TSM&O CONSORTIUM MEETING SUMMARY

Meeting Date:	September 20, 2018 (Thursday)	**Time**: 10:00 AM – 12:00 PM
Subject:	TSM&O Consortium Meeting	
Meeting Location:	Central Florida Expressway Authority 4974 Orl Tower Rd Orlando, FL 32807 CFX Boardroom	

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 District Five. David Williams gave a short introduction and outlined the meeting agenda.

II. SIGNAL TECHNICIAN PROGRAM UPDATE

David Williams gave a brief update to Consortium members on the status of the Orange Technical College partnership.

- Traffic Signal Technician Program with Orange Technical College
  - Meeting was positive and a success for the partnership
  - Follow-up meeting after the Orange Technical College Tour was cancelled because Orange Technical College and CareerSource representatives were fully convinced of the necessity of this program after talking with stakeholders during the campus tour

III. CFMPOA TSM&O PRIORITIZATION FRAMEWORK AND DISCUSSION

Eric Hill spoke on the Central Florida MPO Alliance progress and updates to the project prioritization framework.

- Discussed updated framework document
- Purpose is to have a more regional scale for MPO projects beyond the scope of individual MPOs
- Hoping to integrate TSM&O projects into the prioritized project list
- Met and proposed to add TSM&O projects to the list, but the CFMPOA wanted to be provided a definition of TSM&O and how to introduce projects
- Have had SIS, trail and transit projects in the prioritized projects list; now looking to add a 4th category of TSM&O
- Consortium should develop a methodology of how to introduce TSM&O projects to the list and a clear definition

- Jon Cheney: The CFMPOA creates a list of regional projects that goes directly to FDOT to set up their list of priority projects, so it is a win that we can help determine the projects that FDOT prioritizes
- Question: Are the benefit-to-cost analyses involved in this?
    - No, but there should be a consideration of this process
- What can be considered regional from a TSM&O perspective. Currently I-4 is on this list, what are some similar TSM&O programs?
    - Jon Cheney: Currently the Alliance PPL includes projects that are already on other TPO lists and those projects make it up to the combined list
- Question: One issue with focusing on the alliance now is that we should not bypass the process that is already in place. If we want more TSM&O projects, the important thing is to get more TSM&O projects from the City and local process and get them into the individual MPO TSM&O projects before we can think about a regional scale
- Steven Bostel: An opportunity of this is to leverage existing efforts, for example ATSPM – if an MPO needs 500 controllers, maybe this is also a regional need that can synergize with other MPO's needs
- Eric Hill: Maybe we could have a task force for criteria to define TSM&O projects and get them going
    - Task force – Eric Hill (MetroPlan Orlando), Jon Cheney (Volusia), Humberto Castillero (Orange), Jeremy Dilmore (FDOT), Steven Bostel (SCTPO), Colleen Nicoulin (R2CTPO), and Francis Franco (LSMPO)
- Question: Is there already a dedicated funding source?
    - Jeremy: There are 3 pots – historically $25 million for highway construction – they are state directed. Then another pot that was set up this year: $20 million for connected vehicle projects. However, they are struggling with what the CV plan is for Florida and how to proceed with this money.
    - Work program would try to fund as many projects as possible
        - Had a mechanism for this funding to happen
        - One person works specifically to make these decisions
        - PPL's were not strictly funded by order, just by what could be selected based on the budget
    - Always more needs than there is funding

IV. INTEGRATED CORRIDOR MANAGEMENT

Dale Cody and Jeff Gerken presented on Integrated Corridor Management and recent progress on the program.

- It has been about a year since the ICM program began
- Scope is I-4 and CFX roads, as well as corresponding arterials
- Detect crashes, Traffic Incident Management (TIM), Diversion, Balance Network, Reduce Congestion
- Management Staff: Dale Cody, Jeff Gerken, Eddie Grant, Manny Rodriguez, Marc Morgenstern
- Professional services contract, so we needed to elevate the training
    - IMSA operations training TCSS and Signal levels 1 & 2

    - Road Ranger ride-alongs
    - AAM Dashboard
    - 8 Module training program
- ICAT – Action Tracking
    - Web-based tool for assigning and tracking tasks in real time
    - Current operations and future operations departments; hoping to further separate the two
    - Good reporting for highways but needed more tracking for arterials
    - Matured SunGuide for better handling of arterials
- At physical location: Large control room and AAM room
    - Good FDOT support for resources
    - Real-time incident management
    - Connecting to each maintaining agency system; looking for critical alarms
    - Filter the data to provide actionable information to focus and fix
    - Bluetooth-based travel-time reliability
    - CMS for TSP and AVP
    - A goal is to better integrate with transit information
    - Corridor Smartbook and implementation guide for diversion routes
- Hoping to integrate ICAT into SunGuide
- Want to be taking advantage of all innovations that the region has taken on
- Eric Hill: Seminole County Bob Dallari – How are we providing first responders good information?
    - IVEDS to pull cameras on phone are available
    - Have been exploring what first responders already have and how to upgrade the platforms they are comfortable with
    - Software to message back and forth with CAD operations (MutualLink)
    - This is a two-way street, so we are seeking to get access to dashboard cameras for police officers as well
- MIMS – can assign tickets to various people who will be working on that ticket
- General accomplishments
    - Hurricane Irma response
    - Local Agency Outreach – Not a maintenance organization so learning how to get best information to partners has been important
    - Developed Battle Rhythm Sheets – Formalizing this process
    - Diversion route timings developed and implemented
    - Common clock sync
    - Workforce development
        - Partner Training
        - UCF outreach
        - Jon: Have you also looked to get in touch with high schools?
            - Yes, but there are good opportunities to coordinate among more organizations
            - Prioritizing program with UCF, and then will focus on high school involvement
    - Need to work with planning to identify issues and work towards a solution

    - Looking to help maintaining agencies and be a benefit
- Hazem El-Assar: Have you integrated Bluetooth across the system?
    - There are 3 different systems, so it would be good to integrate these systems and create links. But for diversions these data systems are already working
    - Monthly reports are on CFL Smart Roads – so all partners have access to all the data we collect
        - Summaries have become very important – Data is very granular
- On the Horizon
    - Finalizing SOPs
    - Bottleneck analysis with drones – real-time operations with drones
    - Incorporating CFX into monthly reports
    - Need to know if you are ok with being added to the database
    - Diversion Routes for 408
    - Would like to do more with transit, if we can integrate TSP with transit, that would be great
    - Seven more training modules
- Q: How much training is in the field vs computer-based?
    - Almost all interactive with a trainer or supervisor present
    - Do they need to wait for a training interval or can training happen right away?
        - This depends on the need, but we are flexible
- Jon Cheney: We are creating performance measures. Should it be assumed that the granular data you are collecting is being sent to FDOT, massaged and then sent to the planning organizations?
    - Jeremy: There was a debate on where this data should be distributed – found that this data did not align with HERE and INRIX data. Therefore, this data was discarded
        - Now undertaking a task so that it can be integrated with HERE. This was done and redistributed, but this data is a massive amount of data.
        - Have not been used, but some reporting metrics have been
        - Module has not been released to the rest of the state but trying to integrate with ICMS and released to all districts
    - Jon Cheney: The data is statewide HERE data – can this be tailored to the region or even more granular?
        - Answer: My understanding is that it is done by county line, regional and MPO boundary. We have been getting data by county; that is the most detailed available
        - Has anyone done an INRIX confidence measure?
            - Jeremy: Yes, but it was done by District Six 10 years ago
                - It is good on highways, but retiming on arterials has been too difficult with this data
                - Better for planning but not observations; this is just anecdotal
- Question: Is there an opportunity to link with existing asset management database systems so information is pushed to you easily.
    - It is better for that to happen automatically rather than training staff to translate this information to get it to SunGuide

Jeremy Dilmore then spoke specifically on funding for different projects around the District.

- We were going to work on I-95 first, but I-75 has now been prioritized
- $2.4 million contract for FY 2018 for freeways and arterials for Central Florida
- For 2019 – Freeway section is funded very well, but arterials and express lanes are funded less so
- Express lanes are funded based on a length basis, but operations are based on a segment basis
- Hardware updates
    - TS 1 to TS 2 Type 6 cabinet
    - detection upgrades to 1/3 of intersections
- ATC Controller, upgrade CCTV, DSRC, ATSPM and Bluetooth
- Arterial operations goal is maintenance, then improving maintenance, developing alternative routes, loading controllers, then staff operations and semi-automated ICM
    - Objective is to grow, beginning in downtown Orlando and then across the district
- ICMS – incident detection
- Response plan and diversion route – should a diversion be implemented? Data-based model
- Signal timing plan selection and optimization
- Realtime 30-minute forecasting
- Data Fusion Environment (DFE)
- Traffic engineer dedicated to decision-making instead of just relying on automation
- Detect ICM event → recommend diversion route → ICMS operator review → agency approval → flush corridor timing plan

R-ICMS Update

- Response Plan Development Process (part 1)
- Messages for DMS used by Sunguide
- Response Plan Development Process – Identify Signal Timing Plan Gaps
- Develop Response Plan Rule Sets
- Stakeholder Review and Approval of Developed Response Planes
- Stakeholder approved profile for approving response plans
- Jon Cheney: Are you looking at data for the weekends? Much of our relevant data comes from the weekends
    - We look more closely at the plan than at the traffic data because incidents change the traffic so drastically – looking at signal timing and left turn phases
    - Focusing on I-4 and I-75 first but when we get to I-95 beach traffic will be an important

V. DATA USER AGREEMENTS

Jeremy Dilmore gave an update on the progress of data user agreements for the District.

- Signed deals with TTS, CS and LTD
- Other maintaining agencies are developing or have executed agreements with these firms (see map)
- For LTD, we are providing them no data but this makes it easier for LTD to partner with local agencies because they are free to provide our data without legal issue

  - As part of the agreement, LTD agree to indemnify FDOT and removes local conflict potential
- Data user agreement status – not many have moved forward

VI. FDOT TSM&O TASK TEAM MEETING

- Discussion centered on CAV
- Opportunity to provide safety and mobility
- Challenges: Roles and responsibilities, legal, communication
- Need a clear understanding of roles for government in CAV
  - Plan for establishing recurring communications
  - Cooperative working relationships
  - Deliverables by business unit
  - Implementable action items
  - More effective coordination
  - Titles and responsibilities of each office
  - Understand CAV program
  - Unified Vision
  - Leadership
- Money is available but need to figure out what to do with it with a coordinated plan and a more coherent policy
- Establish clear criteria for design construction and maintenance
- And basic concept for measuring impact and benefits
- Many expect large changes within the next 3-5 years
- CAV effect on transportation safety and mobility substantial in next 6-10 years
- Economic development impacts may take longer
- CAV Business Plan
  - Seven Focus Areas
  - Policies and governance
  - Program funding
  - Education and outreach
  - Industry outreach and partnerships
  - Technical requirements and specification development
  - Implementation ready
- Draft 2 published September 2018
- Working on an 18-month plan

VII. CURRENT INITIATIVES

Jeremy Dilmore briefly discussed current initiatives around the District.

- RFI for AV Shuttle advertised in August 2018
- Asking about capabilities for low-speed shuttle to understand pedestrian and AV interaction
- Better ability to work with pedestrians
- If on shared-use roadway, NHTSA requires strict safety
- Trying to understand ADA compliance (made it a requirement of the project)
- AV testing – work conducted at Seminole County facility
- I-4 FRAME between Tampa and Orlando – District 7 funding

- Tested:
    - Bike and Pedestrian safety
    - TIM
    - Vehicle turning right in front of bus
    - Freight signal priority
    - Queue warning
- Currently difficult to test CV with apps
- Smart Cities Hardened CPU
    - Allows you to offload processing; not required for CV, but helps a lot
- Scope Inclusion
- Standardized wiring for signals
- Data collection for existing signals
    - Don't want to build anything local agencies are not comfortable in maintaining
- ReIP completed
- Agreements with 3rd party data providers
- OBU emulator SA in negotiations
    - Smartphones dismissed by USDOT because of location accuracy and messaging concerns
    - Haptic response could be a solution for this
    - Found vendor to overcome some of these issues
    - Looked at UC Berkley and Stanford research to do things at lower costs for LiDAR
        - $500k for ½ mile for lidar; alternatively
        - Stanford triangulated position through Wi-Fi
            - Accuracy within 6 inches; Big Box retailers looking into use for smart marketing at their brick-and-mortar locations
- RTMC
    - Six weeks ahead of schedule
- Loops
    - Attempting to stay agnostic to loop detection technology
    - If comfortable with video, looking at MyoVision
    - Want loops at major and minor streets
    - Advanced loops can analyze efficiency of signal timing
    - 99% correlation between loops but need loops in turn lanes and everywhere so we don't miss cars
        - Arrivals on red – arrivals on green
    - Q: Can video be used to replace loops?
        - Yes, but a hybrid of the two may work better since there are some places video doesn't work as well
        - Getting with Rhythm and Wavetronix for people that feel comfortable with MVDS
        - Which is most cost-effective is also very important
            - Smart signals have already been included in all the funding for resurfacing
            - Want to use normal project cycles to push this technology
            - Turning movement count in only 1/3 of the signals
        - Using machine learning to create synthetic data to have the least amount of hardware possible
            - For example, "synthetic" counts at one intersection are developed based on the 3 or 4 surrounding intersections that have real counts

- That synthetic count should be relatively accurate, considering we know the surrounding IMCs
  - Actively testing to see how far out this synthesizing can go before it loses accuracy

VIII. NEXT MEETING – November 15, 2018 at Central Florida Expressway Authority

IX. ATTACHMENTS

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

END OF SUMMARY

This summary was prepared by Jordan Crandall 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.*

TSM&O Consortium Relocation
CENTRAL FLORIDA EXPRESSWAY AUTHORITY
VISITOR'S SIGN IN / OUT LOG
SEPTEMBER 2018

	Visitor Name	Company Name	**Person Authorizing Access**	ARRIVAL TIME	DEPARTURE TIME	Visitor Badge Number
9.20.2018	David Williams	VHB	M. Ilkey	9:10	12:00	56
9.20.2018	Jordan Crandall	VHB	M. Ilkey	9:10	12:00	107
9.20.2018	Ryan Cunningham	Kittelson	M. Ilkey	9:30	12:00	79
9.20.2018	Manuel Rodriguez	Albert Gerken	M. Ilkey	9:35	12:00	42
9.20.2018	Jeff Gerken	Albert Gerken	M. Ilkey	0936	12:00	123
9.20.2018	Tushar Patel	FDOT D5	M. Ilkey	9:40	12:00	
9.20.2018	Humberto Castillo	OC.	M. Ilkey	9:46	12:00	64
9.20.2018	Jon Chaney	VCTE	M. Ilkey	9:46	12:00	110
9.20.2018	Charli Wetzel	Seminole Co	M. Ilkey	9:55	12:00	111
9.20.2018	Noel Okeyo	Seminole Co	M. Ilkey	9:55	12:00	113

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SEPTEMBER 2018

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9.20.2018	Edward Grant	Metric	M. Ilkey	9:35AM	12:00	75
9.20.2018	Jenny Dijmar	FDOT D5	M. Ilkey	9:40	12:00	114
9.20.2018	Amy Thurmin	Garnett Fleming	M. Ilkey	9:40	12:00	47
9.20.2018	BRIAN HUTT	LAKE-SUMTER MPO	M. Ilkey	9:45	12:00	117
9.20.2018	Pamela Richard	Apopka	M. Ilkey	9:51	12:00	53
9.20.2018	Steven Bostel	SCTPC	M. Ilkey	9:51	12:00	120
9.20.2018	H. Walker	FTE / JACOBS	M. Ilkey	9:54	12:00	90
9.20.2018	Jenni Lamb	City of Melbourne	M. Ilkey	9:55	12:00	68
9.20.2018	Ezra Hill	MasterPlan	M. Ilkey	9:55	12:00	
9.20.2018	Don Marcotte	City of Winter Park	M. Ilkey	9:58	12:00	83

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SEPTEMBER 2018

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9.20.2018	ALYSSA TORRES	ORANGE COUNTY	M. Ilkey	959	1209	80
9.20.2018	Conroy Jacobs	City of Palm Bay	M. Ilkey	10:00	12:00	50
9.20.2018	Hazem El-Assa	Orange Co.	M. Ilkey	10:00	12:15	67
9.20.2018	Colleen Nicoulin	R2CTPO	M. Ilkey	10:05	12:00	87
9.20.2018	FRANCIS FRANCO	LSMPO	M. Ilkey	10:00	12:00	106
9.20.2018	Amy Dunham	WSP	M. Ilkey	10:10	12:11	51
9.20.2018	Daniela Sabillon	Osceola Transportation	M. Ilkey	10:55	12:00	70
9.20.2018	Sheryl Bradley	FDOT/HNTB	M. Ilkey	11:30	12:00	109
9.20.2018	Mike. Hudson	FDOT/HNTB	M. Ilkey	11:30	12:00	60
9.20.2018			M. Ilkey			

TSM&O Consortium Relocation
CENTRAL FLORIDA EXPRESSWAY AUTHORITY
VISITOR'S SIGN IN / OUT LOG
SEPTEMBER 2018

	Visitor Name	Company Name	**Person Authorizing Access**	ARRIVAL TIME	DEPARTURE TIME	Visitor Badge Number
9.20.2018	Jay Williams	FDOT	M. Ilkey	9:55	12:00	118
9.20.2018	Dale Caly	Metro	M. Ilkey	957	12:00	14
9.20.2018	Alyssa Eide	City of Maitland	M. Ilkey	9:59	12:00	25
9.20.2018	Benton Bonney	Orlando	M. Ilkey	1000	12:00	112
9.20.2018	Joan Calderin	Orlando	M. Ilkey	10:00	12:10	86
9.20.2018	Mark Tobin	Orlando	M. Ilkey	10:00	12:10	97
9.20.2018			M. Ilkey			
9.20.2018			M. Ilkey			
9.20.2018			M. Ilkey			
9.20.2018			M. Ilkey			

Welcome to the TSM&O Consortium Meeting

September 20, 2018

Transportation Systems Management & Operations

FDOT TSM&O Transportation Systems Management & Operations

Central Florida TSM&O Consortium

Meeting Agenda

1. Introduction
2. Signal Technician Program – Update
3. FDOT D5 10-Year TSM&O Request List – Update
4. Data Agreements – Update
5. Integrated Corridor Management
6. TSM&O Task Team Meeting – Update
7. Current Initiatives

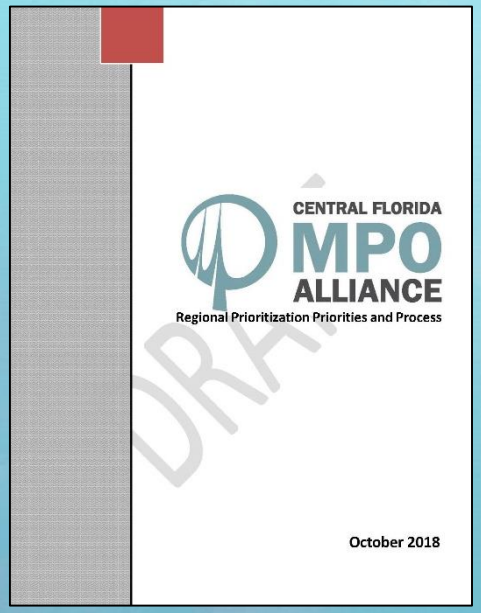
Signal Technicians Program at Orange Technical College – Update

David Williams, VHB

Signal Technician Program

- Held July Consortium at the OTC Mid Florida Campus
- Tour of the campus was a great success
- Letters of support

Central Florida MPO Alliance TSM&O Prioritized Projects Framework



Eric Hill, MetroPlan Orlando

FDOT TSM&O
Transportation Systems Management & Operations

Transportation Systems Management & Operations

CENTRAL FLORIDA TSM&O CONSORTIUM

Integrated Corridor Management

Dale Cody, Metric Engineering

Clay Packard, VHB

District 5

Integrated Corridor Management

I-4, CFX and Surrounding Arterials

FDOT

ICM
Year in Review

ICM Quick Overview

Detect Crash

TIM Activated

Diversion/Adj. Timing

Balance Network

Reduce Congestion

ICM Deployment

Management Staff

- Project Manager – Dale Cody
- Arterial Principal – Jeff Gerken
- RTMC Manager – Eddie Grant
- Arterial Manager – Manny Rodriguez
- Communications Specialist – Marc Morgenstern

Traditional Freeway Staff

- Two Supervisors
- Two Lead Operators
- Approximately 25 Operators

Arterial Staff

- Two Corridor Managers
- One Data Analyst

ICM Deployment

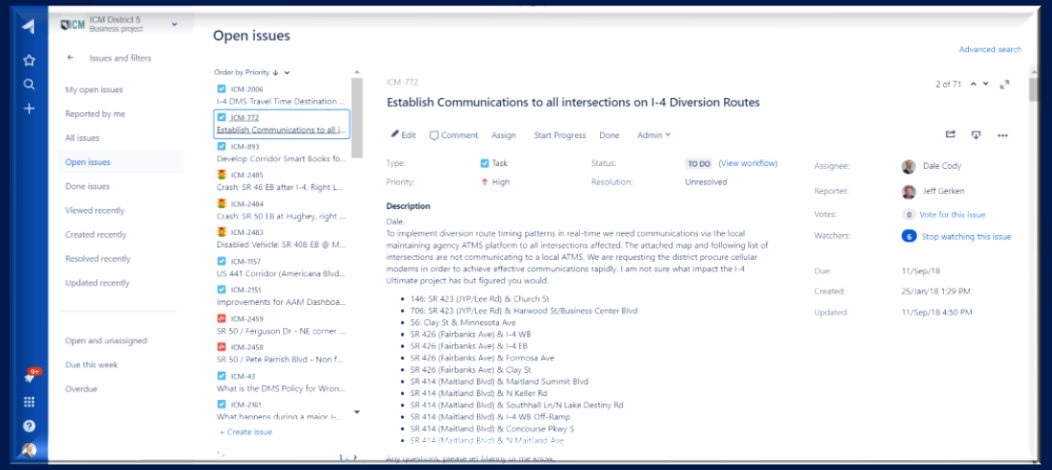
Training

- Developed an 8 module training course
  - Module 1 - Introduction to the D5-RTMC (Operator)
  - Module 2 - RTMC Communication Fundamentals and FDOT Hierarchy (Operator)
  - Module 3 - Road Rangers Overview (Operator)
  - Module 4 - Central Florida Expressway Authority Review (Operator)
  - Module 5 - Arterial Operation Training (Operator)
  - Module 6 - Arterial Corridor Manager Workshop (Corridor Manager training)
  - Module 7 - ICAT Basics (Mgmt)
  - Module 8 - MIMS Insight (Mgmt)
- IMSA Level 1 and 2 (TCSS)
- IMSA Level 1 and 2 (Signals)
- Road Ranger Ride-Alongs
- AAM Dashboard

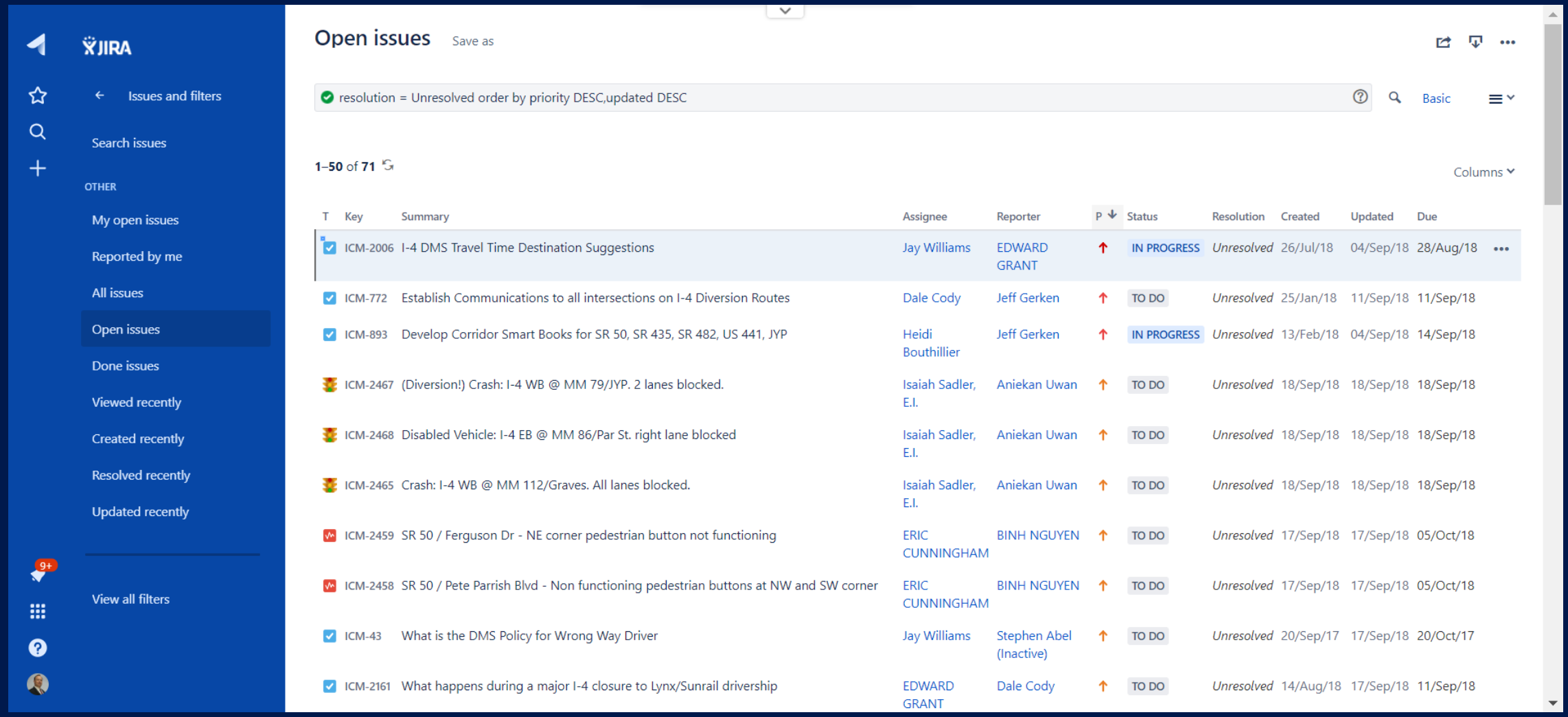
ICM Deployment

Action Tracking - ICAT

- Web Based
- Allows for assigning and tracking Actions in Real-Time
- 2483 Actions to Date
- Used to track arterial events – Added specific arterial fields
  - Tasks
  - Diagnostics
  - Events
  - Complaints
  - Requests for support
  - ICE – Capital Improvements



ICM Deployment

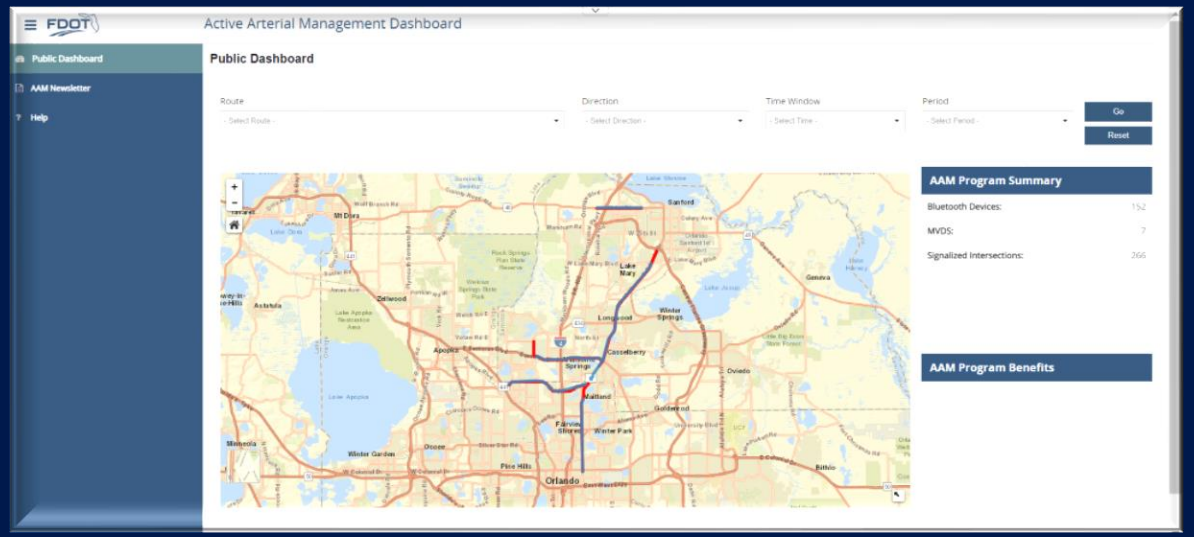


T	Key	Summary	Assignee	Reporter	P	Status	Resolution	Created	Updated	Due
	ICM-2006	I-4 DMS Travel Time Destination Suggestions	Jay Williams	EDWARD GRANT	↑	IN PROGRESS	*Unresolved*	26/Jul/18	04/Sep/18	28/Aug/18
	ICM-772	Establish Communications to all intersections on I-4 Diversion Routes	Dale Cody	Jeff Gerken	↑	TO DO	*Unresolved*	25/Jan/18	11/Sep/18	11/Sep/18
	ICM-893	Develop Corridor Smart Books for SR 50, SR 435, SR 482, US 441, JYP	Heidi Bouthillier	Jeff Gerken	↑	IN PROGRESS	*Unresolved*	13/Feb/18	04/Sep/18	14/Sep/18
	ICM-2467	(Diversion!) Crash: I-4 WB @ MM 79/JYP. 2 lanes blocked.	Isaiah Sadler, E.I.	Aniekan Uwan	↑	TO DO	*Unresolved*	18/Sep/18	18/Sep/18	18/Sep/18
	ICM-2468	Disabled Vehicle: I-4 EB @ MM 86/Par St. right lane blocked	Isaiah Sadler, E.I.	Aniekan Uwan	↑	TO DO	*Unresolved*	18/Sep/18	18/Sep/18	18/Sep/18
	ICM-2465	Crash: I-4 WB @ MM 112/Graves. All lanes blocked.	Isaiah Sadler, E.I.	Aniekan Uwan	↑	TO DO	*Unresolved*	18/Sep/18	18/Sep/18	18/Sep/18
	ICM-2459	SR 50 / Ferguson Dr - NE corner pedestrian button not functioning	ERIC CUNNINGHAM	BINH NGUYEN	↑	TO DO	*Unresolved*	17/Sep/18	17/Sep/18	05/Oct/18
	ICM-2458	SR 50 / Pete Parrish Blvd - Non functioning pedestrian buttons at NW and SW corner	ERIC CUNNINGHAM	BINH NGUYEN	↑	TO DO	*Unresolved*	17/Sep/18	17/Sep/18	05/Oct/18
	ICM-43	What is the DMS Policy for Wrong Way Driver	Jay Williams	Stephen Abel (Inactive)	↑	TO DO	*Unresolved*	20/Sep/17	17/Sep/18	20/Oct/17
	ICM-2161	What happens during a major I-4 closure to Lynx/Sunrail drivership	EDWARD GRANT	Dale Cody	↑	TO DO	*Unresolved*	14/Aug/18	17/Sep/18	11/Sep/18

ICM Deployment

Tools (Added to Daily Operations)

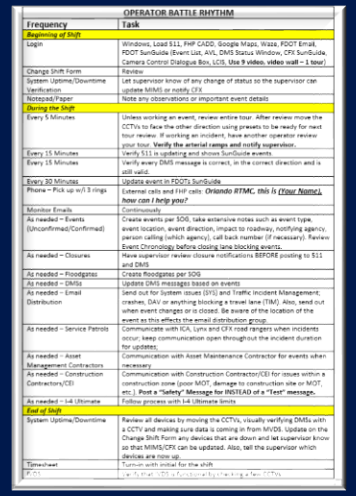
- SunGuide Admin Editor/Response Plan Generator
- ATMS platforms
- MIMS – Expanded Use
- CMS
- Bluetooth platforms
- Corridor Smart Books
- Solar Winds for Arterials
- Added EM locations to arterials
- ATSPM
- AAM Dashboard
- Adding Communications to Isolated Intersections



ICM Deployment

Accomplishments (Overall)

- Hurricane Irma
- Local Agency Outreach
- Developed Battle Rhythm Sheets
- Updated SOGs and SOPs for ICM
- ATMS Grooming
  - Critical Alarms Enabled (for max presence)
- I-4 Diversion Route Timings Developed and Implemented
- Common Clock Sync
- Workforce Development
  - Partners Training
  - UCF Outreach



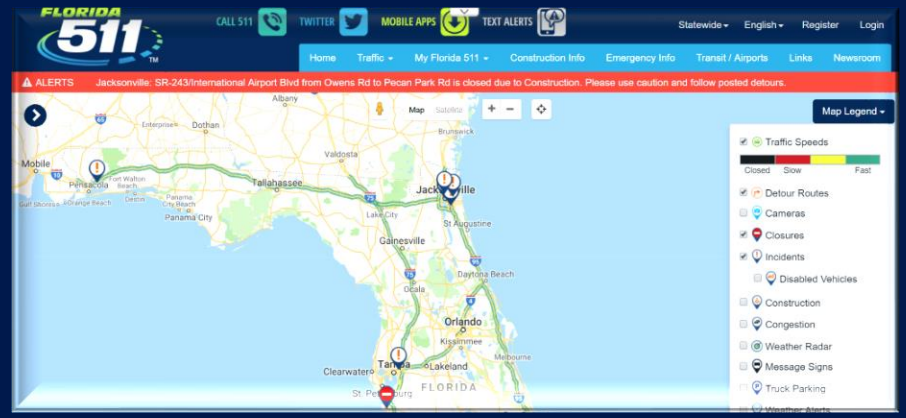
OPERATOR BATTLE RHYTHM

Frequency	Task
Beginning of Shift	
Login	Windows, Load 511, FHP CADD, Google Maps, Waze, FDOT Email, FDOT SunGuide (Event List, AVL, DMS Status Window, CFX SunGuide, Camera Control Dialogue Box, LCIS, **Use 9 video, video wall – 1 tour**)
Change Shift Form	Review
System Uptime/Downtime Verification	Let supervisor know of any change of status so the supervisor can update MIMS or notify CFX
Notepad/Paper	Note any observations or important event details
During the Shift	
Every 5 Minutes	Unless working an event, review entire tour. After review move the CCTVs to face the other direction using presets to be ready for next tour review. If working an incident, have another operator review your tour. **Verify the arterial ramps and notify supervisor.**
Every 15 Minutes	Verify 511 is updating and shows SunGuide events
Every 15 Minutes	Verify every DMS message is correct, in the correct direction and is still valid.
Every 30 Minutes	Update event in FDOT's SunGuide
Phone – Pick up w/ 3 rings	External calls and FHP calls: ***Orlando RTMC, this is (Your Name), how can I help you?***
Monitor Emails	Continuously
As needed – Events (Unconfirmed/Confirmed)	Create events per SOG, take extensive notes such as event type, event location, event direction, impact to roadway, notifying agency, person calling (which agency), call back number (if necessary). Review Event Chronology before closing lane blocking events.
As needed – Closures	Have supervisor review closure notifications BEFORE posting to 511 and DMS
As needed – Floodgates	Create floodgates per SOG
As needed – DMSs	Update DMS messages based on events
As needed – Email Distribution	Send out for System issues (SYS) and Traffic Incident Management; crashes, DAV or anything blocking a travel lane (TIM). Also, send out when event changes or is closed. Be aware of the location of the event as this effects the email distribution group.
As needed – Service Patrols	Communicate with ICA, Lynx and CFX road rangers when incidents occur; keep communication open throughout the incident duration for updates.
As needed – Asset Management Contractors	Communication with Asset Maintenance Contractor for events when necessary
As needed – Construction Contractors/CEI	Communication with Construction Contractor/CEI for issues within a construction zone (poor MOT, damage to construction site or MOT, etc.). **Post a "Safety" Message for INSTEAD of a "Test" message.**
As needed – I-4 Ultimate	Follow process with I-4 Ultimate limits
End of Shift	
System Uptime/Downtime	Review all devices by moving the CCTVs, visually verifying DMSs with a CCTV and making sure data is coming in from MVDS. Update on the Change Shift Form any devices that are down and let supervisor know so that MIMS/CFX can be updated. Also, tell the supervisor which devices are now up.
Timesheet	Turn-in with initial for the shift

ICM Deployment

Accomplishments - Daily

- FMS Operations
  - Review System Uptime/Downtime
    - MIMS
  - CCTV review all limited access roads
  - Verify DMSs/511
  - Create incident events per SOGs
    - COIN, RISC, Wrong Way
  - Coordinate with First Responders
  - Coordinate with CEIs, Maintenance Contractor
  - Identify capital improvements



ICM Deployment

Accomplishments - Daily

- Arterial Operations
  - Communication Reporting (Controller, BlueMac, BlueTOAD)
  - Alarm Tracking (Detectors, etc.)
  - Opticom CMS Error Tracking
  - InSync Camera Error Tracking
  - Maintaining Agency Coordination
  - Incidents – Diversion Routes/Signal Timing Adjustments
  - ATSPM
  - AAM Dashboard
  - Identify capital improvements

ICM Deployment

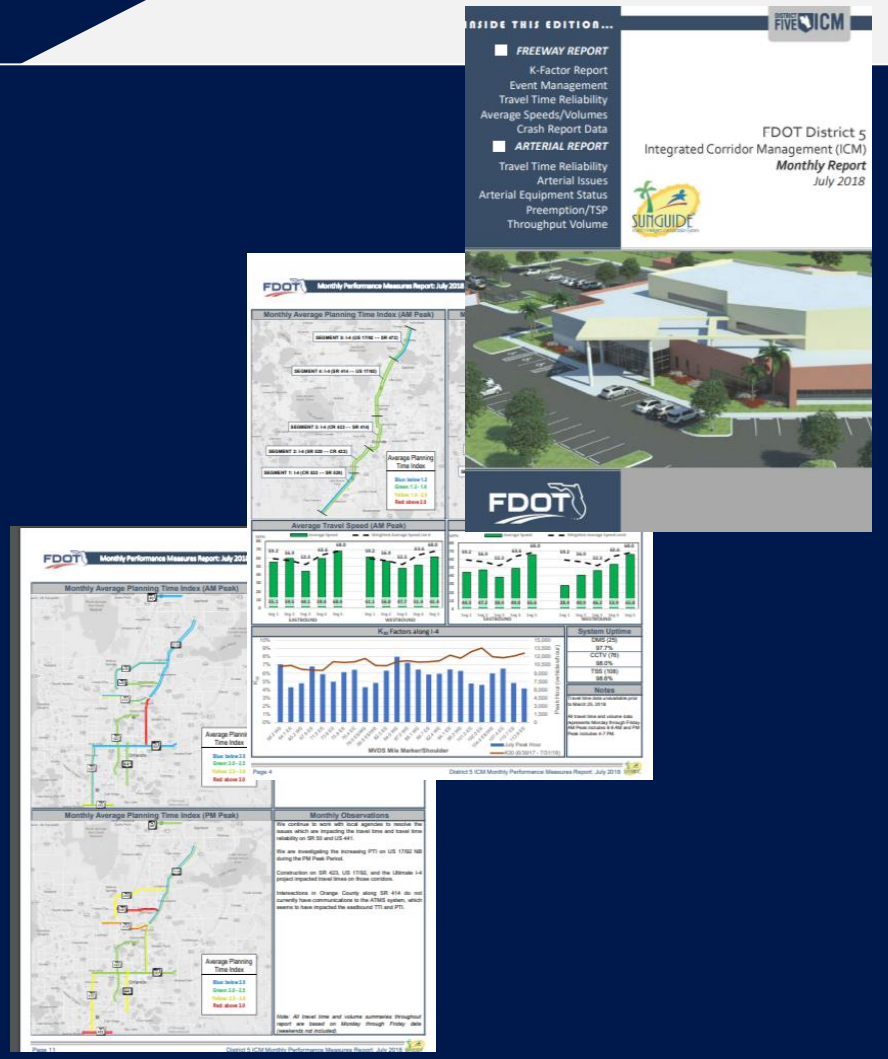
Accomplishments - Weekly

- Arterial Operations
  - ATMS Reports are summarized for Communications, Detector Performance and Alarms
  - CMS TSP/EVP Reports are polled and summarized
  - Emails sent to Maintaining Agencies

ICM Deployment

Accomplishments – Monthly

- Developed detailed Monthly Reports/Analysis
  - Monthly Narratives
  - Travel Time Information
  - Travel Time Reliability
  - Travel Speeds
  - K Factor
  - System Uptime/Downtime
  - RISC/COIN
  - Weather
  - Roadway Clearance Time



ICM Deployment

Accomplishments – Monthly

- Developed detailed Monthly Reports/Analysis (Cont'd)
  - Incidents/Crashes
  - Diversions
  - Secondary Crashes
  - Road Ranger Data
  - Wrong Way Driver
  - Throughput Volumes
  - Lynx On-Time Arrival
  - TSP/EVP Monthly Summary
  - Origin/Destination Data

ICM Deployment

On the Horizon

- Finalizing SOPs
- Bottleneck Analysis with Drones
- Real-time Operations with Drones
- Incorporating CFX into our Monthly Reports
- ICAT for the Maintaining Agencies
- Diversion Route Timings for Along SR 408
- Automating Monthly Reports
- Expanding Arterial CCTV Footprint
- Seven More Training Modules

ICM
In Action

Attempted Robbery

June 8, 2018

Plane Lands on I-4

November 3, 2017

ICM **Funding**

Contract for FY 2018

$2.4M

Covers both freeways and arterials in Central Florida

Also…

$11.9M

ATCMTD grant

ATCMTD Focus Areas	Existing Program	Proposed Programs		
	SunStore	PedSafe	GreenWay	SmartCommunity
Multimodal Integrated Corridor Management (ICM)	✓	✓	✓	
CV Tech at Intersections and Ped Crossings	✓	✓	✓	
Freight Community System	✓		✓	✓
Tech to Support Connected Communities	✓	✓		✓
Infrastructure Assessment	✓			✓
Rural Technology Deployments	✓			✓

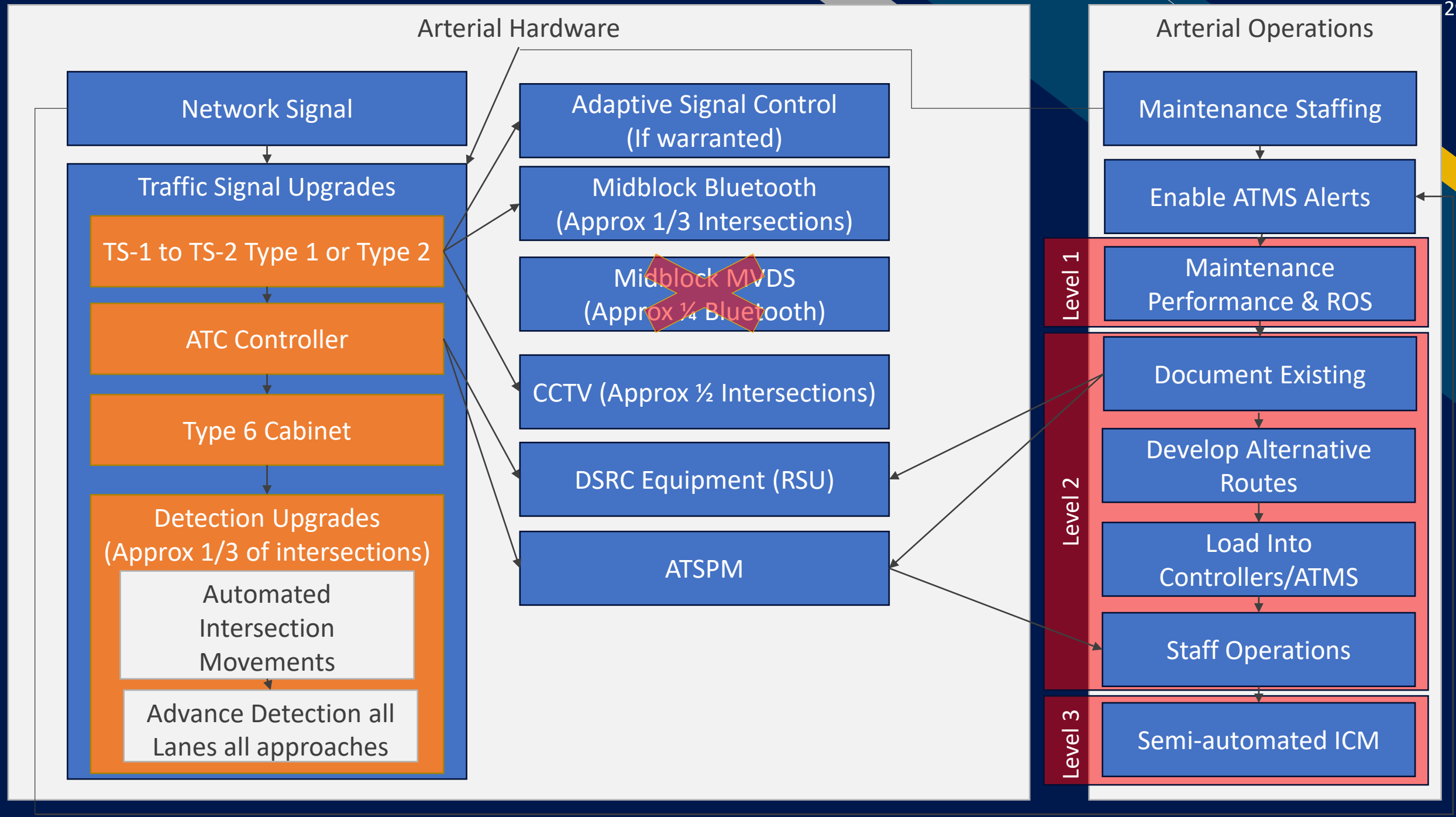
ICM **Policy**

FDOT Funding Formulas 2019…

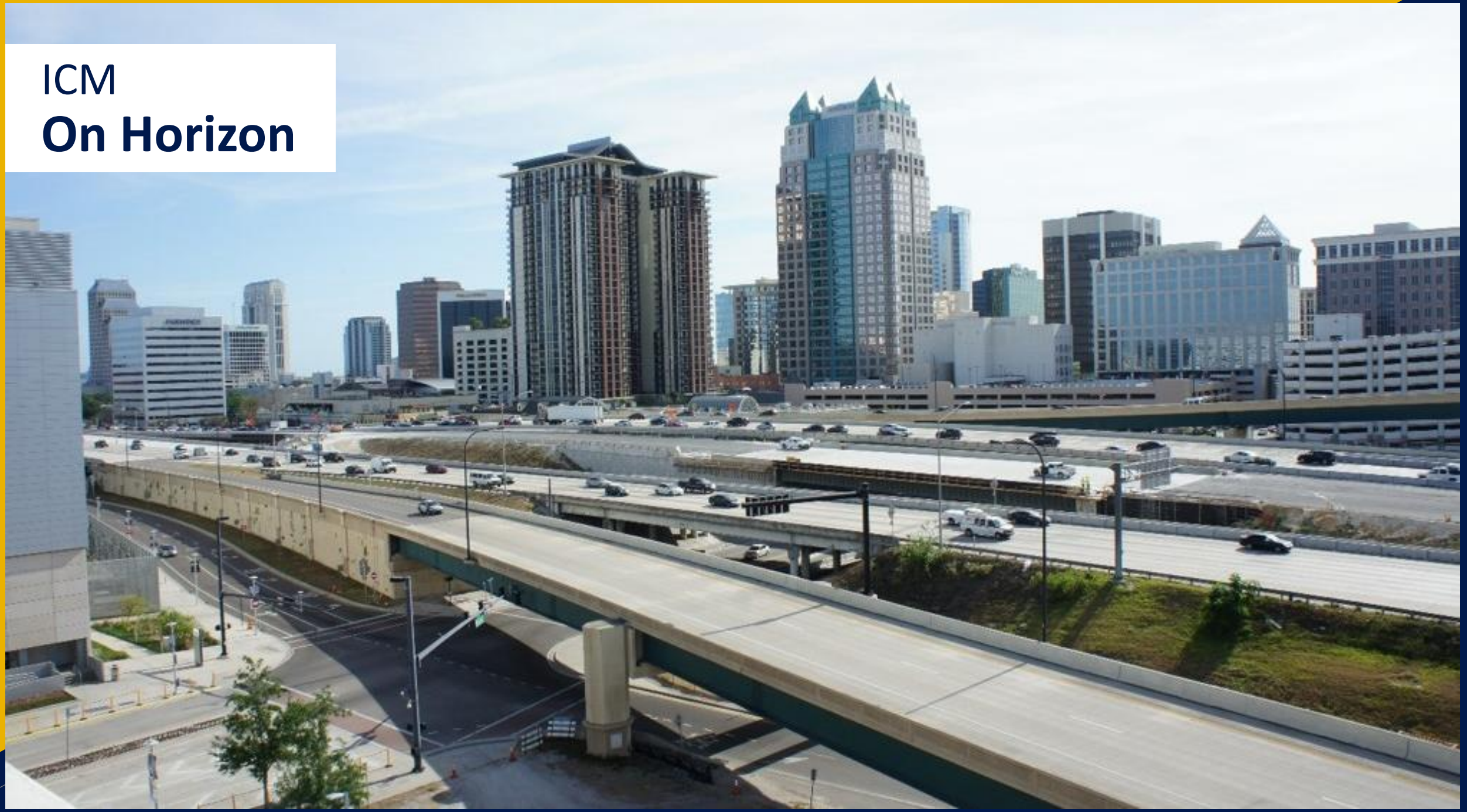
Covers both freeways and arterials

We received smallest increase in state

- Funds Well
  - Freeway
- Funds Less Well
  - Arterials
  - Express Lanes

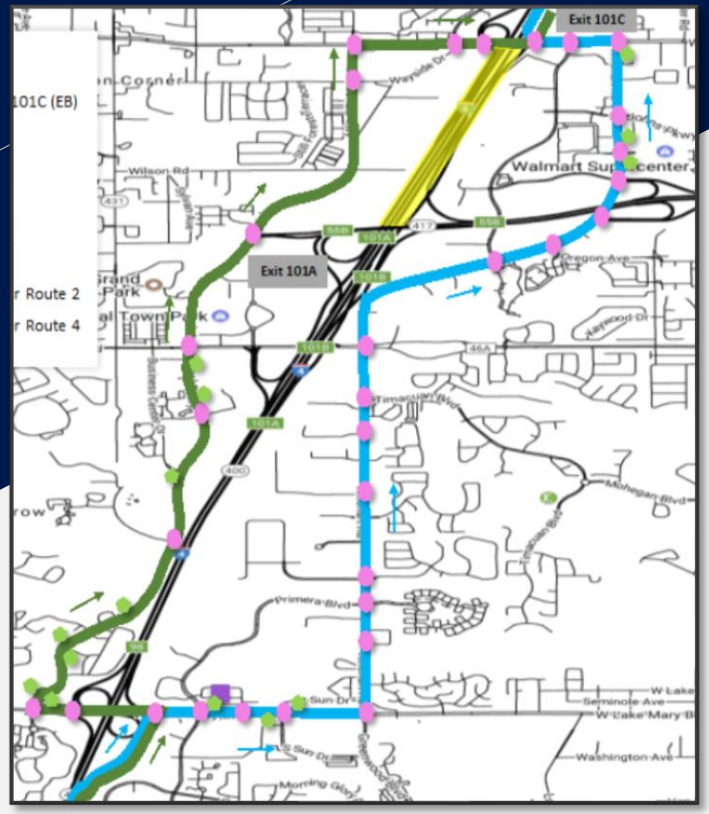

Arterial Hardware
Network Signal
Traffic Signal Upgrades
TS-1 to TS-2 Type 1 or Type 2
ATC Controller
Type 6 Cabinet
Detection Upgrades
(Approx 1/3 of intersections)
Automated Intersection Movements
Advance Detection all Lanes all approaches
Adaptive Signal Control
(If warranted)
Midblock Bluetooth
(Approx 1/3 Intersections)
Midblock MVDS
(Approx ¼ Bluetooth)
CCTV (Approx ½ Intersections)
DSRC Equipment (RSU)
ATSPM
Arterial Operations
Maintenance Staffing
Enable ATMS Alerts
Level 1
Maintenance Performance & ROS
Level 2
Document Existing
Develop Alternative Routes
Load Into Controllers/ATMS
Staff Operations
Level 3
Semi-automated ICM

ICM
On Horizon



Regional Integrated Corridor Management System

Incident Detection



Response Plan
w/ Diversion Route

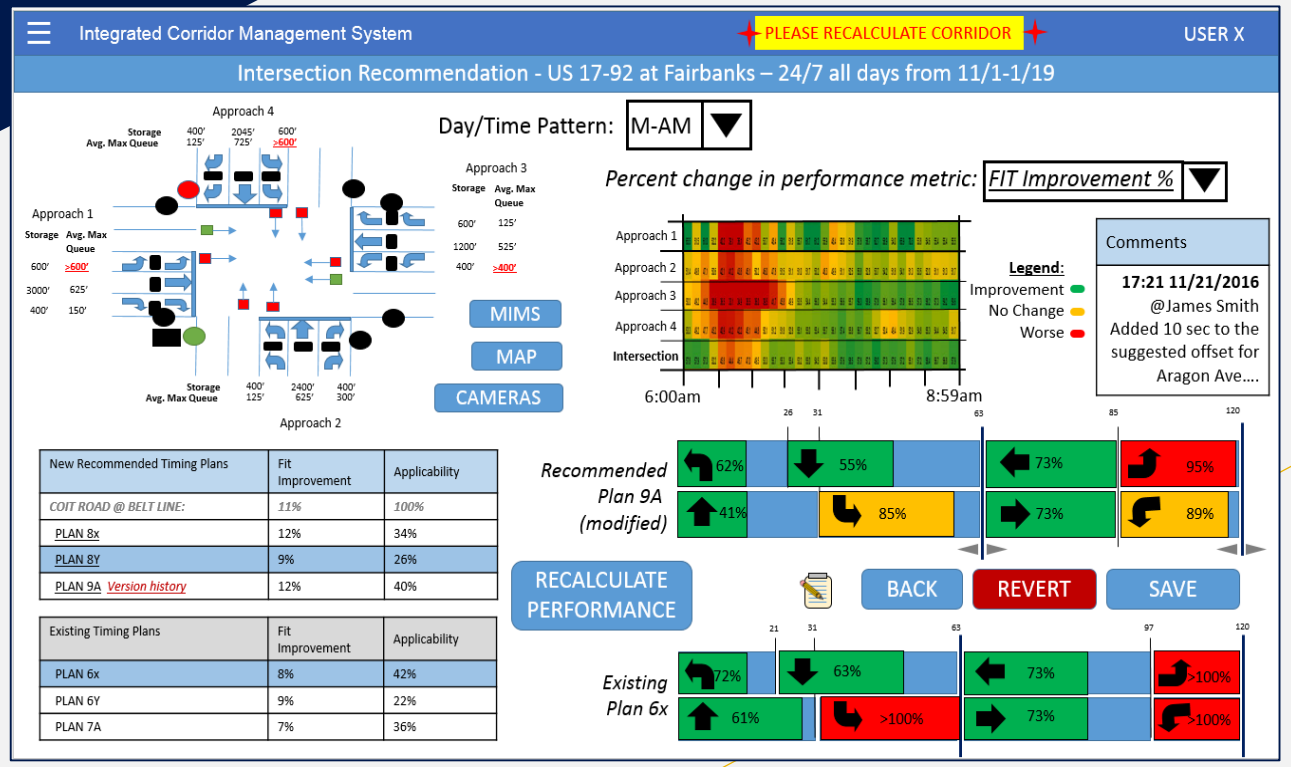
Data Fusion Environment

Signal Timing
Plan Selection and
Optimization

Mesoscopic Simulation
for Realtime 30 Minute
Forecasting

Manage the Arterials

- Separate offline process
- Grouping and clustering time intervals
- Highway Capacity Software used for recommended offsets and cycle lengths
- Traffic Engineer Role:
  - Review
  - Make adjustments
  - Request recalculate measures of effectiveness
  - Approve and Implement via local agency traffic signal ATMS



Automating Recommendation of Action & Implementation

Design Time

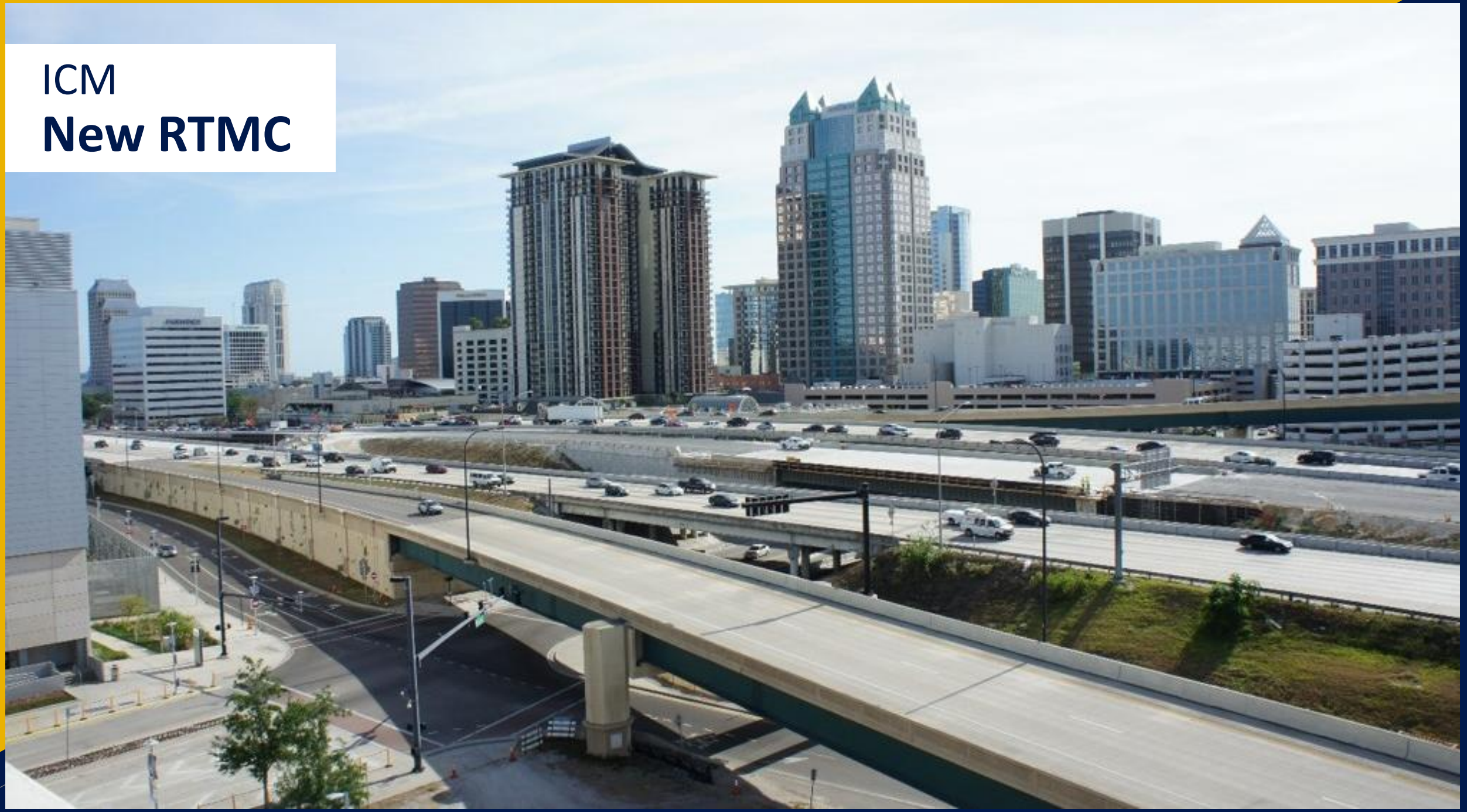
- Repository of Response Plans having Diversion Routes
- Rules engine mapping event attributes to response plans

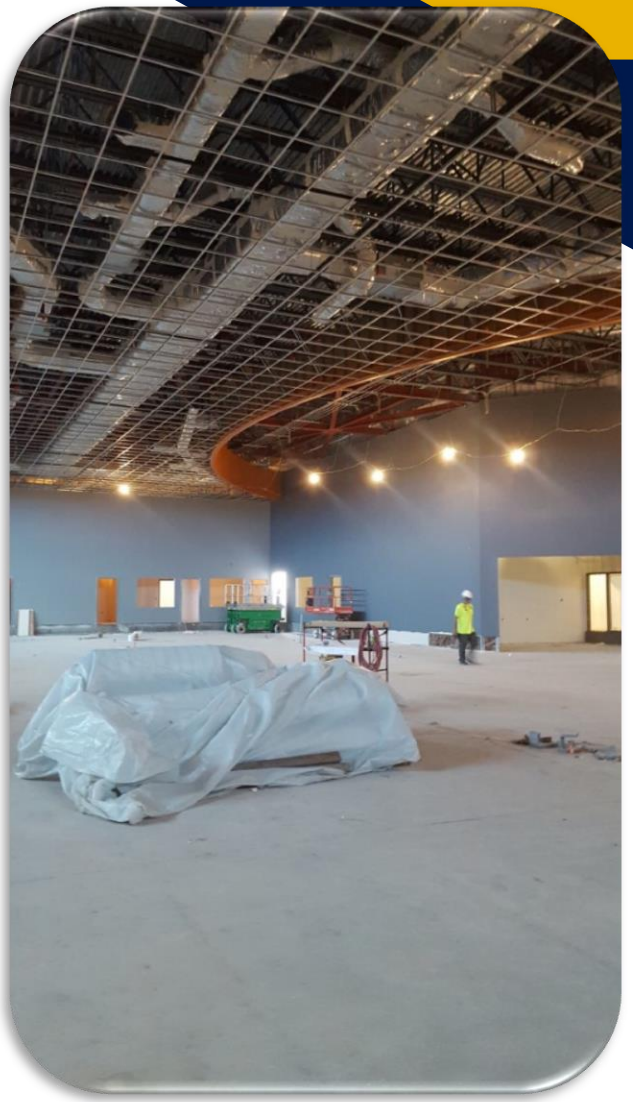
Run-Time

- Rules Engine Selects response plan for active incident
- Mesoscopic simulation engine predicts measures of effectiveness 30 minutes into future
- Operator and Agency Approval obtained prior to activation

ICM

New RTMC






WILSON ROAD
R.O.W. LINE
R.O.W. LINE
INTERNATIONAL PARKWAY
PROPERTY LINE
MAIN ENTRY
LOADING AREA
VEHICLE GATE
DUMPSTER ENCLOSURE
SECURED PARKING
VEHICLE GATE
Regional Transportation Management Center
STAFF ENTRY
CHILLER ENCLOSURE
SERVICE PARKING
WALKWAY
EMERGENCY GENERATOR
RETENTION POND

Thank You.

Jeremy Dilmore

(386) 943-5360

Jeremy.dilmore@dot.state.fl.us

FDOT

Regional Integrated Corridor Management System (R-ICMS)

Stakeholder Input

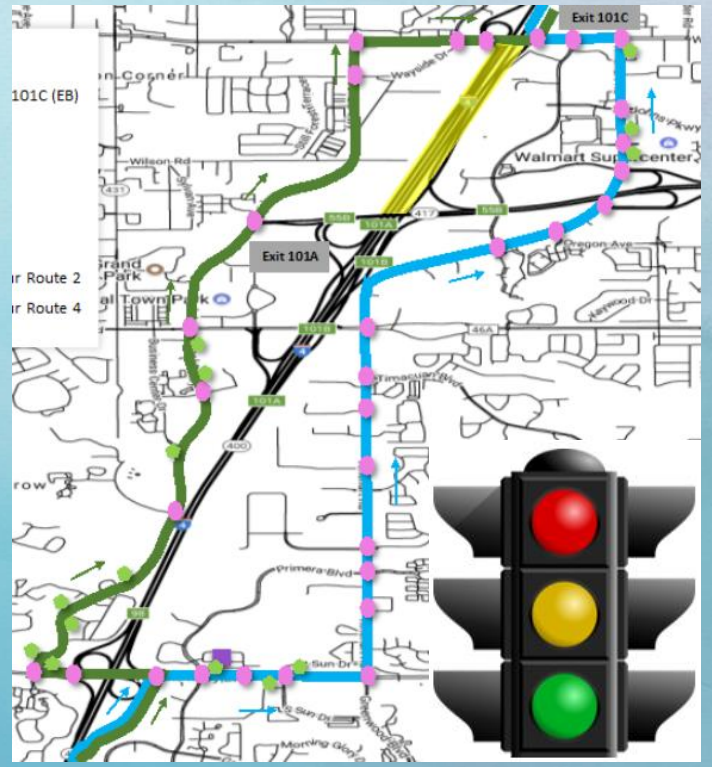
Clay Packard, VHB

R-ICMS Program Update

- Engineering contract – began in 2016
  - Studies, ConOps, procurement support
  - *Response Plan development*
- R-ICMS software construction contract executed March 2018
  - 2 years of development targeting deployment in July 2020
  - 2 years of support, maintenance, and enhancements
- Modelling
  - Model engine software – in procurement process
  - Consultant model build/calibration – recently under contract

R-ICMS Goals Recap:

- Non-Recurring Congestion
  - Decision Support System (DSS) – Divert traffic around freeway incidents
    - Pre-configured response plans,
    - Rule-based decision engine, and
    - Agency profile for approval
- Recurring Congestion
  - Signal Optimization Tool (SOT) –
    - Use collected intersections counts to produce proposed, optimized signal candidate timing plan

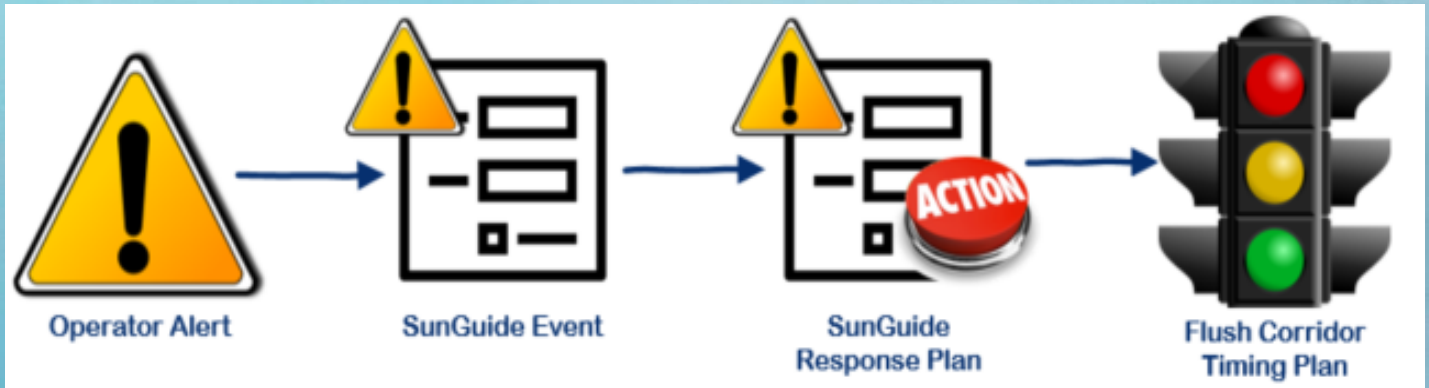


FDOT TSM&O
Transportation Systems Management & Operations

Transportation Systems Management & Operations

CENTRAL FLORIDA TSM&O CONSORTIUM

Recurring Congestion Workflow Recap



Response Plan Development Process (part 1)

- Obtain information (DMS signs along I-4, traffic signals, timing plans including flush plans for ICM, Local restrictions, school locations
- Identify Incident Scenarios
  - Location and Direction: Subdivide I-4 between interchanges,
  - Time of day peak period (AM, PM, OFF Peak)
  - Incident Severity based on lane closure – borrowed from SunGuide severity levels
- Identify possible alternate / diversion routes
- Include response plan elements (see list on next page)

Response Plan Element Types

- **Coordinated timing plans for traffic signals along the detour route,**
- **Messages for DMS used by SunGuide software and operations,**
- Rate changes for ramp metering controllers which meter traffic in the same direction of the incident and upstream of the incident,
- Hard shoulder running activation, if allowed by FDOT and configured,
- Railway crossing,
- Disabled pricing for managed lanes affected by the incident,
- Stakeholder notification,
- Connected vehicle (CV) traveler information messages (TIM), and
- Florida's 511 system event publications.

Response Plan Development Process (part 2)

- Identify Signal Timing Plan Gaps
  - Need for increased through movement, or increased left turn movement
- Develop Response Plan Rule Sets
  - Table mapping incident scenarios to response plan elements
  - Used by the Decision Support System during operations to select candidates
- Stakeholder Review and Approval of Developed Response Plans
- Stakeholder Approved Profile for approving response plans during operations

Questions?

Data User Agreements

Jeremy Dilmore, FDOT District Five

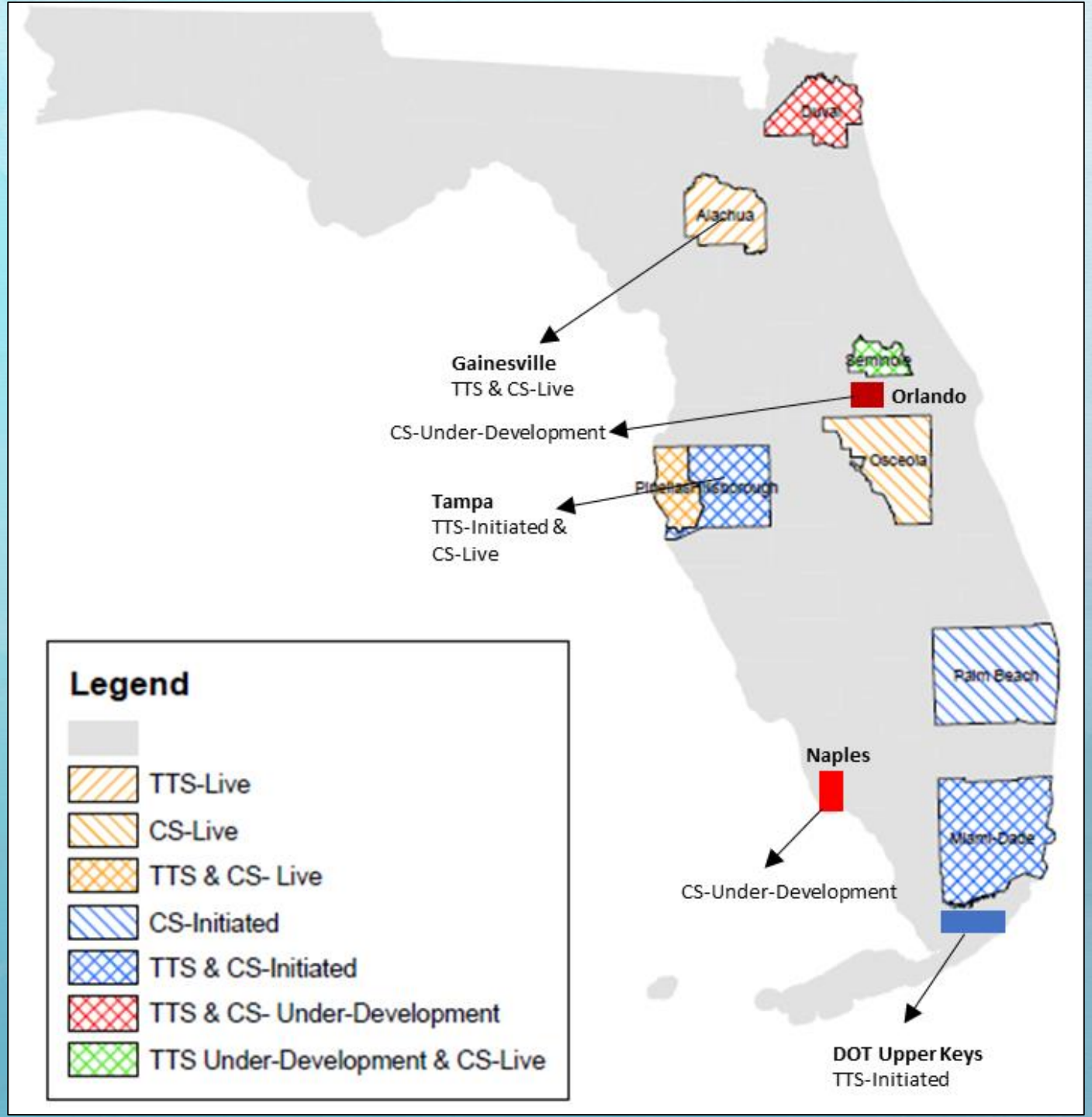
Data Agreements

- FDOT has executed agreements with three vendors
  - Traffic Technology Services, Inc. (TTS)
  - Connected Signals, Inc. (CS)
  - Live Traffic Data Corp. (LTD)

- Other maintaining agencies have developed or executed agreements with these firms

Data User Agreement Status

(DRAFT 9/10)



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CENTRAL FLORIDA TSM&O CONSORTIUM

FDOT TSM&O Task Team Meeting

Jeremy Dilmore, FDOT District Five

FDOT

FDOT TSM&O
Transportation Systems Management & Operations

August 6, 2018

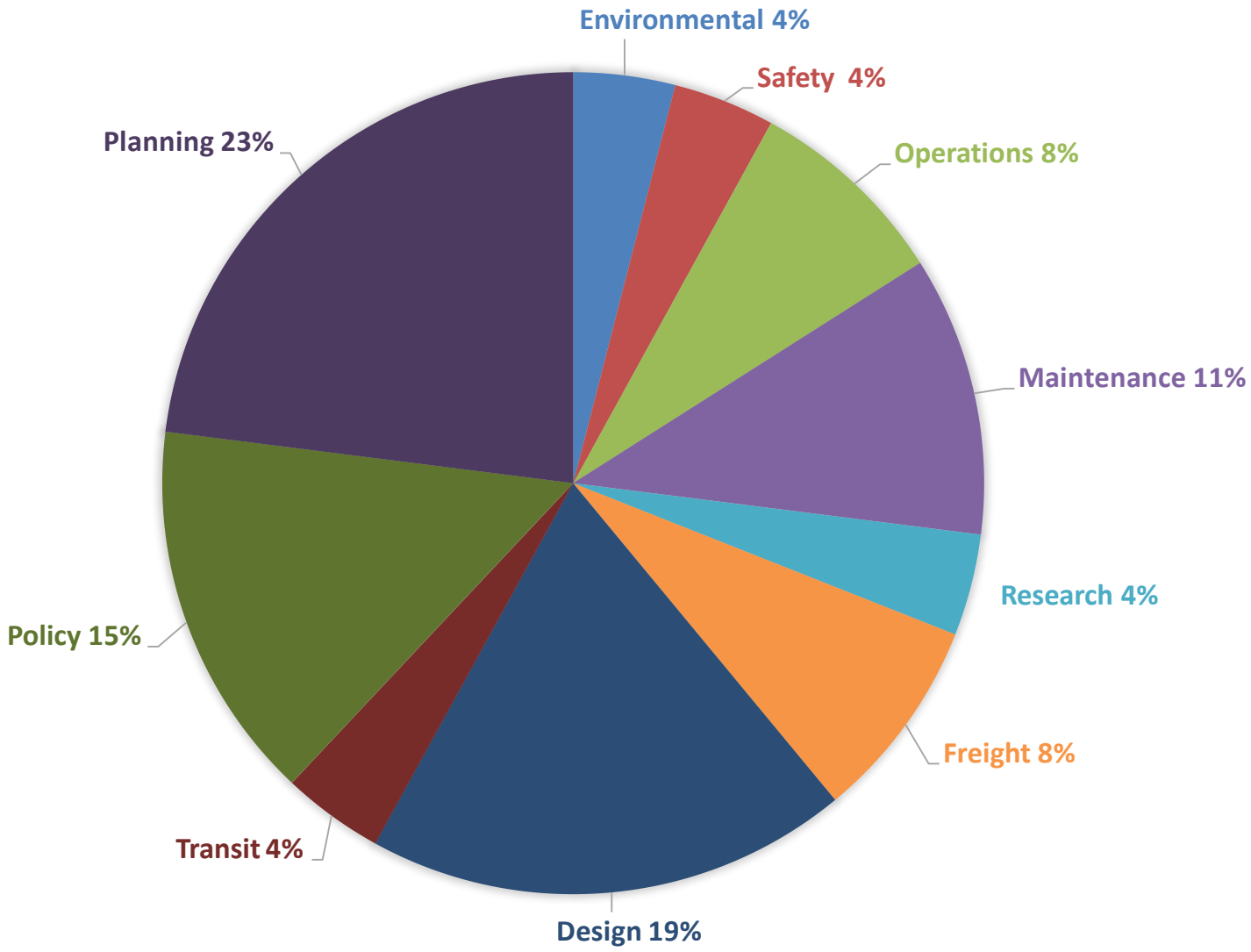
TSM&O Task Team Meeting



Results: Pre-workshop Survey



CAV Survey Results – Functional Areas



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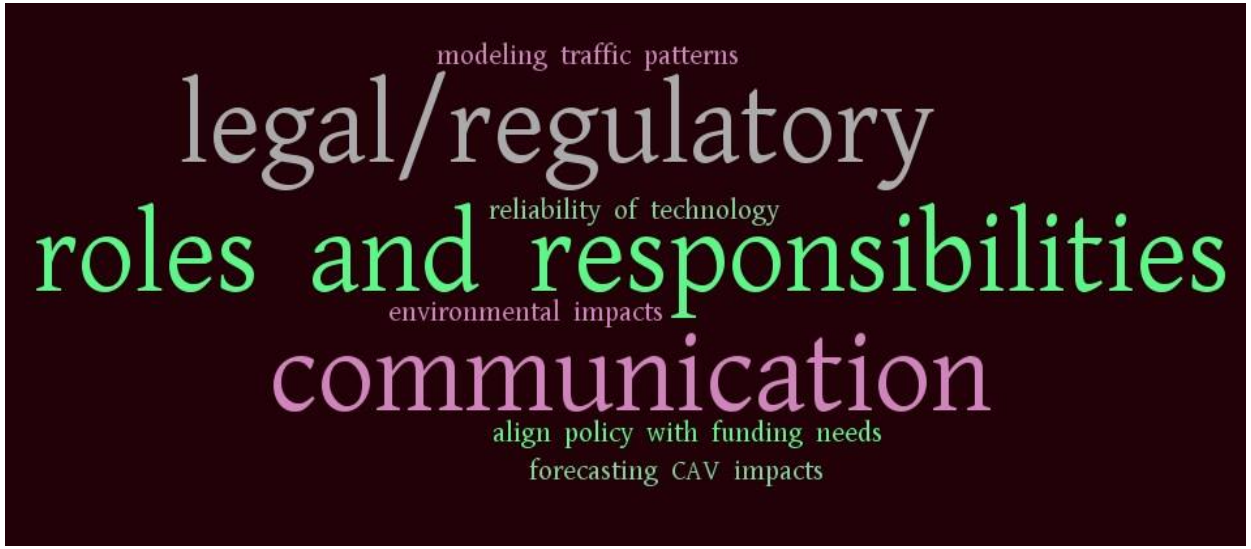
Survey Responses by Grouping

	Workshop Outcome Expectations	Opportunities	Challenges	Roles
Internal/external information, outreach, and education	10	10	18	6
Policy, planning, forecasting, and PD&E	2	2	3	2
Design, construction, and maintenance	1	7	10	0
Management and operations	0	4	1	2
Benefits and impacts	1	27	9	1
Technology and data	0	3	3	2

Survey Responses – Opportunities and Challenges

Opportunities

Challenges



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Internal/External Information, Outreach, and Education

- A **clear delineation of roles & responsibilities**; an understanding of coordinated efforts and inclusion of impacted stakeholders; understanding of applicable technology standards, processes and approvals; sound organizational change management practices to ensure adequate communication with stakeholders both internal and external
- A **plan for establishing recurring communications** between all FDOT offices affected by CAV deployment along with additional lines of communication to CAV testers and policy makers.
- **Cooperative working relationship** between offices
- **Deliverables per business unit** in coordinated manner
- **Implementable action items**
- Improved strategy for and initial steps towards **more comprehensive and effective coordination**.
- Survey results and each office's **roles and responsibilities** related to CAV.
- **Understand CAV program** and how our office should get involved
- **Unified Vision**
- **Leadership**

FDOT TSM&O
Transportation Systems Management & Operations

Policy, Planning, Forecasting, and PD&E

- A coordinated plan to move forward
- A more coherent policy which can be submitted to the Secretary of Transportation and other appropriate officials

Design, Construction, and Maintenance

- Establish clear criteria moving forward that balances all stakeholder concerns, including the Department's needs for infrastructure preservation, safety and operational controls

Impacts/Benefits

- Basic concept for measuring impact

CAV Survey Results – Impact on Roles

4. How much of an impact do you expect CAV will have on your office's roles and responsibilities?

	Little to none	Noticeable	Substantial	Game changer	Responses
Next 1-2 years					
Count	3	5	5	3	16
Row %	18.8%	31.3%	31.3%	18.8%	
Next 3-5 years					
Count	0	3	9	4	16
Row %	0.0%	18.8%	56.3%	25.0%	
Totals					
Total Responses					16

CAV Survey Results – Impact on Safety

5. How much of an impact do you anticipate CAV will have on TRANSPORTATION SAFETY?

	Little to none	Noticeable	Substantial	Game Changer	Responses
Next 1-5 years					
Count	1	9	4	1	15
Row %	6.7%	60.0%	26.7%	6.7%	
Next 6-10 years					
Count	0	1	12	3	16
Row %	0.0%	6.3%	75.0%	18.8%	
Beyond 10 years					
Count	0	0	4	11	15
Row %	0.0%	0.0%	26.7%	73.3%	
Totals					
Total Responses					16

CAV Survey Results – Impact on Mobility

6. How much of an impact do you anticipate CAV will have on TRANSPORTATION MOBILITY?

	Little to none	Noticeable	Substantial	Game Changer	Responses
Next 1-5 years					
Count	3	9	2	1	15
Row %	20.0%	60.0%	13.3%	6.7%	
Next 6-10 years					
Count	0	3	12	1	16
Row %	0.0%	18.8%	75.0%	6.3%	
Beyond 10 years					
Count	0	1	5	9	15
Row %	0.0%	6.7%	33.3%	60.0%	
Totals					
Total Responses					16

CAV Survey Results – Impact on Economy

7. How much of an impact do you anticipate CAV will have on ECONOMIC DEVELOPMENT?

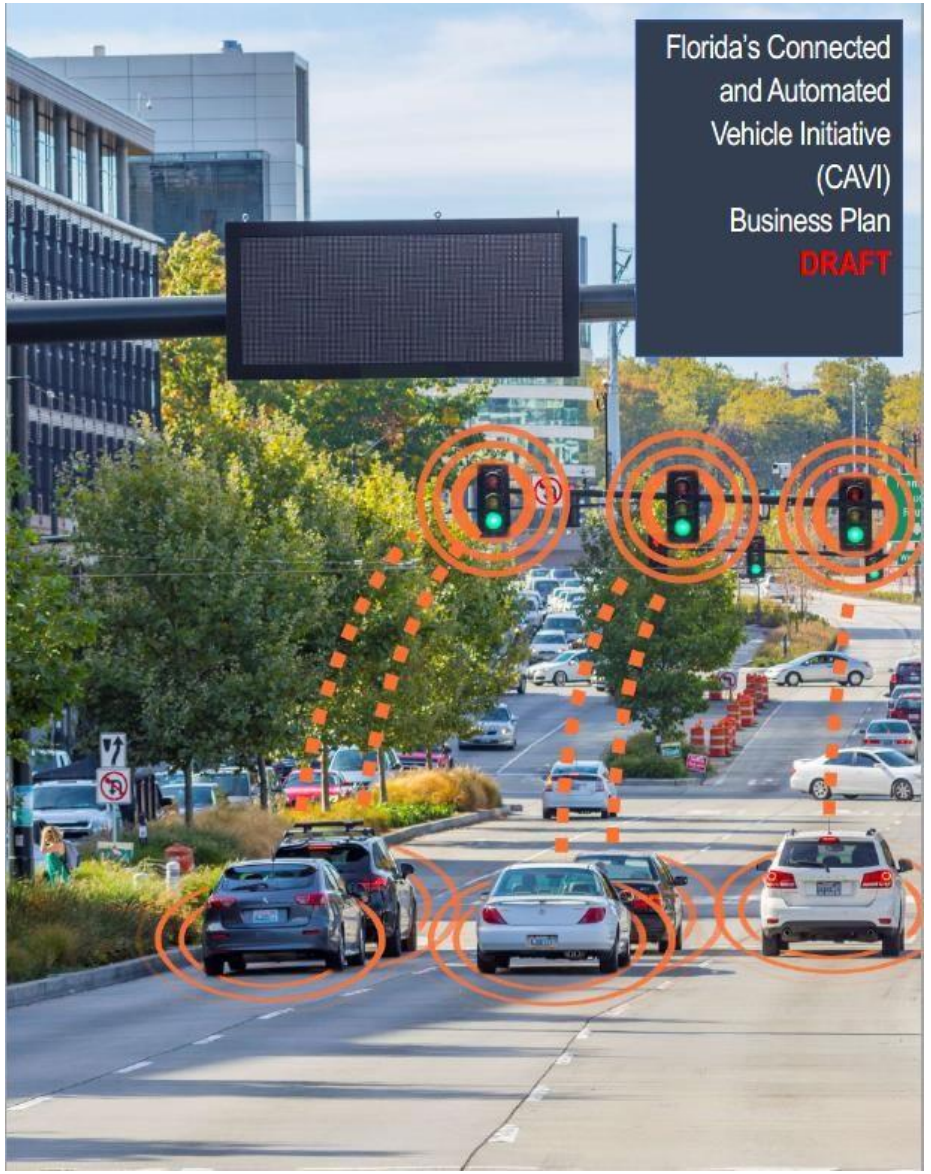
	Little to none	Noticeable	Substantial	Game Changer	Responses
Next 1-5 years					
Count	5	5	4	0	14
Row %	35.7%	35.7%	28.6%	0.0%	
Next 6-10 years					
Count	1	5	7	1	14
Row %	7.1%	35.7%	50.0%	7.1%	
Beyond 10 years					
Count	1	4	4	5	14
Row %	7.1%	28.6%	28.6%	35.7%	
Totals					
Total Responses					14

Next Steps

- Workshop Report
- Statewide Workshop - Proposed Date: 9/27/2018
- Potential Action Items
  - Update CAV Business Plan with survey and workshop results
  - Develop implementation framework for active deployments
  - Engage with districts to identify projects for TSM&O Leadership Team
  - Develop a Communications Outreach and In-reach Plan
  - Others - ?

CAV Business Plan

- Seven Focus Areas:
  - Policies and governance
  - Program funding
  - Education and outreach
  - Industry outreach and partnerships
  - Technical requirements and specification development
  - Implementation readiness
  - Deployment and implementation



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CAV Business Plan

- **Draft 2** (September 2018) in circulation for FDOT/Industry review

- Example Action Item table

Table 3. Program Funding Action Items

Functional Areas and Action Items	Activity	Status	Term	Main Role*	Outcome	Responsibility	Cost
Establish Sustainable CAV O&M Funding	4	⦿	S	E	🕮	LT, TEO	$$
Discuss CAV role in the TSM&O Cost Feasible Plan	5	⦿	S	E	🕮	TEO,D1-7,FTE	$$
Study CAV Maintenance Best Practices	6	O	M	E	🕮	TEO	$$

NOTE: Please refer to the Legend Key, preceding Page 1.
Several Offices (TEO, D, PM, D, C, D1-7, FTE, MPO/TPO, LT, R, PP, P, SIS, FT, TDA, EM, PIO and TT) may have a role.

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Transportation Systems Management & Operations

Current Initiatives

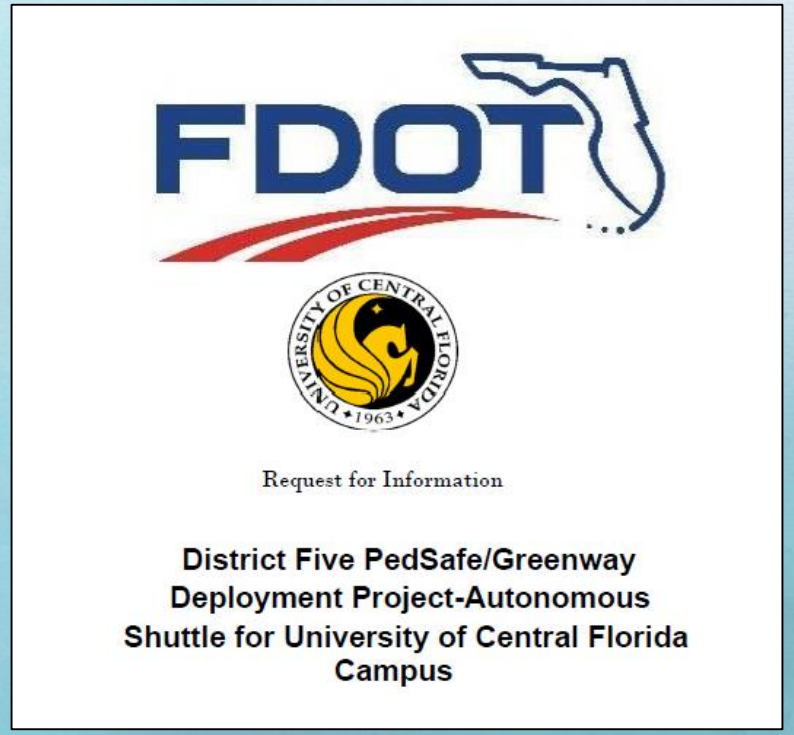
Jeremy Dilmore, FDOT District Five

RTMC Update

- About 75% complete as of September 2018
- *Certificate of Occupancy* expected by late December / early January
- Full operation from RTMC expected by April 1, 2019
  - FHP to move in after July 1, 2019
- Available Space:
  - FDOT – 24,526 SF
  - FHP Dispatch – 6,920 SF
  - Shared Area – 13,548 SF

Request for Information (RFI) for AV Shuttle

- AV Shuttle RFI advertised August 16, 2018
- Vendor responses/proposals due today
- Proposed AV shuttle features:
  - **SAE Level 4** Autonomous Navigation
  - Operation exclusively within pedestrian-access facilities with mixed-use operation, including bicycles, pedestrians and maintenance vehicles
  - Two proposed routes
  - Vehicle to include real-time Automatic Vehicle Location (AVL) consistent with existing UCF services
  - Vehicle to follow ADA compliance

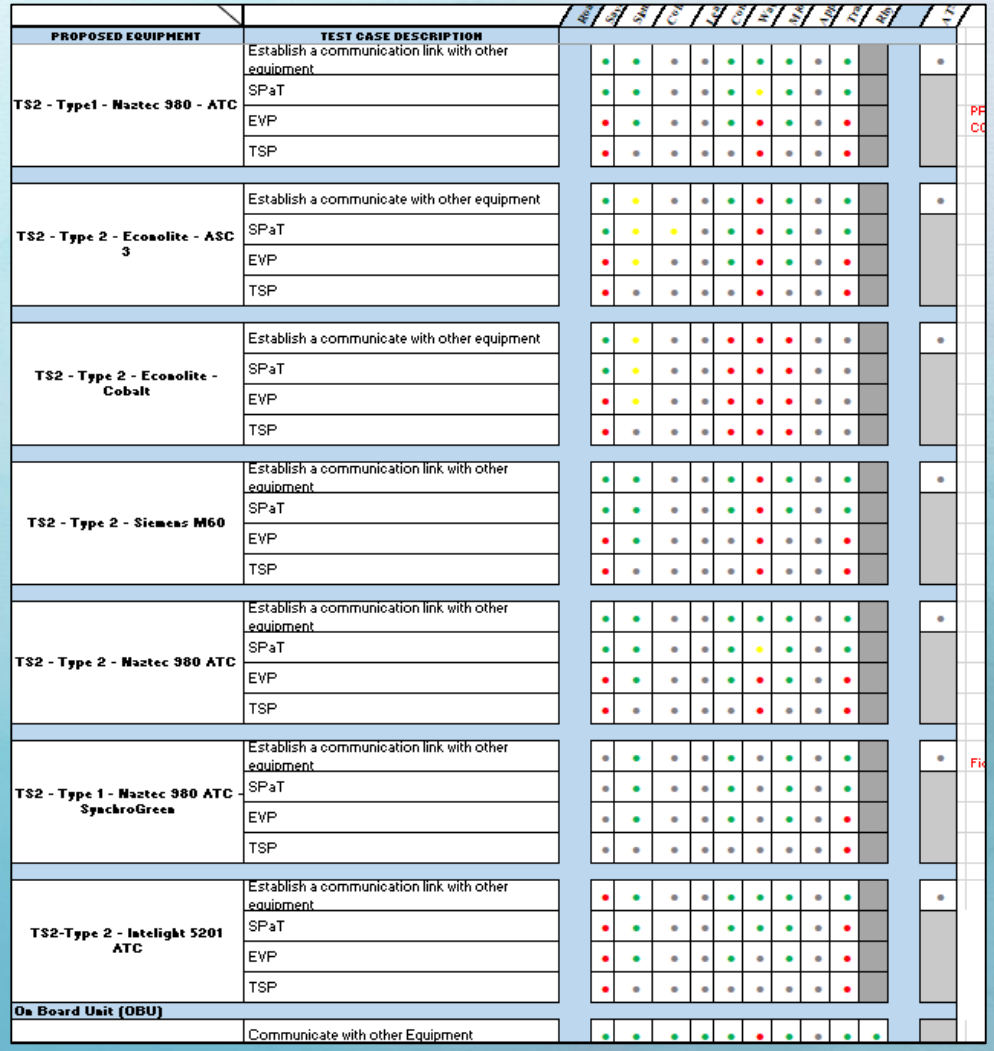


CV Testing

- Connected Vehicle Application Testing of equipment from vendors
  - BSMs, TIM, MAP, SPaT, EVP, TSP, Ped Safety Applications, Collision Warnings, V2V warnings
- Below are all the applications **tested** and/or considered so far:
  - Speed Harmonization
  - Queue Warning
  - Road Weather Alert
  - Dynamic Roadway Warning
  - Dynamic Route Guidance
  - Reduced Speed Zone Warning
  - **Traffic Incident Mgmt System**
  - CV Traffic Signal System
  - **Bike/Ped Safety**
  - In-Vehicle Signage
  - Truck Parking Availability
  - Freight Signal Priority
  - Curve Speed Warning
  - **Vehicle Turning Right in front of bus**

CV Testing

- Success varies by vendor and is documented in the matrix



PROPOSED EQUIPMENT	TEST CASE DESCRIPTION
TS2 - Type1 - Naztec 980 - ATC	Establish a communication link with other equipment
	SPaT
	EVP
	TSP
TS2 - Type 2 - Econolite - ASC 3	Establish a communicate with other equipment
	SPaT
	EVP
	TSP
TS2 - Type 2 - Econolite - Cobalt	Establish a communicate with other equipment
	SPaT
	EVP
	TSP
TS2 - Type 2 - Siemens M60	Establish a communication link with other equipment
	SPaT
	EVP
	TSP
TS2 - Type 2 - Naztec 980 ATC	Establish a communication link with other equipment
	SPaT
	EVP
	TSP
TS2 - Type 1 - Naztec 980 ATC - SynchroGreen	Establish a communication link with other equipment
	SPaT
	EVP
	TSP
TS2-Type 2 - Intelight 5201 ATC	Establish a communication link with other equipment
	SPaT
	EVP
	TSP
On Board Unit (OBU)	
	Communicate with other Equipment

Other District Five CV Efforts

- Smart Cities Hardened CPU
- Scope inclusion
- Standardized wiring for signals
- Data Collection for existing signals
- ReIP completed
- Agreements with 3rd party data providers
- OBU emulator SA in negotiations

THANK YOU!

Next Consortium – November 15, 2018
(located at CFX)

TSM&O Consortium Meeting

MEETING AGENDA

Central Florida Expressway Authority
4974 Orl Tower Rd
Orlando, FL 32807
CFX Boardroom

September 20, 2018; 10:00 AM-12:00 PM

1) WELCOME
2) SIGNAL TECHNICIAN PROGRAM UPDATE
   - David Williams, VHB
3) CFMPOA TSM&O PRIORITIZATION FRAMEWORK AND DISCUSSION
   - Eric Hill, MetroPlan Orlando
4) INTEGRATED CORRIDOR MANAGEMENT
   - Dale Cody, Metric Engineering
   - Clay Packard, VHB
5) DATA USER AGREEMENTS
   - Jeremy Dilmore, District Five TSM&O
6) FDOT TSM&O TASK TEAM MEETING
   - Jeremy Dilmore, District Five TSM&O
7) CURRENT INITIATIVES
   - Jeremy Dilmore, District Five TSM&O