



I-95 CORRIDOR
COALITION

SOUTHERN HIGHWAY OPERATIONS GROUP
PRE-EXCHANGE WEBINAR

Florida DOT's Emergency Shoulder Use

January 9, 2018



Webinar & Audio Information

- The call-in phone number is: **1-xxx-xxx-xxxx & enter xxxxxx# at the prompt**
- This is a virtual meeting experience
 - ✓ Please keep your phone muted until asking a question or speaking (press *6 to mute/unmute individual phone lines)
 - ✓ Please do not place call “on hold” as your hold music will be heard by the group
- Please press *0 to speak to an operator for questions regarding audio
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- The webinar will be recorded

Welcome & Introductions





Hurricane Irma: How FDOT used Emergency Shoulder Use during the Largest Evacuation in US History

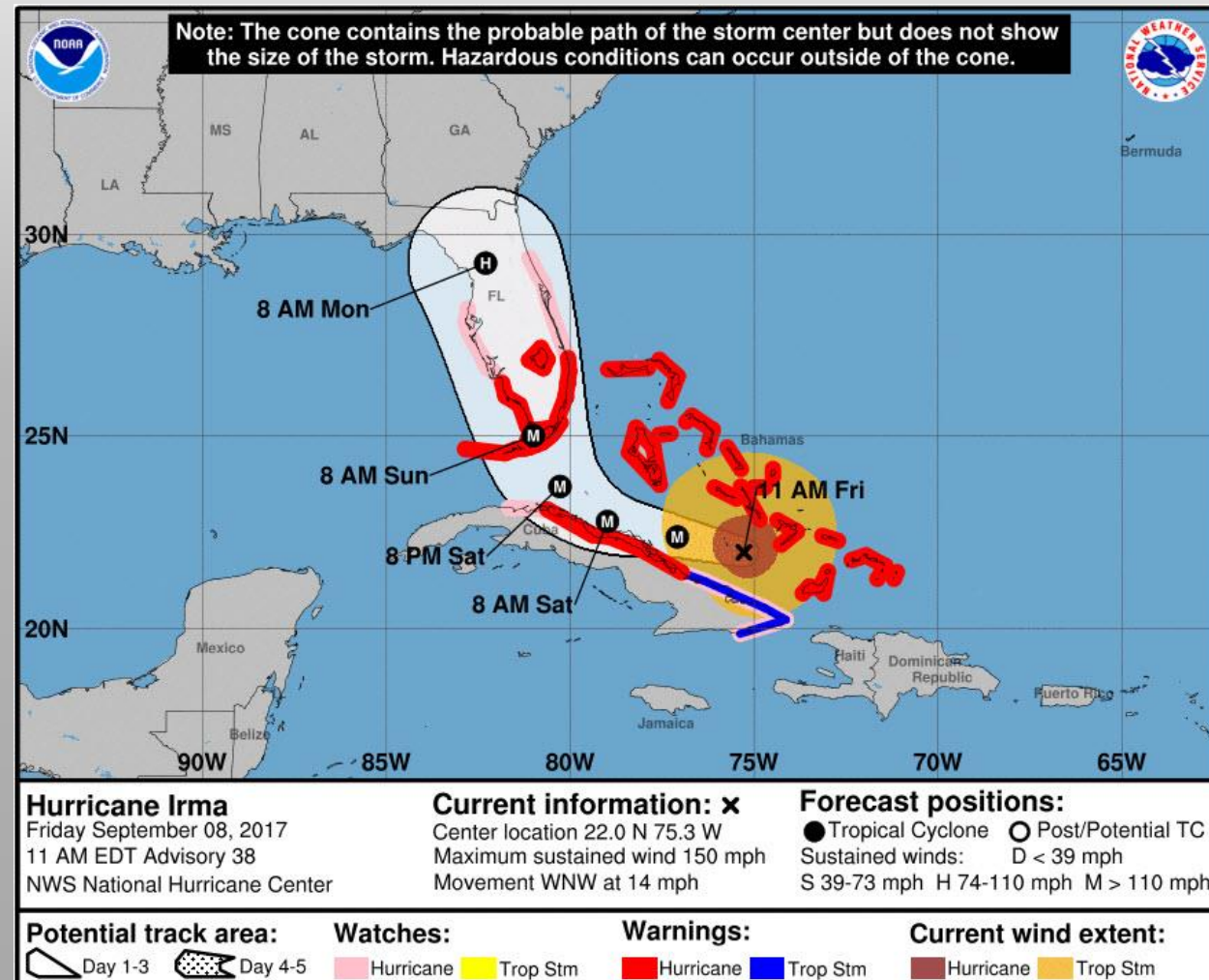
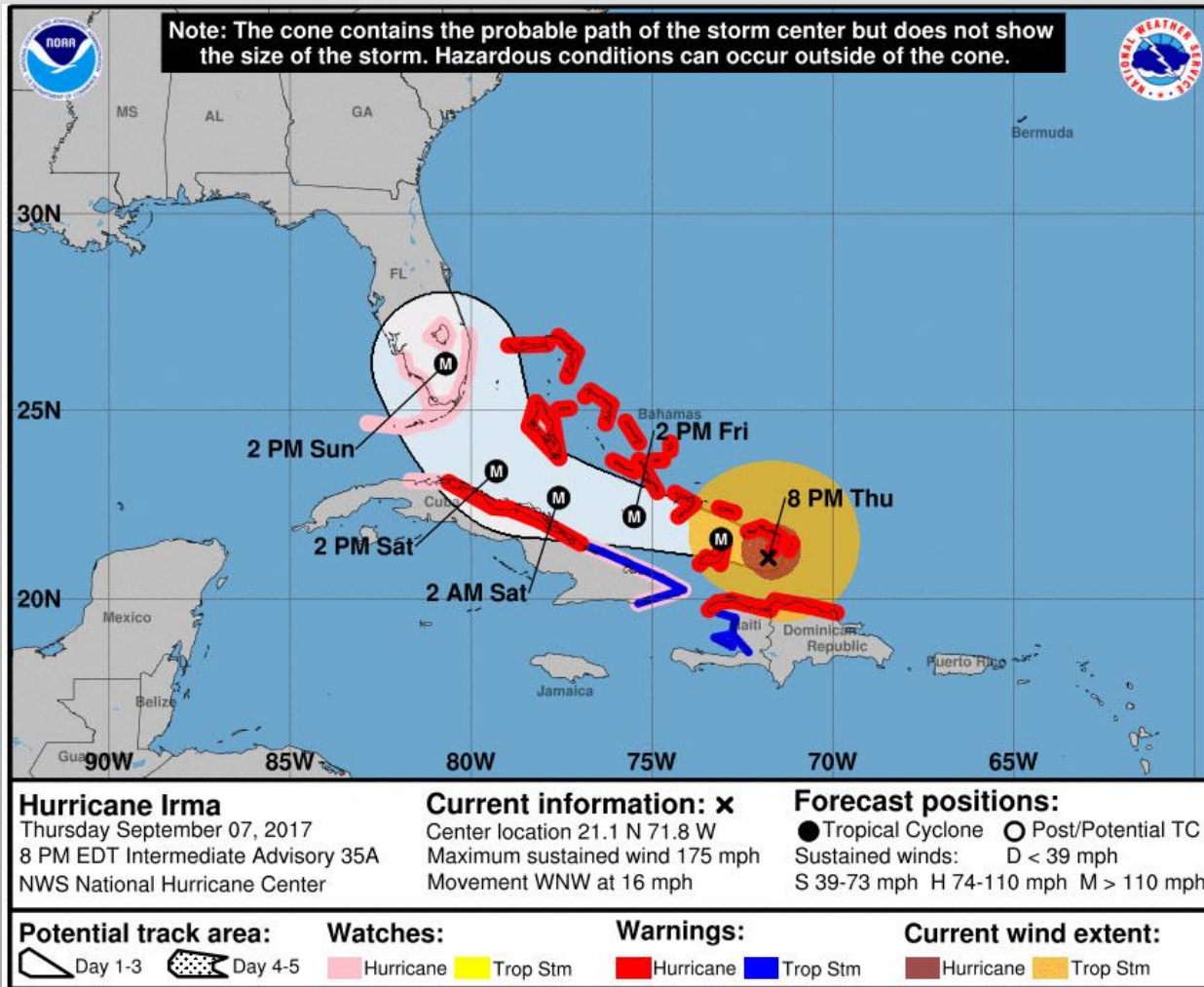
*I-95 Corridor Coalition Southern Highway
Operations Group Pre-exchange
January 9, 2018*

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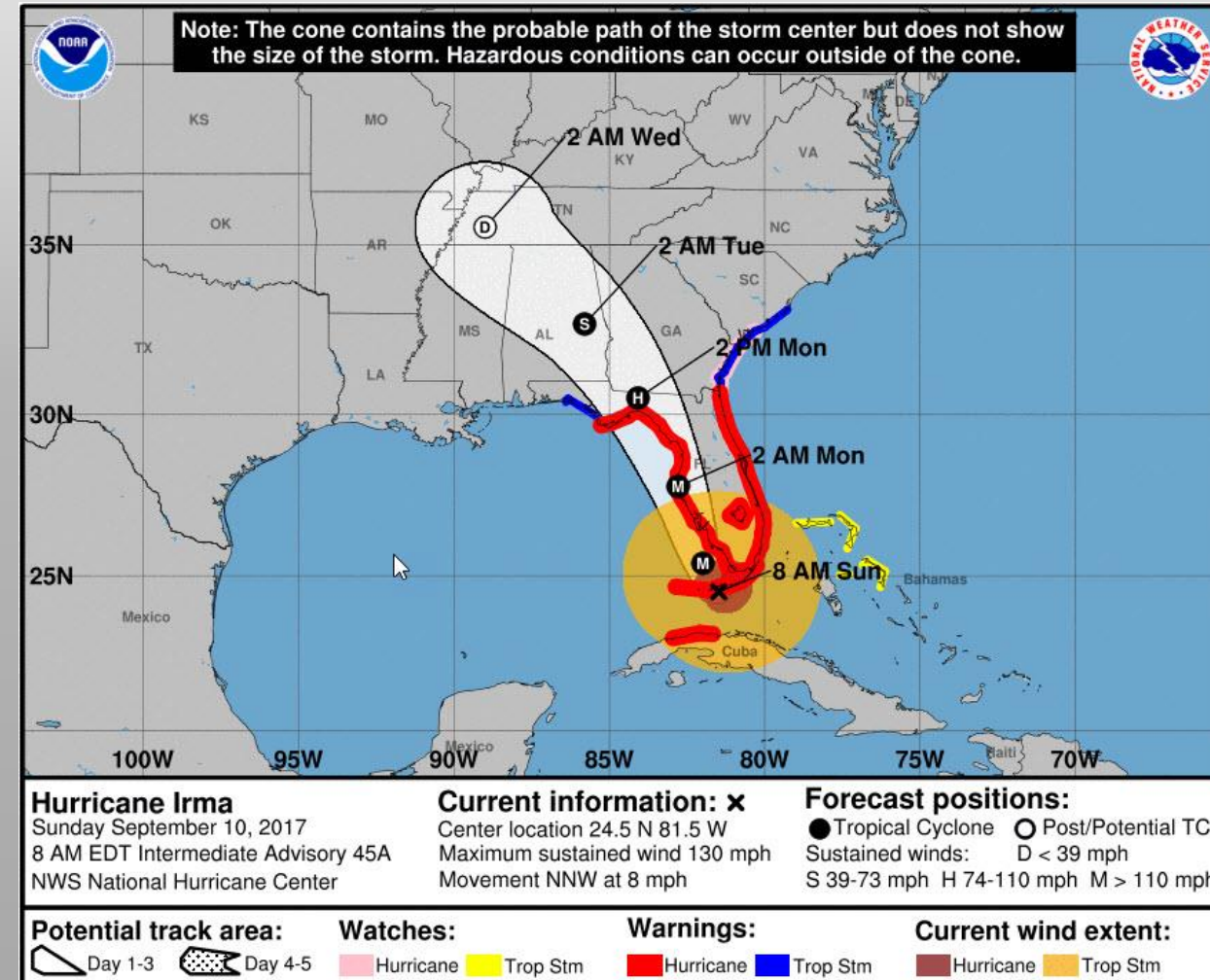
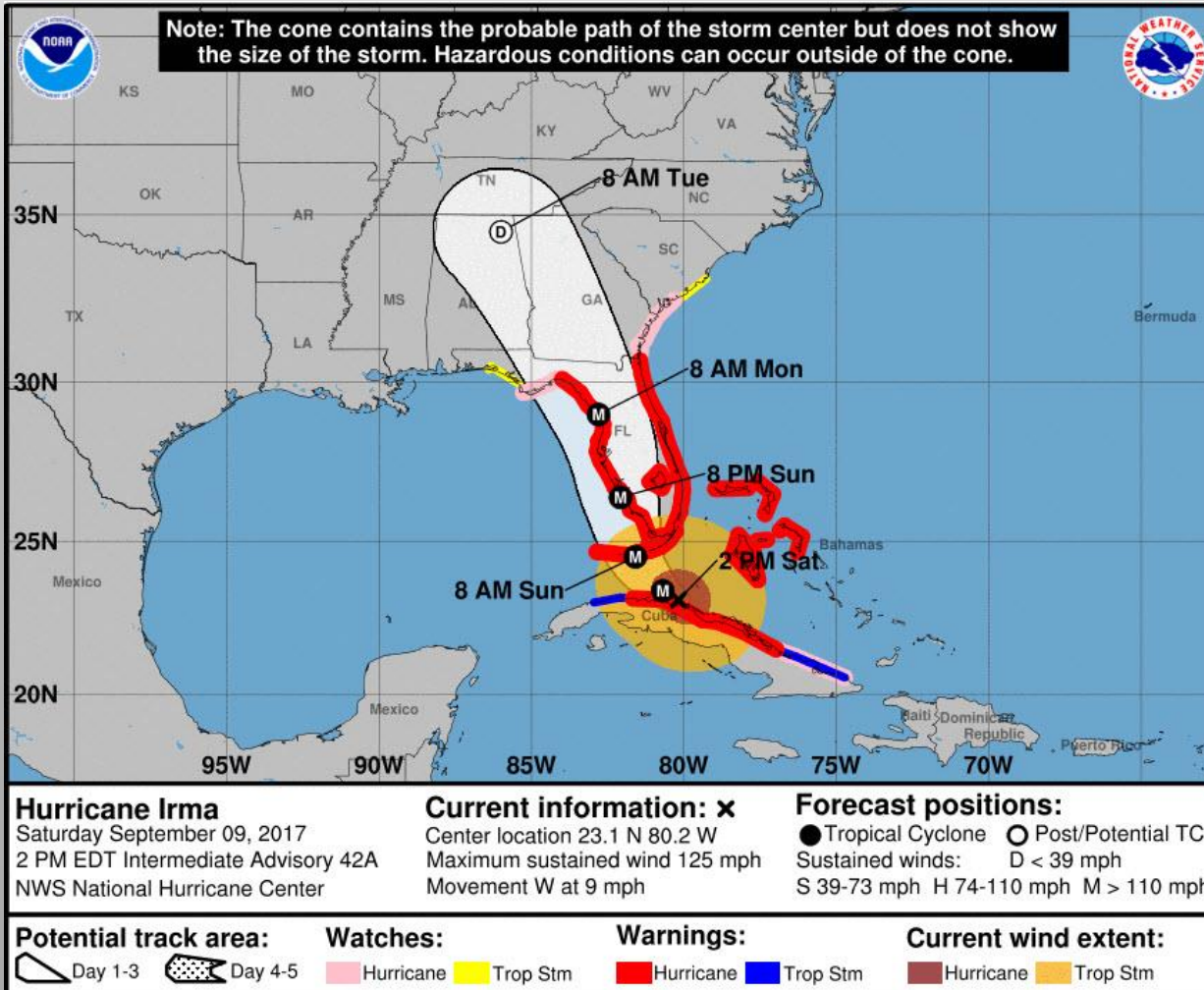


- Hurricane Irma Background
- Florida's 2017 Emergency Shoulder Use (ESU) Plans
- Traffic Modeling
- Why ESU vs. One-Way
- ESU Planning
- ESU Criteria
- ESU Benefits and Challenges
- Concept Plans
- Standard Operating Procedures
- ESU during Hurricane Irma
- Post-Irma ESU Traffic Data Analysis
- Successes
- Challenges
- After-Action Items
- Questions?

Background - Irma's Path Prediction



Irma's Path Predication Shift Westward



Irma's Path Predication Shift Westward

- Tropical Storm on August 30th
- Reached hurricane status on August 31st
- Reached Florida as a Category 4
- Landfall in the Keys and near Marco Island on September 10th



Source: The Weather Channel

Hurricane Irma (2017) and Andrew (1992)



Mandatory Evacuation

- September 4th Florida Declares State of Emergency to prepare Florida for Hurricane Irma
- Estimated 6.8 million people ordered to evacuate
- Evacuation by County

“If you have been ordered to evacuate, you need to leave now...”
- Gov. Rick Scott

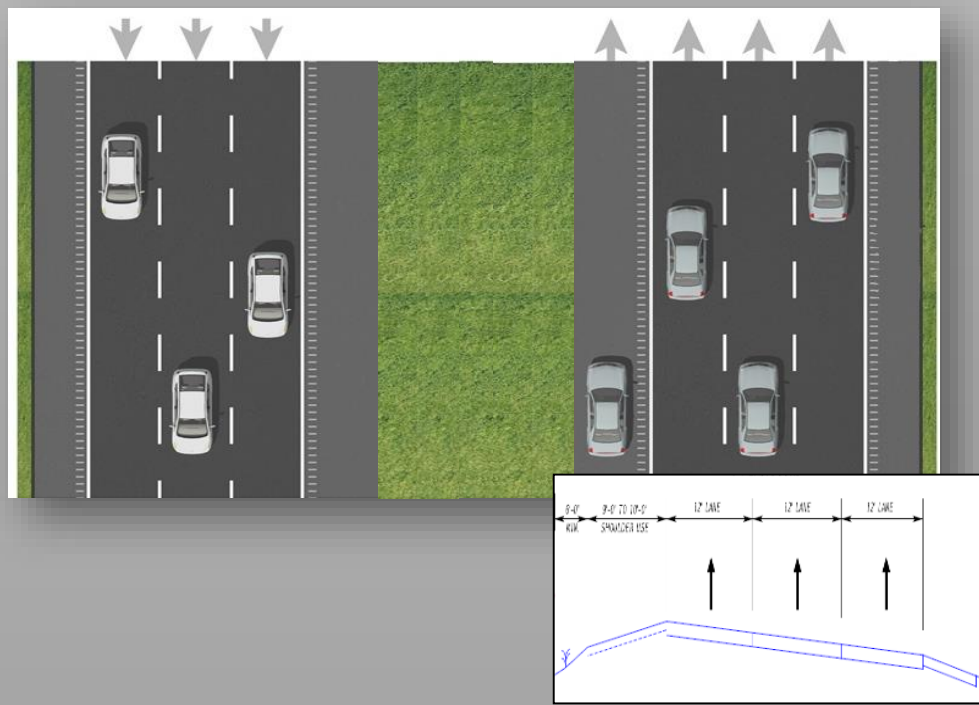


Florida's Emergency Shoulder Use 2017 Plans



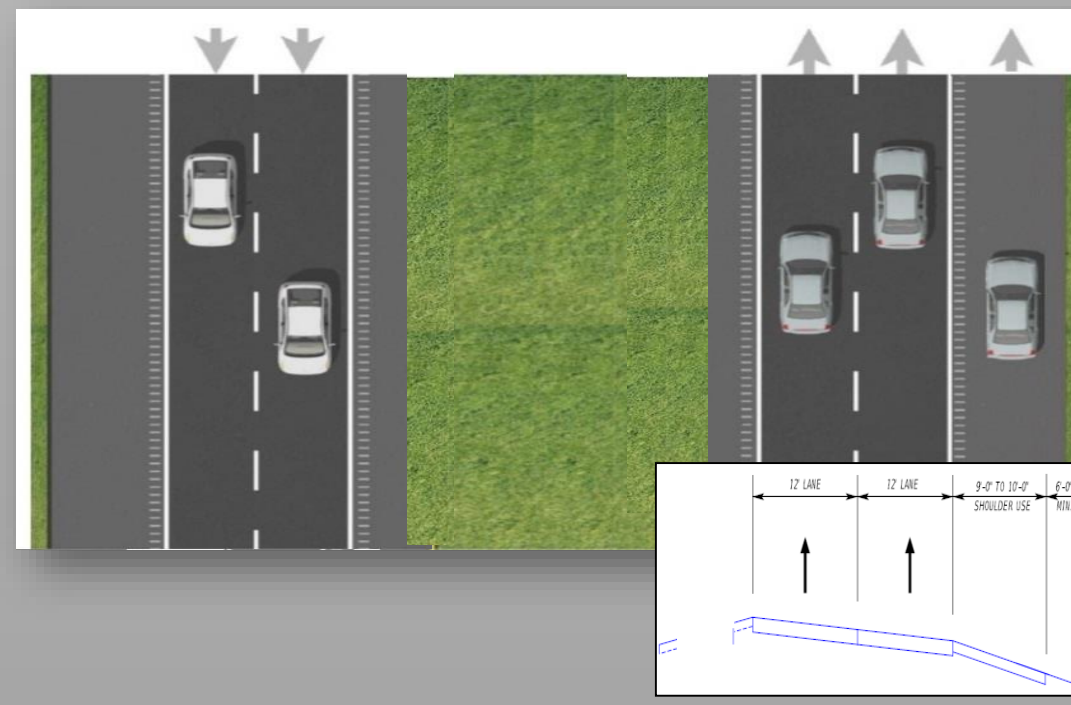
- Inside shoulder use

- I-75, Florida's Turnpike north terminus to Georgia Line (northbound)
- I-4, Tampa to Orlando (eastbound)

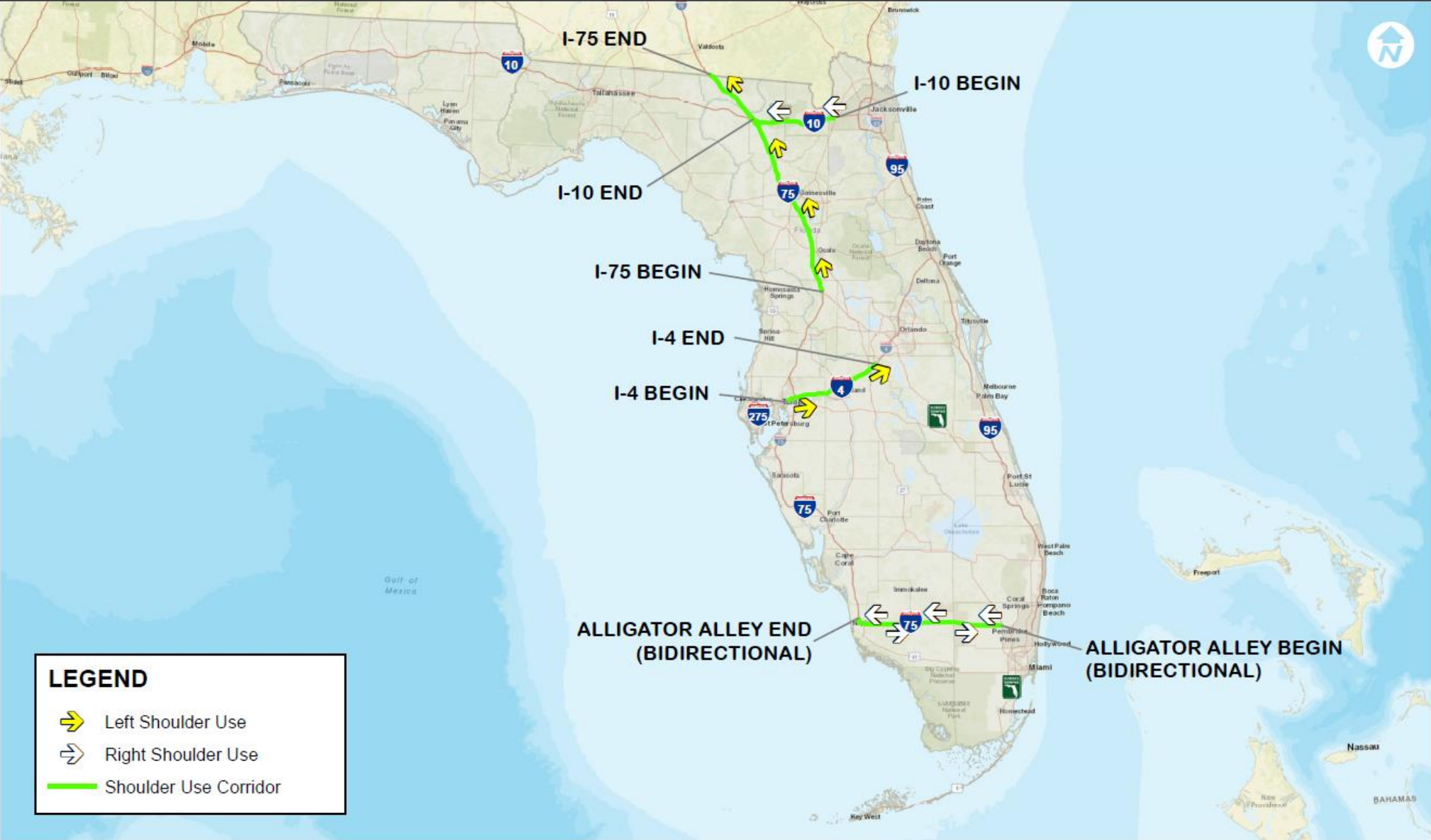


- Outside shoulder use

- I-75, Alligator Alley (eastbound and westbound depending on the storm track)
- I-10, Jacksonville to I-75 (westbound)

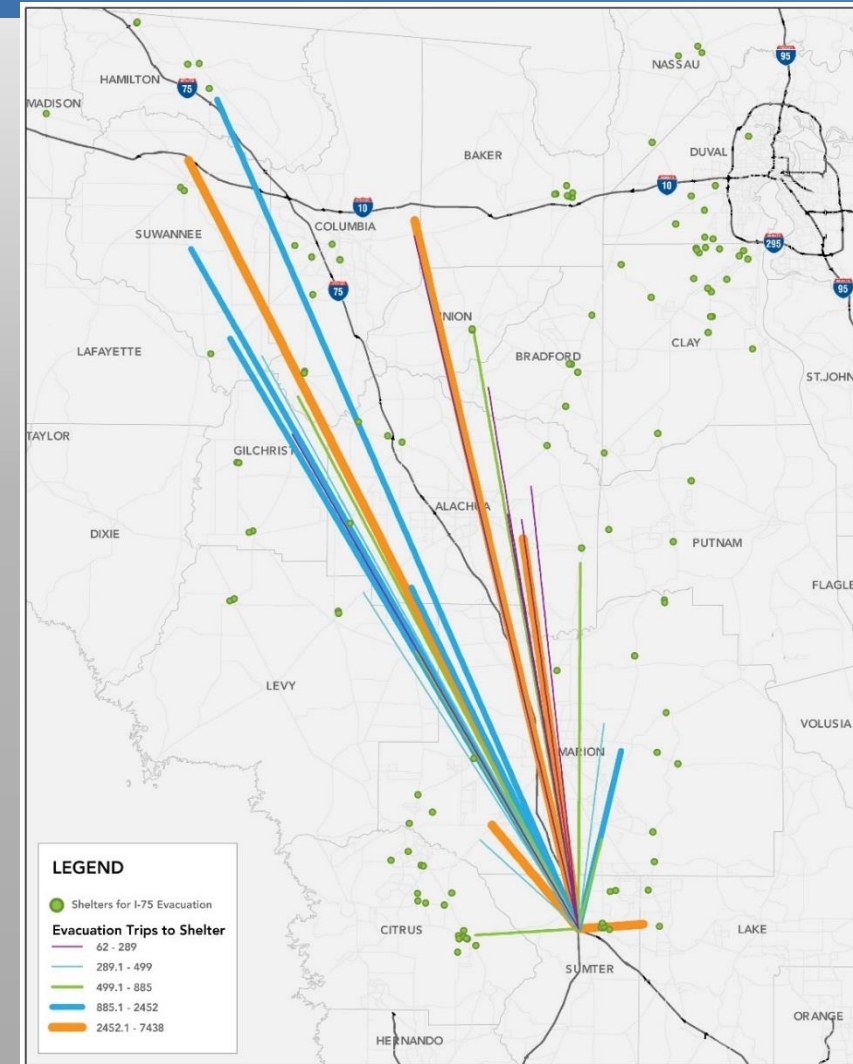


Florida's 2017 ESU Plans



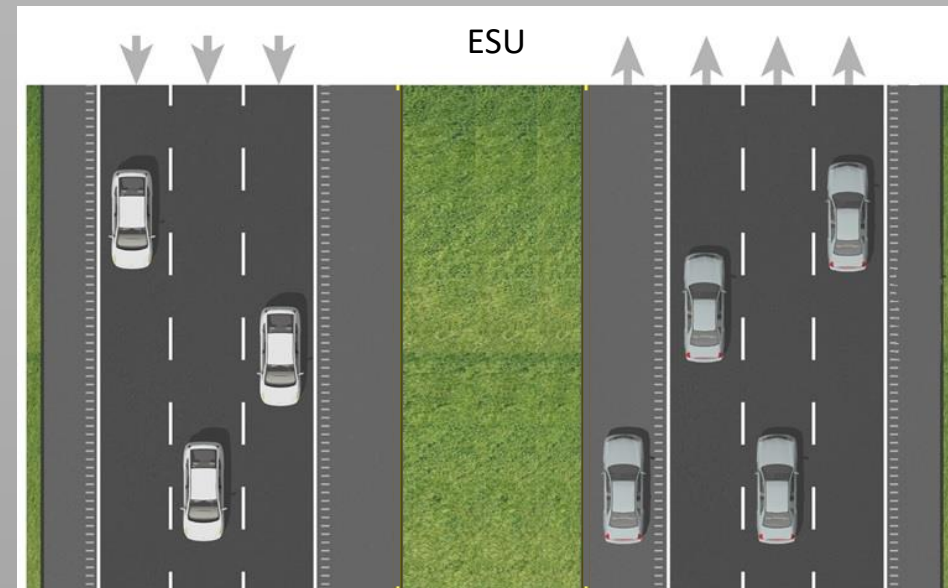
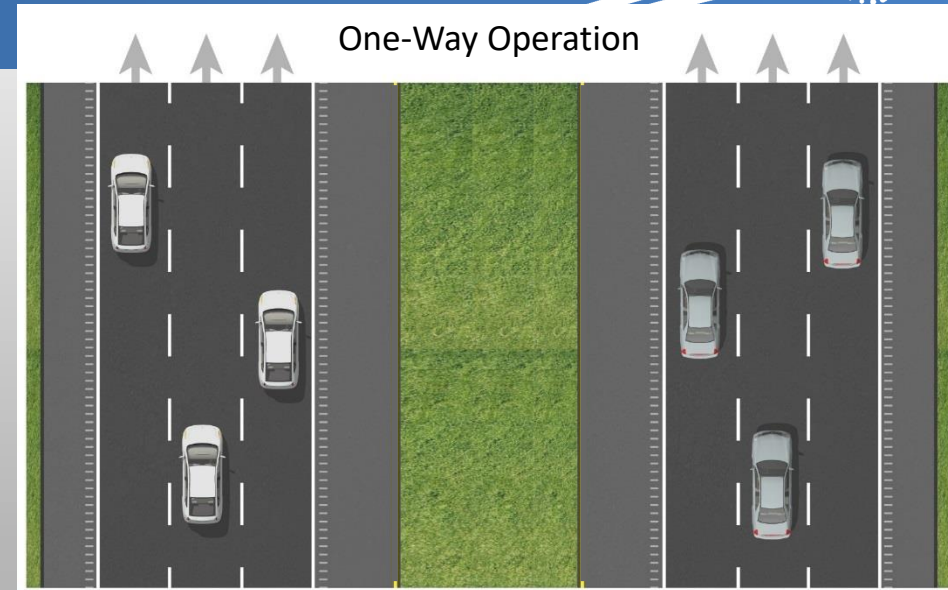
Travel Demand Modeling

- Travel demand modeling developed for I-75 and I-10
- Models developed using Transportation Interface for Modeling Evacuations (TIME) model
- Models assumed Category 5 hurricane, forcing evacuations from
 - **I-75:** Hillsborough, Pasco, Pinellas, and Manatee counties
 - **I-10:** St. Johns, Duval, Nassau, Flagler, and Clay counties
- Model compared two scenarios
 - One-way Operation
 - ESU (I-75 – left shoulder; I-10 – right shoulder)



Micro-Simulation Analysis

- Performed micro-simulation analysis using VISSIM
 - I-75 with left shoulder ESU from Florida's Turnpike to Georgia Stateline
 - I-10 with right shoulder ESU from SR 23 to I-75
 - Option: SR 23 to East of I-75 at Lenoia Way
- One-way flow is 8-hour operation
- ESU is 24-hour operation
- ESU simulation results showed better or comparable results



Why Shoulder Use Versus One-Way

- Available continuously, one-way limited to daylight hours
 - Same 24-hour capacity as one-way
- Reverse direction remained available
 - Emergency and incident response
 - Fuel delivery to evacuation areas
 - Resource staging for quick post storm response
- Easier setup/maintenance/take down
 - Used one-third the resources as One-Way
 - Easily adjustable as traffic patterns changed
 - All interchanges retained full egress/ingress

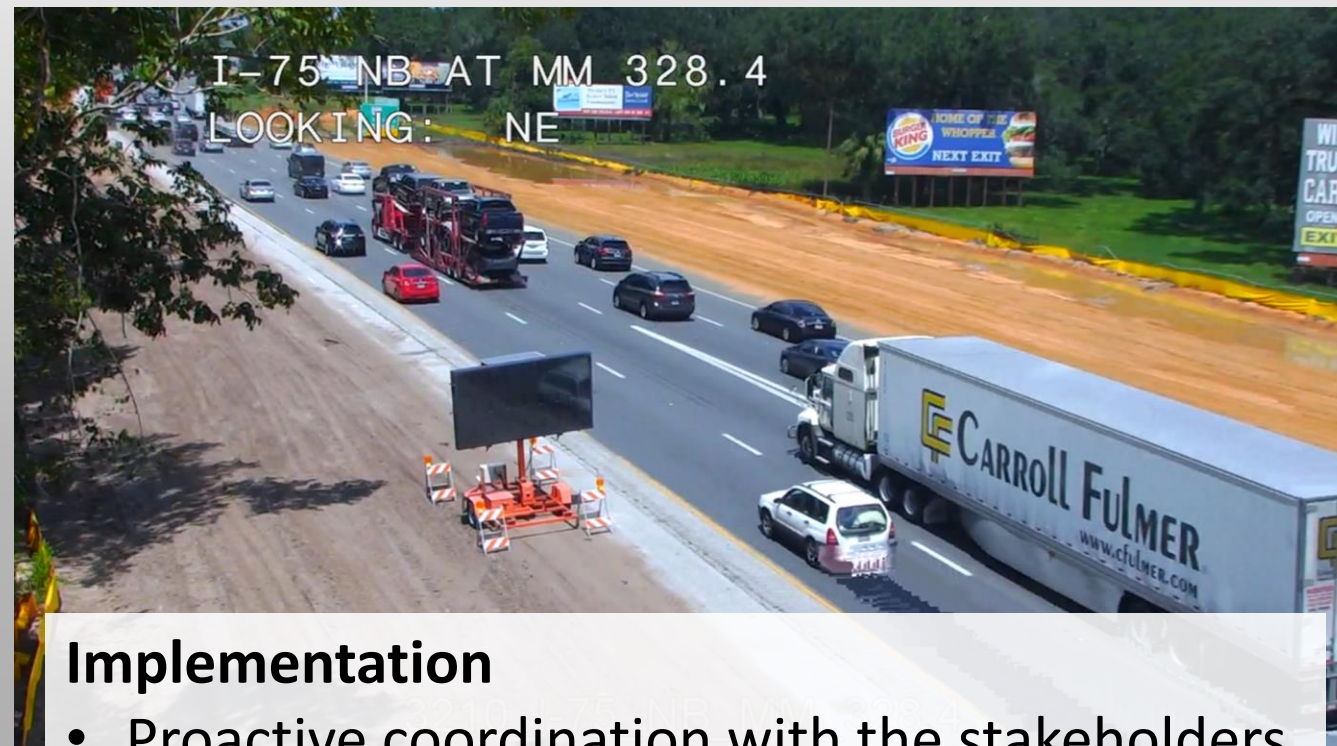


Why Shoulder Use Versus One-Way



Planning Stages

- Concept plans
- Incident management plans
- Traffic management plans
- Standard operating procedures
- Resource deployment plan
- Law enforcement deployment plan
- Field review for the shoulder width availability
- Pinch points and narrow shoulder locations



Implementation

- Proactive coordination with the stakeholders
- Remove debris from shoulder prior to use and keep shoulder debris-free
- Monitor active and upcoming construction projects
- Shelter and hotel coordination

- ESU shoulder width criteria
 - At least 10' shoulder should be available
 - Shoulder width less than 10' and greater than 9' is considered a "Narrow Shoulder"
 - Shoulder width less than 9' is considered a "Pinch Point"
- "Narrow Shoulder" treatment requires
 - Additional signing – both static and Portable Changeable Message Sign (PCMS)
- "Pinch Point" treatment
 - Pinch points will have permanent fixes. If permanent fix is not implemented prior to hurricane, a temporary traffic control plan is available
 - Terminate shoulder use upstream of the pinch point
 - Re-open shoulder use, if needed, downstream of the pinch point
 - Additional enforcement and PCMS



Benefits

- Arterial and local roads are not disrupted
- ESU is 24-hour while one-way is day-time operation
- Less resources required compared to 2014 one-way operation plan quantities
 - I-4: 126 LEOs in one-way vs. 2 in ESU
 - I-75: 31 LEOs in one-way vs. 5 in ESU
 - I-10: 58 LEOs in one-way vs. 20 in ESU
 - AA SB: 93 LEOs in one-way vs. 21 in ESU
 - FDOT staff and numerous traffic cones, barriers, signs, arrow boards compared to ESU plans
- Shorter-notice implementation and shutdown
- Flexibility to implement in sections where there is congestion
- Does not impact opposite-direction responder flow as first responders head towards the incident

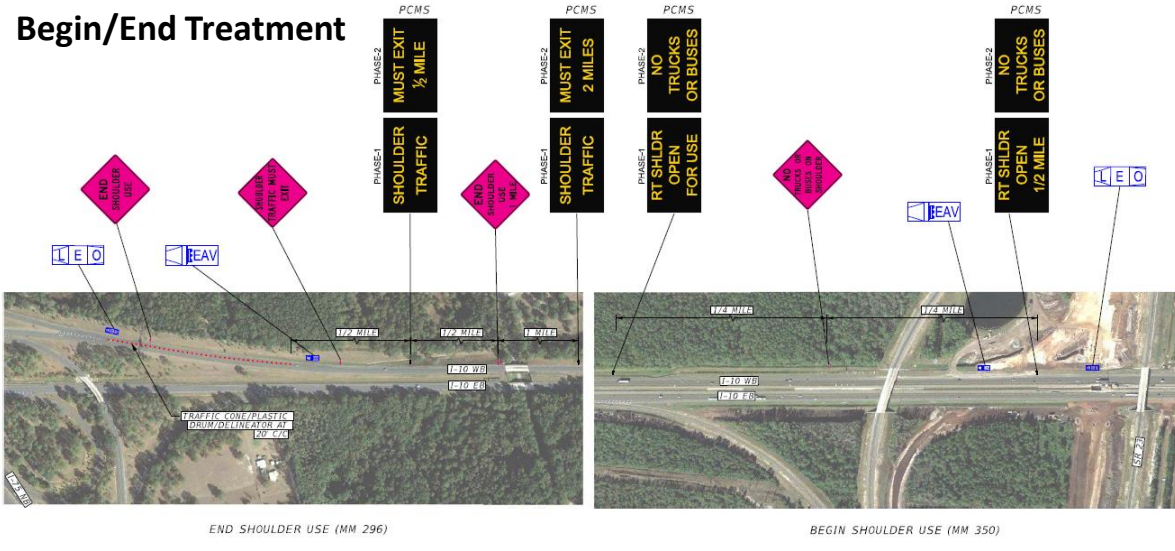
Challenges

- One of the shoulders is not dedicated to responders
 - Emergency Assistance Vehicle (EAV) and Road Rangers
- Rumble strips in travel way
 - Buses, trucks, and trailers restricted from shoulders. Speeds should be 30 MPH to 40 MPH.
- Reduced travel lane
 - Buses, trucks, and trailers restricted from shoulders. Speeds should be 30 MPH to 40 MPH.
- Shoulders need to be debris-free prior to use
 - FDOT Maintenance Standard Operating Procedures (SOPs)
- Shoulders need to be kept debris-free during operation
 - Standard Operating Procedures (SOPs)

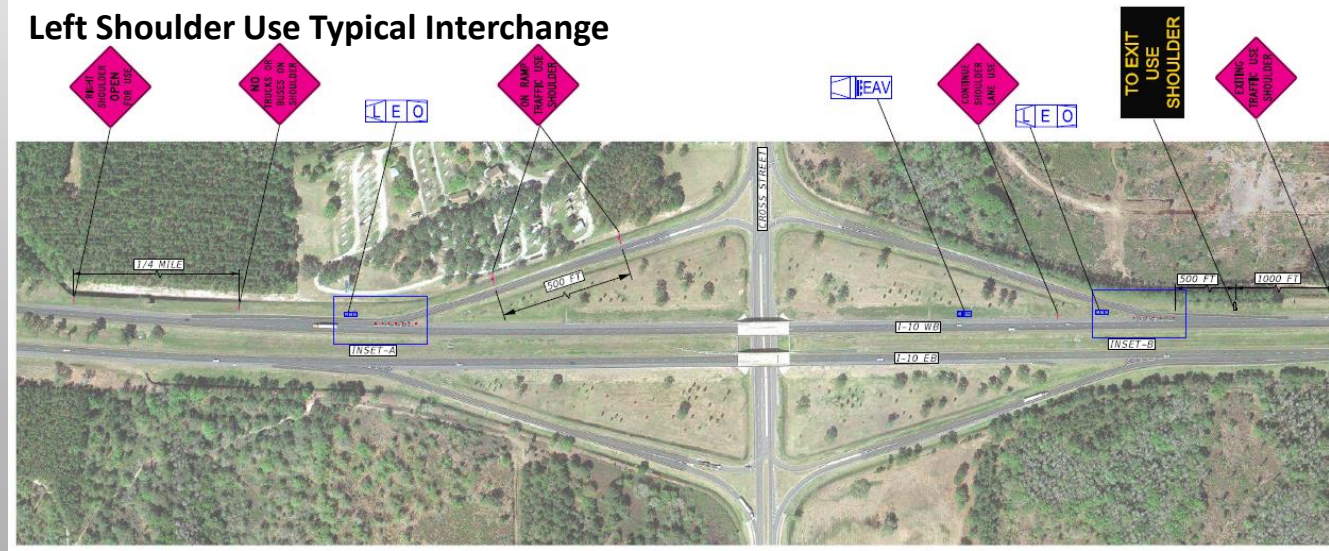
- Coordination occurred between
 - FDOT and State Emergency Operation Center
 - FDOT and Florida Highway Patrol
 - FDOT and Federal Highway Administration
 - FDOT and Georgia Department of Transportation
- Plans review comments received and addressed
- ESU plans addressed
 - Begin and end treatments
 - Interchange, rest area, and recreation area treatments
 - Narrow shoulder and pinch point treatments
 - Law Enforcement Officer (LEO) location and crossover identification
 - Sign color, type, message, location, and spacing
 - EAV locations (concept only)

ESU Concept Plan Examples

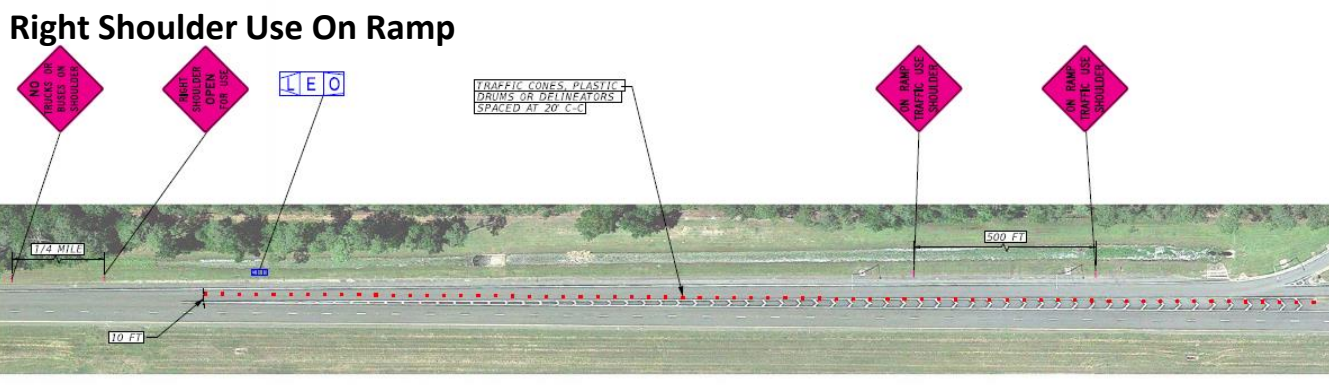
Begin/End Treatment



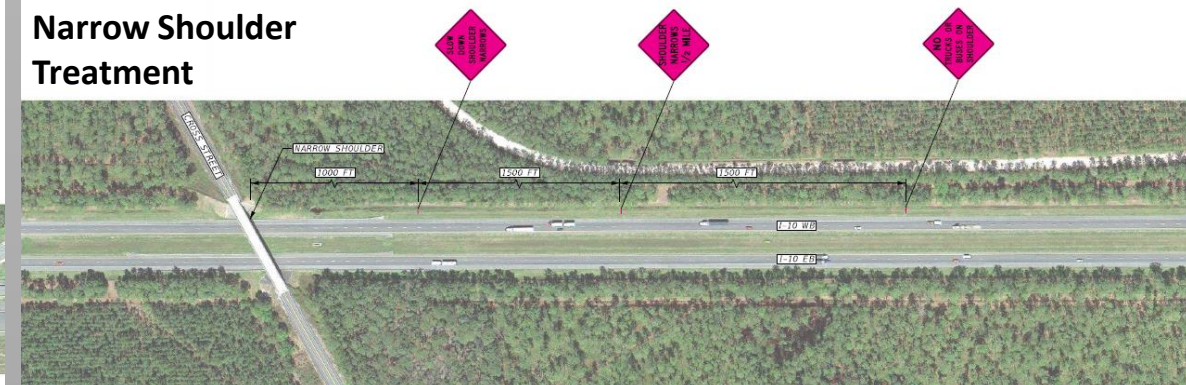
Left Shoulder Use Typical Interchange



Right Shoulder Use On Ramp



Narrow Shoulder Treatment



- Developed by Districts for each corridor
 - Living Documents
 - Coordinated effort of FDOT, Law Enforcement, and FDOT Contracting Partners
- Establish the operations required to be prepared for and to implement ESU as shown in the Concept Plans for each corridor
- Establish who, what, when, where, and how the operation will be performed
- Six primary sections
 - Organization Structure and Communication
 - Equipment List
 - Pre-Implementation Operations Under Blue Skies
 - Pre-Implementation Operations Under Pending Gray Skies
 - Implementation Operations
 - Post-Implementation Operations
- Establish the timeframes to implement once the direction to implement is provided

Emergency Roadside Assistance Services (ERAS)



- ERAS provided on all ESU corridors and supplemented by Road Ranger Service Patrols where available
- There is no Perfect Solution
- The primary goal is to keep traffic moving
- Responsibilities include
 - Relocate disabled vehicles out of travel lane
 - Provide fuel
 - Change tires
 - Perform other minor, very short-term, vehicle repairs
 - Provide transportation for disabled vehicle occupants
- Pre-event Contracts



ESU on I-75 during Hurricane Irma



- September 7th
 - ESU Implementation at 8 PM
 - I-75 from Wildwood to CR 136 north of I-10
- September 8th
 - Terminus was extended to the Georgia State Line
 - Start was extended approximately 2 miles South
- September 9th
 - ESU operation terminated at approximately 11 AM



ESU on I-75 during Hurricane Irma



- Operating Conditions
 - Heavy congestion
 - Free flow conditions in various pockets
- Statistics
 - 18 Emergency Roadside Assistance Vehicles **assisted 509** motorists
 - **Zero Fatalities**
 - Few injuries reported from crashes
 - Crashes: rear-ends and side swipes due to careless driving

ESU on I-4 during Hurricane Irma

September 9th

- Implementation at 3:00PM
- I-4 from 50th Street in Tampa to the Western Beltway (SR429) in Orlando
- ESU terminus extended to Central Florida Greenway (SR 417)
- Terminated at approximately 8PM



ESU on I-4 during Hurricane Irma



- Operating Conditions
 - Heavy congestion
 - Free flow conditions in various pockets
- Statistics
 - 6 Emergency Roadside Assistance Vehicles **assisted 26** motorists
 - **Zero Fatalities**

Emergency Shoulder Use for Evacuation



Emergency Shoulder Use Alerts



FLORIDA 511 Connect. Know. Go.

CALL 511 | TWITTER | FREE APPS | TEXT ALERTS

Home | Traffic | My Florida 511 | Construction Info | Emergency In

ALERTS Expect heavy delays on I-75 NB in Sumter and Marion counties from south of Florida's Turnpike through Ocala and into Gainesville. Please follow roadside messages for sho

Hazard On Road
I-4 E
Left shoulder open for use. - FDOT
Reported by driving79
4 h 23 min ago

Hazard On Road
Left shoulder open for use. - FDOT
Reported by driving79
4 h 29 min ago

Camera
I-75 SB @ MM 344.5

9/7/2017 9:27 PM

N/A

Message Sign
I-75 NB at MM 374.6

**LEFT SHOULDER
OPEN
FOR USE**

Sep 7 2017, 9:40 PM

Emergency Shoulder Use News Releases



FDOT News Releases

- No contraflow or one-way operation
- No other roadways currently approved for shoulder use
- Law enforcement urges motorist to use caution
- FDOT is constantly monitoring traffic flow



September 8, 2017

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Media Advisory

FDOT, FHP Implements Limited Emergency Shoulder Use (ESU) Plan for Hurricane Irma on I-75 at Wildwood to the Georgia State Line

There is no contraflow or one-way operation in use on Florida state roadways

Tallahassee - The Florida Department of Transportation (FDOT), working with the Florida Highway Patrol (FHP), has implemented a limited Emergency Shoulder Use (ESU) plan for Hurricane Irma evacuations on I-75 at Wildwood to the Georgia state line. Motorists should only use the left shoulder when directed by law enforcement and highway signs.

- There is no contraflow or one-way operation in use on Florida state roadways
- No other state roadways are currently approved for shoulder use
- Although there are heavy pockets of evacuation traffic in some areas; traffic is flowing on this section of roadway
- Law enforcement urges motorists to use caution when driving on the shoulder – right shoulder use is prohibited
- FDOT has 13 Traffic Management Centers where hundreds of DOT workers are monitoring traffic cameras 24/7 to ensure traffic flows continue and evacuations proceed without interruption.

NOTE: Contraflow blocks essential southbound lanes needed to bring supplies to shelters and families in the southern part of the state. Contraflow also inhibits emergency vehicles from reaching people in need, and removes law enforcement from critical life safety tasks.

www.fdot.gov



September 9, 2017

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Media Advisory

FDOT, FHP Implement Limited Emergency Shoulder Use (ESU) Plan for Hurricane Irma on I-4 from 50th Street in Tampa to east of SR 429/Western Beltway in Orlando

Tallahassee, Fla. - The Florida Department of Transportation (FDOT), working with the Florida Highway Patrol (FHP), has implemented a limited Emergency Shoulder Use (ESU) plan for Hurricane Irma evacuations on I-4 from 50th Street in Tampa to east of SR 429/Western Beltway in Orlando. This plan is anticipated to assist the large number of motorists evacuating from Florida's west coast. Motorists may only use the left shoulder when directed by law enforcement and highway signs.

- There is no contraflow or one-way operation in use on Florida state roadways
- No other state roadways are currently approved for shoulder use
- Although there are heavy pockets of evacuation traffic in some areas; traffic is flowing on this section of roadway
- Law enforcement urges motorists to use caution when driving on the shoulder – right shoulder use is prohibited
- FDOT has 13 Traffic Management Centers where hundreds of DOT workers are monitoring traffic cameras 24/7 to ensure traffic flows continue and evacuations proceed without interruption.

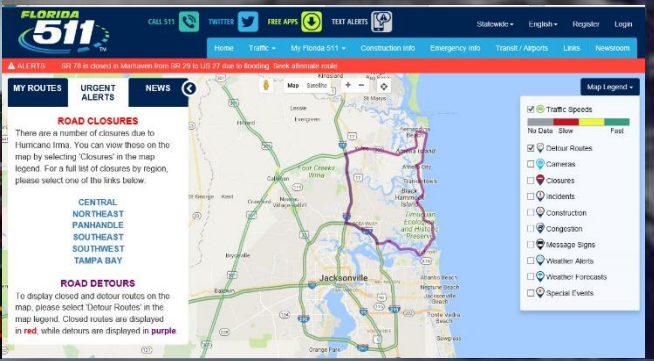
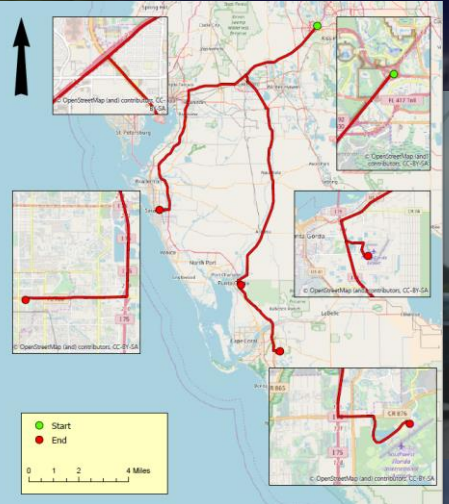
www.fdot.gov

- Largest evacuation in US history achieved with ample time before tropical storm force winds hit impacted areas
 - Unprecedented storm path up the middle of the State impacted all Districts
- Emergency Shoulder Use successfully implemented
 - I-75 from Wildwood to the Georgia State Line
 - I-4 from Tampa to Orlando
 - No traffic fatalities due to ESU
 - Emergency Response Vehicles, including out-of-state responders, were still allowed to travel opposite direction to pre-stage assets

- Pockets of free flow speeds within corridors
- Illegal use of shoulders
 - During evacuation on non-ESU corridors
 - During re-entry
- Back-up on I-75 at Georgia State Line

- Evaluate ESU feasibility and develop ESU plans/SOPs for feasible corridors
 - I-75 from Fort Lauderdale to the Georgia state line, both directions
 - I-10 from Jacksonville to I-75, both directions
 - I-95 NB from north of Palm Beach to the Georgia State Line
 - Turnpike Mainline from Fort Pierce to Wildwood (re-evaluation from last year)
- Coordinate further with the GDOT regarding potential ESU plans on I-75 and/or I-95 in South Georgia
- Using the available actual traffic counts and actual observations from the Hurricane Irma evacuation, validate the previous I-75 model

- Perform a crash analysis of the I-4 ESU and I-75 ESU operation during Hurricane Irma
- To assist in traffic management along ESU corridors, identify any gaps in ITS coverage
- To assist in incident management along ESU corridors, identify any gaps in Road Ranger Service Patrol coverage
- Consider adding additional traffic count stations along ESU routes and including shoulder lane
- Review ongoing and planned construction projects along ESU routes
- Review ESU flip-up sign specifications for potential improvements



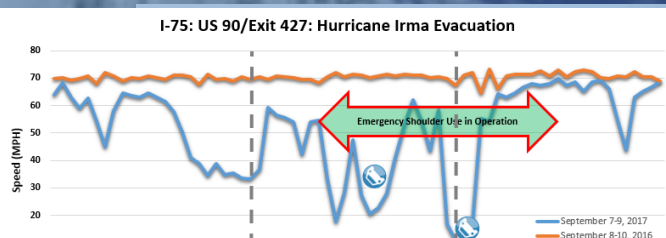
FPL Deployment Route

RT SHLDR
OPEN
FOR USE



Turnpike in St. Lucie Co. [N of Ft. Pierce/SR 70 MP 153]

Date	Time (EDT)	North-Bound			NB % Increase	South-Bound			SB % Increase
		Speed	*VPH	*Hist VPH		Speed	*VPH	*Hist VPH	
9/7/2017	2pm-3pm	60	2288	971	135.6%	76	547	809	-32.4%
9/7/2017	3pm-4pm	49	2590	982	163.7%	76	488	786	-37.9%
9/7/2017	4pm-5pm	57	2052	910	125.5%	77	459	872	-47.4%
9/7/2017	5pm-6pm	69	1904	812	134.5%	76	455	834	-45.4%
9/7/2017	6pm-7pm	70	1894	701	170.2%	77	411	688	-40.3%



Updated 09/09/2017 10:59:20

Report Time	Avg Speed	Avg Deg	Avg Dir	Gust	Gust Dir	AT/W2	RP
10:12:54	6	13	N	23	N	N/M	M
10:41:29	23	7	N	81	N	N/M	M
10:12:14	22	23	NE	55	N	N/M	M
10:56:41	18	18	N	58	N	N/M	M
10:56:27	31	21	N	75	N	N/M	M
10:07:04	19	18	N	51	N	N/M	M
10:44:33	14	32	NE	37	NE	N/M	M
10:51:31	12	7	N	36	N	N/M	M
10:56:34	37	355	N	81	N	N/M	M
10:26:24	27	55	NE	57	NE	N/M	M



Contact Information

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**I-95 CORRIDOR
COALITION**

Thank You!