



CENTRAL FLORIDA TSM&O CONSORTIUM MEETING SUMMARY

Meeting Date: June 27, 2024 (Thursday) **Time:** 10:00 AM – 12:00 PM

Subject: TSM&O Consortium Meeting

Meeting Location: FDOT District Five RTMC (4975 Wilson Rd., Sanford, FL 32771) and Teleconference

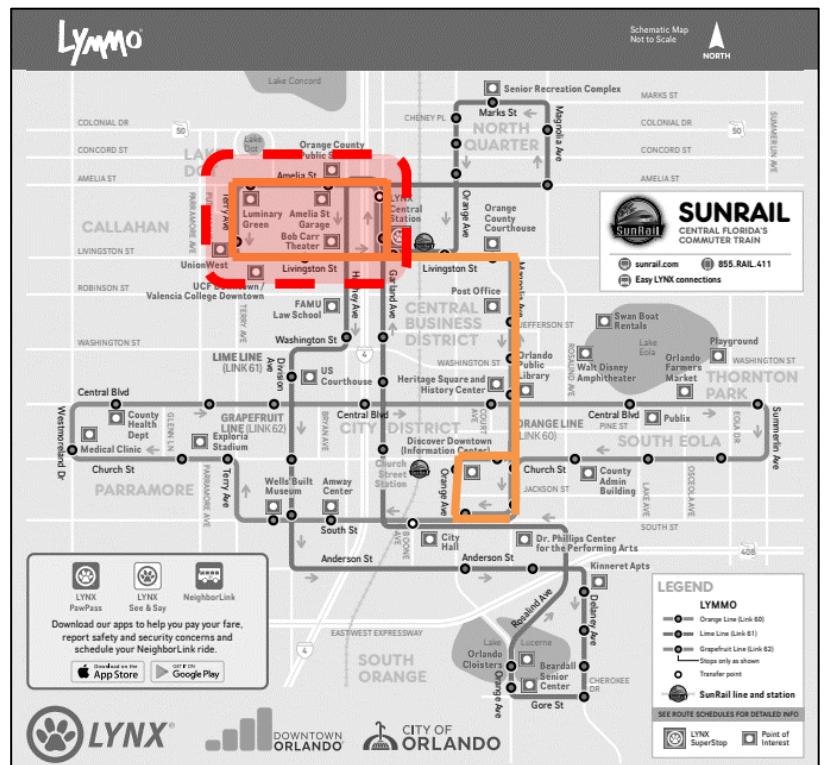
I. OVERVIEW

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

II. SHUTTLING WITH AUTONOMOUS NAVIGATION (SWAN) SHUTTLE

Doug Jamison (LYNX), Innovation Program Administrator, presented on the *Shuttling with Autonomous Navigation (SWAN)* pilot demonstration deployed along the LYMMO Orange line.

- LYNX, City of Orlando, and MetroPlan Orlando completed the Concept of Operations (ConOps) for AV Services in 2021
- Required that AV shuttles provide the same or better level of service as existing service before they are ready for deployment
- A portion of the LYMMO Orange line was identified as the best route for the pilot due to the limited range of the AV Shuttle
- Used during off-peak periods to offset the smaller size of the AV shuttle
- Why do it?
 - Gain feedback on meeting the needs of passengers with an AV shuttle
 - Allow familiarization with the technology to a broad spectrum of ages and technical levels



- Operate in an urban setting including complete multiple lane intersections, an overhead highway, and adjacent pedestrian activity and streetscape
- NHTSA and FMVSS standards – vehicles that do not meet their standards require an exemption; the stipulations of the waiver must be followed to the letter; you cannot deviate from the identified transit route at all
- The pilot’s portion of Orange Line serves multiple communities, the Orange County Public School Academic Center for Excellence (K-8 school), various college campuses, Bob Carr Theater, Marriott and Crown Plaza Orlando Downtown, and LYNX Central Station
- Target of 8-minute headways during business hours, for a six-month demonstration
- Lessons Learned
 - Weather affects operations
 - Sensors see rain as a wall
 - Hurricanes cause significant shutdown periods
 - Heat and humidity cause issues – approximately 25% reduction in battery range due to high heat and heavy A/C usage
 - Pauli Exclusion Principle – two objects cannot occupy the same space at the same time
 - Either bus or shuttle operates in the lane, not both
 - Construction vehicles like to park in bus lanes
 - Some vehicles don’t follow the rules
 - AV Shuttle vehicles are different from buses
 - Vendor attendants are not transit employees; they can’t provide basic transit-related information (schedule, other routes, etc.) that a user would typically ask about
 - Only 11 passengers at one time
 - Waiver requires seatbelts; AV shuttle has an automatic brake mechanism whenever seatbelt is disengaged



- Out of 1,916 schedule hours, the AV shuttle lost time due to:
 - 5% affected by weather events (48 events; 88h 49m)
 - 4% affected by insufficient battery (103 events; 74h 38m)
 - 2% affected by lane blockages (24 events; 40h 3m)
 - 11% affected by construction (59 events; 217h 3m)
 - 3% affected by traffic signal issues (25 events; 57h 38m)
 - 1% affected by loss of GNSS signal (12 events; 7h 45m)

- 1% affected by accidents (4 events; 15h 3m)
 - 3% affected by other issues (33 events; 63h 58m)
- How to improve “transit readiness” of AV technology
 - Sensor technology that operates reliably in all weather conditions
 - “Fuel” that lasts for at least the same shift as a bus operator (10 hours in service)
 - Ability to maneuver around lane blockages on complex streets
 - Acceleration and speed comparable to adjacent traffic
 - Vehicles that can operate on detours without advanced notice to NHTSA
 - Cabins that reflect personal comfort and space rather than maximizing capacity
- Suspension of service
 - All accidents involving AV shuttles are required to be reported to NHTSA within 24 hours
 - 2 incidents
 - Lesson 1 – crash with an AV Shuttle can make national and international news, even if the damage is only scratches
 - Lesson 2 – crash with an AV shuttle can result in a review of the waiver to conduct the deployment (but the transit agency still has to provide service)
- AVs are not a replacement for service; they’re an additional layer
- Can this be cost-competitive with transit?
 - It’s not good at moving a lot of people, especially in peak period
 - Would be better at demand stops
- What’s next?
 - Reviewing results
 - Next generation of AV shuttles go up to 35mph
 - Jacksonville Transit will be deploying next generation shuttles; we’ll see how that goes

Discussion

- Q: Can this be cost-competitive with transit?
 - A: It’s not good at moving a lot of people, especially in peak period
 - Would be better at demand stops
- Q: Why didn’t you test in closed environment?
 - A: had to go into revenue service to capture a lot of nuance, especially related to human-machine interface
- Q: How do you feel about riders’ confidence?
 - Surveyed riders; most people felt safe; “too safe” as it turns out, because the vehicle moved too slowly

III. UPCOMING TRAINING AND WORKFORCE DEVELOPMENT

David Williams gave a brief presentation on the CV Pilot Deployment Program as of 2024.

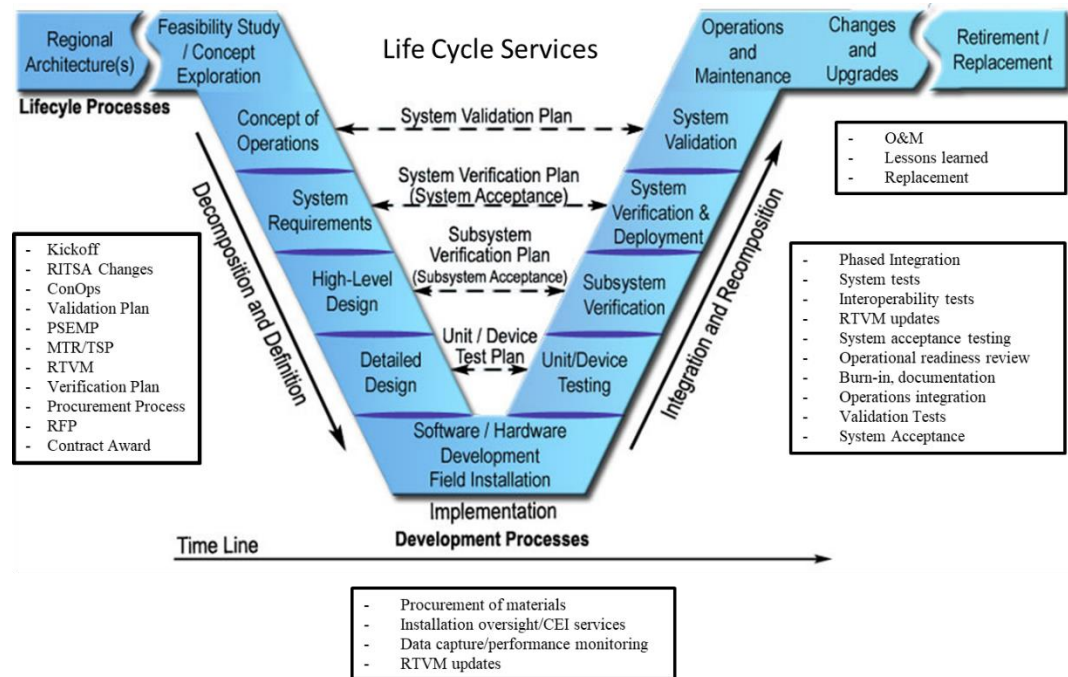
- CV Pilot Deployment Program sites were selected by USDOT in 2015
 - Wyoming DOT
 - Efficient and safe movement of freight through 400 miles of I-80 corridor
 - Roadside alerts, parking notifications, dynamic travel guidance

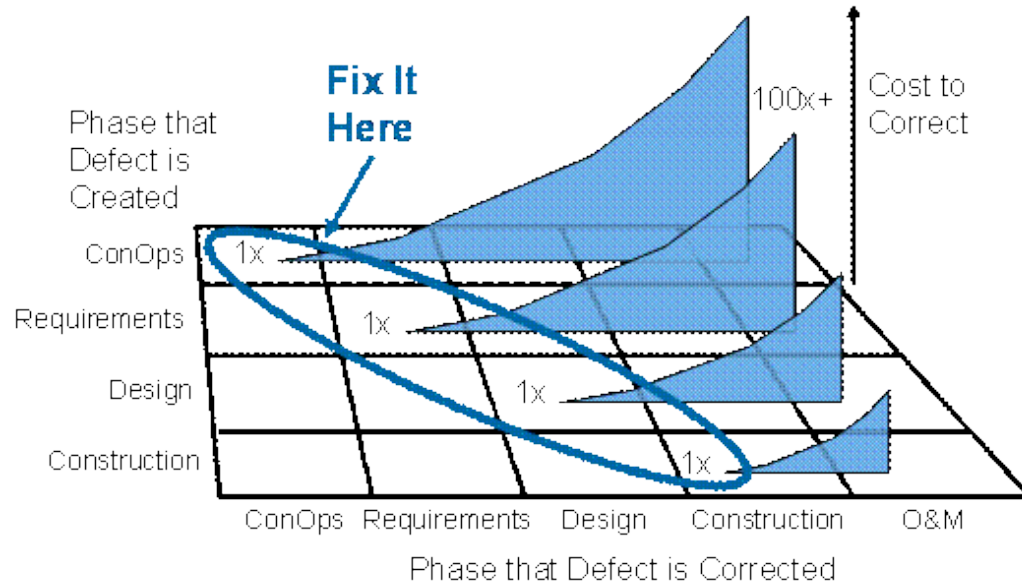
- 325 OBU-equipped vehicles (170 heavy trucks, 150 WYDOT fleet, snowplows)
- New York City DOT
 - Pedestrian safety in dense urban environment in Manhattan and Brooklyn
 - 3,000 city fleet vehicles and 12 buses equipped
- Tampa Hillsborough Expressway Authority (THEA)
 - Reduce wrong-way driving (WWD) and other conflicts, improving safety and mobility in downtown Tampa
 - 1,000 cars, 7 buses, and 8 trolleys equipped
- Three phases
 - Phase 1 – Comprehensive Deployment Concept
 - Phase 2 – Design, Build, Test, Deploy (3-5 year process)
 - Phase 3 – Operations and Monitoring
- Identified Benefits from deployments
 - Safety
 - WYDOT
 - 50% of drivers given a WZ or Winter Weather warning reduced their speed
 - Drivers reduced speed within 3 seconds of receiving a Forward Collision Warning (FCW) for 85% of FCW events
 - NYCDOT
 - Red light violation warning (RLVW) reduced red-light running by 41%
 - Lane change warning reduced unsafe lane change rate by 46%
 - THEA
 - WWD entry application correctly warned 14 drivers from entering the wrong way
 - Mobility
 - THEA – end of ramp deceleration warning was estimated to reduce the travel-time index by 30%
 - Environment
 - WYDOT – CV applications had an estimated savings of 46.5 gallons of diesel from reduced idling for trucks per one-hour road closures
 - NYCDOT – CV applications had an estimated reduction in emissions of 1,287kg
 - Customer Satisfaction
 - NYCDOT – survey findings indicated 83% of pedestrians felt safer using the mobile crossing application
 - THEA – survey findings indicated 79% of drivers found the end of ramp deceleration warning helpful
 - Public Agency Efficiency
 - WYDOT – data from the CVs increased the quantity of road condition reports nearly 4x, improving the ability of the TMC to generate more accurate alerts and advisories

IV. ITS ARCHITECTURE CHANGE REQUEST

David Williams gave a brief presentation on the ITS Architecture Change Request and the ITS Architecture program.

- 23 Code of Federal Regulations (CFR) Part 940 establishes ITS Architecture Framework
 - National ITS Architecture (NITSA)
 - State ITS Architecture (SITSA)
 - Regional ITS Architecture (RITSA)
 - Project ITS Architecture (PITSA)
 - SITSA and RITSA govern the planning, design, development, integration, implementation, maintenance, and operation of Florida’s ITS projects
 - Requires systems engineering approach for all ITS projects
 - “a structured process for arriving at a final design of a system. The final design is selected from a number of alternatives that would accomplish the same objectives and considers the total life-cycle of the project including not only the technical merits of potential solutions but also the costs and relative value of alternatives”
- Systems Engineering Approach





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- RITSA (FDOT District 5)
 - FDOT conducts periodic ITS Architecture maintenance update cycles
 - During SE activities, necessary ITS Architecture changes should be identified
 - An ITS Architecture Change Request Form (750-040-04) should be completed for any project/service that needs to be updated in the Architecture
 - The maintenance update cycle is intended to keep up with rapid pace of ITS deployment and innovation in Florida, and to maintain compliance/conformity with NITSA
- What triggers the need for an ITS Architecture Change Request?
 - New stakeholders
 - Changes in services
 - Changes due to ITS project definitions/implementation
 - Changes due to ITS project completion/addition/deletion
 - Changes in stakeholder/element names
 - Changes in ITS project priority
 - Updated Long Range Transportation Plan (LRTP)
- FDOT is always accepting ITS Change Request Forms
 - For this year, forms must be submitted by July 31st to sysandarch@dot.state.fl.us
- The SITSA and RITSA are available here: <https://teo.fdot.gov/architecture/index.html> or search "FDOT Architecture"

V. ANNUAL MAINTENANCE MEETING

David Williams briefly discussed the planned Annual Maintenance Meeting involving maintaining agencies.

- Previously held annual meeting to discuss ITS Maintenance activities, lessons learned, and best practices
- The Annual Maintenance Meeting is planned for November 19, 2024 from 8:00am to 12:00pm at

the District RTMC

- Intended Audience
 - Senior traffic signal technicians
 - Traffic signal technician managers
 - Traffic engineering staff
 - Traffic operations staff
- Developing agenda over the next few months; if you have any suggestions, please reach out

VI. AI-ENABLED ITS CMM WORKSHOP

David Williams briefly discussed the upcoming AI-Enabled ITS Capability Maturity Model Workshop.

- District 5 is hosting a workshop to discuss AI, ITS, and Transportation
 - Overview on AI and AI in transportation
 - Review of ongoing AI work conducted by agencies in Central Florida
 - CMM and AI-enabled ITS
 - Federal research priorities on AI
- August 29 from 10:00am to 12:00pm at District 5 RTMC
- Standard TSM&O CMM made up of 6 dimensions
 - Business Processes
 - Culture
 - Collaboration
 - Organization and Workforce
 - Systems and Technology
 - Performance Measurement
- AI-enabled ITS CMM
 - Business Processes
 - Culture & Organization
 - Collaboration
 - Cybersecurity
 - AI Data and Infrastructure
 - AI Models and Applications
 - AI Integration and Operations

VII. FLASH AWARD

Kevin Marquez (FDOT) gave a brief presentation of FDOT's FLASH Award to Melbourne Traffic Operations team members.

- This is District Five TSM&O's new recognition program for outstanding maintaining agency response to traffic signal emergencies
- Focuses on showcasing specific efforts throughout the District
- Discuss processes, best practices, lessons learned, etc.
- US 441 at Kaley Avenue (Orange County)

- Routine inspection on September 8th, 2023 found that conditions at one of the mast arms had deteriorated at a much faster rate than expected
- Inspection noted the mast arm had significant section loss with corrosion holes, tears/cracks, and the arm was buckling
- Damaged mast arm was the older clamp-on design
- Emergency Response Details
 - FDOT Structures Maintenance team requested the damaged arm be taken down September 8, 2023 12:47 PM
 - Orange County Traffic Engineering acknowledge receipt request and began developing plans to find a short term and long term solution
 - Options evaluated : Short term temporary span and long term arm replacement using older mast arms from their yard
 - September 15th update from the County indicated they had found a candidate arm replacement in their yard, but a temporary span would still be needed while arm was removed and new arm installed and rebuilt for signalization
 - September 19th update from the County indicated that their team had completed the removal of the damaged arm, and installed a temporary span utilizing the remaining upright and a new wood pole
 - Temporary span was set up in a diagonal manner due to lack of ROW in the adjacent corner across US 441 and overhead and underground utilities to work around
 - Orange County used the removed damaged arm to compare and remeasure the proposed used arm. County also coordinated with FDOT Structures Maintenance team to inspect the new arm
 - October 16th update from the County indicated the new arm was installed, and temporary span was removed.
- Key successes
 - Team longevity and experience empowers technicians to handle these kinds of emergencies
 - The team is available 24/7/365 to ensure proper response to emergencies
 - Critical Thinking and Adaptability enabled team to quickly respond and identify solution.
 - Ongoing Training and Skill Development: Regular training and skill development are essential to keep the team prepared for a wide range of emergencies. Investing in continuous education helps us stay current with best practices and new technologies.
 - A collaborative team effort enables staff to handle these situations effectively
 - Orange County had material in stock and available; it just required us a purchase order for additional minimal unique components.
- Best Practices
 - Save and store mast arms that are in good shape; don't scrap everything during replacement projects
 - Orange County has continuing term contracts with multiple signal contractors for large tasks.

VIII. CURRENT INITIATIVES

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

- **All Red Extend** – District 5 has been looking into All Red Extend applications at pilot intersections
- **Regional Cyberkey Integration**
 - District is looking into hosting a regional license for Cyberkeys; would enable better pricing
- **High-Definition Engineering Intersection Data via Integrative Modeling (HEIDI)**
 - Data digital twin
 - 2 test corridors set up with ATSPM and probe data (fused together)
 - Pre-walkthrough next week
 - Lake Mary Blvd (urban) and US 301 (rural) sites
 - If this works, want to expand deployment
 - Look at alternative treatments of signal timings
- **Digital Analytics Notification for Incident and Event Localization (DANIEL)**
 - Video analytics and computer vision
 - Kickoff last week
 - Dropping a circuit into RTMC to get their own multicast stream

IX. NEXT MEETING

- October 24, 2024

X. ATTACHMENTS

- A – Presentation Slides
- B – Meeting agenda

END OF SUMMARY

This summary was prepared by David Williams and is provided as a summary (not verbatim) for use by the Consortium Members. The comments do not reflect FDOT's concurrence. Please review and send comments via e-mail to david.williams2@dot.state.fl.us so the meeting summary can be finalized.

Welcome to the TSM&O Consortium Meeting June 27, 2024



Meeting Agenda

1. Shuttling with Autonomous Navigation (SWAN) Shuttle
2. CV Pilot Deployment (2024 Update) ITS JPO
3. ITS Architecture Change Request
4. Annual Maintenance Meeting
5. AI Capability Maturity Model Workshop
6. FLASH Award for Emergency Repairs – Orange County
7. Current Initiatives



Swan
SHUTTLE

S huttling
With
A utonomous
N avigation

 CITY OF
ORLANDO

 LYNX®

 beep™

First Things First – What is the Plan?



LYNX AV Services Study

Concept of Operations Report

FINAL
April 2021

LYNX, the City of Orlando, and MetroPlan Orlando completed the Concept of Operations for AV Services in 2021

- 🐾 Autonomous vehicles need to provide the same or better service as existing before they are ready for deployment
- 🐾 LYMMO Orange was identified best option for pilot
- 🐾 Pilot option was to operate with a focus on off-peak periods to offset smaller vehicle size
- 🐾 Stakeholder roles identified
 - LYNX – operate service
 - City of Orlando – maintain infrastructure

First Things First – Why are we doing it?



Continued development of autonomous vehicle technology in a “living lab” to:

- 🐾 Gain feedback on meeting the needs of passengers with an autonomous vehicle
- 🐾 Allow familiarization with the technology to a broad spectrum of ages and technical levels
- 🐾 Operate in an urban setting including complex multiple lane intersections, an overhead highway, and adjacent pedestrian activity and streetscape

LYNX will share the final report with the Federal Transit Administration and with other transit agencies with the lessons learned during the pilot

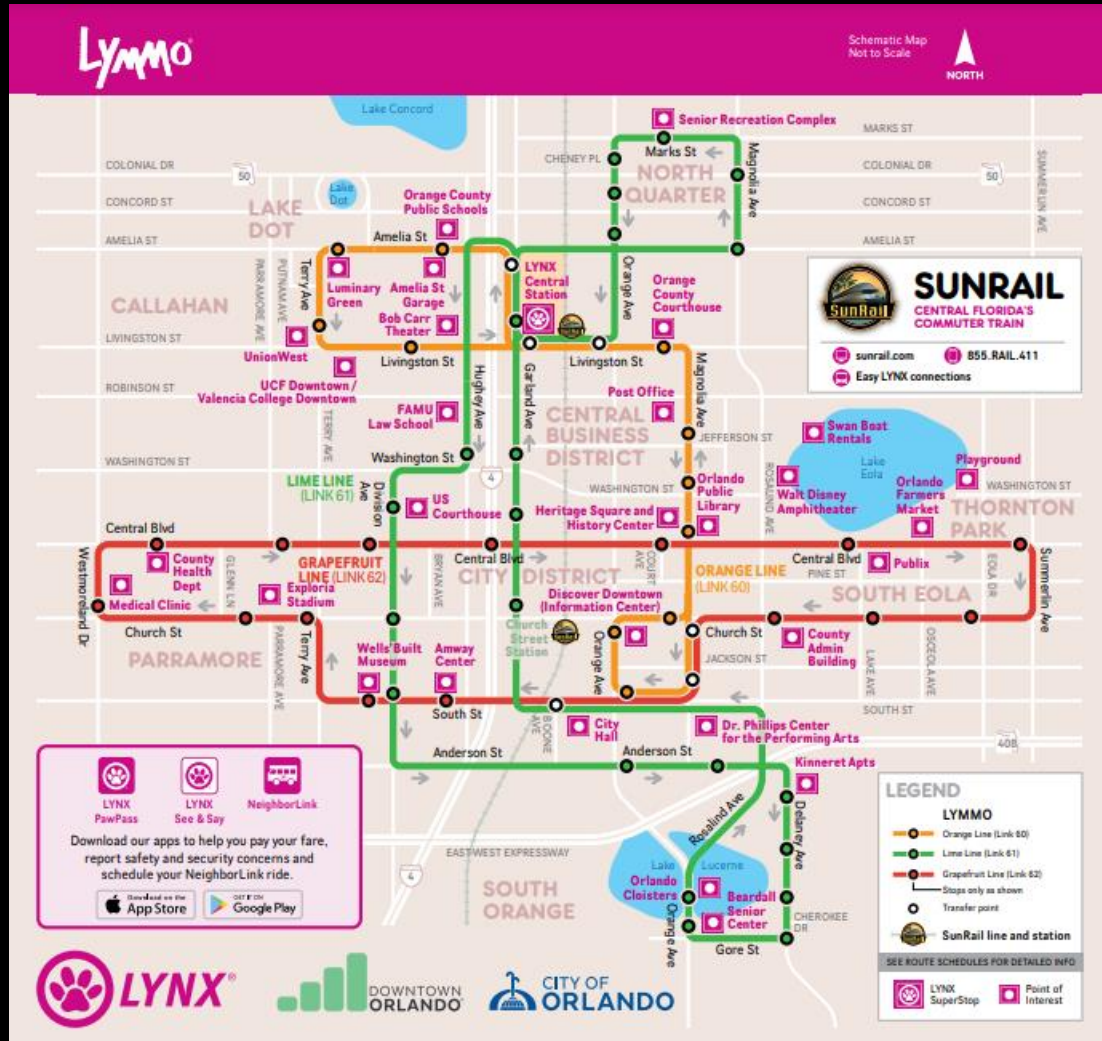
First Things First – NHTSA and FMVSS



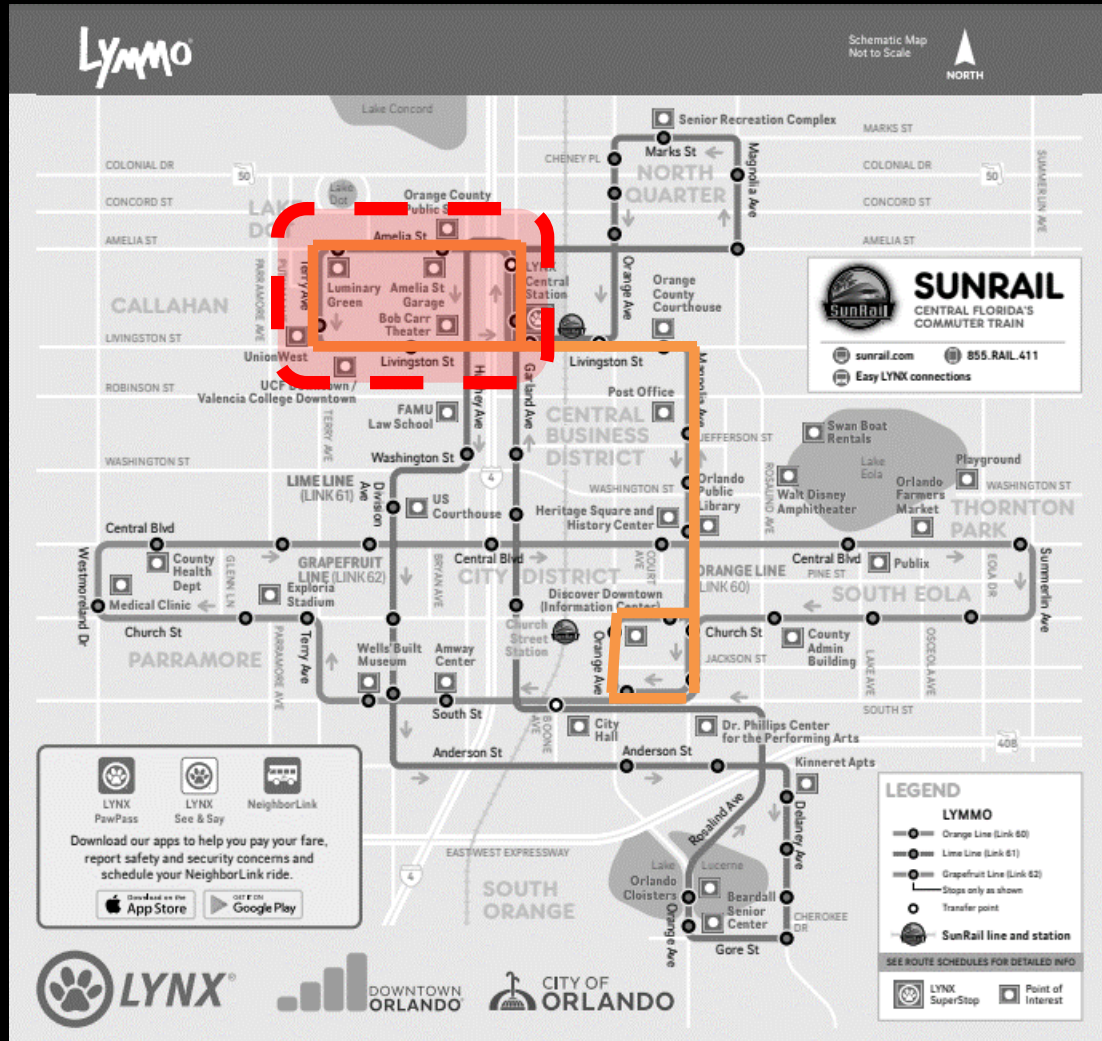
The National Highway Traffic Safety Administration (NHTSA) established the Federal Motor Vehicle Safety Standard (FMVSS) specifying 73 standards that must be on vehicles sold in the United States.

- 🐾 FMVSS uses human-centric federally-mandated standards (examples include steering wheels, brake pedals, driver's seat, mirrors)
- 🐾 Vehicles that do not meet FMVSS require a petition for a temporary exemption from NHTSA to be permitted on public roads
- 🐾 NHTSA requires operators of autonomous vehicles to report crashes to the agency

First Things First – Where is it?



First Things First – Where is it?



First Things First – Why here?

Pilot location serves:

- Callahan and Parramore Neighborhoods, Salvation Army Orlando Citadel/William Booth /Catherine Booth Towers (Justice40)
- Orange County Public School Academic Center for Excellence (K-8 school)
- Orlando Technical College, Valencia College, University of Central Florida, and Florida A&M (higher education)
- EA Orlando (technology)
- Bob Carr Theater, Marriott, Crown Plaza Orlando Downtown (visitors)
- LYNX Central Station (bus and rail transit hub)



- Six-month demonstration
- Existing transit service
- Off-peak hours
- 8-minute headways during business hours

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What Have We Learned



Weather affects operations

- 🐾 Sensors see rain as a wall (launched August 20, 2023)



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Weather affects operations

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- 🐾 Hurricanes Franklin and Idalia (August 30, 2023)
- 🐾 Heat (and humidity) affect battery range



Yahoo Finance

September						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
				1 ☁️ +88° night +79°	2 ☁️🌧️ +86° night +77°	3 ☁️ +88° night +77°
4 ☀️ +90° night +75°	5 ☁️ +90° night +75°	6 ☀️ +91° night +77°	7 ☀️ +93° night +79°	8 ☁️🌧️ +86° night +81°	9 ☀️ +88° night +73°	10 ☀️ +90° night +77°
11 ☀️ +90° night +79°	12 ☁️🌧️ +90° night +77°	13 ☁️🌧️ +88° night +81°	14 ☁️ +88° night +79°	15 ☁️ +88° night +79°	16 ☁️🌧️ +86° night +77°	17 ☁️🌧️ +88° night +79°
18 ☁️ +88° night +81°	19 ☁️ +86° night +75°	20 ☁️🌧️ +88° night +77°	21 ☁️🌧️ +86° night +75°	22 ☀️ +84° night +75°	23 ☀️ +86° night +72°	24 ☁️ +88° night +72°
25 ☁️🌧️ +88° night +75°	26 ☁️🌧️ +86° night +77°	27 ☁️🌧️ +84° night +75°	28 ☁️🌧️ +84° night +75°	29 ☁️🌧️ +86° night +75°	30 ☁️🌧️ +84° night +75°	

What Have We Learned



Pauli Exclusion Principle:

What Have We Learned



Pauli Exclusion Principle: two objects cannot occupy the same space at the same time

What Have We Learned

Pauli Exclusion Principle: two objects cannot occupy the same space at the same time

- 🐾 Either buses or shuttles operate in the lane, not both



A solid white line marks the edge of the roadway or separates lanes of traffic moving in the same direction. You may travel in the same direction on both sides of this line, but you should not cross the line unless you must do so to avoid a hazard.

What Have We Learned

Pauli Exclusion Principle: two objects cannot occupy the same space at the same time

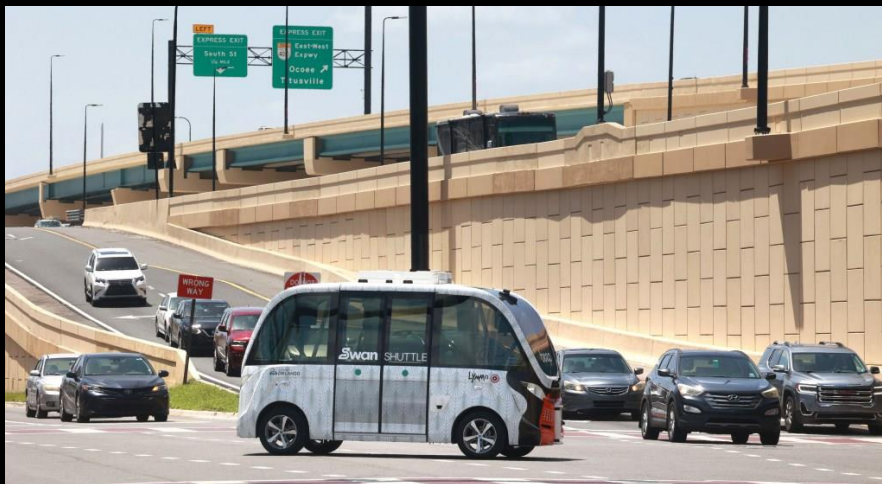
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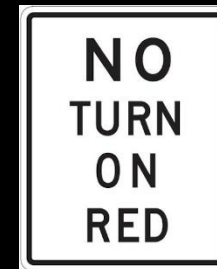
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Orlando Sentinel

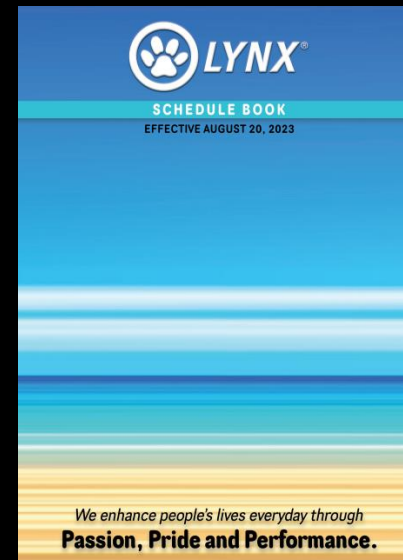


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Autonomous shuttle vehicles are different than buses

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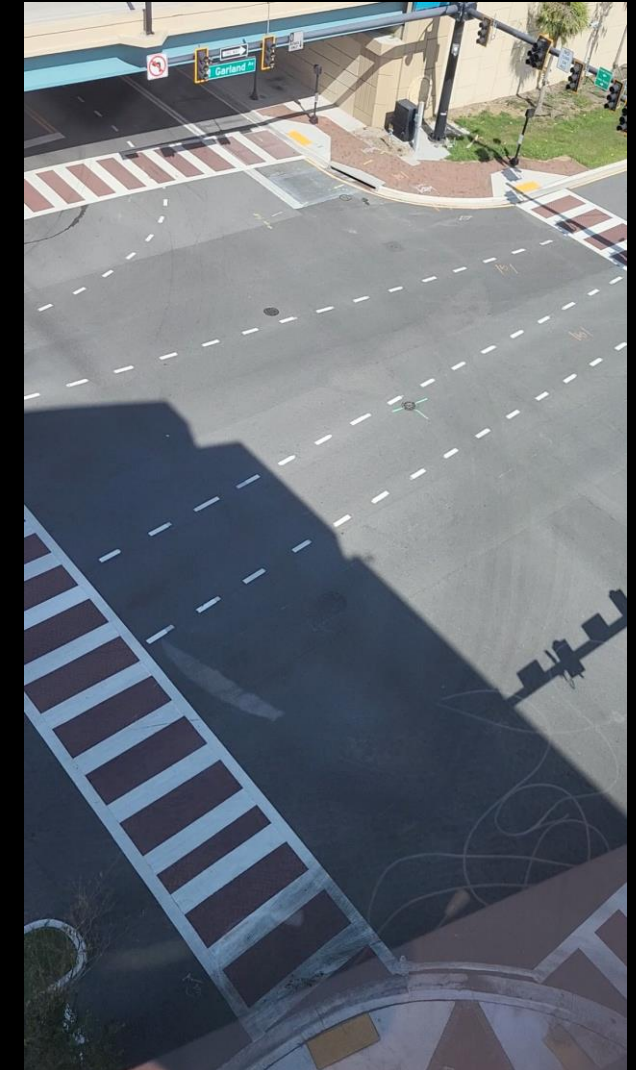
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- 🐾 People stop the shuttle to ask questions (headways)
- 🐾 Snuggle up (11 passengers?)
- 🐾 Buckle up



What Have We Learned

Autonomous shuttle vehicles are different than buses

- 🐾 Vendor attendants are not transit employees
- 🐾 People stop the shuttle to ask questions (headways)
- 🐾 Snuggle up (11 passengers?)
- 🐾 Buckle up
- 🐾 Zero to 60 mph in ?



What Have We Learned



Out 1,916 scheduled hours, we have experienced:

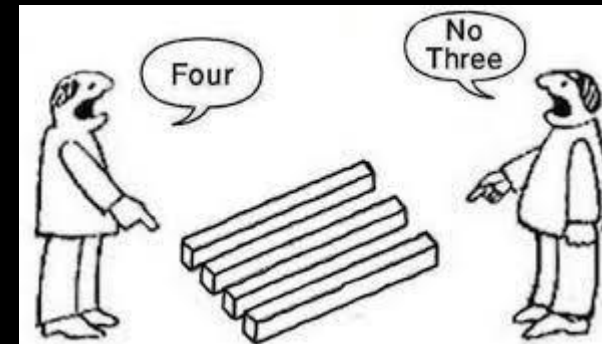
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- 🐾 3% affected by other issues (33 events for 63h 58m)

What Have We Learned



Out 1,916 scheduled hours, lost 196 hours and 14 minutes (8%)

- 5% affected by weather events (48 events for 88h 49m)
- 4% affected by insufficient battery (103 events for 74h 38m)
- 2% affected by lane blockages (24 events for 40h 3m)
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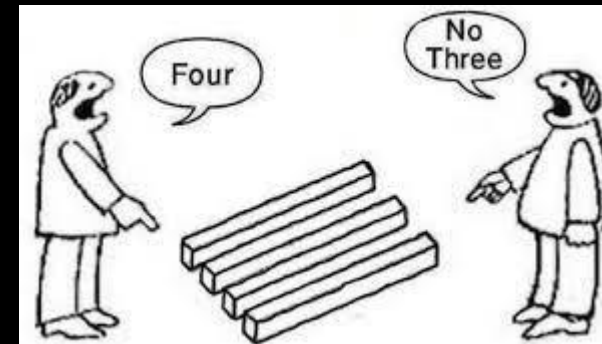
Technology
Perspective

What Have We Learned



Out 1,916 scheduled hours, lost 592 hours and 56 minutes (31%)

- 5% affected by weather events (48 events for 88h 49m)
- 4% affected by insufficient battery (103 events for 74h 38m)
- 2% affected by lane blockages (24 events for 40h 3m)
- 11% affected by construction (59 events for 217h 3m)
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Transit
Perspective

How to Improve “Transit Readiness”



Sensor technology that operates reliably in rain, snow, and fog

“Fuel” that lasts for at least the same shift as a bus operator (at least 10 hours in service)

Ability to maneuver around lane blockages on complex streets

Acceleration and speed comparable to adjacent traffic

Vehicles that can operate on detours without advanced notice

Cabins that reflect personal comfort and space rather than maximize capacity

Suspension of Service



Operators of vehicles equipped with Level 2 to Level 5 autonomous driving capability must report any accidents to the National Highway and Traffic Safety Administration (NHTSA) within 24 hours.

August 23, 2023 – Bus merges into shuttle vehicle, back in service the next morning

November 11, 2023 – Shuttle (manual) advances through stop signal and hits bus

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Lesson 1: A crash with an autonomous vehicle can make national and international news, even if vehicle only has scratches



Lesson 2: A crash with an autonomous vehicle can result in a review of the waiver to conduct the deployment (still have to provide service)





Thank You

Doug Jamison

Program Administrator - Innovation





Connected Vehicle Pilot Deployment Program (2024 Update)

David Williams, VHB

CV Pilot Deployment Program (2024 Update)

- USDOT selected the CV Pilot Deployment in 2015
 - Wyoming Department of Transportation (WYDOT)
 - New York City Department of Transportation (NYCDOT)
 - Tampa Hillsborough Expressway Authority (THEA)
- 3 phases
 - Phase 1 – Comprehensive Deployment Concept
 - Phase 2 – Design, build, test, deploy (3-5 year process)
 - Phase 3 – Operations and Monitoring

CV Pilot Deployment Program (2024 Update)

- Wyoming Department of Transportation (WYDOT)
 - Efficient and safe movement of freight through 400 miles of I-80 corridor
 - Roadside alerts, parking notifications, dynamic travel guidance
 - 325 OBU-equipped vehicles (170 heavy trucks, ~150 WYDOT fleet, snowplows)
- New York City Department of Transportation (NYC DOT)
 - Pedestrian safety in dense urban environment in Manhattan & Brooklyn
 - 3,000 City fleet vehicles and 12 buses
- Tampa Hillsborough Expressway Authority (THEA)
 - Reduce WWD and other conflicts, improving safety and mobility in downtown Tampa
 - 1,000 cars, 7 buses, 8 trolleys



Identified Benefits

- Safety

CV Pilot Site	Goal Area	Finding
WYDOT	Safety	The evaluation found that 50 percent of drivers given a work zone or winter weather warnings reduced their speeds. (2023-B01735).
WYDOT	Safety	Drivers reduced speed within 3 seconds of receiving a Forward Collision Warning (FCW) for 85% of FCW events [3].
NYCDOT	Safety	Red Light Violation Warning reduced red-light running by 41% (2022-B01691).
NYCDOT	Safety	Lane Change Warning reduced unsafe lane change rate by 46% (2022-B01691).
NYCDOT	Safety	Curve Speed Compliance alerts reduced average speeds by 8.75 mph (2022-B01650).
THEA	Safety	Wrong-Way Entry application correctly warned 14 drivers from entering the wrong way (2021-B01550).

Identified Benefits

- Mobility

THEA	Mobility	End of Ramp Deceleration Warning was estimated to reduce the travel-time index (defined by peak travel time / off-peak travel time) by 30% (2021-B01583).
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Identified Benefits

WYDOT	Environment	CV applications had an estimated savings of 46.5 gallons of diesel from reduced idling for trucks per one-hour road closure (2023-B01761).
NYCDOT	Environment	CV applications had an estimated reduction in emissions of 1,287 kg (based on modeling the prevention of 4 hypothetical collisions) (2022-B01701).
NYCDOT	Customer Satisfaction	Survey findings indicated 83% of pedestrians felt safer using the mobile crossing application (2022-B01650).
THEA	Customer Satisfaction	Survey findings indicated 79% of drivers found the End of Ramp Deceleration Warning helpful (2022-B01702).
WYDOT	Public Agency Efficiency	Data from the CVs increased the quantity of road condition reports nearly 4x, improving the ability of the TMC to generate more accurate alerts and advisories (2023-B01735).



ITS Architecture Change Request

David Williams, VHB

23 Code of Federal Regulations (CFR) Part 940

- Establishes ITS Architecture framework

National ITS Architecture (NITSA)

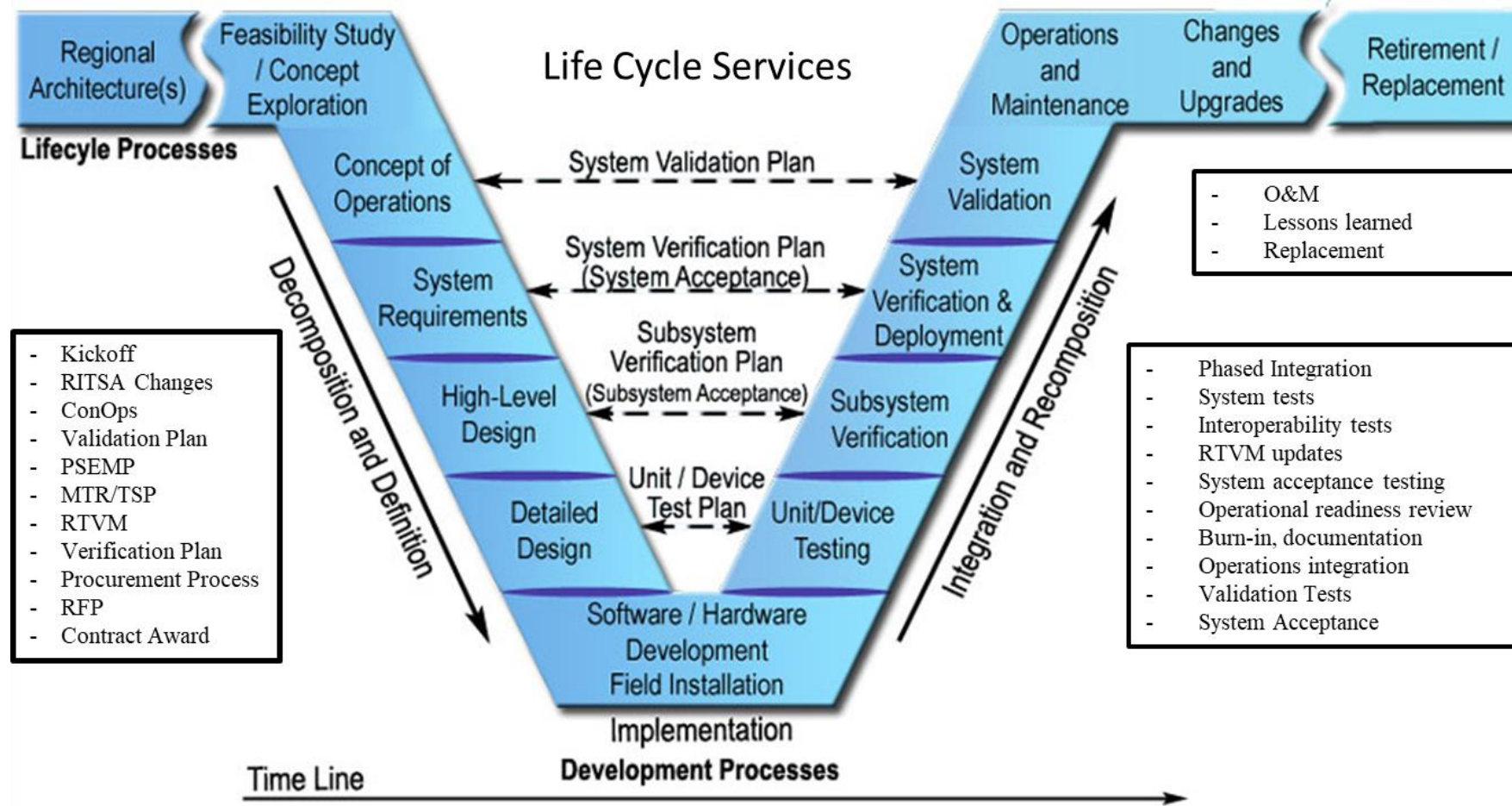
State ITS Architecture (SITSA)

Regional ITS Architecture (RITSA)

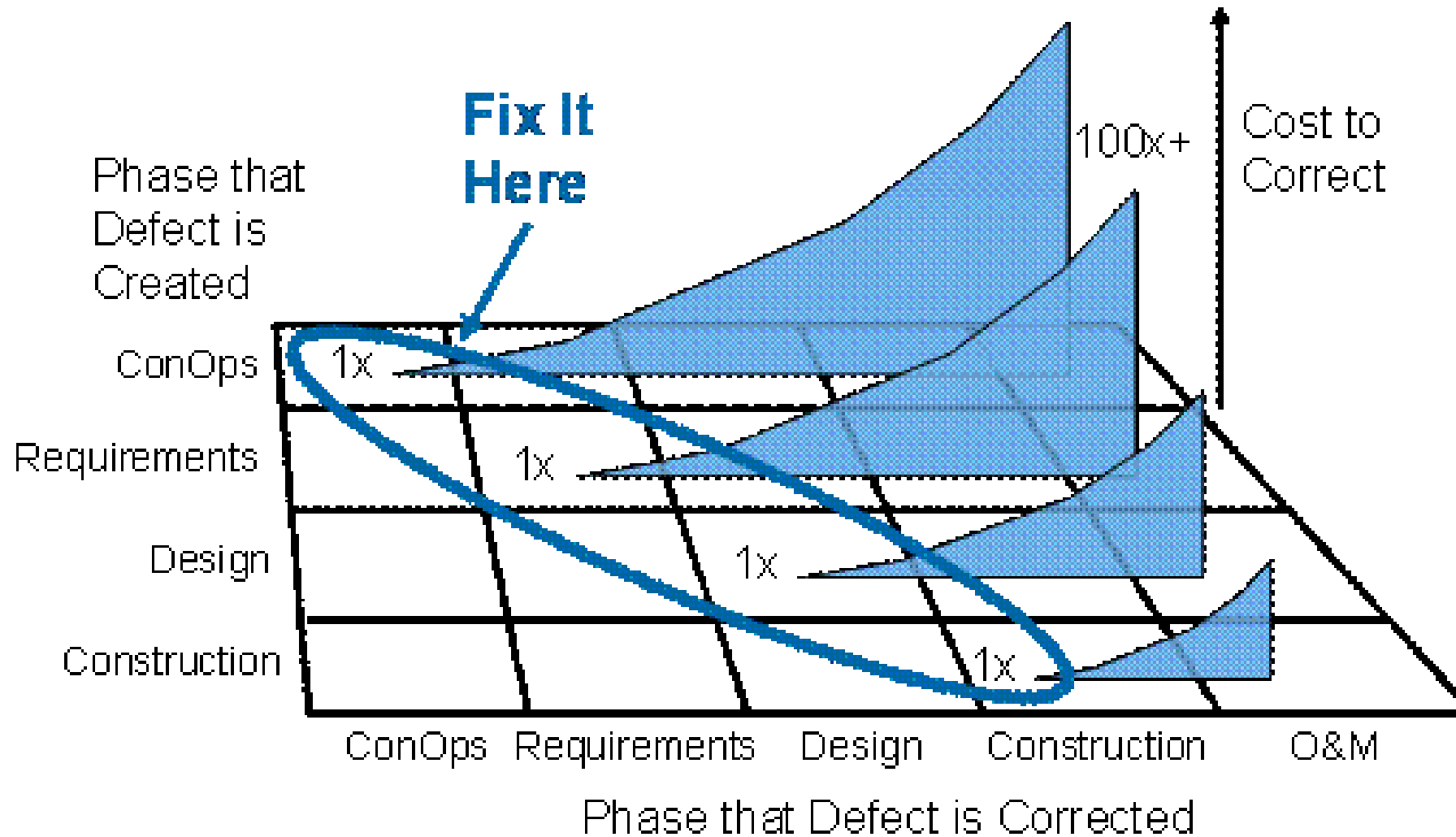
Project ITS Architecture (PITSA)

- Also requires the systems engineering approach for all ITS projects

Systems Engineering



Systems Engineering Approach



<https://ops.fhwa.dot.gov/publications/seitsguide/section3.htm>

Regional ITS Architecture (District 5)

- FDOT conducts periodic ITSA maintenance update cycles
- During SE activities, necessary ITSA changes should be identified
- An **ITS Architecture Change Request Form** should be completed
 - 750-040-04

FLORIDA DEPARTMENT OF TRANSPORTATION
ITS ARCHITECTURE CHANGE REQUEST FORM

750-040-04
TRAFFIC OPERATIONS
09/25

- Instructions for Submitting Form:**
Agency representative requesting changes to the Statewide, Regional or Project ITS Architectures must submit the completed form electronically to FDOT District TSM&O Program Engineer, and FDOT TSM&O Program Development Engineer (sysandarch@dot.state.fl.us).
- Financial Project ID (If Available):** _____
- Agency:** _____
- Agency contact's name, phone, and e-mail:** _____
- Form submitter's name, agency, phone, and e-mail:** _____
- Affected architecture:**
 Statewide District 1 District 2 District 3 Districts 4 & 6
 District 5 District 7 Florida's Turnpike Enterprise
- Title of proposed change(s):** _____
- Detailed description of proposed change(s):** _____
- Rationale for proposed change(s):** _____
- Additional stakeholder(s) impacted by proposed change(s) (if any):** _____
- Comments or additional supporting information (federal grant application, planning documents, concept of operations or system engineering documents, project descriptions, website links, priority of the change, etc.):** _____
- List of attachments:** _____

For FDOT Internal Use Only
Change request added to RITSA Maintenance Log: Date: _____ Tracking Number: _____
Change request returned to submitter for additional information: Date: _____



Regional ITS Architecture (District 5)

- What could trigger a change?
 - New stakeholders
 - Changes in services
 - Changes due to ITS project definitions/implementation
 - Changes due to ITS project completion/addition/deletion
 - Changes in stakeholder/element names
 - Changes in ITS project priority
 - Updated Long Range Transportation Plan

Regional ITS Architecture (District 5)

- FDOT is always accepting ITS Change Request Forms
- To be included in upcoming cycle, the ITS Change Request Form must be **submitted by July 31, 2024**
 - sysandarch@dot.state.fl.us
 - Coordinate with David
- To review the FDOT SITSA and RITSA, visit
 - <https://teo.fdot.gov/architecture/architectures/d5/index.html>
 - or search: “FDOT Architecture”

Regional ITS Architecture (District 5)

Questions?

katie.king@dot.state.fl.us

david.williams2@dot.state.fl.us





Annual Maintenance Meeting

David Williams, VHB

Annual Maintenance Meeting

- Previously held annual meeting to discuss ITS maintenance activities, lessons learned, best practices
- Developing agenda next few weeks
 - If you have any suggestions, please reach out to Tricia or David
- November 19, 2024, from 8:00a to 12:00p at the District 5 RTMC
 - Invite to follow Consortium meeting

Annual Maintenance Meeting

- Intended audience is maintaining agency staff:
 - Senior traffic signal technicians
 - Traffic signal technician managers
 - Traffic Engineering staff
 - Traffic Operations staff



Artificial Intelligence (AI)-Enabled ITS Capability Maturity Model Workshop

David Williams, VHB

AI-Enabled ITS CMM Workshop

- District 5 is hosting a Workshop to discuss AI-enabled ITS:
 - Overview of AI / AI in Transportation
 - Review of ongoing AI work conducted by agencies in Central Florida
 - Capability Maturity Model and AI-enabled ITS
 - Federal Research Priorities on AI
- August 29, 2024 from 10:00a to 12:00p at District 5 RTMC
 - Invite to follow the TSM&O Consortium

AI-Enabled ITS CMM Workshop

- AI-enabled ITS Webinar today from 2:00p to 3:15p
 - https://www.its.dot.gov/press/2024/ai_its_webinar.htm
 - Search: “AI-enabled ITS webinar”

FLASH AWARD

- D5 TSM&O's new recognition program for outstanding maintaining agency response for traffic signal emergencies
- Focuses on showcasing specific efforts throughout D5
- Discuss processes, best practices, lessons learned, etc.



FLASH AWARD

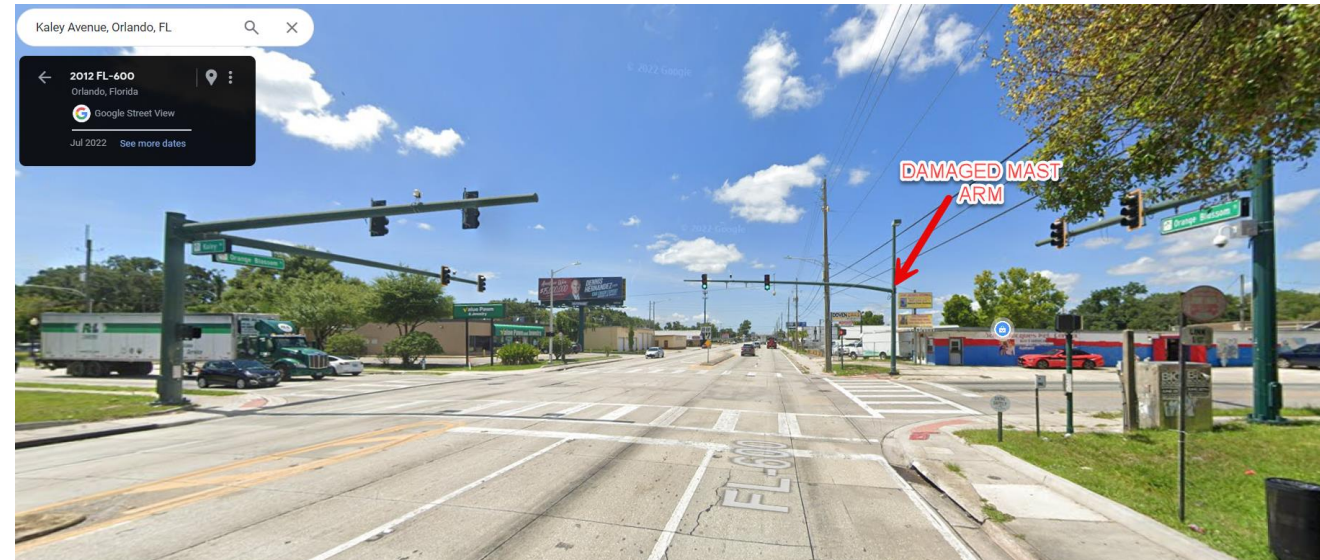
- D5 TSM&O's new recognition program for outstanding maintaining agency response for traffic signal emergencies
- Focuses on showcasing specific efforts throughout D5
- Discuss processes, best practices, lessons learned, etc.



US 441 at Kaley Avenue Orange County



- Routine inspection on September 8th, 2023 found that conditions at one of the mast arms had deteriorated at a much faster rate than expected
- Inspection noted that the arm had significant section loss with corrosion holes, tears/cracks at the moment connection and that the arm was buckling
- Damaged mast arm was older clamp-on design



US 441 at Kaley Avenue Orange County



US 441 at Kaley Avenue Orange County



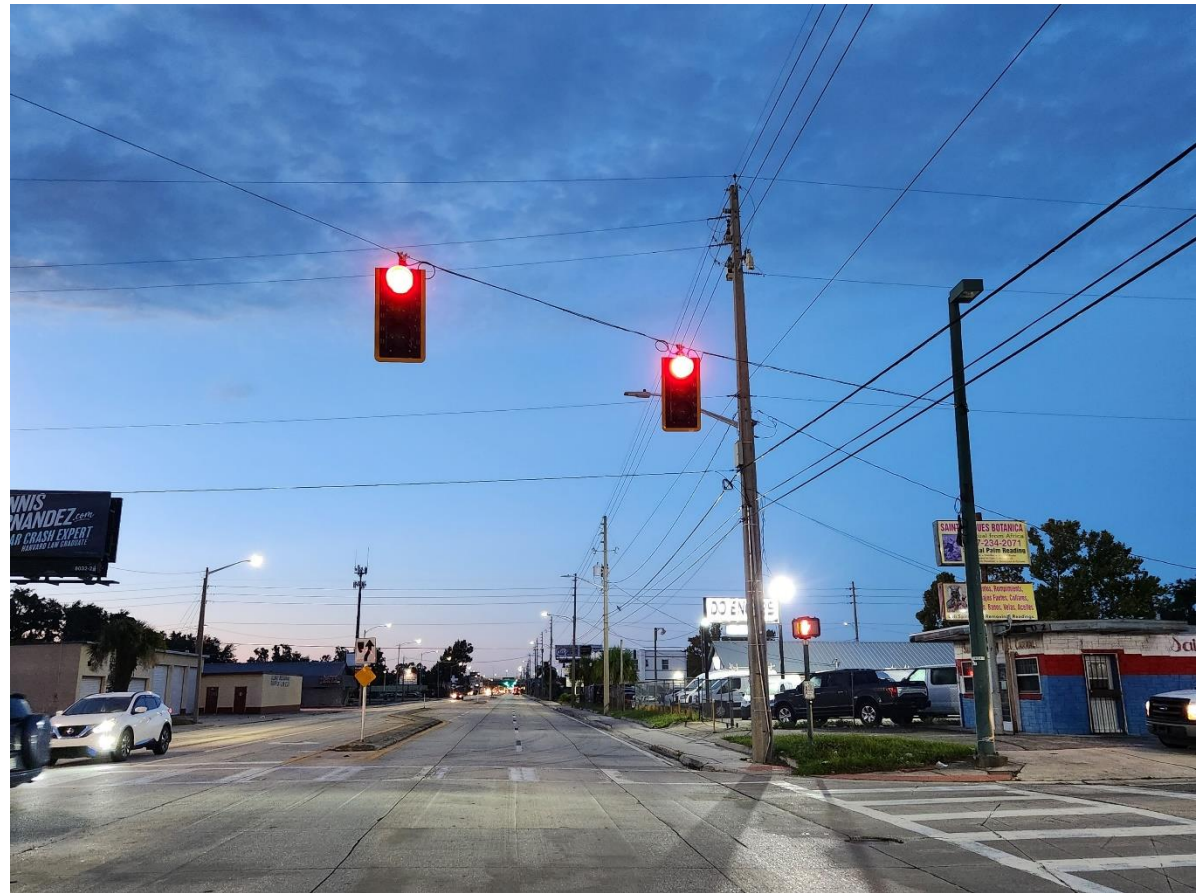
- Emergency Response details

- FDOT Structures Maintenance team requested the damaged arm be taken down September 8, 2023 12:47 PM
- Orange County Traffic Engineering acknowledge receipt request and began developing plans to find a short term and long term solution
 - Options evaluated : Short term temporary span and long term arm replacement using older mast arms from their yard
- September 15th update from the County indicated they had found a candidate arm replacement in their yard, but a temporary span would still be needed while arm was removed and new arm installed and rebuilt for signalization
- September 19th update from the County indicated that their team had completed the removal of the damaged arm, and installed a temporary span utilizing the remaining upright and a new wood pole

US 441 at Kaley Avenue Orange County



- Temporary span was set up in a diagonal manner due to lack of ROW in the adjacent corner across US 441 and overhead and underground utilities to work around
- Orange County used the removed damaged arm to compare and remeasure the proposed used arm. County also coordinated with FDOT Structures Maintenance team to inspect the new arm
- October 16th update from the County indicated the new arm was installed, and temporary span was removed.



US 441 at Kaley Avenue Orange County



- New condition



US 441 at Kaley Avenue Orange County



- Key successes

- Team Expertise and Longevity: Having a dedicated team with long-term experience significantly enhances our ability to respond effectively to emergencies. technicians who have been with us for over 15 years and are highly trained to handle these kinds of emergencies.
- Continuous Availability: Maintaining a team that is available 24/7/365 ensures that we can respond to emergencies at any time, providing immediate and reliable support when it's most needed.
- Critical Thinking and Adaptability: Even without specific training for every type of emergency, our team's critical thinking skills and adaptability enable them to develop responses that meet the highest standards. This flexibility is crucial in handling unexpected situations effectively.
- Ongoing Training and Skill Development: Regular training and skill development are essential to keep the team prepared for a wide range of emergencies. Investing in continuous education helps us stay current with best practices and new technologies.
- Collaborative Approach: Encouraging teamwork and communication among our staff fosters a collaborative environment where knowledge and expertise are shared, leading to more effective and cohesive responses.
- Orange County were able to have most of the material in stock and they were currently available, it just required us a purchase order for additional minimal unique components.

US 441 at Kaley Avenue Orange County



- Next Steps
 - Per the TSMCA, a change of order will be made to add overseen work or events like the one that was contemplated in this emergency response. Approximate cost was \$30,000
- Highlights / Best Practices
 - Save and store mast arms if they are in good shape, don't scrap everything during replacement projects
 - Orange County has continuing term contracts with multiple signal contractors for large tasks. In this project assistance was also provided by Yunex Traffic

US 441 at Kaley Avenue Orange County

- Key Staff Involved – Orange County
 - Nekia Frazier - purchasing process
 - Humberto Castillero - Division Manager and liaison
 - Roger Smith - Project Manager
 - Matt Shipley - pole yard coordination confirming the mast arm size and field reviews
 - Mike Colon - signal inspections and field reviews
 - Andrew Pointer - signal inspections and field reviews





All Red Extend

David Williams, VHB

All Red Extend

- District has been looking into All Red Extend applications at pilot intersections
- Lake County has deployed 2 NoTraffic detection units
 - ATSPM, Counts, Data Analytics



Regional Cyberkey Integration

Steve Johnson, FDOT District Five

Regional Cyberkey Integration

- District is looking into hosting a regional license for Cyberkeys
 - Would enable better pricing than individual accounts
- Would require a “Parent-Child” hierarchy
- There may be some growing pains relating to...
 - Access and User management
 - Integration of participating agencies’ databases
 - Want to avoid having to re-input data

Regional Cyberkey Integration

- If any agency is interested in pursuing a regional license, please reach out to:
 - Steve Johnson (steve.johnson@dot.state.fl.us) or
 - David Williams (david.williams2@dot.state.fl.us)



Project Updates DANIEL and HEIDI

Katie King, Metric Engineering

Current Initiatives

- High-Definition Engineering Intersection Data via Integrative Modeling (HEIDI)
- Digital Analytics Notification for Incident and Event Localization (DANIEL)



Current Initiatives

Jeremy Dilmore, FDOT District Five

Automated Vehicles

- Technologies like Automated Vehicles are discussed more frequently at MPO/TPO meetings, and more broadly in the public
- How do we best spread the word to folks outside the TSMO practice area?

Workforce Development Training

- Wavetronix Training on July 15th

Current Initiatives

- I-4 Express Lanes
- I-4 FRAME
 - Coordination with local agencies and device configuration underway
- OBU Deployment

Current Initiatives

- PedSafe II
- CRISI Grant 2023-2024
 - Submitted to FRA on May 28
 - Deployments across Central Florida
 - Pre-signals
 - Queue Cutters
 - Crossing Gate Monitoring System



Current Initiatives

- AV Shuttle
- Kiosks at UCF



Current Initiatives

- Smart Work Zone
 - Mobilized in late November





THANK YOU!

Next Consortium – October 24, 2024



TSM&O Consortium Meeting

MEETING AGENDA

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

June 27, 2024

10:00 AM-12:00 PM

- 1) SHUTTLING WITH AUTONOMOUS NAVIGATION (SWAN) SHUTTLE
 - Doug Jamison, LYNX
- 2) CITY OF ORLANDO SPECIAL EVENT COORDINATION
 - Jim Young, City of Orlando
- 3) CONNECTED VEHICLE PILOT DEPLOYMENT (2024 UPDATE) – ITS JPO
 - David Williams, VHB
- 4) ITS ARCHITECTURE CHANGE REQUEST
 - David Williams, VHB
- 5) UPCOMING MEETINGS AND WORKSHOPS
 - David Williams, VHB
- 6) FLASH AWARD FOR EMERGENCY REPAIRS
 - Kevin Marquez, FDOT District Five Traffic Operations Pushbutton Program
- 7) CURRENT INITIATIVES
 - Jeremy Dilmore, FDOT District Five Traffic Operations