TSM&O Consortium Meeting Summary

Meeting Date:	May 4, 2017 (Thursday)	**Time**: 10:00 AM – 12:00 PM
Subject:	TSM&O Consortium Meeting	
Meeting Location:	FDOT's Orlando Office 133 S. Semoran Blvd., Orlando, FL 32807 Lake Apopka B Conference Room	

I. OVERVIEW

The purpose of this recurring meeting is to provide an opportunity for District Five FDOT staff and regional agency partners to collaborate on the state of the TSM&O Program and ongoing efforts in District Five.

II. DISTRICT FIVE TSM&O IMPLEMENTATION PLAN UPDATE

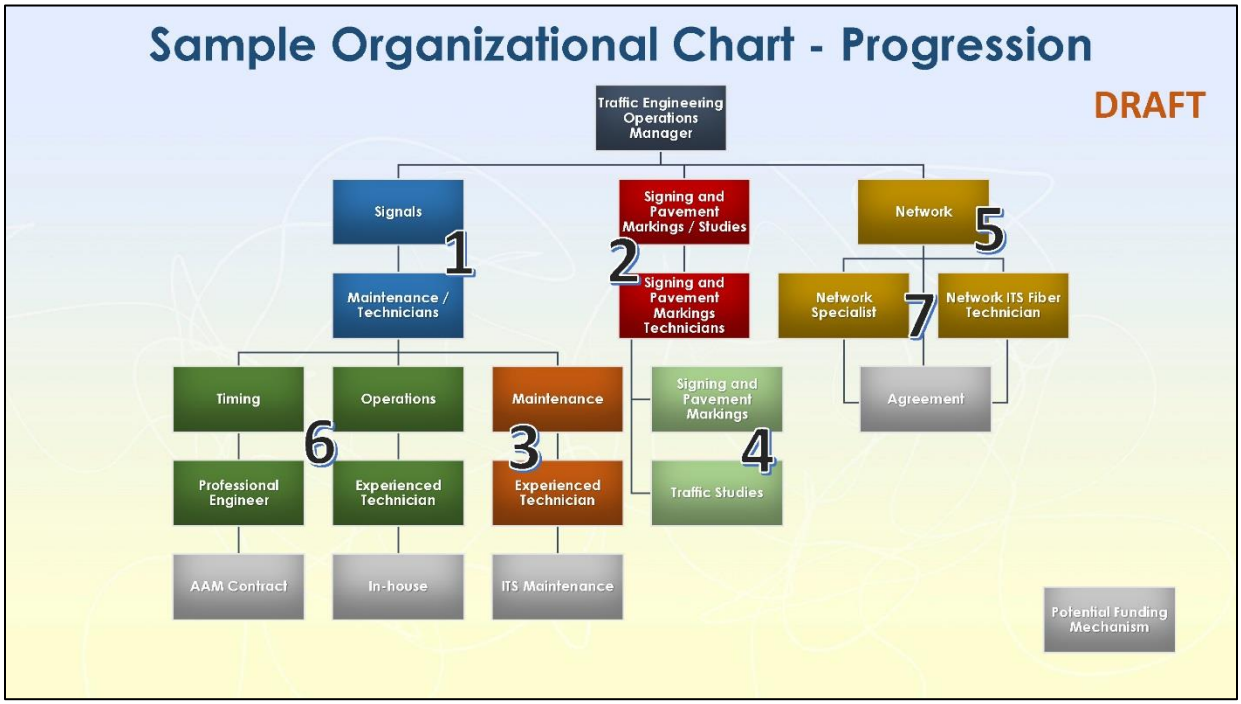
David Williams (VHB) presented slides to update consortium members on the status of the District 5 TSM&O Implementation Plan.

- Visit www.CFLSmartRoads.com/tsmo.html for the draft Implementation Plan
- Structure of Implementation Plan:
  - Executive Summary
  - Introduction
  - Business Processes Dimension
  - Organization & Workforce Dimension
  - Culture
  - Collaboration
  - Systems & Technology
  - Performance Measures
  - Resources and Tools in District Five
- Next Steps:
  - Executive Summary
  - Resources and Tools section
  - Refine existing content based on
    - Feedback
    - Additional reviews
  - General formatting of document
- Question: Is there a deadline for comments to be submitted to FDOT?
  - Answer: There is no deadline, but the sooner the team can gather the feedback, the sooner it can be incorporated into the Implementation Plan.

III. SAMPLE LOCAL AGENCY ORGANIZATIONAL CHART AND FUNDING ELIGIBILITY

David Williams (VHB) presented a sample local agency organizational chart and funding eligibility flowchart. Please note this presentation was meant to illustrate a potential option for local agencies to form and establish their traffic operations/traffic engineering division. The purpose of the presentation was to show the Consortium stakeholders an example, and to gather their feedback on what could be adjusted, added, or removed in order to best meet their needs.

FIGURE 1: SAMPLE ORGANIZATIONAL CHART AND FUNDING MECHANISMS



In Figure 1 above, the numbers in each of the groupings represent a progression as the traffic operations/engineering division expands in both volume and complexity due to an increase in traffic signals and other ITS infrastructure. This is just an example; the categories and progression may not fit each agency perfectly. With that in mind, the following are some key points of interest to consider for each of the numbered units and the overall progression of the division in Figure 1:

1) Signals – during the early stages of the traffic engineering division, it may only support a few key positions, including the Traffic Engineering Operations Manager and a few signal maintenance and technician positions.
2) Signing and Pavement Markings (S&PM) / Traffic Studies – As the traffic engineering division, expands, it may begin efforts in the second identified category: *S&PM and Traffic Studies*. During this initial phase, the traffic studies may be carried out intermittently, or in another unit entirely, as explained by several Consortium stakeholders.
3) Maintenance – As the ITS infrastructure expands, the *Signals* category may specialize into a distinct Maintenance unit, made up of experienced technicians who will maintain the more complex ITS infrastructure within the jurisdiction
4) S&PM and Traffic Studies Specialization – As the local agency's roadway network expands, the *S&PM / Traffic Studies* category may need to specialize further into two distinct group, one focusing exclusively on S&PM, the other on Traffic Studies. As discussed during the Consortium, this may depend on each agency's current organizational structure.

5) Network – The District recognizes that the *Network* category is the most contingent on each agency's ITS infrastructure as well as the agency's financial / staffing capabilities. This category may be an in-house position, or it may be contracted out as a part-time or full-time equivalent position, depending on need.
6) Timing / Operations – As the volume and complexity of traffic signals within the local agency's jurisdiction expands further, it may be necessary to specialize the *Signals* category into Timing and Operations groups. The Timing group would work exclusively on signal timing, while the Operations group would work exclusively on traffic signal maintenance, repair, and other daily-routine functions.
7) Network Specialist and Fiber Technician – The specializations within the *Network* category may come about as a result of an agency's continued advancement in ITS/networking infrastructure. These positions may be filled by in-house staff, or contracted out as part-time or full-time positions, depending on the needs and capabilities of the agency.

- Potential funding mechanisms for these items include:
    - Active Arterial Management contract
    - ITS maintenance contract
    - In development: labor-sharing concept
        - Voluntary agreement that would allow participating local agencies to submit a proportional amount of funds to a resource pool.
        - Based on the projected needs and funds provided, District Five would then obtain the services of one or more network personnel, supporting participating local agencies on an as-needed basis.
        - Each agency's usage of the agreement's personnel would be used as a baseline projection for the following year of the agreement

David noted that both the organizational chart and funding mechanisms are not expected to fit the needs of each agency perfectly, and requested that the Consortium stakeholders feel free to suggest revisions to the organizational structure and to suggest other possible funding mechanisms.

- Question: Why does signing and pavement include traffic studies? This is not typical.
    - Responses:
        - Brevard – Traffic Engineering does studies
        - Seminole – Studies are done in Traffic Operations division
        - Orlando – Signing & Markings come out of traffic studies. TSM&O and ITS is the other side.
        - Volusia – Traffic Operations & Maintenance is separate from Signing & Pavement. Most engineering provides the workload for Signing & Pavement office. Operational needs coming out of studies filter to Operations & Maintenance office.
- Question: Is there the ability for an agreement to be signed between FDOT and the local agencies so that retiming contracts can cross jurisdictional boundaries? This would allow each intersection to be paid for at the rate of the additional intersection cost instead of a full analysis.
    - Jay Williams will speak with Jim about the additional intersection part of the scope to see if this will be possible.
      A stakeholder indicated they had heard the standard for the region is approximately $5,000 per intersection for retiming purposes

IV. FUNDING PROCESS

Todd Davis (VHB) presented a Funding Process chart overview. As the process is further developed, it will become part of the agreement conversation.

- Prioritized Projects List
- 4P Application Written Scope
- On a Route of Significance (RoS) or Strategic Intermodal System (SIS) Roadway
    - Emerging RoS – while a RoS requires performance measures, an Emerging RoS can deploy equipment and gather data, then call it a RoS once performance measures are in place
    - Eligibility for FDOT Production Support
    - Technical Level (Produces a recommendation to Director)
        - Scope based on 4P
        - On or directly affecting a state road
        - Demonstrated O&M capabilities
        - Submitted in Time for Technical Scope Development (January for July programming)
        - LREE developed based on technical scope
        - Adequate design and CEI funding
            - Director level

V. CFX WRONG-WAY DRIVING PROGRAM

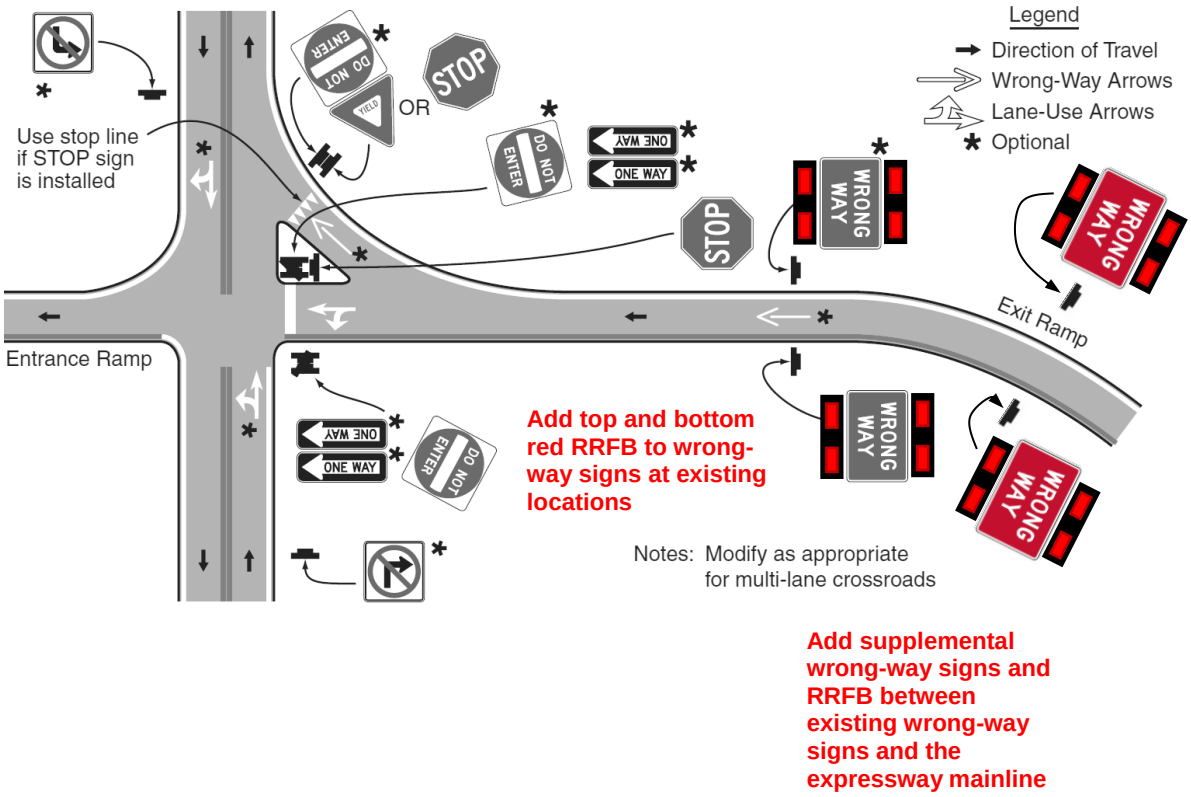
Bryan Homayouni (CFX Traffic Operations) presented on the CFX Wrong-Way Driving (WWD) Program.

- Wrong-way collisions account for 3% of crashes on high-speed divided highways, and have a 12 to 27 times higher fatality rate than other types of accidents.
- Nationally:
    - 1,566 fatal wrong-way crashes on limited-access highways (2004-2009)
    - 2,139 fatalities (2004-2009)
    - Averages 261 fatal collisions per year nationally (2004-2011)
    - Averages 360 fatalities per year (2004-2011)
- Alcohol is a strong contributing factor to wrong-way driving accidents.
- Research study conducted by the University of Central Florida (UCF)
    - Examination of:
        - Crash statistics
        - Citations
        - Reported WWD driving activity
        - Telephone survey of CFX customers
- Based on results of telephone survey:
    - Estimated that only 10% of drivers who see WWD call 911
    - WWD driving activity may be underreported
    - Data collection required to determine full extent of problem
- Study recommended a pilot deployment of WWD countermeasures equipment to:
    - Test RRFB countermeasures
    - Collect data to help CFX determine the extent of WWD activity at the pilot locations
- Study led to a model for predicting the number of crashes associated with WWD on CFX network
- Parking lot testing
    - Temporary parking lot test conducted to verify technology

- Tested visibility of beacons during day and night conditions
- Experimented with radar detection zones in a controlled environment

- Preliminary Lessons Learned
  - Two light bars per sign (top and bottom) will be used to improve visibility of beacons
    - Initial test only had one light bar
  - Two pairs of signs will be deployed at each ramp
    - Provides enhanced visibility of warning in the event the driver passes the first sign before beacon activation

Figure 2: Ramp Detection Equipment Diagram



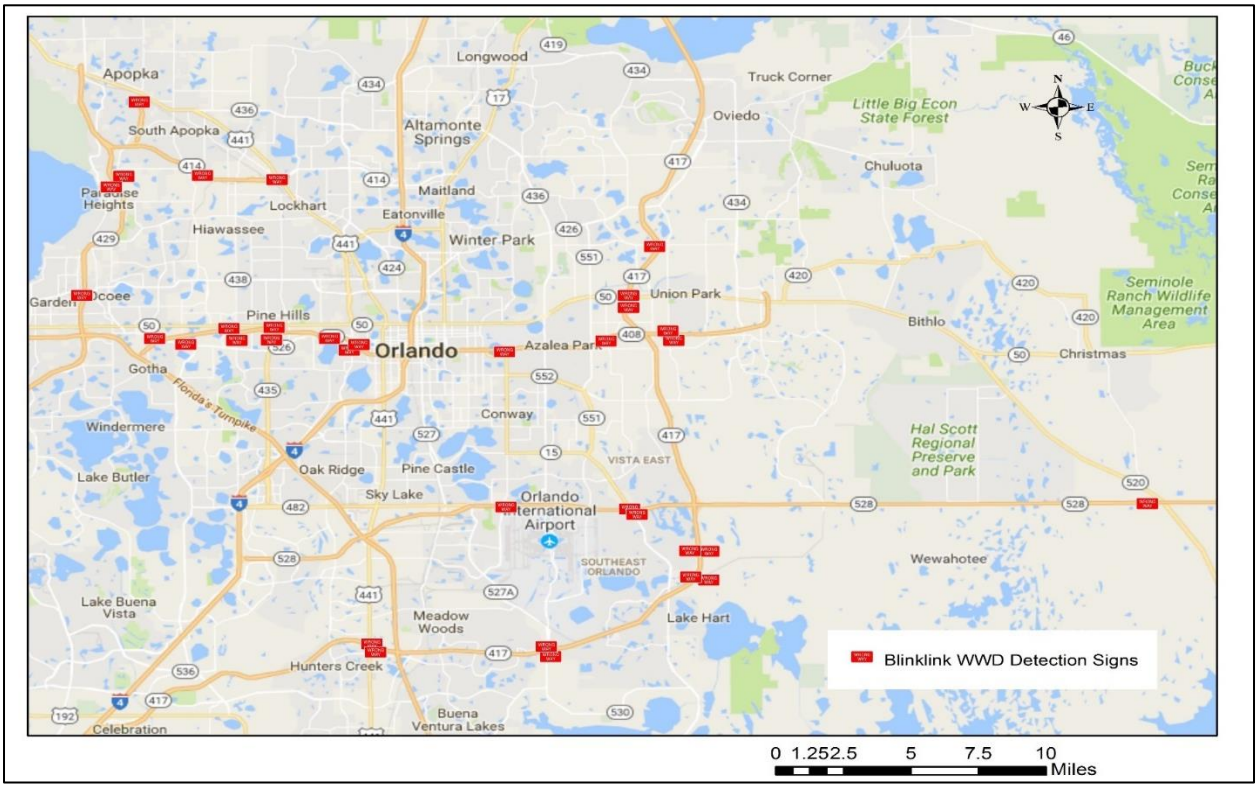
  - Cameras provide visual verification and detection of WWD activity
  - If WWD activity is detected, a confirmation photo is taken and beacons are activated. If car proceeds, in detection zone 2 a second series of photos taken, and audible alerts are sent.

- Status of project
  - Ramp 1 (Phase 1):
    - Installed January 2015
  - Ramps 2-5 (Phase 1):
    - Installed June 2015
  - 19 Additional Ramps (Phase 2a):
    - Installed September 2016
  - 10 Additional Ramps (Phase 2b):
    - Installed February 2017

- 34 Current Total Deployments

- Current WWD deployments:

FIGURE 3: CURRENT WRONG-WAY DRIVING DEPLOYMENTS



  - Question: Does the glare from beacons inhibit visibility of the Wrong Way signs?
    - No, the glare is more a function of the video/photo. Test drivers have not had a problem reading the Wrong Way signs.
  - Ryan Cunningham: A statewide study led to a state mandate that interchanges should be well-lit. Upgrades for wrong-way driving should include intersection lighting, which helps with sign visibility.
  - Concerns about rectangular rapid flash beacons (RRFB) inhibiting visibility of pedestrians. The standard now is to put lights wherever RRFBs are placed.
- Reporting and documentation with UCF
  - Phase 3 study to provide continued monthly reporting on existing system
  - Started August 2015
  - Pulling data from BlinkLink, TAPCO, SunGuide and FHP monthly
  - Provides summary of WWD activity identified by the CFX system deployed
  - FHWA RTE Bi-Annual Reports
  - WWD Phases 1, 2, and 3 led by Dr. Haitham Al-Deek
- Wrong-way turnarounds
  - 83.4% documented turnaround rate for WWD system detections using the RRFB technology.

- False activations
    - Relatively low prevalence, averaging 4.5/month over the past 8 months.
- Planned SunGuide enhancements
    - Addition of TAPCO Interface driver
        - Interface directly with WWD camera equipment
        - Supports deployments used by CFX and other FDOT districts
        - Video snapshot(s) and video added to WWD Alert window
    - Anticipated release Summer 2017, as component of v7.1
- UCF Optimized Approach: WWD Hotspots Model, a New Tool
    - Work within limited budgets and resources
    - Implement advanced countermeasures at WWD hotspots
- Questions:
    - When you don't have a turnaround, is there a communications procedure with Florida Highway Patrol?
        - Currently there is a software tied in that is linked to the RRFB system – an audible alert goes to the computer, there is a pop-up screen. Provided a workstation at the Regional Traffic Management Center that is constantly running, handing it off to District Five from there.
    - Question: Is there no interface with RTMC software to put up a warning message?
        - In SunGuide there is a WWD component that can automate posting messages. When v7.1 is released, will be integrated into SunGuide.
    - Question: Is there any liability for not posting warning messages regarding detected WWD activity?
    - Question: Is there any relationship between construction zones and wrong-way driving?
        - Has not been identified. Haven't drilled to that level of detail.
    - Lessons learned: ensure that the contractor replaces the system in kind after construction.
    - Question: Systems currently use a cellular modem, could they be hardwired to fiber?
        - Running fiber for communication with RTMC. No way to locally post. Developing a local deployment option for local server. Have been using cellular modem for 1.5 years, haven't had an issue getting photos sent in good time.

VI. MEMORANDUM OF AGREEMENT – VIDEO ACCESS

Tushar Patel (FDOT District Five ITS) presented slides on a Memorandum of Agreement (MOA) concept for video access.

- Purpose
    - No formal agreements in place regarding use or transmittal of local agency video feeds via FDOT
    - Video Access Programs:
        - iVDS (first responders)
        - SunGuide and FL 511 (traveler support information)
        - Media
- MOA – Video Access
    - Agreement will establish ability for FDOT to provide local agency video feeds to the appropriate entity(ies):
        - First Responders (via iVDS)
        - Traveling Public (via SunGuide and FL 511)

        - Media
    - Agreement will cover all entities eligible to receive video feeds within each category
        - e.g. an agency cannot stipulate which news channel or category of first responder receives their feed
        - Quality of Service (Not Guaranteed)
    - Important to keep in mind existing protocol you are using and number of requests on network to avoid flooding.
    - The MOA will be a collaborative effort between FDOT and local agencies; FDOT will develop the initial draft and then ask local agencies for their feedback/comments

VII. MEMORANDUM OF AGREEMENT – SECURITY STANDARDS

Tushar Patel (FDOT District Five ITS) presented slides on a MOA concept for network and security standards. Purpose. These are mutually agreed-upon standards per the District Five ITS Master Plan that are required to support the desired ITS functions in the region that rely on information sharing as we progress with AV and CV technology.

- MOA – Network & Security Standards
    - Network (Communication and Security)
        - Firewall
        - Password Protection (not default)
        - Providing access via some type of security means
        - Securing cabinets
    - AV/CV technology
        - WiFi & Dedicated Short Range Communications (DSRC)
- Cyberlocks
    - CFX, Osceola County developing contract to purchase its own cyberlocks, City of Ocala is doing the whole city.
    - City of Orlando – have some #2s, some XXs, padlocks, contractors get ahold of padlock keys. Orange County uses padlocks.
- As changes are being made (e.g., improve intersection, new cabinet) – needs to have cyberlock already installed.
- Prioritization of which locks to install
- The MOA will be a collaborative effort between FDOT and local agencies; FDOT will develop the initial draft and then ask local agencies for their feedback/comments
- Question: Is there an advantage to having a single type of cyberlock for the entire region?
    - Steve talked about it, FDOT has cyberlock software. Local agency has its own controllers, program 1 key for multiple agencies.
    - Provide key to contractors only for one area.
    - When you recharge the key, it logs who was in the cabinet at what time. FDOT would have to ask for key if it was on a different system.
    - Assign keys to maintenance contractors. This provides more accountability for who goes in the signal cabinets.
    - More generic agreements, appendix where they can be altered.

VIII. CMF SELF-ASSESSMENT – POLLING

David Williams (VHB) led a CMF Self-Assessment for the region, providing a brief overview of each of the six dimensions, including the general capabilities associated with each dimension level. The results were as follows:

- Business Process
  - Level 1 – 12%
  - **Level 2 – 65%**
  - Level 3 – 24%
  - Level 4 – 0%
- Systems & Tech
  - Level 1 – 13%
  - **Level 2 – 63%**
  - Level 3 – 25%
  - Level 4 – 0%
- Performance Measures
  - **Level 1 – 56%**
  - Level 2 – 39%
  - Level 3 – 6%
  - Level 4 – 0%
- Org & Workforce
  - Level 1 – 17%
  - **Level 2 – 44%**
  - **Level 3 – 33%**
  - Level 4 – 6%
- Culture
  - Level 1 – 0%
  - **Level 2 – 71%**
  - Level 3 – 18%
  - Level 4 – 12%
- Collaboration
  - Level 1 – 0%
  - **Level 2 – 61%**
  - Level 3 – 33%
  - Level 4 – 6%

IX. ATTACHMENTS

- A – Sign in sheets
- B – CMF Self-Assessment Handout
- C – Presentation Slides
- D – Meeting agenda

END OF SUMMARY

This summary was prepared by Kayla Costello 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 Meeting
May 4, 2017

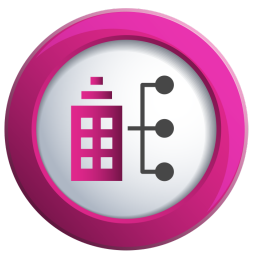
NAME	AGENCY	E-MAIL ADDRESS
Jon Cheney	Volusia Co TE	jcheney@volusia.org
Sheryl Bradley	FDOT/HNTB	sheryl.bradley@dot.state.fl.us
Corrina Gumm	Brevard Co TO	corrina.gumm@brevardfl.gov
George Gadiel	Lake Countr	ggadiel@lakecountrfl.gov
TODD DAVIS	VHB	tsdavis@vhb.com
James Globig	LC TOPS	jglobig@lakecountyfl.gov
Charlie Wetzel	Seminole	cwetzel@seminolecountyfl.gov
Steven Bostel	SCTPO	steven_bostel@brevardfl.gov
BRYAN HOMAYOUNI	CFX	bryan.homayouni@cfxway.com
Hazem El-Assar	Orange Co.	hazem.el-assar@ocfl.net
Eric Gordin	Turnpike	eric.gordin@dot.state.fl.us
Chris Cairns	Orlando	christopher.cairns@cityoforlando.net
Amy Dunham	WSP/PB	dunhama@pbworld.com
DAVE MULHOLLAND	VHB	dmulholland@vhb.com

TSM&O Consortium Meeting
May 4, 2017

NAME	AGENCY	E-MAIL ADDRESS
Richard Ataman	Brevard County	Rich.Ataman@brevardfl.gov
Leon Platt	Lake BCC	lplatt@lakecountyfl.gov
Ryan Cunningham	Kittelson	rcunningham@kittelson.com
Denis Dietz	Lake County Traffic Ops	ddietz@lakecountyfl.gov
Noel Oteyza	Seminole County	Noteyza@seminolecountyfl.gov
H. Walker	Traffic Ops - TP	holly.walker@dot.state.fl.us
Brent Poole	CFX	Brent.Poole@cfxway.com
Bob Keeth	R2CTPO	rkeeth@r2ctpo.org
Benton Bonney	Orlando	benton.bonney@cityoforlando.net
Crystal Mercedes	Metroplan	cmercedes@metroplanorlando.org
Jay Williams	FDOT	jay.williams@dot.state.fl.us
Carlos Bonilla	Osceola County	carlos.bonilla@osceola.org
FRANCIS FRANCO	LSMPO	FFRANCO@LAKESUMTERMPO.COM
Katie King	FDOT/MET	Katie.King@dot.state.fl.us
Prasad Chittaluru	EPIC	prasad@epicgroupllc.com

Agency CMF Self-Assessment

Name_____ **Agency**_____

Dimension	Level 1	Level 2	Level 3	Level 4
BUSINESS PROCESSES	Traffic management development and deployment processes are agency specific and ad hoc.	Agencies implement a nominally systematic approach to traffic management to address immediate concerns. Traffic management approaches are operator driven and either static or based on time of day.	Traffic management development and deployment processes are standardized and have a more system-wide approach that is well documented.	Development and deployment processes related to traffic management are streamlined across an entire region, and agencies have a continuous improvement process for traffic management.
SYSTEMS AND TECHNOLOGY	Traffic management approaches are developed on an ad hoc basis independent of the systems engineering process.	The systems engineering process and ITS architecture are consistently applied within the traffic management context. Agencies apply advancements and technologies in spot locations.	Agencies apply advanced technologies but with a limited level of automation. Traffic management systems are replicated and integrated within operations, with standardized documentation.	Automation of traffic management processes is based on historical, current, and predicted data. New and emerging technologies are deployed on a continuous basis to improve system efficiency.
PERFORMANCE MEASUREMENT	Use of performance measurement processes for traffic management is not undertaken on a regular basis.	Agencies employ performance measurement assessment of traffic management strategies primarily to analyze impacts post deployment.	Agencies identify desired outcome measures and consistently utilize performance measure analyses to improve strategy deployment and overall operations.	Agency traffic management goals and objectives are mapped to performance measures, which are regularly used to manage systems. Documentation of analyses results are distributed internally and externally and are archived for later use.
 ORGANIZATION AND WORKFORCE	In-house personnel have limited traffic management experience with no specialized experience in engineering, traffic analysis, etc. Agency personnel roles are fragmented.	Core staff knowledge, skills, and abilities are identified within the traffic management arena, and roles are linked across various responsible groups.	Traffic management staff members and their related knowledge, skills, and abilities (KSAs) are identified and established on a broad basis and within individual groups.	Traffic management program support exists to engage in advancement of KSAs. Formal and ongoing training on traffic management is offered and supported by the agency.
CULTURE	Traffic management is primarily an assortment of loosely related projects and strategies. Only a few champions lead the efforts.	Traffic management is recognized as valuable and a key role of the agency. Select agency managers lead efforts for traffic management.	Traffic management is recognized as a core program that coordinates with other programs on an ongoing basis.	Traffic management is a program that is highly integrated with related core functions, such as planning, design, construction, maintenance, etc. All agency staff members, from leadership to rank and file, embrace the importance and value of traffic management.
COLLABORATION	Relationships and collaboration between stakeholder organizations are informal and ad hoc.	Collaboration with stakeholders is more formal and related to specific traffic management needs and projects.	Agencies collaborate on traffic management at a high level via engagement of regional stakeholders.	Agencies approach traffic management at the regional level

Show Summary

FHWA

Welcome to the TSM&O Consortium Meeting

May 4, 2017

FDOT

Transportation Systems Management & Operations

Meeting Agenda

1. Introduction
2. D5 TSM&O Implementation Plan Update
3. Sample TSM&O Org Chart & Funding Eligibility
4. CFX Wrong Way Driving Program
5. Memorandum of Agreement – Video Access
6. Memorandum of Agreement – Security Standards
7. CMM Self-Assessment – Polling

Transportation Systems Management & Operations

TSM&O Implementation Plan Update

David Williams, VHB

Transportation Systems Management & Operations

Purpose of the Implementation Plan

The TSM&O Implementation Plan **IS**:

- Program framework
- A living document
- Inclusive of all 6 CMF Dimensions
- Specific to District Five
- Dependent on **Stakeholder Buy-In**

The TSM&O Implementation Plan **IS NOT**:

- Project Specific
- Only applicable to some functional units
- An ITS program
- One size fits all

Implementation Plan Framework

Introduction		
Program Purpose and Goals		CMF Overview
Business Process Dimension		
MPO/TPO Process	FDOT Process	Task Action Matrix
Organization and Workforce		
Proposed Roles & Responsibilities		Task Action Matrix
Culture		
Proposed Education & Outreach		Task Action Matrix
Collaboration		
Proposed Districtwide Collaboration		Task Action Matrix
Systems and Technology		
Proposed Districtwide Vision		Task Action Matrix
Performance Measures		
Proposed Systemwide Evaluation		Task Action Matrix
Resources and Tools		

Status of the Implementation Plan

- Task Action Matrices for all six dimensions
- Business Process – TSM&O Funding sources
- Org & Workforce – Staffing and Organization Charts
- Culture – Education and Outreach Materials
- Systems & Technology – Commonalities between ITS Master Plans
- Collaboration – Local sharing / communication processes
- Performance Measures – Standardized evaluation metrics

Please visit **CFLSmartRoads.com/tsmo.html** for the draft Implementation Plan

FDOT

Transportation Systems Management & Operations

Status of the Implementation Plan

- Next Steps:
  - **Implementation Plan Summary** section
  - **Resources and Tools** section
  - Refine existing content
    - Feedback
    - Additional reviews
  - Formatting

Please visit **CFLSmartRoads.com/tsmo.html** for the draft Implementation Plan

FDOT

Transportation Systems Management & Operations

Questions?

http://www.CFLSmartRoads.com/tsmo.html

Transportation Systems Management & Operations

Sample Local Agency Organizational Chart and Funding Eligibility

David Williams, VHB

FDOT

Transportation Systems Management & Operations

Sample Organizational Chart - Progression

Traffic Engineering Operations Manager

DRAFT

Transportation Systems Management & Operations

Sample Organizational Chart - Progression

DRAFT

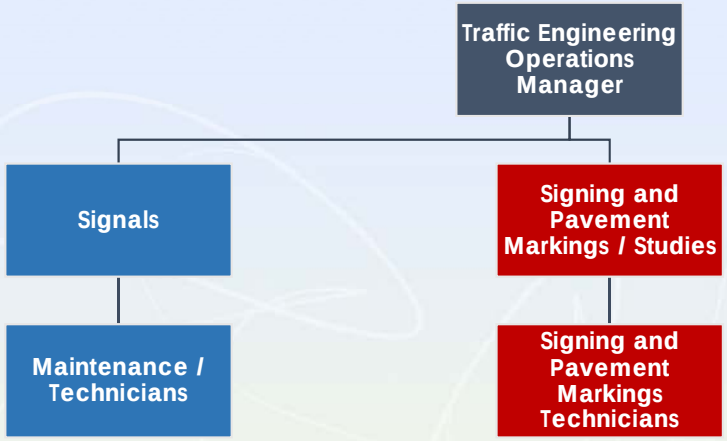
FDOT

Transportation Systems Management & Operations

TS M&O

Sample Organizational Chart - Progression

DRAFT



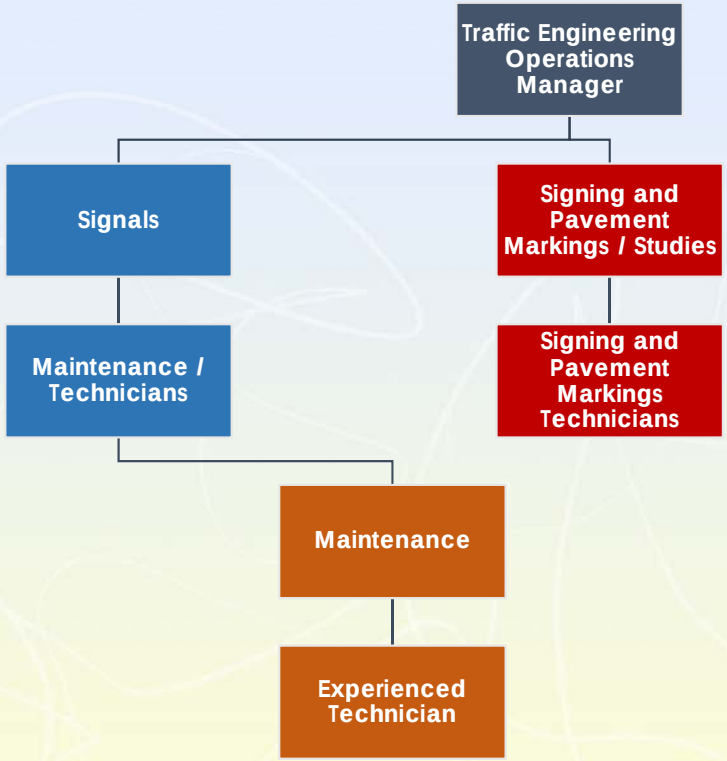
FDOT

Transportation Systems Management & Operations

TS M&O

Sample Organizational Chart - Progression

DRAFT



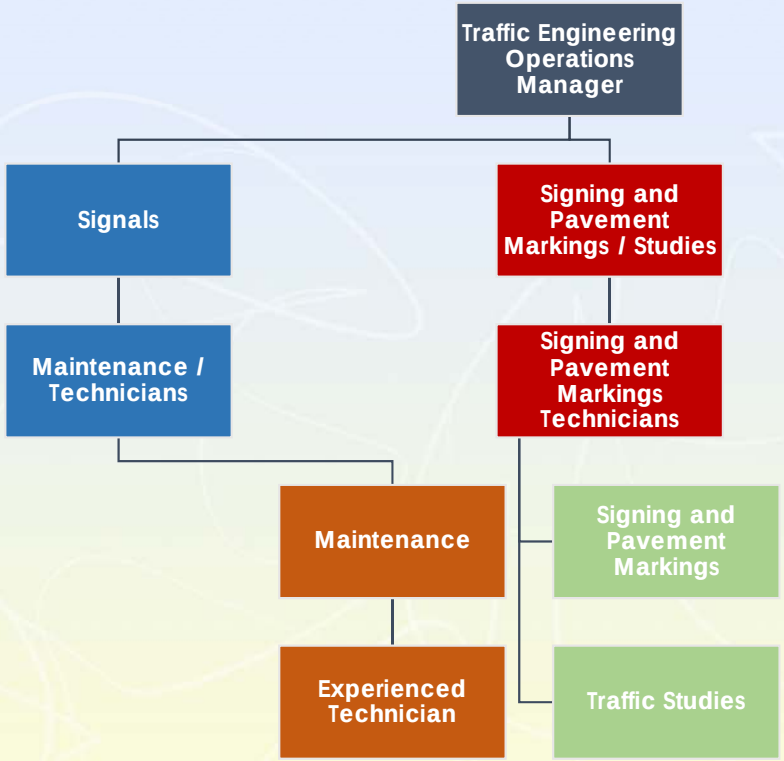
FDOT

Transportation Systems Management & Operations

TS M&O

Sample Organizational Chart - Progression

DRAFT



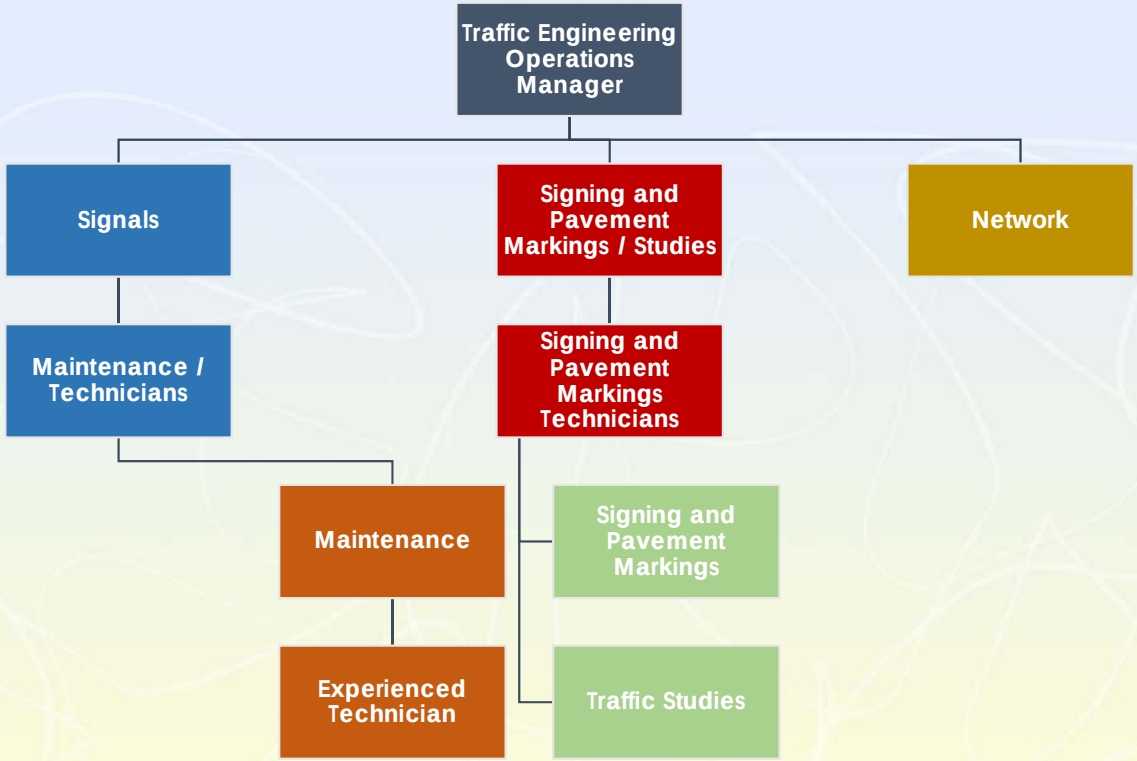
FDOT

Transportation Systems Management & Operations

TS M&O

Sample Organizational Chart - Progression

DRAFT



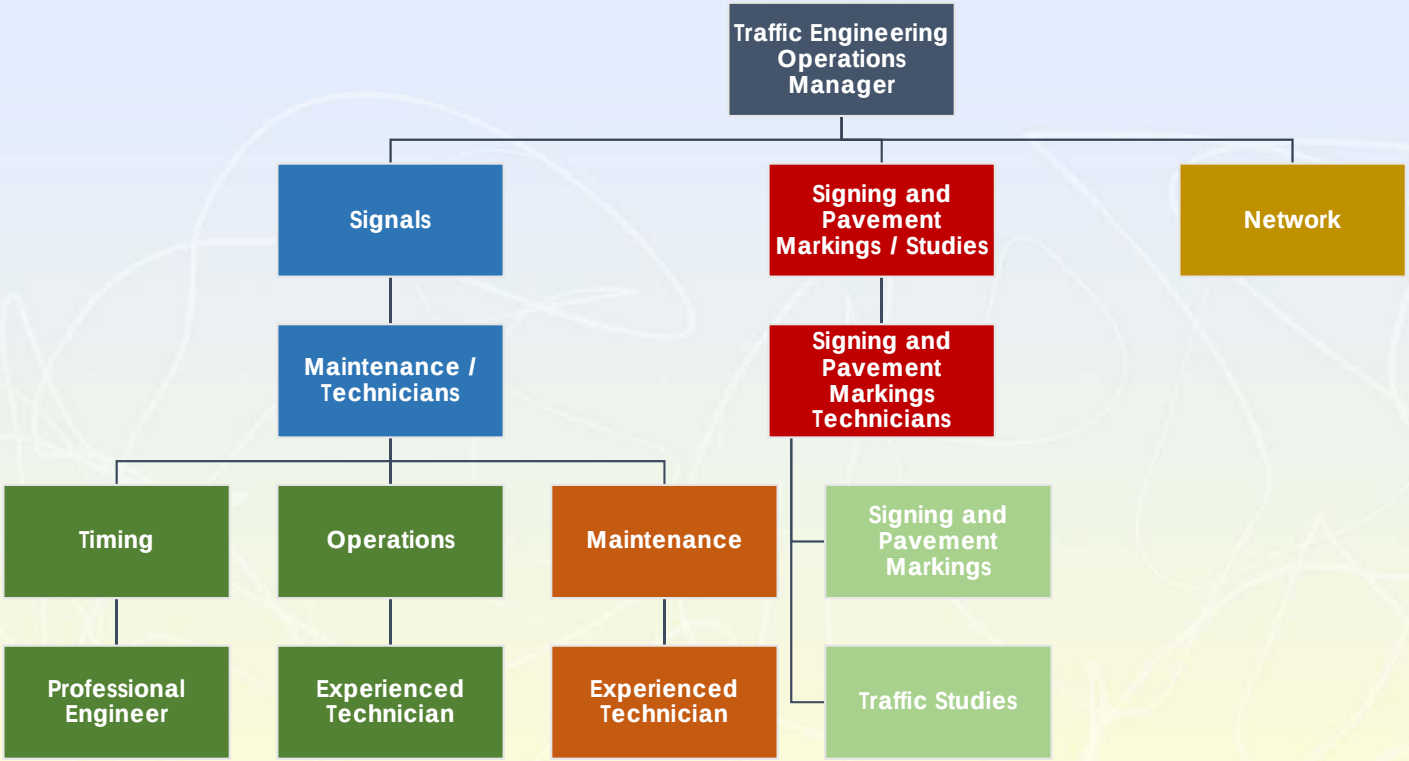
FDOT

Transportation Systems Management & Operations

TS M&O

Sample Organizational Chart - Progression

DRAFT

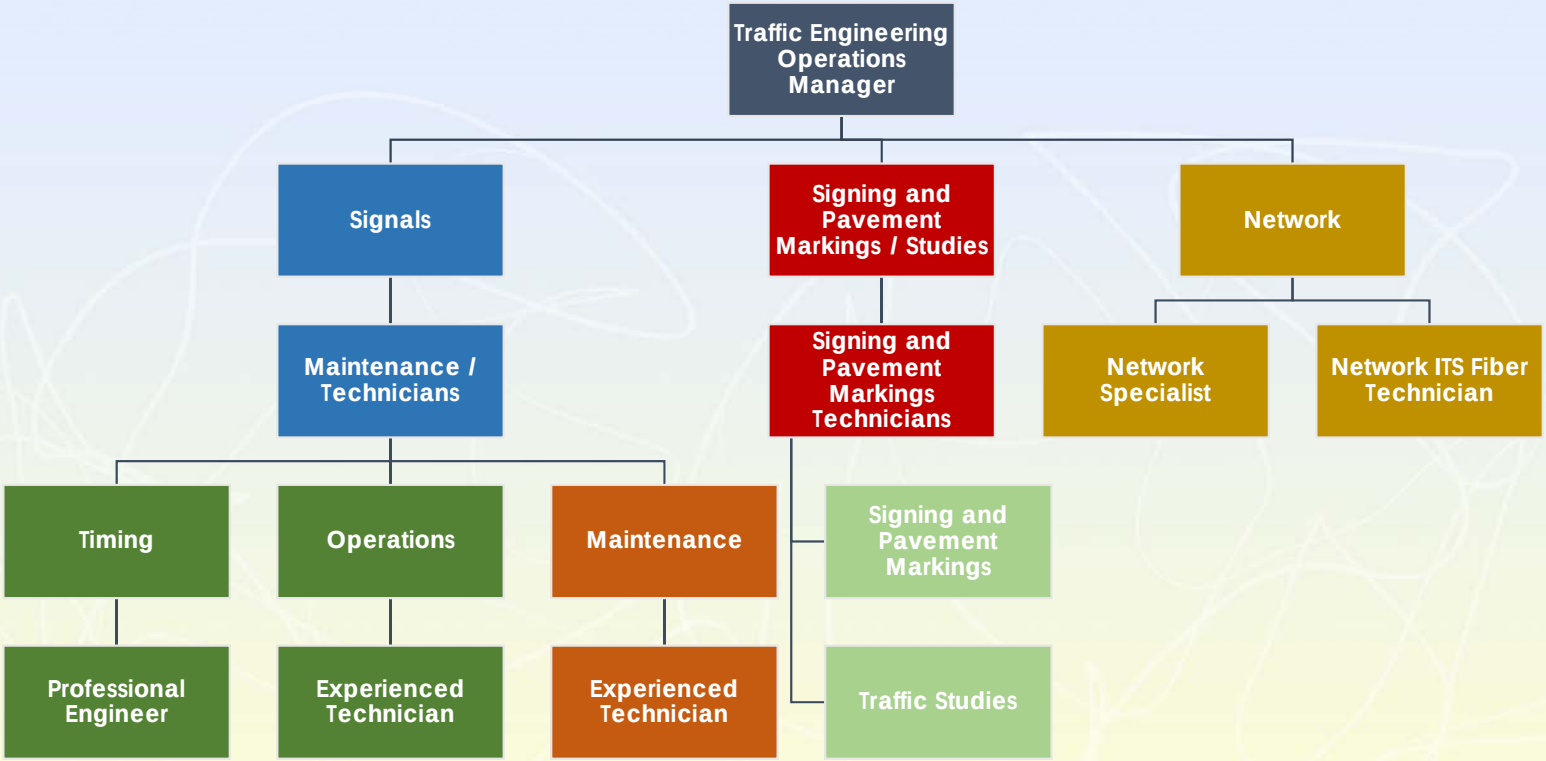


FDOT

Transportation Systems Management & Operations

Sample Organizational Chart - Progression

DRAFT



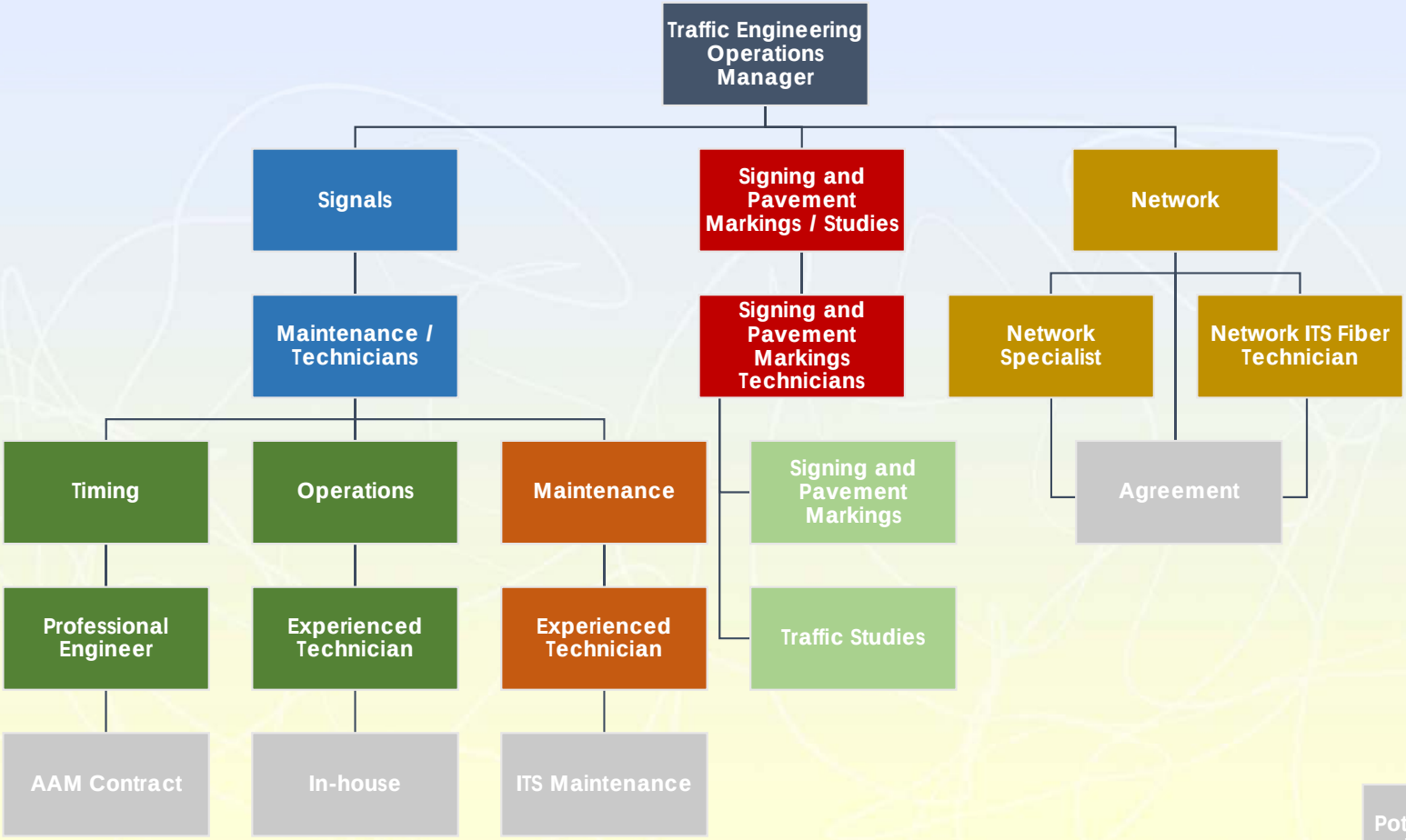
FDOT

Transportation Systems Management & Operations

TS M&O

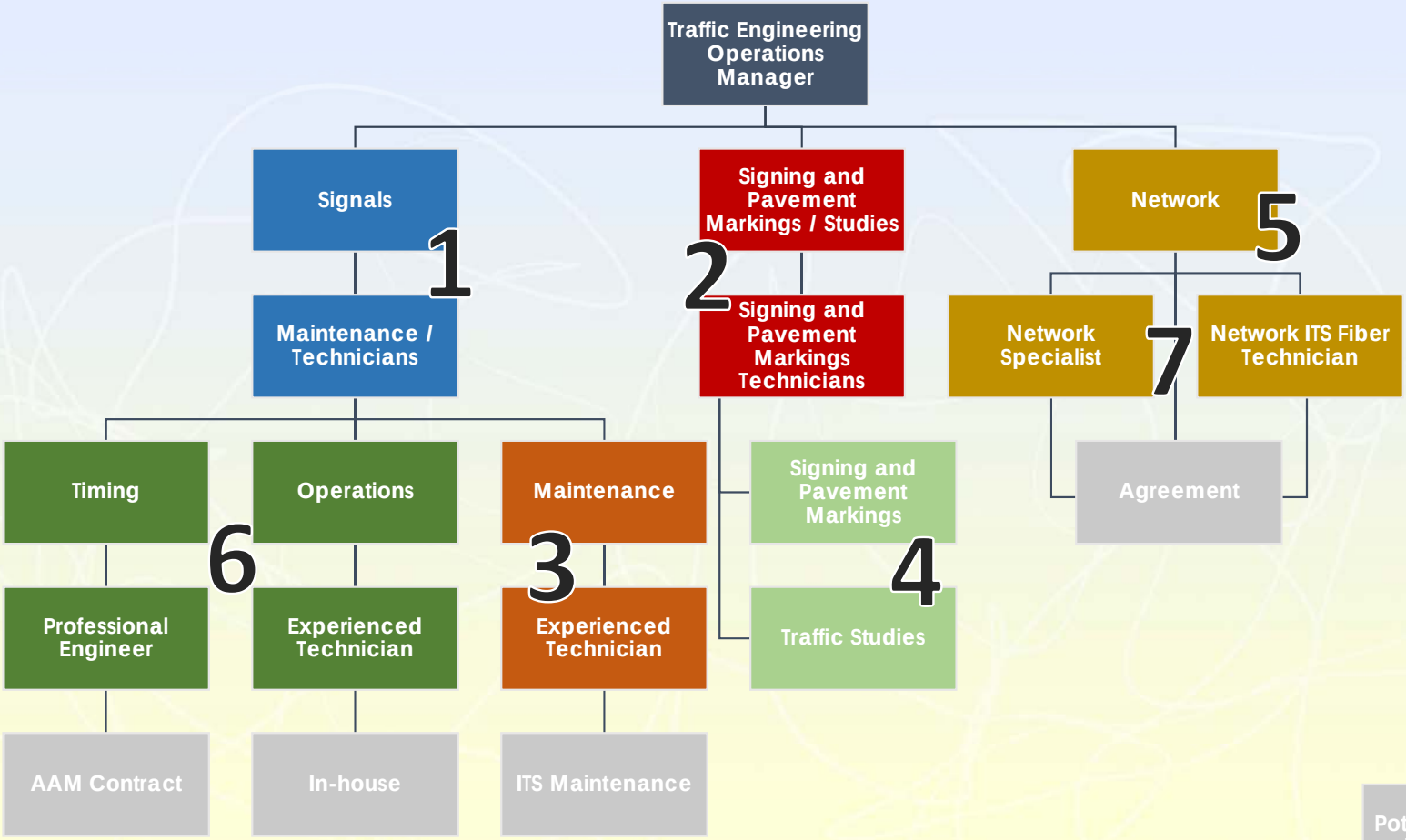
Sample Organizational Chart - Progression

DRAFT

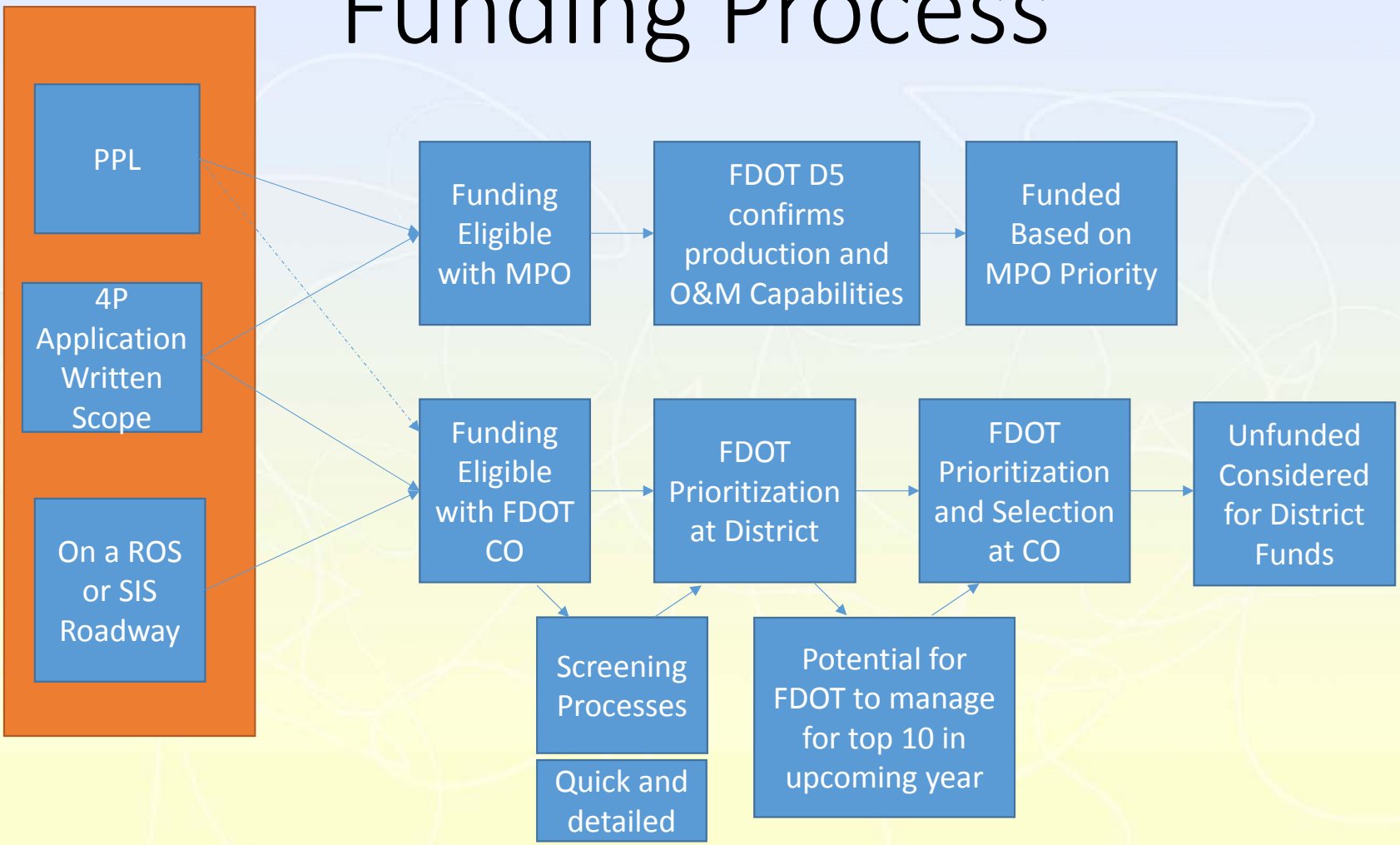


Sample Organizational Chart - Progression

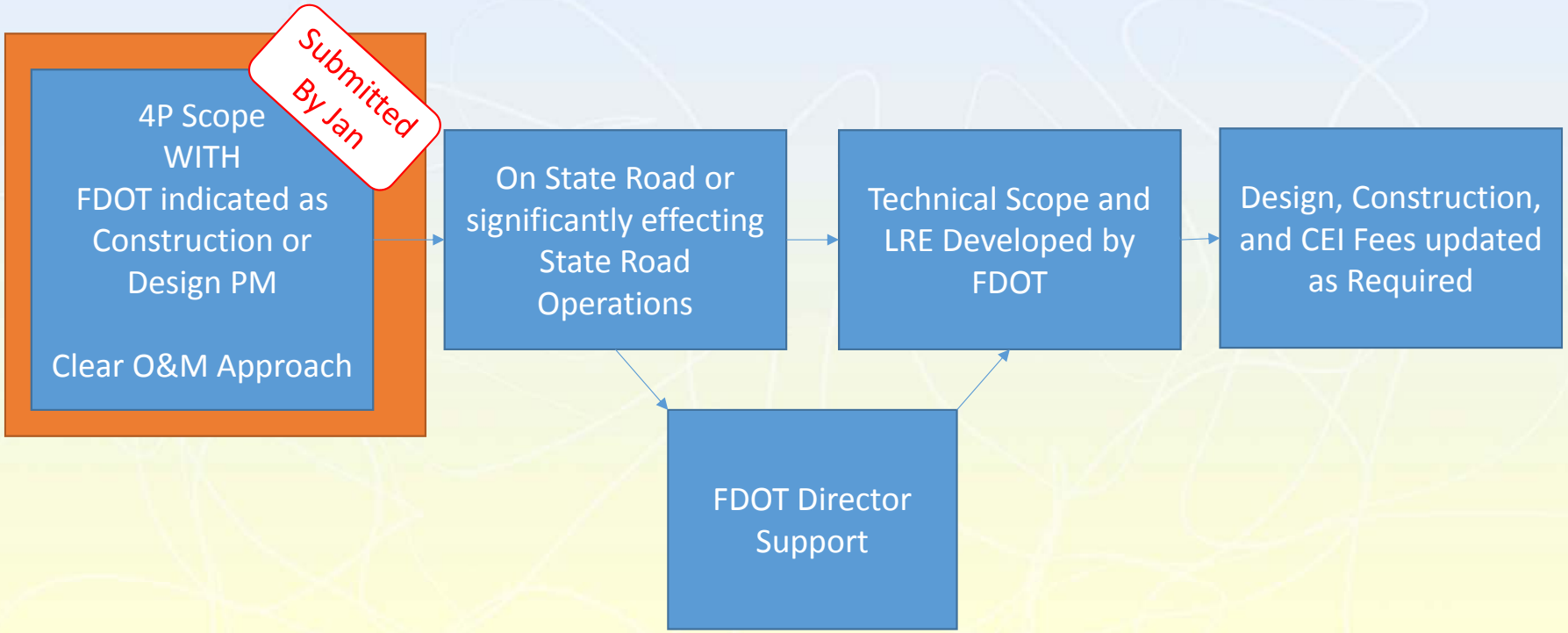
DRAFT



Funding Process



Project to be Managed By FDOT



Eligibility for FDOT Production Support

Technical Level (Produces a recommendation to Director)

- Scope based on 4P
- On or directly effecting a state road
- Demonstrated O&M capabilities
- Submitted in Time for Technical Scope Development (January for July programming)
- LRE developed based on technical scope
- Adequate Design and CEI funding

Director Level

- Approval of Director

Transportation Systems Management & Operations

Questions?

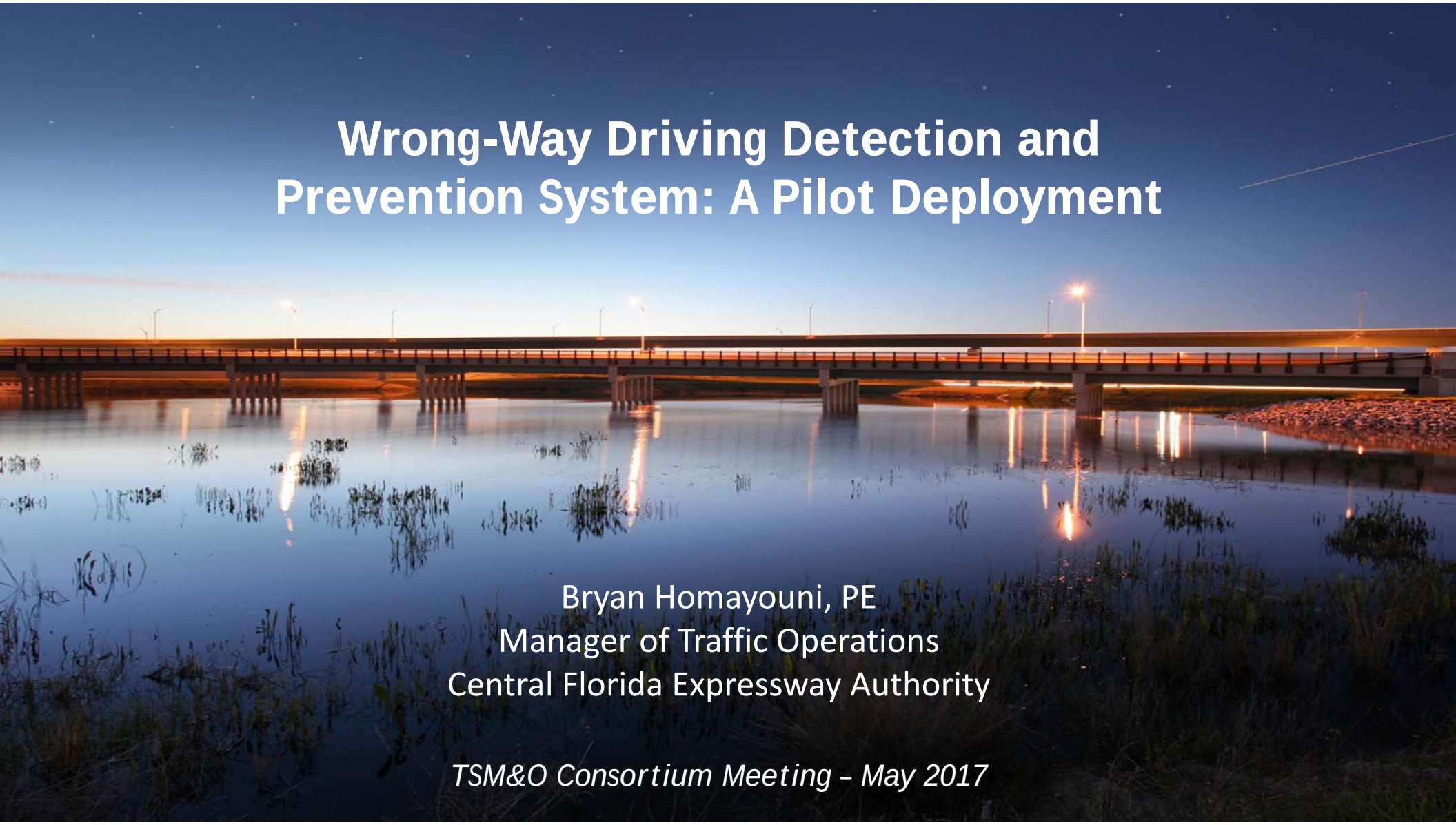
Transportation Systems Management & Operations

CFX Wrong-Way Driving Program

Bryan Homayouni, CFX

FDOT

Transportation Systems Management & Operations



Wrong-Way Driving Detection and Prevention System: A Pilot Deployment

Bryan Homayouni, PE
Manager of Traffic Operations
Central Florida Expressway Authority

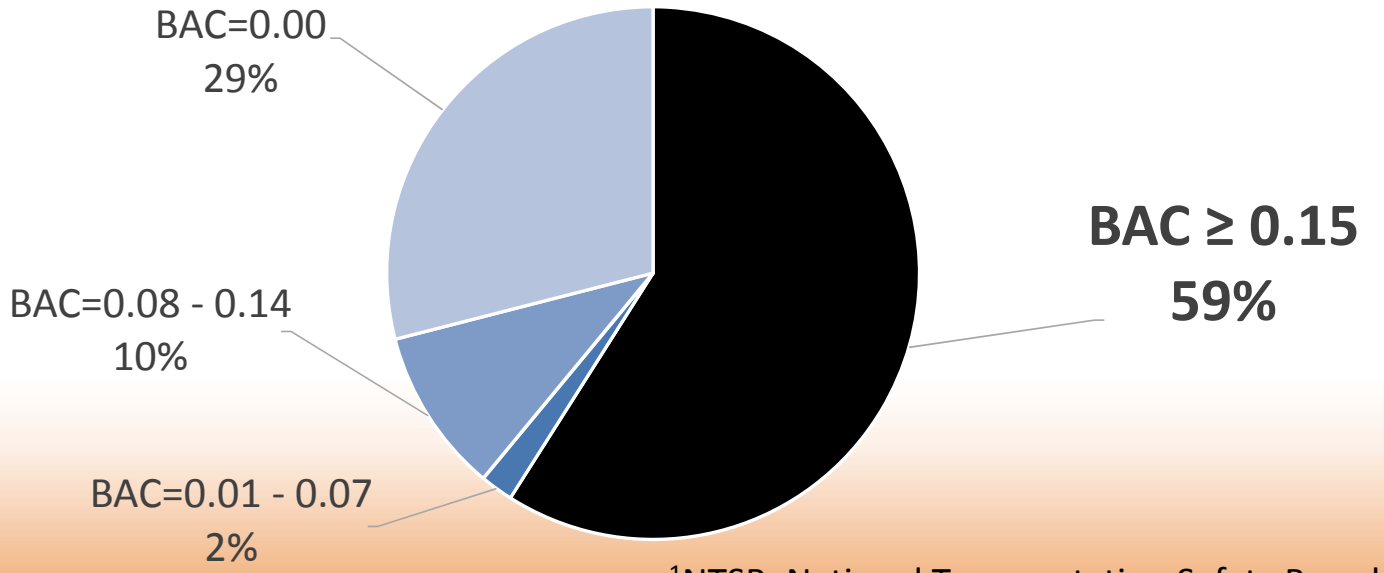
TSM&O Consortium Meeting – May 2017

WRONG-WAY DRIVING STATISTICS

- Wrong-way collisions:
  - 3% of crashes on high-speed divided highways
  - 12-27 times higher fatality rate than other types of accidents
- Nationally:
  - 1,566 fatal wrong-way crashes on limited-access highways (2004-2009)
  - 2,139 fatalities (2004-2009)
  - Averages 261 fatal collisions per year nationally (2004-2011)
  - Averages 360 fatalities per year (2004-2011)

WRONG-WAY DRIVING STATISTICS

NTSB[1] analysis of FARS[2] data (2004-2009) showing reported blood alcohol concentration (BAC) levels of wrong-way drivers



[1]NTSB: National Transportation Safety Board
[2]FARS: Fatality Analysis Reporting System

STUDYING WRONG-WAY DRIVING ON CENTRAL FLORIDA EXPRESSWAYS

- Research study conducted by the University of Central Florida (UCF)
- Examination of:
  - Crash statistics
  - Citations
  - Reported WWD driving activity
  - Telephone survey of CFX customers
- Based on results of telephone survey:
  - Estimated that only 10% of drivers who see WWD activity call 911
  - WWD driving activity may be under-reported
  - Data collection required to determine the full extent of the problem

STUDYING WRONG-WAY DRIVING ON CENTRAL FLORIDA EXPRESSWAYS

- Study recommended a pilot deployment of WWD countermeasures equipment
- Pilot deployment will:
  - Test RRFB countermeasures
  - Collect data to help CFX determine the extent of WWD activity at the pilot locations
- Study led to a model for predicting number of crashes associated with WWD on CFX network

Picture courtesy of UCF (Concept Slide Produced by UCF and Presented to CFX in Spring 2013)

Approved UCF Concept for Testing (FHWA) - Double Red RRFB on "Wrong Way" sign (US Patent Pending 62/199, 579)

PARTNERS

- U.S. Department of Transportation Federal Highway Administration
- University of Central Florida (UCF)
- Florida Highway Patrol (FHP)
- Florida Department of Transportation (FDOT)
- Central Florida Expressway Authority (CFX)

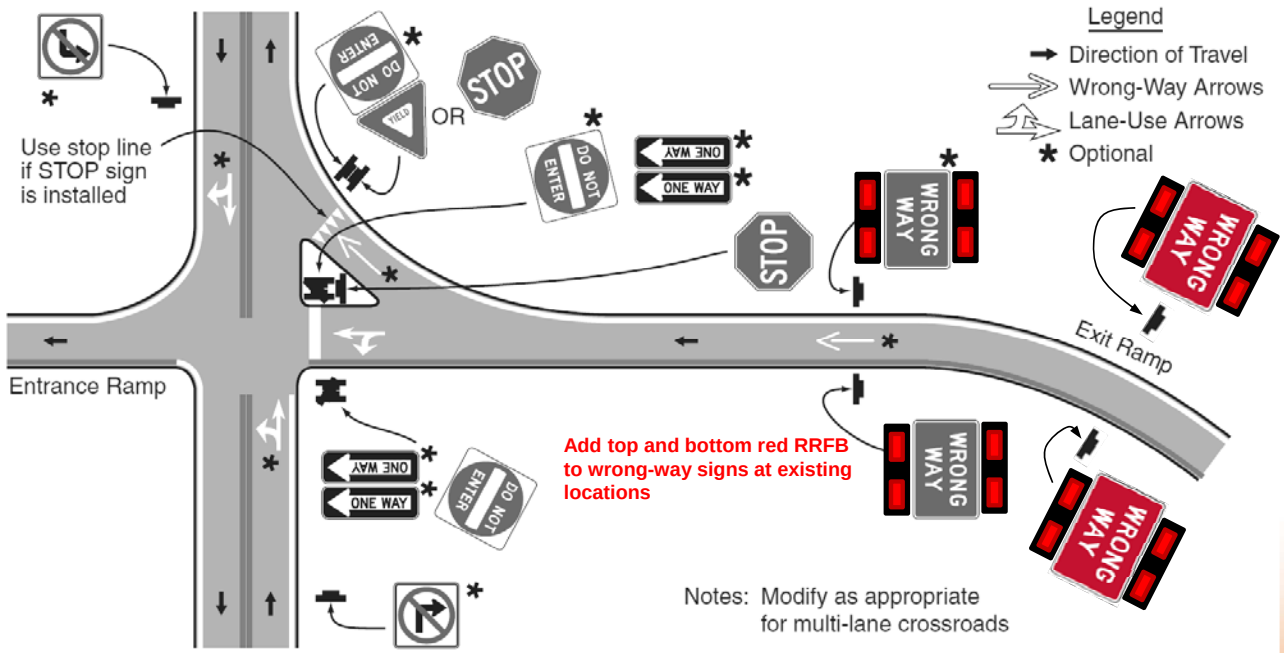
PARKING LOT TESTING

- Temporary parking lot test conducted to verify technology
- Tested visibility of beacons during day and night conditions
- Experimented with radar detection zones in a controlled environment

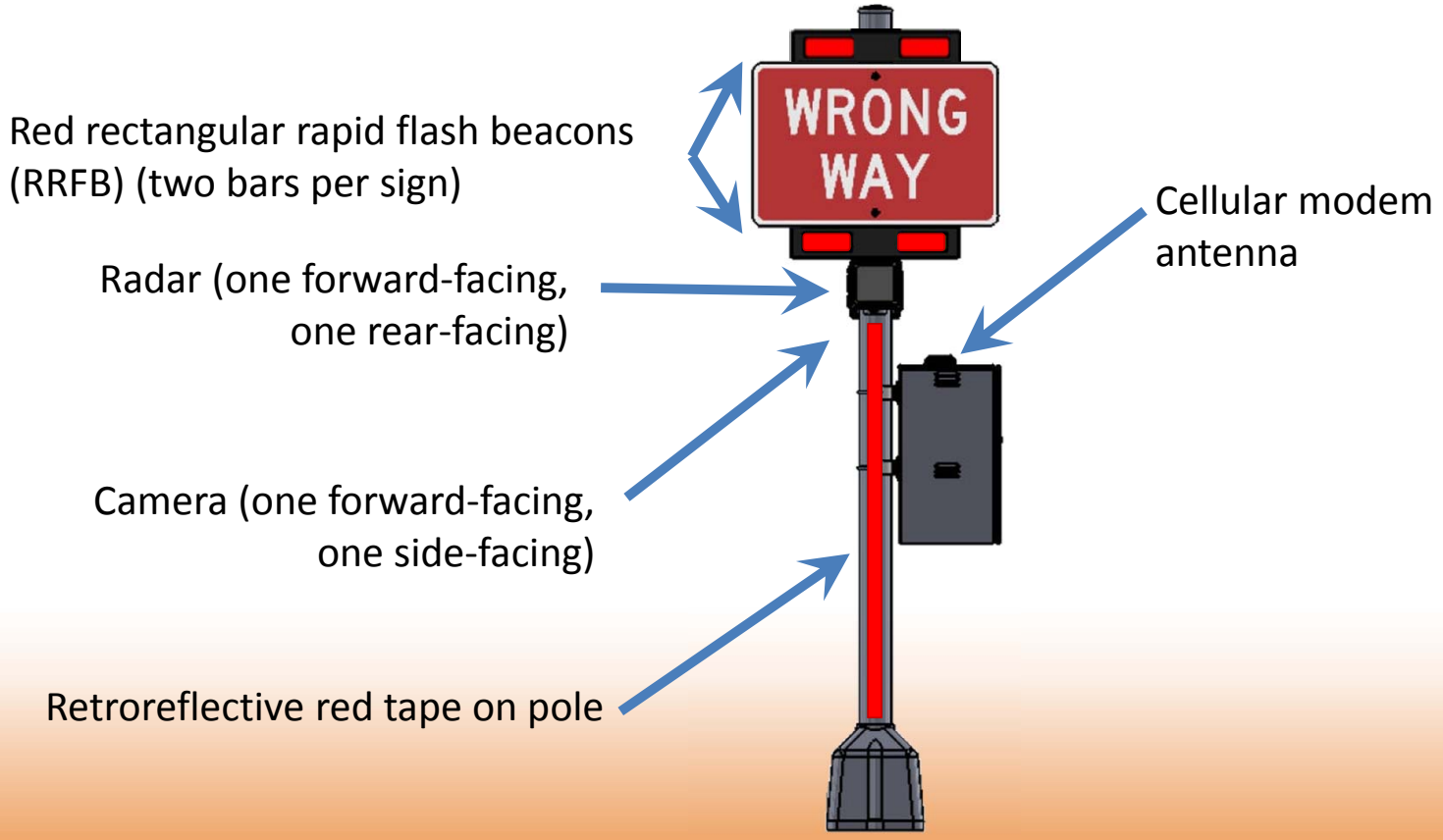
PRELIMINARY LESSONS-LEARNED

- Two light bars per sign (top and bottom) will be used to improve visibility of beacons
  - Initial test only had one light bar
- Two pairs of signs will be deployed at each ramp (beacons at the remote pair slaved to the first pair)
  - Provides enhanced visibility of warning in the event the driver passes the first sign before beacon activation

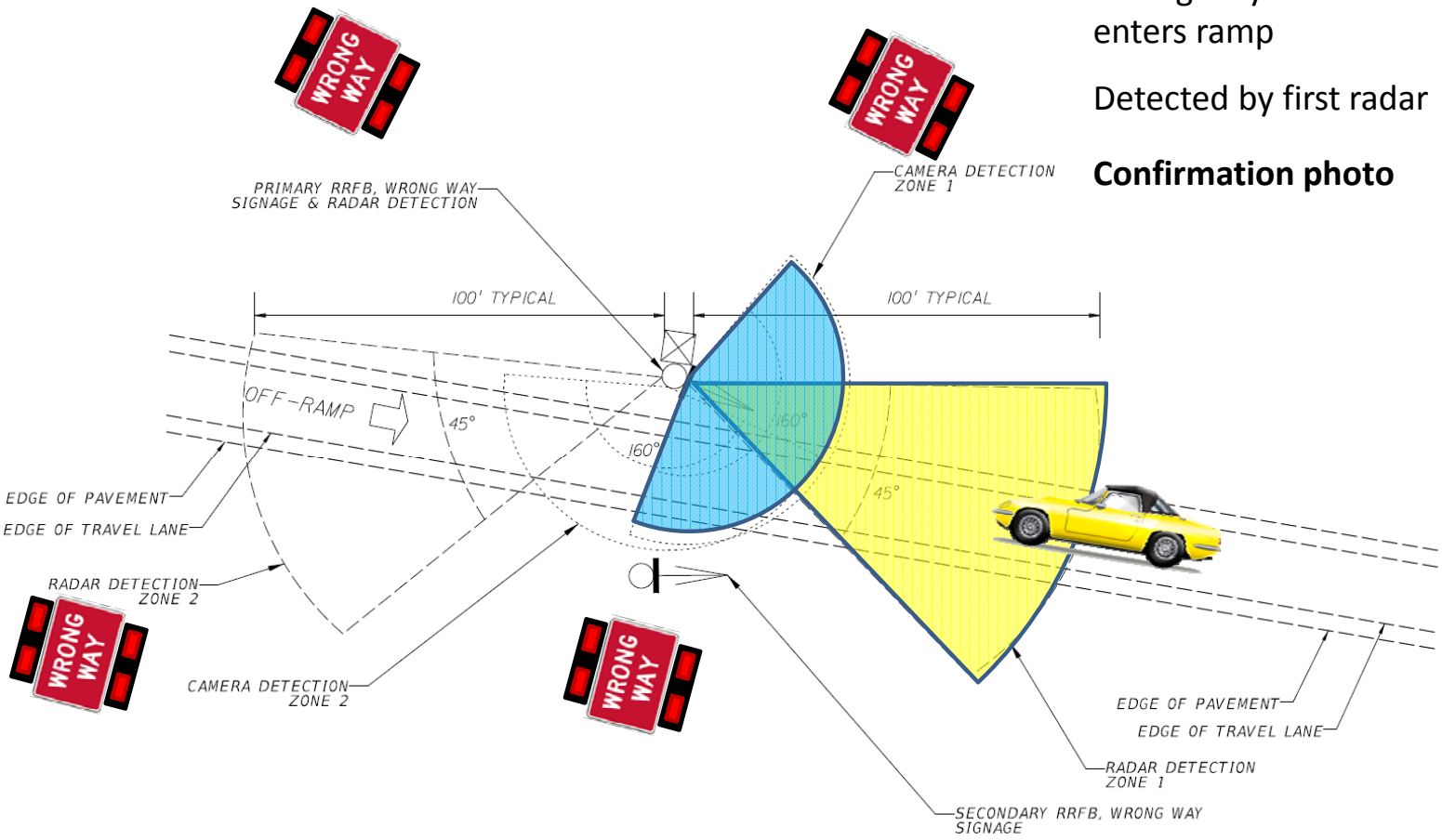
RAMP DETECTION EQUIPMENT



RAMP DETECTION EQUIPMENT



RAMP DETECTION EQUIPMENT

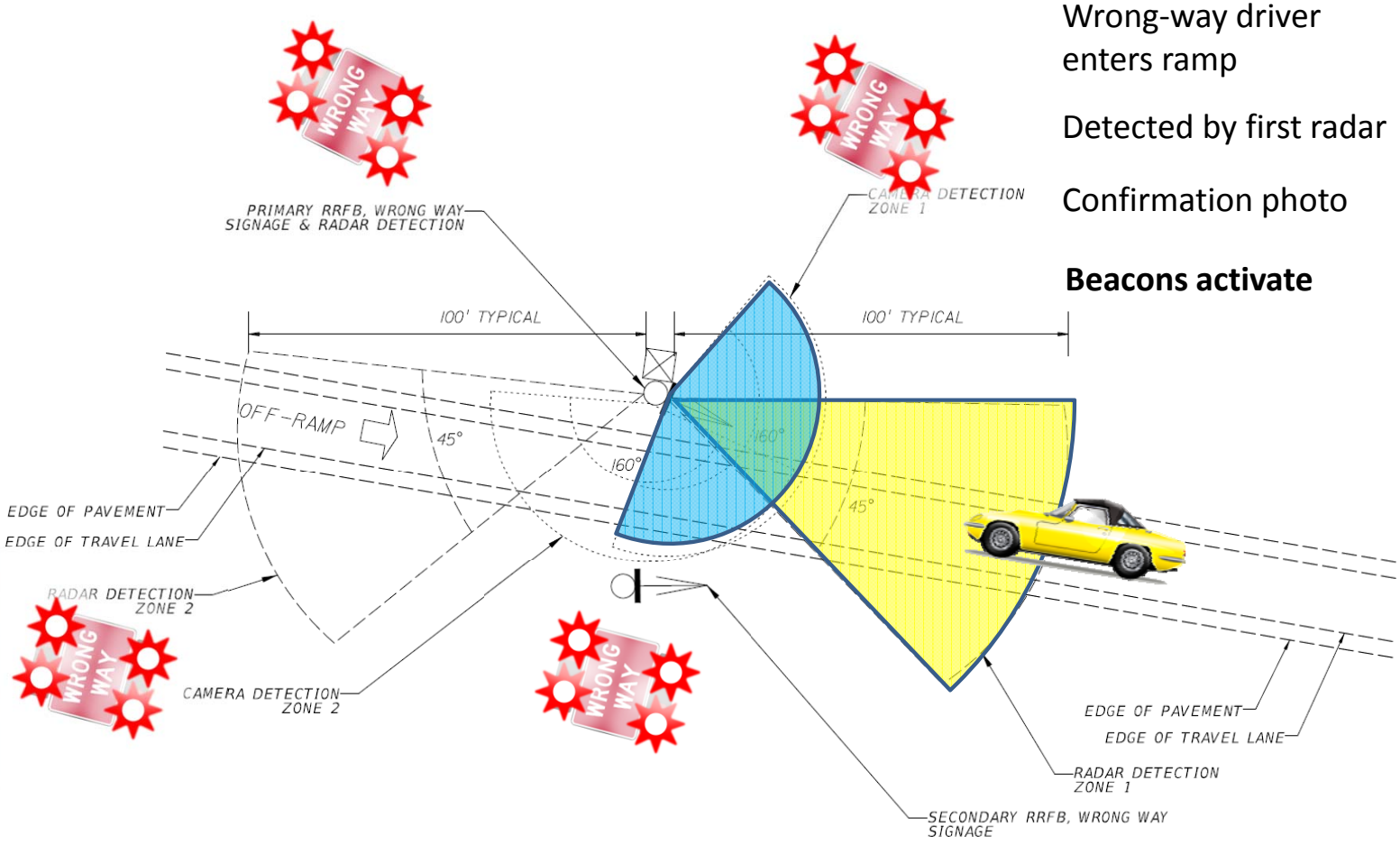


Wrong-way driver enters ramp

Detected by first radar

Confirmation photo

RAMP DETECTION EQUIPMENT



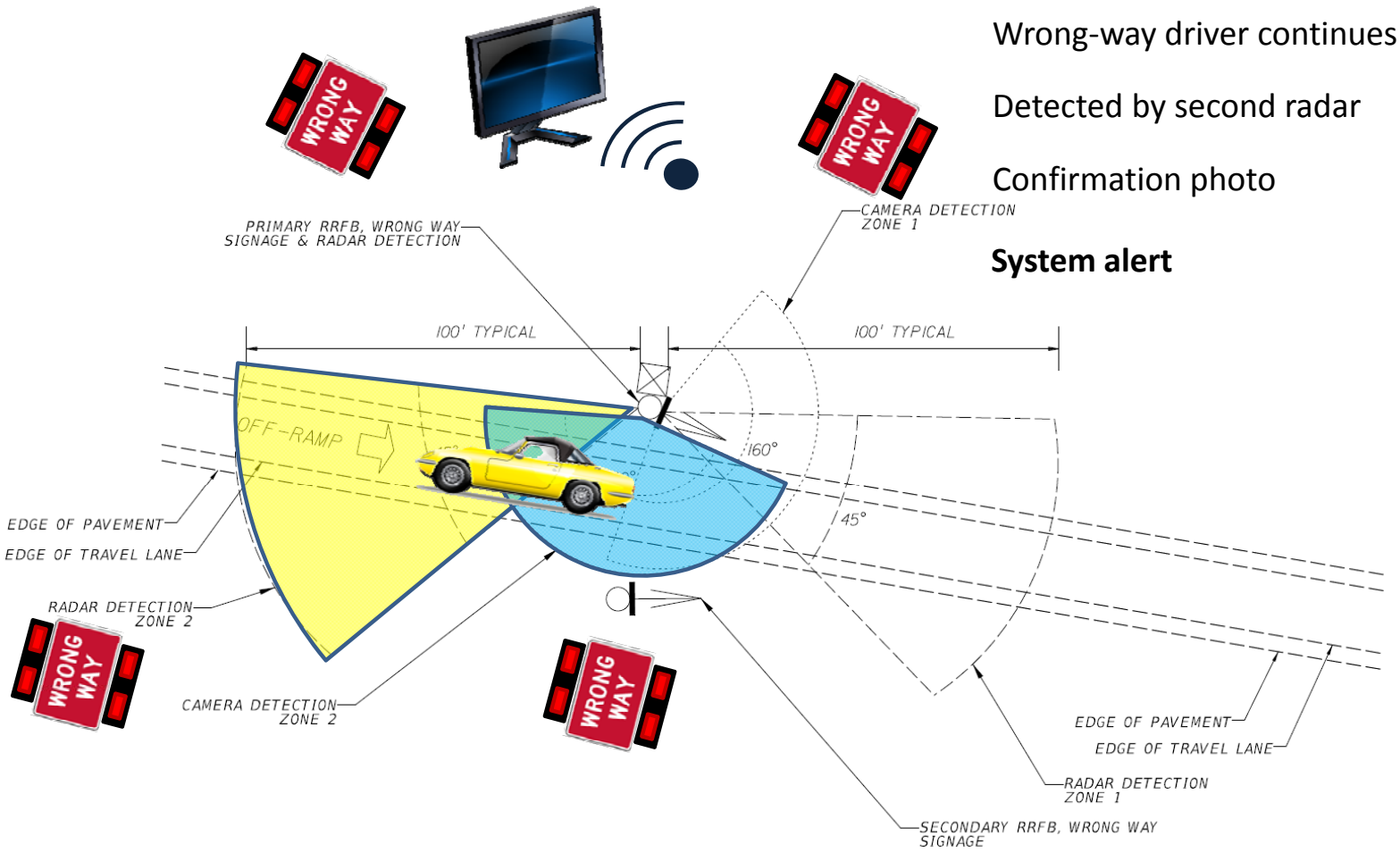
Wrong-way driver enters ramp

Detected by first radar

Confirmation photo

Beacons activate

RAMP DETECTION EQUIPMENT



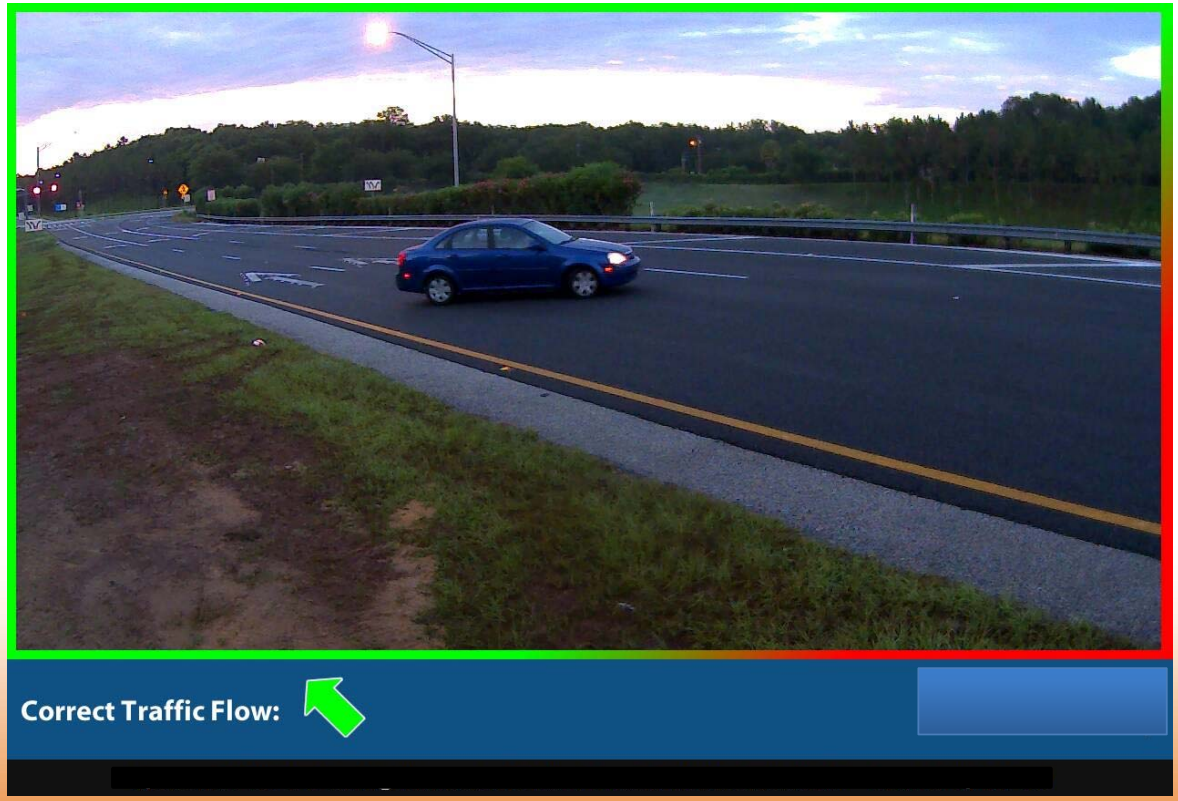
Wrong-way driver continues

Detected by second radar

Confirmation photo

System alert

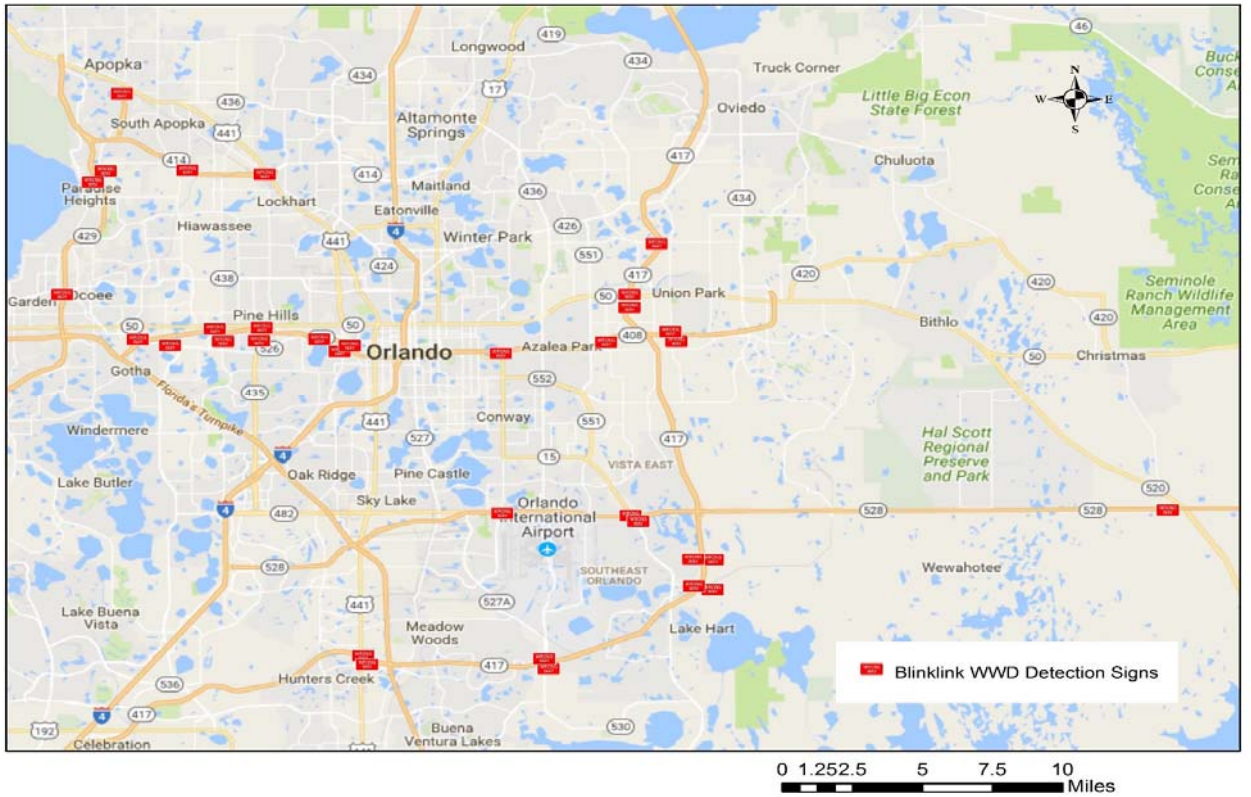
ACTUAL TURN-AROUND



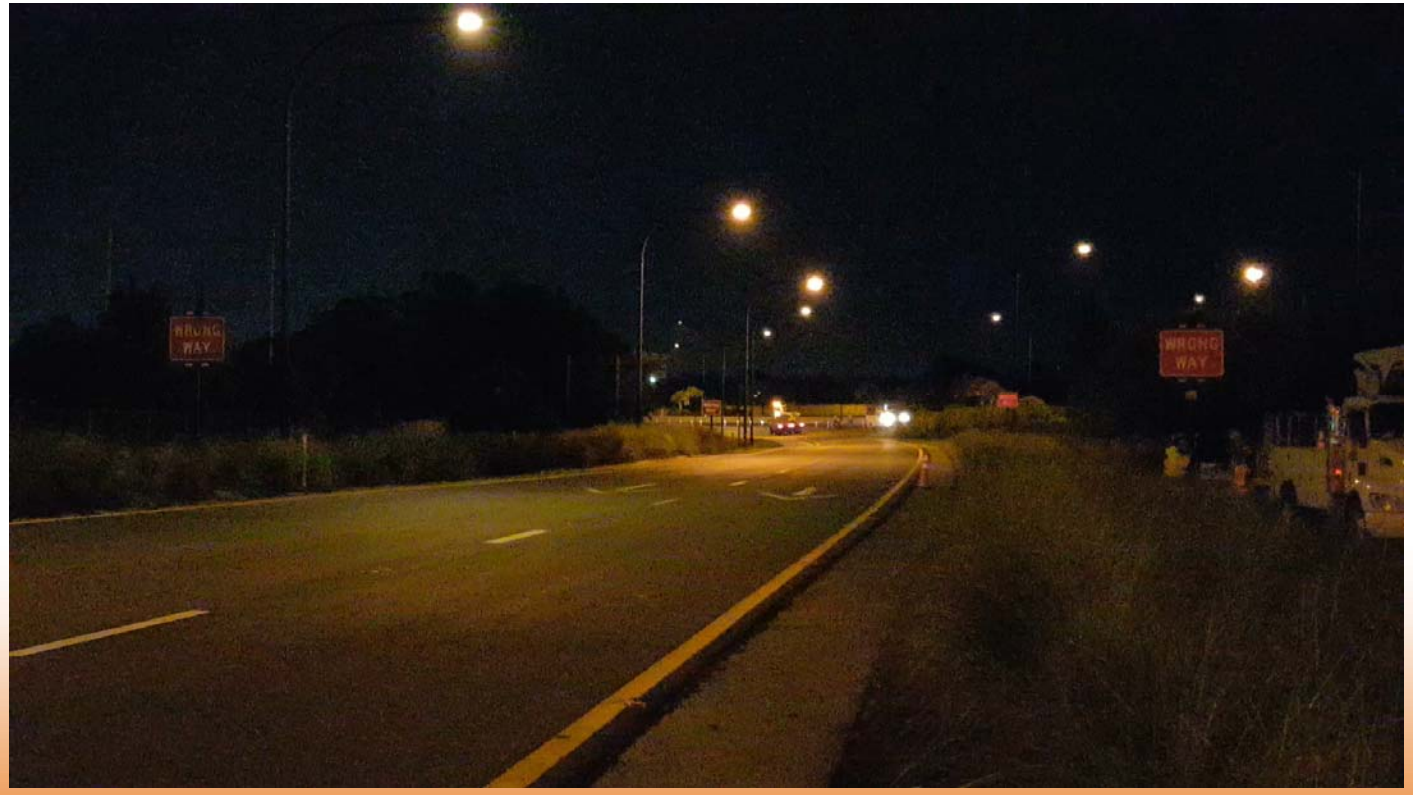
STATUS OF PROJECT

- Ramp 1 (Phase 1):
  - Installed January 2015
- Ramps 2-5 (Phase 1):
  - Installed June 2015
- 19 Additional Ramps (Phase 2a):
  - Installed September 2016
- 10 Additional Ramps (Phase 2b):
  - Installed February 2017
- 34 Current Total Deployments

CURRENT WWD DEPLOYMENTS



WRONG-WAY DRIVING PREVENTION TESTING AT SR 408



WRONG-WAY DRIVING PREVENTION TESTING AT CHICKASAW TRAIL

REPORTING AND DOCUMENTATION WITH UCF

- Phase 3 Study to provide continued monthly reporting on existing system
- Started in August 2015
- Pulling data from BlinkLink, TAPCO, SunGuide and FHP on a monthly basis
- Provides summary of WWD activity identified by the CFX system deployed
- FHWA RTE Bi-Annual Reports
- WWD Phases 1, 2 and 3 led by Dr. Haitham Al-Deek

WRONG-WAY TURNAROUNDS

Current Reports show we have a 83.4% documented turn around rate for WWD system detections using the RRFB technology

Period Covered	Total WWD Detections	Documented Turn Arounds
March 2017	20	19
Feb 2015 – March 2017	157	131

- A WWD act occurs when a passenger vehicle is driving the wrong way on the exit ramp. It does not include vehicles reversing on the exit ramp; bicyclists traveling the wrong way on the exit ramp; or lawn mowers, utility vehicles, or emergency vehicles driving the wrong way on the exit ramp.
- **Confirmed turn arounds** are WWD acts that have images taken from the TAPCO Cameras or CCTV camera monitored by the Regional Traffic Management Center (RTMC) which clearly show the wrong-way driver starting to turn around.
- **Probable turn arounds** are WWD acts that did not trigger the side camera. In these cases, the images do not clearly show the driver turning around. However, since the vehicle did not trigger the side camera, it is most likely the driver turned around.
- **Documented turn arounds = Confirmed turn arounds + Probable turn arounds**

(Definitions and Reporting Data Produced by UCF)

FALSE ACTIVATIONS

- There is a relatively low prevalence of False Activations – averaging 4.5/month over the past 8 months
- A False Alert is defined as a Wrong Way Driving event that is created when there is no vehicle traveling in the wrong direction on the ramp.
- This does not include alerts caused by vehicles reversing on the exit ramp; bicyclists traveling the wrong way on the exit ramp; or lawn mowers, utility vehicles, or emergency vehicles driving the wrong way on the exit ramp.
- This also does not include detections where only one of the cameras was triggered, but there was no object or vehicle traveling the wrong way. In this case a sign alert is created and stored by the system, but no audible alarm is sent to the RTMC.

Month	False Alerts
Feb 2015	0
March 2015	0
April 2015	0
May 2015	0
June 2015	0
July 2015	0
Aug 2015	0
Sep 2015	0
Oct 2015	0
Nov 2015	4
Dec 2015	0
Jan 2016	1
Feb 2016	0
March 2016	2
April 2016	1
May 2016	0
June 2016	0
July 2016	1
Aug 2016	5
Sep 2016	4
Oct 2016	5
Nov 2016	6
Dec 2016	3
Jan 2017	6
Feb 2017	3
March 2017	5
Total	46

(Definitions and Reporting Data Produced by UCF)

PLANNED SUNGUIDE ENHANCEMENTS

- Addition of TAPCO Interface driver
  - Interface directly with WWD camera equipment
  - Supports deployments used by other CFX and other FDOT districts
  - Video snapshot(s) and video added to WWD Alert window
- Anticipated release in summer 2017 as a component of v7.1

UCF Optimized Approach: WWD Hotspots ™ Model, A New Tool

- Work within limited budgets and resources.
- Implement advanced countermeasures at WWD hotspots™.
- Demonstrate that implementing advanced countermeasures at hotspots in an optimized manner can provide the most efficient way to reduce WWD events.

THANK YOU!

Bryan Homayouni, PE
Manager of Traffic Operations
bryan.homayouni@CFXWay.com

Corey Quinn, PE
Chief of Technology / Operations
corey.quinn@CFXWay.com

Central Florida Expressway Authority
(407) 690-5000

Questions?

Transportation Systems Management & Operations

Memorandum of Agreement Video Access

Tushar Patel, District Five ITS

Transportation Systems Management & Operations

MOA – Video Access

- Purpose
  - No formal agreements in place regarding use or transmittal of local agency video feeds via FDOT
  - Video Access Programs:
    - iVDS (first responders)
    - SunGuide and FL 511 (traveler support information)
    - Media

FDOT

Transportation Systems Management & Operations

TS M&O

MOA – Video Access

- Agreement will establish ability for FDOT to provide local agency video feeds to the appropriate entity(ies):
  - First Responders (via iVDS)
  - Traveling Public (via SunGuide and FL 511)
  - Media
- Agreement will cover all entities eligible to receive video feeds within each category
  - e.g. an agency cannot stipulate which news channel or category of first responder receives their feed
  - Quality of Service (Not Guaranteed)
- Important to keep in mind existing protocol you are using and number of requests on network to avoid flooding.

Questions?

Transportation Systems Management & Operations

Memorandum of Agreement Network & Security Standards

Tushar Patel, District Five ITS

Transportation Systems Management & Operations

MOA – Network & Security Standards

- Purpose
  - These are mutually agreed upon standards per the master plan that are required in order to support the desired ITS functions in the region that rely on information sharing as we progress with AV and CV technology

MOA – Network & Security Standards

- Network (Communications and Security)
  - Firewall
  - Password Protection (not default)
  - Providing access via some type of security means
  - Securing cabinets

- AV/CV technology
  - WiFi & Dedicated Short Range Communications (DSRC)

Questions?

Transportation Systems Management & Operations

CMM Self-Assessment Polling

David Williams, VHB

FDOT

Transportation Systems Management & Operations

Business Process

- In the context of TSM&O, refers to activities such as planning, programming, agency project development processes, as well as training, human resource management, contracting and procurement, information technology, and agreements
- In many cases, business process elements go beyond the day-to-day operational activities and require broader institutional support and involvement to address

Business Process – Assessment

- Level 1 – Traffic management development/deployment processes are **agency-specific** and **ad hoc**.

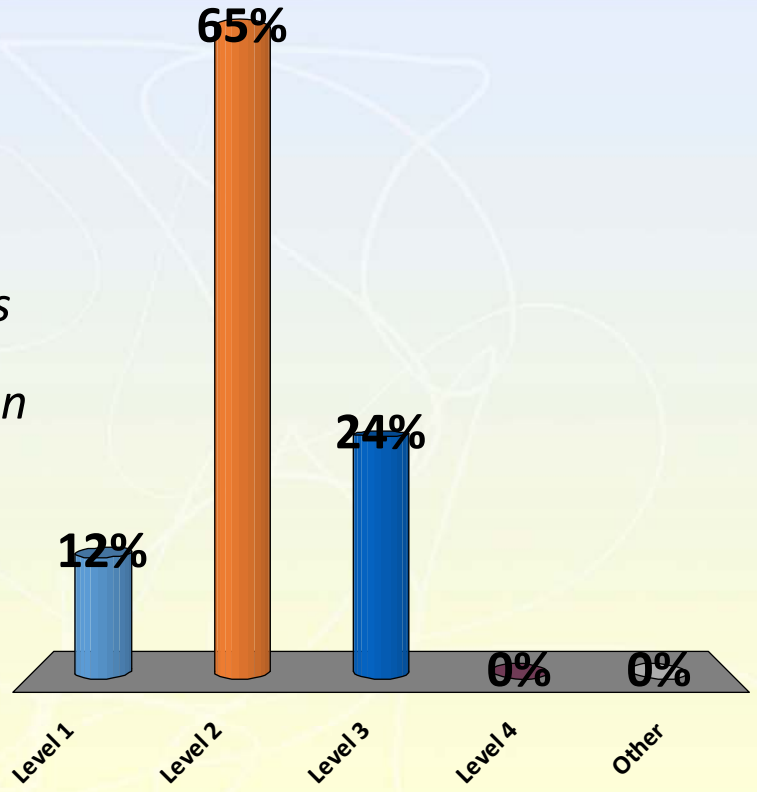
- Level 2 – Agencies implement a **nominally systematic approach** to traffic management to address immediate concerns. Traffic management approaches are **operator-driven** and **either static or based on time of day**.

- Level 3 – Traffic management development/deployment processes are **standardized** and have a more **system-wide approach** that is **well-documented**.

- Level 4 – Development/Deployment processes related to traffic management are **streamlined across an entire region**, and agencies have a **continuous improvement process** for traffic management

Business Process – Regional Assessment

1. Level 1 - *Ad hoc process*
2. Level 2 - *Systematic process*
3. Level 3 - *Standardized, well-documented process*
4. Level 4 - *Streamlined process across entire region*
5. Other



Systems & Technology

- Use of the appropriate processes for design and implementation of systems to ensure that the needs of the region are appropriately addressed, that systems are implemented in an efficient manner, and that interoperability with other systems is achieved

Systems & Technology – Assessment

- Level 1 – Traffic management approaches are developed on an **ad hoc** basis **independent of the systems engineering process**.

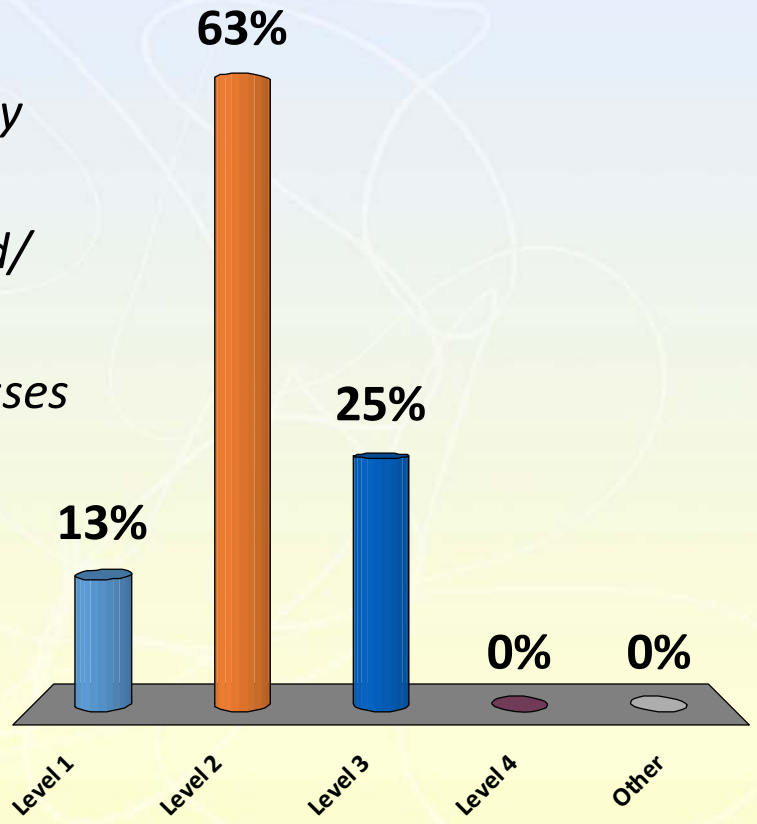
- Level 2 – The systems engineering process and ITS architecture are **consistently applied** within the traffic management context; agencies apply advancements and technologies in **spot locations**.

- Level 3 – Agencies apply advanced technologies but with a **limited level of automation**; traffic management systems are **replicated and integrated within operations**, with **standardized documentation**.

- Level 4 – Automation of traffic management processes is **based on historical, current, and predicted data**; new and emerging technologies are **deployed on a continuous basis** to improve system efficiency.

Systems & Technology – Regional Assessment

1. Level 1 - *Ad hoc process*
2. Level 2 - *System engineering process consistently applied in spot locations*
3. Level 3 - *Traffic management systems replicated/ integrated*
4. Level 4 - *Automated traffic management processes*
5. Other



Performance Measurement

- The means of determining program effectiveness, determining how changes are affecting performance, and guiding decision-making
- Performance measures can be used to demonstrate the extent of transportation problems and can be used to make the business case for operations within an agency, as well as for decision-makers and the traveling public
- Performance measures can also be used to further demonstrate the accomplishments of investments on the transportation network

Performance Measurement – Assessment

- Level 1 – Use of performance measures for traffic management is **not undertaken on a regular basis**.

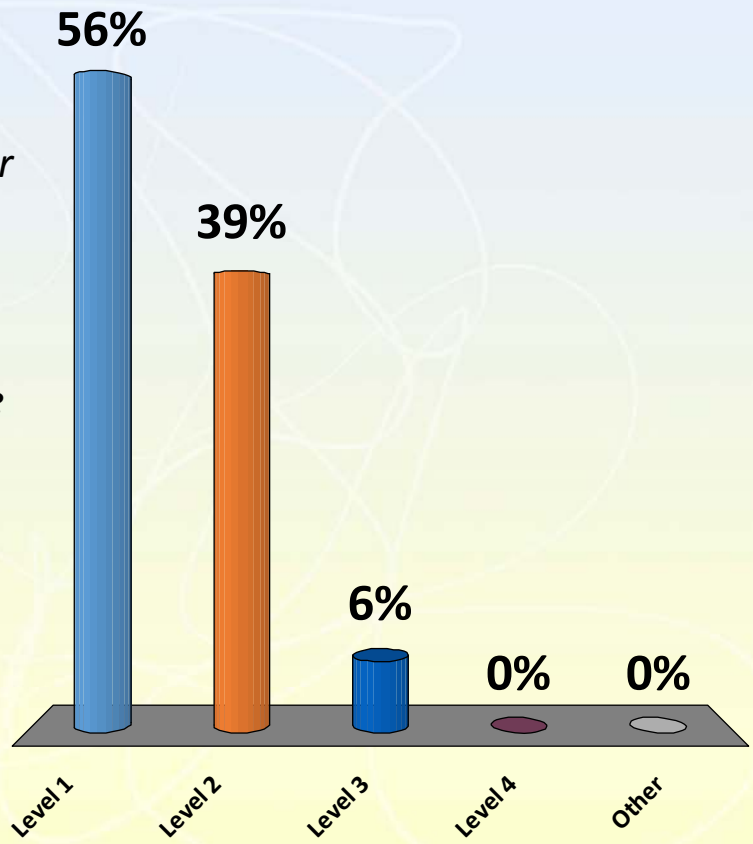
- Level 2 – Agencies employ performance measures of traffic management strategies primarily to **analyze impacts post-deployment**.

- Level 3 – Agencies identify desired outcome measures and **consistently utilize performance measure analyses** to improve **strategy deployment** and **overall operations**.

- Level 4 – Agency traffic management **goals and objectives are mapped to performance measures**, which are **regularly used to manage systems**; **documentation** of analyses results are **distributed internally and externally** and are **archived** for later use.

Performance Measurement – Regional Assessment

1. Level 1 - *PMs not used on regular basis*
2. Level 2 - *PMs used to measure impacts of strategies only for the post-development period*
3. Level 3 - *PMs used to consistently assess performance of overall operation and strategy deployments*
4. Level 4 - *Goals/Objectives mapped to PMs; used to manage system; PMs well-documented and archived*
5. Other



Organization & Workforce

- The efficient execution of processes supporting effective programs requires the appropriate combination of coordinated organizational functions and technical, qualified staff with clear management authority and accountability

Organization & Workforce – Assessment

- Level 1 – In-house personnel have **limited traffic management experience** with **no specialized experience in engineering, traffic analysis, etc.**; agency personnel roles are **fragmented**.

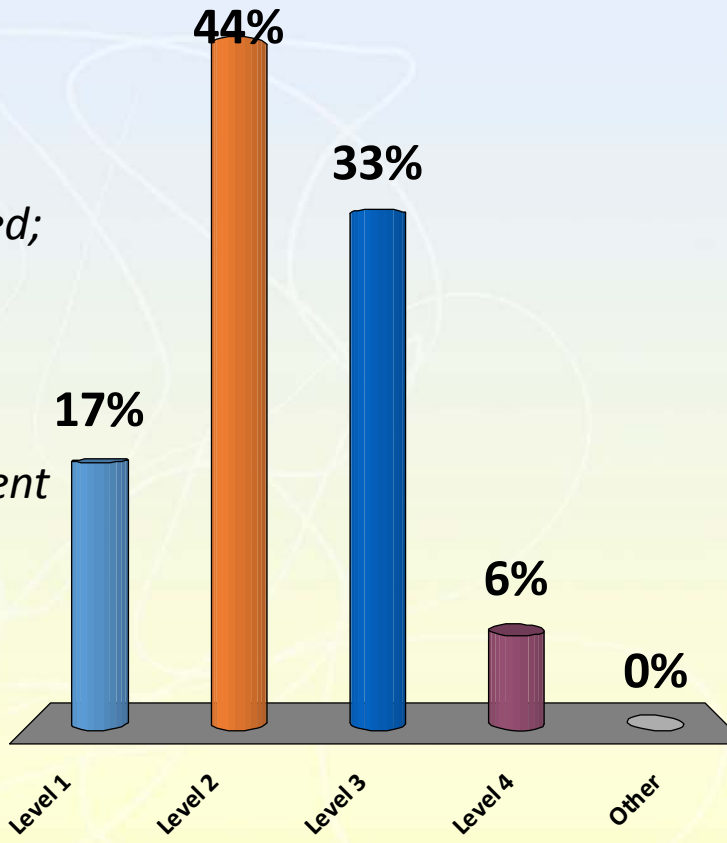
- Level 2 – **Core staff knowledge, skills, and abilities (KSA) are identified** within the traffic management arena, and **roles are linked** across various responsible groups.

- Level 3 – Traffic management staff members and their related KSAs are **identified and established on a broad basis** and within individual groups.

- Level 4 – Traffic management program support exists to **engage in advancement of KSAs**; formal and ongoing training on traffic management is **offered and supported** by the agency.

Organization & Workforce – Regional Assessment

1. Level 1 - *Staff roles not clearly defined; limited traffic management experience*
2. Level 2 - *Core staff knowledge, skills, abilities (KSA) identified; roles linked across various responsible groups*
3. Level 3 - *Staff and their related KSAs are identified and established on a broad basis and within groups*
4. Level 4 - *Support structure in place to engage in advancement of KSAs; training offered and supported*
5. Other



Culture

- The combination of values, assumptions, knowledge, and expectations of the agency in the context of its institutional and operating context, and as expressed in its accepted mission and related activities

Culture – Assessment

- Level 1 – Traffic management is primarily an assortment of **loosely related projects and strategies**; **only a few champions** lead the efforts.

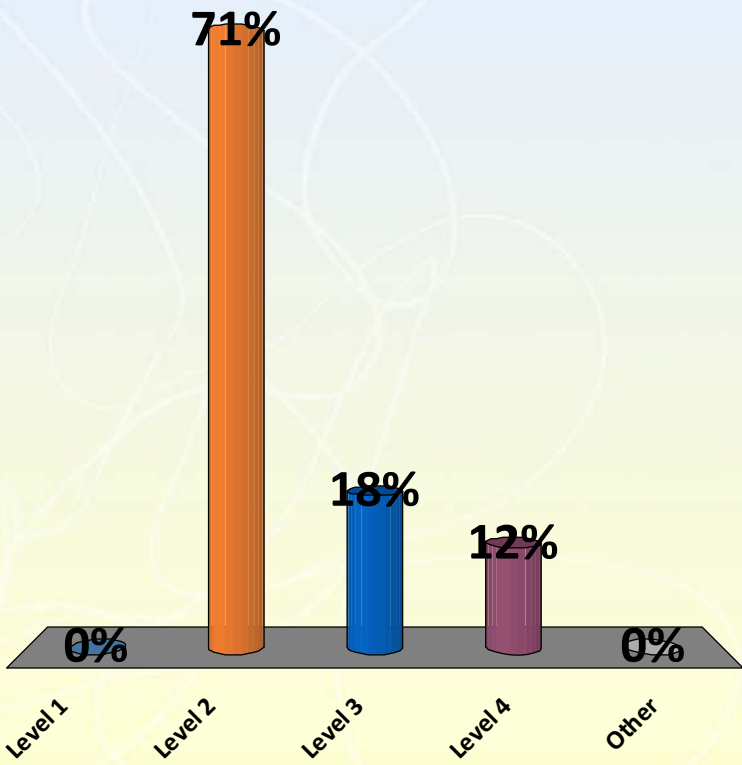
- Level 2 – Traffic management is **recognized as valuable and a key role of the agency**; **select agency managers lead efforts** for traffic management.

- Level 3 – Traffic management is **recognized as a core program** that **coordinates with other programs** on an ongoing basis.

- Level 4 – Traffic management is a program that is **highly integrated with related core functions**, such as planning, design, construction, maintenance, etc.; **all agency staff members**, from leadership to rank-and-file, **embrace the importance and value of traffic management**.

Culture – Regional Assessment

1. Level 1 - *Loosely related projects/strategies; few champions*
2. Level 2 - *Traffic management valued; select agency managers lead efforts*
3. Level 3 - *Traffic management a core program; coordinates with other programs on regular basis*
4. Level 4 - *Traffic management highly integrated with other core programs; all staff embrace its importance*
5. Other



Collaboration

- The development and implementation of TSM&O requires a collaborative approach; the effectiveness of most strategies is dependent on improving the coordinated performance of each partner

Collaboration – Assessment

- Level 1 – Relationships and collaboration between stakeholder organizations are **informal and ad hoc**.

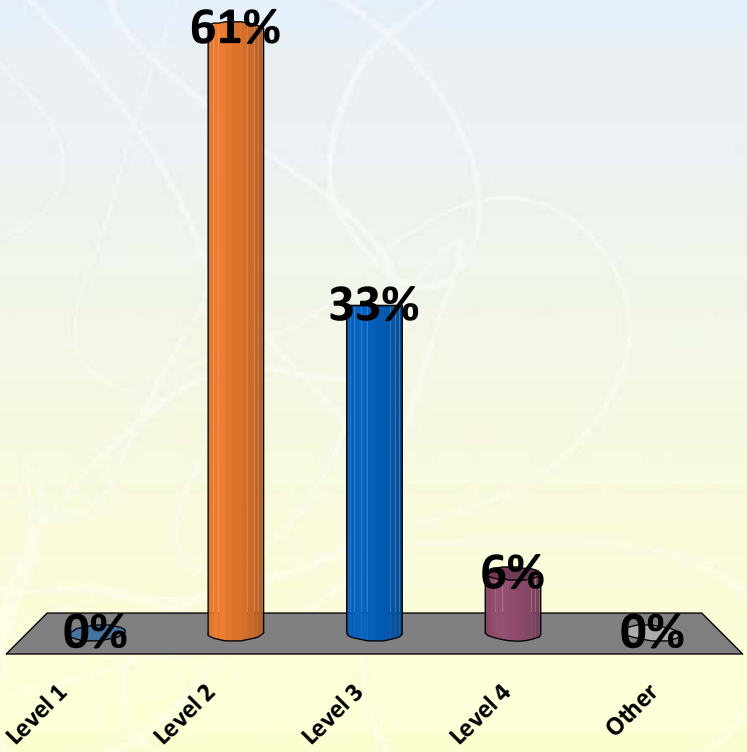
- Level 2 – Collaboration with stakeholders is **more formal** and related to **specific traffic management needs and projects**.

- Level 3 – Agencies **collaborate** on traffic management at a **high level** via **engagement of regional stakeholders**.

- Level 4 – Agencies approach traffic management at the **regional level**.

Collaboration – Regional Assessment

1. Level 1 - *Informal/ad hoc relationships between agencies*
2. Level 2 - *Stakeholder collaboration more formal; related to specific traffic management needs/projects*
3. Level 3 - *Agencies collaborate at high level via regional stakeholders*
4. Level 4 - *Agencies approach traffic management at regional level*
5. Other



Questions?

Transportation Systems Management & Operations

TSM&O Consortium Meeting

MEETING AGENDA

D5 Urban Office
133 S. Semoran Blvd.
Orlando, FL 32807
Lake Apopka B Conference Room

May 4, 2017; 10:00 AM-12:00 PM

1) WELCOME

2) FDOT D5 TSM&O IMPLEMENTATION PLAN UPDATE

   http://www.cflsmartroads.com/tsmo.html

   - David Williams, VHB

3) SAMPLE TSM&O ORGANIZATIONAL CHART AND FUNDING ELIGIBILITY

   - David Williams, VHB

4) CFX WRONG-WAY DRIVING PROGRAM

   - Bryan Homayouni, CFX Traffic Operations

5) MEMORANDUM OF AGREEMENT – VIDEO ACCESS

   - Tushar Patel, District 5 ITS

     i) Sharing of information (Other local agency, Media, FL 511, First responders)

6) MEMORANDUM OF AGREEMENT – SECURITY STANDARDS

   - Tushar Patel, District 5 ITS

     i) Master Plan Commitments

        (1) Network (Communication and Security)

        (2) AV/CV technology

7) CMF SELF-ASSESSMENT – POLLING

   - David Williams, VHB