




June 19 - 20, 2025
Hollywood, FL

ITS Device Testing Modified Special Provisions and Process Improvements

Transportation Symposium Website



SCAN ME

1

Speakers

Nick Slupecki, P.E.
TSM&O Integration Engineer



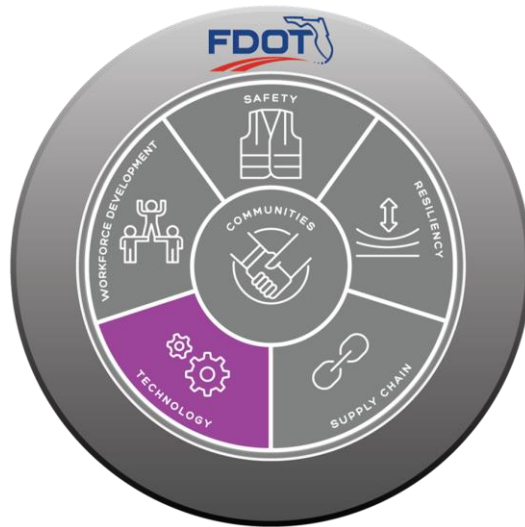
Sarely Tejeda, P.E.
Broward Construction Manager



TRANSPORTATION SYMPOSIUM

2

2



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3

3

Compass – Technology Impacts

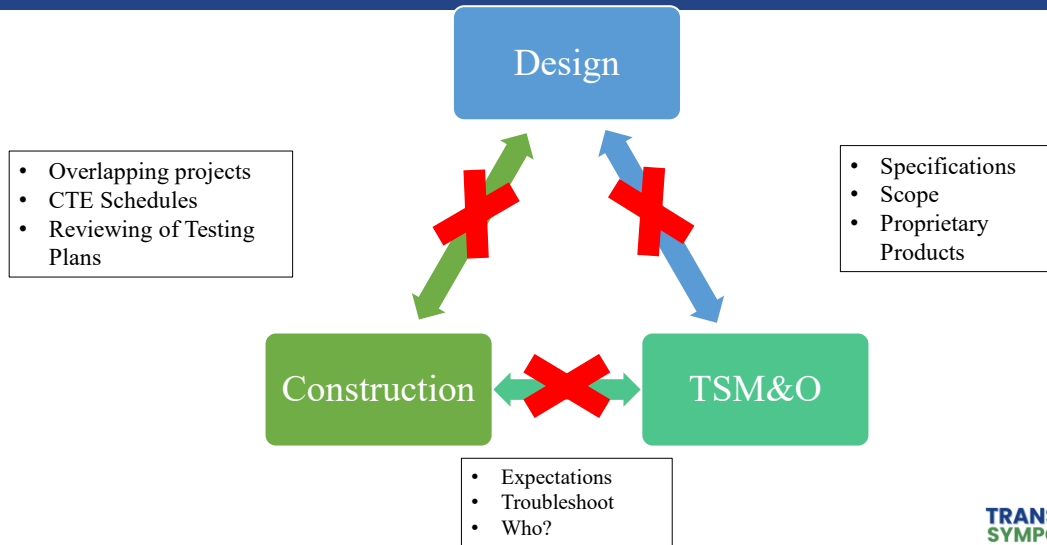


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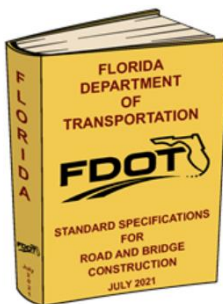
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The Issue



5

ITS System Testing



611-5 ITS System Acceptance Test.

After the stand-alone tests have been completed and approved by the Engineer, perform the System Acceptance Test in the presence of the Engineer and, when applicable, a representative of the agency designated to accept maintenance responsibility.

Conduct an approved 30-day System Acceptance Test during which all ITS Systems, Sub-Systems and, at a minimum, all control, monitoring, and communication functions of the field equipment are evaluated from a Transportation Management Center (TMC). Complete the System Acceptance Test documentation and turn them over to the Engineer for approval.

DESIGN

CONSTRUCTION

TSM&O

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6

6

Modified

4. CCTV STANDALONE TEST CHECKLIST

The Contractor shall provide all resources required for successful testing, to include:

1. Cabinet key (as applicable)
2. Lowering device or bucket truck (as applicable)
3. Maintenance of Traffic (as applicable)
4. Laptop with VLC player
5. Laptop with Vendor Software

Date/Time: _____ Local Hub: _____ CCTV: _____ Latitude: _____

IP: _____ MAC: _____ Serial No.: _____ Longitude: _____

Weather: _____

Step	Procedure	Expected Result	Pass/Fail
1.	Using a laptop computer, establish local communication to the CCTV via an Ethernet cable using an IP address and web interface or CCTV software.	Communication is established as described.	Pass: <input type="checkbox"/> Fail: <input type="checkbox"/>
2.	(If applicable) For pressurized cameras verify there is no message indicating "low pressure" and pressure measurement reads 5 psi.	There is no message indicating "low pressure" and pressure measurement reads 5 psi.	Pass: <input type="checkbox"/> Fail: <input type="checkbox"/> N/A: <input type="checkbox"/>
3.	Using 'Pan/Tilt' controls, adjust the CCTV until the horizon is in view. 'Pan' left and stop after a 360° rotation.	CCTV completes the command and stops. Mark N/A for a fixed camera.	Pass: <input type="checkbox"/> Fail: <input type="checkbox"/> N/A: <input type="checkbox"/>
4.	'Pan' right and stop after a 360° rotation.	CCTV completes the command and stops. Mark N/A for a fixed camera.	Pass: <input type="checkbox"/> Fail: <input type="checkbox"/> N/A: <input type="checkbox"/>
5.	'Tilt' down and stop when perpendicular with the ground.	CCTV completes the command and stops. Mark N/A for a fixed camera.	Pass: <input type="checkbox"/> Fail: <input type="checkbox"/> N/A: <input type="checkbox"/>

611-4.2 Intelligent Transportation
functions of the ITS devices as detailed in
Engineer.

For the managed field Eth

750-040-07 for all installed field switche

For the closed-circuit tele

750-040-08 for all installed CCTV camer

For microwave vehicle de

750-040-09 for all installed MVDS senso

For the camera lowering d

750-040-10 for all installed CLDs.

For the dynamic message

750-040-11 for all installed DMS.

For the remote power mar

750-040-12 for all installed RPMU.

For the ITS cabinet, comp

ITS cabinets.

For ITS devices without o

Contract Documents and as approved by

test procedures and obtain Department-a

approved by the Engineer, perform
ing Department-approved procedures.
representative of the agency designated

test during which all ITS Systems,
and communication functions of the
gement Center (TMC). Complete the
r to the Engineer for approval.

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7

7

Department Approved Test Plans

DEVICE: CCTV VERIFICATION

ST DEVICE: MVDS VERIFICATION

ST DEVICE: RPMU VERIFICATION

ST DEVICE: RSS VERIFICATION

ST DEVICE: WRONG WAY VEHICLE DETECTION SYSTEM VERIFICATION

* Not Exhaustive

STEP NO.	PROCEDURE	EXPECTED RESULTS	PASS/FAIL
1	Notify operations t under testing will b and out of service t during this test per		
2	Trigger wrong direc using the WWVDS function or driving direction area.		
3	Trigger wrong direc using the WWVDS function or driving direction area.		
4	Record all events in a tracking log so that False Positives can be calculated at the end of the 30-day test period. False	All events are recorded in tracking log for comparison at the end of 30-day test period against Average Annual Daily	Pass: _____

2.2. Testing Schedule

Contractor anticipates 30 days to complete the System Acceptance Testing. Testing will occur at the start and conclusion of the 30-day Test period with routine intervals of twice a week during the test period. Please refer to the table below for the schedule timeline. I.e, Mondays and Fridays, or Tuesdays and Fridays, etc as proposed, as well as the start time.

Week NO.	DAYS OF THE WEEK	TIME
1		
2		
3		
4		

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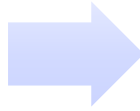
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8

MSP Approval and Implementation

Today

- Add MSP project by project, identified by Pay Item
- Projects letting between now and FY 27



FY 27

- Blanket MSP for all future projects that contain ITS Pay Items

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9

9

Why Does It Matter?

- Florida Transportation Commission (FTC)
 - Nine Members appointed by the Governor and confirmed by the Florida Senate
 - Oversight and performance monitoring of FDOT and expressway, bridge, and transportation authorities
 - In-depth evaluation and compliance review of the FDOT Tentative Work Program
 - Recommend improvements to the FDOT organization to streamline and optimize efficiency



FLORIDA
TRANSPORTATION
COMMISSION

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10

10

FTC Performance Measures

Florida Transportation Commission - Performance Measures Scorecard		
Performance Measure		Objective
Safety of the Current State System		
1	Reduction of the number of fatalities all public roads in Florida year over year.	3,191
Construction Contracts		
4	Contract time: For all construction contracts completed during the year, the percentage of those contracts that were completed within 120% of the original contract time.	80%
5	Contract cost: For all construction contracts completed during the year, the percentage of those contracts that were completed at a cost within 110% above the original contract amount.	90%
5	Contract cost: For all construction contracts completed during the year, the percentage of those contracts that were completed at a cost within 110% above the original contract amount.	90%
6	The construction contract dollars let as a percentage of the original estimated amount.	95% to 105%
7	Construction contracts let as compared to the number planned.	95%

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11

11

Construction Impacts

Original Contract Time		139			
Present Contract Time		546			
Weather Days/Holidays		74			
SA & Extensions		36			
Percent Complete Time		101.65%			
Percent Increase Time		246.04%			
Future estimated time (Days)	Weather	0 estimated days	Expected or additional LD days	0	Expected early completion
	Holidays	0 estimated days	Current days in LD	9	Pending/expected completion
Days Used	Cut Off Date	First Contract Day		Last Contract Day	
555	05/18/25	November 11, 2023		May 9, 2025	

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12

12

Construction Challenges



- Overlapping projects
 - Three different projects using the same infrastructure to connect the devices
 - Needing several redesigns
 - Causing disruptions to the signal of devices on the other projects
- Tying into future infrastructure
- Current infrastructure damaged and needing troubleshooting

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13

13

Construction Challenges

- Unclear expectations between TSM&O and CEI
 - Point of contact for questions/coordination
 - Timeline to request inspection for punchlist items
- CEI new to ITS projects unfamiliar with closeout process
 - ITSFM Training
 - Requesting Inspection



ITSFM Data Collection Forms Audit Record



Report Date: 30-Jan-25
Serving Area: Broward RTMC
Project Name: E4V22
Contractor: Horsepower Electric
County: Broward

LAST AUDIT NOTES

ITSFM1001
REV 10/23

Audit Number	GPS File Name	Submittal Date	Testing Date	Number of Forms				Submittal Results	
				Tested	Pass	Failed	Missing	Score	Pass/Fail
3	ITSFM D4 BROWARD-E4V22-V4-20-1	04/11/25	04/03/25	73	73	0	0	100%	PASS

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14

14

Construction – Lessons Learn

ITS Construction Subsystem/System Testing Timeline	
Below is an outline of the timeline commitments to System Testing that need to be considered during construction project that includes ITS/TSM&O scope. Ensure that you take into account the days noted below that are needed to complete the System Testing process. Note: this is not a concrete timetable; all projects vary in complexity.	
1. After installation of devices, perform all stand alone testing (per Spec 611-4.2)	
a. Include all devices, along with fiber/locate wire/grounding testing. See Standalone Testing Matrix below for common ITS Devices and their respective sample test for	
1-3 Days	2. After or During Step 1, integrate devices into SunGuide
	a. Request the SunGuide Integration and Inventory Template spreadsheet
	b. Once provided, fill out information and return to TSM&O
3. After all stand alone testing is completed and devices have been integrated into SunGuide, prepare for System Testing	
a. System test plans will need to be approved by the EOR (per Spec 611-5)	
i. Submit to TSM&O for concurrence when approved	
2-4 Days	b. TSM&O/SmartSunGuide Domain Accounts need to be created
	i. Request access forms for person(s) who will be conducting the in-person System Test at the TMC (typically, Contractor and CEI/Inspector)
	ii. Return completed access form and CBT Certificate of Completion via email, along with full name, email address, and what resources will be needed (i.e. SunGuide and/or SG Test Server, vendor software needs, etc.)
4. Submit System Testing Request	
a. Include all days/times that testing is anticipated to occur	
b. Will receive confirmation that there is an available workstation for testing to occur	
30 Days	5. Perform System Testing
	a. Conduct the approved 30-Day System Acceptance Test, during which all ITS Systems and Devices are evaluated from the TMC (per Spec 611-5)
	b. While the testing plan will not outline testing frequency, it is important to note that frequent testing is encouraged. While the frequency is ultimately up to the project manager, it is recommended to test twice a week at a minimum to ensure there are no unnecessarily long setbacks
	i. If at any point the systems or devices fail, you will need to add the time from the last successful test to the time of failure to the original 30 days. For example, if there is a week long gap between the last test and the failure, another week will need to be added to the test. The shorter the time between test, the lower the risk
	c. After the 30 days are complete and the test is successful, notify TSM&O and submit all produced System Test forms.

ITS Construction Subsystem/System Testing Timeline

Below is an outline of the timeline commitments to System Testing that need to be considered during a construction project that includes ITS/TSM&O scope. Ensure that you take into account the days included below that are needed to complete the System Testing process. Note: this is not a concrete timetable; all projects vary in complexity.

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 - a. Include all devices, along with fiber/locate wire/grounding testing. See Standalone Testing Matrix below for common ITS Devices and their respective sample test forms.

1-3 Days

2. After or During Step 1, integrate devices into SunGuide
 - a. Request the SunGuide Integration and Inventory Template spreadsheet
 - b. Once provided, fill out information and return to TSM&O

3. After all stand alone testing is completed and devices have been integrated into SunGuide, prepare for System Testing

- a. System test plans will need to be approved by the EOR (per Spec 611-5)
 - i. Submit to TSM&O for concurrence when approved
- b. TSM&O/SmartSunGuide Domain Accounts need to be created
 - i. Request access forms for person(s) who will be conducting the in-person System Test at the TMC (typically, Contractor and CEI/Inspector)
 - ii. Return completed access form and CBT Certificate of Completion via email, along with full name, email address, and what resources will be needed (i.e. SunGuide and/or SG Test Server, vendor software needs, etc.)

2-4 Days

4. Submit System Testing Request

- a. Include all days/times that testing is anticipated to occur
- b. Will receive confirmation that there is an available workstation for testing to occur

30 Days

5. Perform System Testing
 - a. Conduct the approved 30-Day System Acceptance Test, during which all ITS Systems and Devices are evaluated from the TMC (per Spec 611-5)
 - b. While the testing plan will not outline testing frequency, it is important to note that frequent testing is encouraged. While the frequency is ultimately up to the project manager, it is recommended to test twice a week at a minimum to ensure there are no unnecessarily long setbacks
 - i. If at any point the systems or devices fail, you will need to add the time from the last successful test to the time of failure to the original 30 days. For example, if there is a week long gap between the last test and the failure, another week will need to be added to the test. The shorter the time between test, the lower the risk
 - c. After the 30 days are complete and the test is successful, notify TSM&O and submit all produced System Test forms.

SFM Collection and Training

S Maintenance Walkthrough
ProceduresPower Service Point Transfer
Formation

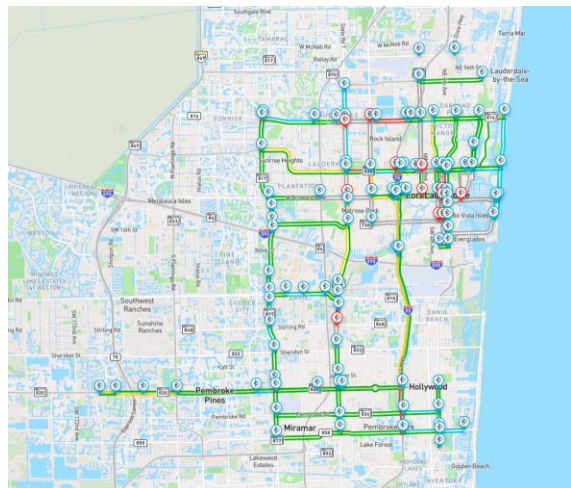
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15

15

Lessons Learned – Bluetooth

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16

16

Design Applications

3. Is there existing ITS within the project limits?

- ☐ No, go to section 4.
- ☐ Yes, continue and ensure the following two (2) pay items are included in the project:
 - a. Pay Item 102-112, Existing ITS Maintenance
 - b. Pay Item 633-6, Fiber Optic Locator
- ☐ Review plans for impacts to existing ITS, and if there are impacts, ensure (Maintenance of Communication (MOC) plans preserve the existing ITS during construction. If there are no MOC plans and/or existing ITS will be impacted, coordinate with the TSM&O Office and FDOT Design PM to address.
- ☐ Ensure ITS device coverage is equal or better than existing ITS coverage as a result of the project, i.e. are lanes being added that may affect MVDS and CCTV coverage.

6. Proprietary Products

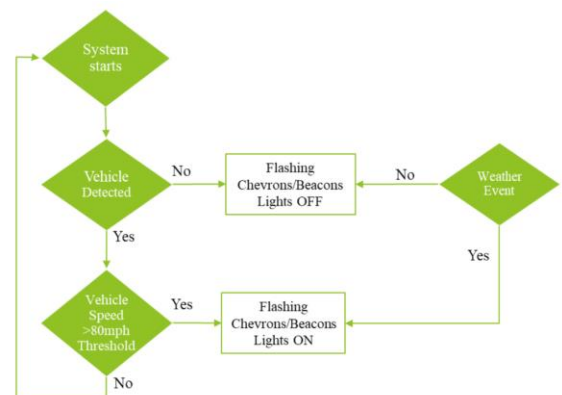
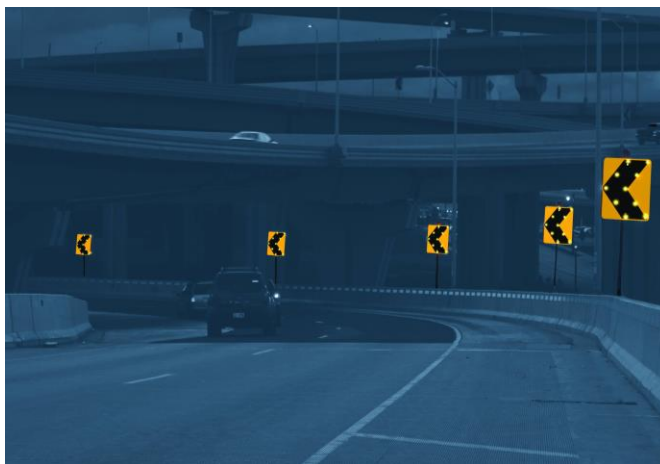
- ☐ Verify if any Proprietary Product applications need to be submitted for the project by contacting the maintaining agency concerning synchronization with their existing systems. The number of proprietary product certifications and types of ITS/Traffic Signalization devices will vary based on maintaining agency.
 - Current Proprietary Products used by the TSM&O Office include the:
 - Managed Field Ethernet Switch (MFES): Cisco IE-3300-8T2S-E equipped with IEM-3300-8T= expansion module, and PWR-IES0W-AC-L= power supply, CON-SNT-IEW213Q1 for a duration of twelve (12) months, IOT-OTHER, IOT-ROADWAYS, and 2 EA of GLC-LH-SMD=, APL #684-002-014
 - Vehicle Detector – AVI (Automatic Vehicle Identification): Iteris BlueTOAD Spectra, APL #660-027-007
- ☐ A signed proprietary product certification shall be included in the ADMIN folder of the Phase submittal, signed by both the maintaining agency and the District Design Engineer (DDE)

PHASE SUBMITTAL CHECKLIST CONSTRUCTABILITY DIGITAL DELIVERY (Version 040325)			
Please check mark either N/A or Complete for the appropriate required document. Provide any comments if necessary.			
** IF PROJECT IS AN FDOT IN-HOUSE JOB TYPE N/A			
FDPM:		DESCRIPTION / LIMITS	
STRUNG PROJECT (Y/N)?		STRUNG WITH (M):	
STATE ROAD#:		COUNTY / SECTION:	
FDOT PM:		CONSULTANT COMPANY NAME OR IN-HOUSE SECTION #:	
FDOT PM CONTACT #:		CONSULTANT COMPANY CONTACT #:	
CREATION DATE: mm/dd/yy		ENGINEER OF RECORD NAME (EOR):	
N/A	COMPLETE	.ADMIN FOLDER	PDF NAMING CONVENTION GUIDELINES
<input type="checkbox"/>	<input type="checkbox"/>	Approved Pavement Design	PavementDesignReport.pdf
<input type="checkbox"/>	<input type="checkbox"/>	Approved Access Management Plan	access_mngt_plan.pdf
<input type="checkbox"/>	<input type="checkbox"/>	Approved Bridge Hydraulic Report	BridgeHydraulicsReport.pdf
<input type="checkbox"/>	<input type="checkbox"/>	Approved Geotech Report	EXAMPLES: RoadwayGeotechReport.pdf, LightingGeotechReport.pdf
<input type="checkbox"/>	<input type="checkbox"/>	Approved Pond Siting Report	PondSitingReport.pdf
<input type="checkbox"/>	<input type="checkbox"/>	Approved Typical Section	TypicalSectionPackage.pdf
<input type="checkbox"/>	<input type="checkbox"/>	Completed ITS Project Risk Assessment Checklist (Form 750-040-06) (Required for all projects with ITS scope)	ITSRiskAssessment.pdf
<input type="checkbox"/>	<input type="checkbox"/>	Systems Engineering Project Checklist (Form 750-040-06) (Required for all high-risk ITS projects)	SystemsEngChecklist.pdf
<input type="checkbox"/>	<input type="checkbox"/>	Systems Engineering Documentation (Required for all high-risk ITS projects)	PSEMP.pdf, ConOps.pdf, ArchitectureChangeRequest.pdf, RTVM.xlsx, VerificationPlan.pdf, and ValidationPlan.pdf

17

17

Lessons Learned – System Engineering



DCWS

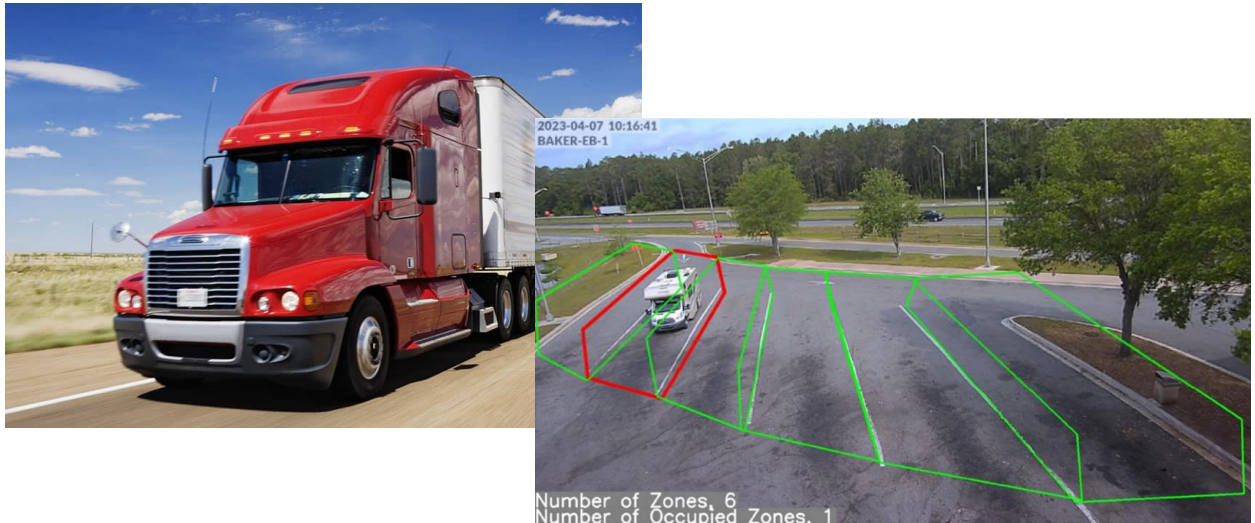
RWIS

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18

18

Further Coordination Efforts



19

19

Project Collaboration – US 27



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20

20

Safety Message



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21

21

Contact Us

Nick Slupecki, P.E.

nicholas.slupecki@dot.state.fl.us

954-847-2738

Sarely Tejeda, P.E.



sarely.tejeda@dot.state.fl.us


954-958-7685


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22

22

 June 19 - 20, 2025
 Hollywood, FL

 **TRANSPORTATION SYMPOSIUM**

 Please be sure to **certify your attendance** before leaving this event or no later than **Monday, June 30**, in order to receive PDH/CEC. Detailed instructions are available on the Transportation Symposium website.

Transportation Symposium Website

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