TSMO CONSORTIUM MEETING SUMMARY

Meeting Date:	February 6, 2020 (Thursday)	**Time**: 10:00 AM – 12:00 PM
Subject:	TSMO Consortium Meeting	
Meeting Location:	FDOT District Five – RTMC 4975 Wilson Road Sanford, FL 32771 Turing Conference Room	

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 TSMO Program and ongoing efforts in District Five. David Williams gave a short introduction and outlined the meeting agenda.

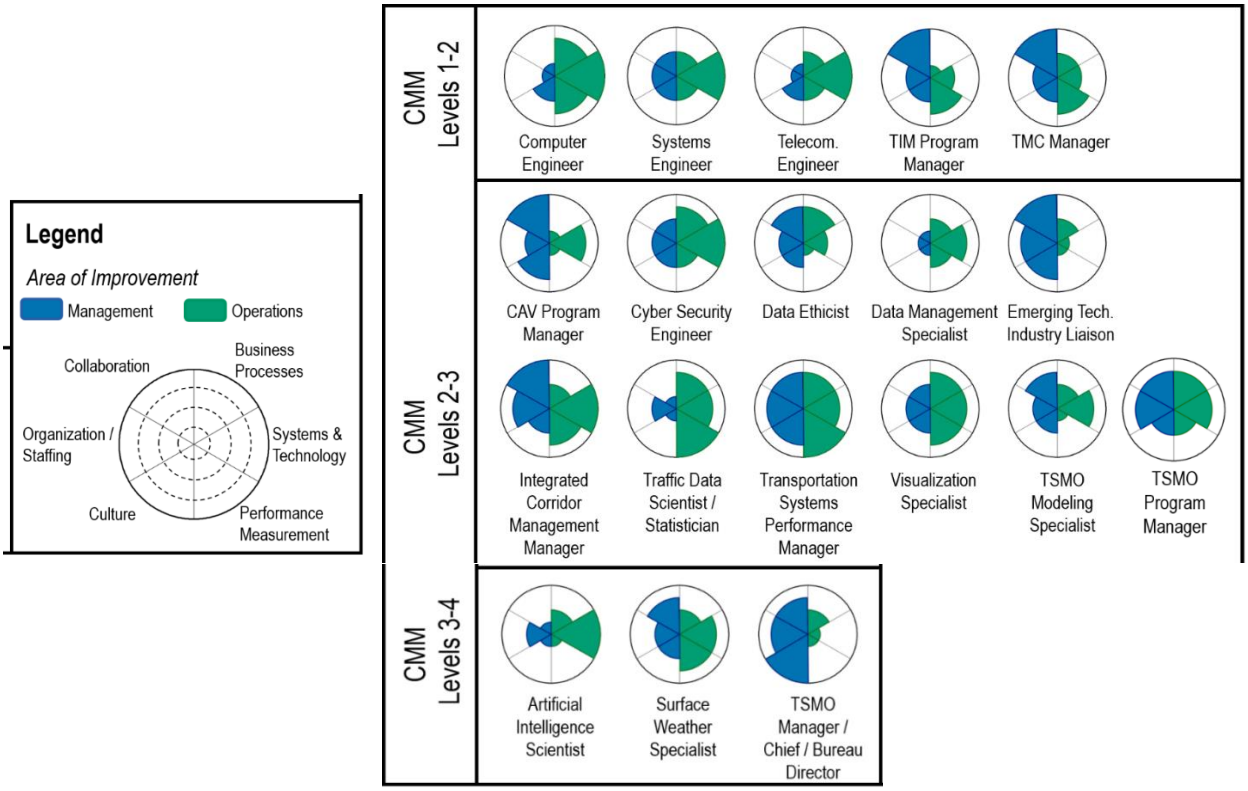
II. TSM&O WORKFORCE DEVELOPMENT – BEST PRACTICES AND LESSONS LEARNED

Patrick Son, the Managing Director of the National Operations Center of Excellence (NOCoE), presented on nationwide development of TSM&O practices.

- Workforce Development, Resources, and Activities
  - The Workforce Development Guidebook
    - Goal: Assist you in creating meaningful TSMO-related positions that will help advance your organization's maturity.
    - Intended to be used as a starting point.
    - Intended users:
      - People at transportation agencies looking to begin or advance a TSMO program
      - People involved in recruiting, hiring, or training in the transportation operations field
      - Consultants working with TSMO programs
      - Educators at the undergraduate and graduate levels
    - The guidebook is a set of tools and examples. For its success, workforce development must be flexible. The contents of the guidebook should be modified to fit your organization – if doing so, please share this information with NOCoE.
    - Recruiting a TSMO Workforce:
      - Understand evolving skillsets needed for success and innovation
      - Understand when an agency is ready to hire TSMO personnel

- Recommendations and best practices for hiring TSMO positions

- Model TSMO Position Descriptions:
  - 19 different positions identified
  - Identified by literature review, backed by stakeholder interviews and panel recommendations
  - Some exist, but not widespread or can be expected to exist in future
  - Developed to include:
    - When position might be needed – "Triggers"
    - How it relates to CMM improvement
    - Knowledge, Skills Abilities for position
  - Use positions descriptions as starting point – Modify to fit your needs
  - The 19 positions are:
    - Computer Engineer
    - Systems Engineer
    - Telecommunications Engineer
    - Traffic Incident Management (TIM) Program Manager
    - Transportation Management Center Manager
    - CAV Program Manager
    - Cyber Security Engineer
    - Transportation Data Ethicist
    - Data Management Specialist
    - Emerging Technologies Industry Liaison
    - Integrated Corridor Management Manager
    - Traffic Data Scientist/Statistician
    - Transportation Systems Performance Manager
    - Visualization Specialist
    - TSMO Modeling Specialist
    - TSMO Program Manager
    - AI Scientist
    - Surface Weather Specialist
    - TSMO Manager/Chief/Bureau Director
      - Detailed descriptions of each role can be found at: https://transportationops.org/workforce/model-tsmo-position-descriptions
    - Capability Maturity Model Improvement Potential – Requirements for each position:



- Information from the guidebook can be found on the NOCoE website, and has been divided between four categories:
  - Recruiting a TSMO Workforce
  - Developing a TSMO Workforce
  - Model TSMO Position Descriptions
  - TSMO Workforce Retention
    - https://transportationops.org/workforce
  - TSMO training resources can also be found on the website:
    - https://transportationops.org/training
    - Please send any new training resources to NOCoE to be added to the website.

- 2nd Annual Transportation Technology Tournament (TTT) (held at ITE Austin)
  - 2019 Submissions: 9 teams, 5 finalists
    - University of Michigan
    - Florida International University
    - University of Tennessee, Knoxville
    - University of South Florida (2 Teams)
  - NOCoE Partnership with U.S. DOT ITS Joint Program Office
  - Each team paired with agency to solve real-world DOT problem
  - Focus on soft skills for students
- NOCoE Fellowship Program

        - Purpose: To provide opportunities for early career, or career switching TSMO professionals to develop Knowledge, Skills, and Abilities (KSAs) that can be applied on the job and in support of their long-term career growth.
        - Key Elements:
            - Identify a select number of public agency practitioners that would benefit from being immersed in TSMO culture
            - Work with fellows and their agency over a year to:
                - Create individual development plans
                - Provide them with opportunities to increase TSMO knowledge and develop interpersonal skills (writing, presentations, networking)
                - Link these activities to their Agency's intended outcomes
            - Recognize fellows at AASHTO/ITE/ITS America Meetings
- Data Management – TSMO Awards
    - Awards are split into four categories:
        - Best TSMO Project or Strategy Implementation
        - Agency Improvement: Use of Capability Maturity Model (CMM)
        - TSMO Workforce Development
        - Best Use of Management of Data to Improve TSMO
    - Each submission to the awards is added as a case study to the NOCoE website for future reference. There are now over 100 case studies.
    - The slides include an example of a winning submission to the Data Awards contest (see slides 28-32)
- Progress of our TSMO Practice
    - Considering progress in three phases: Research, Adoption, and Institutionalization.
        - Research will continue throughout the other two phases.
        - We are currently in the Adoption phase.
        - We are preparing for the institutionalization phase.
    - In order to continue to progress, the transfer rate of knowledge across the industry needs to increase.
        - Commit to identifying how to transfer knowledge:
            - In Your Department
            - Across Departments
            - Across the Industry

More detailed information on the topics included in this presentation can be found at: www.transportationops.org.

III. ENSURING AMERICAN LEADERSHIP IN AV TECHNOLOGIES: *AUTOMATED VEHICLES 4.0*

David Williams presented on the Autonomous Vehicles 4.0 report published by the National Science and Technology Council and the USDOT.

- Sections within Automated Vehicles 4.0:
  - I. Discussion of US Government AV Technology Principles
    - AV 4.0 establishes US Government AV technology principles that consist of three core interests:
      1. Protect Users and Communities
         1. Prioritize Safety
            - US will lead efforts to facilitate safe integration of AV tech
         2. Emphasize Security and Cybersecurity
            - US will support the design and implementation of secure AV tech to protect public safety posed by criminal or other malicious use of AVs.
            - US will work with developers, manufacturers, integrators, and service providers of AVs and AV services to ensure the successful prevention, mitigation, and investigation of crimes and security threats (both physical and cyber).
         3. Ensure Privacy and Data Security
         4. Enhance Mobility and Accessibility
            - US embraces "freedom of the road," including driving your own vehicle.
            - US envisions and environment in which AVs operate alongside conventional, manually driven vehicles and other road users.
      2. Promote Efficient Markets
         5. Remain Technology Neutral
            - US will adopt flexible, technology-neutral policies that will allow the public, not government, to choose the most economically efficient and effective transportation and mobility solutions.
         6. Protect American Innovation and Creativity
            - US will continue to advance pro-growth policies, promote new engines of growth, and prioritize America's innovative/creative capacity
         7. Modernize Regulations
            - US will modernize or eliminate outdated regulations that unnecessarily impede AV development to encourage consistent regulator and operational environment
            - US will seek rules that are as performance-based and non-prescriptive as possible and do not discriminate against American technologies and products
            - US will promote regulatory consistency among State, Local, Tribal, Territorial, and international laws and regulations so that AVs can operate seamlessly nationwide and internationally
      3. Facilitate Coordinated Efforts
         8. Promote Consistent Standards and Policies

- US will prioritize participation in and advocate abroad for voluntary consensus standards and evidence-based and data-driven regulations
- US will engage with non-Federal agencies and the industry to promote the development and implementation of voluntary consensus standards, advance policies

9. Ensure a Consistent Federal Approach
   - US will proactively facilitate coordination of AV research, regulations, and policies
   - US funds will comply with Executive Order 13788 (Buy American and Hire American)
   - US funds will comply with Executive Order 13881 (Maximizing Use of American-Made Goods, Products)
10. Improve Transportation System-Level Effects
    - US will focus on opportunities to improve transportation system-level performance, efficiency, and effectiveness while avoiding negative transportation system-level effects from AV technologies
      - Example that comes to mind: AV-induced sprawl and VMT increases

II. Efforts to Support AV Technology Growth and Leadership

- Investments, Documentation, Research in:
  - Advanced Manufacturing
  - AI and Machine Learning
    - *E.O. 13840: Maintaining American Leadership in Artificial Intelligence* (2019)
  - Connected Vehicles and Spectrum
    - *Facilitate America's Superiority in 5G Technology Plan (5G FAST Plan)*
      - (DSRC, C-V2X, Wi-Fi, and the CV Spectrum)
      - Pushing more spectrum into the marketplace
      - Updating infrastructure policy
      - Modernizing outdated regulations
    - FCC proposal on CV Spectrum change – DSRC out; making way for C-V2X and Wi-Fi
  - STEM Education
    - *Charting a Course for Success: America's Strategy for STEM Education* (2018)
      - Sets Federal strategy for the next 5 years on STEM education and innovation
  - STEM Workforce
    - *E.O. Establishing the President's National Council for the American Worker* (2018)
  - Supply Chain Integration
    - *E.O. on Securing the Information and Communications Technology and Services Supply Chain* (2019)
  - Quantum Information Science

III. US Government Activities and Opportunities for Collaboration

A. Investments in AV Sector (by Federal agency)

- Safety
- Ensuring Mobility for All Americans *(USDOT p. 10)*
  - USDOT announced during *Access and Mobility for All Summit*
    - Complete Trip ITS4US ($40 million grant program)
    - $5 million in cash prizes for planned Inclusive Design Challenge
    - NOFO for FTA's FY2020 *Mobility for All Pilot Program*
- Fundamental Research *(USDOT p. 41)*
  - $60 million ADS Demonstration Grants and other programs
- Security and Cybersecurity *(USDOT/NIST pp. 22-3)*
- Infrastructure *(USDOT p. 24)*
  - FHWA National Dialogue → FHWA will facilitate the development of a "national roadway automation integration readiness strategy"
    - This strategy will provide flexible framework for coordinated planning among State and local transportation agencies, and with ADS developers
  - FHWA – three truck platooning field tests
  - FHWA/ITS JPO – Work Zone Data Exchange (WZDx) Program
- Spectrum and Connectivity *(FCC/NIST p. 26)*
- Economics and Workforce Research

B. Enabling Activities in AV Sector

- Fostering Collaboration with Government
  - Engaging stakeholders at all levels
    - Federal, State, Local, Tribal
    - OEMs
    - Disability Advocates
    - Academia
    - TNCs (Transportation network companies)
    - Private citizens
- Voluntary Consensus Standards and Other Guidance
  - AV 2.0 and AV 3.0 voluntary guidance (and now AV 4.0)
  - CV Pilot Cybersecurity Framework Profile
    - Based on 3 CV pilot test sites (Tampa)
- Regulatory Authority and AVs
- Taxation, Trade, and Intellectual Property
- Environmental Quality
- Competition, Privacy, and Market Transparency

C. Resources for AV Sector Innovators

- Federal Laboratories, Test Beds, and Technology Transfer
  - Federal Laboratory Consortium for Technology Transfer (FLC)
    - Nationwide network of over 300 federal labs, agencies, and research centers that fosters commercialization best practices
- Small Business Administration Resources

- US Patent and Trademark Office's Inventor & Entrepreneur Resources
- www.USAspending.gov
  - Follow the money from congressional appropriations to Federal agencies to local communities and businesses
  - AV innovators and entrepreneurs can use this to identify potential US Government funding opportunities

IV. TRAFFIC INCIDENT MANAGEMENT (TIM)/INTEROPERABILITY - UPDATE

Sheryl Bradley, District Five TSM&O, gave an update on the TIM program.

- The Traffic Incident Management (TIM) Program is focused on networking with agencies to improve TIM practices
  - So far, the program has trained several hundred first responders internally
  - A major reason for this is to improve response times and clearance times
    - With every minute that a crash remains on the road, the likelihood of a secondary crash (or pass on crash) increases by 2.5% (a pass on crash is almost guaranteed after 38 minutes).
    - This risk is now significantly higher due to cell phone use by drivers
  - Greatest improvements in response time:
    - By service: Road Rangers, and in Verification
    - By location: on all limited access highways in District Five
- Rapid Incident Scene Clearance (RISC)
  - Originated in District Two
  - Specialized contractors are needed to tow difficult crashes and historically can take 4-8 hours to arrive
  - Working with *Safetow* towing company to improve road safety after crashes
    - If the tow truck is delayed or not responsive, Safetow will send out a wrecker to get a difficult crash off the roadway and into a safe area to wait for the tow truck.
  - Applying existing best practices so that we lead in response to large scale incidents
  - The Turnpike also has a RISC contract
- Focus of TIM Improvements
  - Verification Phase
    - Drivers often do not know where they are on a roadway
      - Lack of knowledge causes delays in agency response time and additional burden on agency resources
    - Interoperable Communications - Mutualink
      - Goal: Develop familiarity with Mutualink by using it for traffic management, so that it can be used efficiently in worst-case scenarios
      - One benefit to Mutualink is that it is used in the RTMC and there are TIM staff in the RTMC daily
      - Reduces response time and need for resources
      - Mutualink can provide real-time video info to emergency services to affect how they respond to crashes and improve response time

        - Example: An overturned dump truck on SR 528 had spilled a large quantity of lime rock onto the road surface. This was first seen through the Mutualink feed from the site and was used to inform first responders of the location and severity of the crash.
    - Current/Past TIM efforts:
        - POTUS Rally in Orlando
            - Orlando Chief of Police remarked that, from a traffic standpoint, it was the best coordinated presidential visit they had seen since joining the agency
        - Cape Canaveral Shuttle Launches
            - Traffic movement in and out of Titusville can be significantly improved
            - If all agencies use the same communication platform, tasks such as identifying uncongested routes for emergency responders can be improved
        - Regional Interoperable Workshop
            - Presented the TIM platform to the public and showed how it is being used
            - Encouraged connection with the platform for direct communications
            - Road Ranger Demonstration
                - Drone demonstration
                - RTMC tour
                - Showed how information is sent to the RTMC
                    - Using Mutualink to send live video can clarify terminology between two agencies/people (washout, signal down, etc.)
- Notification Phase
    - Can be significant delay in emergency calls coming through to TIM – 5-8 mins
        - By the time cameras are pulled up, emergency responders are already on the scene so little good can be done.
        - TIM is now monitoring outside websites (e.g. pulsepoint.org) to get crash alerts quicker
            - Some agencies also text the information directly to TIM
    - UF Research Project
        - Conducting research into integrating CAD from partners directly into our system
            - collected input from partner agencies
    - Emergency responder safety
        - Developing more effective communication with drivers to send them out of the way of emergency vehicles
            - Effectiveness of driver communication will depend on driver behavior
        - Monitoring roadway traffic saturation
    - TIM GIS Tool
        - Aids in moving traffic through communities effectively

        - Detours are planned and finalized by local agencies and the RTMC, but emergency responders mobilize them in the field:
            - Need better communications to send instructions to emergency services and receive feedback from the field
        - The practice was initiated in D3; now pushing out timing plan to emergency responders
    - Performance Measures of TIM Training
        - Roadway Clearance Time has improved 16-35% across all D5 counties
        - There is a clear correlation between engagement with TIM training and practices and most significant improvements.

Discussion

Q: Have you considered using curtains/screens to provide a visual barrier at crash scenes?

A: Curtains and screens present a challenge in Florida because of winds; they have a high potential to be blown over/away and thus become a bigger risk factor to traffic. Visual screens provide a benefit, the challenge is in finding a system that can be efficiently deployed without creating another hazard.

V. NEW POLICY ON FEDERAL GRANT APPLICATIONS – GOVERNOR'S OFFICE OF POLICY AND BUDGET

Jeremy Dilmore presented the new policies for Federal Grant Applications being submitted by FDOT.

- Governor's Office of Policy and Budget has established a new policy for Federal grant applications
- If FDOT (or similar state agency) is applying for a Federal grant, application must meet the following:
    - Completed package and all supporting documentation must be submitted for review to Governor's office 21 days before official submission to Federal agency. No exceptions.
    - Application must be reviewed and approved by District Program Management before it can be sent to Governor's office (consistency with Work Program)
- This policy does not apply to local/regional agencies pursuing federal grants UNLESS FDOT is partnering with the local agency on the grant request, then it must follow the process for FDOT-initiated grant requests
- Major Takeaway:
    - Please respond ASAP to any requests for support or participation in FDOT's grant application process

VI. WORK ZONE DATA EXCHANGE (WZDx)

Jeremy Dilmore presented on advancements and challenges in Work Zone Data Exchange.

- General Issues and Challenges for Work Zones
    - Real-time information about dynamic conditions occurring on roads can help ADS and humans navigate safely and efficiently

  - Many Infrastructure Owners & Operators (IOO) maintain data on work zone activity, but it is often difficult for OEMs and navigation applications to access and use data across jurisdictions
  - Similar issue developed with transit data
    - GTFS grew out of this challenge
  - MetroPlan TSMO Committee feedback on Work Zone issues
    - Specific location and timing of work zones are often unknown
    - Utility "quick-fixes" are the hardest to capture in real-time
    - On-site CEIs can identify when closures occur
    - Contractor is supposed to notify operations staff of Work Zone but often neglects to do so in a timely manner
- Learning from Open Transit Data
  - Considering General Transit Feed Specification (GTFS) in order to feed all data through SunGuide.
- WZDx Specification
  - Purpose: One simple, open specification that is broadly adopted will save lives.
  - Anticipated Benefits
    - Used by 3rd parties for general public dissemination
    - CAVs can use data to navigate around work zones or avoid entirely
    - Used by planners/engineers to determine safety/mobility constraints caused by work zones
    - Used for real-time traffic operations
  - Anticipated grant program
    - Total Funding: $2.4 million
    - Up to 12 awards
    - Up to $200,000 per award
    - 12-month performance period
    - 20% non-Federal share
    - NOFO to be released Spring 2020 (most likely)
- FDOT Project Proposal
  - Considered gathering data from dash cameras; however, this method raises serious ethical questions
  - Apply Bluetooth low-energy (BLE) devices to barrels; provide positional data in real-time
    - BLE needs to be weatherproof and withstand rough use of barrel for ~3 years (average barrel lifespan)
  - Backhaul via wireless modem in arrow board
    - Requires added security as theft of arrow board batteries is common
  - Smart arrow board would have CCTV, ability to detect message on board, and speaker to alert workers of issue
    - System would be able to detect rapid changes in position of cone(s) with confirmation from CCTV camera to determine if unauthorized vehicles enter work zone perimeter

- FDOT Proposal
  - BLE Device Concept
    - Inexpensive: $25 without scaling
    - Last 2-3 years
    - Include power, communication, and code
    - Don't need 100% performance to be effective
    - Currently contacting vendors with promising responses
  - Smart Arrow Board Concept
    - Expensive: $4,000 for CCTV, modem, speaker combo
    - $35 / month / device communication
    - Will require regular maintenance
  - MetroPlan TSMO Committee feedback on FDOT proposal
    - If you have to rely on manual data input, you won't get accurate/timely data; need to automate data entry
    - Should include MOT equipment vendors in coordination
    - There would be great value in agency-wide system to catalog Work Zones, fleet, traffic supplies, etc. that can be used by the region's different owner-operators
    - If we identify appropriate devices, can incorporate into future contracts
- WZDx Specification and Demonstration Grant
  - For more information: https://www.transportation.gov/av/data/wzdx
    - (first link sends you to GitHub site)

VII. CURRENT INITIATIVES

Jeremy Dilmore led a discussion on current initiatives in D5.

- ICMS
  - SwRI is in its 3rd iteration; pending an essay to extend the contract development time
  - Setting up business rules and meeting with all affected agencies to ensure that everyone is comfortable with what is agreed on
- Hardware – Smart Signal Guidance
  - Documentation available: http://www.cflsmartroads.com/projects/smartsignals.html
  - Developing intersection detection, bike/ped counting, connecting to planning
    - Ultimately to provide guidance to signal designers
  - Shared information with several other states
  - Hitting some blocks in progressing to next steps, expansion, etc. but making steady progress
- Miovision – problems with performance from vendor
  - Miovision was unaware of the constant reboots that were occurring
  - District staff met with senior level Miovision staff; they appeared to take great interest in responding to the problems and a solution is currently being worked on.
- Data Sharing
  - Received information from Denver regarding procurement

    - V2X Hub
        - Still waiting for vendors to determine performance standards
        - When implementing CVs, an industrialized computer will most likely be needed
        - Still figuring out how the V2X platform will look
            - Trying to make all operational data available
- Orlando Accelerating Innovative Deployments (AID) Grant
    - The grant focuses on multimodal interests and infrastructure in downtown areas. In Downtown Orlando, the focus is on the area around the Dr. Phillips Center, Amway Center, and the Orlando City Stadium.
        - This area experiences high volumes of ped traffic when events are held and high volumes of vehicular traffic at other times.
        - Study will determine how demands fluctuate and modify signal timings to respond to demands.
            - Optimization based on corridor characteristics.
        - Originally intended to focus on Garland Ave and South St, but due to I-4 construction, will instead focus on Orange Ave and Magnolia Ave
            - Applied for the grant for Downtown Orlando in 2017, told that we won it in January
- SunStore Research Data Exchange
    - D5 is supplying API and CV info so that it can tie into SunStore
    - Code from SunStore for ATSPM data to be sent to amazon webservices
        - One benefit is that university research programs will have easier access to the data, rather than having to be given a hard drive or access a site that keeps crashing when they attempt to download the data
    - Making good progress; SunStore is the local version of this project, the APIs can be reflected on a national platform
- iVEDDS Upgrade
    - Upgrade should be completed this fiscal year
    - Much more robust system
    - Pull multi-cast feeds to TMC
    - Looking at going to unicast standard internally and then go to multicast to central
        - Cheaper switches
        - Lowers the barrier of entry into marketplace for workforce and agencies
        - With the update, each camera will only submit one join request, so that iVEDDS no longer has the problem of oversubscribing cameras
    - The firewall has improved; up to 96% from 22%
    - Seminole County and CFX have made the switch and so far, the network topology is working
- AV Shuttle
    - Planning for revised signage on shared-use paths
        - Make pedestrians aware that AV shuttle will share path
    - Mapping to begin after the 17th – the machine made it through customs
    - Received contact for Utah DOT to communicate about their installation and lessons learned

- Complete Trip ITS4US
    - Coming out in summer
    - Service for a complete trip
    - Aims to provide everyone with access to the transportation system
    - Factors and demographics being considered with regard to potential users include:
        - Economics
        - Language use
        - Disabilities
        - Disadvantaged groups
        - People who do not own a smartphone
            - Kiosks will be built that can be managed and operated like a pc
        - Unbanked people
    - Some services that have been considered for inclusion are:
        - Multimodal trip planning
        - Service alert
        - Timely updates about trip
        - Adjusting services based on origin/destination
    - Will use GTFS feeds to get data
    - Intended to be implemented throughout the region
    - Webinars are still happening through April
    - Contact Jeremy if you have any ideas or concepts for this
- OBU Emulator
    - Progress is still being made
    - There are 8 concepts being prepared for the grant; they are all conceptually high level
    - The task team wants to pre-screen each concept and get them through the Governor's office early
    - If you wish to add on to or modify the concepts, or propose new ones, feel free to do so; we will send the current ones to you
- TMDD
    - Data feed taken out of controllers to provide to Sunguide, so that everything happening at a traffic signal can be observed.
    - Necessary for CV developments with industry
    - Important for connecting to ICMS
        - Intelight and Trafficware or Cubic are close to making it work
        - Econolite is not close to making it work

VIII. NEXT MEETING

- April 2, 2020

IX. ATTACHMENTS

- A – Sign in sheets
- B – Presentation Slides
- C – Meeting agenda

END OF SUMMARY

This summary was prepared by Amanda Johnson and 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 they can be finalized for the files.*

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February 6, 2019

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Welcome to the TSM&O Consortium Meeting

February 6, 2020

WiFi: ONRAMP
Follow instructions

Transportation Systems Management & Operations

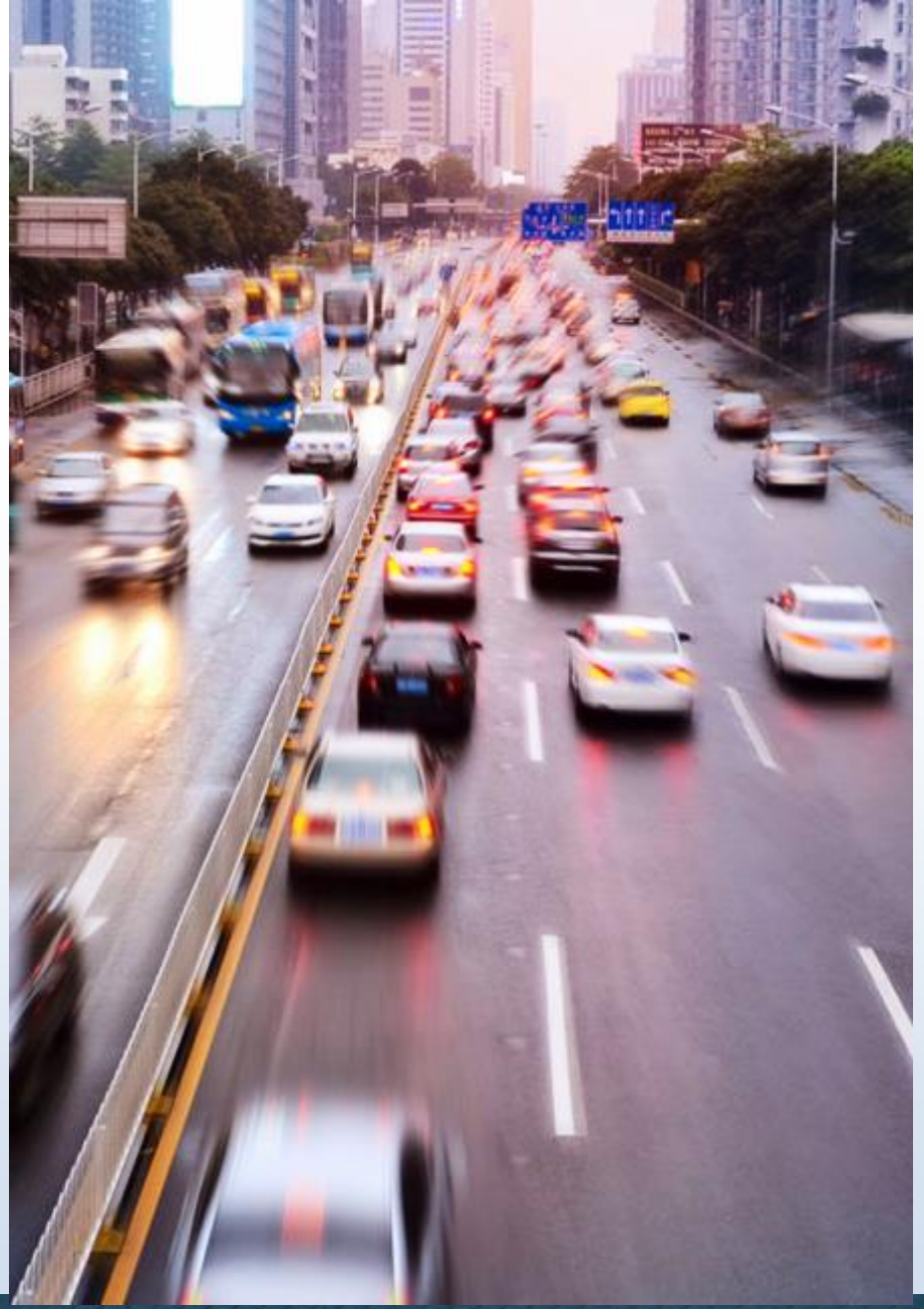
Meeting Agenda

1. Welcome
2. TSM&O Workforce Development
3. Ensuring American Leadership in AV Technologies: *Automated Vehicles 4.0*
4. Traffic Incident Management – Update
5. New Policy on Federal Grant Applications
6. Work Zone Data Exchange (WZDx) Program
7. Current Initiatives


"Transferring knowledge about the TSMO practice around the country"
TSMO Consortium – Orlando, FL
NOCoE
National Operations Center of Excellence
Patrick Son, P.E.
Managing Director

VISION: Provide exceptional services to the TSMO community to save lives, reduce congestion, and enhance economic vitality

MISSION: Empower the TSMO community to succeed by enhancing knowledge, skills, and abilities



Presentation Outline

1. Workforce Development, Resources and Activities
2. Data Management – TSMO Awards
3. Progress of our TSMO Practice
4. Leadership – Removing Barriers

The Workforce Development Guidebook

(What it is and what it is not)

GOAL

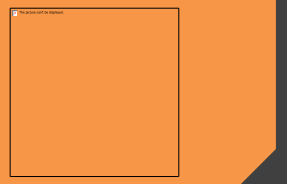
Assist you in creating meaningful TSMO-related positions that will help advance your organization's maturity

Who is this for?

- People at transportation agencies looking to begin or advance a TSMO program **GET GUIDANCE**
- People involved in recruiting, hiring, or training in the transportation operations field **GET ADVICE**
- Consultants working with TSMO programs **UNDERSTAND CHANGING ROLES**
- Educators at the undergraduate and graduate levels **KNOW HOW TO PREPARE TOMORROW'S WORKFORCE**

Focus on you, your needs

01

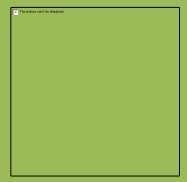


Workforce development must be flexible

02

Process depends on adaptability

03



Guidebook is a set of tools and examples

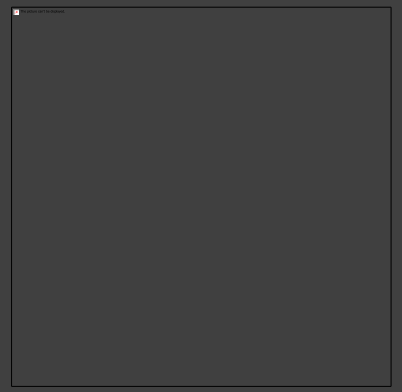
04

Modify to fit your organization

05

Please share information

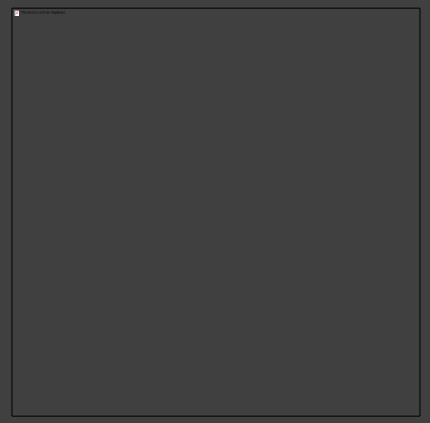
What will be useful to me in my job?



	WHICH PART OF THIS RINGS TRUE WITH YOU NOW?
Recruiting a TSMO Workforce	1. Understand **evolving** skillsets needed for **success** and **innovation**
	2. **Understand** when an agency is **ready** to hire TSMO personnel
	3. Recommendations, best practices for hiring TSMO positions

	WHICH PART OF THIS DO YOU NEED TO UNDERSTAND BETTER?
Model TSMO Position Descriptions	1. Descriptions of 19 different TSMO-related positions
	2. **KSAs that may be required for the positions**
	3. When, where, and how to recruit for each of the positions

What are the positions?



- 19 different positions identified
- Identified by literature review, backed by stakeholder interviews and panel recommendations
- Some exist, but not widespread or can be expected to exist in future
- Developed to include:
  - When position might be needed – “Triggers”
  - How it relates to CMM improvement
  - Knowledge, Skills Abilities for position
- Use positions descriptions as starting point – Modify to fit your needs

Traffic Data Scientist/Statistician	Cyber Security Engineer
TSMO Manager/Chief/Bureau Director	Transportation Data Ethicist
TSMO Program Manager	Surface Weather Specialist
Computer Engineer	Systems Engineer
Artificial Intelligence Scientist	TSMO Modeling Specialist
Telecommunications Engineer	Emerging Technologies Industry Liaison
Data Management Specialist	Transportation Systems Performance Manager
Visualization Specialist	Integrated Corridor Management Manager
Connected and Automated Vehicles (CAV) Program Manager	Transportation Management Center Manager
Traffic Incident Management (TIM) Program Manager	

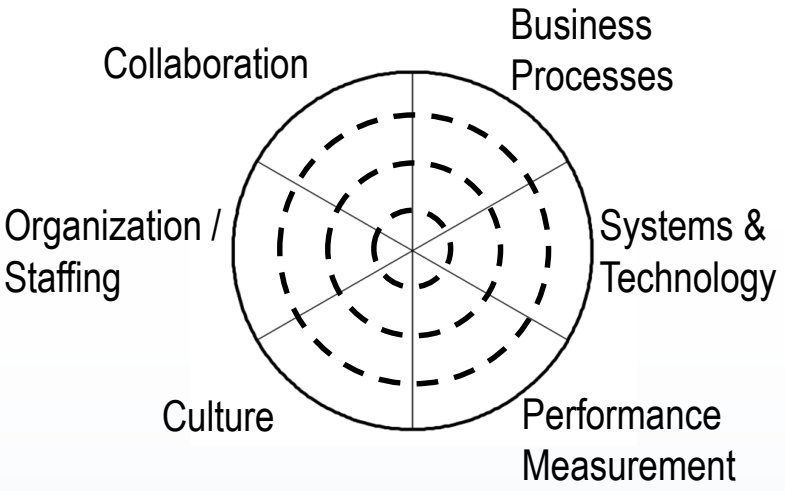
https://transportationops.org/workforce/model-tsmo-position-descriptions

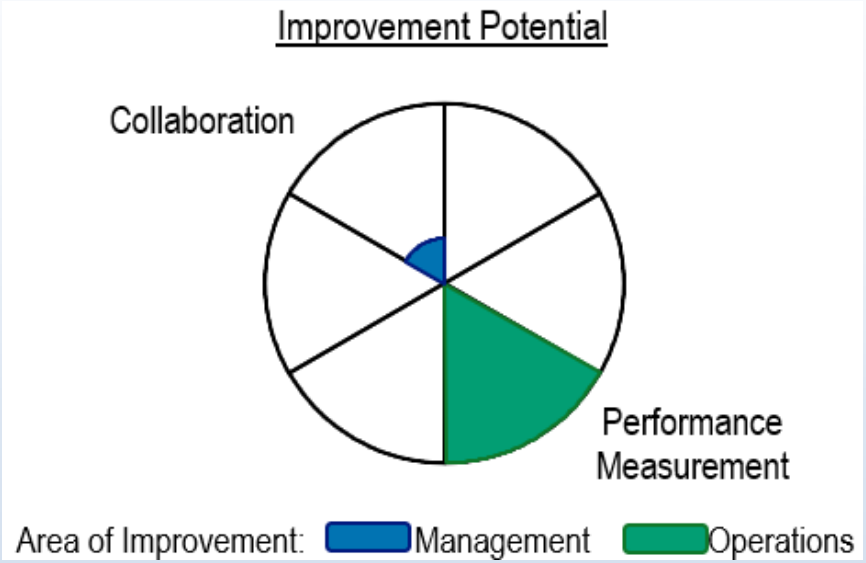
What motivates your organization to change its face(s)?

Position	Motivations
Traffic Data Scientist / Statistician	• TSMO relies on effective extraction and manipulation of “big data” • Growing opportunity and expectation for data-driven decision-making, including advanced pattern recognition and statistical methods • Spatial data requires combining expertise in geographic information systems (GIS), statistics, data science, visualization, and web applications

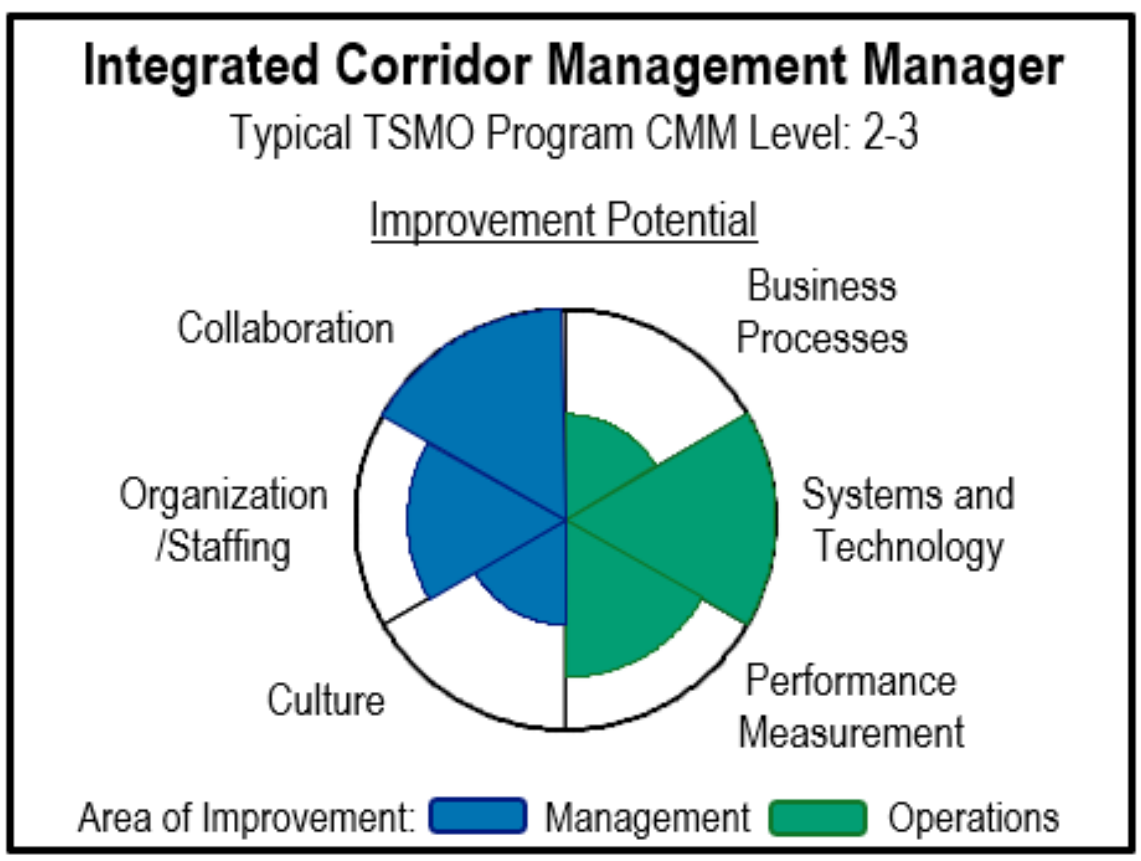
Illustrating CMM Improvement Potential

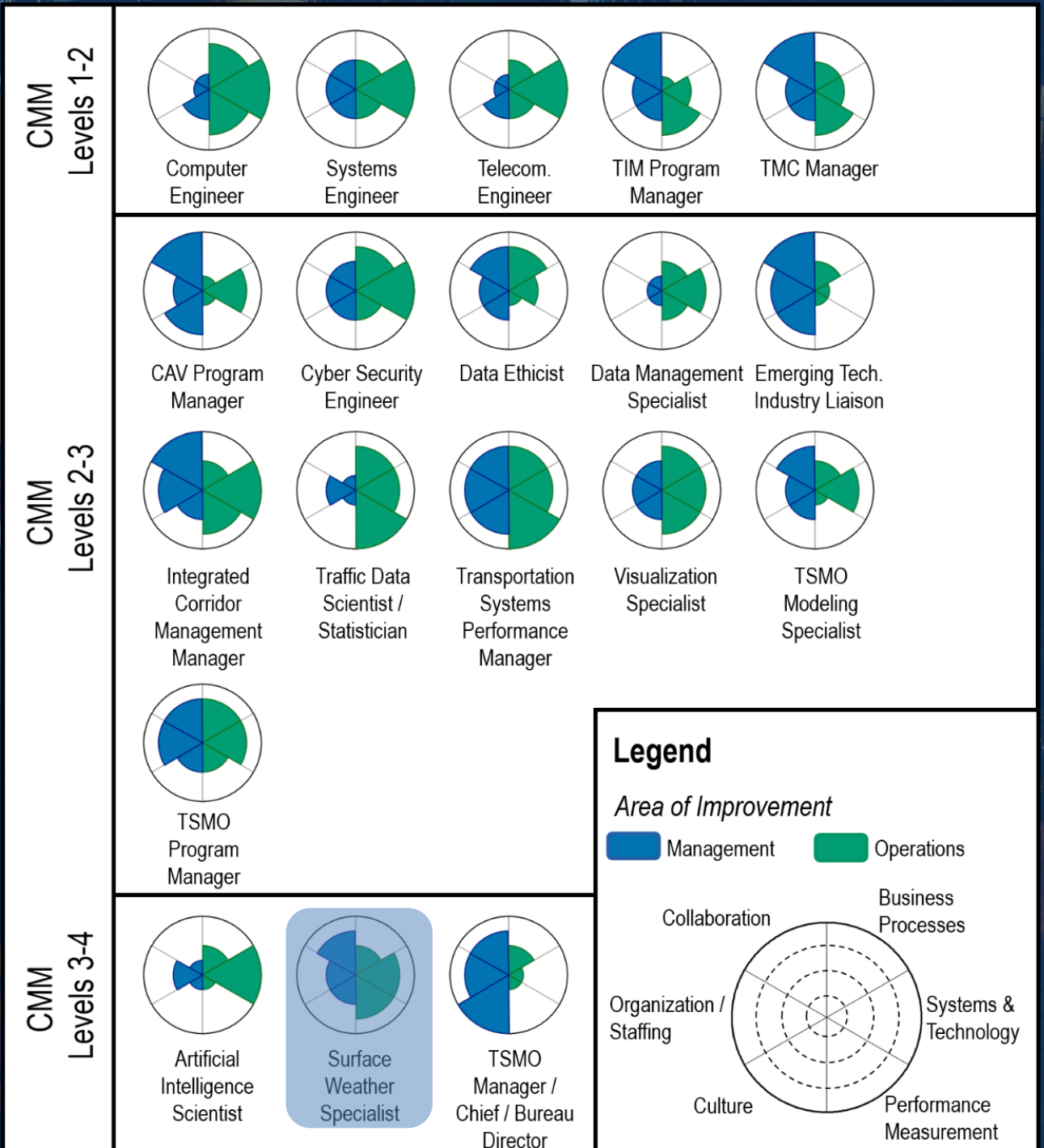
- Developed Concept Analogous to Right vs Left Brain
- Right Brain (Management) – More Creative and Artistic
  - Collaboration
  - Organization/Staffing
  - Culture
- Left Brain (Operations) – More Analytical
  - Business Processes
  - Systems and Technology
  - Performance Management
- The more the radial graphs are filled out the higher potential to improve CMM category





Capability Maturity Model Improvement Potential

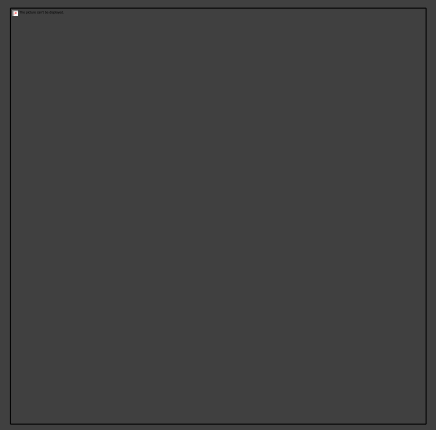


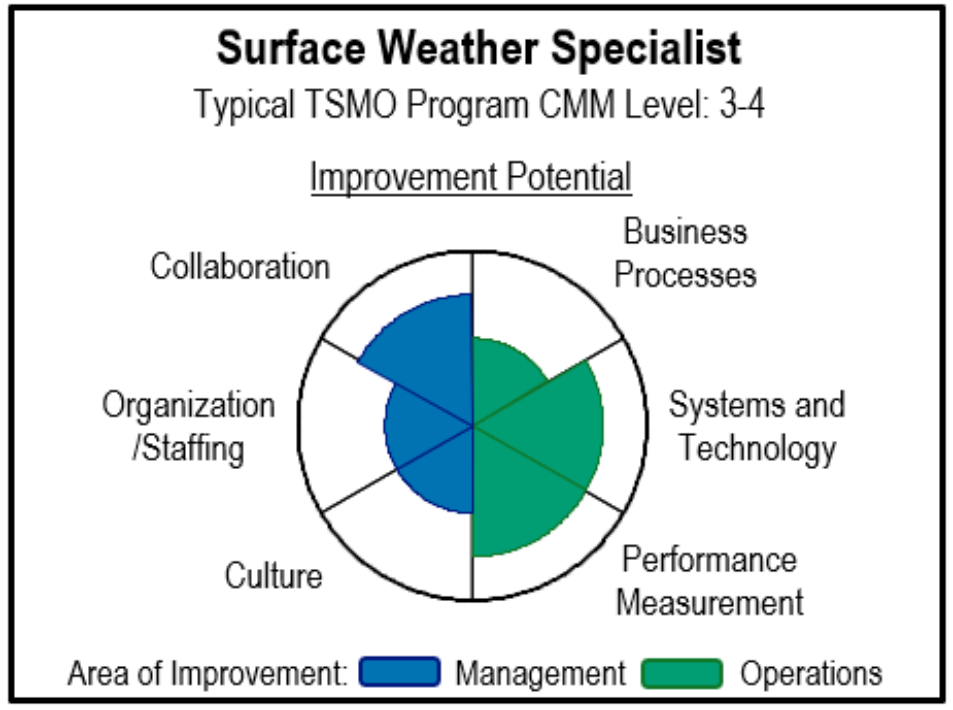


Beyond just what the jobs are

EXAMPLE - WHEN AND WHY TO HIRE?

- The agency is looking to enhance their TSMO program by improved weather condition connectivity
- Weather data needs integration with other TSMO activities for performance assessment and improvement
- Interest in improving TSMO applications by adapting to real-time and predictive weather effects





Greatest potential to impact CMM is on collaboration, systems, performance improvement

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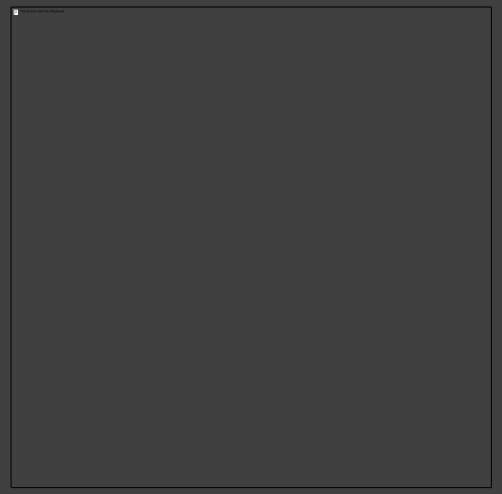
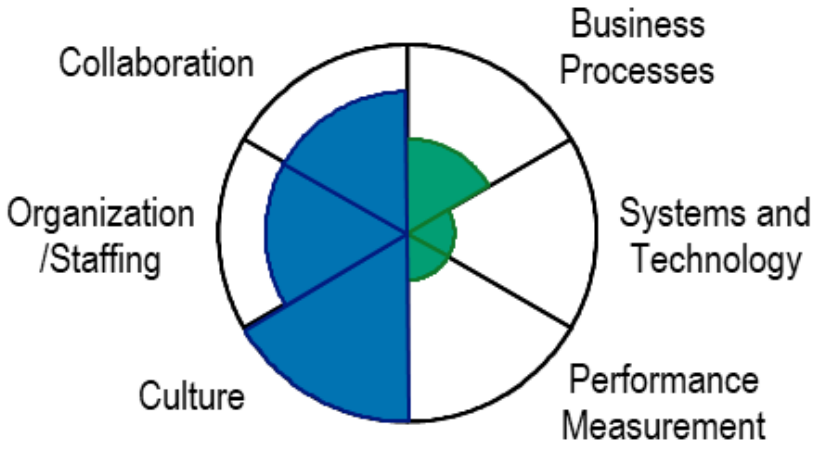
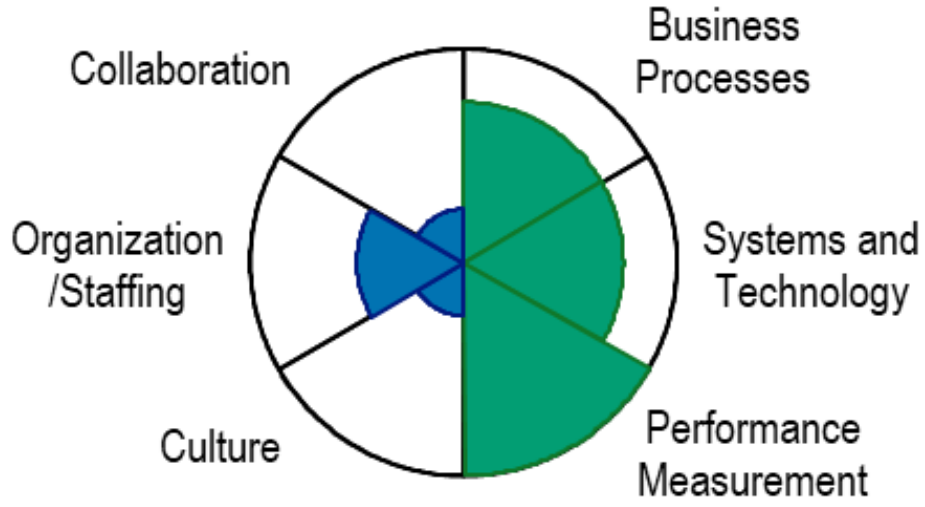
Example Operations vs. Management Positions



TSMO Manager/Chief/Bureau Director



Traffic Data Scientist/Statistician



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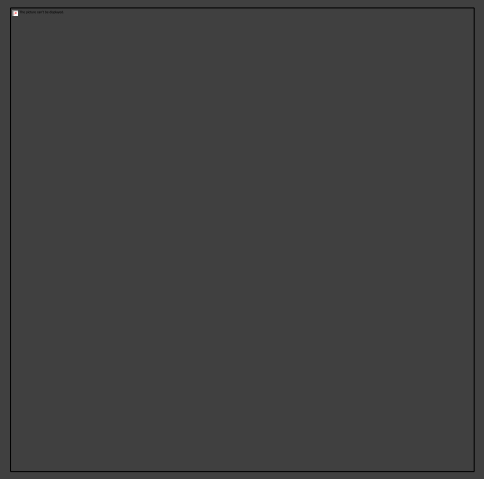
So where do I find?

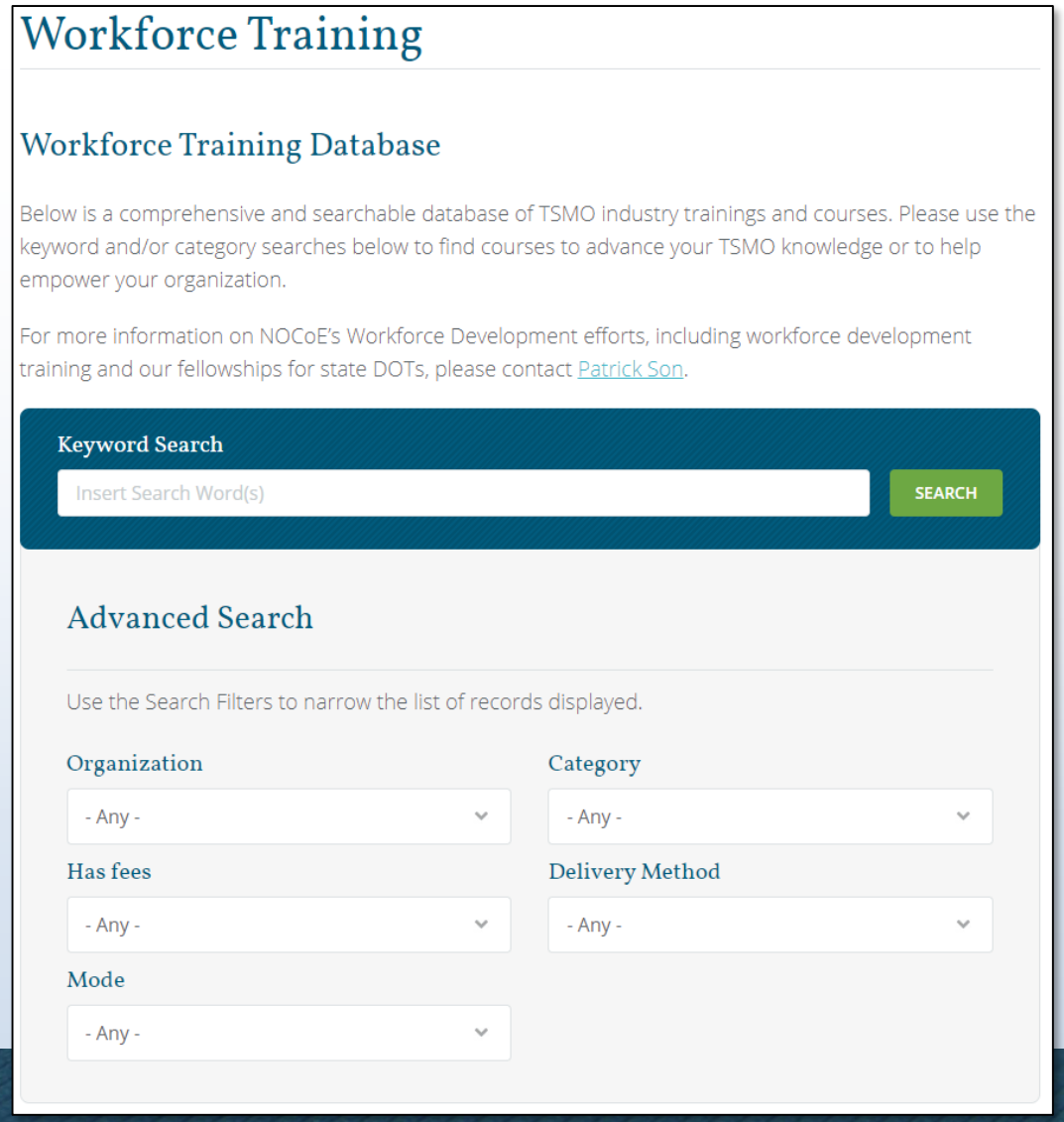
- Recruiting a TSMO Workforce
- Model TSMO Position Descriptions
- **NOCoE Website**
- Developing a TSMO Workforce
- TSMO Workforce Retention

So where do I find?



https://transportationops.org/workforce

Searchable Training Database



Research converted to online database

https://transportationops.org/training

Please send new training to NOCoE

NOCoE National Operations Center of Excellence

2nd Annual Transportation Technology Tournament (TTT)
ITE Austin

Transportation Technology Tournament

2019 SUBMISSIONS: 9 Teams, 5 finalists

5 Finalists:

- University of Michigan
- Florida International University
- University of Tennessee, Knoxville
- University of South Florida (2 Teams)

TTT – ITE Austin

- NOCoE Partnership with U.S. DOT ITS JPO
- Each team paired with agency to solve real-world DOT problem
- Focus on soft skills for students

NOCoE Fellowship Program

Purpose:

To provide opportunities for early career, or career switching TSMO professionals to develop knowledge, skills, and abilities (KSAs) that can be applied on the job and in support of their long term career growth.

Courtney Sell – WSDOT
NOCoE's First Fellow

NOCoE
National Operations Center of Excellence

NOCoE Fellowship Program

Key Elements:

- Identify a select number of public agency practitioners that would benefit from being immersed in TSMO culture
- Work with fellows and their agency over a year to:
  - Create individual development plans
  - Provide them with opportunities to increase TSMO knowledge and develop interpersonal skills (writing, presentations, networking)
  - Link these activities to their Agency's intended outcomes
- Recognize fellows at AASHTO/ITE/ITS America Meetings

Presentation Outline

1. Workforce Development, Resources and Activities

2. **Data Management – TSMO Awards**

3. Progress of our TSMO Practice

4. Leadership – Removing Barriers

2nd Annual NOCoE TSMO Award Categories

1. Best TSMO Project or Strategy Implementation

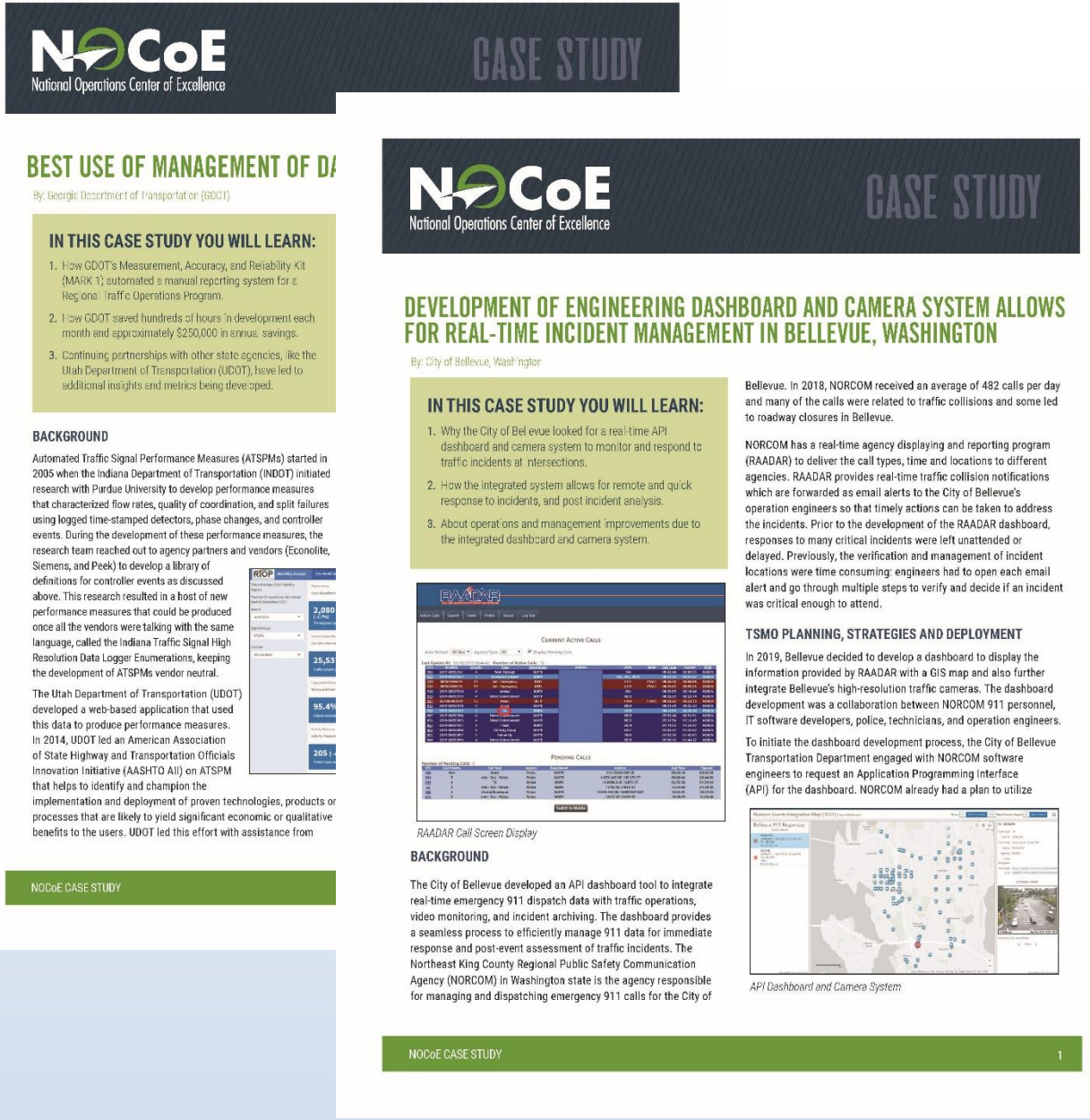
2. Agency Improvement: Use of Capability Maturity Model (CMM)

3. TSMO Workforce Development

4. Best Use of Management of Data to Improve TSMO

Case Studies

- 2nd TSMO Awards adds another 40+ new case studies (total 100+)
- Highly requested by TSMO community; well received according to targeted NOCoE research
- New categories of Workforce Development and Data Management



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CASE STUDY

BEST USE OF MANAGEMENT OF DA

By: Georgia Department of Transportation (GDOT)

IN THIS CASE STUDY YOU WILL LEARN:

1. How GDOT's Measurement, Accuracy, and Reliability Kit (MARK 1) automated a manual reporting system for a Regional Traffic Operations Program.
2. How GDOT saved hundreds of hours in development each month and approximately $250,000 in annual savings.
3. Continuing partnerships with other state agencies, like the Utah Department of Transportation (UDOT), have led to additional insights and metrics being developed.

BACKGROUND

Automated Traffic Signal Performance Measures (ATSPMs) started in 2005 when the Indiana Department of Transportation (INDOT) initiated research with Purdue University to develop performance measures that characterized flow rates, quality of coordination, and split failures using logged time-stamped detectors, phase changes, and controller events. During the development of these performance measures, the research team reached out to agency partners and vendors (Econolite, Siemens, and Peek) to develop a library of definitions for controller events as discussed above. This research resulted in a host of new performance measures that could be produced once all the vendors were talking with the same language, called the Indiana Traffic Signal High Resolution Data Logger Enumerations, keeping the development of ATSPMs vendor neutral.

The Utah Department of Transportation (UDOT) developed a web-based application that used this data to produce performance measures. In 2014, UDOT led an American Association of State Highway and Transportation Officials Innovation Initiative (AASHTO AII) on ATSPM that helps to identify and champion the implementation and deployment of proven technologies, products or processes that are likely to yield significant economic or qualitative benefits to the users. UDOT led this effort with assistance from

NOCoE CASE STUDY

NOCoE National Operations Center of Excellence

CASE STUDY

DEVELOPMENT OF ENGINEERING DASHBOARD AND CAMERA SYSTEM ALLOWS FOR REAL-TIME INCIDENT MANAGEMENT IN BELLEVUE, WASHINGTON

By: City of Bellevue, Washington

IN THIS CASE STUDY YOU WILL LEARN:

1. Why the City of Bellevue looked for a real-time API dashboard and camera system to monitor and respond to traffic incidents at intersections.
2. How the integrated system allows for remote and quick response to incidents, and post incident analysis.
3. About operations and management improvements due to the integrated dashboard and camera system.

RAADAR Call Screen Display

BACKGROUND

The City of Bellevue developed an API dashboard tool to integrate real-time emergency 911 dispatch data with traffic operations, video monitoring, and incident archiving. The dashboard provides a seamless process to efficiently manage 911 data for immediate response and post-event assessment of traffic incidents. The Northeast King County Regional Public Safety Communication Agency (NORCOM) in Washington state is the agency responsible for managing and dispatching emergency 911 calls for the City of Bellevue. In 2018, NORCOM received an average of 482 calls per day and many of the calls were related to traffic collisions and some led to roadway closures in Bellevue.

NORCOM has a real-time agency displaying and reporting program (RAADAR) to deliver the call types, time and locations to different agencies. RAADAR provides real-time traffic collision notifications which are forwarded as email alerts to the City of Bellevue's operation engineers so that timely actions can be taken to address the incidents. Prior to the development of the RAADAR dashboard, responses to many critical incidents were left unattended or delayed. Previously, the verification and management of incident locations were time consuming: engineers had to open each email alert and go through multiple steps to verify and decide if an incident was critical enough to attend.

TSMO PLANNING, STRATEGIES AND DEPLOYMENT

In 2019, Bellevue decided to develop a dashboard to display the information provided by RAADAR with a GIS map and also further integrate Bellevue's high-resolution traffic cameras. The dashboard development was a collaboration between NORCOM 911 personnel, IT software developers, police, technicians, and operation engineers.

To initiate the dashboard development process, the City of Bellevue Transportation Department engaged with NORCOM software engineers to request an Application Programming Interface (API) for the dashboard. NORCOM already had a plan to utilize

API Dashboard and Camera System

NOCoE CASE STUDY 1

NOCoE National Operations Center of Excellence

Work Zone Database Creation and Maintenance

Team 2

Funding Challenges

- Who owns the app?
- Who maintains the app?
- How is it supported long term?
  - Internal v. contractor support
- What is the cost of changes to business practice? (staffing, coordination with other groups, etc.)
- How do you ensure data quality? Who checks this?
  - New staff?
  - Regional TMC/TOC?
- Use a regional data server to push data to WAZE
- Does the DOT have an ITS Architecture already in place to support this? Or does this have to be setup?
  - How frequently is this updated? Every second? Every few minutes?
  - How do you fund this?
- Use CMAQ funds?
- Maintenance is a shared responsibility between local agency and state

Assumptions

- Everyone has some type of system in place for work zone data
  - Although not always accurate
- Need a construction coordinator
- Internal or external?
  - Some agencies can do it internally
  - Most would need to hire a contractor
- Total time of 9-15 months to create app
- Who would maintain this?
  - Add to 511 contractor
  - State IT agency
  - DOT manages in house
  - Contractor manages
- Enforcement
  - Require contractors to use app

Activity and Funding Map

Task	Task Details	Time Estimate	Cost Estimate	Funding Source
Update TOPS data fields		2 weeks	$20,000-$50,000	**Local funds** or state (ITS) funds
App development	Generating real-time reporting application	6-9 months	$100,000-$250,000	Local funds or state funds
Data integration	Development of database server and merging of appropriate data sources	3-6 months	$100,000-$250,000 (equipment) + $100,000-$250,000 (labor)	Local funds or state funds
Ongoing maintenance	Performance of system, updates, ownership, quality control, etc.	Ongoing	$100,000 per year (labor) + $50,000 per year (equipment)	Federal funds (CMAQ for first 3 years, STBG ongoing)
Identify TSMO applications		Ongoing	TBD	On-call contracts, TSMO planning funds
Enforcement	Police, etc.	Ongoing	Not applicable	Contract incentives
Totals		9-15 months	$420,00-$950,000 (development + 1st year)	

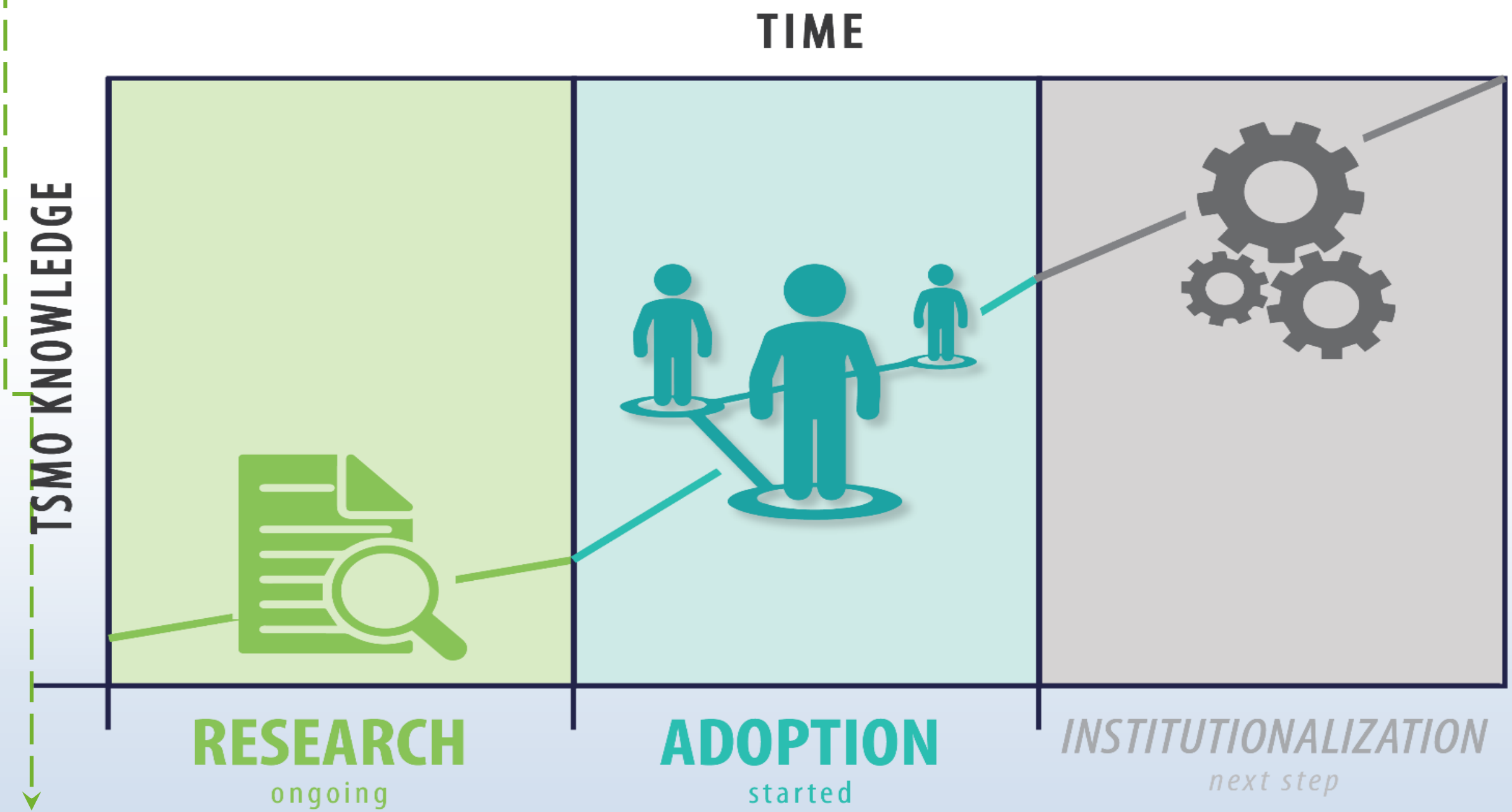
Insights

- Creating apps, servers, and data feeds aren't typical DOT function
- Need to consider what types of contractors you hire
- Will field crews embrace this? How do you require it?
- Internal apps (with maps) for enforcement (to make construction inspection more efficient)
- Need outreach and collaboration
- Need training
- Because this isn't traditional, don't have flexibility of funds to use this at discretion
- Need to sell this and be creative without a discretionary fund
- Cost-benefit can help sell

Presentation Outline

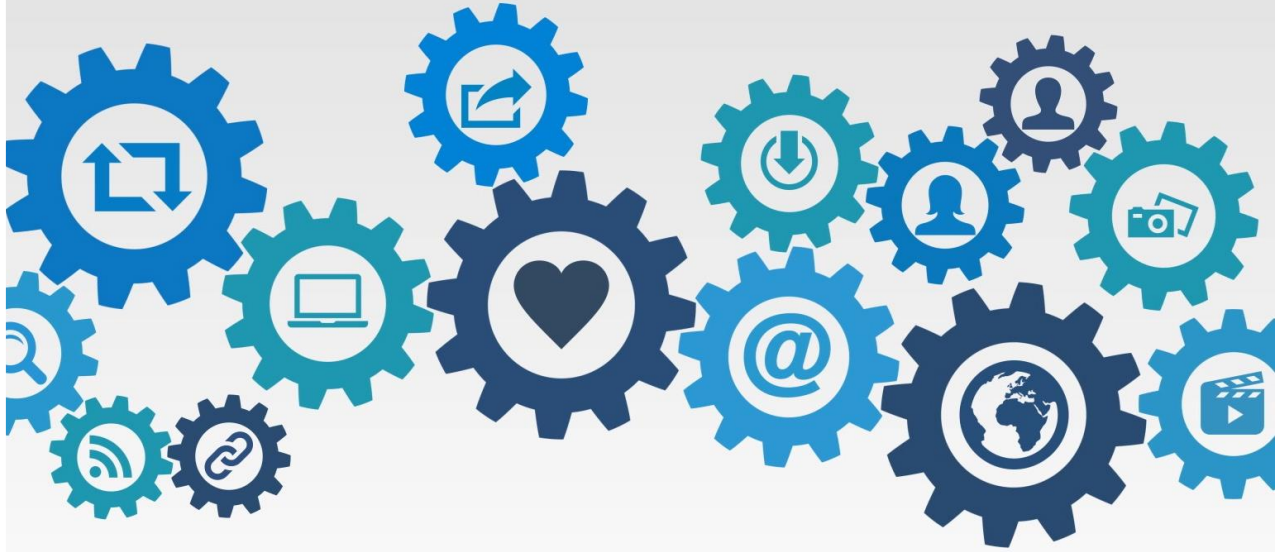
1. Workforce Development, Resources and Activities
2. Data Management – TSMO Awards
3. **Progress of our TSMO Practice**
4. Leadership – Removing Barriers


The Future of Transportation is Rooted in TSMO.


TIME
TSMO KNOWLEDGE
RESEARCH
ongoing
ADOPTION
started
INSTITUTIONALIZATION
next step

We need to increase the knowledge transfer rate.

If we don't think about transferring knowledge everyday, we are losing.



Knowledge Transfer is Everyday…

Commit to identifying how to transfer knowledge:

- In Your Department
- Across Departments
- Across the Industry

Leadership

Removing Barriers

Engage Us: Online or Social

Ensuring American Leadership in Automated Vehicle Technologies: *Automated Vehicles 4.0*

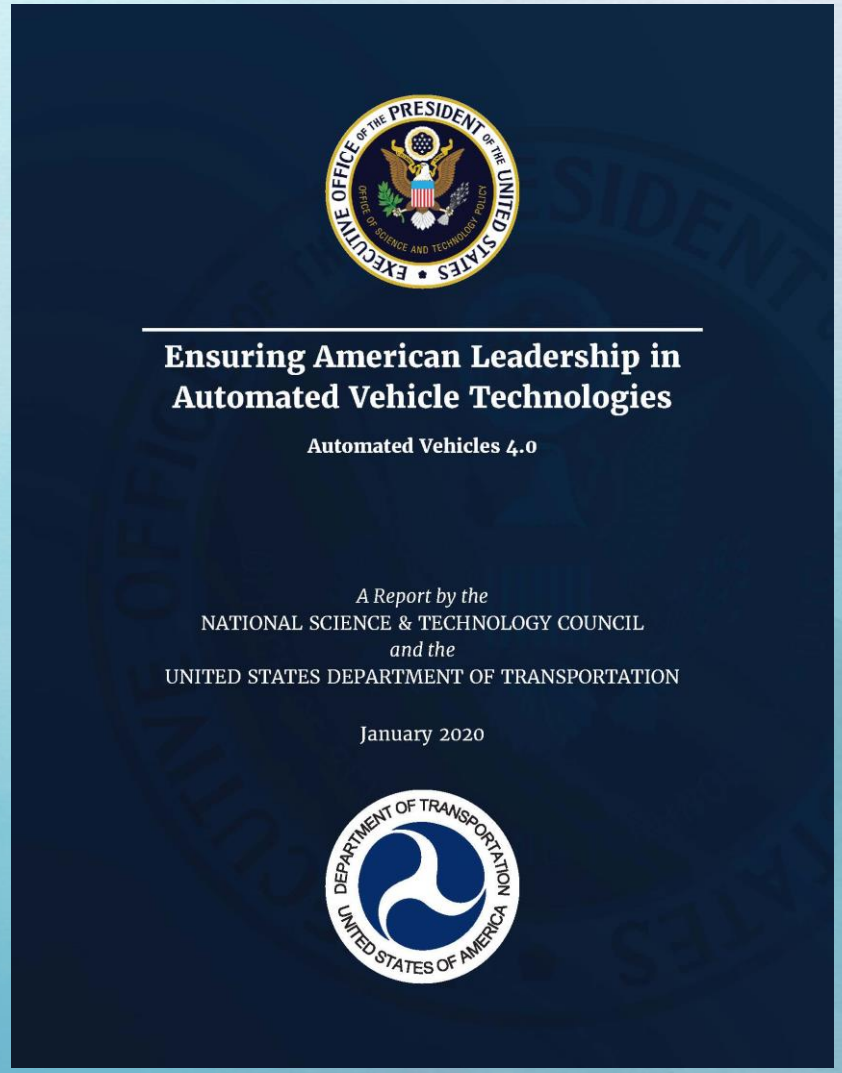
David Williams, VHB

Automated Vehicles 4.0

- Organization of Automated Vehicles 4.0
  I. Discussion of US Government AV Technology Principles
  II. Efforts to Support AV technology growth and leadership
  III. US Government Activities and Opportunities for Collaboration

I. US Government AV Technology Principles

- AV 4.0 establishes US Government AV technology principles that consist of three core interests:
  1. Protect Users and Communities
  2. Promote Efficient Markets
  3. Facilitate Coordinated Efforts



I. US Government AV Technology Principles

I. Protect Users and Communities

1. Prioritize Safety
2. Emphasize Security and Cybersecurity
3. Ensure Privacy and Data Security
4. Enhance Mobility and Accessibility

I. US Government AV Technology Principles

II. Promote Efficient Markets

5. Remain Technology Neutral
6. Protect American Innovation and Creativity
7. Modernize Regulations

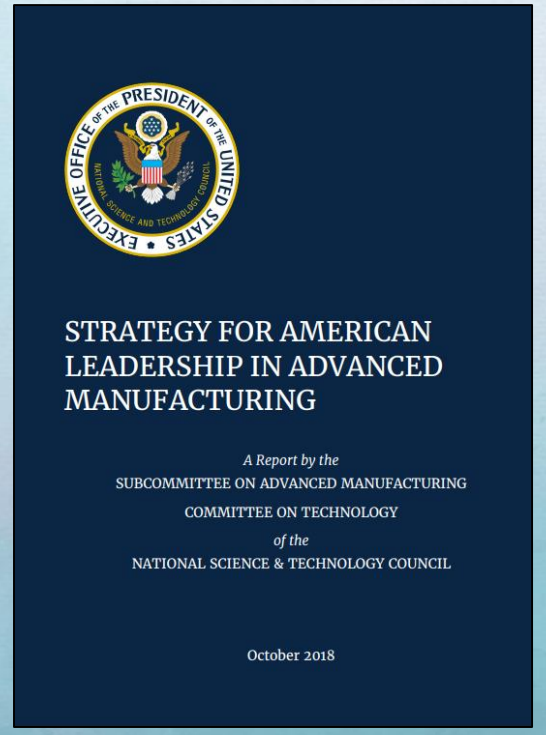
I. US Government AV Technology Principles

III. Facilitate Coordinated Efforts

8. Promote Consistent Standards and Policies
9. Ensure a Consistent Federal Approach
10. Improve Transportation System-Level Effects

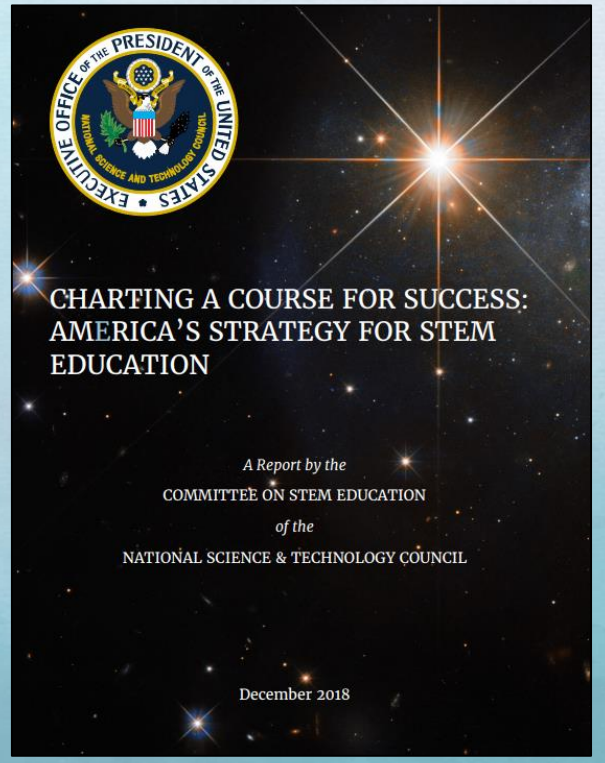
II. Administration Efforts Supporting AV Technology Growth and Leadership

- Investments, Documentation, Research in:
  - Advanced Manufacturing
    - *A Strategy for American Leadership in Advanced Manufacturing* (2018)
  - AI and Machine Learning
    - *E.O. 13840: Maintaining American Leadership in Artificial Intelligence* (2019)
  - Connected Vehicles and Spectrum
    - *Facilitate America's Superiority in 5G Technology Plan (5G FAST Plan)*
    - **(DSRC, C-V2X, Wi-Fi, and the CV Spectrum)**



II. Administration Efforts Supporting AV Technology Growth and Leadership

- STEM Education
  - *Charting a Course for Success: America's Strategy for STEM Education* (2018)
- STEM Workforce
  - *E.O. Establishing the President's National Council for the American Worker* (2018)
- Supply Chain Integration
  - *E.O. on Securing the Information and Communications Technology and Services Supply Chain* (2019)
- Quantum Information Science
  - *National Quantum Initiative Act* (2018)



III. US Government Activities and Opportunities for Collaboration

A. <u>Investments in AV Sector (by Federal agency)</u>

- Safety
- Ensuring Mobility for All Americans (USDOT US p. 10)
- Fundamental Research (USDOT p. 41)
- Security and Cybersecurity (USDOT/NIST pp. 22-3)
- Infrastructure (USDOT p.24)
- Spectrum and Connectivity (FCC/NIST p. 26)
- Economics and Workforce Research

US Government Activities and Opportunities for Collaboration

B. Enabling Activities in AV Sector

- Fostering Collaboration with Government
- Voluntary Consensus Standards and Other Guidance
- Regulatory Authority and AVs
- Taxation, Trade, and Intellectual Property
- Environmental Quality
- Competition, Privacy, and Market Transparency

US Government Activities and Opportunities for Collaboration

C. Resources for AV Sector Innovators

- Federal Laboratories, Test Beds, and Technology Transfer
- Small Business Administration Resources
- US Patent and Trademark Office's Inventor & Entrepreneur Resources
- www.USAspending.gov
- Additional Resources

Program Update

Sheryl Bradley, D5 TIM Program Mgr.
Consultant (HNTB)

Outreach


FDOT
AXIS COMMUNICATIONS
See flashing lights?
MOVE OVER
or slow down!
EMERGENCY SCENE AHEAD
LAW ENFORCEMENT AMBULANCE
TRAFFIC INCIDENT MANAGEMENT
TRAFFIC INCIDENT MANAGEMENT
#SlowDown
#MoveOverFL
In partnership with FDOT
FLORIDA 511


OCEAN CENTER
MOVE OVER
INCIDENT RESPONSE
FDOT
ROAD RANGER
LYNX
TRAFFIC INCIDENT MANAGEMENT
TRAFFIC INCIDENT MANAGEMENT
In partnership with FDOT
FLORIDA 511

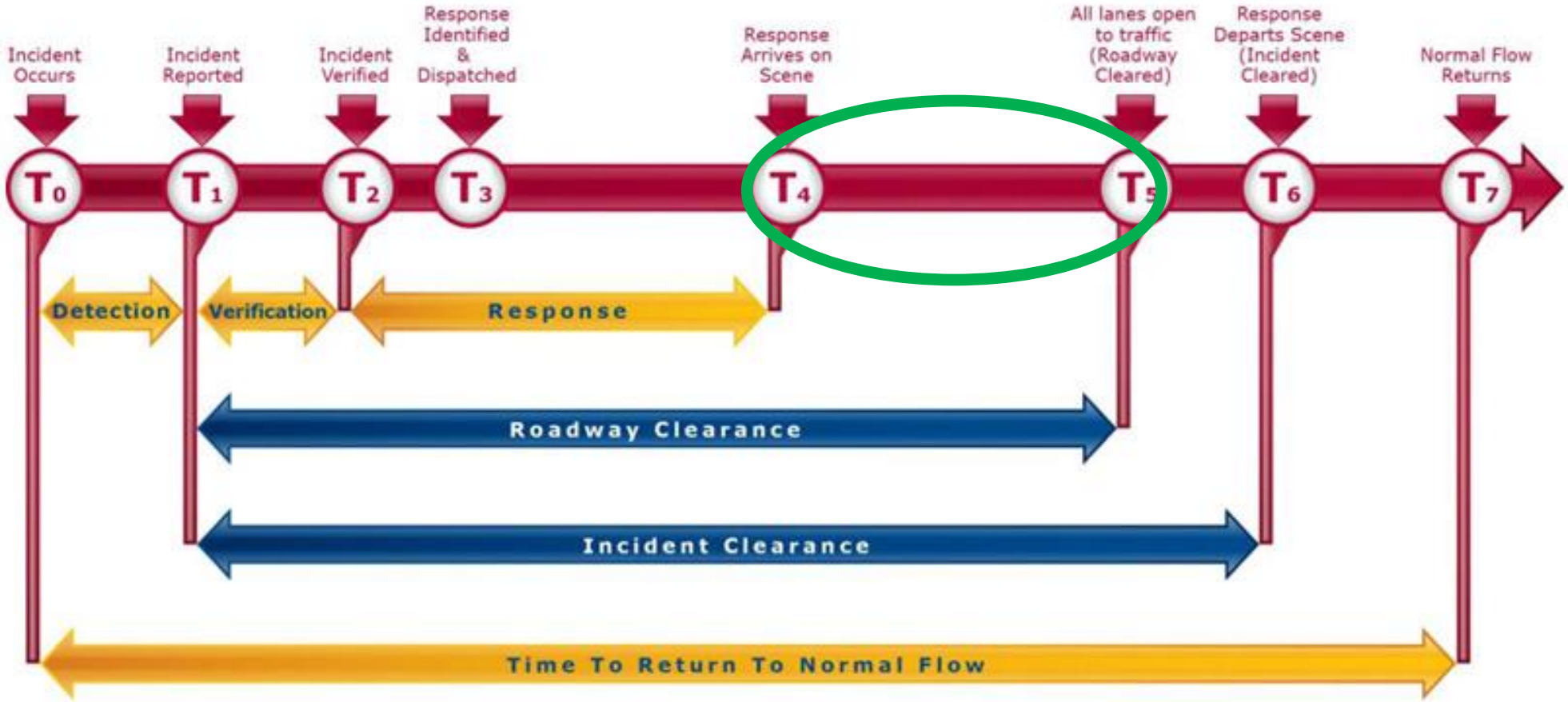
SHRP2 TIM Training

100+ certified trainers

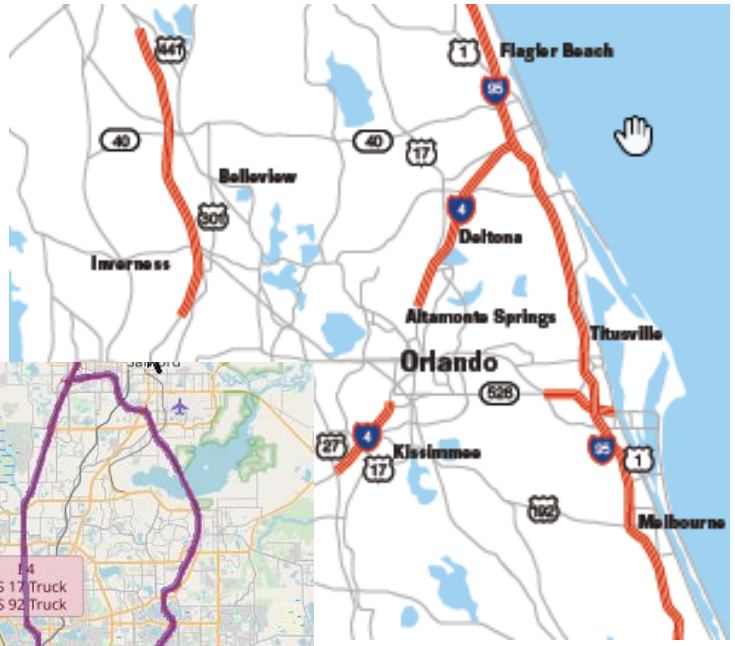
Fire/Rescue
Law Enforcement
FHP dispatch
Road Rangers
Asset Management
Towing
FDEP

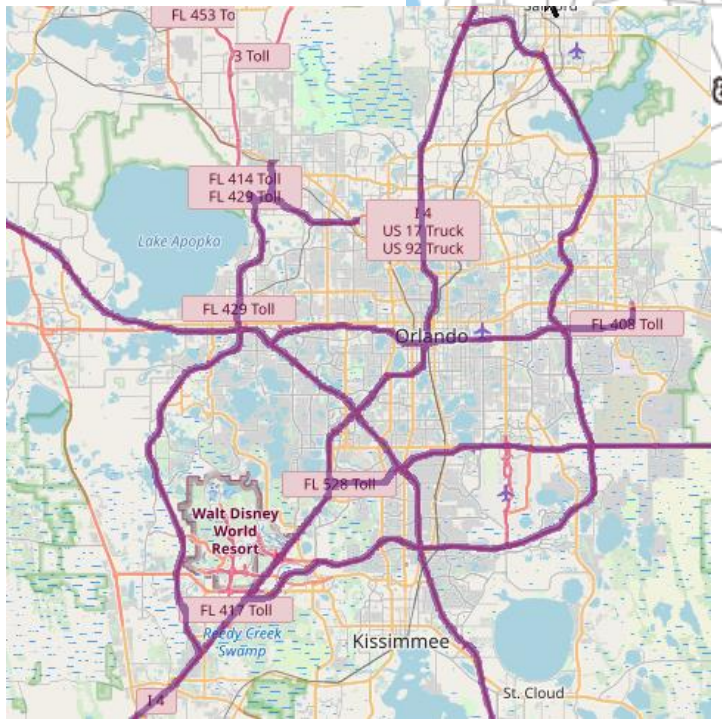
Training Pays Off


JYP/SAND LK
LOOKING: N
ORANGE COUNTY GOVERNMENT FLORIDA


Incident Occurs
Incident Reported
Incident Verified
Response Identified & Dispatched
Response Arrives on Scene
All lanes open to traffic (Roadway Cleared)
Response Departs Scene (Incident Cleared)
Normal Flow Returns
T0
T1
T2
T3
T4
T5
T6
T7
Detection
Verification
Response
Roadway Clearance
Incident Clearance
Time To Return To Normal Flow

Road Rangers





FDOT TSM&O
Transportation Systems Management & Operations

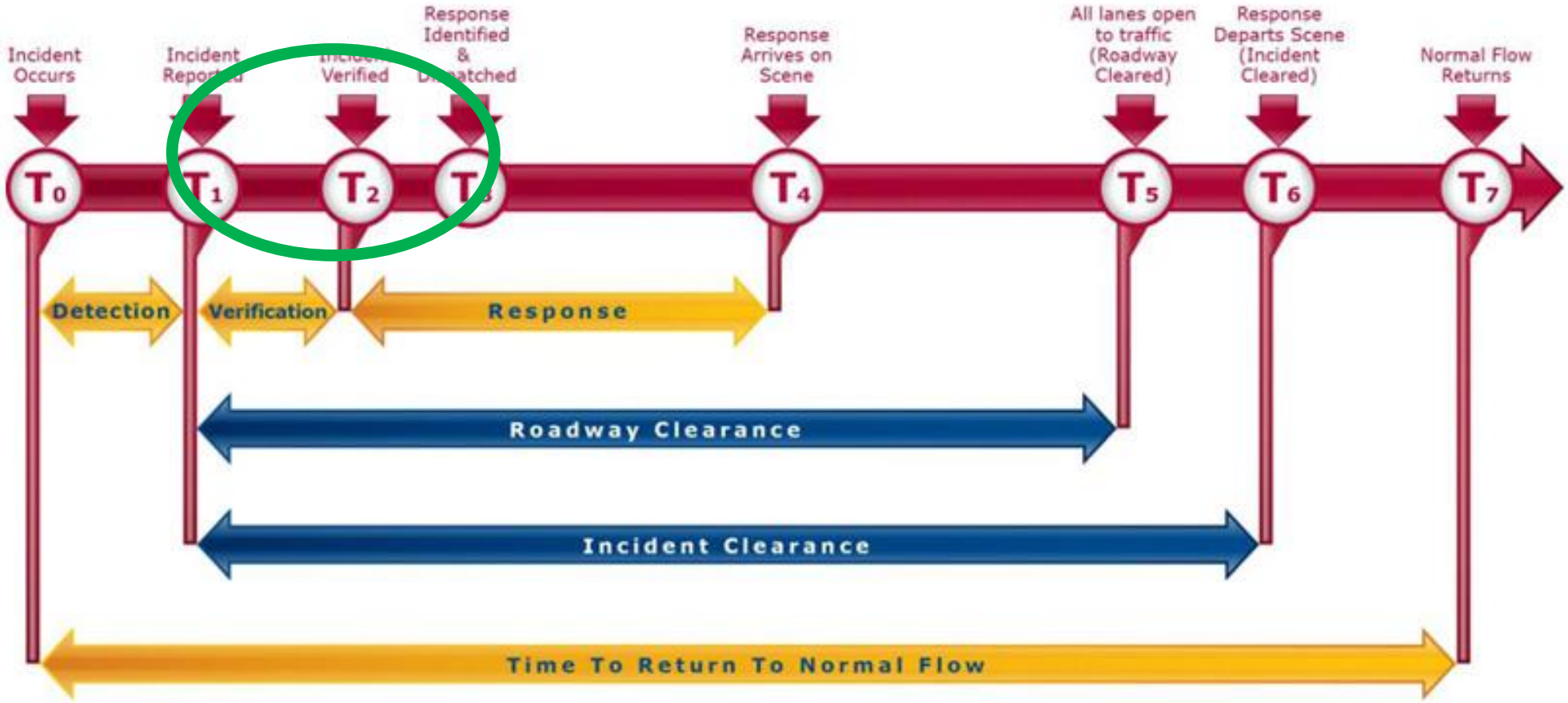
RISC

YTD Program Average Clearance Time:

83 min

New Contract – Summer 2020

SafeTow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Normal Flow Returns
T0
T1
T2
T3
T4
T5
T6
T7
Detection
Verification
Response
Roadway Clearance
Incident Clearance
Time To Return To Normal Flow

Interoperable Communications

Daily Incident Management

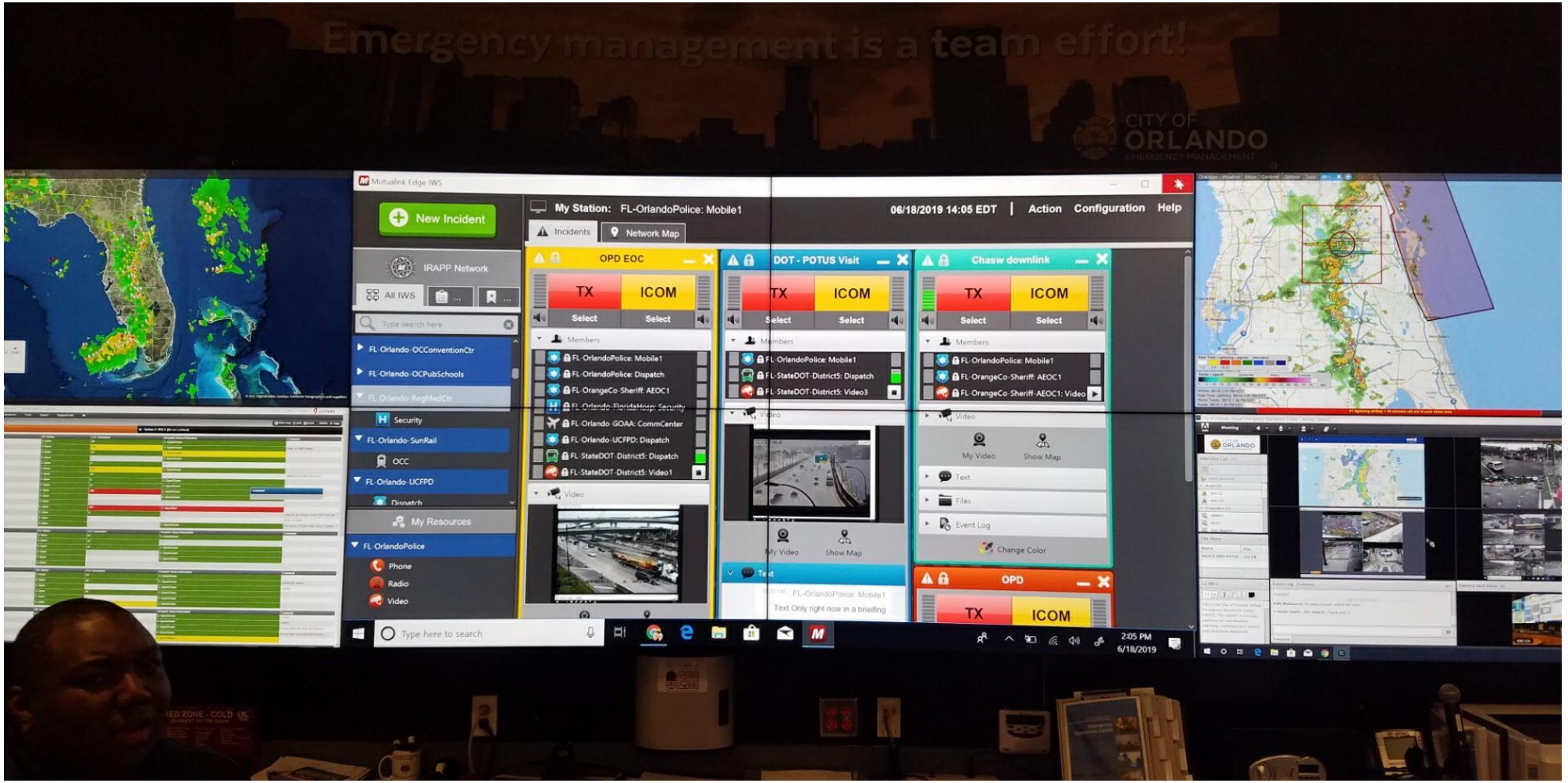
FDOT TSM&O
Transportation Systems Management & Operations

Traffic Incident Management

Daily Incident Management

POTUS VISIT TO CFL

FDOT TSM&O
Transportation Systems Management & Operations



Traffic Incident Management

Brevard Co Shuttle Launch

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Transportation Systems Management & Operations

TIM
Traffic Incident Management

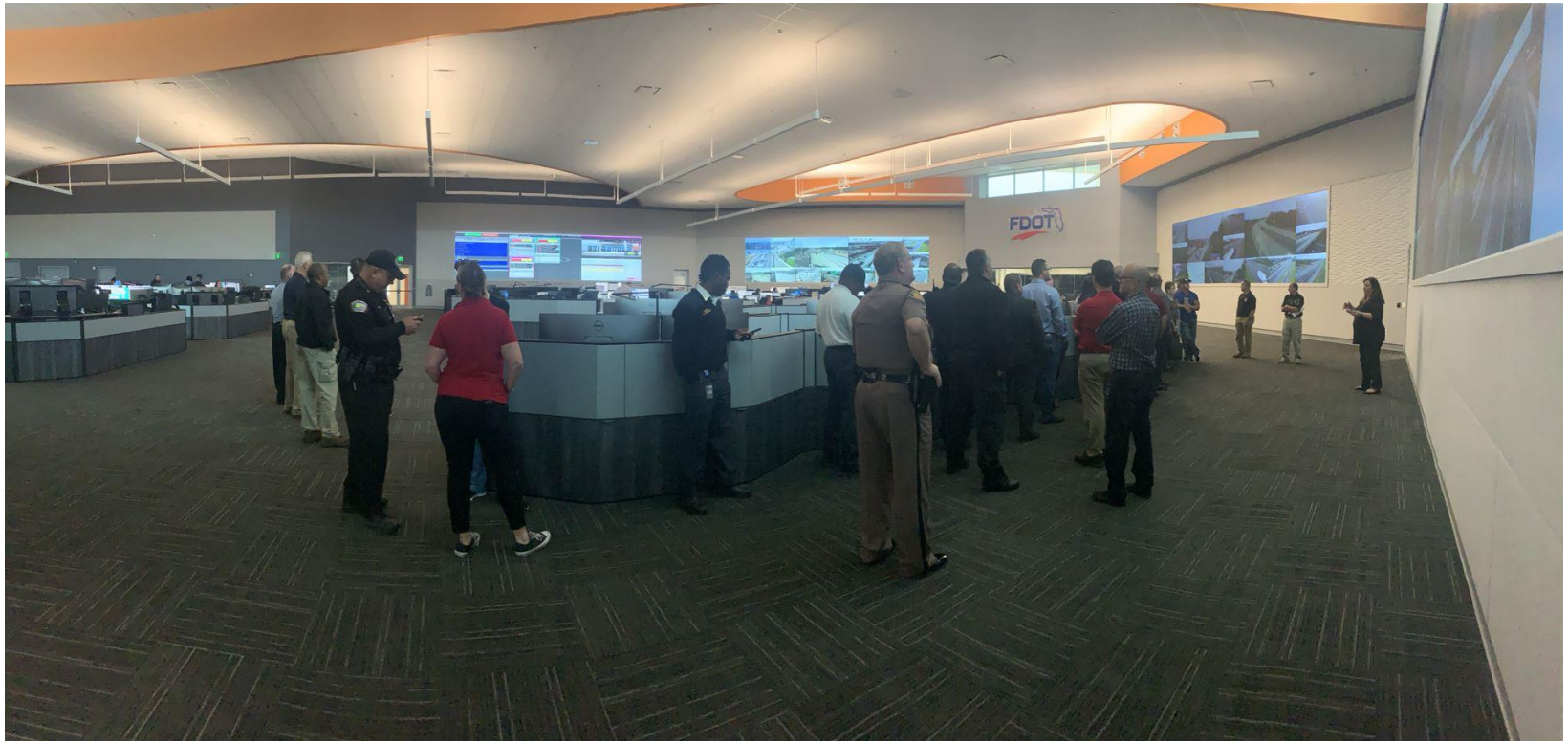
Regional Interoperable Communications Workshop

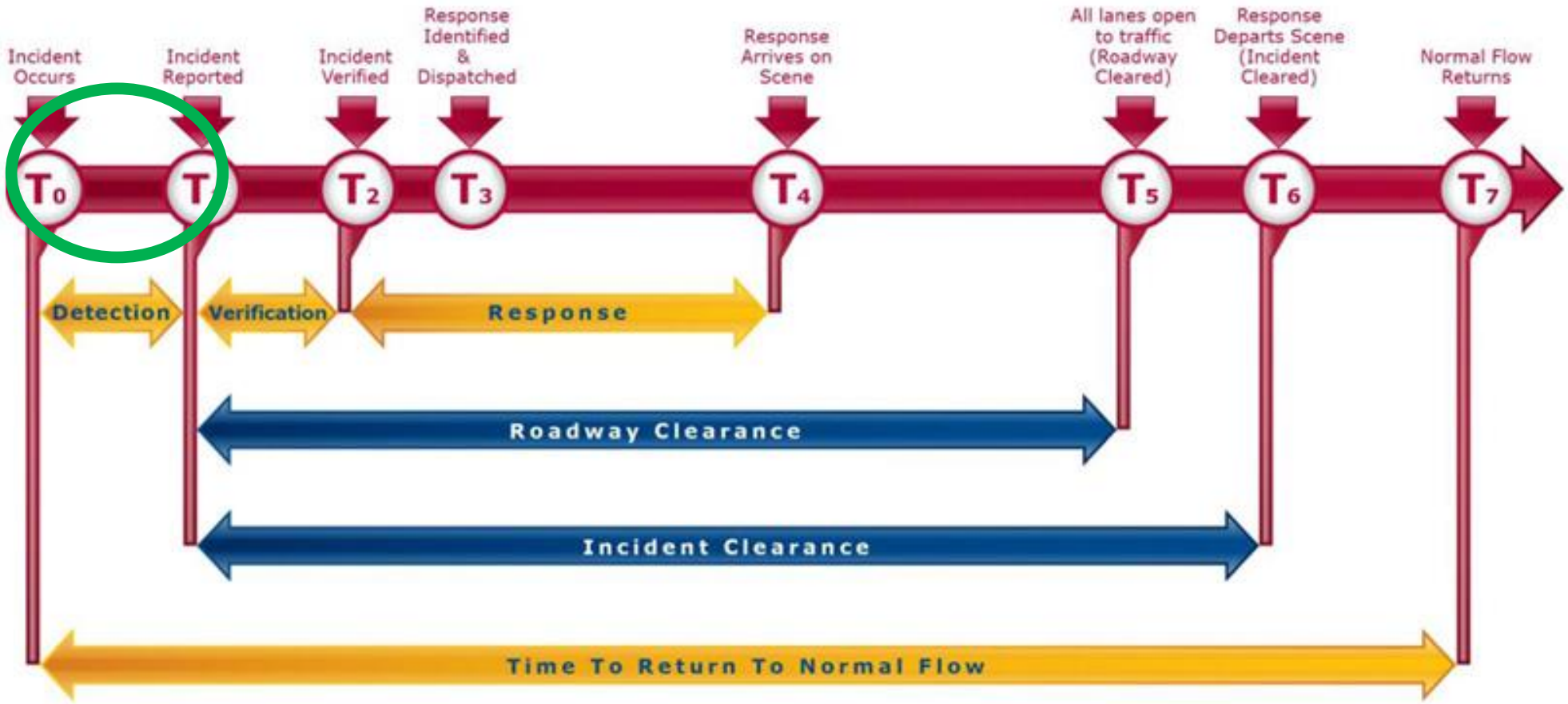
60 Responders

All 9 counties in D5

Others from across the state

Traffic Incident Management




Incident Occurs
Incident Reported
Incident Verified
Response Identified & Dispatched
Response Arrives on Scene
All lanes open to traffic (Roadway Cleared)
Response Departs Scene (Incident Cleared)
Normal Flow Returns
T0
T1
T2
T3
T4
T5
T6
T7
Detection
Verification
Response
Roadway Clearance
Incident Clearance
Time To Return To Normal Flow

Incident Information & CAD Integration

0 min ago	FHP	Incident detected by FHP Incident: AccidentsAndIncidents - Orange	I-4 East - MM88 (88) {Lat: 28605590, Lon: -81386360}		
0 min ago	FHP	Incident detected by FHP Incident: Unknown - Seminole (Removed)	I-4 East - MM94 (94) {Lat: 28696040, Lon: -81387080}		

(215) 970-0791 • Sat 10:40 PM

Seminole County Fire: MVC Mm 91 I4 Eb Altamonte Springs MM 91 I4 EB (Orange County Line/ SR 436) TAC: 49D MpBk:030 JZ:ALTA-800 DISPATCH TIME: 12:35 am UNITS: R12,E12,E22 <1 > Problem Description: 2 VEH MVC Chief Complaint: 77, CCText: Motor Vehicle Collision , <2 > Paging Groups Notified:MVC/HWY,

(215) 970-0791 • Sun 12:36 AM

Seminole County Fire: zMVC NO INJ NO HAZ Mm 91 I4 Eb Altamonte Springs MM 91 I4 EB (Orange County Line/ SR 436) TAC: 49D MpBk:030 JZ:ALTA-800 DISPATCH TIME: 12:35 am UNITS: R12,E12,E22 <1 > Problem Description: 2 VEH MVC Chief Complaint: 77, CCText: Motor Vehicle Collision , <2 > Paging Groups Notified:MVC/HWY, <3 > Dispatch

(215) 970-0791 • Sun 12:37 AM

CAD Integration Research

UF | Institutional Review Board
UNIVERSITY of FLORIDA

Chief:

As discussed in recent Traffic Incident Management (TIM) meetings, FDOT is working with the University of Florida to conduct research into integrating computer aided dispatch (CAD) sys systems. Interoperable communications have been highlighted in multiple reports as critical to safe and efficient response to roadway incidents.

The FHP CAD system currently pushes traffic incidents to the FDOT TMC, enabling the DOT to provide traffic control, dispatch Road Rangers, and inform the public via roadway message si faster than if we relied on other ways to detect those events. Incident responders are safer when coordination, communication, and cooperation are present. For this reason, FDOT is cor public safety agencies and we need your input on the topics. Here is an example of the FHP CAD feed: https://www.flhsmv.gov/fhp/traffic/live_traffic_feed.html

The survey link below is the next step in finding or developing a way to improve communication and responder safety. We ask that you please have your communications center manager December 13, 2019.

https://ufl.qualtrics.com/jfe/form/SV_cT0XqtqYfsfOuEd

Thank you for your continued support of the FDOT and our mutual goal of public service and responder safety. Please contact me if you have any questions.

Kind Regards,

Sheryl Bradley
TIM Program Manager

Traffic Operations
Consultant for Florida Department of Transportation
HNTB Corp.

Office: 321-257-7347 Cell: 321-300-5846
email: sheryl.bradley@dot.state.fl.us

Visit CFLTIM.com for information on TIM meetings, state roadway and ITS projects, and other resources.

*If you have any questions regarding the rights of a research subject, please contact the Institutional Review Board (IRB02) office (352-392-0433 or irb2@ufl.edu.)

IRB Project #: **IRB201900937**

38 PSAPs in D5

25 Respondents (66%)

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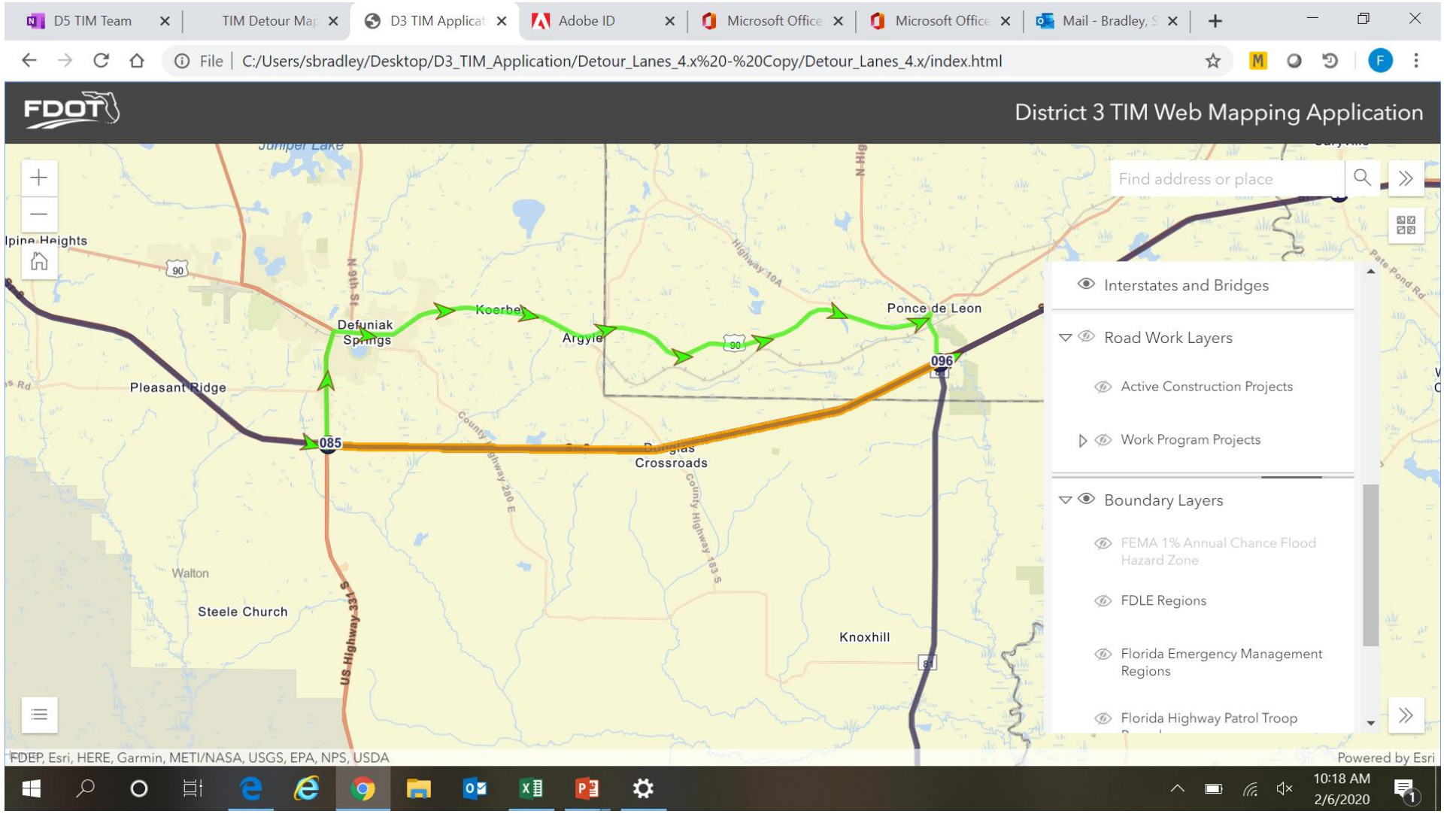
Transportation Systems Management & Operations

Other Research

- Secondary Crash Risks
- Emergency Responder Safety
  - Emergency Vehicle Location/Approach – Driver Feedback
    - Saturation
    - Effectiveness

TIM GIS Tool



Traffic Incident Management

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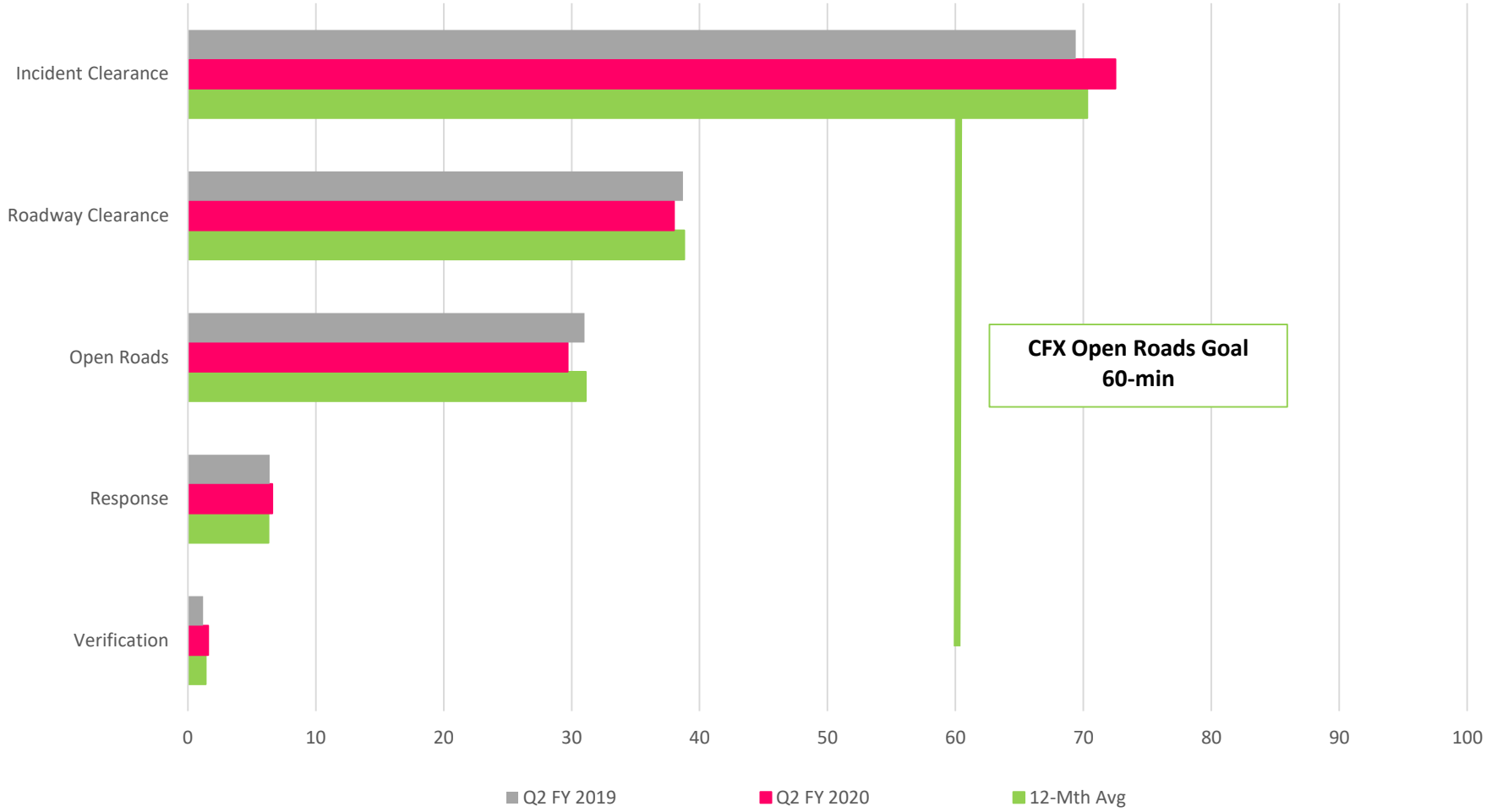
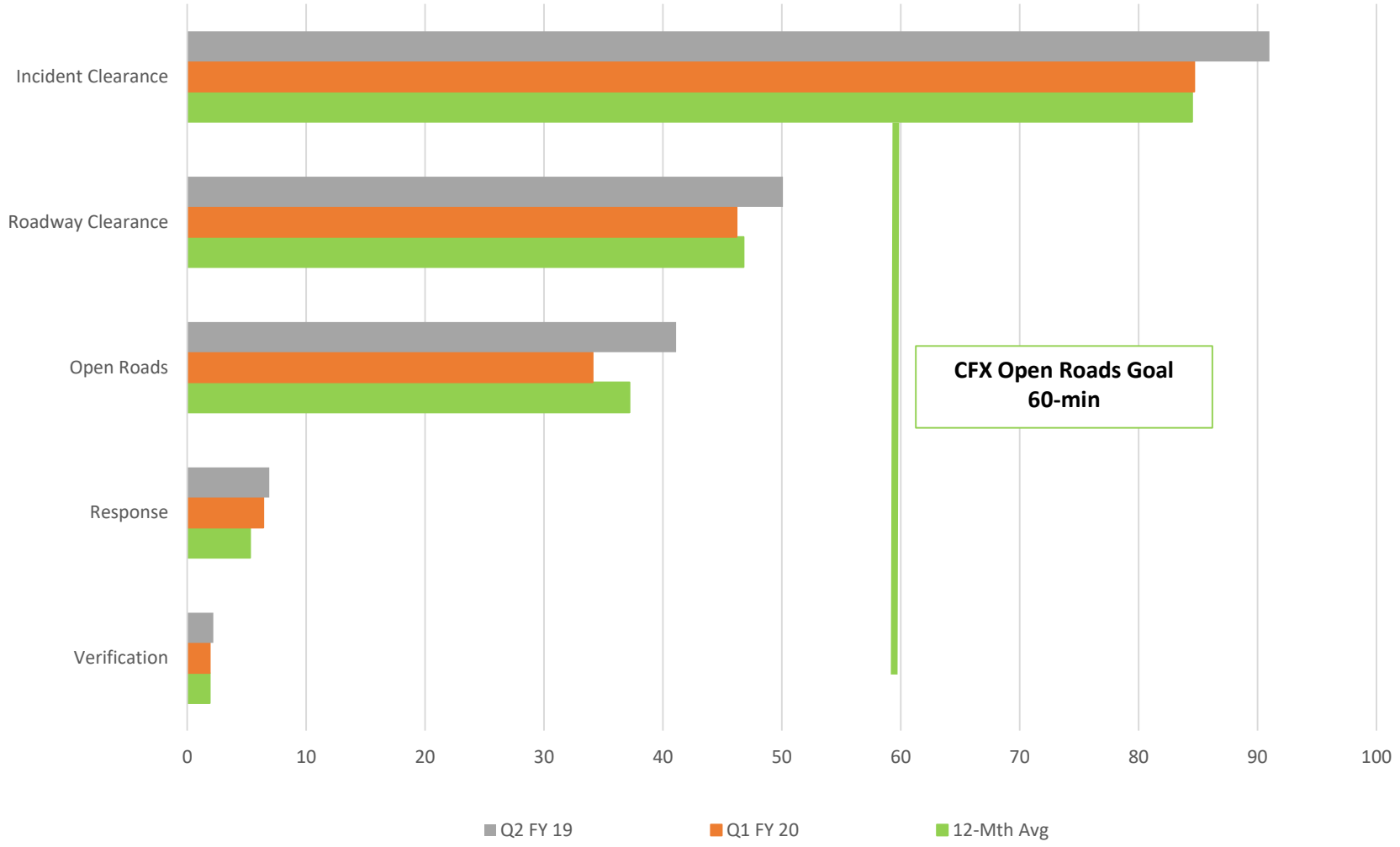
Performance Measures

Clearance Times



Clearance Times



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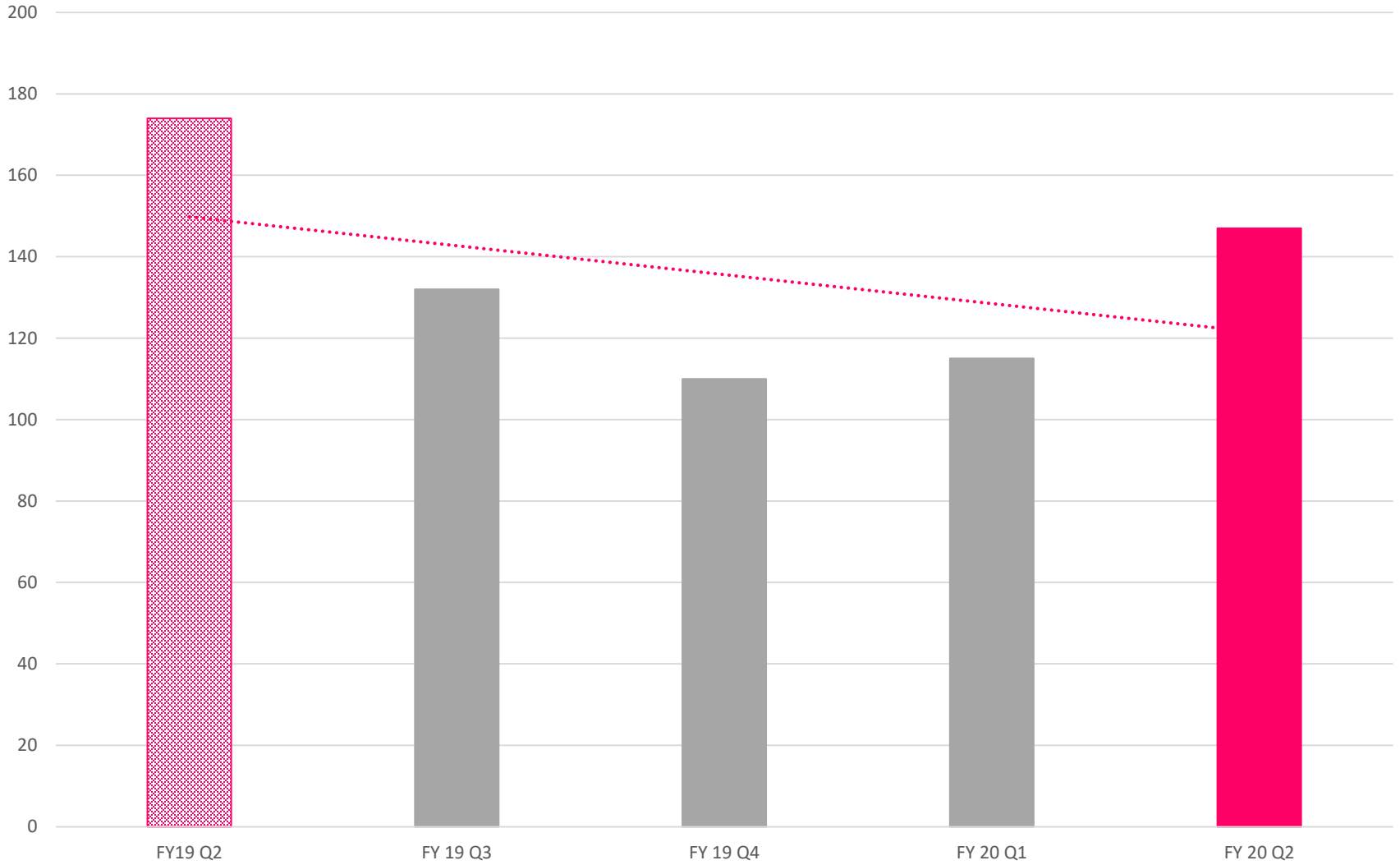
Clearance Times

3-Yr Trend

16 – 53%

Secondary Crashes



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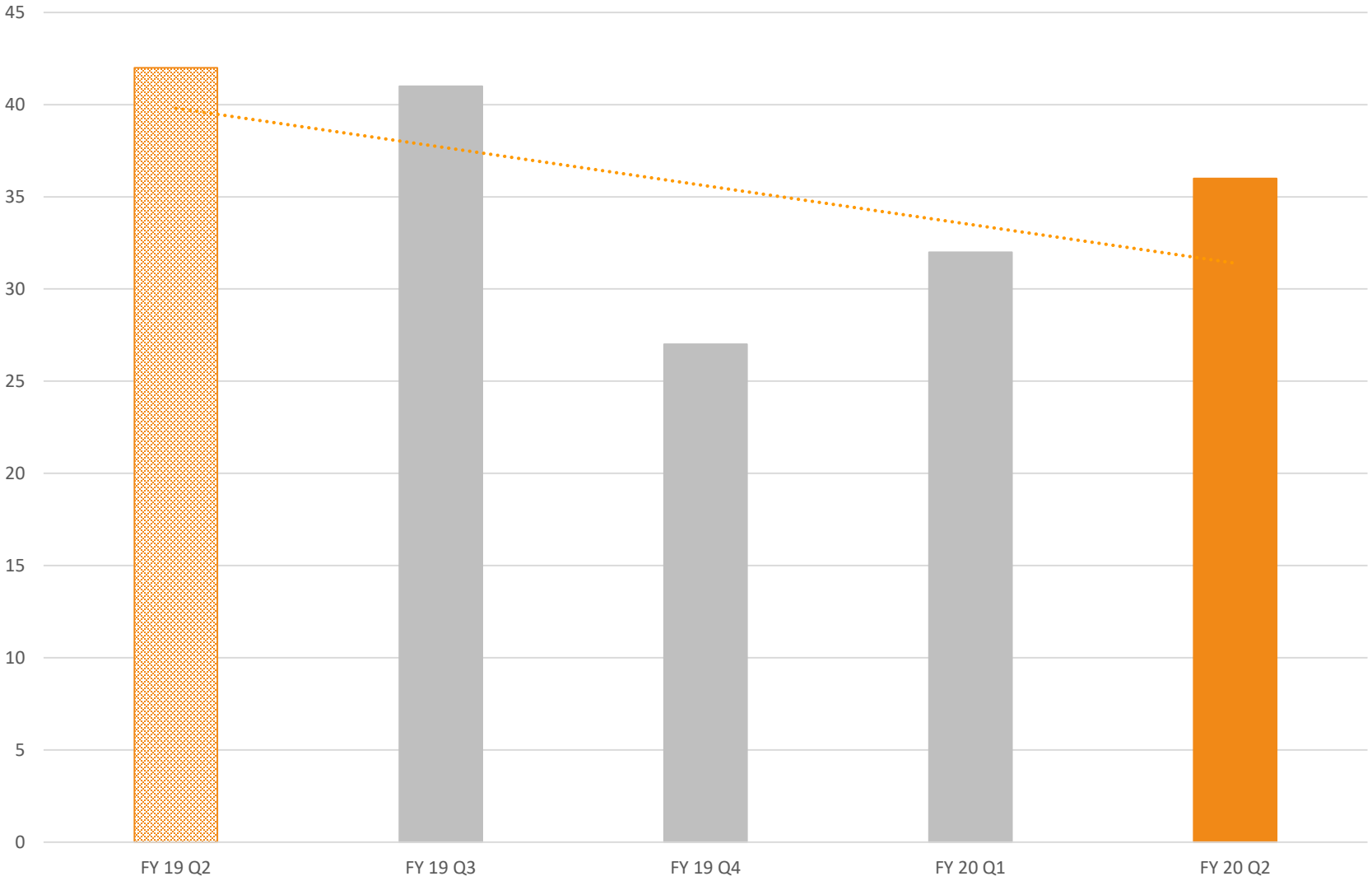
Secondary Crashes



Traffic Incident Management

FDOT TSM&O
Transportation Systems Management & Operations

QUESTIONS?

New Policy on Federal Grant Applications

Jeremy Dilmore, District Five TSM&O

Policy for Federal Grant Applications

- Governor's Office of Policy and Budget has established a **new policy** for Federal grant applications
- If FDOT (or similar state agency) is applying for a Federal grant, application must meet the following:
  - **Completed package and all supporting documentation** must be submitted for review to Governor's office **21 days before official submission** to Federal agency. No exceptions.
  - Application must be reviewed and approved by District Program Management before it can be sent to Governor's office (consistency with Work Program)

Policy for Federal Grant Applications

- This policy **does not apply to local/regional agencies** pursuing federal grants

  UNLESS…

- **FDOT is partnering with the local agency** on the grant request, then it **must follow the process** for FDOT-initiated grant requests

Major Takeaway

- Please respond ASAP to any requests for support or participation in FDOT's grant application process

Work Zone Data Exchange (WZDx)

Jeremy Dilmore, District Five TSM&O

General Issues and Challenges for Work Zones

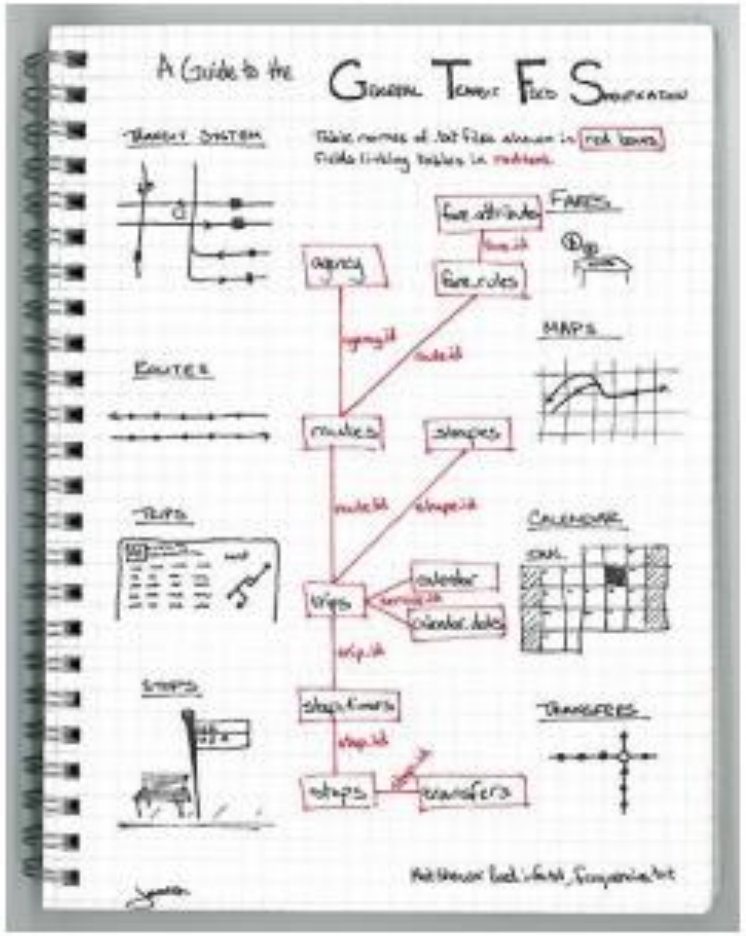
- **Real-time information about dynamic conditions** occurring on roads can help ADS and humans navigate safely and efficiently
- Many Infrastructure Owners & Operators (IOO) maintain data on work zone activity, but it is **often difficult for OEMs and navigation applications to access** and use data across jurisdictions
- **Similar issue developed with transit data**
  - GTFS grew out of this challenge

General Issues and Challenges for Work Zones

- **MetroPlan TSMO Committee feedback** on Work Zone issues
  - Specific location and timing of work zones are often unknown
  - Utility “quick-fixes” are the hardest to capture in real-time
  - On-site CEIs can identify when closures occur
  - Contractor is supposed to notify operations staff of Work Zone

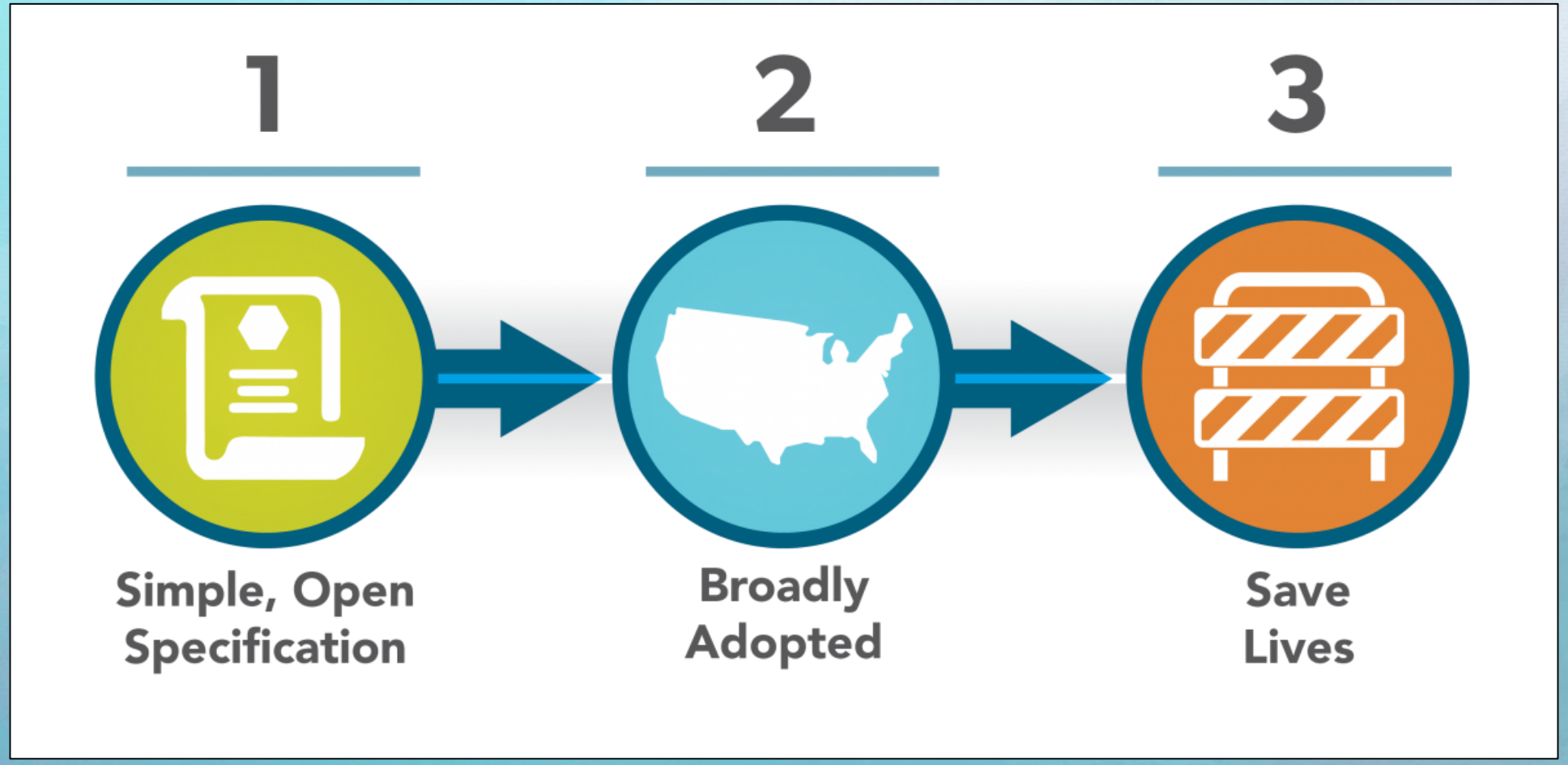
Learning from Open Transit Data

A **simple** specification…



…with a **wide range** of uses

WZDx Specification



WZDx Specification

74 lines (58 sloc) | 8.52 KB

Raw Blame History

Work Zone Data Exchange (WZDx) - v2.0

Last updated 1/14/2020 - WZDx specification v2.0

What is the WZDx Specification?

The Work Zone Data Exchange (WZDx) Specification enables infrastructure owners and operators (IOOs) to make harmonized work zone data available for third party use. The intent is to make travel on public roads safer and more efficient through ubiquitous access to data on work zone activity. Specifically, the project aims to get data on work zones to vehicles to help automated driving systems (ADS) and human drivers navigate more safely.

Why is WZDx being developed?

Improving access to work zone data is one of the top needs identified through the US Department of Transportation (USDOT) Data for Automated Vehicle Integration (DAVI) effort.

Up-to-date information about dynamic conditions occurring on roads – such as construction events – can help ADS and humans navigate safely and efficiently. Many IOOs maintain data on work zone activity. However, a lack of common data standards and convening mechanisms makes it difficult and costly for third parties – including original equipment manufacturers (OEMs) and navigation applications – to access and use these data across various jurisdictions.

Thus, inspired by GTFS, USDOT launched WZDx to jumpstart the voluntary adoption of a basic work zone data specification through collaboration with data producers and data users. Longer term, the goal is to enable collaborative maintenance and expansion of the specification to meet the emerging needs of ADS.

Who is involved in developing WZDx?

WZDx Specification

- Anticipated Benefits
  - Used by 3rd parties for general public dissemination
  - CAVs can use data to navigate around work zones or avoid entirely
  - Used by planners/engineers to determine safety/mobility constraints caused by work zones
  - Used for real-time traffic operations

WZDx Demonstration Grant

- Anticipated grant program
  - Total Funding: $2.4 million
  - Up to 12 awards
  - Up to $200,000 per award
  - 12-month performance period
  - 20% non-Federal share
  - NOFO to be released Spring 2020 (most likely)

FDOT Project Proposal

- Apply Bluetooth low-energy (BLE) devices to barrels; provide positional data in real-time
- Backhaul via wireless modem in arrow board
- Smart arrow board would have CCTV, ability to detect message on board, and speaker to alert workers of issue
  - System would be able to detect rapid changes in position of cone(s) with confirmation from CCTV camera to determine if unauthorized vehicles enter work zone perimeter

FDOT Proposal

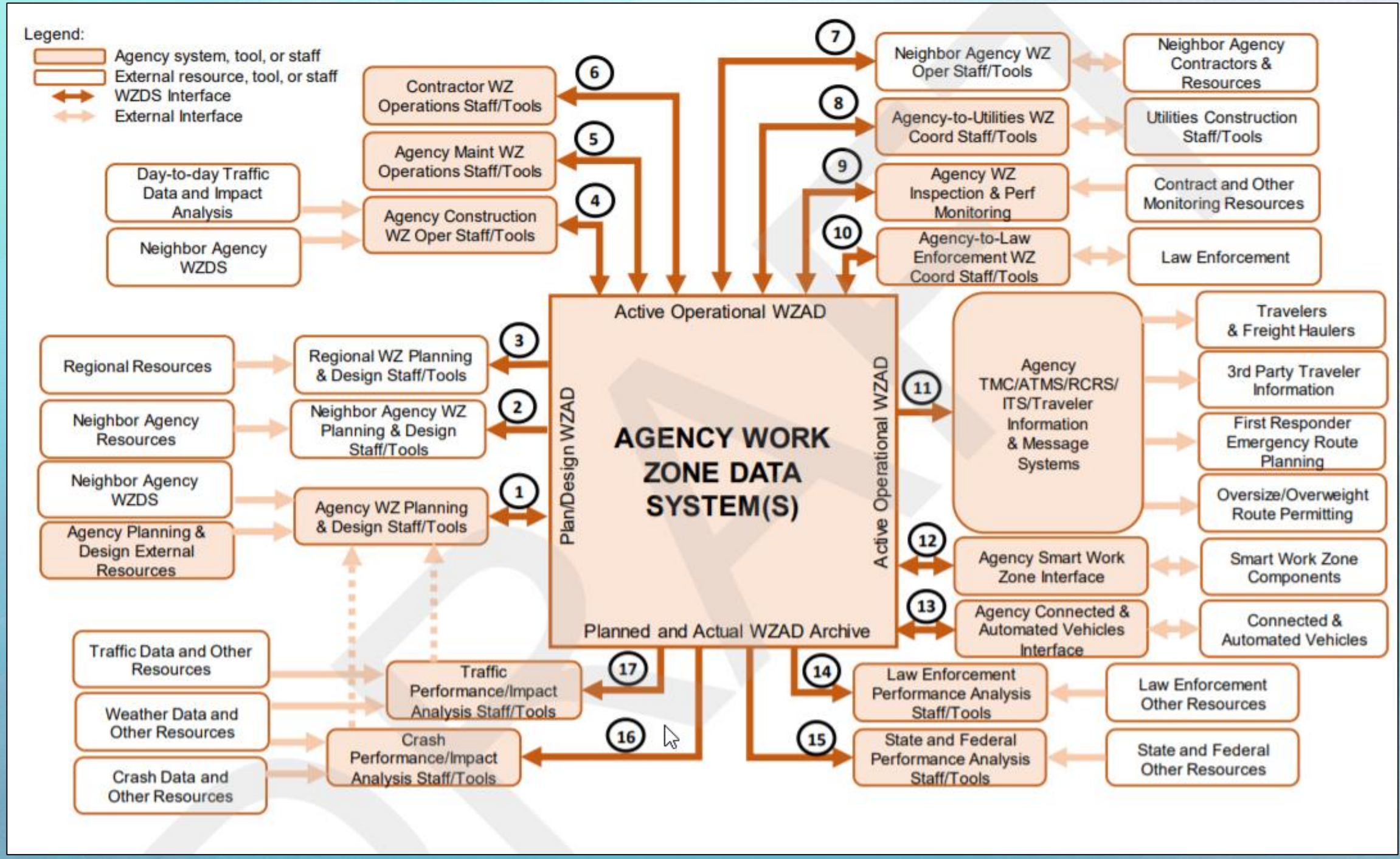
- BLE Device Concept
  - Inexpensive: $25 without scaling
  - Last 2-3 years
  - Include power, communication, and code
  - Don’t need 100% performance to be effective

FDOT Proposal

- Smart Arrow Board Concept
  - Expensive: $4,000 for CCTV, modem, speaker combo
  - $35 / month / device communication
  - Will require regular maintenance

FDOT Proposal

- **MetroPlan TSMO Committee feedback** on FDOT proposal
  - If you have to rely on manual data input, you won't get accurate/timely data; need to automate data entry
  - Should include MOT equipment vendors in coordination
  - There would be great value in agency-wide system to catalog Work Zones, fleet, traffic supplies, etc. that can be used by the region's different owner-operators
  - If we identify appropriate devices, can incorporate into future contracts


Legend:
Agency system, tool, or staff
External resource, tool, or staff
WZDS Interface
External Interface
Contractor WZ Operations Staff/Tools
Agency Maint WZ Operations Staff/Tools
Agency Construction WZ Oper Staff/Tools
Day-to-day Traffic Data and Impact Analysis
Neighbor Agency WZDS
Neighbor Agency WZ Oper Staff/Tools
Agency-to-Utilities WZ Coord Staff/Tools
Agency WZ Inspection & Perf Monitoring
Agency-to-Law Enforcement WZ Coord Staff/Tools
Neighbor Agency Contractors & Resources
Utilities Construction Staff/Tools
Contract and Other Monitoring Resources
Law Enforcement
Active Operational WZAD
Plan/Design WZAD
AGENCY WORK ZONE DATA SYSTEM(S)
Active Operational WZAD
Planned and Actual WZAD Archive
Regional Resources
Neighbor Agency Resources
Neighbor Agency WZDS
Agency Planning & Design External Resources
Regional WZ Planning & Design Staff/Tools
Neighbor Agency WZ Planning & Design Staff/Tools
Agency WZ Planning & Design Staff/Tools
Agency TMC/ATMS/RCRS/ ITS/Traveler Information & Message Systems
Travelers & Freight Haulers
3rd Party Traveler Information
First Responder Emergency Route Planning
Oversize/Overweight Route Permitting
Agency Smart Work Zone Interface
Smart Work Zone Components
Agency Connected & Automated Vehicles Interface
Connected & Automated Vehicles
Traffic Data and Other Resources
Weather Data and Other Resources
Crash Data and Other Resources
Traffic Performance/Impact Analysis Staff/Tools
Crash Performance/Impact Analysis Staff/Tools
Law Enforcement Performance Analysis Staff/Tools
State and Federal Performance Analysis Staff/Tools
Law Enforcement Other Resources
State and Federal Other Resources
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WZDx Specification and Demonstration Grant

- **For more information:**
  - https://www.transportation.gov/av/data/wzdx
    - (first link sends you to GitHub site)

Current Initiatives

Jeremy Dilmore, District Five TSM&O

THANK YOU!

Next Consortium – April 2, 2020

TSM&O Consortium Meeting

MEETING AGENDA

FDOT RTMC
4975 Wilson Rd.
Sanford, FL 32771
Turing Conference Room

February 6, 2020
10:00 AM-12:00 PM

1) WELCOME

2) TSM&O WORKFORCE DEVELOPMENT – BEST PRACTICES AND LESSONS LEARNED

   - Patrick Son, National Operations Center for Excellence

3) ENSURING AMERICAN LEADERSHIP IN AV TECHNOLOGIES: *AUTOMATED VEHICLES 4.0*

   - David Williams, VHB

4) TRAFFIC INCIDENT MANAGEMENT (TIM) / INTEROPERABILITY – UPDATE

   - Sheryl Bradley, District Five TSM&O

5) NEW POLICY ON FEDERAL GRANTS – GOVERNOR'S OFFICE OF POLICY AND BUDGET

   - Jeremy Dilmore, District Five TSM&O

6) WORK ZONE DATA EXCHANGE (WZDx)

   - Jeremy Dilmore, District Five TSM&O

7) CURRENT INITIATIVES

   - Jeremy Dilmore, District Five TSM&O