access controls**
  - Configure network perimeter devices to complement each other via access control lists (ACL) to regulate ingress/egress

# Network Architecture and Design

- **Implement a network access control (NAC) solution**
  - Prevents unauthorized physical connections
  - Monitors authorized physical connections on a network
  - NSA recommends an NAC solution that identifies/authenticates unique devices connected to the network
- **Limit and encrypt virtual private networks (VPN)**
  - VPN gateways tend to be **accessible from the internet** and are prone to scanning, brute force attempts, and zero-day vulnerabilities
  - To mitigate these threats, disable all unneeded features and implement strict traffic filtering rules for traffic flowing to VPN gateways
- **Verify software and configuration integrity**

# Security Maintenance

- **Maintain proper file system and boot management**
  - Network devices typically have 2 configurations: one saved in persistent storage, and an active copy
  - Permanent changes to the configuration should be saved to persistent storage to prevent inconsistencies if device is rebooted or loses power
- **Maintain up-to-date software and operating systems**
  - Devices running outdated software are more susceptible to vulnerabilities
  - NSA recommends upgrading OS/software on all devices to latest stable version
- **Stay current with vendor-supported hardware**

# Authentication, Authorization, Accounting (AAA)

- **Implement centralized servers**
  - NSA recommends configuring all devices to use centralized AAA servers
  - NSA recommends using at least two AAA servers to ensure availability
- **Configure authentication**
  - Verifies identity of person/entity
  - All devices should be configured to **use AAA servers first**, then local administrator accounts as a backup method ONLY IF AAA servers are down
- **Configure accounting**
  - System configuration changes should be centrally recorded, with a process implemented to periodically review these records for malicious activities

# Authentication, Authorization, Accounting (AAA)

- **Apply principle of *least privilege***
  - Users given lowest privilege level necessary to perform authorized tasks
- **Limit authentication attempts**

# Local Administrator Accounts and Passwords

- **Use unique usernames and account settings (no default settings)**
- **Change default passwords**
- **Remove unnecessary accounts**
- **Employ individual accounts**
  - Disable all shared or group administrator accounts
- **Store passwords with secure algorithms**
  - NSA recommends to never store passwords as clear text

# Local Administrator Accounts and Passwords

- **Create strong passwords**
- **Utilize unique passwords**
  - Assign a unique, complex, secure password for each account and privileged level on each device
- **Change passwords as needed**

# Remote logging and monitoring

- **Enable logging**
- **Establish centralized remote log servers**
  - Log messages sent to remote log servers are less likely to be compromised or erased in the event a device is compromised
  - NSA recommends establishing at least 2 remote, centralized log servers
- **Capture necessary log information**
- **Synchronize clocks**

# Remote Administration and Network Services

- **Disable clear text administration services**
  - Clear text passes traffic across the network "in the clear" (unencrypted)
- **Ensure adequate encryption strength for encrypted connections**
  - NSA recommends that 3072 bits or higher be used for key generation
- **Utilize secure protocols**
  - NSA recommends ensuring administration services are using latest version of protocols, with proper security settings adequately enabled

# Remote Administration and Network Services

- **Limit access to services**
  - Configure access control lists (ACL) to allow only administrator systems to connect to devices for remote management
- **Set acceptable timeout period**
- **Enable Transmission Control Protocol (TCP) keep-alive messages**
- **Disable outbound connections**
  - If adversary compromised device, the outbound connection could potentially be used to advance through the network

# Remote Administration and Network Services

- **Remove SNMP read-write community strings**
- **Disable unnecessary network services**
- **Disable discovery protocols on specific interfaces**
  - These discovery protocols are “broadcast” protocols that periodically advertise network topology and device info to neighboring devices
- **Proper remote network administration service configuration**
  - NSA report provides a walkthrough for properly configuring remote network administration services

# Routing

- **Disable IP source routing**
  - IP source routing bypasses internal routing table; adversary can transmit packets through a route of their choosing, bypassing network restrictions
  - Vulnerability for both routers and switches
- **Enable unicast reverse-path forward (uRPF)**
  - uRPF is a protective measure against IP spoofing
- **Enable routing authentication**

# Interface Ports

- **Disable dynamic trunking**
  - Adversary that is connected to a dynamic port could instruct it to become a trunk port and potentially gain access to network traffic
  - Ensure when a device is added to the network that all interface ports are configured as either trunk ports or access ports
- **Enable port security**
- **Disable default VLAN**
  - NSA recommends moving all management and operational traffic to different VLANs (not the default) that separate management traffic from user data and protocol traffic

# Interface Ports

- **Disable unused ports**
  - Adversary can attach rogue device to the network through an active, unused port
- **Disable port monitoring**
- **Disable proxy Address Resolution Protocol (ARP)**

# Questions

# Current Initiatives

Jeremy Dilmore, District Five TSM&O

# Current Initiatives

- I-4 Ultimate – Express Lanes
  - High growth rates with demand

- Wekiva Pkwy
  - Fall 2022 – Opening of Segments 6, 7A
  - Summer 2023 – Opening of Segment 7B
  - TBD – Opening of Wekiva 8

# Current Initiatives

- PedSafe
  - Working through challenges with transit kiosk visibility
  - LiDAR being integrated with single processor
  - Many lessons learned

- AV Shuttle
  - Working through power/permitting issues

- Kiosks at UCF
  - To conform to ADA, having issues for visibility of screen for non-ADA people

# Current Initiatives

- Smart Work Zone Trailer
  - Next step – deployment at a construction project
- STROZ
  - Operational and ready for training

# Current Initiatives

- I-4 FRAME
  - NTP expected in August for first set; District 5 to follow a few months later
- ATC Controller Changeouts
  - City of Orlando – ~50 intersections remaining
  - Cities of Orange County – all intersections are complete
  - Orange County – ~100 intersections remaining
- CV Status
  - Iteris – firmware in testing with them, then with us next
  - Siemens – hardware issues with 6
  - Commsignia – up and running

# Current Initiatives

- R-ICMS – operational, with some enhancements in the works
  - Completed several response plan workflow enhancements
  - Pending enhancements to Signal Optimization Tool

- TMDD
  - Osceola (Econolite Centracs) – operating as expected
  - Orange (Intelight Maxview TMDD) – operating as expected
  - District 5 ATMS (Intelight Maxview TMDD) – operating, but missing some data; under investigation
  - City of Orlando (Trafficware TMDD) – operating, but pending upgrade to handle cycle length greater than 255 characters
  - Seminole County – (Trafficware TMDD) – operating, but misfiring on immediate patterns, under investigation

# Current Initiatives

- Event Management
  - Testing with BOS wiring changing is the only holdup
- TSMCA Update
  - Working with FDOT legal on draft *Exhibit E*
  - NOEMI application Exhibit A tracker is complete
- TAPs-LA Osceola
  - DERQ has been selected by County
- SODA TOP

# THANK YOU!

Next Consortium – July 28, 2022

# TSM&O Consortium Meeting

## MEETING AGENDA

Teleconference or
FDOT District 5 RTMC (4975 Wilson Rd, Sanford, FL 32771)

*May 19, 2022*
*10:00 AM-12:00 PM*

1) WELCOME

2) ITS DEPLOYMENT TRACKING SURVEY: 2020 KEY FINDINGS (ITS-JPO 2021 REPORT)

   - David Williams, VHB

3) FDOT GRANT PROCESS – UPDATE

   - David Williams, VHB

4) TAKING TIME TO FLEX – WHAT'S NEW IN THE TRAINING PORTAL

   - David Williams, VHB

5) NETWORK INFRASTRUCTURE SECURITY GUIDANCE (NSA 2022 REPORT)

   - Jeremy Dilmore, District Five TSM&O

6) CURRENT INITIATIVES

   - Jeremy Dilmore, District Five TSM&O