2026 EI&T Seminar Learning Objectives

February 5, 2026

Smart St. Augustine Technologies and Benefits to the City

Presenter(s): Peter Vega, P.E. - District Two TSM&O Program Manager - Florida Department of Transportation

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Abstract

St. Augustine is noted as our nation's oldest city (founded in 1565) and has become a massive tourist destination that attracts 6 million visitors each year. The local population is over 15,000 and roadways are designed as such. Due to the enormous number of tourists and limited footprint along the roadway corridors, advanced technologies are being deployed to address the parking situation, pedestrian/bicyclist safety, bridge closures, flooding. Connected Vehicle technology, passive detection systems, parking system monitoring sensors, dynamic message signs, flood sensors, and conditions app are being implemented within the project.

This is "Plan A" in the overall technology efforts desired by the city. In the future, the data will be utilized for satellite parking tied to autonomous shuttles. The objective is to return this relic of a city to its historic nature by making travel more pedestrian, bicyclist, and physically disabled friendly.

Learning Objectives (30 minutes)

- **First 10 minutes:** The initial learning objective will cover what was done to determine the limitations and needs of a very challenged roadway system. The discussion will then lead into potential technological solutions to improve on these challenges.
- **Second 10 minutes:** The second objective identifies and explains the technologies being implemented, the reason, how the products were chosen, and the intent for future expansion of this deployment's capabilities.
- **Third 10 minutes:** The third objective recognizes advanced technologies that would enhance this deployment. This could be done using AI software applications, C-V2X capabilities, and the coming evolution with autonomous vehicles.

SWAN Autonomous Shuttle

Presenter(s): Doug Jamison – Program Administrator, Central Florida Regional Transportation Authority (LYNX)

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Abstract

The SWAN (Shuttling With Autonomous Navigation) Shuttle Program is a joint project launched by the City of Orlando and Central Florida Regional Transportation Authority (LYNX), powered by Beep™. The project intent is to help advance Orlando's Future-Ready efforts and furthers the city's goal of the Autonomies Shuttle Pilot Project, providing a free-ride driverless experience for up to nine passengers. The experience helps the city with it's connected community goal, by investing in the state-of-the-art technology and offering sustainable transit solutions that are safe, efficient, and environmentally friendly.

Learning Objectives (30 minutes)

- **First 10 minutes:** Assess the experience of the one-mile-long route with the five stops connecting LYNX Central Station and SunRail to University of Central Florida/Valencia College downtown campuses.
- **Second 10 minutes:** Explain the effectiveness of the autonomous shuttles operating in the existing bus lane dedicated to the LYMMO Orange Line.
- **Third 10 minutes:** Evaluate the usefulness of the operating schedule during early afternoon and evening from 10:00 AM to 2:00 PM and 6:30 PM to 10:30 PM

Solving wastewater biosolids challenges in the face of uncertainty

Presenter(s): Chris Andres, Water Reclamation Division Manager, City of Orlando

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Abstract

The City of Orlando has three large wastewater treatment plants (WWTPs) that produce approximately 280 wet tons per day of biosolids that must be safely managed and disposed under varying weather conditions. Existing facilities are aging, land application sites are competitive and dwindling, landfill tipping fees are rising, and concerns regarding PFAS regulations have created uncertainty about the future of land application. Despite this, the City must maintain 24/7 operation of wastewater treatment facilities. This presentation describes challenges, successes, and lessons learned from navigating this situation, which includes rapid deployment of a thermal drying technology with add-on PFAS destruction capabilities.

Learning Objectives (30 minutes)

- **First 10 minutes:** Describe existing conditions and challenges driving the needs and requirements
- **Second 10 minutes:** Identify and review major technologies and associated implementation strategies
- **Third 10 minutes:** Discuss lessons learned from navigating uncertainty and key factors for success

Building a Smarter City: Altamonte Springs' Digital Twin Journey

Presenter(s): John Sember, Director of Strategic Planning and Analysis, City of Altamonte Springs

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Abstract

Cities face the continuous challenge of managing infrastructure, optimizing resource allocation, and maintaining citizen engagement within the constraints of limited budgets and evolving demands. Digital twins are a groundbreaking technology that provides a virtual replica of real-world physical assets, systems or processes, enabling cities to model, simulate, and optimize operations. Altamonte Springs is one of the first cities in Central Florida to pilot a digital twin and move it into the development phase. The City's digital twin is oriented toward mobility, infrastructure, public safety, and venue management and will integrate data from multiple systems into one dynamic platform. This presentation will provide an overview of what a digital twin is, share the City's pilot project journey and proof-of-concept objectives, and present examples of the pilot's 3D environment. In 2025, the digital twin project moved into the feature development phase and the presentation will discuss where the project is headed.

Learning Objectives (30 minutes)

- **First 10 minutes:** Identify the characteristics of a digital twin, apply the maturity spectrum for digital twins of the built environment, and describe the possible benefits of a geospatial digital twin.
- **Second 10 minutes:** Explore components of the pilot project, including objectives, study area, good-better-best model, and reality capture methods. Review the pilot project successes through visual examples.
- **Third 10 minutes:** Gain insights as to where the City's digital twin project is headed. Explain the feature development process and the features planned to be deployed in the areas of mobility, infrastructure, public safety, and venue management.

Fast & Furious? Sarasota's Journey to Safer Speeds

Presenter(s): Corinne Arriaga, Senior Transportation Planner - City of Sarasota
Alvimarie Corales, Chief Transportation Planner - City of Sarasota

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Abstract

The City of Sarasota is taking steps to unify traffic calming and speed mitigation at the city level. Originally, the traffic calming program reviewed spot locations, evaluating whether traffic calming measures should be installed. Seeing how this program didn't take a system-level approach to solving the perceived speeding crisis in neighborhoods, transportation planning teamed with RK&K to take a proactive approach to address speeding concerns throughout the city. Leaning into a multi-disciplinary leadership task force and an actively engaged community think tank, the city is developing a city-wide traffic calming plan. One of the key approaches is to marry the existing local streets' traffic calming approach with speed mitigation on collectors and arterials.

Learning Objectives (30 minutes)

- **First 10 minutes:** Analyze speed data at a city-wide level using big data technology
- **Second 10 minutes:** Apply the analysis performed to street-level traffic calming evaluations
- **Third 10 minutes:** Develop meaningful community engagement that elevates voices from various backgrounds and communities

FDOT Multicounty Flood Sensor Project.

Presenter(s): Terry Shaw, Sr. Practice Builder, Kimley-Horn

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Abstract

This presentation will discuss the deployment of water level sensor technologies by FDOT District 2 that will support the needs for Transportation Systems Management and Operations (TSM&O) and resiliency planning in Clay, Duval, Nassau, and St. Johns Counties. The project will implement a 24-month data collection program for water levels and street flooding technologies. Street flooding is increasingly common in North Florida and these flooding events create a safety concern and require traffic to be diverted creating delays. Flooding challenges in North Florida are multifaceted, involving natural and human-induced factors. Rising sea levels, intense rainfall, and storm surge events contribute to the region's susceptibility to flooding. Leveraging water level sensors will allow the Florida Department of Transportation (FDOT) and local partners to notify travelers to avoid streets where flood is anticipated to occur which will enhance safety and reduce congestion.

Learning Objectives (30 minutes)

- **First 10 minutes:** Participants will be provided with an overview of various water level technologies to Identify the best fit for various site conditions and applications.
- **Second 10 minutes:** Participants will be provided with an overview of factors that can be used to evaluate flood risk and define site conditions for water level sensors.
- **Third 10 minutes:** Participants will recognize how to use the data collected in operations and resiliency applications through a demonstration of data use cases.

High-Performance Emulsions: Engineering Durable, Circular, and Cost-Effective Pavements for Florida

Presenter: Amy Blaida, Ergon Asphalt & Emulsion

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Abstract

As Florida faces increasing material costs and extreme environmental demands, the next generation of asphalt emulsions must prioritize resilience and resource efficiency. This session moves beyond traditional additives to explore how Bio-Oils, Lignin, and Biochar act as high-performance modifiers that stabilize binders against Florida's intense UV and moisture cycles. We will discuss the practical implementation of Circular Roads – maximizing RAP usage to hedge against supply chain volatility – and the engineering of Perpetual Pavements designed for a 50-year lifespan. Attendees will gain a technical roadmap for utilizing "Atmospheric Waste" (Biogenic Carbon) not as a regulatory checkbox, but as a tool for creating a self-healing, cost effective, and long-lasting roadway network.

Learning Objectives (30 minutes during lunch break)

- **First 10 minutes:** Identify new ways to extend pavement life. Demonstrate how bio-based additives act as "sunscreen" for roads to prevent UV damage and cracking in the Florida heat.
- **Second 10 minutes:** Reduce project costs using recycled materials. Specify how to safely increase the use of recycled asphalt (RAP) in mixes to hedge against rising material and hauling costs.
- **Third 10 minutes:** Bridge the gap between innovation and Policy. Explain how to frame sustainable paving technologies as "fiscal resilience" tools that comply with Florida's latest legislative (SB 1628) and budgetary requirements.

United Kingdom Standard for AI Pavement Assessments

Presenter(s): Glen Hutchinson, Enterprise Sales Executive, Vaisala, Inc.

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Abstract

PAS 2161 is the UK Department for Transportation (DfT) road condition monitoring data specification for national reporting in England, developed with the British Standards Institution (BSI) and authored by the Transport Research Laboratory (TRL). It modernizes how agencies report road condition by shifting from a single mandated survey approach to approved technology options, while keeping results comparable through a defined approvals process. The standard introduces a 1-5 condition category format (1 = no deterioration, 5 = severe deterioration) aligned to an engineers view of the maintenance likely required creating a more decision-ready output for prioritization and investment conversations. This session translates PAS 2161 into practical takeaways for AI-enabled pavement assessments: what the standard is trying to achieve, what good data and QA/QC look like, and how to apply the PAS mindset to procurement, acceptance criteria, and program governance even outside the UK

Learning Objectives (30 minutes)

- **First 10 minutes:** Participants will be better able to:
  - Define PAS 2161 and describe how it supports national road condition reporting in England.
  - Differentiate PAS 2161's 1–5 condition categories from legacy reporting approaches and explain why direct "apples-to-apples" mapping to older categories can break trendlines.
  - Summarize the implementation timeline (dual running, transition periods) and identify what changes are operationally for agencies and suppliers.
- **Second 10 minutes:** Participants will be better able to:
  - Interpret key PAS 2161 coverage expectations by road class and apply them to a realistic network reporting plan.
  - Explain how the approvals process benchmarks technologies against engineer reference results to protect comparability and credibility.
  - Identify the minimum "defensible data" elements (traceability, repeatability, and QA evidence) that reduce risk in AI-based condition reporting.
- **Third 10 minutes:** Participants will be better able to:
  - Develop procurement and acceptance criteria for AI pavement assessments using PAS-style requirements (inputs, outputs, QA/QC, and auditability).
  - Evaluate vendor deliverables for decision-readiness (consistency, explainability, and governance fit) rather than "cool tech demos."
  - Draft a lightweight implementation playbook that connects PAS-aligned condition categories to maintenance prioritization and performance reporting.

Connected Vehicle Priority and Preemption

Presenter(s): William Johnson, Engineering Associate, Hillsborough County

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Abstract

Hillsborough County staff are proposing a presentation on the county's Connected Vehicle Priority and Preemption (CVPP) project. The CVPP project was designed as a leased turn-key solution that is comprised of a vehicle preemption unit (VPU) that communicates the emergency vehicle position, bearing and speed via a cellular and a redundant direct radio-based communication to the adjacent traffic signals. An integrated field management unit (FMU) at each intersection communicates with each emergency vehicle and each traffic signal controller to provide preemption of the traffic signal to safely clear the approach in front of the emergency vehicle. The CVPP system includes a connected vehicle component via smartphone application that sends safety messages to vehicles and pedestrians along the path of the responding emergency vehicle. Signal Phasing and Timing (SPaT) data is also displayed on the smartphone application to improve safety and traffic flow while reducing emissions.

The CVPP started with 26 vehicles and 13 intersections to demonstrate proof-of-concept. Post acceptance, the system has now been implemented countywide, deployed in 158 fire rescue apparatus and at (>592) intersections maintained and operated by Hillsborough County. Benefits of the system include:

- Decreased emergency response times.
- Improved emergency vehicle route selection through better information of traffic conditions and route obstacles.
- Safer passage through signalized intersections.
- Reduction in crashes related to approaching emergency vehicles.
- Improved situational awareness for all roadway users.
- Last mile communications for remote and aged infrastructure locations.

Learning Objectives (30 minutes)

- **First 10 minutes:** Participants will be able to establish goals for implementing an emergency vehicle preemption system.
- **Second 10 minutes:** Participants will be able to determine what factors need to be considered when selecting an emergency vehicle preemption system.
- **Third 10 minutes:** Participants will be able to identify some of the challenges of implementing emergency vehicle preemption area wide.

CFX Flex Lanes Deployments

Presenter(s): Dalita Singh, P.E., TSM&O Project Manager, CFX
Zubayer Islam, Ph.D, Assistant Professor, UCF

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Abstract

The Flex Lanes program is a mix of Part-time Shoulder Use on the Shoulder and Active Lane Management. It is an innovative active traffic management strategy designed to optimize capacity on roadways that are experiencing peak period congestion. Currently, this feature allows the left shoulder to temporarily open to traffic when an incident occurs in one or more of the right lanes, resulting in their closure. In the future and as congestion increases, the Flex Lanes system will use the inside shoulder as a temporary travel lane during high-demand periods, without requiring full roadway widening. Controlled by dynamic overhead Lane Control Signs displaying green arrows for open lanes and red X's for closed lanes;the system will enhance traffic flow, improve travel time reliability, and increase safety by reducing crash risks associated with congestion. Flex Lanes is a cost-effective solution that accommodates fluctuating traffic volumes while minimizing construction costs compared to permanent lane additions. Early data demonstrates reductions in delays and crashes, making Flex Lanes a viable tool for the modern transportation infrastructure.

Learning Objectives (30 minutes)

- **First 10 minutes:** Define and explain the concept of Flex Lanes
- **Second 10 minutes:** Identify key benefits and operational advantages
- **Third 10 minutes:** Evaluate real-world implementation and outcomes based on initial stages of data collection

D5 Innovative Projects Discussion Panel

Presenter(s): Tricia Ballard, FDOT D5 TSM&O Engineer;Katie King, D5 TSM&O Planning PM, Metric Engineering;Jessica Knox, Director of TMC Operations, Metric Engineering;Aurelio Giovinazzo ICM Project Manager (I-95), AECOM

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Abstract

Project 1 - FDOT District 5 Red Clearance Extension - This presentation will discuss District 5's approach to implementing All-Red Clearance Extension at signalized intersections and the criteria used in intersection decision-making. All-Red Clearance Extension helps reduce the risk of red-light running crashes and enhances safety for all roadway users by extending the red clearance interval when a vehicle is detected approaching the intersection at high speed during the red clearance phase. This solution leverages existing detection equipment, and most ATC controllers are already compatible with the technology. All-Red Clearance Extension is a proven safety countermeasure, and District 5 plans to expand its use across the network.

Project 2 - FDOT District 5 Heidi Project - This presentation will discuss District 5's High-definition Engineering Intersection Data via Integrative modeling (HEIDI) project. The goal of HEIDI is to improve data completeness on arterials so we can better manage signals as a part of the integrated corridor management system. The most beneficial data sets to make traffic decisions are all some derivative of speed, volume, and occupancy. Volume data, especially turning movement count volume is difficult to collect but is extremely helpful in making signal timing adjustments. The smart signal program has been working to improve data availability by deploying ATC controllers and smart detection. This project uses AI to combine third-party probe data with smart signal data to provide arterial volume data across 2,000 signalized intersections within the 9 County District area. With the emerging use of AI, it is important to implement a system in line with the Department AI policy, using a man in the middle approach the HEIDI project provides access to volume data and key advanced traffic signal performance measures to allow retiming engineers to make data driven signal timing adjustment decisions.

Project 3 - FDOT District 5 Signal Siren - Signal Siren is a software-based Emergency Vehicle Preemption system that grants fire and rescue vehicles green-light priority at signalized intersections without relying on expensive roadside devices or line-of-sight hardware. By removing the need for traditional emitter and detector infrastructure, it reduces installation complexity, long-term maintenance, and overall infrastructure cost while improving response reliability. The platform uses configurable rules and secure communications to initiate and manage intersection priority, with event logging and monitoring that supports performance tracking and operational oversight. The result is faster, more consistent emergency response and improved roadway safety by helping emergency vehicles move through intersections more efficiently and predictably. Signal Siren is currently deployed in 160 vehicles and configured for 421 traffic signals.

Project 4 - FDOT District 5 - I-4 FRAME Project - The I-4 Florida's Regional Advanced Mobility Elements (FRAME) project is an initiative led by the Florida Department of Transportation (FDOT) to deploy connected vehicle (CV) and intelligent transportation system (ITS) technologies along a key 72-mile stretch of Interstate 4 (I-4) between Tampa and southwest Orlando. The project, spanning four counties (Hillsborough, Polk, Osceola, and Orange), aims to enhance regional mobility, safety, and corridor management by establishing an integrated corridor management (ICM) system and roadside infrastructure equipped to communicate with connected vehicles and traveler information systems. It will install roadside units and related ITS components to support vehicle-to-infrastructure (V2X) communication, enabling real-time traffic, signal timing, and incident warnings to motorists. Funded in part by federal grants and implemented across multiple FDOT districts, I-4 FRAME seeks to reduce congestion, improve traffic flow and safety outcomes, and serve as a model for future connected transportation deployments.

Learning Objectives (60-90 minutes)

- **First 30 minutes:** Explain and compare how advanced traffic signal and corridor technologies, including All-Red Clearance Extension, AI-enabled arterial data integration (HEIDI), emergency vehicle preemption (Signal Siren), and connected vehicle infrastructure (I-4 FRAME) are used to improve safety, mobility, and operational efficiency across urban networks.
- **Second 30 minutes:** Evaluate the role of real-time and integrated data sources (e.g., detection systems, probe data, AI-derived volumes, and V2X communications) in supporting data-driven decision-making for signal timing, emergency response prioritization, and integrated corridor management.
- **Third 30 minutes:** Apply best-practice criteria and implementation considerations from FDOT District 5 case studies to identify opportunities for deploying scalable, cost-effective intelligent transportation solutions within their own agencies or corridors.